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# Opossums

***(Common Chuchas) Marmosas and  
Colicortos in Colombia***



**Fundación Zarigüeya – FUNDZAR**

**Francisco Javier Flórez Oliveros  
Carolina Vivas Serna**

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***“It was only a possum similar to one hundred thousand others. But I protected her, took care of her and kept her, now she is unique and special in the world! ;she is my friend!”***

***Taken and adapted from The Little Prince (Le Petit Prince, 1943), Antoine de Saint-Exupéry.***



To my father Arquimedes Olivero Gaitán, to my mother Carmen Rosa Rico Fierro, to my brother Hugo Fernando Olivero, to my children Tito and Tara, all of them R.I.P. To the Tito's (Aldo, Canela, Lupita and Chicharita) the best flowers of my harvest ¡I love them!

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# Content

<b>Presentation</b> .....	15
<b>The Zarigüeya Foundation – Fundzar</b> .....	23
<b>Introduction</b> .....	27
<b>Chapter 1: Colombia in the global context of biodiversity</b> .....	29
<b>Chapter 2: The role of the environmental authority in biodiversity conservation</b> .....	33
<b>Chapter 3: Biology, Ecology and Taxonomy of Marsupials (order Didelphimorphia)</b> .....	36
Age of newborns and cubs of possum or common chucha <i>Didelphis marsupialis</i> and <i>D. pernigra</i> based on morphological and ethological parameters .....	45
Some morphological characteristics of the species <i>Didelphis marsupialis</i>	
The marsupio .....	49
The breasts, nipples or tits. ....	49
The prehensile tail .....	50
The opposable thumb .....	51
Puppies or neonates .....	53
The fur .....	55
The vibrissas .....	57
<b>Chapter 4. Some species of Didelphimorphia species (Didelphidae) in Colombia</b> .....	58
<b>Genus <i>Didelphis</i></b> .....	60
<i>Didelphis marsupialis</i> .....	63
<i>Didelphis pernigra</i> .....	65
<b>Genus <i>Chironectes</i></b> .....	65
<i>Chironectes minimus</i> .....	65
<b>Genus <i>Caluromys</i></b> .....	69
<i>Caluromys lanatus</i> .....	69
<i>Caluromys derbianus</i> .....	72
<b>Genus <i>Metachirus</i></b> .....	75
<i>Metachirus nudicaudatus</i> .....	75
<b>Genus <i>Philander</i></b> .....	78



<i>Philander opossum</i> .....	79
<i>Philander opossum</i> .....	82
<i>Philander andersoni</i> .....	85
<b>Genus Marmosa</b> .....	87
<i>Marmosa xerophila</i> .....	89
<i>Marmosa robinsoni</i> .....	91
<i>Marmosa lepida</i> .....	94
<i>Marmosa regina</i> .....	96
<i>Marmosa murina</i> .....	99
<i>Marmosa demerarae</i> .....	101
<i>Marmosa alstoni</i> .....	104
<b>Genus Marmosops</b> .....	105
<i>Marmosops caucae</i> .....	108
<i>Marmosops handleyi</i> .....	110
<i>Marmosops chucha - Marmosops magdalenae</i> .....	111
<i>Marmosops fuscatus</i> .....	117
<b>Genus Monodelphis</b> .....	113
<i>Monodelphis adusta</i> .....	117
<i>Monodelphis brevicaudata</i> .....	119
<b>Genus Gracilinanus</b> .....	121
<i>Gracilinanus dryas</i> .....	125
<i>Gracilinanus emiliae</i> .....	132
<i>Gracilinanus marica</i> .....	126
<b>Genus Glironia</b> .....	127
<i>Glironia venusta</i> .....	128
<b>Genus Lutreolina</b> .....	131
<i>Lutreolina crassicaudata</i> .....	132

<b>Chapter 5: Didelphis Genus in América</b> .....	136
<i>Didelphis marsupialis</i> .....	137
<i>Didelphis virginiana</i> .....	138
<i>Didelphis albiventris</i> .....	140
<i>Didelphis pernigra</i> .....	143
<i>Didelphis aurita</i> .....	144
<i>Didelphis imperfecta</i> .....	146

<b>Chapter 6. The role of the possum or common chucha in scientific research in Colombia and America</b> .....	148
<i>Brazilian Possums</i> .....	148
<i>Some anatomical features of the Didelphis</i> .....	152



<b>Chapter 7: Diet in wildlife of opossum or common chucha</b>	157
Where was this study conducted?	157
What do they eat?	158
What is its importance in ecosystems?	159
<b>Chapter 8: Run over</b>	161
<b>Chapter 9: Anthropocentric view of the possum or common chucha</b>	170
Regarding to history:	170
Regarding to Myths:	171
Regarding to common names in Colombia and America:	172
Regarding folklore:	174
Regarding Urban Tribes:	176
Regarding zodiac signs:	179
Regarding to legends:	182
Tlacuache legend and the fire of gods:	182
Tlacuache legend in the Mexican Culture:	183
Regarding the tales:	184
Coyote and Tlacuache, (In Coyotl huan in Tlacuatl)	184
<b>Chapter 10: First aids ABC</b>	188
Recommendations and considerations:	188
Directory of Environmental Authorities in Colombia	191
Ministerio de Medio Ambiente, y Desarrollo Sostenible, MADS	191
Environmental Urban Units	191
SDA – Secretaría Distrital de Ambiente – Bogotá	191
AMVA – Área Metropolitana del Valle de Aburrá – Medellín	192
DAGMA – Departamento Administrativo de Gestión del Medio Ambiente – Cali	192
DAMAB – Departamento Técnico Administrativo del Medio Ambiente de Barranquilla	192
DADMA – Departamento Administrativo Distrital del Medio Ambiente de Santa Marta	192
EPA – Establecimiento Público Ambiental – Cartagena	192
Corporación Autónoma Regional del Alto Magdalena – CAM	192
Corporación Autónoma Regional de Cundinamarca – CAR	193
Corporación Autónoma Regional de Risaralda – CARDER	193
Corporación Autónoma Regional del Canal Del Dique – CARDIQUE	193
Corporación Autónoma Regional de Sucre – CARSUCRE	193
Corporación Autónoma Regional de Santander – CAS	193
Corporación Autónoma Regional para la Defensa de la Meseta de Bucaramanga – CDMB	193
Corporación Autónoma Regional del Centro de Antioquia – CORANTIOQUIA	193
Corporación Autónoma Regional de las Cuencas de los Ríos Negro y Nare – CORNARE	193

Corporación Autónoma Regional del Magdalena – CORPAMAG..... 194

Corporación Autónoma Regional de Boyacá – CORPOBOYACA..... 194

Corporación Autónoma Regional de Caldas – CORPOCALDAS ..... 194

Corporación Autónoma Regional del Cesar – CORPOCESAR..... 194

Corporación Autónoma Regional de Chivor – CORPOCHIVOR..... 194

Corporación Autónoma Regional de La Guajira – CORPOGUAJIRA..... 194

Corporación Autónoma Regional del Guavio – CORPOGUAVIO..... 194

Corporación Autónoma Regional de Nariño – CORPONARIÑO ..... 194

Corporación Autónoma Regional de la Frontera Nororiental – CORPONOR ..... 195

Corporación Autónoma Regional de la Orinoquia – CORPORINOQUIA..... 195

Corporación Autónoma Regional del Tolima – CORTOLIMA..... 195

Corporación Autónoma Regional del Atlántico – CRA..... 195

Corporación Autónoma Regional del Cauca – CRC ..... 195

Corporación Autónoma Regional del Quindío – CRQ ..... 195

Corporación Autónoma Regional del Sur de Bolívar – CSB..... 195

Corporación Autónoma Regional del Valle del Cauca – CVC ..... 195

Corporación Autónoma Regional de los Valles del Sinú y del San Jorge – CVS..... 196

Corporaciones Autónomas Regionales para el Desarrollo Sostenible..... 196

Corporación para el Desarrollo Sostenible del Norte y el Oriente Amazónico – CDA..... 196

Corporación Autónoma Regional para el Desarrollo Sostenible del Chocó –  
CODECHOCO ..... 196

Corporación para el Desarrollo Sostenible del Archipiélago de San Andrés, Providencia  
y Santa Catalina – CORALINA..... 196

Corporación para el Desarrollo Sostenible del Área de Manejo Especial de La Macarena  
– CORMACARENA ..... 196

Corporación para el Desarrollo Sostenible del Sur de la Amazonia – CORPOAMAZONIA.... 197

Corporación para el Desarrollo Sostenible de La Mojana y El San Jorge –  
CORPOMOJANA..... 197

Corporación para el Desarrollo Sostenible del Urabá – CORPOURABA..... 197

Corporación Autónoma Regional del Río Grande de la Magdalena – CORMAGDALENA..... 197

**Chapter 11: Chuchas for Colombia and the world** ..... 198

**Chapter 12: A chucha for eternity** ..... 217

**Chapter 13: In summary** ..... 219

**Glossary**..... 220

**References**..... 240



# Presentation

Once again, and thanks to the authors' request, I am pleased to present this guide focused on the dissemination of knowledge associated with opossums and their protection in Colombia. The authors' decision to increase the existing information on these species has led to the incorporation of new colleagues and specific topics, expanding the coverage of the first edition. As a first consequence, the volume has been increased to a little more than triple the pages and the information has been updated in a remarkable way. As on the previous occasion, the effort to continue consolidating data that contribute to the understanding of the natural history of a group of mammals that have traditionally been little or not appreciated, but that at the same time are representative of Colombia and the Neotropics and should be highlighted. Their relevance is such that, as one of the sections of this guide appropriately expresses, they are widely represented in Latin American stories and legends.

It is pertinent to say that **OUR** possums are native to this region and that their origin dates back to the last 30-50 million years, and that their evolutionary process has become more than 100 current species. Much of the little appreciation that is held of them, is based on erroneous anthropocentric appreciations of their customs and ways of life, possums being neither more nor less dangerous or clean than any other individual in wildlife. Furthermore, it is often forgotten that, like all living organisms with which we coexist, they provide important services to the ecosystem, including their role as dispersers, pest controllers (insects and small vertebrates), and even as prey to other larger animals (raptors and carnivores).

For those interested in some basic aspects of their biology, more information is presented in new sections, seeking to better appreciate the incredible diversity of this group, in Colombia and Latin America. Although it is a very dynamic field due to the volume of information that is permanently created through a wide network of researchers, an attempt has been made to update the list and distribution of the members of this interesting group of mammals. Likewise, their conservation status is indicated, following the categorization used by the International Union for Conservation of Nature (IUCN).

A central component to this book continues to be that of their vulnerability due to various human activities that can negatively affect the abundance of certain species that live with us in the city and its periphery. From the various studies carried out in countries such as Mexico, Brazil and Colombia, the impact rates for urban and peri-urban fauna due to collisions on main and minor roads are detailed, and how a technical evaluation of this problem could provide

simple solutions in the short term. term. In addition to this, the sections on the handling of animals affected by this problem have been expanded, including additional information on contacts in environmental corporations, in order to facilitate the completion of the fauna recovery process and ensure that they can be returned. to its natural environment with the least possible damage.

This point reinforces the commitment of the corporations and the authors to make an adequate management of this problem and work together in the valuation of this and other native species.

I congratulate the authors of this guide for their important effort, I trust that the positive effect will continue to spread so that new works continue contributing in this same line and the importance of urban biodiversity is recognized, so that we all collaborate in its active protection and conservation.



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**T**he municipality of Envigado, in the department of Antioquia, through the Secretariat of Environment and Rural Development, has led policies such as planning use of municipal land, guiding its occupation and sustainable management from its potentialities, ensuring its environmental management, optimizing its productivity and the prevention and mitigation of risks, aiming for the sustainability of the hydric resource, improving, recovering and conserving the offer in quality and quantity required to meet social and environmental demands, based on the scientific knowledge that allows its identification, quantification, evaluation and administration, placing this resource as the structuring axis of the development of environmental culture processes in the municipality.

The municipality decided to strengthen, with solid strategies, the conservation of natural ecosystems threatened by different anthropic causes, especially in the environment of the metropolitan region of Aburrá's Valley, betting as municipal innovation since 2011 to the conservation of the territory, with the profiling of a strategic project based on the figure of protected areas, which was developed until then mainly at the national, departmental and regional levels; however doing analogy of existing experiences and with a legal basis in Decree 2372 of 2010, the municipality defined that at the local level, protected areas would be a high impact system in the conservation of strategic ecosystems, biodiversity and goods and environmental services derived from them. The process then started with the Municipal Council Agreement No. 010 of 2011, through which notable changes to the Plan of Territorial planning in force.

The municipality, in order to build the conservation process and the obligation to define a SILAP (local system of protected areas) in said POT, made evident the importance supported by the knowledge tool of the local diversity of fauna groups, so in this way, important species of fauna and flora were identified (more than 600 species) including 4 felines, carnivores, birds, marsupials such as possums and others included in the threatened, charismatic, rare or similar list.

This is how today we are linked in the publication of this work, which will help not only the conservation of the opossum, but also, will create environmental awareness around that important natural resource called wildlife that lives in our forests and urban settings.



#### **MUNICIPALITY OF ENVIGADO**

Secretary of Environment and Rural Development  
Envigado - Colombia



**T**he Regional Autonomous Corporation of the Río Negro and Nare Basins - CORNARE, as well as the other Regional Autonomous Corporations (CARs) of Colombia, aims at the execution of environmental policies, plans, programs and projects and renewable natural resources, as well as compliance and timely application to current legal provisions on their administration, management and exploitation, in accordance with the regulations, guidelines and guidelines issued by the Ministry of Environment and Sustainable Development (MADS). In this way, working on the purpose of caring for and conserving our wildlife is articulated with the function as an Environmental Authority and is part of our daily work, where the protection of biodiversity is one of our fundamental pillars of work.

The integral management of biodiversity and the environmental authority are included in the Institutional Action Plan in the program “Conservation and Recovery of Wildlife.” To address the problem represented by the illegal trafficking of wildlife species, the passing home and the technical team of the Forests and Biodiversity Group of the Corporation are responsible for the reception, medical assessment, care, rehabilitation and subsequent release of wildlife that enters, coming from voluntary deliveries, seizures or bailouts. In the case of mammals, the possum or common chucha is the species with the highest number of income, from bailouts made by the community, and represents a large percentage of individuals in a state of youth development. For the first semester of the year 2019, the entry of possums to the corporation's passage home, represented 76% of the total number of mammals admitted, with a total of 82 individuals.

Another of the biodiversity conservation strategies is focused on generating preventive mechanisms to reduce the run-over of wildlife on the roads. Through different works carried out between CORNARE and the Metropolitan Technological Institute (ITM), different critical points of high accident of wildlife have been detected in the roads of the CORNARE jurisdiction and the opossums are among the biggest victims of being run over. For this reason, a total of 21 fences alluding to speed control and respect for the wildlife that crosses the roads have been located, in order to try to reduce animal casualties from run-over and mitigate the impacts of the roads on biodiversity.



#### **CORNARE**

Regional Autonomous Corporation of the  
Watersheds of the Negro and Nare Rivers  
Santuario – Antioquia – Colombia



**T**he Masbosques Corporation, within its pillars, has the conformation of an inter-institutional, intersectoral and interdisciplinary work system that allows, through consultation, analysis and project execution, to promote in the different regions the sustainable management of forests, taking into account that the ecosystems work under a delicate structure, formed by the vegetation and the animals that live in it and that both groups depend on each other to keep the ecosystems functional and healthy. The conservation and protection of forests implies the direct conservation of different species of wildlife, including opossums.

Traditionally, the close relationship between species of flora and fauna is not considered. This idea is incorrect, as wildlife is necessary within forested ecosystems, since without animals, vegetation could not exist, not at least as we know it. For example, in tropical forests, most tree species depend on wildlife to disperse their seeds. Between 50% and 90% of all woody species in these communities are dispersed by vertebrate animals. In addition, animals are the ones who allow the balance and maintenance of ecosystems through their functions as seed dispersers, an extremely important process for the maintenance of the biodiversity of ecosystems and for the regeneration of plant communities.

Opossums disperse seeds by two methods: the first consists of adhesion of seeds to their fur (exozooecoria) and the second consists of ingestion of seeds (endozooecoria). Both processes are perhaps the most effective seed transport strategies, due to the wide distribution ranges of this species. Given this, it is recognized that there is an important positive interaction between opossums and forests (including opossums as species that are part of the native Colombian wildlife) where the conservation of each system is vital for maintaining the ecosystem balance.



**MÁS BOSQUES**  
Corporation for the Sustainable Management of Forests  
Rionegro – Antioquia - Colombia



**T**he Pereira Flora and Fauna Theme Park - Ukumarí Biopark, has an area of 44.7 hectares, of which we have 20 hectares dedicated to conservation. The Biopark is located within the ecosystem characterized as tropical dry forest (Bs-T), an ecosystem that has worldwide priority for its conservation, not only for its high degrees of endemism and speciation but also for being located in areas with strong anthropogenic pressure (Espinal & Montenegro, 1977; Miles *et al.*, 2006; Pennington *et al.*, 2009), identifying this ecosystem as a priority site for the conservation of different species of fauna and flora. Within these 20 hectares where the Biopark performs in situ conservation, we find wetlands, guaduales and protective forest areas, which have a great biodiversity of flora and fauna in the region.

We find within this exclusive list, a very special inhabitant, badly called “chucha” or opossum, the only marsupial in the American continent. In the municipality of Pereira, this species has been affected by the loss of its habitat, road expansion, being run over and by ignorance of people about this species, which they associate with rodents. It is there that the Ukumarí Biopark promotes the protection of our opossum, an important species for the conservation of ecosystems, like all the wild species in our region.

Among the objectives of the Biopark is to contribute to the conservation of wildlife through research, education, with the implementation of economically sustainable and socially just actions that contribute to the protection, in situ and ex situ of the biodiversity and the appropriation of knowledge of the territory and the species with which we share the planet.



**UKUMARÍ BIO PARK**  
A world full of life that is worth keeping  
Pereira - Risaralda





**DYNAMICA** Ingeniería y Ambiente S.A.S., is a company established since 2005 in Medellín, Colombia. It provides advisory, consulting and auditing services to public and private organizations. Its scope of action is related to a wide variety of aspects related to engineering, environment and development.

The DYNAMICA technical team has extensive experience in studying the interactions of human activities with terrestrial and aquatic ecosystems and their abiotic, socioeconomic and biotic environments; In this medium, contributions have been made to different groups of biodiversity where records, monitoring and environmental management plans for the genus *Didelphis* and the order Didelphimorphia in general stand out, encompassing the formulation of scientific baseline and rescue plans, within the framework of the development of mining, energy, road and urban development projects in different municipalities and departments of Colombia.

This book has been highly anticipated by the general community. We believe that, from the experience of the authors, we will have a magnificent work that will surely end up increasing the good status of the marsupial group in Colombia and America.

The book that we present today by the different partners, sponsors and the Zarigüeya Foundation - FUNDZAR, is not a field guide, it is more a reference guide that shows a very broad and general overview of the group of opossums present in Colombia, about which we must have an important handling and care in its conservation, in order to avoid its disappearance.

From our expertise and daily work, we are willing to continue sponsoring this series of events that involve the different actors of the territory and that recompose the social fabric, closely linked to the good state and conservation of that important natural resource such as our wildlife.

**F**or some years now, the Aburrá Valley Metropolitan Area understood the importance of articulating the different processes that are being developed for the generation of optimal spaces that conserve our biodiversity; and we are clear that, in order to conserve, the first thing we must do is know what we have.

This articulation has allowed us to create various strategies related to the recovery of green public spaces, generation of biodiversity banks that allow preserving, restoring, rehabilitating and recovering the sustainability of the territory; This, in order to preserve forests, avoid the fragmentation of urban ecosystems and continue to improve the environmental conditions of the Aburrá Valley.

In our projects we have identified strategies that not only aim to make visible the beauty of our biodiversity and educate environmentally, but that we can act directly to create ecological connectivity systems to enable a comprehensive process in urban and rural ecosystems. Hence the importance of truly achieving an ecological balance, which not only optimizes the role of the environmental authority and generates increasingly positive results in our natural environment.

It is there that from the project called **“Metropolitan Ecologists”** acting as the articulating axis of environmental education, and from its three pillars: *Provoke, Build and Transform* in the dimensions of being, knowing and doing, towards the consolidation of collective knowledge, from the articulation and integration of knowledge, science and research to favor the environment.

Ecologists generates transformations from knowing more and developing best practices, promoting experiences and responsible lifestyles towards sustainability, in the rational, sustainable use, conservation and protection of environmental heritage, developing changes in the environment, appropriating habits for a style more responsible and friendly life with the planet.

Now, through this strategy, we recognize and value one of the most important wildlife species on our planet, called the opossum or misnamed chucha. Finally, we praise the work carried out by the Zarigüeya Foundation - FUNDZAR since their tireless work in the protection and conservation of our marsupial in its natural environment is embodied in strategies related to this book.



**UNIDAD DE EDUCACIÓN Y CULTURA**  
ÁREA METROPOLITANA DEL VALLE DE ABURRÁ  
Environmental Authority  
Medellín - Antioquia



# The Zarigüeya Foundation – FUNDZAR



**W**ithout showing off the failure, however, not being too successful, I begin to write these lines in this chapter, with the firm intention of making known the magical, exuberant and until now very unknown possum or common chucha that is found length and breadth of the geography of Colombia and America, an animal of wildlife that we all have. Now, not so dear and rather unknown in the neighborhood. Four years ago with the help of Beatriz Elena Henao González (to whom I profess deep admiration and infinite respect) we created the Zarigüeya Foundation - FUNDZAR and I have to recognize that it was more passion than technique, due, perhaps because we only knew about the chucha is that it was necessary to protect it and it was because of the innumerable run-ins, poisonings and beatings to this animal, which led us to initiate all kinds of actions, which at least made visible all the situations of abuse that make the chucha an animal of the wildlife of Colombia and America hated like none.

In 2015, after having initiated activities of environmental education and activism through social networks, we were created and constituted according to regulations of law (Registration before the Chamber of Commerce of Medellín-Antioquia on July 21, 2015 - Resolution DIAN, NIT 900,870,254-0). From there we have been working hand in hand with government entities, private, environmental groups, social groups of the community in general, as well as education institutions (schools, colleges and universities) in projects for research, conservation and protection of the opossum. The Zarigüeya Foundation - FUNDZAR, is made up of professionals from different areas of knowledge who, from their expertise, have made this individual a little better known for the important role it plays in the good health of forests.

Today we have seen the possum or common chucha appears as the protagonist of television programs, newspapers, magazines of national and regional circulation, videos on social networks, not only from Colombia but also from America, which has allowed us to carry and make known an individual which has been on earth for more than 65 million years and that, for the vast majority of common people, is totally unknown.

In the Foundation we have three pillars under which our actions are based: 1. animal welfare, 2. environmental education and 3. Conservation research. Within our education strategies, we highlight the creation of a play entitled: *Doña Zary, an unknown heroine*, thanks to the help and sponsorship of the Municipality of Medellín - Secretariat of the Environment, the Tironeta Teatro collective (Juanita, Gustavo and Walter) who made and are part of this strategy that reveals the adventures of a possum mom (Mrs. Zary) which teaches its little puppy (Marsupialiptus) to survive in a hostile environment, amid widespread unknowledge and ignorance in around this species. Don Ramón, Monchito the builder, Zarycobain, the angry mob and all the animals that live in the forest take part in this work. <https://www.youtube.com/watch?v=2Ra6blaHipM>.



**Image 1.** Play Mrs. Zary, a committed heroine, Tironeta Theater, Book Fair. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.



The book that you are reading today has a hold on our first publication that took place in 2016 (Vivas-Serna, C., FJ Flórez-Oliveros and JF Castrillón. 2016. *"Guidelines for the management of opossum pups in a state of defenselessness, Zarigüeya Foundation "*) that had the support and sponsorship of many friends and entities such as the Municipality of Medellín - Ministry of Environment, Society for Public Improvements, Santa Fe Zoo, Antioqueña de Ornitología Society - SAO and Parque Explora, publication that as of the date of the launch of this book, it has more than twenty-five thousand (25,000) deliveries, between digital and physical files and has been downloaded (from our pages) throughout Latin America, the United States, Canada, Spain, France, Italy, Denmark, United Kingdom, Holland, Poland, Switzerland, Bulgaria, Belgium, Estonia, Russia, China, India and Hong Kong.






**Image 2.** Reader: "Guidelines for the management of baby opossums in a defenseless state. Zarigüeya Foundation" Source: Zarigüeya Foundation FUNDZAR © Copyright. 2020.

Within the research pillar, we are about to initiate a project to establish, define and identify the role of the possum or common chucha in the germination and dispersion of seeds of the flora present in the Protected Areas in Urban Contexts of the Aburrá Valley (APU's), a project that has the support of the environmental authority of the Metropolitan Area of the Aburrá Valley, University of Antioquia, and the municipal administrations and environmental secretariats of the municipalities of Envigado, Bello and Medellín.

It is necessary to emphasize that the conservation and protection of biodiversity is not possible without all the articulation of the different actors of the territory, the official entities, the NGOs, the environmental groups and, above all, without the appropriation of the knowledge of the communities around their natural resources.

In the Zarigüeya Foundation - FUNDZAR, we bet on the construction of collective knowledge, through the exercise of appropriation of citizen science as a transversal axis of environmental education. The official web page of the possum or common chucha in Colombia and the world is: <http://fundaciozarigueya.org>.

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Medellín – Colombia





# Introduction

Colombia hosts around 10% of the total diversity of the planet. Considered a megadiverse country, it occupies the first place in number of species of amphibians, palms and birds and the second in butterflies and beetles. Studies and results show that ours is one of the countries with the greatest renewable capital. In flora, there are records close to 26,500 species with flowers, in ferns 1,600 species, in mosses 976 species and in lichens 1,700 species, which places us as one of the richest countries in this regard at the level of the Neotropic.

As for wildlife groups, we could say that Colombia is the richest country in birds with 1,912 species, 700 amphibians, 512 reptiles and 528 mammals. It is also important to mention that this is one of the countries with more diversity in plant coverings: about 1,200 different types of forests, scrubs, and grasslands confer this title. The different natural regions, including the Andean region, are the ones that represent the greatest number of biodiversity, the Choco biogeographic, the moors, have no comparison with any other type of formation or region in the world. Among the reasons why we could attribute this great environmental heritage are: the geographical position, the influence of two seas, the geological history, the existence of five natural regions and their climatic variability, among others (Rangel, 2015).

However, this biological diversity faces strong threats. One of them is the transformation of the landscape that generates changes in the structure and function of biotic communities. In ecosystems, the modification of the landscape alters the assemblages present and can even cause local extinctions, as a result of the isolation of small populations of species in their altitudinal limits (Kattan *et al.*, 1994).

The possum was the first marsupial known in Europe at the beginning of the 16th century, when a specimen was taken from Brazil to Spain and they observed the sack it possessed in its abdomen (marsupium or small bag). In 1758 this mammal was classified by Linnaeus as *Didelphis marsupialis*, belonging to the order of insectivores (Grimwood, 1969). Currently, didelphimorphs (Didelphimorphia) are an order of mammals that groups most of the marsupials and includes a little more than 100 species that have been reunited in a single family (Didelphidae) with four subfamilies, Caluromyinae and Didelphidae among others (Gardner, 1993, 2005, Voss & Jansa, 2009).

Among the groups of small terrestrial mammals studied in our country regarding biology, ecology and taxonomy, there are opossums, marmoses and colicortos. This effort in producing a document around these species is perhaps a unique publication and a little more updated among others. Because of this, information on some relevant aspects that will raise awareness about these wonderful individuals will be provided; which, although they are our neighbors, are virtually unknown.



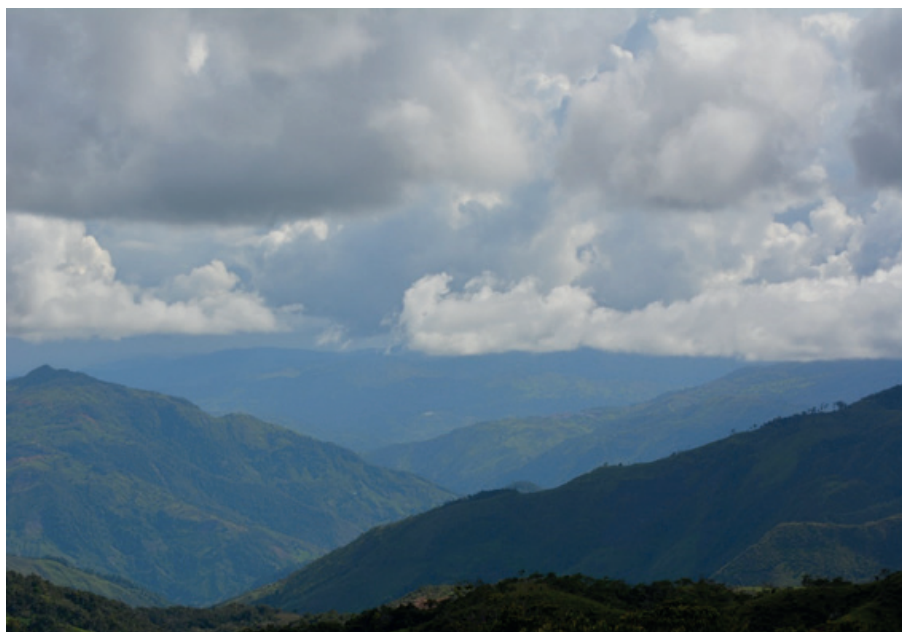
# Chapter 1.

## Colombia in the global context of biodiversity

**W**ealth has generally been the most common indicator to refer to biodiversity, through the representation of the number of species present in a territory. Although in Colombia there are no detailed and complete biological inventories for the entire territory, the current estimates place the country in the first places in terms of species diversity worldwide.

In our country, currently we have 54,871 registered species, 3,625 of which only inhabit our territory (66 birds, 1,500 plants, 367 amphibians, 115 reptiles, 34 mammals and 1,543 orchids, all of the previous endemic to Colombia). We have 7,432 vertebrate species: 528 mammals, 1,912 birds, 512 reptiles, 700 amphibians, 2,000 marine fish, 1,533 freshwater fish and 197 migratory birds. We have 30,436 species of plants. We have 32 terrestrial biomes and 314 types of ecosystems, where the moors represent approximately 1.7% of the Colombian territory that provide water to 70% of the population (Biodiversity - IDEAM, 2017).

Regarding the estimated diversity for some biological groups, Colombia ranks first in diversity of birds and orchids, second in diversity of plants, amphibians, freshwater fish and butterflies, third in diversity of reptiles and palms and fourth place in mammals (Biodiversity - IDEAM, 2017). Colombia, along with Bolivia, Brazil, China, Costa Rica, Ecuador, India, Indonesia, Kenya, Mexico, Peru, South Africa and Venezuela, is part of the so-called *Group of Megadiverse Countries*, which are home to the highest biodiversity index on the planet. Now, the most important international framework that deals with the understanding and management of biodiversity is the Convention on Biological Diversity (CBD), which was ratified by Colombia in 1995. This global agreement has set the standard for the design of policies, initiatives and efforts that include the management of biodiversity in Colombia and the world. According to the CBD, biodiversity is defined as:



**Image 3.** Forests of Northeast Antioquia. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

*“The variability of living organisms from any source, including, among other things, terrestrial and marine ecosystems and other aquatic ecosystems and the ecological complexes of which they are part; it includes the diversity within each species, between species and ecosystems.”*

Now, these are estimated figures because we still do not know the amount of microorganisms and species that make up our Biodiversity. That is why science and research are two valuable tools with which we can, first, know unexplored worlds of our planet and, second, contribute to the care and preservation of our world, propose alternatives of change for the well-being of all. Undoubtedly, talking about biodiversity implies not only thinking about natural resources, but in all manifestations of life and culture, customs, dialects and ways of life.

However, deforestation of our natural forests is one of the biggest environmental threats facing our country. The natural forest is all the land occupied mainly by trees, which may also contain shrubs, palms, guaduas, herbs and lianas, in which tree cover predominates with a minimum canopy density of 30%, a minimum canopy height (in situ) of 5 m. at the time of identification, and a minimum area of 1.0 ha. Tree coverings of commercial forest



plantations such as conifers and / or broadleaf trees are excluded from this estimate. (IDEAM 2012).

***Facing urban diversity in the Municipality of Medellín and the Aburrá Valley***, Medellín is located in the region known as the Aburrá Valley, an inner valley of the Central Andes of the Colombian Andes, crossed by the Medellín River that runs at an average of 1,450 m.a.s.l. and whose slopes descend from 3,150 m.a.s.l. in the Alto del Padre Amaya. Its average annual temperature is 24 ° C and its annual average rainfall is 1,571 m.m. Its administrative jurisdiction covers 37,621 hectares, 27.1% of which are classified as urban land (Medellin City Hall, 2006).

Medellín has a significant history of strategies to promote knowledge, administration and management of natural resources, which has been strengthened in investment and management in the last twenty years. However, the achievements in the political positioning of the environment, generation of public institutions for its regulation, refinement of information systems, increase of planning instruments, support studies for decision-making and incipient management processes of the knowledge, have not translated significantly in improving the conditions of habitability and urban and rural environmental sustainability in the city.

According to the records collected, it is estimated that the municipality has 2,603 species of vascular plants, 1,346 insects, 445 birds, 76 mammals, 44 reptiles, 30 amphibians and 44 fish. Of these, 112 species are in some threat category and 67 species of birds and insects are migratory. The flora of Medellín includes more than 196 families, 1,106 genera and 2,603 plant species, with numerous orchids (235 species), legumes (172 species), asteraceae or "compound" (170 species), and pastures (107 species). 77 endemic species from Medellín, Antioquia or Colombia have been registered. (Medellin City Hall, 2006).

In front of the group of mammals according to the latest report of the study of integral biodiversity management, carried out in 2014 by the Mayor's Office of Medellín, 76 native species were found (62 genera, 24 families and 11 orders) with confirmed distribution for Medellín and 15 species with potential presence in the municipality. The order with the greatest wealth was Chiroptera (bats), followed by Rodentia, Carnivora and Didelphimorphia (marsupials). The remaining orders have between one and two species. Species richness for Medellín represents 35% of the species registered for Antioquia by Cuartas and Muñoz (2003). This shows the great potential of the city in terms of conservation of this group and the ecosystem services that such a diverse assembly may be providing.

It is worth highlighting the richness of carnivores in Medellín, which includes the Puma concolor puma, the second largest feline in the country, recorded by observing some excreta in the Altavista district, backed by recent records in three towns in neighboring

municipalities in Medellín. A greater number of species appears towards the slopes of the valley, which reflects the best state of conservation of the habitats present there.

Finally, it is necessary to highlight the work of the municipality of Envigado to the south of the Aburrá Valley and how the conservation model shows us based on the Envigado Local System of Protected Areas (SILAPE), currently defined and strengthened and which motivates the municipalities to build new local agendas and strategies and integrating different participatory instances, so that they are conserved and take into account, from ecology, the strategic ecosystems that must be viewed globally as space (habitat of many species), where different groups constitute the great engine, the tendency to balance and sustainability, where all are fundamental, starting from the flora, the soil, the air, the water and even our charismatic findings of striking species such as the tigrillos, puma, strongly threatened and violated by impacts negatives of inadequate urban planning, making them the continuous victims of anthropic processes as the different ones are opossum species. The death and continuous violation of species in different places is regrettable and shocking due to causes such as ignorance of the value of the species and its role in the chain or due to myopic or inequitable valuation due to appearance, or due to the loss of the right to life of the species, among other causes no less strong, (Gutiérrez, 2020).

With the deterioration of strategic ecosystems, the continuous and obscene loss of specimens in numerous urban and rural habitats, it is necessary to act against time in the short term to improve institutional and community awareness, executing effective and prompt restoration actions, with different means of management and in that sense consolidate SILAPs, this in turn will allow to preserve ecosystems of the municipalities undervalued in their formality, even functional or with probability of finding some level of balance and connectivity; This management must have two levels between municipalities and regions, just as with climate change, action must be rationalized but with immediate action, in a solid manner at the local and regional level; otherwise not only the valuable opossums and other species will be lost, but also more and more ecosystems, corridors, areas with connectivity possibilities and in general the essential biodiversity, the basis of sustainability, both at the local (municipal) and regional level, (Gutiérrez, 2020).

The municipalities should be called and generate a management purpose to conserve, with the Protected Areas strategy, as well as greater recognition and incorporation, at other levels, both from instances such as the SIDAP's, SIRAP's and others levels as competent and where they find their fair assessment and support.



## Chapter 2.

# The role of the environmental authority in the conservation of biodiversity

In 1993 the Colombian government enacted Law 99, called the General Environmental Law, where the public sector in environmental matters is rearranged in Colombia and the National Environmental System - SINA is created, as a tool to manage the environment and the different natural resources that make it up; SINA is made up of the Ministry of Environment and Sustainable Development, the Autonomous Corporations Regionals, Territorial entities and Research Institutes attached and linked to the Ministry. In compliance with the provisions established in Law 99 of 1993, the Regional Autonomous Corporations of Sustainable Development and the Environmental Authorities of the large urban centers that are part of the SINA, herein after environmental authorities, since 1995 assumed the functions of the former Institute National Renewable Natural Resources and Environment -INDERENA, on issues related to the administration and management of the environment.



To address the issue of the role of environmental authorities in the conservation of national biological diversity, it is important to make a retrospective of the genesis and evolution of the issue, since in the national context the policies on the protection and conservation of biodiversity and of environmental management, they were the result of international movements such as the 1972 Stockholm summit, where the starting point was marked to generate an international position in environmental matters; this is how in 1973, Law 23 of 1973 was formulated in Colombia, a preamble to what is now the National Code of Renewable Natural Resources and Environmental Protection established by Decree Law 2811 of 1974.

From this last norm several regulations have been detached regarding the protection and conservation of biological diversity, to which national and international initiatives have been added, such as the Convention on Biological Diversity signed in Rio de Janeiro in June 1992 and ratified in the Decision 391 of 1996 of the Cartagena Agreement.

Specifically, in the matter of administration and management of wildlife, as one of the natural resources of special importance for the conservation and preservation of biological diversity, Decrees 1608 and 1681 are issued in 1978, by which wildlife is regulated and hydrobiological resources respectively, which are regulated in Law 611 of 2000 *"By which rules for the sustainable management of wildlife and aquatic fauna species are dictated."*

In this order of ideas and in compliance with environmental regulations regarding wildlife, environmental authorities have developed lines of work on four topics: conservation research; traffic control and illegal possession; environmental education; and the articulation of public and private sectors towards the harmonious development of the territory, as tools to sensitize and raise awareness among Colombian citizens about the respect and sustainable use of wildlife resources.



The obtained results in the implementation of these four lines of work have generated a change in citizen awareness and in the perception of wildlife, all of the above supported by the knowledge of the species and the role they play in the biological and ecological functionality of the ecosystem structure of urban and rural environments; actions that have resulted in the preservation and conservation of national biological diversity.

A clear example is what has happened with opossums, once identified as large rats and now seen as species that fulfill biological and ecological functions of special importance to ecosystems, as they are seed dispersers, pest controllers and food of other species of the national wildlife, changing the perception of seeing them as a problem or conflict to be an ally of the human being, that contribute directly to the survival of many living beings with whom we cohabit.



The above is reflected in the figures of reports, rescue and recovery of this species by the environmental authorities, who previously saw how the possums were slaughtered mercilessly and are now defended by a high percentage of citizenship. All this, product of the awareness and awareness campaigns developed by different public and private sectors, with which it has been possible to demystify the image that was had and generate a process of cultural transformation to see them wandering through parks, streams and areas with vegetation cover of the city, where they perform functions of special importance in urban ecology.

As can be seen, the environmental authorities are: energizing the continuous relationship between public and private; generating processes of transformation and adaptation to environmental changes; sponsors of innovation and the articulation of harmonious development with nature and promoters of the preservation and conservation of biological diversity in the national territory. All this with the purpose of creating a sense of awareness, responsibility and belonging, as a strategy to maintain a quality environment for the existence of living beings and their continuous interrelation.

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## Chapter 3.

# Biology, ecology and taxonomy of the marsupials (order Didelphimorphia)

**I**n America, a little more than 100 species belonging to the order Didelphimorphia (Voss and Jansa, 2009) are currently mentioned five species belonging to the order Paucituberculata (Ojalá-Barbour *et al.*, 2013) and three of the Microbiotheria (D'Elia *et al.*, 2016).

By 2003, in the Liaoning province of northeastern China, an intact fossil of a mouse-sized marsupial with a long tail *Sinodelphys szalayi* was discovered. According to paleontologists, the remains have an approximate age of 125 million years, becoming the oldest marsupial fossil found to date (Grzimek *et al.*, 2003) as it is 25 million years older than that discovered in North America. This finding brings about the change on the stage in the investigation of the historical biogeography of the marsupials and the rethinking of many theories (Geisler & Uhen, 2005).



**Image 4.** *Didelphis marsupialis* opossum or common chucha in wildlife. Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020.



Possums are mammals, distant relatives of kangaroos, koalas, wombats, and wallabies. They are native from the American continent and are distributed from Canada to Argentina. They are known by different names, depending on the region and the country. There are around 100 species in total (Gardner, 2008; Voss and Jansa, 2009) and it is estimated that 38 of them inhabit Colombia (Solari *et al.*, 2013), although recent studies state of a number close to 50 species for Colombia. South America has a large number of endemic species and the greatest diversity. Current environmental conditions and ignorance about the importance of this species, increase its vulnerability, this as an approximation to the knowledge of the biology of the opossum, a species threatened by urban growth, widespread ignorance and little investment in investigation of this important species, (FUNDZAR, 2020).

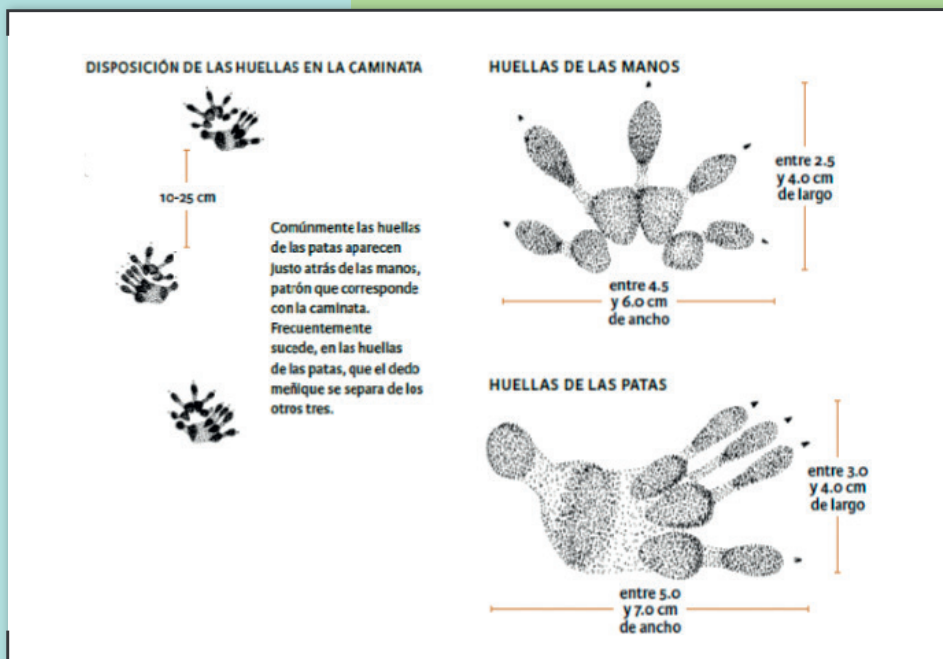
In general, the Didélfidos (possums, chuchas, marmosas, colicortos) are marsupials of the order Didelphimorphia, widely distributed in tropical and temperate habitats of the New World (Voss and Jansa, 2003). They have been reunited in a single family (Didelphidae) with four subfamilies, among others, Caluromyinae and Didelphinae (Gardner, 1993, 2005), although different groupings have been suggested (Jansa and Voss, 2000; Voss and Jansa, 2003). According to Cuartas-Calle and Muñoz (2003), the Dodelfdids are mostly nocturnal, arboreal, some terrestrial and a single semi-aquatic species (Cuartas-Calle and Muñoz, 2003).

An alternative proposal has been to recognize a second family, Marmosidae, to include small chuchas, which would be represented by more than 70 species, with geographic distribution in Central and South America. The main criterion to recognize these individuals (marmosas and small chuchas) as a different family, is that the species included do not have a true marsupial bag, which seems contradictory to their condition of marsupials. In general, despite showing a general conservative morphotype, many variable characteristics are presented. For example, the tail may be prehensile or not, its length may be less, equal to or greater than the head-body length; the base can be little or very hairy. The skull can be delicate or robust; the tips of the postorbital process may be present or absent. Similarly, the dentition, while maintaining the same formula with 50 teeth, shows variation in the arrangement of certain structures (cusps and ridges) and relative sizes of the molars. The diploid number of chromosomes is  $2n: 14, 2n$ .

Within this family, the largest species are represented by the following genera: *Didelphis*, *Caluromysiops*, *Philander*, *Chironectes*, *Metachirus*, *Caluromys*, *Glironia* and *Lutreolina*, with geographical distribution from North, Central and South America. The face is elongated and conical; some species have clear spots on the eyes. They have a long tail (mostly prehensile) and hairy at the base; (except *Glironia venusta*, with a tail completely provided with hairs) the caudal scales are rhomboid and spirally arranged. The tips of the postorbital process are well developed, as are the sagittal crest. These are the species commonly called chuchas or possums (Cuartas-Calle and Muñoz, 2003).



**Image 5.** *Didelphis marsupialis*. Source: Cuartas-Calle & Muñoz-Arango (2003), drawing made by Gloria Mora, based on an illustration by Cox (1988). © Copyright.



**Image 6.** Footprints of the anterior and posterior limbs of *Didelphis marsupialis*. Source: Aranda. © Copyright. (2012).



However, all marsupials, such as possum or common chucha, have a biological characteristic that represents them as a group, is their form of reproduction, characterized by short gestation periods ranging from 8 to 45 days, depending on the species. After this, the offspring are born embryonic and migrate to a bag called marsupium, located in the abdomen and inside which are the mammary glands where they adhere to complete their development (Ceballos *et al.*, 2002b; Morales-Jiménez, *et al.*, 2004). In the genera *Didelphis*, *Philander*, *Caluromys* the marsupium develops when there is a process of childbirth, while in *Chironectes*, the marsupium is well developed. However, in all cases, the mammary glands are associated with the marsupium, being inside (Patton *et al.*, 2000).

In summary, the Didelphidae family represents the majority of American marsupials widely distributed in South America (Tirira, 2007), their geographical distribution extends from southern Canada to central Argentina and from sea level, to over 3,000 m, occupy almost all types of habitats except for extremely high elevations and desert areas (Gardner, 2008). Knowledge about the taxonomy and systematics of American marsupials has received recent significant advances, especially at the specific supra level (e.g., Voss and Jansa, 2003 - 2009). However, despite the wide geographical distribution of the group, the ecology and behavior in the Didelphidae family remain poorly explored. There are still many aspects of natural history unknown and others little mentioned or not described in detail in the scientific literature (Croft and Eisenberg, 2006).

Urban forests are important shelters for tolerant animal species and their eating habits expose ecological functions that they perform in this type of habitat (Cantor *et al.*, 2010). As for its ecology, opossums are omnivorous, a large percentage of their diet are fruits and seeds of the forest, so they are potential seed dispersers of plants within their habitat. Both the male and female include a wide variety of foods in their diet, mainly invertebrates, fruits and seeds, most of the fruits consumed are species of pioneer plants, which are common to find in disturbed areas, according to habits Opossums of the possum. Seed dispersal is the result of the mutualistic interaction between plants and animals, which feed on fleshy and nutritious fruits, which contain a great variety of seeds (Van der Pijl, 1982).

The reward received by the plant is the increase in germination success, either by removing the seeds from the environment, thus avoiding the high mortality to which they are exposed, when they are close to the mother plant, due to high competition for local resources and intense predation by insects and rodents. Another positive aspect is the transit through the digestive system that helps scarification of some seeds that have a very strong outer wall (Janzen, 1970; Connell, 1971; Howe *et al.*, 1985). Although it is little known, one of the important biological functions of this mammal is to leave seeds where it passes. This task is done by excrement. Faced with the situation when these individuals



ingest fruits, transport the seeds in their digestive tracts (endozoocoria) and defecate or regurgitate them in conditions that could be appropriate for germination (Traveset, 1998). With this, frugivorous vertebrates contribute to the regeneration of plant populations (Schupp *et al.*, 2010), the connectivity of meta-populations (Spiegel and Nathan, 2007) and the colonization of vacant habitats (Carlo and Yang, 2011; Escribano-Ávila *et al.*, 2013).

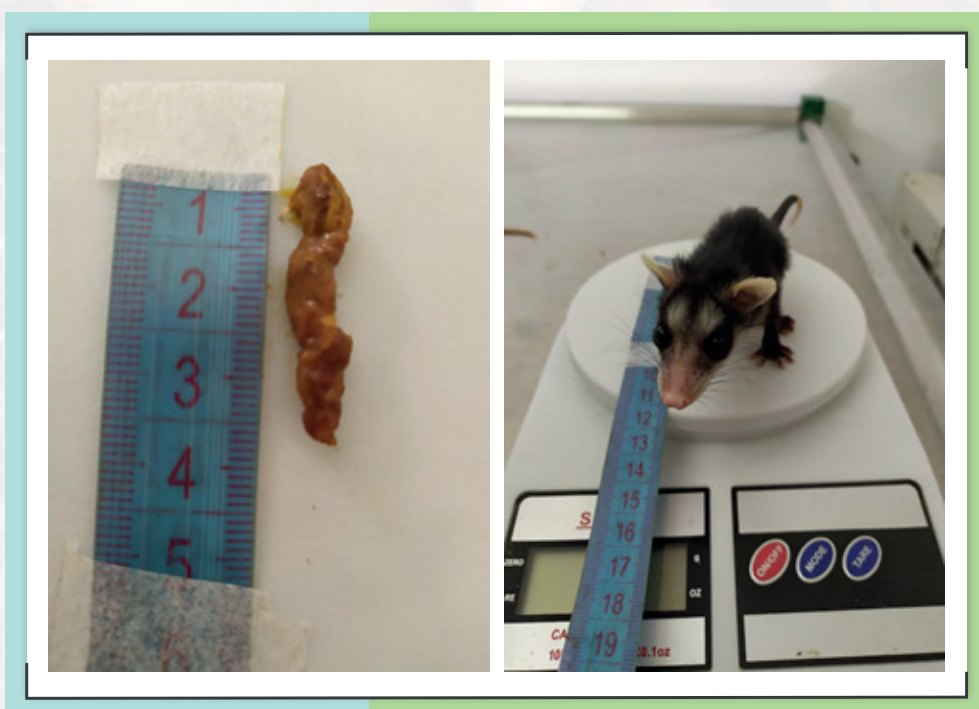


**Image 7.** Footprints of opossum or common chucha, *Didelphis marsupialis*. Source: Gabriel Camilo Jaramillo Giraldo - biologist University of Antioquia © Copyright. 2020.





**Image 8.** Size of excreta of *Didelphis marsupialis*. Source: Aranda. © Copyright. (2012).



**Image 9.** Feces size of a 2.5-month-old opossum or common chucha *Didelphis marsupialis*. Source: Corporación Autónoma Regional Rionegro Nare - CORNARE. © Copyright. 2020.

In general, feces do not require a special technique for their collection, except, perhaps, be careful not to disrupt them, especially those with little consistency. The feces or excreta in general, for *D. marsupialis*, are cylindrical in shape, dark brown to black, with no peculiar characteristics. The possum or common chucha can defecate almost anywhere, so that their excreta are not easy to find on some occasions, it is not common that there are variations in color (Aranda, 2012).



**Image 10.** Opossum or common (adult) chucha *Didelphis marsupialis* feces.  
Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020.

In these habitats, where forest regeneration becomes especially necessary, individuals commonly known as possum or common chucha, can play a significant role in the reforestation process, by dispersing the seeds of the fruits consumed. In relation to the dispersal of seeds, some experiences reported by farmers in the municipality of Anorí, in the Department of Antioquia, state that they have seen individuals of this species ingesting fruits of the genera of floristic species such as: carate, *Vismia* sp., Mico guava tree, *Bellucia* sp., Guamo, *Inga* sp., among others, which were scattered by the animals in the middle of the pasture, far away from the forests of origin, (FUNDZAR, 2020).

In contrast to the sampling sites, we have been doing a review of the places visited in the last five (5) years, since we started working with this individual as a foundation and we believe that its preference for places disturbed and operated by the man is notorious, the high stubble, the secondary forests, the paddocks, the ravines near the



residential units, the same residential units with green areas within them and means close to agricultural crops, chicken sheds, etc., are the preferred by the opossum, and in general, any type of cover that is close to man. It is as if its survival was directly linked to closeness with man, without knowing that this is a death sentence (FUNDZAR, 2020).



**Imagen 11.** *Didelphis marsupialis* (juvenile) opossum or common chucha, associated with urban environments. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

On the other hand, primary (intervened) natural forests do not appear to be their preferred habitat, or at least for *D. marsupialis*. We do not know if because of the presence of predators or because food is not so easy or because we are not looking for it well. However, we did an exercise in one hectare of primary natural forest (intervened) and one kilometer in length of a creek, where we walked step by step and with the help of a thermal camera (Flirk CAT -S60) doing sweeps and panning in general in the area only at night time in places preferred by it, such as burrows, fragmented rocks, stilt palm roots (*Socratea exorrhiza*), decomposing trunks, etc., which did not give a positive result in the observation, (FUNDZAR, 2020).





**Image 12.** Natural habitats preferred by the opossum or common chucha. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.










**Image 13.** Urban natural environments preferred by the opossum or common chucha, Laureles second park, Medellín, Antioquia. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

Opposite urban areas and environments, the opossum expressly reveals its predilection. The constant sightings, the conflicts generated with man, with pets, complaints to environmental authorities, make this individual have a strong presence in cities, not only in Colombia, but in America.



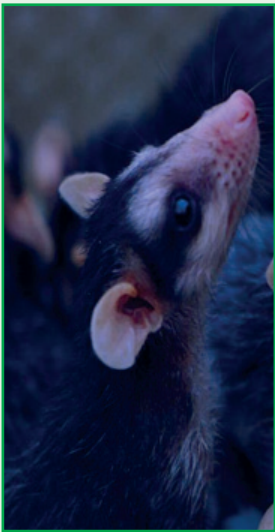
**Age of newborns and cubs of possum or common chucha *Didelphis marsupialis* and *D. pernigra* based on morphological and ethological parameters.** The age of neonates or opossum puppies is a determining factor for their care and management, since they depend on the marsupium to survive. Knowing the stage, they are in, allows them to be given the resources they need to complete their development and be able to be released in their natural habitat, *only by the Environmental Authority*. There are no studies to calculate the age of the infants of *Didelphis marsupialis* or *Didelphis pernigra*. However, Arcangeli (2014) presents a table on the weather in days and the morphological description for *Didelphis virginiana* based on Petrides (1949) and Reynolds (1952) and which can serve as a guide to estimate the approximate age of the opossum offspring Worked on this text. In addition to this, we complement this table with information and images that, throughout all these years, we have developed as the Zarigüeya Foundation - FUNDZAR and that was adapted for the species of the *Didelphis* genus, present in Colombia.




**Table 1.** Calculation of the age of a neat and opossum cub *D. marsupialis* in its, first 120 days of life based on their morphological description (Petrides, 1949; Reynolds, 1952). Complements the Zarigüeya Foundation information, images FUNDZAR © Copyright. 2020.


MORPHOLOGICAL AND ETHOLOGICAL PARAMETERS TO DETERMINE THE AGE OF AN OPOSSUM			
PARAMETERS		OBSERVATIONS	
Age	1 week		
Behaviour	Pink color without hair, embryonic form, eyes closed.		The development of the hind legs begins. They twist their tail voluntarily. They have no open eyes, no hair, no ears, no breathing (no developed lungs) rather perspire. They have developed the anterior spine, ribs, anterior extremities and mouth.
Appearance	It crawls into the bag and hooks to the nipple.		
Weight	Between 5 to 10 grams.		
Age	1 to 2 weeks		
Behaviour	Pink color without hair, embryonic form, eyes closed.		The sexual organs begin to be observed.
Appearance	Intentional movements, the embryonic form continues.		
Weight	Between 10 to 15 grams.		
Age	2 to 3 weeks		
Behaviour	The hair begins to appear, like the whiskers (vibrissas), the skin is changing by the gray color.		The ears are released from the head. They can move the hind legs. The growth of the vibrissas (mustaches) and the hair begins. This is easily observable with a magnifying glass or sometimes with the naked eye.



MORPHOLOGICAL AND ETHOLOGICAL PARAMETERS TO DETERMINE THE AGE OF AN OPOSSUM			
PARAMETERS			OBSERVATIONS
Appearance	Certain sneezes are denoted to get mom's attention.		
Weight	Between 15 to 20 grams.		
Age	<b>Between 4 to 5 weeks.</b>		
Behaviour	The skin darkens even more, the eye cleft appears.		The length of the body, from the head to the tail, is about 10 to 12 cm. The hair looks short and scattered. The back already has pigmentation. The eyes and mouth are partially closed. Ears fully detached and white to cream.
Appearance	Shows newborn behavior, sleeps most of the time.		
Weight	Between 20 to 25 grams.		
Age	<b>Between 6 to 7 weeks.</b>		
Behaviour	Eyes wide open, the bite becomes stronger, black hair in its entirety, except for the tail that is totally naked and black and white.		They can open their eyes. The hair already looks dark and covers the body. The third premolar erupts.

MORPHOLOGICAL AND ETHOLOGICAL PARAMETERS TO DETERMINE THE AGE OF AN OPOSSUM			
PARAMETERS			OBSERVATIONS
Appearanace	They begin to explore the environment with their eyes wide open.		
Weight	Between 25 to 30 grams.		
Age	Between 8 to 9 weeks.		The hair is long and completely covers the body, except those areas that will be bare. The second premolar erupts.
Behaviour	Black shiny fur.		
Appearance	Stay more active and enjoy playing with the other puppies.		
Weight	Between 30 to 40 grams.		
Age	Between 10 to 12 weeks.		The length of the body, from the head to the tail, is about 20 cm. The incisors, the canines and the first premolar appear.
Behaviour	It starts to get expectant in front of its surroundings.		
Appearance	Start climbing and being independent in food.		
Weight	Between 40 to 55 grams.		



MORPHOLOGICAL AND ETHOLOGICAL PARAMETERS TO DETERMINE THE AGE OF AN OPOSSUM			
PARAMETERS			OBSERVATIONS
Age	Between 13 to 20 weeks.		There is sexual maturity, they are independent individuals, ears with black spots just before they become totally black.
Behaviour	They resemble being adults, the ears begin to turn black with spots.		
Appearance	They start to get active mainly at night.		
Weight	Between 55 to 450 grams.		

**Some morphological characteristics of the species *Didelphis marsupialis*.**\_\_In this segment of the chapter we will try to show, through our own photographs and achieved through the different experiences and works with this individual (*D. marsupialis*) of the wildlife of Colombia and much of America, each of the components of the morphological characteristics and that help to differentiate the possum or common chucha from other groups of mammals.

**The marsupium** (from the latin marsupium, bag) is the most striking feature of the marsupials. It consists of a skin fold that covers the breasts and forms an epidermal bag that works as an incubator. The pups of the marsupials are born in a very incomplete, almost fetal state of development, and they crawl after being born from the womb of the female to the marsupium, where they will breastfeed until they complete their development. The marsupium acts basically as an incubator, because the newborn marsupials are so small that their weight is never greater than 1 gram, even, a complete litter does not exceed 1% of the mother's body weight. However, and as we are going to deal with throughout this book, there are some species of the order Didelphimorphia that do not have marsupium. For America, this characteristic is reported in the genera: *Didelphis*, *Caluromys* (develops when you have puppies) *Chironectes*, *Lutreolina* and *Philander*. The rest of the genera included in the Didelphidae family do not include this morphological characteristic; the case of marmosas, colicortos and marsupial mice, finally, the four brown-eyed chucha, genus *Metachirus* that also does not include this characteristic.



**Image 14.** Marsupium present in the species *Didelphis marsupialis*. Source: TBF Semedo, ASM -MIL. © Copyright. 2020.

**Breasts, nipples or tits.** Female opossums have an odd number of nipples, usually placed in a circle, with one in their center, inside their bag or marsupium. The species *Didelphis marsupialis* has 10 nipples, while *Didelphis virginiana* has 13.

The number of offspring is usually higher than the number of nipples, up to 20 in some species, so many of them do not reach adults, since they have to spend a period of about two months inside the mother's bag attached to one of the nipples to survive, due to the low level of development with which they are born, as well as other marsupials.

To prevent the young from releasing the nipple, it remains swollen and the individual remains attached under pressure, until the little ones are mature enough to grab themselves to the mother's hair safely. These nipples can have a length of up to 3 cm in the case of *Didelphis marsupialis* species.





**Image 15.** The breasts, teats or nipples in the species *Didelphis marsupialis*. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

**Prehensile tail.** Animals with prehensile tail are mostly mammals and are characterized by having that limb developed and enabled to be used as transport, to cling to a branch or even grab objects.

A prehensile tail is the tail of an animal that has a biological adaptation that allows it to grab or hold objects. Fully prehensile tails can be used to hold or handle objects, and in particular to help tree creatures find and eat food in trees. If the tail cannot be used to hold or manipulate objects, it is considered only partially prehensile. Such tails are often used to anchor the body of an animal when hanging from a branch or as an aid to climb. The term prehensile means “capable of grasping” (it comes from the latin *prehendere*, grasping, grasping).

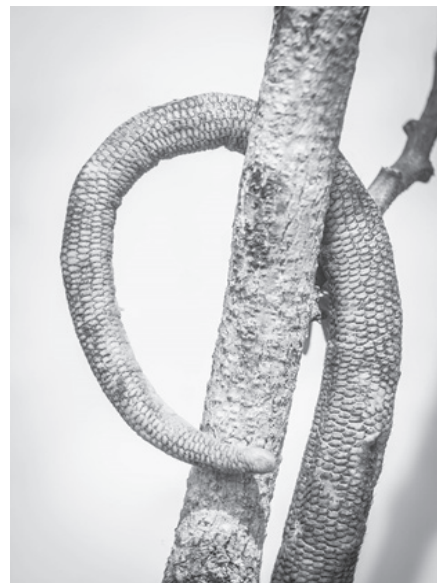


**Image 16.** Prehensile tail in *Didelphis marsupialis*. Source: Davis Travis / Deybi Beltrán Cerón / La Casita del Bosque. © Copyright. 2020.

In addition to being able to grab objects or branches, prehensile tails must be able to support the weight of the animal. This makes the musculature and skeleton have to be able to withstand both torsion and lateral thrust, so the tails of these animals will be stronger than non-prehensile. Some animals even show tails with hair-free areas or scales, to prevent them from slipping and falling to the ground from the top of the trees.

Some researchers (Delgado - V *et al.*, 2014) have documented the use of prehensile glue to transport nesting material. The prehensile capacity of the tail is not the same for all opossum species (Delgado - V *et al.*, 2014).





**Image 17.** Prehensile tail in *Didelphis marsupialis*.

Source: Zarigüeya Foundation - FUNDZAR. © Copyright. 2020.

**The opposable thumb.** The hand of today's humans is distinguished from that of other primates by having the long and robust opposable thumb that allows it to be grasped with great precision. However, we are not the only species that has an opposable thumb.

Although our thumb is very specialized, it is a common feature for most of the species that make up the group of primates, although not all have them developed to the same extent or have the same skill. This thumb is a great evolutionary advantage over other species, this means that thanks to new movements (to a greater or lesser extent), these species acquire new capacities that give them an advantage in the environment, such as the transport of objects instead of taking them in the mouth, the elaboration and use of tools or even a better subjection to trees and branches, which is very advantageous in nature, if it is chased by a predator and needs to disappear from its sight quickly.

Thanks to its developed thumb, the possum can hold its food or ascend with great ease almost by any type of surface, trees, fences, walls, ropes of light etc. The opossum, although it is a marsupial, also has five fingers and on its hind legs one of them is a thumb, the only finger that does not have an apparent nail, is scaly and black and hairless. The pads of the anterior and posterior extremities have a friction crest, these are organized in three pairs, increasing the grip on any type of surface, (FUNDZAR, 2020).



**Image 18.** Anterior limb (front) and posterior limb (rear) of the species *Didelphis marsupialis* and *D. aurita*. Source: Zarigüeya Foundation - FUNDZAR, [https:// web.facebook.com/ groups/1559837174299862/Gambás brasileiros, Opossums & Zarigüeyas](https://web.facebook.com/groups/1559837174299862/Gambás-brasileiros,-Opossums-&Zarigüeyas) © Copyright. 2020.



**Image 19.** Anterior limb (front) and posterior limb (rear) of the species *Didelphis marsupialis*. Source: Zarigüeya Foundation - FUNDZAR. © Copyright. 2020.



**Puppies or neonates.** The gestation period of a possum is very short (10 to 13 days); After this time, up to 20 pups are born, migrating to the marsupium where they continue their development, fixing themselves to a nipple for 90 to 120 days. Since the female has only a certain number of nipples (this varies by species), this is the maximum number of offspring that can survive. These are weaned between 90 and 108 days after birth. Upon leaving the marsupium they are completely independent and their lonely life begins (Ceballos and Galindo, 1984; Zarza and Medellín, 2005; Krause and Krause, 2006).

The degree of development of the young at birth is minimal, weighing around 0.15 g. of weight. However, the claws of the hands acquire a great development, helping them to cling to the skin of the mother's womb until reaching the marsupium. Those young that manage to stick to the nipples can be kept there for at least 60 days. The young are weaned near 120 days of age, (FUNDZAR, 2020).



**Image 20.** Puppy or neonate of an opossum or common pike *Didelphis marsupialis*, with an age close to 10 or 12 days. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

**The fur.** Hair (and the coat of hair, called fur) is an exclusive feature of mammals. No other creature has real hairs and all mammals have at least some hairs at some stage in their lives. The hairs grow from inside skin pits called follicles. The base of the hair, which is buried in the skin, is called the root and the part that emerges outside is the stem.



The possum or common chucha, *Didelphis marsupialis*, presents a coloration of the coat that can occur and can vary according to the diet and environmental or climatic aspects in general. The back is black to gray and the ventral area generally similar to the back, but paler or orange. The fur is sometimes bristled like a crest along the column. The coat has two strata. The lower one is dense, yellow and pale that is below the protective hairs that are long and rough black or gray. The head is dark yellow, sometimes with poorly defined black lines that run from the nose, through the eyes to almost the ears. The cheeks are yellow, orange or dark white, without contrasting intensely with the color of the muzzle, (FUNDZAR, 2020).

Puppies can have black fur in their entirety, from two to four months. After this age, prominent white hairs begin to appear, giving the appearance of illuminations and contrasting with the hairs that appear at the base, (FUNDZAR, 2020).



**Image 21.** Fur present in different individuals of opossum or common chucha, *Didelphis marsupialis*. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.



**The vibrissas.** Vibrissas (from Latin vibrissae - hairs) are a type of specialized rigid hairs that some animals possess (especially mammals, as a tactile sensory element). They are found in some mammals such as primates, marsupials, rodents, shrews and carnivores, among others. Although they are found in various parts of the body, facial vibrissas are the most studied. In animals, the vibrissas have a very sensitive root that allows them, in many cases, to detect air currents. This, together with the sense of smell, makes them perceive the origin of odors. Some of these currents can be generated by the movement of the animal itself. The vibrissas in the possum or common chuck *Didelphis marsupialis*, are well developed, 12 to 15 cm long, are distributed from the snout densely, passing through the eye area and ending in the border area with the ears where its number decreases markedly.

Rigid hairs, more or less long, that act as tactile receptors, typical of large numbers of mammals and that appear isolated or forming groups, in different parts of the head and members, especially on the lips. For example, the whiskers of the cat. "3. F. zool. Sows of varied arrangement that the birds have at the foot of the wing feathers, sometimes between the legs and, in some species, at the base of the beak, as in the chotacabras and in the guácharo. 4. f. zool. Even sows near the upper angles of the buccal cavity of the dipterans, "(Royal Spanish Academy - RAE, 2019).



**Image 22.** Vibrissas in opossum or common chucha *Didelphis marsupialis*. Source: Zarigüeya Foundation - FUNDZAR. © Copyright. 2020.

## Chapter 4.

# Some species of Didelphimorphia (Didelphidae) in Colombia

**T**his chapter includes a review of some species of Didelphimorphia (Didelphidae) present in Colombia, structured from the genus and reaching the species. However, for the genus *Didelphis*, with which this chapter begins, an additional description will be made later, where the six (6) species are detailed in detail (biology, ecology, taxonomy, conservation status, etc.) Present in America.

On the other hand, this chapter also includes the conservation status that refers to an endangered species, such as the one that presents conservation problems (threats) that means extinction risk in the medium and short term (at least 10% probability of extinction in 100 years). For this reason, these species have been included or listed in any of the categories that represent threat. These lists are often known as Lists of Endangered Species, List of Species with Conservation Problems, or Red List. Knowing the status or risk of extinction of species, has global and national relevance, this allows focusing or directing efforts for preservation, facilitating the management of funds and research, protection and / or recovery programs and the proposal of measures for necessary regulation.

Globally, starting in the 1960s, “red lists” began to be proposed under the supervision of the International Union for the Conservation of Nature (IUCN or IUCN in English, see [www.redlist.org](http://www.redlist.org)).

The Ministry of Environment and Sustainable Development (MADS) of the Republic of Colombia, together with the research institutes and the academy, in the construction of new information and knowledge about the current status of the species, has generated the red books, that allow the decision making of species according to their categorization and their conservation status. This information aims to serve as a basis for the development of management plans, guidance of national legislation, identification of important areas for conservation and the possibility of project formulation with the objective of protecting and conserving the species with the highest risk of extinction. Likewise, international conventions have been implemented: Convention on Biological Diversity CBD; Convention on International Trade in Endangered Species of Wild Fauna and Flora - CITES; Convention on Wetlands - RAMSAR through national, regional and local strategies and actions.



In Colombia, the series Red Books of Endangered Species of Colombia follows the guidelines for the categorization of fauna and flora species of the IUCN (2001) and collects updated information on the conservation status of the populations of the species they include (Ardila *et al.* 2002, Calderón *et al.* 2002, Castaño 2002, Linares and Uribe-Meléndez 2002, Mejía *et al.* 2002, Mojica *et al.* 2002, Renjifo *et al.* 2002). According to data from the Information System on Biodiversity of Colombia (SIB), currently in Colombia approximately 54,870 species can be counted among vertebrate animals, invertebrates, plants and plants. In comparison with other countries, the figure may seem high, however, the SIB estimates that there are around 1,500 species of animals and plants in danger of total disappearance in our country.

Various efforts are currently being generated, especially focused on protecting areas for the preservation of biological elements and the ecological processes inherent in nature. Thus, to develop new protected areas, three objectives are sought: the conservation of large functional ecosystems, biodiversity and species or communities of special interest (Meffe and Carroll 1997).

Seeking effective protection at the species level is difficult since there is usually little information on the presence and even less on the populations of many species. However, the approach has several advantages: it facilitates the monitoring of conservation effectiveness, the public identifies with certain species and many other species benefit under the “umbrella” of the protection of the species of interest (Meffe and Carroll 1997).

The Ministry of Environment and Sustainable Development (MADS) of the Republic of Colombia, through *Resolution 1912 of September 2017* has declared wild species that are threatened in the national territory. In this sense, MADS defines a threatened species as:

*“Threatened species is understood to be one that has been declared as such by international treaties or conventions approved and ratified by Colombia or has been declared in some category of threat by the Ministry of Environment, Housing and Territorial Development.”*

In the case of the order DIDELPHIMORPHIA, **the *Marmosops handleyi* species in critical danger is referenced CR.** This species is included as a family Marmosidae, although the correct denomination is Didelphidae.

Below we refer to each of the species treated throughout this text and according to category ordered by the International Union for the Conservation of Nature (IUCN or IUCN in English, see [www.redlist.org](http://www.redlist.org)). Date of consultation, July 2019. Finally, appendixes I, II and III of CITES are referenced - CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA.

*The species reported in this chapter for Colombia are based on the work done by Professor Sergio Solari Torres Ph. D. of Universidad de Antioquia. Solari, S. et al, 2013. Wealth, Endemism and Conservation of Mammals of Colombia. Neotropical Mastrozoology, 20 (2), pp. 301-365.*

### Genus *Didelphis*

***Didelphis marsupialis*** - Common opossum, possum, common chucha, fara, fox chucha. It is large in size (565-1960 g). The head is dirty yellow, sometimes with poorly defined black lines that extend from the nose, passing over the eyes, to almost the ears. The back is black to gray and the belly is paler or orange. The ears are usually black, large and bare. The eyes are large, black, with a bright whitish yellow eye reflex, and the nose is pink. The cheeks are yellow, pale orange or dirty white, without contrasting intensely with the color of the muzzle. The tail is prehensile. The basal third of the tail is black and the distal rest is white. Males are larger than females. The young are small blackish, with a clearer head and sharper facial markings. The ears of the young have white tips or are similar in color to adults. *Females have marsupium*, with opening to the anterior limb (Voss & Jansa, 2003). The skull is wider than that of *D. albiventris*, but the most notable features that distinguish *D. marsupialis* from *D. albiventris* or *D. pernigra* are the black ears and the lack of contrast in the face and crown marks (Anderson, 1997).



**Image 23.** *Didelphis marsupialis*, opossum or common chucha. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.



They are usually nomads: it has been observed that they cannot remain in an area for more than two or three months, in general terms it was evidenced that the female is usually more sedentary than the male and that both use smell and touch to move throughout the areas they inhabit, however, they do not usually defend a specific area or territory. However, when several burrows intersect in the areas they move through, each mammal (usually the male) marks the area with saliva, urine or its excreta. If two or more males meet, they may exhibit aggressive behaviors that they manifest by opening their mouths, growling, whistling or dragging their legs, although usually they tend to distance themselves more. Their burrows are made in log hollows, roosts abandoned by other mammals, rock cracks and roofs of houses. At night they can walk up to a kilometer and it is easy to detect them, since their eyes have a red color when they are illuminated.



**Image 24.** Distribution of *Didelphis marsupialis*. Source: IUCN (International Union for Conservation of Nature) 2008. *Didelphis marsupialis*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

Its distribution is extensive: it is found from eastern Mexico to northern Argentina, in Colombia it inhabits the entire country.

It should be clarified that the large amount of information obtained from the analysis of this mammal's life clearly indicates that the phenomena of reproduction, density and survival are closely related to more complex environmental variables, including climatic conditions, distribution, abundance and quality of food, predator-prey relationship and housing conditions, among others.

The longevity or period of life of *Didelphis marsupialis* depends on whether it is in a wild environment or, conversely, in captivity. In a wild environment it can live up to two years, while in captivity it can reach up to seven years of life, although the average in captivity is 4.2 years.

## *Didelphis marsupialis*, Common Opossum, LC Preocupación Menor (IUCN). 2019.

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Didelphis</i>
<b>Specie:</b>	<i>Didelphis marsupialis</i>



*Didelphis marsupialis*

CITATION  
Astua de Moraes, D., Lew, D., Costa, L.P. & Pérez-Hernandez, R. 2016. *Didelphis marsupialis*. The IUCN Red List of Threatened Species 2016: e.T40501A22176071. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T40501A22176071.en>. Downloaded on 09 July 2019.

**Image 25.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Didelphis marsupialis*. Date of consultation July 2019.



***Didelphis pernigra*** - Andean white-eared opossum, white-eared Andean carachupa is similar to *D. albiventris* and until its recent reclassification was considered a subspecies of *D. albiventris* (Lemos & Cerqueira, 2002). However, they are currently considered different biological entities. The fur is denser, composed of long and black protective hairs that, in a similar proportion, give rise to black or gray phase individuals. Black facial marks are more pronounced due to the extreme whiteness of the contrasting background. The ears are completely white or pink. Males and females differ in their cranial morphology. In addition, the third large upper premolar distinguishes *D. pernigra* from *D. albiventris* (Lemos & Cerqueira, 2002).



**Image 26.** *Didelphis pernigra* opossum or common white-eared chucha. Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020.

It reaches between 59 and 87 cm in length from the nose to the end of the tail. It weighs between 500 and 2,000 g. The fur on the back is dense and dark gray, with different tones that go to black and with white tips; Ventral fur is often whitish or pale yellowish. The yellowish white head, with a thick black ring around the eyes and with a triangular black stripe that is born between the eyes and goes to the crown, to join back with the dorsal fur; bare ears whitish or pink. The tail is naked. He lives in the Andes between 1,500 and 3,700 m of altitude in areas with vegetation, near water courses. Night habits, feeds on invertebrates and small vertebrates such as lizards, birds and mice.



**Image 27.** Distribution of *Didelphis pernigra*. IUCN (International Union for Conservation of Nature) 2008. *Didelphis pernigra*. The IUCN Red List of Threatened Species. Version 2019-. July 2019.

***Didelphis pernigra*, Andean White-eared Opossum, LC Preocupación Menor (UICN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Didelphis</i>
<b>Specie:</b>	<i>Didelphis pernigra</i>

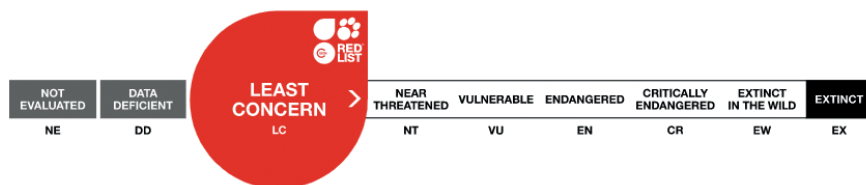




*Didelphis pernigra*

## CITATION

Pérez-Hernandez, R., Solari, S., Tarifa, T. & Lew, D. 2016. *Didelphis pernigra*. *The IUCN Red List of Threatened Species* 2016: e.T136395A22176668. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T136395A22176668.en>. Downloaded on 19 September 2019.



**Image 28.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Didelphis pernigra*. Date of consultation September 2019.

## Genus *Chironectes*.

The name of the genus *Chironectes* comes from the Greek words kheir, which means hand and nêo, to swim, therefore, nêktês means swimmer or swimmer's hand, alluding to the swimming membranes that present between the toes of the legs, which have derived of their aquatic customs. The *minimus* epithet comes from the Latin meaning the smallest, the least. When Zimmermann described this species, he thought it was a small otter type (Tirira, 2004). They are nocturnal and lonely. It is the only semi-aquatic marsupial (Marshall, 1978), driven by the movement of its hind legs. While swimming, the front hands extend them forward looking for prey in the substrate, the tail serves as a rudder while swimming. Once he captures the dam, he takes it to the shore. It feeds mainly on vertebrates such as fish, more commonly slow species or found at the bottom of streams or rivers, including frogs; It also feeds on invertebrates such as crustaceans and mollusks, occasionally fruits and aquatic plants (Stein and Patton, 2007). The rough structure of the palms, allows you to explore through the touch, the bottom of the estuaries and rivers where you live.

***Chironectes minimus*** - Water opossum, is the only one of the genus *Chironectes*. It is the only semi-aquatic marsupial; it lives in burrows and ravines that it builds in gorges or streams, emerging after catching fish, crustaceans and other aquatic animals that it will eat at the bank. It inhabits bodies of water from Mexico and the Caribbean to the northeast of Argentina and the northeast of Uruguay. It is also known as water weasel, water opossum, water tlacuache, water fox, water lollipop or even yapok, denomination of Guaraní origin. It is a small animal of 27 to 35 cm in length, with 30 to 40 cm of tail. The skin is marbled gray

and black, while the snout, eyes and crown are black. A lighter band runs through the spine to the ears, which are rounded and hairless. It has vibrissas on the cheeks or cheeks. The tail, thick and black at the base, is yellow or white at its end. It has several adaptations for your aquatic lifestyle. He has short, dense hair, water repellent; the propulsive legs are webbed, moving with alternating impulses; they are symmetrical to distribute the force in a balanced manner in both webbed back rooms, which increases hydrodynamic efficiency. The long tail helps in the momentum. Being a marsupial and at the same time an aquatic animal, it has developed a way to protect its young while swimming. Strong muscular rings make a bag (which they close while submerged), so the offspring will remain dry, even if their mother is totally submerged in the water. The male also has the same bag (although not airtight like that of the female), where he protects his genitals before swimming, and thus prevents injuries in contact with submerged branches, allowing high speeds without that risk.



**Image 29.** *Chironectes minimus*, water chucha. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

Mating occurs in December and the young, in numbers of 1 to 5 puppies, are born in the nest two weeks later. They do not appear outside the marsupium until 20 days. At 22 days the appearance of hairs begins and at 40 they open their eyes and they already peek something from the maternal bag. At 48 days they grab perfectly on the nipples and continue sleeping with their mother.

Apparently it reproduces more than once a year. In Brazil, births were registered in December and January. Approximately one month after life, the young leave the marsupial bag, but remain with their mother until weaning. In captivity they can live up to 3 years.



Their habitat is, for the most part, rainforests and tropical and subtropical forests, always associated with rivers and streams; from sea level to 1,800 meters high.



**Image 30.** *Chironectes minimus*, water chucha, forelimb. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

During the day it is hidden in caves, about 0.5 meters deep, which it builds on the margins of the water courses just above the current level. It also usually rests in nests that it builds with leaves and grass on the ground beside the water. On land he walks bent over the back. It can climb, but it rarely does. Distribution from southern Mexico, Central America, Colombia, Venezuela, Guayanas, Ecuador, Peru and northern Bolivia. In addition, in eastern Paraguay, southeast of Brazil and northeast of Argentina and Uruguay. It is a rare species. IUCN: minor concern. Colombia: minor concern Argentina; potentially vulnerable Bolivia: minor concern. Brazil: vulnerable in Rio Grande do Sul and insufficient data in Paraná. Uruguay: very vulnerable and insufficiently known.

The registration of the individual and the images referenced in this file were obtained in Colombia, Department of Antioquia, Aburrá Valley, near the Municipality of Envigado and El Retiro. Above 2,000 meters above sea level.



**Image 31.** Distribution of *Chironectes minimus* IUCN (International Union for Conservation of Nature) 2008. *Chironectes minimus*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Chironectes minimus*, Water Opossum, LC Preocupación Menor (UICN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Chironectes</i>
<b>Specie:</b>	<i>Chironectes minimus</i>

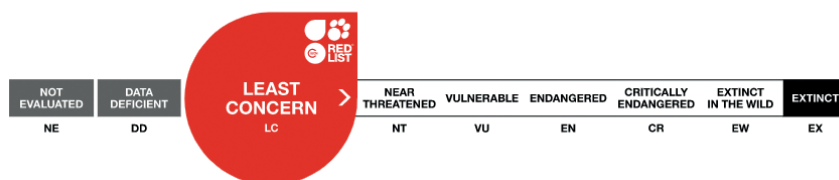




*Chironectes minimus*

## CITATION

Pérez-Hernandez, R., Brito, D., Tarifa, T., Cáceres, N., Lew, D. & Solari, S. 2016. *Chironectes minimus*. *The IUCN Red List of Threatened Species* 2016: e.T4671A22173467. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T4671A22173467.en>. Downloaded on 13 July 2019.



**Imagen 32.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Chironectes minimus*. Date of consultation July 2019.

## Genus *Caluromys*.

The name of the genus *Caluromys* comes from the Greek kalos which means beautiful, of course; oura tail; and mys, myos genitive, a mouse, “a beautiful tail mouse.” It is arboreal, nocturnal and lonely. It feeds on a variety of fruits, insects, small vertebrates, flowers and nectar (Tschapka and Von Helvesen, 1999; Gardner, 2007). Build their nests using leaves and branches that are placed in tree hollows (Emmons and Feer, 1999). It looks for its food in the high part of the trees, reason why very rarely it descends to the ground. Apparently females are more sedentary than males. The average gestation period for the entire marsupial group is 12 to 15 days, after which the offspring remain in the marsupium for an additional 60 to 70 days (Bucher and Hoffmann, 1980).

***Caluromys lanatus*** - Brown-eared woolly opossum, is a tree, nocturnal and solitary species. It feeds mainly on fruits and invertebrates (such as beetles and hymenoptera). It is an opportunistic species that consumes a great variety of fruits, both in size and nutritional content (Astúa, 2015). The fruits they consume are characterized by being fleshy with abundant water content. Occasionally it can feed on flowers and pollen. Because of this they possibly act as pollinators (Gribel, 1988; Gardner, 2007; Astúa, 2015). It is also considered likely to feed on gums and exudates produced by the bark of certain trees. During the day he takes refuge in tree hollows where he has a habit of building their nests with leaves and branches. At night it is very quiet and moves slowly (Bucher and Hoffmann, 1980). Apparently they can reproduce during any time of the year (Gardner, 2007). It prefers primary forests and is less frequently found in secondary forests.

It is a kind of medium size and slender body. Back reddish brown to pale brown, being more intense on the shoulders, forearms and hind legs, while the ventral area is yellowish white more grayish in the middle. The head is gray and the face has a prominent dark strip in the direction of the center. The rings around the eyes are reddish brown and continue with a dark stripe from the corner of the eye to the nose. The eyes are dark brown; the ears are cinnamon pink. The tail is densely hairy dorsally in the proximal half and ventrally to the fifth part. The tip of the tail is bare, whitish and dotted with brown spots. The feet vary from red brown to dark gray. Adult females have the inguinal region and the area around the nipples, orange brown. They develop their marsupium only when transporting the offspring (Emmons and Feer, 1999).



**Image 33.** *Caluromys lanatus*, woolly chucha, butter chucha . Source: <https://www.facebook.com/groups/chuchaszarigueyasymarsupiales/?ref=bookmarks>. © Copyright. 2020.

It is distributed in the north and center of Colombia, in the northwest and south of Venezuela, east of Ecuador, east of Peru, east of Bolivia, east and south of Paraguay, north of Argentina and west and south of Brazil (Gardner, 2007).





**Image 34.** Distribution of *Caluromys lanatus* IUCN (International Union for Conservation of Nature) 2008. *Caluromys lanatus*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Caluromys lanatus*, Brown-eared Woolly Opossum, LC Preocupación Menor (IUCN).**

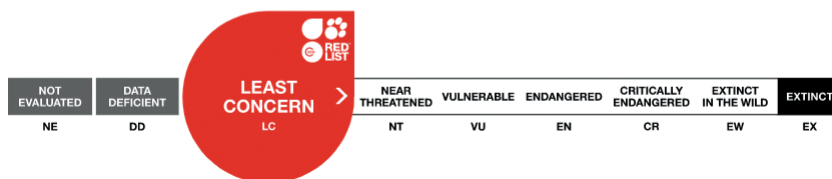
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Caluromys</i>
<b>Specie:</b>	<i>Caluromys lanatus</i>



## *Caluromys lanatus*

### CITATION

Costa, L.P., Astua de Moraes, D., Brito, D., Lew, D. & Tarifa, T. 2015. *Caluromys lanatus*. *The IUCN Red List of Threatened Species* 2015: e.T3648A22175609. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T3648A22175609.en>. Downloaded on 13 July 2019.



**Image 35.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Caluromys lanatus*. Date of consultation July 2019.

***Caluromys derbianus*.** Central American woolly opossum, a species described by Waterhouse (1841), Valle del Cauca in Colombia being the type locality. Currently six subspecies are recognized (Gardner, 2005). The epithet *derbianus* was awarded in honor of Edward George Geoffrey Smith (1799-1869), Earl of Derby, English aristocrat benefactor and collector in studies of natural history and *anus* of Latin, suffix meaning belonging to, “belonging to the Earl of Derby” (Tirira, 2004).

It is arboreal, nocturnal and lonely. It feeds on a variety of fruits, insects, small vertebrates, flowers and nectar (Tschapka and Von Helversen, 1999; Gardner, 2007). Build their nests using leaves and branches that place them in tree hollows (Emmons and Feer, 1999). It looks for its food in the high part of the trees reason why very rarely it descends to the ground. Apparently, females are more sedentary than males. The average gestation period for the entire marsupial group is 12 to 15 days, after which the offspring remain in the marsupium for an additional 60 to 70 days (Bucher and Hoffmann, 1980). It has been recorded that it can live up to five years, three months in captivity (Walker, *et al.* 1964). It is present in primary, secondary and intervened forests, including cultivation areas and farms (Tirira, 2007; Astúa, 2015).

It is a species of medium size and slender body that has long, soft, dense, woolly and slightly veined fur. The back is intense reddish brown while the ventral zone is yellowish white to reddish gold. The back has a pale gray spot between the shoulders and in the hip area. The head is pale gray with a dark brown strip in the central part of the face. The rings around the eyes are brown and extend in a dark line between the eyes and nose. The eyes of this species are dark brown with the black pupil. The ears lack hair and have a whitish



to pinkish color. The front legs and feet are creamy white while the rear feet are brown. The tail is prehensile and notoriously larger than the head-body length and has a dense coat in the dorsal part that extends from the base of the tail to 30-50% of its length. In the ventral area of the tail, the fur extends up to 25% of the total size. The tip of the tail is bare, pale and with brown spots especially near the middle. Females develop marsupium only when they carry young, while at other times it is reduced to small folds (Bucher y Hoffman, 1980; Emmons y Feer, 1999; Tirira, 2007). Juvenile specimens have a gray color than adults (Astúa, 2015).



**Image 36.** *Caluromys derbianus*. Source: © Diego G. Tirira. 2019. <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Caluromys%20derbianus>. © Copyright. 2020.

It is distributed to the western Andes in Colombia and Ecuador. It also inhabits Central America and Mexico (Gardner, 2007).



**Image 37.** Distribution of *Caluromys derbianus*. IUCN (International Union for Conservation of Nature) 2008. *Caluromys derbianus*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Caluromys derbianus*, Central American Woolly Opossum, LC Preocupación Menor (IUCN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Caluromys</i>
<b>Specie:</b>	<i>Caluromys derbianus</i>

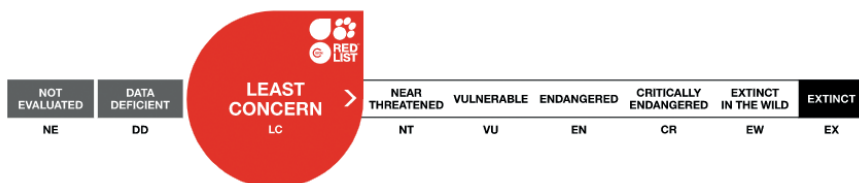




*Caluromys derbianus*

## CITATION

Solari, S. & Lew, D. 2015. *Caluromys derbianus*. *The IUCN Red List of Threatened Species* 2015: e.T3650A22175821. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T3650A22175821.en>. Downloaded on 13 July 2019.



**Image 38.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Caluromys derbianus*. Date of consultation July 2019.

## Genus *Metachirus*.

The name of the genus *Metachirus* comes from the Greek words *meta*, *between*, in the middle of, next to and *kheir*, which means hand. The epithet *nudicaudatus* comes from the Latin *nudi*, naked; *cauda*, which means tail and *atus*, suffix that means provided with, “with naked tail, without hair” (Tirira, 2004). It is a nocturnal, solitary and terrestrial species (Gardner and Dagosto, 2007). It feeds predominantly on termites, ants, opiliones and coleoptera (Santori, 1995; Freitas, *et al.*, 1997; Cáceres, 2004). However, they include fruits and small vertebrates in their diet (Santori, *et al.*, 1995; Carvalho, *et al.*, 1999; Cáceres, 2004; Lessa and Costa, 2010; Lessa and Geise, 2010). It moves along the ground and over fallen logs. It takes refuge in holes near the ground or in roots of palms or other trees or in holes a maximum of one-meter-high (Emmons and Feer, 1999; Santori *et al.*, 1996; Astúa, 2015). The nests are spherical and built with leaves and small branches, the entrance is closed with a leaf (Loretto, *et al.* 2005).

***Metachirus nudicaudatus*** - Brown four-eyed opossum, is a nocturnal, solitary and terrestrial species (Gardner and Dagosto, 2007). The nests are spherical and built with leaves and small branches, the entrance is closed with a leaf (Loretto, *et al.*, 2005). The material used for construction is transported with the tail and the marsupium (Delgado-V, *et al.*, 2014). They reach reproductive maturity at 10 months, although there are records of sub-adult females with offspring. The gestation period is 20 to 28 days in captive individuals. They can have five to nine offspring per litter (Astúa, 2015). Once the offspring are born, they remain attached to the female’s breasts for 75 to 80 days; then the mother leaves them in the nest while going out to feed, it takes about 30 to 45 days until the offspring are fully weaned

and separate at approximately 130 days of age. Lactating females have been registered in Peru in the months of January, February, March, May, June and October. Juveniles collected in May, June, July, September, October and November, and subadults in June and November (Díaz, 2014); in Colombia, lactating females were found in April, while in Venezuela these were in the months of April and May (Astúa, 2015). The peaks of activity during the night are from 20:00 to 23:00, then its activity decreases dramatically (Astúa, 2015).



**Image 39.** *Metachirus nudicaudatus*, four brown eyes chucha. Source: Corporación Autónoma Regional Rionegro Nare- CORNARE © Copyright. 2020.

***Metachirus nudicaudatus*** It is a medium-sized species with dense, short and rough-looking fur. Back of reddish brown, yellowish or grayish brown with the center of the back sometimes blackish with shallow yellow hairs or with beige tips, slightly intermingled. This dark coloration extends to the outer sides of the extremities. The eye rings of this species are dark brown and extend from the nose to the ears, blurring at the top of the head. The eye rings contrast with the yellowish white spots on the eyes; for which it is given its name (brown raposa with four eyes).

This species has the middle stripe on the face from the tip of the snout to the top of the head. This line is the same color as the eye rings. Belly and lower cheeks of uniform light yellow or orange color (Gardner and Dagosto, 2007; Astúa, 2015).



The crown is black, sometimes extending like a black stripe over the neck. The ears are bare and brown. The nose is gray and the eyes are dark brown. Tail brown or gray pale towards the tip and bare from near its base. Pink scrotum *Female without marsupium*, with nine breasts, four on each side and a half (Emmons and Feer, 1999; Tirira, 2007; Astúa, 2015).

It is distributed in Colombia, the western states and south of the Orinoco River in Venezuela, the Guyanas, Ecuador, Brazil (except the northeast), east and central Paraguay, northern Argentina, eastern Bolivia and Peru. The species is also found in Central America and southern Mexico (Gardner and Dagosto, 2007). In Ecuador it lives on the Coast, the Amazon and foothills of the Andes, in tropical and subtropical forests, wet and dry (Tirira, 2007).



**Image 40.** Distribution of *Metachirus nudicaudatus* IUCN (International Union for Conservation of Nature) 2008. *Metachirus nudicaudatus*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

### ***Metachirus nudicaudatus*, Brown Four-eyed Opossum, LC Preocupación Menor (UICN). 2019.**

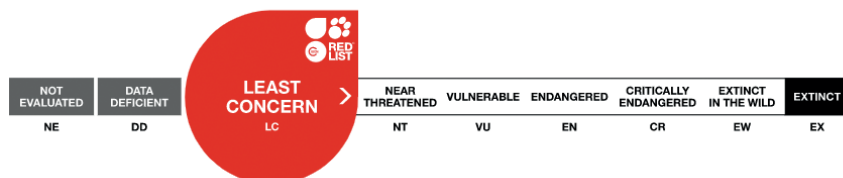
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Metachirus</i>
<b>Specie:</b>	<i>Metachirus nudicaudatus</i>



## *Metachirus nudicaudatus*

### CITATION

Brito, D., Astua de Moraes, D., Lew, D. & de la Sancha, N. 2015. *Metachirus nudicaudatus*. *The IUCN Red List of Threatened Species* 2015: e.T40509A22177475. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T40509A22177475.en>. Downloaded on 19 September 2019.



**Image 41.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Metachirus nudicaudatus*. Date of consultation September 2019.

## Genus *Philander*.

The generic name *Philander* is derived from the primary vernacular name, “Philander opossum” used by Seba (1734, cited in Castro-Arellano *et al.*, 2000). According to, Tirira (2004) is derived from the name *Philander* formerly used for some Australian marsupials Thomas (1899) does not refer to the etymology of the name *melanurus*, but frequently he assigned specific names based on or in relation to the main character of the species he was describing, in this case it may be alluding to the tip of the dark tail, which differentiated this form from the rest of subspecies included in *P. opossum* at that time.

*Philander melanurus* It is a recently revalidated (“resurrected”) species, so that natural history information in this way is now inseparable from that of *P. opossum*. Based on the information available for *P. opossum*, *P. melanurus* must be a kind of nocturnal, solitary and mostly terrestrial habits, although they can easily climb and swim; it can be found climbed in trees up to five meters high (Charles-Dominique *et al.*, 1981). Like its congeners it is omnivorous, it feeds on insects, fruits, invertebrates and occasionally it can feed on carrion and even nectar (Hershkovitz, 1997); However, it has been recorded that 50% of their diet corresponds to fruits.

The species of the *Philander* genus are medium-sized didelphids (head-body length = 250-350 mm; weight = 280-700 g) characterized by (Patton and da Silva, 2007; Voss *et al.*, 2018) have two spots supraocular whitish on the face and eyes framed by dark periorcular spots that resemble a mask.



They lack the dark rostral fringe that runs along the medial axis in other species of didelphid; the dorsal coloration is gray and uniform, with short hairs; the color of the belly is pale but varies between species and within the same species; the front legs have the third digit longer than the fourth (i.e., mesaxonicas) that end in long claws and lack a carpal tuber; the fourth digit of the hind leg is longer than the rest of the fingers, they have marsupium, they have five or seven breasts.

Its tail is blackish in its proximal portion and contrastingly clear in its distal portion, although in some cases specimens with the totally black tail can be observed. It is longer than the head-body length and although it is robust it is not thickened, the caudal scales are organized in spiral series. 4-6 hairs or bristles emerge from the distal margin of each scale; the distal portion of the ventral surface is modified in a pad or callus that serves the species for support and adhesion during tree locomotion.

Voss *et al.* (2018) describe in detail the skull of this genus, some cranial morphological characters reported by them are: relatively small and delicate skull when compared to genera such as *Didelphis*, whose skull is morphologically similar. The nasal passages are short, the anterior end does not exceed the first pair of upper incisors and widens at the height of the fronto-maxillary suture; they have a well-developed sagittal crest; palatal forages are small and in posterolateral position; the upper canine is simple without accessory cusps, the first superior premolar is smaller than the posterior premolars but conspicuous (non-vestigial), the third superior premolar is taller than the second, the deciduous superior premolar is large and molariforme, the molars resemble at the butcher type, the width of the upper molars decreases from the first molar to the fourth molar, the lower incisors lack lingual cusps, the lower canine is erect, pointed and simple.

***Philander opossum*** – Gray four-eyed opossum, the chucha four gray eyes is one of the marsupial species present in America (Gardner, 2005). It is distributed from central-eastern Mexico to Argentina, from lowlands to 1,600 m.a.s.l. (Reid, 1997; Castro-Arellano *et al.*, 2000). The four gray-eyed chucha is an individual with a head and body length 253-315 mm, tail length 273-329 mm, foot length 43-50 mm, ear length 33-41 mm, weight 263- 1,400 g.

Medium size. Dorsal part of dark brown-grayish to blackish-gray color dotted with white hairs, imparting a slight shine. Ventral part and the surface of the legs are cream or yellow. The fur is dense and slightly woolly. Black ears; cream colored spots at the base of the coat.

Blackish head with contrasting cream-colored spots on the eyes; cream cheeks. Before the reflection of the light, the eyes are bright and reddish. The tail base is hairy like the body (30-50mm.), Two thirds or more of its length are almost bare, contrasting with its white end.

This species is common in different types of forest (deciduous, always green, secondary growth) and is also found in gardens or orchards (Reid, 1997). It is an omnivorous species that feeds on invertebrates, small vertebrates and fruits, a diet similar to that observed in opossums of the genus *Didelphis* (Jackson, 1994).



**Image 42.** *Philander opossum*, juvenile, four gray eyes chucha. Source: Claudia González, México D.F.  
© Copyright. 2020.





**Image 43.** Distribution of *Philander opossum* IUCN (International Union for Conservation of Nature) 2016. *Philander opossum*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Philander opossum*, Gray Four-eyed Opossum, LC Preocupación Menor (UICN). 2019.**

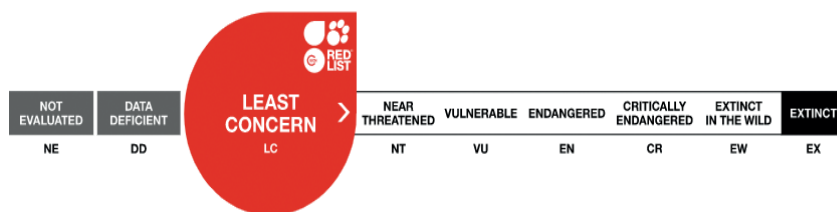
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Philander</i>
<b>Specie:</b>	<i>Philander opossum</i>

## *Philander opossum*

### CITATION

de la Sancha, N., Pérez-Hernandez, R., Costa, L.P., Brito, D. & Cáceres, N. 2016. *Philander opossum*. *The IUCN Red List of Threatened Species* 2016: e.T40516A22176779.

<http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T40516A22176779.en>. Downloaded on 14 July 2019.



**Image 44.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Philander opossum*. Date of consultation July 2019.

***Philander andersoni*** - Anderson's four-eyed opossum. According to Tirira (2004) it is derived from the name *Phylander* formerly used for some Australian marsupials. The specific epithet *Andersoni* is the Latinization of the proper name Anderson, by zoologist Michael Playfair Anderson (1879-1919) who collected the holotype in the early twentieth century (Beolens *et al.* 2009).

*Philander andersoni* It is a medium-sized species, with a slender body, short, dense and soft fur with a velvety appearance. The back is dark gray with a conspicuous almost black strip of 3–4 centimeters in the midline of the back, from the neck to the base of the tail, this line contrasts with the gray sides of the body (Hershkovitz, 1997; Patton and da Silva, 2007; Astúa, 2015). The entire back features protective hairs that are long, thick and darker. The ventral region is cream colored with the base of gray to pale gray hairs, gray-looking with a certain yellowish hue that becomes more evident at the abdomen (Emmons and Feer, 1999). The cheeks are cream color and have supraocular spots (on each eye), creamy color, no midline on the face. The head is elongated with the blackish face. The tail is longer than the length of the head and body together (110%), it has hair in the proximal part of the body and the naked part is dark gray to black; The last third of the tail is white (Astúa, 2015). The legs are black. Big, bare and brown ears with a pale cream-colored spot at the base.





**Image 45.** *Philander andersoni*. Source: Carlos Boada © Copyright. 2019. <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Philander%20andersoni>. 2020.

They are nocturnal, solitary and mostly terrestrial animals; however, they have also been found in trees. It is an omnivorous species, it feeds on insects, other terrestrial invertebrates and fruits, it can eventually feed on meat (Herskovitz, 1997). Some researchers suggest that *Philander andersoni* should be more arboreal and aquatic than *Philander opossum* (Patton and da Silva, 2007).

It takes refuge in small cavities in the ground, hollow trees and branches of trees or shrubs at low altitude (Herskovitz, 1997). This species has been registered with young in the marsupium in the month of March, other females with their young have been reported in the months of March, May, July and a lactating female in the month of October in Peru (Díaz and Flores, 2008; Díaz, 2014). The litter size is two to five offspring per reproductive period (Díaz and Flores, 2008; Fleck and Harder, 1995).

Females have well developed marsupium that opens forward, may have an orange color when it reaches adulthood; it has seven breasts, three on each side and a half (Herskovitz, 1997; Emmons and Feer, 1999; Astúa, 2015). This species has sexual dimorphism in the skull (Astúa, 2010).



**Image 46.** Distribution of *Philander andersoni*. IUCN (International Union for Conservation of Nature) 2008. *Philander andersoni*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Philander andersoni*, Anderson's Four-eyed Opossum, LC Preocupación Menor (IUCN). 2019.**

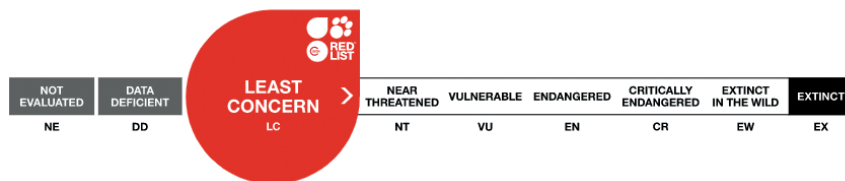
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Philander</i>
<b>Specie:</b>	<i>Philander andersoni</i>



*Philander andersoni*

## CITATION

Astua de Moraes, D., Pérez-Hernandez, R. & Costa, L.P. 2016. *Philander andersoni*. *The IUCN Red List of Threatened Species* 2016: e.T40515A22177040. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T40515A22177040.en>. Downloaded on 14 July 2019.



**Image 47.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Philander andersoni*. Date of consultation July 2019.

## Genus *Marmosa*

The *Marmosa* genus is a name of unknown origin, first given by the Frenchman Georges Buffon (1707-1788) to a species of this genus; in French there are two words that have some resemblance in *marmosa*: marmouset, means “monigote”, and marmotte, “a small European rodent”.



**Image 48.** Gender *Marmosa* sp. Source: <https://www.facebook.com/groups/chuchaszarigueyasmarsupiales/>. © Copyright. 2020.

The different species of the *Marmosa* genus are distributed throughout wide areas of South America and practically all of Central America. The northernmost species is *Mexican Marmosa*, which extends from northern Mexico to western Panama, distributed through numerous ecosystems from the central Mexican desert, to tropical jungles and coasts throughout Central America.

The *marmosa guajira* or *Marmosa xerophila*, in Colombia, is also an inhabitant of arid areas, constituting the exception to the generality of the species of the genus, which usually inhabit wooded territories and of high humidity.



**Image 49.** *Marmosa* sp. Chucha gray shaggy butter. Source: Zarigüeya Foundation - FUNZAR © Copyright. 2020.

Hair color varies not only among different species, but between individuals, and even according to their age. However, its discoloration is generalized from the dorsal midline to the ventral. It usually has grayish or brown and reddish tones in the dorsal and white regions, light grayish, creamy or yellowish in the ventral. The head is small, with the snout accumulated. The large mouth with sharp teeth. The eyes, black and bulging, with a reddish glow to the reflection of light, can be framed in black spots in some species such as *M. mexicana*. The ears are round and bare. The tail is bare and prehensile. They lack marsupium, the breasts are arranged in pairs along the ventral midline in the abdominal region.

The feeding of these animals is mostly insectivorous, being important predators of animals harmful to agriculture such as large grasshoppers and lobsters. However, as a counterpart,



they usually also feed on sweet and juicy fruits, plantations of grapes, bananas and mangoes. They supplement their diet with some vertebrates such as small rodents or lizards and bird eggs.

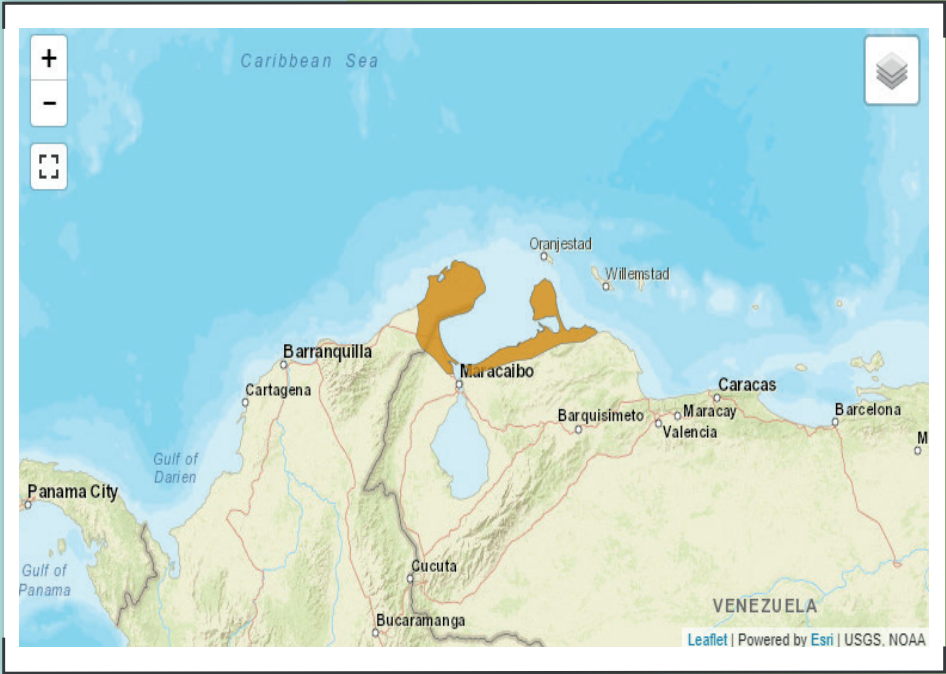
In various specimens of the different species of the *Marmosa* genus, nomadic behaviors have been evidenced with sedentary periods in which territorial settlements are violently defended by their owners. On some occasions there is overlapping of the areas between males and females, but in no case between two or more individuals of the same gender. They are partially arborícolas, with more terrestrial tendencies those species that inhabit lands of lower vegetal density like arid plains shrubs or deserts. They build burrows in variable locations depending on the habitat in which they operate, not ruling out taking advantage of nests and other shelters abandoned by other animals.

***Marmosa xerophila*** - Dryland mouse opossum, the Marsh Guajira, also known as *Marmosa* del Desert or Opossum of La Guajira is an endemic marsupial from La Guajira (northeast of Colombia) and Zulía (northwest of Venezuela).

*Marmosa xerophila* is endemic to arid habitats and dry forests in a restricted area in northern Colombia (department of La Guajira) and northwestern Venezuela in the states of Zulía and Falcón (Eisenberg, 1989; Thielen *et al.*, 1997a, b). *M. xerophila* is categorized as Vulnerable (VU) by the IUCN Red List of Threatened Species (Pérez-Hernández *et al.*, 2016b). **Note: In the following image this individual has a red snout because it is eating the fruit of the cactus.**



**Image 50.** *Marmosa xerophila*, high and medium Guajira - Colombia. Source: Marleny Jaramillo - Biologist Ornithologist. © Copyright. 2020.



**Image 51.** Distribution of *Marmosa xerophila*. IUCN (International Union for Conservation of Nature) 2008. *Marmosa xerophila*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Marmosa xerophila*, Dryland Mouse Opossum, VU Vulnerable (IUCN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosa</i>
<b>Specie:</b>	<i>Marmosa xerophila</i>





*Marmosa xerophila*

## CITATION

Pérez-Hernandez, R., López Fuster, M. & Ventura, J. 2016. *Marmosa xerophila* (errata version published in 2017). *The IUCN Red List of Threatened Species* 2016: e.T12815A115106154.  
<http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T12815A22174448.en>. Downloaded on 13 July 2019.



**Image 52.** Conservation status IUCN (International Union for Conservation of Nature) VU, *Marmosa xerophila*. Date of consultation July 2019.

***Marmosa robinsoni*** - Robinson's mouse opossum. This species is sexually dimorphic where males are larger and darker than females. The dorsal coat is usually reddish brown and the belly is yellowish or orange. It has a dark mask that surrounds the eyes, large and membranous ear pavilions and a long, thin and prehensile tail.

*It does not have marsupium.* The testicles of the males have a blue color. It is a species very similar to *M. robinsoni* from which it can be differentiated only with cranial characteristics.

It is an arboreal species, escansorial, it is found mainly along the branches and lianas in search of fruits and insects, it is nocturnal, solitary and does not present migration. It builds nests in the shape of a drawer with leaves that attach to the trees. It reproduces once a year, probably in the dry season.

Not much is known about the size of the litter, but it may be related to the number of breasts found in females that are between 6 and 12.

It occurs within humid forests and is more abundant in secondary vegetation compared to primary forests.

It is distributed from southern Costa Rica, Panama, coastal strip of northern Colombia, coast of Venezuela, including the nearby islands Trinidad and Tobago, Grenada. In Colombia it has been registered from 0 to 1,500 m.a.s.l. in the Andean, Caribbean and Pacific region.



**Image 53.** *Marmosa robinsoni*, western butter chucha. Source: www.fotonatura.org © Copyright. 2020.



**Image 54.** Distribution of *Marmosa robinsoni* IUCN (International Union for Conservation of Nature) 2012. *Marmosa robinsoni*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.



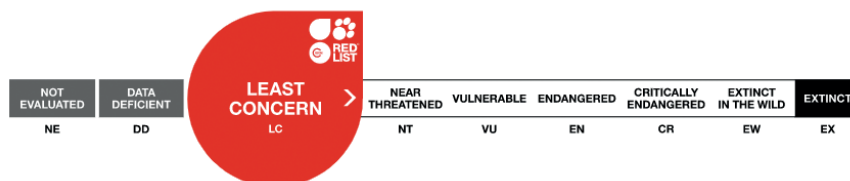
***Marmosa robinsoni*, Robinson's Mouse Opossum, LC Preocupación Menor (IUCN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosa</i>
<b>Specie:</b>	<i>Marmosa robinsoni</i>

***Marmosa robinsoni***

## CITATION

Pérez-Hernandez, R. 2016. *Marmosa robinsoni*. *The IUCN Red List of Threatened Species* 2016: e.T40506A22174162. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T40506A22174162.en>. Downloaded on 13 July 2019.



**Image 55.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa robinsoni*. Date of consultation July 2019.

***Marmosa lepida*** – Little rufous mouse opossum, species described by Thomas (1888). Type locality: in Santa Cruz, Loreto, Peru. No subspecies are currently recognized (Gardner, 2005). Under the analysis of maximum parsimony based on the cytochrome-b matrix, *Marmosa lepida* is recognized as a sister taxon of *Marmosa andersoni*, which, although both species are very divergent form a lineage with a weak support (Voss *et al.*, 2014).

There is little specific information on this species. Brito and Pozo-Zamora (2015) report an adult male individual manually collecting in the early hours of the night while descending from a guava or guamo tree *Inga* sp. 3 m from a small creek. The habitat was characterized by dominance of shrimp (Araceae), *Heliconia* sp. and abundance of *Dyctocaryum lamarckianun* palms. Apparently it lives only in primary forests (Tirira, 2007).

The average gestation period for the entire marsupial group is 12 to 15 days, after which the offspring remain in the marsupium for an additional 60 to 70 days (Bucher and Hoffmann, 1980). It lives in the Amazon, in low and subtropical lands, in tropical rainy montane forest in dense forests (Astúa, 2015; Brito and Pozo-Zamora, 2015).

Small species with long and dense fur. The back is an intense uniform brown or reddish orange while the ventral part is cream white with a pink tint. This coloring pattern is an adaptation to its development within humid forests.

The snout is pronounced and has black and prominent eye rings, forming a mask around the eyes. The ears are bare, red-brown and short reaching half the eyes when they lean forward. Naked and very long tail, thin, pale brown, slightly covered with white hairs below. Scrotum densely covered with cream-colored fur. Cream colored feet.

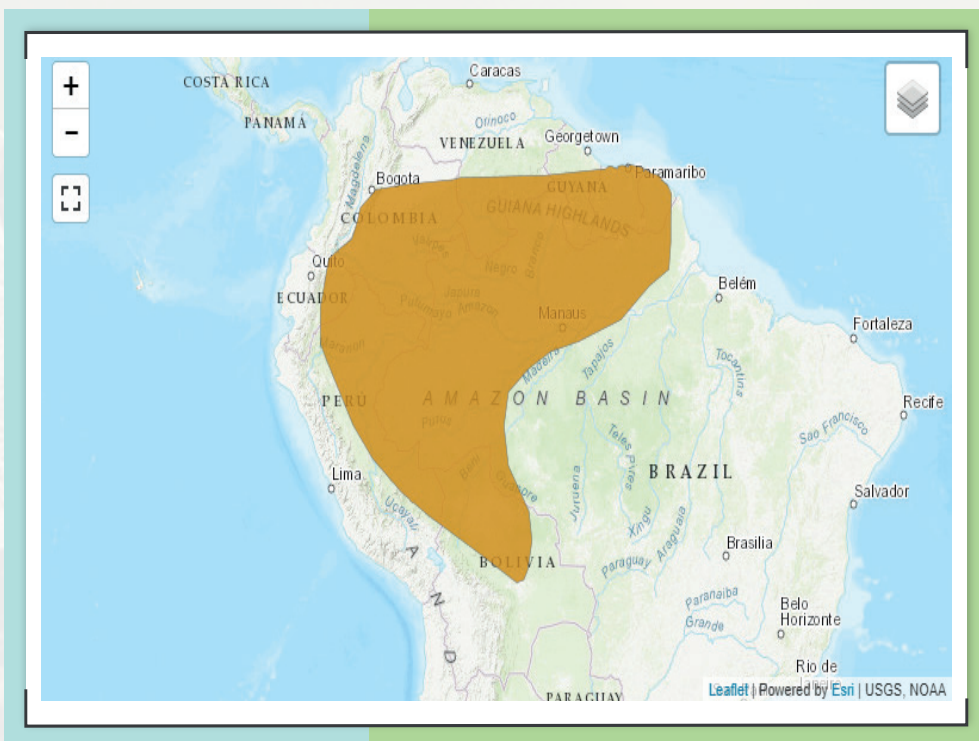
Females without marsupium and with seven functional breasts (Emmons y Feer, 1999; Tirira, 2007; Creighton y Gardner, 2007).



**Image 56.** *Marmosa lepida*. Source: Paúl Sarmiento Bermúdez © Copyright. 2019. <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Marmosa%20lepida>. © Copyright. 2020.

It is distributed in northern Suriname, Guyana, French Guyana, Southern Venezuela, western Brazil and the lowlands of Colombia, Ecuador, Peru and Bolivia (Creighton and Gardner, 2007; Astúa, 2015).





**Image 57.** Distribution of *Marmosa lepida*. IUCN (International Union for Conservation of Nature) 2016. *Marmosa lepida*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Marmosa lepida*, Little Rufous Mouse Opossum, LC Preocupación Menor (UICN). 2019.**

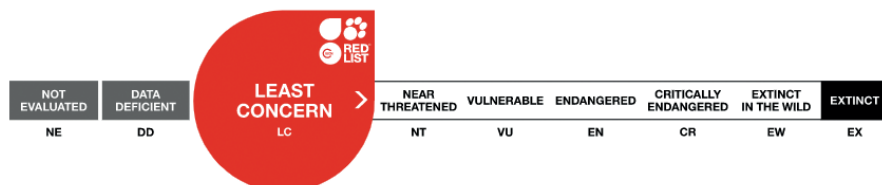
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosa</i>
<b>Specie:</b>	<i>Marmosa lepida</i>



## *Marmosa lepida*

### CITATION

Cáceres, N., Solari, S. & Tarifa, T. 2016. *Marmosa lepida*. *The IUCN Red List of Threatened Species* 2016: e.T12814A22173952. <http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T12814A22173952.en>. Downloaded on 13 July 2019.



**Image 58.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa lepida*. Date of consultation July 2019.

***Marmosa regina*** – Short-furred woolly mouse opossum, species described by Thomas (1989). Type locality: West of Cundinamarca, Bogotá Region, Cundinamarca, Colombia. Three subspecies *M. r. Regina*, *M. r. German* and *M. r. rappa*.



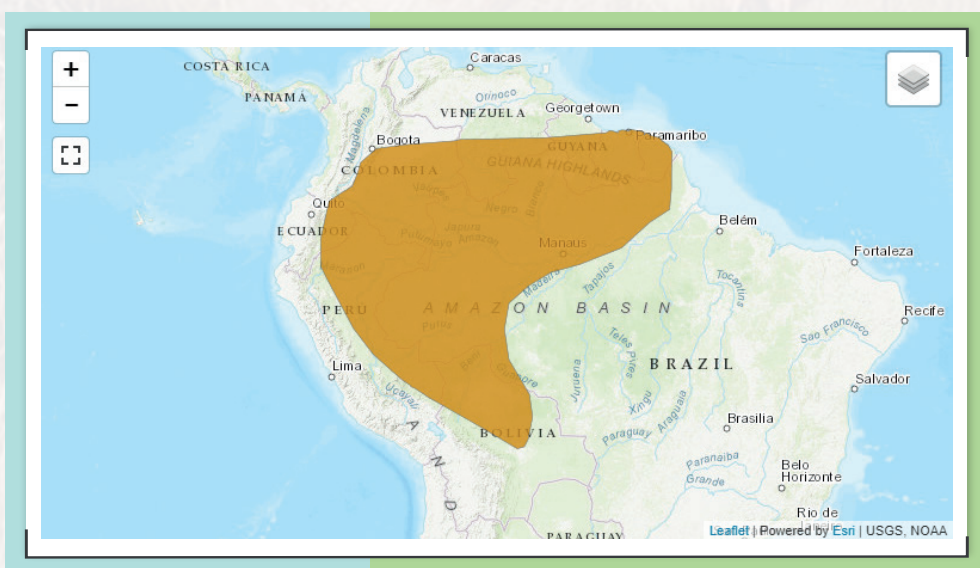
**Image 59.** *Marmosa regina*. Source: Carlos Boada © Copyright. 2019. <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Marmosa%20regina>. © Copyright. 2020.

Previously *Micoureus* was treated as an independent genus, after molecular analyzes it was determined that this corresponds to a subgenus within *Marmosa*, which covers the species *alstoni*, *constantiae*, *demerarae*, *paraguayana*, *phaea* and *regina* (Voss and Jansa,



2009; Voss *et al.*, 2014). The *Marmosa regina* species forms a sister taxon of *Marmosa constantiae* (de la Sancha, *et al.*, 2012; Voss, *et al.*, 2014). There is no complete information of its natural history. However, the genus is characterized by its nocturnal, arboreal and solitary habits. It feeds on insects, other invertebrates and fruits (Tirira, 2007; Astúa, 2015). They are preferably found in the upper stratum of the forest and less frequently in the soil (Díaz-Nieto, 2014); and captured 5 to 10 m high. It is found both on land and in temporarily flooded areas (Patton *et al.*, 2000). Reproductive females have been found in the months of February, September, October and November, so it is suggested that they have young in dry and rainy season. They can have 6 to 8 offspring (Patton *et al.*, 2000). Females with their young have been captured in the months of July and August (Creighton and Gardner, 2007).

This species has dense and long fur, 10 mm. on the back. Brown in both the back and the side, dyed orange, yellow or pink. The eyes are black with a narrow eye ring. The cheeks and chin are orange, pinkish or beige. The tail is long (140% of the length of the body), it has hair in the first 3 centimeters proximal to the body, the naked part of the tail is brown, and white spots may appear on the tip. The ventral coat is light orange to beige from the chin and cheeks to the English. The hairs on the sides of the abdomen and chest have the grayish base. The ears are brown. Females do not possess marsupium (Patton *et al.*, 2000; Astúa, 2015).



**Image 60.** Distribution of *Marmosa regina* IUCN (International Union for Conservation of Nature) 2011. *Marmosa regina*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Marmosa regina*, Short-furred Woolly Mouse Opossum, LC Preocupación Menor (IUCN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosa</i>
<b>Specie:</b>	<i>Marmosa regina</i>



*Marmosa regina*

CITATION

Solari, S., Tarifa, T., Astua de Moraes, D. & Cáceres, N. 2015. *Marmosa regina*. *The IUCN Red List of Threatened Species* 2015: e.T40511A22174686. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T40511A22174686.en>. Downloaded on 19 September 2019.

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**Image 61.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa regina*. Date of consultation September 2019.

***Marmosa murina***- Linnaeus's mouse opossum, also known as eyeglasses mouse, raposa chica, ratona weasel or mouse possum.

Associated with humid habitats and tropical evergreen forests. It is found in the jungle, often in the dense undergrowth and tangled forest or in areas with weeds. It is also found in vegetation along rivers and in secondary forests.

This species is especially common in swamps, intervened areas such as those dominated by heliconias species in modified forest areas, (CORTOLIMA, 2009).

The body measures between 10 and 16 cm in length and weighs between 38 and 52 g. Its fur is soft and velvety, on the back of brown or dark gray, with reddish tones; and yellowish

96



white on the neck, chest and belly. The eyes are surrounded by a blackish patch. The ears lack hair. Very prehensile and hairless tail 16 to 19 cm long. *The female has no marsupium*, so she carries the young on her back.



**Image 62.** *Murine Marmosa*. Source: Photo 12948748, Cameron Rutt, some rights reserved (CC BY-NC) © Copyright. 2020.

It feeds on insects, lizards, small rodents, eggs and fruits. It has preferably nocturnal and terrestrial habits.



**Image 63.** *Marmosa murina*. Source: <http://insolitanaturaleza.blogspot.com/2014/12/marmosa-marmosa-murina.html>. © Copyright. 2020.

Its distribution goes from Trinidad and Tobago, Venezuela (except for the western third, including islands near the coast), Guyana, Suriname, French Guiana, north and east coast of Brazil, northwestern Bolivia, eastern Peru, Ecuador and Colombia. It prefers forests up to 1,500 m.a.s.l.



**Image 64.** Distribution of *Marmosa murina* IUCN (International Union for Conservation of Nature) 2008. *Marmosa murina*. The IUCN Red List of Threatened Species. Version 2019-. July 2019.

***Marmosa murina*, Linnaeus's Mouse Opossum, LC Preocupación Menor (IUCN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosa</i>
<b>Specie:</b>	<i>Marmosa murina</i>

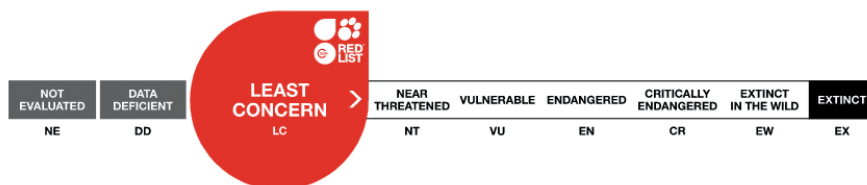




*Marmosa murina*

## CITATION

Brito, D., Astua de Moraes, D., Lew, D., Soriano, P. & Emmons, L. 2015. *Marmosa murina*. *The IUCN Red List of Threatened Species* 2015: e.T40505A22174039. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T40505A22174039.en>. Downloaded on 13 July 2019.



**Image 65.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa murina*. Date of consultation July 2019.

***Marmosa demerarae*** – Woolly mouse opossum, the gray woolly shortbread chucha prefers dense vegetation full of lianas, with many palm trees, but it is also found in tall open forest. This species builds a nest of dead leaves in the canopy of a palm tree or in interwoven vines. This species is found in tropical humid forests that are always green, mature and secondary, gallery forests, gardens and plantations (Emmons 1999). The dorsal part of *M. demerarae* is smoky brown gray; Long, soft and woolly fur, about 1 cm long in the legs. Wide, black, moderately notorious eye rings, restricted to a circle around the eyes and a slight extension to the nose; pale orange from the cheeks to below the ears; bare ears, brown. Dense hairy tail in the first 3-5 cm, the rest bare, gray brown, usually with a whitish, long, speckled tip with dark spots, around the dark white or entirely dark junction, sometimes with white dots near the tip.

Ventral region orange, yellowish or gray bathed in orange; fur of the ventral region with a partially or totally gray base. Feet yellowish, robust. *Females without marsupium*. Scrotum of the blue males. Young people are more gray than adults, with shorter fur and less hairy tail base, but the hair extends well over the tail. This species is nocturnal, lonely and builds nests in open trees. It feeds on insects, small vertebrates, fruits and nectar. It is usually seen in the undergrowth and forest canopy, but it is more frequent on the ground in the dry season. They are reproductively active in the months of February, April, September and November. They present a litter of seven offspring on average. Inhabits tropical and humid forests, is present in primary forests and little intervention, with high canopy. Sometimes it is found in areas with dense vegetation with undergrowth near water sources.



**Image 66.** *Marmosa demerarae*, Chucha gray woolly churn. Source: Museum of Vertebrate Zoology, University of California, Berkeley © Copyright. 2020.



**Image 67.** Distribution of *Marmosa demerarae* Distribution International Union for the Conservation of Nature 2015. *Marmosa demerarae*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.



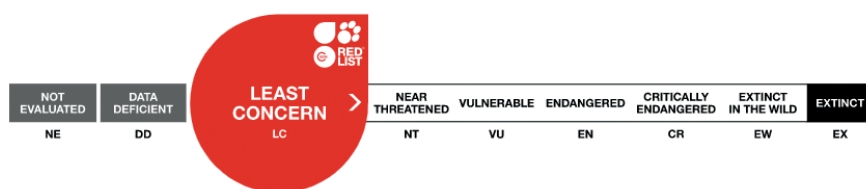
***Marmosa demerarae*, Woolly Mouse Opossum, LC Preocupación Menor (UICN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosa</i>
<b>Specie:</b>	<i>Marmosa demerarae</i>

***Marmosa demerarae***

## CITATION

Brito, D., Astua de Moraes, D., Lew, D. & Soriano, P. 2015. *Marmosa demerarae*. *The IUCN Red List of Threatened Species* 2015: e.T40510A22174563. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T40510A22174563.en>. Downloaded on 14 July 2019.



**Image 68.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa demerarae*. Date of consultation July 2019.

***Marmosa alstoni*** - Alston's woolly mouse opossum, woolly *marmosa* of Alston, the first record for *Marmosa alstoni* Colombia (JA Allen, 1900) is a juvenile male captured in 2001 in the Western Cordillera, 100 meters above sea level, in the Pacurita district, municipality of Quibdó, Department of Chocó, Colombia. Currently, this species is recognized in Central America, from Belize to Panama and the adjacent Caribbean islands. The finding constitutes a new record of extension and geographic distribution of the species. He was supposed to be in Colombia because of his presence in Panama, on San Cristobal Island, Bocas del Toro Province, borders with Colombia; but, it had not been captured in the country. *M. alstoni* is added to the other three species of the genus, *M. demerarae*, *M. phaea* and *M. regina*, present in Colombia.

It is large in size, the dorsal part is light brown, intermediate brown, grayish brown to brown gray, which has a stark contrast to the creamy or whitish ventral color. The fur is dense, soft, long and woolly.

The ears are rounded dark brown and translucent. The base of the tail has a coat of 25-50 mm, just like the body; dark brown naked part with a long white tip (usually half brown, half white, sometimes all dark or with a small white end or stained end).



**Image 69.** *Marmosa alstoni*. Source: Michigan Science Art © Copyright. [https:// animaldiversity. org / site / resources / Grzimek\\_mammals / Didelphimorphia / Marmosa alstoni.jpg / view. html /](https://animaldiversity.org/site/resources/Grzimek_mammals/Didelphimorphia/Marmosa_alstoni.jpg/view.html). © Copyright. 2020.

Females do not have a marsupial bag. Young have been found in June, August and October. In a burrow built of green leaves 11 offspring were found. In the Monteverde Biological Reserve (Costa Rica) a female with 7 pups was found, with an average of 13g. of weight. A juvenile of this species was collected in the Braulio Carrillo National Park (Costa Rica) Carrillo sector, 500 m.a.s.l., in April.

They are frugivorous and insectivorous (they feed on nocturnal butterflies and beetles (drones). They are nocturnal and mainly arboreal, solitary. Sometimes they form groups.



They are predated by owls and other carnivores of tree habits. Sometimes they can invade houses located near areas wooded, inhabits humid lowland forests, is found in shrubs and bushes, takes refuge in nests that it builds with green leaves on tree branches.

It is distributed in Central America from Belize to the north and west of Colombia. For Colombia it is registered in the Pacific region.



**Image 70.** Distribution of *Marmosa alstoni* IUCN (International Union for Conservation of Nature) 2011. *Marmosa alstoni*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Marmosa alstoni*, Alston's Woolly Mouse Opossum, LC Preocupación Menor (UICN). 2019.**

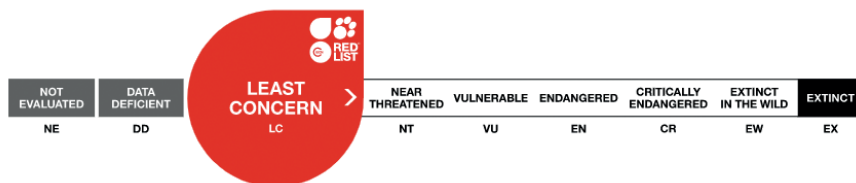
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosa</i>
<b>Specie:</b>	<i>Marmosa alstoni</i>



## *Marmosa alstoni*

### CITATION

Martin, G.M. 2016. *Marmosa alstoni*. *The IUCN Red List of Threatened Species* 2016: e.T13296A22173632. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T13296A22173632.en>. Downloaded on 14 July 2019.



**Image 71.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa alstoni*. Date of consultation July 2019.

## Genus *Marmosops*

Commonly known as *marmosas* or slender raposas. The slender marmoses populate the neotropical region from Panama to the north and east of South America. The genus *Marmosops* comes from another genus of raposa *marmosa*, name of unknown origin first given by the Frenchman Georges Buffon (1707-1788) to a species of the genus *Marmosa* and ops, genitive of opsis, appearance, appearance, "with the appearance of *Marmosa*, alluding to the external similarity that exists between these two genders (Tirira, 2004). For example, the caucae epithet granted by the type locality on the Cauqueta river, which is a tributary of the Cauca river (Thomas, 1900).

Young and adult individuals have the same layer, although in older age the hair is longer. It varies from brown to gray on the back, becoming lighter in the belly. On the other hand, its length has seasonal variations depending on the ambient temperature.

The ears are big and naked. The bulging eyes are outlined by black spots that extend to the snout. It has marked sexual dimorphism, reaching males larger than females. The tail is long, about the length of a body and a half, naked and prehensile. They are animals of partially arboreal habits, they move with slow movements between the branches of trees and shrubs in the lowest stratum of the forest. The female seems to show gregarious behavior, while males tend to be rather sedentary. Most of the studied species of this genus feed mainly on insects and fruits, without discarding other animal and vegetable resources. Specifically, *Marmosops*, seems to show special predilection for large insects such as beetles, lobsters and grasshoppers.





**Image 72.** Gender *Marmosops*, slim butter Little chucha. Source: [https://www.google.com/search?Q=Genero+Marmosops&source=lnms&tbm=isch&sa=X&ved=0ahUKEwj9wfSXLKnjAhUNuVvKkHQQiCaAQ\\_AUIECgB&biw=1366&bih=657#imgcr=nW1qdo](https://www.google.com/search?Q=Genero+Marmosops&source=lnms&tbm=isch&sa=X&ved=0ahUKEwj9wfSXLKnjAhUNuVvKkHQQiCaAQ_AUIECgB&biw=1366&bih=657#imgcr=nW1qdo) © Copy right. 2020.

***Marmosops cauae*** – Species described by Thomas (1900). Type locality: Cauqueta river, tributary of the Cauca river, near Cali. Colombia. Alt. 1,000 m.a.s.l. It is considered as *M. cauae* because the holotypes of *M. impavidus* have not been found (Díaz-Nieto, *et al.*, 2016). *M. cauae* is currently a taxon synonymous with *M. impavidus* and *M. neblina* (Díaz-Nieto, *et al.* 2011).

This *cauae* species forms a complex of species that include one of the most widely distributed series geographically. It appears as a species that has two clades A and B, which are a sister group to *Marmosops ucayaliensis*. The species present in Ecuador, according to the molecular analysis, would correspond to *cauae* according to the study conducted by Díaz-Nieto *et al.* (2016).

This individual is present in cloud forests, dry mountains and low Amazon. Lonely It is terrestrial and partially arboreal, it has been captured both in the ground and in lianas and shrubs (Gardner and Creighton, 2007). This species has been registered during lactation during the months of August and October and juveniles at all times of the year (Tate, 1933).

There is evidence that its period of reproduction is in the dry season (Emmons and Feer, 1999; Tirira, 2007). Within this genus it is considered that they feed on insects and fruits (Emmons, 1997; Nowak, 1991). However, there is very limited research about the natural history of *Marmosops* (Voss *et al.*, 2004).

Build nests with dry branches and leaves, on trees, but at a low height. The average gestation period for the entire group of marsupials is 12 to 15 days, after which the offspring remain in the marsupium for an additional 60 to 70 days. The litters are from 7 to 9 individuals. They live between one to three years (Nowak, 1991). *Bothriechis schlegelii*, known as eyelash viper and *Momotus aequatorialis* known as canyon, has been registered as a predator of this species, among others.



**Image 73.** *Marmosops caucuae*. Slim butter little chucha. Source: Photo by Jorge Brito  
© Copyright. 2019. [https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Marmosops% 20caucuae](https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Marmosops%20caucuae). ©Copyright. 2020.

It is a small species (Tirira, 2007; Díaz-Nieto, 2012). The fur is soft, short 7-8 mm, but dense, longer towards the back. The dorsal coat is brown with gray tones. The central part of the face is paler than the back (Thomas, 1900); The eye mask is black around the eyes that does not touch the base of the ears (Thomas, 1900; Díaz-Nieto, 2012), this patch extends to the root of the vibrissas, although its limit is not well defined. The ears are bare and its base has no projections. The ventral part is a white, pale yellowish color (Thomas, 1900).

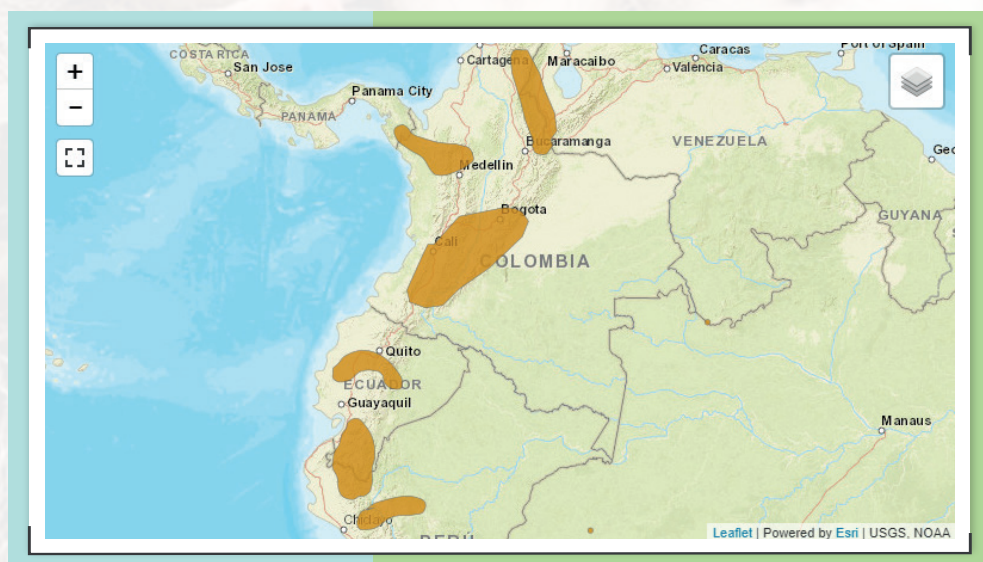
This band is usually shaped like an hourglass (wide in the chest, narrow in the abdomen and wide in the inguinal region) that extends from the chin to the inguinal region (Díaz-Nieto, 2014). The hairs on the sides of the belly appear orange (slate) in two thirds of its length. The outer part of the extremities is blackish, with the inner part the same as the sides of the belly; The hands and feet are lightly covered with dull whitish hair, the wrists and elbows are brown. The tail is prehensile and bicolor (brown or dark gray on the back



and ventrally lighter) (Díaz-Nieto, 2014); it is naked except for the base that has abundant hair (Emmons and Feer, 1999; Tirira, 2007); In addition, it is shorter than in other species (Thomas, 1990).

The testicles present the whitish scrotum. Adult females have the ocher breast area and *lack marsupium*; the offspring adhere with the mouth to the mother's nipples and are hung (Díaz-Nieto, 2014).

The chuchita slender butter is distributed on the western slope of the Andes of Colombia and Ecuador, as well as on the eastern slope of the Andes in Venezuela, Colombia, Ecuador, Bolivia and Peru. It is more frequent in montane forests (Tirira, 2007).



**Image 74.** Distribution of *Marmosops caucae* IUCN (International Union for Conservation of Nature) 2017. *Marmosops caucae*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

### *Marmosops caucae*, LC Preocupación Menor (UICN). 2019.

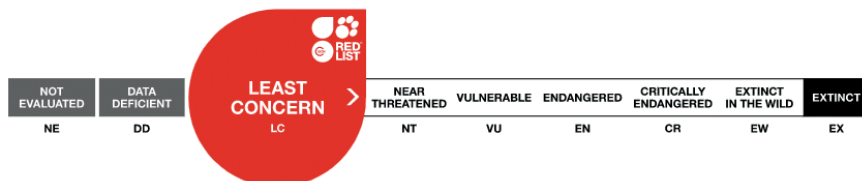
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosops</i>
<b>Specie:</b>	<i>Marmosops Caucae</i>



# *Marmosops cauae*

## CITATION

Martin, G.M. 2017. *Marmosops cauae*. The IUCN Red List of Threatened Species 2017: e.T89333777A89333796. <http://dx.doi.org/10.2305/IUCN.UK.2017-2.RLTS.T89333777A89333796.en>. Downloaded on 14 July 2019.



**Image 75.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosops cauae*. Date of consultation July 2019.

***Marmosops handleyi*** – This species of marsupial has the dark and brown dorsal and lateral parts; the fur is long and slightly woolly. The mask is dark; the cheeks are yellowish or matte cream; The chin is dirty white or cream. The ventral part has gray coloration at the base and buffalo, cream, yellowish or dirty white at the tips. The metatarsals are dark and the rest of the foot pale. The tail is hairy at the base, dark above and with pale indistinct hairs, matte; the caudal scales are arranged spirally.

Females do not have a marsupial bag and the mammary region has reddish pigmented hairs. Males have a bifid penis, a scrotum covered with white fur and no gular gland. Terrestrial, nocturnal, arboreal and solitary species.

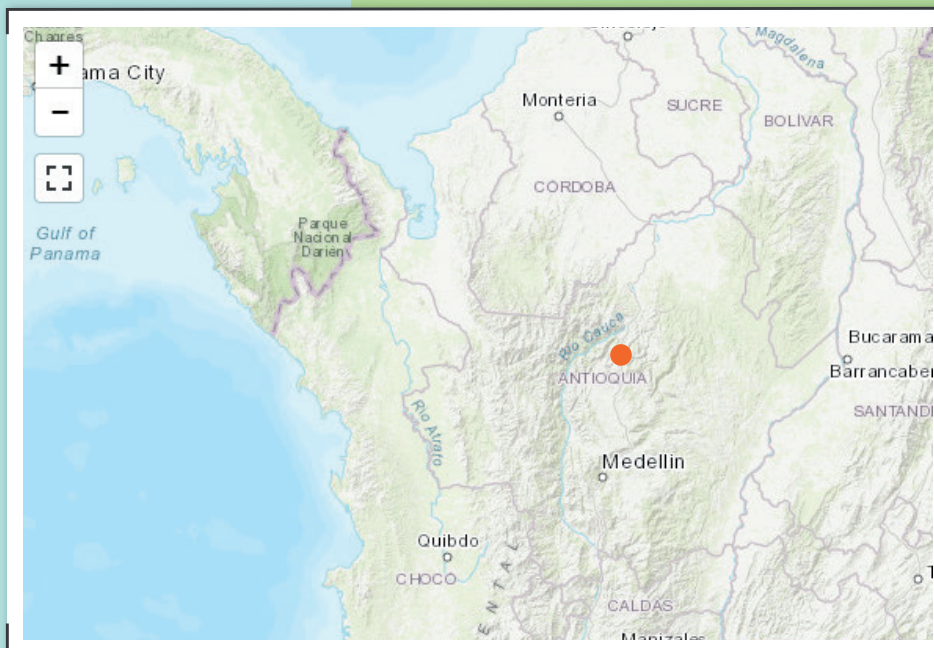
This species is considered critically endangered (CR B1a (iii)) (Rodríguez-Mahecha *et al.*, 2006), since its limited distribution makes the survival of its populations possibly dependent on the permanence of forest cover at the northern end of the Cordillera Central in Antioquia (Alberico, 2006). Although obviously, this category must be reevaluated in the future with the registration of new locations (Díaz-N, 2006).

This marsupial is reported in South America. Colombia, in the Andean region: Antioquia, Valdivia. They are located in the Central mountain range at 1,400 m.a.s.l. Until recently it was known only from its typical locality (9 km south of Valdivia, Antioquia) (Alberico, 2006) however, recent records are documented in the north of the Central Mountain Range, including the Alto de Ventanas (Yarumal municipality) and Caracolí-Guayabito (Amalfi) (Díaz-N, 2006).





**Image 76.** *Marmosops handleyi*. Source: Juan Fernando Díaz Nieto Ph. D. © Copyright. 2020.



**Image 77.** Distribution of *Marmosops handleyi* IUCN (International Union for Conservation of Nature) 2008. *Marmosops handleyi*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Marmosops handleyi*, CR En Peligro Crítico (UICN). 2019.**

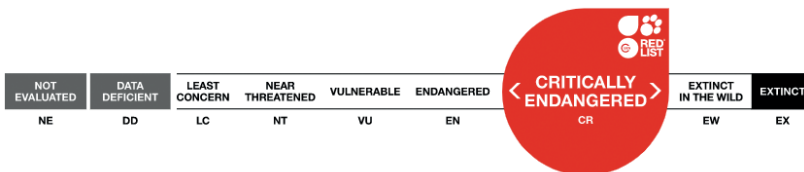
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosops</i>
<b>Specie:</b>	<i>Marmosops handleyi</i>



# *Marmosops handleyi*

CITATION

Pérez-Hernandez, R. & Cáceres, N. 2016. *Marmosops handleyi*. *The IUCN Red List of Threatened Species* 2016: e.T12820A22179321. <http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T12820A22179321.en>. Downloaded on 14 July 2019.



**Image 78.** Conservation status IUCN (International Union for Conservation of Nature) CR, *Marmosops handleyi*. Date of consultation July 2019.

***Marmosops chucha* - *Marmosops magdalenae*.** They are known as possums, weasels or chuchas. In Colombia, two new species of these marsupials were recently discovered (*M. chucha* and *M. magdalenae*). The first is from the Seribeía de Abibe to the La Pradera landfill, near the Aburrá Valley, while the second lives towards the eastern margin of the Magdalena River.

In the illustration by Carolina Rivera (Image 70), the main morphological characteristics of the *Marmosops chucha* species can be observed.

In summary, *Marmosops chucha* and *M. magdalenae* are two new species discovered in Colombia recently. The finding of these specimens of endemic fauna and that was published



by the Museum of Natural History of New York, was made by Juan F. Díaz, professor of EAFIT, during his doctorate at the University of Minnesota.



**Image 79.** *Marmosops chucha*. Source: <http://www.eafit.edu.co/escuelas/ciencias/noticias/Paginas/nuevos-chuchas-colombia-marsupiales.aspx> © Copyright. 2020.



**Image 80.** *Marmosops magdalenae*. Source: <http://www.eafit.edu.co/escuelas/ciencias/noticias/Paginas/nuevos-chuchas-colombia-marsupiales.aspx> © Copyright 2020.

***Marmosops fuscatus*** - *Marmosops fuscatus* - Gray-bellied slender mouse opossum, commonly called slender brown *marmosa*. The dorsal part is grayish brown, dark gray or matt gray, the fur is short and slightly stiff, the head is similar in color to the back, sharp face, with prominent mask, pale face between the eyes, whitish cheeks, ears large and oval gray-brown, has long vibrissas.

Females do not have a marsupial bag. It is found in South America: Colombia, Venezuela and Trinidad Island. *Marmosops fuscatus*, is distributed in the eastern Colombian mountain range (Lew et al., 2011).

### Didelphimorphia - Didelphidae

*Marmosops fuscatus*

Dusky Slender Opossum

P V August

ASM - MIL



**Image 81.** *Marmosops fuscatus*. <http://www.mammalogy.org/marmosops-fuscatus-006#requestFullSizeImageWebformContent> © Copyright. 2020.



**Image 82.** Distribution of *Marmosops fuscatus*. Distribution IUCN (International Union for Conservation of Nature) 2011. *Marmosops fuscatus*. The IUCN Red List of Threatened Species. Version 2019-1: July 2019.



## *Marmosops fuscatus*, Gray-bellied Slender Mouse Opossum, DD Datos Insuficientes (IUCN). 2019.

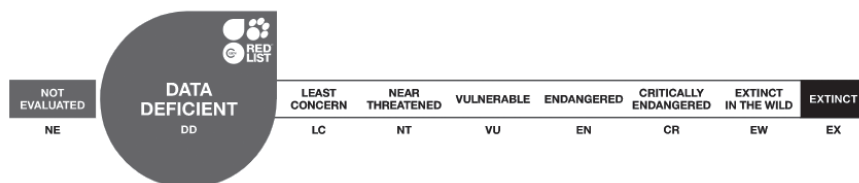
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Marmosops</i>
<b>Specie:</b>	<i>Marmosops fuscatus</i>



### *Marmosops fuscatus*

#### CITATION

Pérez-Hernandez, R., Ventura, J. & López Fuster, M. 2016. *Marmosops fuscatus*. *The IUCN Red List of Threatened Species* 2016: e.T12819A22179192. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T12819A22179192.en>. Downloaded on 14 July 2019.



**Image 83.** Conservation status IUCN (International Union for Conservation of Nature) DD, *Marmosops fuscatus*. Date of consultation July 2019.

## Genus *Monodelphis*

The *Monodelphis* genus comes from the Latin monkeys, which means one, unique and delphus, uterus, "one uterus", which does not have two uteruses like the rest of American marsupials. It probably refers that this species has no marsupial pouch. The epithet "gaunt" is a latin word that has the meaning burnt, toasted, in reference to the dark coloration of its fur (Tirira, 2004).

They are small opossums, but with great morphological similarities, as is the general rule in all didelphimorphs; nevertheless, his study, with the exception of the gray or domestic colicorto, domestic *Monodelphis*, is not very advanced.

All species of this gender have a preference for wooded and humid lands, occupying practically all of the jungles of South America, from Panama to the north and northeast of Argentina. Only the southern colicorto, *Monodelphis dimidiata*, seems to have a certain predilection for grasslands and open fields, but also of high humidity.



**Image 84.** Gender *Monodelphis*. <https://www.brazilianfauna.com/chestnut-striped-shorttailed-opossum-monodelphis-rubida/> © Copyright. 2020.

Somewhat larger in size than a common mouse *Mus* sp. (up to fifteen grams' males and ten females), differ by having a much more conical head and the tail of the species belonging to this genus is partially or slightly prehensile.

The color of the hair varies widely among the different species, but it can be generalized that there is a group of them that usually present reddish brown colorations in the dorsal and grayish regions in the ventral, with dark bands and lines on the back; another in which the specimens are usually dark brown on the back and head and cream on the neck, chest and belly; a third with a well-defined gray line that runs along the entire dorsal midline from the nose to the rump, highlighting the reddish layer of both flanks. The ventral areas of this group of species are usually covered with light gray hair and, finally, a fourth group which includes the Andean colicorto, *Monodelphis adusta*, dark brown, except in the ventral regions, also gray.

They owe their vernacular name to the fact that, unlike in most *didelfimorphs*, the tail, up to 8 cm, does not reach half the length of the body that can reach up to 20 cm in males



of relative great size. In all species the tail is covered with very thin hair, except in a few millimeters near the base, where it is completely covered by short, dense and soft hair, similar to the generality of the dorsal layer of the specimen.



**Image85.** Gender *Monodelphis*. Source: [https://www.google.com/search?q=monodelphis&source=lnms&tbn=isch&sa=X&ved=0ahUKEwj72\\_qX7a3jAhXukOAKHZYJCc4Q\\_AUIECgB&biw=1366&bih=657#imgc=Copyright:10kIMLQOV2020](https://www.google.com/search?q=monodelphis&source=lnms&tbn=isch&sa=X&ved=0ahUKEwj72_qX7a3jAhXukOAKHZYJCc4Q_AUIECgB&biw=1366&bih=657#imgc=Copyright:10kIMLQOV2020).

The marsupium is not developed. The breasts are arranged in a circle in the womb, in number between 8 and 14, depending on the species. After less than two weeks of gestation, these animals usually give birth to litters of between five and fourteen individuals, although sixteen have been counted in copies of *Monodelphis dimidiata*.

This species has the peculiarity of giving birth normally in the summer months in the southern hemisphere, unlike *Monodelphis domestica*, in which up to five annual deliveries have been counted in captive specimens, becoming sexually active until after 39 months in the case of males and 28 in that of females. Young individuals become independent around three or four months of age, although they are not sexually mature until they reach four or five. The study of the behavior in freedom of the colicortos is very difficult since they are small animals, extremely elusive, of nocturnal habits and inhabitants of dense tropical jungles.

The extremities are, as in other didelfimorphs, well adapted for tree life, although they have been frequently found on the ground. In fact, a large part of the captures and visualizations

of the red-tailed Hummingbird *Monodelphis brevicaudata* have taken place in open areas. They are solitary animals that do not tolerate the presence of other congeners except in times of heat, producing numerous confrontations between adults that normally do not become major conflicts.



**Image 86.** *Monodelphis adusta* (juvenile) Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

They are omnivorous species that include in their diet small rodents and other vertebrates, arthropods such as scorpions, for whose hunting some species are specially adapted, eggs, carrion, fruits, seeds and many other foods of plant origin. Some of the species are mostly insectivorous, although the same hunting effectiveness is not evident as in the others. Apart from the data provided by the captive-bred *Monodelphis domestica* specimens, there are few studies on the reproductive physiology of these animals.

They are basically nocturnal, although certain species show a certain tendency to diurnal activity, such as *Monodelphis dimidiata*, particularly active before sunset.

***Monodelphis adusta*** - Sepia short-tailed opossum. The short-tailed sepia marsupial is a terrestrial species, although it can easily climb. It is mainly nocturnal (Albuja and Rageot, 1986). It is lonely. It feeds on insects and other invertebrates, the stomach content of this species reveals that it consumes beetle larvae, as well as small vertebrates such as frogs and some type of plant material that can be fruits or seeds (Astúa, 2015). Look for their food under leaf litter, among trunks, fallen branches and stones (Tirira, 2007). This species uses holes in trees as a burrow (Albuja and Rageot, 1986). It presents larvae of *Ixodes pararicinus* (Díaz *et al.*, 2007).



Its habitat includes transitional forests, from humid clouds to tropical forests. It is associated with bodies of water (Pine and Handley, 2007; Astúa, 2015). It has a homogeneous distribution throughout different areas, from primary forests to open areas, being less susceptible to forest fragmentation (Santos-Filho *et al.*, 2008). Small species (Thomas, 1897). Robust body, the coat is short (4 mm), dense and soft. Back brownish to dark brown, has an undefined area on the back and darker tail. The head has a similar color, this species of colicorto has no eye rings or the midline of the face.

The tail is smaller than the length of the head and body together, it is practically naked with fine black hairs, dark brown to blackish, partially or slightly prehensile. The belly is pale brown, gray or orange gray, sometimes presenting a cream-colored line in the midline, which may or may not be conspicuous. The head is elongated and the face is sharp, similar in color to the face. Ears gray to blackish brown, naked, oval and short (Thomas, 1897; Tirira, 2007; Astúa, 2015). The legs are blackish brown with bare fingers (Thomas, 1897).

Females lack marsupium. The breasts have a circular arrangement in the abdomen (Nowak, 1991) This species has no sexual dimorphism in the shape or size of the skull (Astúa, 2010).



**Image 87.**

*Monodelphis adusta*. Source: Janina Bonilla <https://bioweb.bio/faunaweb/mammaliaweb/> / FichaEspecie / *Monodelphis% 20adusta* © Copyright. 2020.

It is distributed at low and medium elevations in the Andes of Colombia and Ecuador, western Venezuela and northern Peru (Solari, 2007; Díaz, 2014; Astúa, 2015). 200-2,200 m.a.s.l., most commonly at medium elevations between 1400-2200 m.a.s.l. (Astúa, 2015).



**Image 88.** Distribution of *Monodelphis adusta* International Union for the Conservation of Nature 2015. *Monodelphis adusta*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

***Monodelphis adusta*, Sepia Short-tailed Opossum, LC Preocupación Menor (UICN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Monodelphis</i>
<b>Specie:</b>	<i>Monodelphis adusta</i>

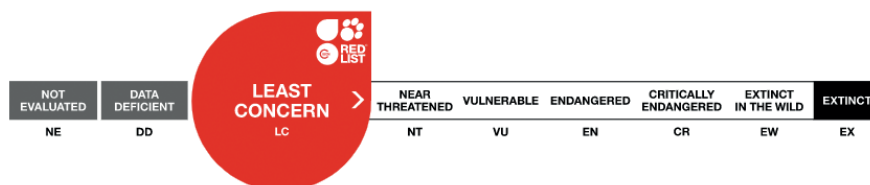




## *Monodelphis adusta*

### CITATION

Solari, S. & Tarifa, T. 2015. *Monodelphis adusta*. *The IUCN Red List of Threatened Species* 2015: e.T51343071A22170648. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T51343071A22170648.en>. Downloaded on 14 July 2019.



**Image 89.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Monodelphis adusta*. Date of consultation July 2019.

***Monodelphis brevicaudata*** - Northern red-sided opossum, the colirorto patirojo or chuchita colicorta flanquiroja has a dark gray color in the dorsal part, brownish to grayish from the nose to the base of the tail, as a longitudinal broad band that extends from the head to The base of the tail, on both sides, from the nose to the back leg has a red, reddish or brown color with the base of the gray hairs, the coat is short dense and soft. Females have no marsupial bag.

Juvenile individuals are equal to adults; however, the fur at the base of the tail is less thick.

Groups of up to 14 young individuals are born at any time of the year. They do not have a coat to house their young so that the young one's cling to the mother's skin and when they are somewhat older, are accommodated on the back.

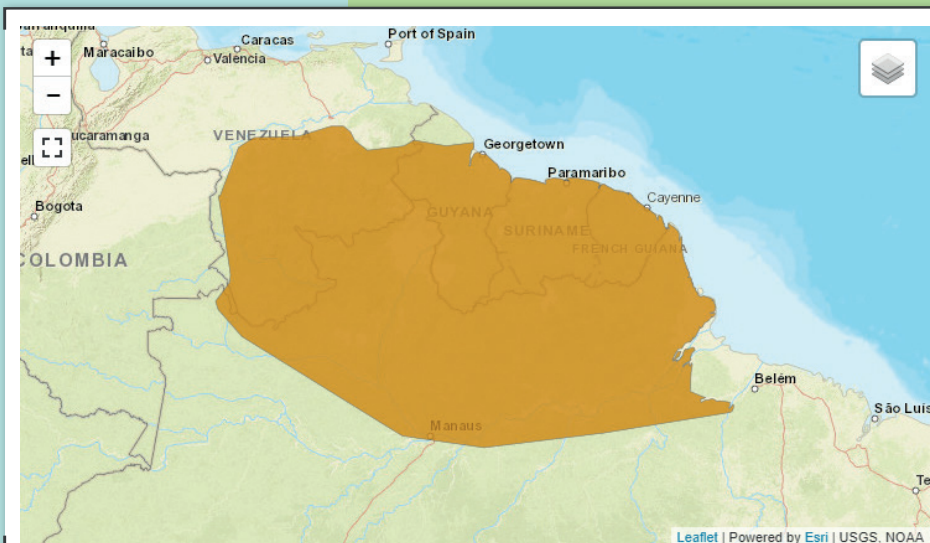
They live in wooded areas, although they are not good climbers and remain on the forest floor. They are nocturnal animals and during daylight hours they build nests in dry trunks or trees. It moves quietly between the leaf litter and quickly hides in the face of any disturbance.

Terrestrial and solitary twilight day species, it is mainly insectivorous, but also includes spiders, earthworms, and sometimes fruits and seeds. It inhabits humid forests, mature always green, can be found in humid hot lands. It can be found on the ground especially near or under fallen bushes. Their diet consists of seeds, sprouts and fruits, insects, carrion and some small rodents.



**Image 90.** *Monodelphis brevicaudata*. Source: <http://www.mammalogy.org/monodelphisbrevicaudata-1396> © Copyright. 2020.

It is distributed in South America: Brazil, Colombia, Venezuela and the Guianas. In Colombia it is distributed to the East of the Eastern Cordillera.



**Image 91.** Distribution of *Monodelphis brevicaudata* IUCN (International Union for Conservation of Nature) 2008. *Monodelphis brevicaudata*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.



## *Monodelphis brevicaudata*, Northern Red-sided Opossum, LC Preocupación Menor (IUCN). 2019.

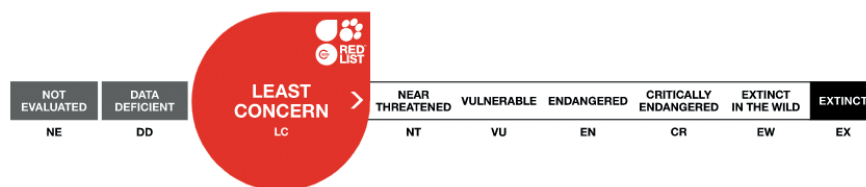
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Monodelphis</i>
<b>Specie:</b>	<i>Monodelphis brevicaudata</i>



### *Monodelphis brevicaudata*

#### CITATION

Catzefflis, F., Costa, P., Lew D. & Soriano, P. 2015. *Monodelphis brevicaudata*. *The IUCN Red List of Threatened Species* 2015: e.T40513A22171441. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T40513A22171441.en>. Downloaded on 14 July 2019.



**Image 92.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Monodelphis brevicaudata*. Date of consultation July 2019.

## Genus *Gracilinanus*

it is a genus of small marsupials that inhabit humid tropical and subtropical forests, preferably in low terrain.

The different species are distributed throughout the neotropical region, from the Caribbean coast to central Argentina and southern Brazil and while some species such as *Gracilinanus agilis* can be found in large territorial demarcations, others such as *G. aceramarcae*, only inhabit small areas of the subcontinent. These small marsupials barely exceed 10 cm in length.

The opposable finger they have on the feet, characteristic of the family, is much larger than the rest and lacks a nail. The long tail is naked and endowed with prehensile capacity. It usually exceeds the animal's body in length (head + trunk), reaching 15 cm. They are omnivorous, including in their diet numerous types of foods such as insects and other invertebrates, fruit and other products of plant origin. The most studied species is *Gracilinanus agilis* and one of the few of which its reproductive biology is known. Females are fertile with 8 or 9 months of age. They usually give birth to two litters of underdeveloped offspring after a gestation period of 20 days.



**Image 93.** *Gracilinanus agilis*. Source: Lucas Amílcar Retamosa, <http://www.ecoregistros.org/> LucasAmilcarRetamosa © Copyright. 2020.

These species lack marsupium. The offspring cling to one of the mother's 13 nipples to complete her postnatal development during the 60 to 70 days of breastfeeding.

*G. agilis* is small in size, long and soft fur. The back is brown or grayish brown. The belly and limbs are light cream. The face is clearer than the rest of the body and the eyes are surrounded by a black ring. The tail is long, prehensile and bicolor, brown in the dorsal area and much clearer ventrally; it is covered by small scales arranged in rings and does not show seasonal thickening as in the species of the genus *Thylamys*. The female lacks marsupium.

It is nocturnal and arboreal. It is very skilled climber and builds nests with grasses and vegetable fibers in tree hollows or in bushes up to a height of 1.5 meters from the ground. Its varied diet includes mainly insects, fruits and also small vertebrates.



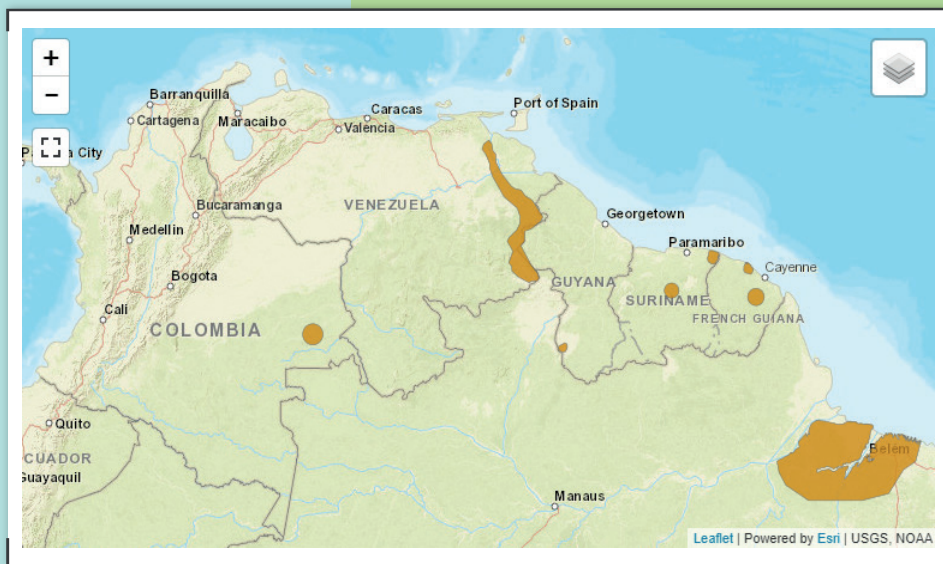


**Image 94.** *Gracilinanus agilis*. Source: <http://www.mammalogy.org/gracilinanus-agilis-480>  
© Copyright. 2020.

For Colombia, the following species are reported with this distribution according to IUCN.



**Image 95.** Distribution *Gracilinanus dryas* IUCN (International Union for Conservation of Nature) 2016. *Gracilinanus dryas*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.



**Image 96.** Distribution *Gracilinanus emiliae* IUCN (International Union for Conservation of Nature) 2016. *Gracilinanus emiliae*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.



**Image 97.** Distribution of *Gracilinanus marica* IUCN (International Union for Conservation of Nature) 2016. *Gracilinanus marica*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.



## *Gracilinanus dryas*, Wood Sprite Gracile Mouse Opossum, LC Preocupación Menor (IUCN). 2019.

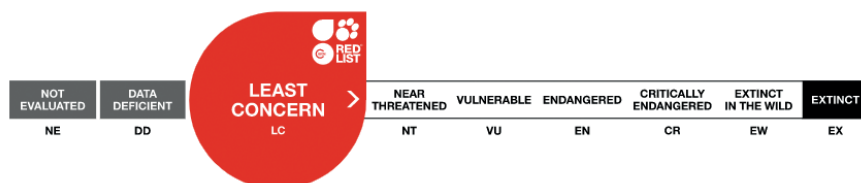
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Gracilinanus</i>
<b>Specie:</b>	<i>Gracilinanus dryas</i>



### *Gracilinanus dryas*

#### CITATION

Pérez-Hernandez, R., Ventura, J. & López Fuster, M. 2016. *Gracilinanus dryas*. The IUCN Red List of Threatened Species 2016: e.T9418A22169714. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T9418A22169714.en>. Downloaded on 13 July 2019.



**Image 98.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Gracilinanus dryas*. Date of consultation July 2019.

## *Gracilinanus emiliae*, Emilia's Gracile Opossum, DD Datos insuficientes (IUCN). 2019.

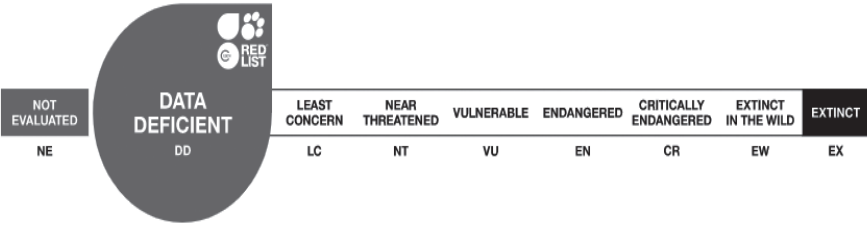
<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Gracilinanus</i>
<b>Specie:</b>	<i>Gracilinanus emiliae</i>



*Gracilinanus emiliae*

CITATION

Pérez-Hernandez, R., Brito, D., Astua de Moraes, D. & Carmignotto, A.P. 2016. *Gracilinanus emiliae*. *The IUCN Red List of Threatened Species* 2016: e.T9419A22170041. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T9419A22170041.en>. Downloaded on 13 July 2019.



**Image 99.** Conservation status IUCN (International Union for Conservation of Nature) DD, *Gracilinanus dryas*. Date of consultation July 2019.

*Gracilinanus marica*, Northern Gracile Mouse Opossum, LC Preocupación Menor, (UICN). 2019.

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Gracilinanus</i>
<b>Specie:</b>	<i>Gracilinanus marica</i>

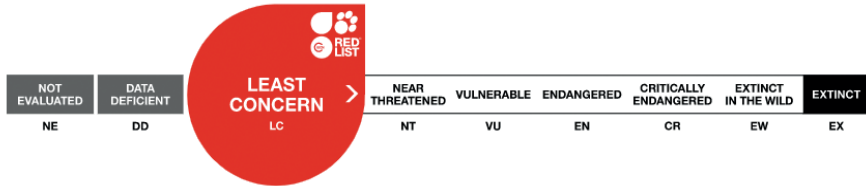




*Gracilinanus marica*

## CITATION

Pérez-Hernandez, R., Ventura, J. & López Fuster, M. 2016. *Gracilinanus marica*. *The IUCN Red List of Threatened Species* 2016: e.T9420A22169944. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T9420A22169944.en>. Downloaded on 13 July 2019.



**Image 100.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Gracilinanus marica*. Date of consultation July 2019.

## Genus *Glironia*

The genus *Glironia* comes from the Latin Glir, glis or gliris, which means a lirón, a small mammal similar to a 30 cm long mouse, of which half corresponds to the tail; while ia is a Greek suffix that denotes quality or condition, which resembles, or relates to, “which resembles a lily.” Apparently the name refers to the shape of the tail. Venustus, full of grace, charm, elegance, beauty (Marshall, 1978; Tirira, 2004).

The brush-tailed opossum, hairy-tailed raposa, or gray *glironia*, is a species of double-headed marsupial, the only member of the genus *Glironia*; it is a very little known animal of which references are scarcely a dozen copies.

The dorsal regions of the head and trunk are covered with dense blonde-brown hair. The ventral regions are clearer, from white to ashen gray. The texture varies from soft and silky to woolly and tight. A dark band furrows each eye, appearing to be a mask. The structure of the skull and teeth are similar to the species of the other genera of the subfamily, although externally they are more similar to the species of the *Marmosa* genus.

The tail is long and prehensile and is covered with hair all over the surface, a feature that distinguishes this opossum from the rest. In addition, it presents a tuft of white hair or dotted with hairs of this color. *Glironia* is eminently arboreal, although it descends to the ground at least to feed, Marshall in 1978 observed one of the first specimens in the undergrowth.

The behavior of these animals has not been sufficiently studied given the few contacts they have had with them. Like other nearby species, solitary, arboreal and nocturnal animals are assumed.



**Image 101.** Gender *Glironia*. Source: Paulo Sergio Bernado © Copyright. 2020.

***Glironia venusta***, Bushy-tailed opossum, is a nocturnal and solitary species. It is considered highly arboreal, with postcranial morphology consistent with this hypothesis (Flores and Díaz, 2009). Not much is known about their behavior. Nowak (1999) speculum that its diet consists of insects, eggs, seeds and fruits, based solely on anatomical similarities with other species whose natural history is well known. They have also been observed licking the surface of some branches, a female with her young has been recorded licking the exudate of *Schefflera morototoni* (Araliaceae) (Emmons and Feer, 1999; Astúa, 2015). During the day it takes refuge in cavities in the upper part of the trees (Tirira, 2007). There is a record of females with young in Pará, Brazil in the month of December and another individual with three offspring was captured in July to the northwest of Mato Grosso; In Peru, a newly nursing individual was registered in December. These records suggest that this species has at least two reproductive periods annually (Astúa, 2015). Previously it was thought that it was an exclusive animal of primary forests and susceptible to fragmentation (Tirira, 2007; Santos-Filho, *et al.* 2008); however, other records indicate that they may be tolerant to disturbed areas (Calzada, *et al.* 2008).





**Image 102.** *Glironia venusta*. Source: Photo by Luis Gualavisi © Copyright. 2019. <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Glironia%20venusta>. © Copyright. 2020.

It is a medium-sized species that has soft, dense, velvety or woolly fur. The dorsal part is pale brown or cinnamon; sometimes with a dark strip in the center while the ventral part is gray or white with orange tint.

The face has a wide black stripe on each side that extends from the nose, passes through the eyes and reaches the crown. These stripes are separated by a gray or cream band that extends in the direction of the center of the face, from the nose to the ears, the cheeks have a similar color. The ears are prominent, oval, naked and are blackish brown, the eyes are black. The feet are dark white.

The tail is cylindrical, longer than the head and body together (110%), it is completely covered with hairs until its end in its dorsal and lateral part. 60% of the ventral part is covered with short bristles, while the remaining 40% has no hairs. The tip is white or darker than the base. They do not have marsupium and it is the only species of raposa without the middle breast (Marshall, 1978; Emmons and Feer, 1999; Tirira, 2007; Astúa, 2015).

Similar species: The woolly raposa of the east *Caluromys lanatus* is the only marsupial within its range that has the tail with abundant fur. However, the tail fur reaches only 50% of the tail and also lacks the 2 stripes on the face (Tirira, 2007).

It inhabits the Amazonian lowlands of Colombia, Brazil, Peru, Bolivia, Ecuador and Colombia (Barkley, 2007).



**Image 103.** Distribution *Glironia venusta* IUCN (International Union for Conservation of Nature) 2016. *Glironia venusta*. The IUCN Red List of Threatened Species. Version 2019.

***Glironia venusta*, Bushy-tailed Opossum, LC Preocupación Menor (IUCN). 2019.**

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Glironia</i>
<b>Specie:</b>	<i>Glironia venusta</i>

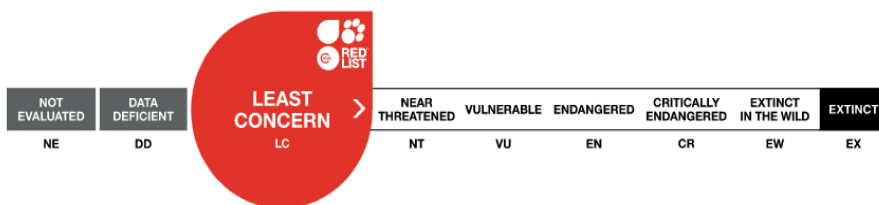




*Glirionia venusta*

## CITATION

Solari, S. & Martin, G.M. 2016. *Glirionia venusta*. The IUCN Red List of Threatened Species 2016: e.T9245A22179598. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T9245A22179598.en>. Downloaded on 13 July 2019.



**Image 104.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Glirionia venusta*. Date of consultation July 2019.

## Genus *Lutreolina*

The thick-tailed possum or red weasel *Lutreolina crassicaudata* is a species of marsupial exclusive to South America, where it inhabits two disjoint population centers: one in eastern Paraguay, central and northeastern Argentina, southern Brazil and Uruguay; and another still little known and that could be another species in Colombia, Venezuela and Guyana.

It is due to the appearance of *Lutreolina crassicaudata* reminiscent of that of a mustelid, that the Spaniards arriving in South America began calling these marsupial mammals “weasels”, which are not related to the real weasels.

This marsupial weasel is the largest member of the family after the species of the genus *Didelphis*, with an elongated body measuring between 60 and 75 cm, of which between 30 and 35 belong to its long tail, quite thick in its initial half, characteristic which has given him one of his common names. His body weight is between 0.6 and 1.5 kg. Its head is small, as well as its ears, which are rounded. Its coat varies greatly in color, which varies from a light yellowish or reddish brown or brown to dark brown. It has 50 teeth. Males are larger than females, which sometimes do not develop marsupium.



**Image 105.** Gender *Lutreolina*. Source: <http://cerrito.gob.ar/reservalovera/?p=1938>.  
© Copyright. 2020.

***Lutreolina crassicaudata*** Little water opossum, lives mainly in open environments with lagoons and few trees, although it is also found in forests and jungles. It is always associated with bodies of water and flood areas. It inhabits until 1.700 m.a.s.l.

It is characterized by the elongated shape of its body. The coat is short and thick, uniform in color, usually orange or reddish, although it has a great variation from yellowish to dark brown; ventrally it is clearer.

The snout is short and the ears are small and rounded. The legs are short and strong. The tail is long and somewhat prehensile; its first third is very thick and is covered by abundant hairs, gradually it is tuned towards the tip, being the dark brown or black middle portion and the whitish distal. The female has marsupium, but its degree of development is not very clear. Males are larger than females.

The female has 9 breasts. It is supposed to reproduce twice a year, first in spring and then when the juveniles have already become independent. Gestation is short, approximately two weeks, and each litter has between 6 and 9 offspring. Although the female has marsupium, the juveniles are apparently raised in a nest made of dry grass. In captivity you can live up to three years.

Lonely, twilight and night. It is mostly terrestrial habits, but climbs and swims easily; His movements are agile and fast. During the day he takes refuge in tree hollows, in abandoned



nests or caves or in spherical burrows that he builds with leaves and branches. It presents various forms of social communication through vocalizations and visual and olfactory marks. It has been estimated that its area of action is 800 m<sup>2</sup>.



**Image 106.** *Lutreolina crassicaudata*. Source: J. Simón Tagtachian. © Copyright. 2020.

It basically feeds on small mammals, birds, reptiles (videos have been uploaded to social networks, where this individual is hunting a yaro *Bothrops alternatus* in Argentina) fish, insects and mollusks and to a lesser extent fruits and plants.

It presents a discontinuous distribution in South America. In the north it is present in the east of Colombia and Venezuela and in the west of the Guayanas. In the south, from eastern Bolivia, southern Brazil, Paraguay, Uruguay to central Argentina.



**Image 107.** Distribution of *Lutreolina crassicaudata* IUCN (International Union for Conservation of Nature) 2016. *Lutreolina crassicaudata*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

*Lutreolina crassicaudata*, Little Water Opossum, LC Preocupación Menor (IUCN). 2019.

<b>Kingdom:</b>	Animalia
<b>Edge:</b>	Chordata
<b>Class:</b>	Mammalia
<b>Order:</b>	Didelphimorphia
<b>Family:</b>	Didelphidae
<b>Genus</b>	<i>Lutreolina</i>
<b>Species:</b>	<i>Lutreolina crassicaudata</i>

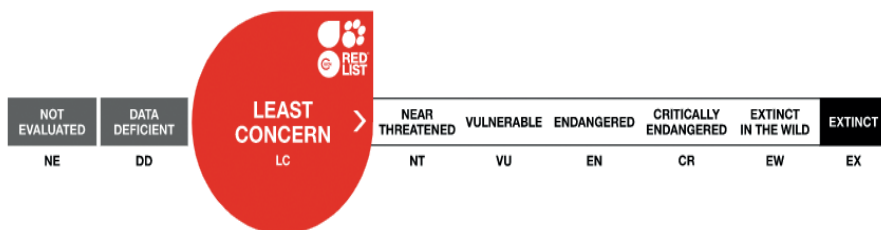




*Glirionia venusta*

## CITATION

Solari, S. & Martin, G.M. 2016. *Glirionia venusta*. *The IUCN Red List of Threatened Species* 2016: e.T9245A22179598. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T9245A22179598.en>. Downloaded on 13 July 2019.



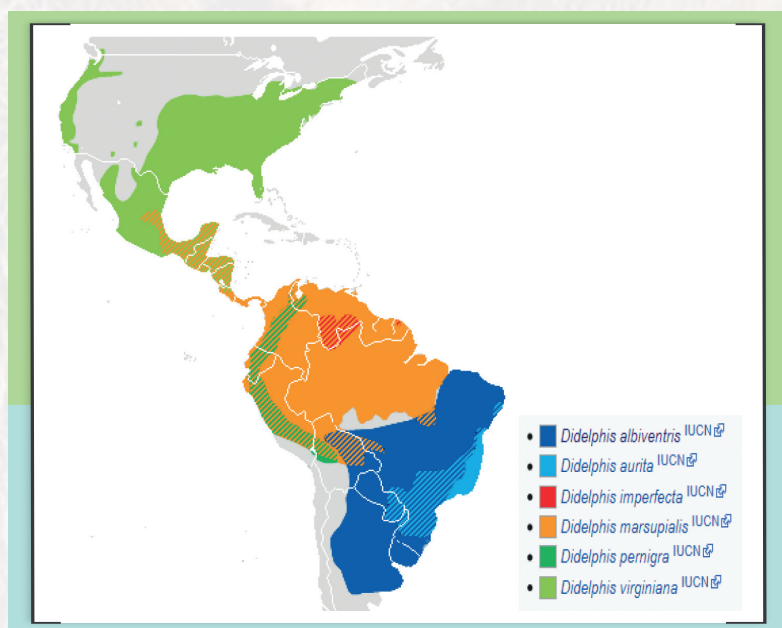
**Image 108.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Lutreolina crassicaudata*. Date of consultation July 2019.

## Chapter 5.

# The *Didelphis* gender in America

The genus *Didelphis* comes from two words of Greek origin *di-*, prefix meaning two; and *delphus*, uterus. The marsupialis epithet comes from the Latin *Marsupium*, bag and -*alis*, a suffix meaning belonging to, related to, “related to the bag” in reference to its marsupial bag (Tirira, 2004). Commonly known as greater opossums or common opossums, among which are two of the most well-known and widespread American marsupial species on the continent: the common or South American Opossum *Didelphis marsupialis*, which is the type species and the Virginia or North American *Didelphis opossum* species *virginiana*.

Despite their tremendous capacity to adapt to virtually any biome, these animals prefer the humid environments of the jungle and the temperate forest, although they are capable of surviving in numerous ecosystems, including relatively arid or considerably cold spaces. Among the species of this genus are the only marsupials that still populate the North American subcontinent. This is the Virginia opossum (*Didelphis virginiana*), whose populations extend through numerous habitats from the southern half of the United States to Costa Rica. The rest of the species of the genus are distributed only by the neotropical region.



**Image 109.** Distribution of the species of the gender *Didelphis* in America. Source: <https://commons.wikimedia.org/wiki/File:Didelphis.png>. © Copyright. 2020.



Next, the six (6) species of the genus *Didelphis* in America are referenced.

***Didelphis marsupialis*** – Common opossum, is distributed in Trinidad and Tobago, the Guyanas and the great Amazon basin, including the humid forest habitats of the eastern slopes of the Andes of Venezuela, Colombia, Ecuador, Peru and Bolivia. The Cerrado in Brazil and the Chaco in Bolivia are the limit of its range to the east and south. It is also found north and west of the Andes, in northwestern Venezuela and north and west of Colombia, south through Ecuador and Peru. He also lives in Central America, Mexico and the Lesser Antilles (Cerqueira and Tribe, 2007).

It is one of the species of the genus *Didelphis* of greater size present in America. The back is black to gray and the ventral area generally similar to the back, but paler or orange. The fur is sometimes bristled like a crest along the column. The coat has two hirsute. The lower one is dense, yellow and pale that is below the protective hairs that are long and rough black or gray. The head is dark yellow, sometimes with poorly defined black lines that run from the nose, through the eyes to almost the ears. The cheeks are yellow, orange or dark white, without contrasting sharply with the color of the muzzle. Pink nose, big ears, peeled and black. The feet are black. The tail lacks hairs and is generally longer than the head and body together. It has a blackish color with the white tip. In females, the marsupium can be observed throughout the time and not only when it carries its young (Emons and Feer, 1999; Tirira, 2007); It has 11 to 13 breasts, five or six on each side and a half (Astúa, 2015).



**Image 110.** *Didelphis marsupialis* opossum or common chucha in wildlife. Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020.



***Didelphis virginiana*** - Virginia opossum, the North American opossum, *Didelphis virginiana*, stands out for its hirsute hair layer, has protective hair that is usually long and light colored, which emerge from among those that have a wire or hard texture and dark coloration. In female specimens the marsupium is present, inside it there are about 13 breasts. Its head is elongated just like the snout, this in turn is thin and pointed, with the presence of vibrissas as a sense of sensory organs, the skin of the snout does not have hair and is pinkish. The possum's eyes are small, black in color, sometimes surrounded by a dark ring. In the middle of the forehead a dark coloring line predominates towards the snout.

The tail of *Didelphis virginiana* is long and prehensile, hairless, although covered with scales, very useful as if it were a hand. Their ears do not have hair, they are small in size and can appear white in the upper area. The hands are provided with five fingers and with claw nails that enable it to climb among the trees. The feet, however, only have four fingers with claws and an opposable thumb without claw or fingernail. Both the soles of the hands and feet have granulations that serve to grip better between the branches of the trees, especially those with a smooth surface.



**Image 111.** *Didelphis virginiana*, opossum of North America. Source: Claudia González, Jecka Gomez Canul. Puerto Morelos, Acapulco, Mexico © Copyright. 2020.



They have great capacity to adapt to different habitats, they can be seen from lowlands to 3,000 m altitude. The North American opossum prefers areas with humidity, especially forests and scrubland areas, with ponds, rivers or streams, since they do not despise bathing, they can also live in semi-urban areas. They communicate by means of certain vocalizations, also the smell and the ear that are indispensable for their survival. With regard to sight, being nocturnal animals, it is less developed.

*Didelphis virginiana* is distributed throughout North America (United States and Canada) and Central America (from Mexico to Costa Rica). The species *Didelphis virginiana* is evaluated in the Red List as a minor concern, since it is considered common and well distributed, in fact, the population trend is increasing.

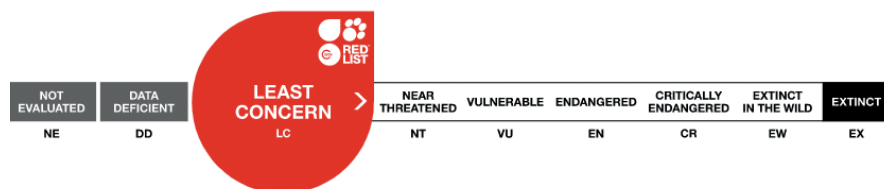


**Image 112.** Distribution of *Didelphis virginiana*. IUCN (International Union for Conservation of Nature) 2008. *Didelphis virginiana*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

## *Didelphis virginiana*

### CITATION

Pérez-Hernandez, R., Lew, D. & Solari, S. 2016. *Didelphis virginiana*. *The IUCN Red List of Threatened Species* 2016: e.T40502A22176259. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T40502A22176259.en>. Downloaded on 12 July 2019.



**Image 113.** Conservation status for *Didelphis marsupialis* LC - Least Concern. Source: IUCN Red List of Threatened Species. July 2019.

***Didelphis albiventris*** - White-eared opossum, is one of the largest American marsupials. The body is covered by a thick woolly fur, yellowish white at the base and almost black towards the tip, interspersed with long white bristles; the yellowish white of the bottom of the hair predominates on the flanks and the black on the back; The belly is lighter in color.

There is a great variation in the color of the coat, being able to even find almost completely black or white specimens. The face is white and has a frontal black band and two very dark bands that surround the eyes. The head is triangular in shape, with a pointed snout and ending in a pink (rinary); the ears, except the base that is black, are very light flesh colored. The legs are completely black. The tail is very prehensile; it is covered by abundant hairs at the base and the rest by few short hairs that reveal the color of the scales, black in the proximal half and whitish in the distal half. The female has a well-developed marsupium.

It is lonely and twilight or nocturnal; although it is mainly of terrestrial habits, usually it climbs with agility, helping itself with the tail; it is also a good swimmer. During the day it rests in hollows of trees, fallen trunks or in burrows that she makes. It is territorial, especially males are very aggressive with each other.

When she feels threatened, she opens her mouth and emits high-pitched squeals while releasing an unpleasant odor secretion made by two glands in the genital region; if the danger persists, it can enter a state of immobility similar to death, which lasts up to six hours.



Its omnivorous diet includes from fruits, seeds and leaves, to worms, insects, spiders, mollusks and vertebrates of different sizes; It also frequently attacks poultry.

Being very opportunistic and omnivorous animals, they have also adapted to living in urban environments, although due to their nocturnal and elusive behavior, it is not easy to see them frequently. The greatest threats of these animals, in addition to the destruction of their natural habitat, are road run-ins, attacks by domestic animals such as dogs and conflicts with farmers because they usually cause damage to plantations and attack poultry.

Some local communities in certain regions also hunt them for food.



**Image 114.** *Didelphis albiventris* in wildlife. Source: Graciela Paoloni Córdoba Province, Argentina © Copyright. 2020.

Present in very varied environments, from subtropical forests to open areas such as savannas and grasslands; it prefers vegetated places near bodies of water. It is also usually found in rural and even urban areas. From sea level to 4,000 meters high. It inhabits only in South America. Its distribution includes from the Atlantic coast of the northeast region of Brazil, and to the south (without entering the Andes mountain range) to latitude 41 in the Patagonian province of Río Negro in the center-south of Argentina, and all what is among them, including: eastern Bolivia, all of Paraguay, all of Uruguay, the entire Atlantic coast from the Province of Río Negro in Argentina to the state of Ceará in Brazil, the Pampas region, the Chaco region, the estuaries of Iberá, the swamp and the catingas, among other ecosystems.



**Image 115.** *Didelphis albiventris* in wildlife. Source: Graciela Paoloni Córdoba Province, Argentina© Copyright. 2020.



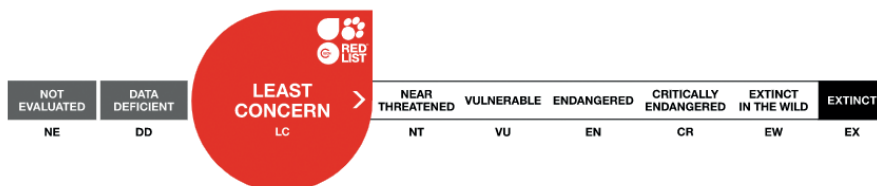
**Image 116.** Distribution of *Didelphis albiventris* IUCN (International Union for Conservation of Nature) 2008. *Didelphis albiventris*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.



*Didelphis albiventris*

## CITATION

Costa, L.P., Astua de Moraes, D., Brito, D., Soriano, P. & Lew, D. 2015. *Didelphis albiventris*. *The IUCN Red List of Threatened Species* 2015: e.T40489A22176404. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T40489A22176404.en>. Downloaded on 12 July 2019.



**Image 117.** Conservation status for *Didelphis albiventris* LC - Least Concern. Source: IUCN Red List of Threatened Species. July 2019.

***Didelphis pernigra*** - It is nocturnal, lonely and mostly terrestrial but good climber. No specific information is known for this species; nevertheless, some data of its congeners and general of the order Didelphimorphia are presented. An omnivorous species, it feeds on insects, other invertebrates, fruits and eventually small vertebrates, depending on the availability of these resources (Tirira, 2007; Astúa, 2015). During the day he takes refuge in hollow trees, cavities in the ground or between rocks (Tirira, 2007). In Colombia this species registers a gestation period of 12 days, and an average litter size of 4.2, with a range of two to seven offspring. It is a general species that is found in secondary forests, open areas and intervened areas, being very tolerable to modified environments (Barrera-Niño and Sánchez, 2014; Astúa 2015).

*D. pernigra* is a species of large size. The fur is sometimes bristled like a crest along the column. The back with the exception of the head is black to intense gray with two layers, the lower one has soft yellowish-white pale hair with black tips, these are under the guard hairs, which are black with their white tips (Allen, 1900; Tirira, 2007; Astúa, 2015). The head is white with a black mask that starts at the nose and goes back from the eyes and extends weakly to the base of the ears where it intermingles with the white fur. The cheeks are white to beige, and has a triangular stripe in the center of the forehead, it is tuned and ends between the eyes. The tail is similar in size to the length of the body and the head together, although it can be smaller, has hair at its base and is black to three fifths of its length, the rest is white. The ventral coat is whitish or pale yellow. The throat is slightly darker. The ears are pink or black, but have white tips. The legs are black, with dark brown and almost naked fingers (Allen, 1900; Tirira, 2007; Astúa, 2015). The female has developed marsupium (Tirira, 2007). This species has sexual dimorphism in the shape of the skull (Astúa, 2010).



**Image 118.** *Didelphis pernigra* opossum or common white-eared chucha. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

***Didelphis aurita*** - Brazilian common opossum, the Brazilian opossum *Didelphis aurita* is also known by the names of shrimp, mbicuré overo and opossum opossum. Of appearance and coloration very similar to the weasel overa *Didelphis albiventris*, it differs from it by its completely black ears. The female has a marsupial bag. Males are larger than females. Its habitat is the forests and subtropical forests, in general near water courses. It presents less affinity to man-modified environments than the overa weasel *Didelphis albiventris*.

It is of nocturnal and solitary customs. It is mainly terrestrial habits, but it is also an excellent climber. It takes refuge in hollows of trees or nests under the roots or under mounds of dry leaves. The area of action of females is approximately 0.6 to 1.7 ha, while that of males is greater, between 2.3 and 2.7 ha; males overlap their territory with that of females and that of other males. It has a sebaceous cervical gland whose odorous secretions are used in social communication. Its diet is omnivorous and opportunistic, it feeds mainly on arthropods and fruits, but it can also consume crustaceans, worms, small mammals, birds, reptiles and fish.

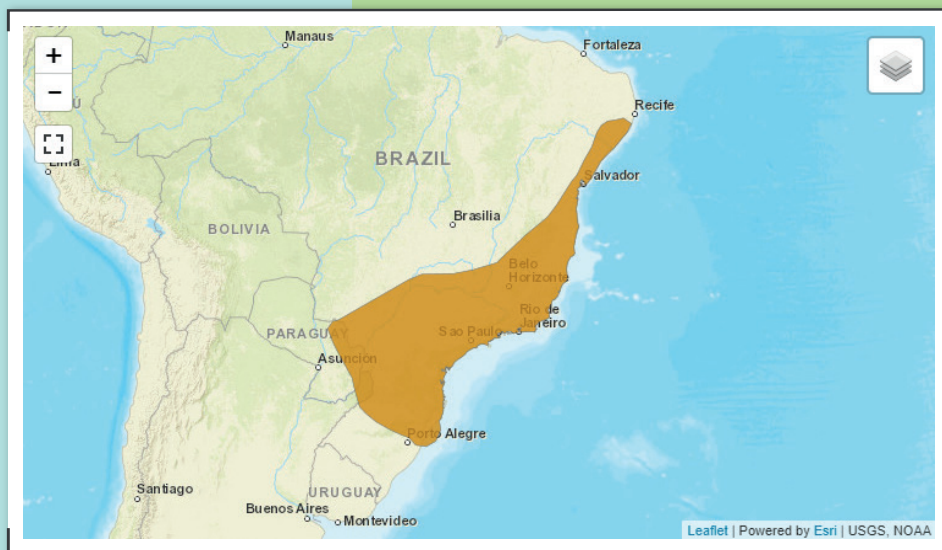
The breeding season coincides with the wet season, when the fruit is more abundant. Apparently the gestation period is short and has 2 or 3 litters per year, with an average of 7 offspring per litter. Breastfeeding continues for about 100 to 120 days until weaning occurs.





**Image 119.** *Didelphis aurita*. Brazilian opossum. Source: [https://www.facebook.com/ groups / 1559837174299862 /](https://www.facebook.com/groups/1559837174299862/) - Iluska Magalhães - © Copyright, Rio de Janeiro - Brazil. © Copyright. 2020.

The population situation is defined as a common species, although in the future its populations could be affected by habitat alteration. IUCN: minor concern. Its distribution goes from the Southeast of Brazil, to the east of Paraguay and Argentina.

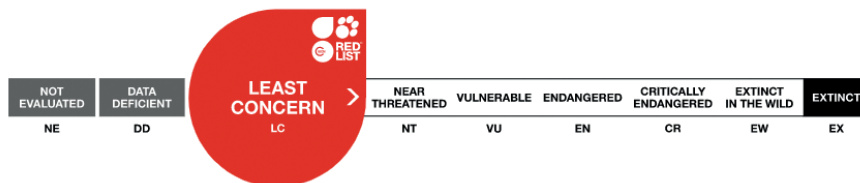


**Image 120.** Distribution of *Didelphis aurita* International Union for the Conservation of Nature 2015. *Didelphis aurita*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.

## *Didelphis aurita*

### CITATION

Astua de Moraes, D., de la Sancha, N. & Costa, L. 2015. *Didelphis aurita*. *The IUCN Red List of Threatened Species* 2015: e.T40500A22175929. <http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T40500A22175929.en>. Downloaded on 12 July 2019.



**Image 121.** Conservation status for *Didelphis aurita* LC - Least Concern. Source: IUCN Red List of Threatened Species. July 2019.

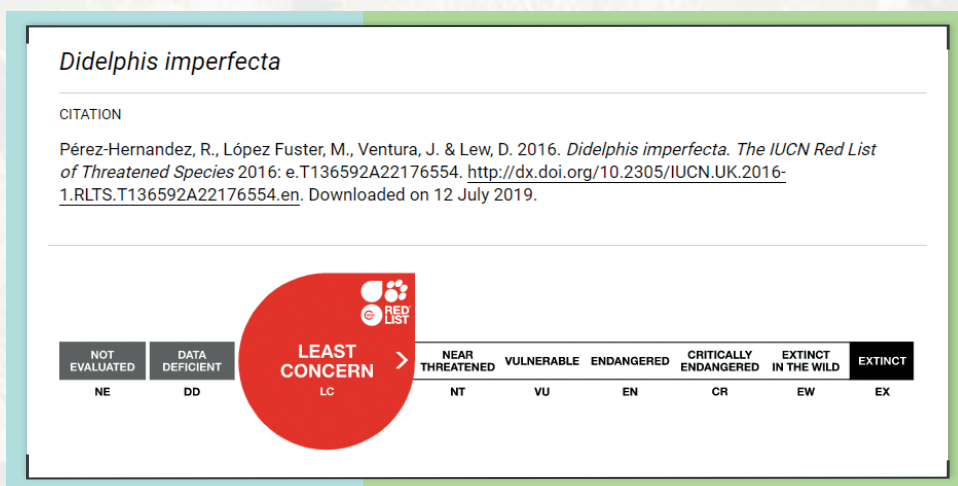
***Didelphis imperfecta*** – Guianan white-eared opossum, the white-eared Opossum of Guyana is a species that inhabits southern Venezuela, northern Brazil, southwest Suriname and northeastern French Guiana. Species of solitary, nocturnal and arboreal habits. They feed mainly on fruits and insects.



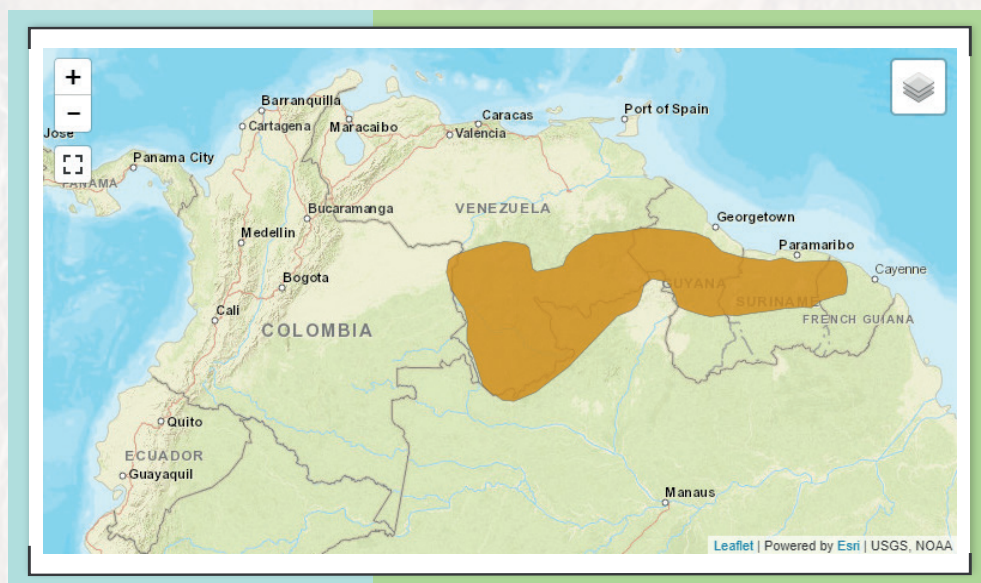
**Image 122.** *Imperfect Didelphis* - white-eared opossum of the Guyanas. Source: <https://esacademic.com/dic.nsf/eswiki/348992>. © Copyright. 2020.



In view of the conservation status, what is evaluated by IUCN is presented.



**Image 123.** Conservation status for *Imperfect Didelphis* LC - Least Concern. Source: IUCN Red List of Threatened Species. July 2019.



**Image 124.** Distribution of *Imperfect Didelphis* IUCN (International Union for Conservation of Nature) 2011. *Imperfect Didelphis*. The IUCN Red List of Threatened Species. Version 2019-1. 2019.

## Chapter 6.

# The role of the possum or common chucha in scientific research in Colombia and America

**A**lthough there are more than one hundred (100) species of marsupials in America, research studies are relatively few. Some isolated studies and publications, rather not so recent, suggest that the field in this regard has been lost.

The different roles and the role that individuals of the order Didelphimorphia can play in the wild forests of America, is still unknown, however, some descriptions that, in isolation, have been made by researchers in countries of America such as **Diego G. Tirira Saá** in Ecuador and its innumerable contributions to the knowledge of mammals in Ecuador; **Damián Rumiz** and his contribution by Norka Rocha to the publication of medium and large mammals in Bolivia; **Sergio Solari** and the elaboration of the work *Wealth, endemism and conservation of mammals in Colombia*; **Juan Fernando Diaz Nieto**, who focuses his interest in the recognition of the biotic diversity of the neotropic, focused mainly on mammals; **Carlos Andres Delgado V.**, with studies at the local level about running over wildlife and using the tail in marsupials to transport nesting material. Just to mention some researchers and some research experiences with marsupials. However, much of the history in wildlife, ecology, biology and the role in the conservation of wild ecosystems by marsupials has not been fully documented or appears to be rather insufficient. Next, we present the articles made by the PhD student of the Postgraduate program in Anatomy of Domestic and Wild Animals of the Faculty of Veterinary Medicine and Zootechnics of the University of São Paulo, veterinary doctor **Catia Helena de Almeida Lima Massari**.

### Brazilian possums

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Opossums are popularly called “Gambás” in Brazil. This name comes from the Tupi-Guarani language, in which *gã'bá* or *guaambá* means “hollow mom”, a clear reference to the marsupium of females, the ventral bag where mammary papillae are located and where neonates can complete their development. In some regional communities they are also known as “raposinha”, “timbú”, “sarûê”, “sariguê”, “sarigueia” or “micurê”. Meanwhile, the name “gambá” is sometimes confused by Brazilians with that of “cangambá” (skunk). The fault of this error is in the incorrect translation of the cartoon *Pepé Le Pew* (Pepe Le Gambá in the Portuguese language) in which the black and white protagonist is a “cangambá” in love who tries to conquer without success his diva, the cat Penelope Pussycat. However, these two animals are completely different and unrelated, since the skunk *Mephitis* is not a marsupial and does not even belong to the Brazilian fauna. In the Brazilian territory, in a total area of 8,515,767,049 km<sup>2</sup> (IBGE, 2019), there are at least four species of opossum of the genus *Didelphis* (*D. albiventris*, *D. aurita*, *D. marsupialis* and *D. imperfecta*) in all the geographical regions (North, Northeast, Southeast, Central-West and South) (Table 2). Some authors believe that *D. albiventris* and *D. imperfecta* are the same species; Additional studies are required to differentiate between these two species (Tardieu *et al.*, 2017).

According to IUCN, populations of *Didelphis* species are stable and are categorized as species of least concern (Costa *et al.*, 2019). Unfortunately, they suffer an unfair and unnecessary persecution by people who confuse them with rats or ignore their importance in the ecosystem as predators of ticks and scorpions, as well as being seed dispersers (Cáceres, 2002). These small animals can weigh on average 1 to 3 kg when they are adults.

They live from 2 to 5 years old. They are solitary habits, with the exception of mating seasons (Cáceres & Monteiro-Filho, 2001). Its distribution range is 0.2 Ha in females and 3.0 Ha in males. Opossums live in both rural and urban environments. *D. albiventris* has been detected in periurban areas of the southeast region of Brazil (Tedesco *et al.*, 2018). The photoperiod influences the start of the breeding season, therefore, its reproductive cycles are markedly seasonal (Cerqueira, 2005). One study showed the highest percentage of pregnant females during the months of January and February (beginning of the wet season) so that juveniles will have greater food availability during the peak of the wet season (May) (Catzefflis *et al.*, 2019).

Opossums have an opportunistic diet, characterized by a consumption of foods with greater relative abundance (Lessa and Geise, 2010). The diet of young possums is different from that of older adults. The former prefer insects and plants, while the latter consume vertebrate animals and carrion. Habits are also different, young opossums have arboreal habits, while adults are more terrestrial (Table 2) (Tardieu *et al.*, 2017). In unprotected rural properties, they can cause damage to poultry, because they hunt chickens and also feed on the eggs found. In urban space, they tend to explore in the

courtyards and roofs of houses at night, many times looking for concentrated dogs and cats or also food remains in the dumps without cover (Teodoro *et al.*, 2019; Cáceres & Monteiro-Filho, 2001). In Brazil, most of the information on the dietary habits of the *Didelphis* marsupials come from studies conducted in the Atlantic Forest. In other biomes such as Cerrado, Amazonas, Caatinga and Pantanal, information is scarce (Lessa and Geise, 2010).

**Table 2.** Animals of the genus *Didelphis* present in Brazil. Source: Tardieu et al., 2017; gives Rocha et al. (2017); Delciellos (2016); Santos et al., (2016); Lessa and Geise, 2010.

SCIENTIFIC NAME	VERNACLE NAME	EATING HABIT	GEOGRAPHICAL DISTRIBUTION	ECOLOGICAL DISTRIBUTION
<i>Didelphis albiventris</i>	White-eared Opossum	High preference for fruits. Fruits and invertebrates during the wet season. Flowers during the dry season.	Described in large part of the national territory, especially in the states of Minas Gerais and São Paulo (southeast region) and Rio Grande do Sul (South region); In addition to Pernambuco, Sergipe, Piauí and Paraíba in the Northeast of the country.	Wide variety of habitats, from plains and swamps to open and deciduous forests and mountainous areas.
<i>Didelphis aurita</i>	Black-eared Opossum	High preference for insects and other invertebrates. Fruits and invertebrates during the wet season. Flowers during the dry season.	It inhabits the entire Atlantic forest coast region, especially in the states of São Paulo, Minas Gerais, Rio de Janeiro (Southeast Region), Rio Grande do Sul (South Region) and in the Amazon (North Region).	Primary and secondary forests and fragmented areas
<i>Didelphis marsupialis</i>	Common Opossum	Animals and vegetables (fruits). Reptiles (poisonous snakes)	Inhabits the central region of Brazil and the Amazon.	Tropical rainforest, broadleaf forests.
<i>Didelphis imperfecta</i>	White-eared Opossum		Found only at the northern end of the national territory.	





**Image 125.** White-eared opossum *Didelphis albiventris* in the interior of the State of São Paulo, Brazil. Source: Massari © Copyright. 2020.

In Brazil, the possum has food and artisanal uses (da Silva Santos *et al.*, 2019) which makes this species a potential source of protein through the zoocria (Tardieu *et al.*, 2017). In relation to the main conditions found in Brazilian opossums, bite and scratch injuries caused by domestic animals are common. They are also victims of road run-ins and can suffer serious trauma (Ribas *et al.*, 2016). Another cause of death in urban centers is electrocution, when they are caught in high voltage lines (Silva *et al.*, 2007).

The parasites that affect opossums in Brazil have already been evaluated; In the gastrointestinal tract, *Cruzia tentaculada* (Nematoda: Cruzidae) was observed followed by the finding of eggs similar to Ancilostomatidae, Trichuridae, Syngamidae, Trichostrongilidae, Spiruroidea; in addition to coccidia; and among the hemoparasites, *Trypanosoma cruzi* and *Leishmania* sp. have been found, which makes them reservoirs of these zoonotic protozoa, with a high potential for transmission to humans, since phlebotomos (jején) have also been found near the nests of the possums (Teodoro *et al.*, 2019). *Sarcocystis* sp. It has also been found in possums in Brazil, which also implies a risk of transmission to humans and domestic species such as horses and cattle (Valadas *et al.*, 2016).

Currently, it is essential to raise awareness among Brazilians about the importance of preserving opossums, in order to achieve a harmonious relationship between society and the environment. It is necessary to continuously demystify the information on these animals so harmless to humans, report abuse and fight for the conservation of the different species of possums present in the national territory.

## Some anatomical features of the Didelphids

**Catia Helena de Almeida Lima Massari<sup>1</sup>, Lynda Jhailú Tamayo Arango<sup>2</sup>, Maria Angélica Miglino<sup>3</sup>**

Undoubtedly, the most striking anatomical features of didelphids are related to their reproduction and the way the young develop. Opossums are marsupials of the Didelphidae family, of the genus *Didelphis*. These names come from Latin, with the meaning of Di “double” and Delphos “belly.” In anatomy, this refers to the gestational period of these animals, which occurs in two stages, that is, first the embryonic development begins in the mother’s womb and, in a second phase, the development continues in the marsupium. Thus, only the young that migrate to the marsupium to complete their development will have a chance to survive (Tyndale-Biscoe, 2005; Graipel & Santos Filho, 2006).

The marsupials belong to the infraclass Metatheria or Metatheria. In contrast to Eutheria infraclass, which are placental mammals, with prolonged pregnancy and lactation, marsupials have a short gestation period. The corpus luteum is not maintained, so the offspring are expelled at the end of the estrous cycle (Freyer *et al.*, 2003). They are born with a good development of the mouth, tongue and facial muscles, as well as of the thoracic limbs, which allows migration from the vulva to the marsupium and grab itself to a nipple and start breastfeeding. The lactation period is much longer than the gestation period (4-7 weeks) (Eisenberg & Redford, 2000). The placenta in all marsupials is choriovitellin, in which the yolk sac, in two non-vascular layers or three vascular layers, juxtaposes the uterine epithelium until birth (Freyer *et al.*, 2003).

The female has two completely separate uteri (with their respective cervix), a vaginal breast, two lateral vaginas and a pseudovaginal canal or birth canal. Both the lateral vaginas and the pseudovaginal canal flow into the urogenital sinus (space between the vulva and the urethral opening), and the urogenital canal is continued. Each lateral vagina receives a part of the bifid penis (Matheus *et al.*, 2011) and serves as a channel for sperm ascent to the uterus. Together with the vaginal breast, they also serve for sperm storage until ovulation. The pseudovaginal canal is a transitory structure, as it closes after the passage of the embryos outwards (Schimming *et al.*, 2018).

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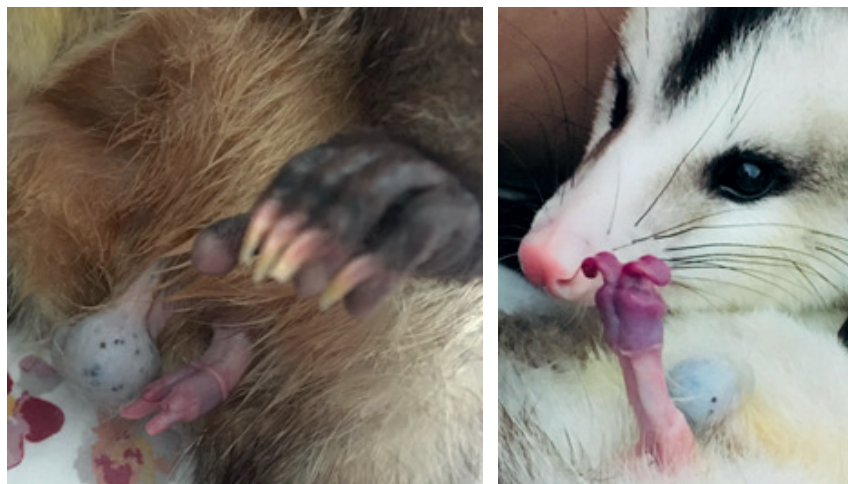
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In the ventral portion of the abdomen of the females is the marsupium, consisting of a horseshoe-shaped skin bag or letter “U”. Inside that anatomical structure are the mammary glands, composed of 11 mammary papillae, 10 of them arranged in pairs in a circular position and one in the center. As a peculiarity, no papillary sphincter muscle is observed on histological examination (Samoto *et al.*, 2006).



**Image 126.** Bifid glans in *Didelphis albiventris*. Source: Massari © Copyright. 2020.

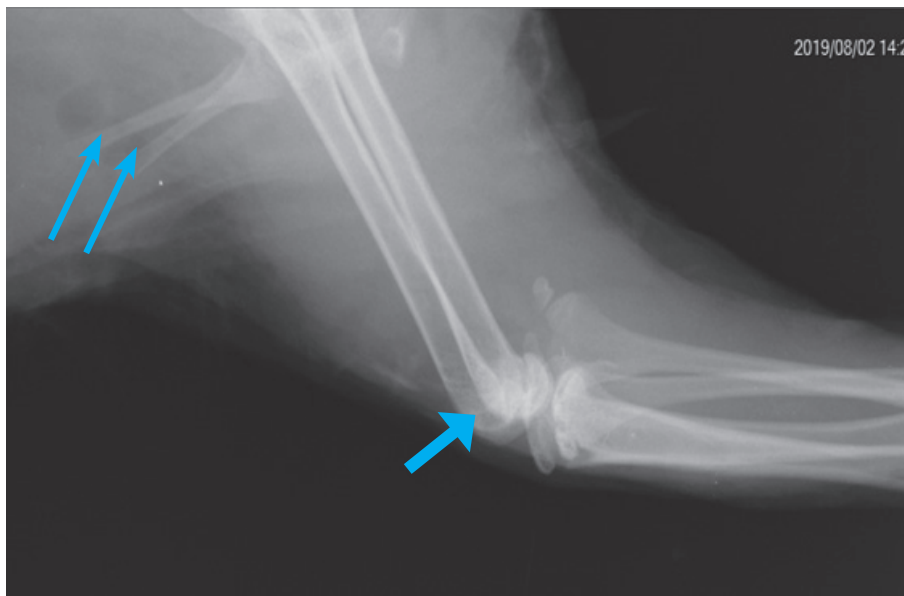
The marsupials adopted a reproductive strategy quite different from the other mammals, that is, they prioritize a long phase of breastfeeding, unlike a prolonged gestation. Thus, they manage to generate a large offspring in a short period of time and with a lower energy expenditure, once the energy expenditure of pregnancy is higher than that of lactation (Silva *et al.*, 2006; Hsu *et al.*, 1999).

Its head is relatively small and narrow, both the neurocranium and the viscerocranium are elongated. The hard palate has a rounded palatal foramen and an elongated premaxillary foramen, this characteristic of cleft palate is a diagnostic character for most species compared to euteria (Eisenberg & Redford, 2000). Its outer sagittal crest is marked and can be palpated in the dorsal part of the skull in the live animal. It has an incomplete infraorbital flange on its lateral part, which is completed by the orbital ligament, as occurs in dogs and cats (Massari *et al.*, 2019).

Its dental formula is  $I \ 5/4, C \ 1/1, PM \ 3/3, M \ 4/4$ , for a total of 50 teeth. They have no deciduous teeth, with the exception of the first deciduous molar that is replaced by the third premolar when they are preadults (Silva *et al.*, 2007). These dental characteristics

allow the calculation of age. The canines are long and pointed, and premolars and molars slightly sharp and flat, which evidences their omnivorous behavior (Massari *et al.*, 2019).

The marsupials are characterized by having epipubic bones, connected through a synovial joint with the pubis and through muscles to the ventral midline and the femur. They support marsupium and influence locomotion and breathing (Reilly *et al.*, 2009). Another peculiarity with respect to the opossum skeleton is that they have no patella, but a fibrocartilage within the quadriceps tendon. This is a common feature among marsupials (Inamassu *et al.*, 2017). Its tail is highly prehensile and devoid of hair in its two distal thirds (Eisenberg & Redford, 2000).



**Image 127.** Epipubic bone (thin arrows) and absence of patella (thick arrow) in *Didelphis marsupialis*. Source: Tamayo-Arango and Sepúlveda (unpublished data). © Copyright. 2020.

In relation to the thoracic and pelvic members, opossums have a penta finger pattern, that is, five digits on the hands and feet. With that, they basically walk quadripedalism, supporting the four members on the floor or during their tree climbing. However, exclusively the digit I or halux of each of the feet does not have nails or claws, that facilitates grasping trunks or branches (Silva *et al.*, 2007).



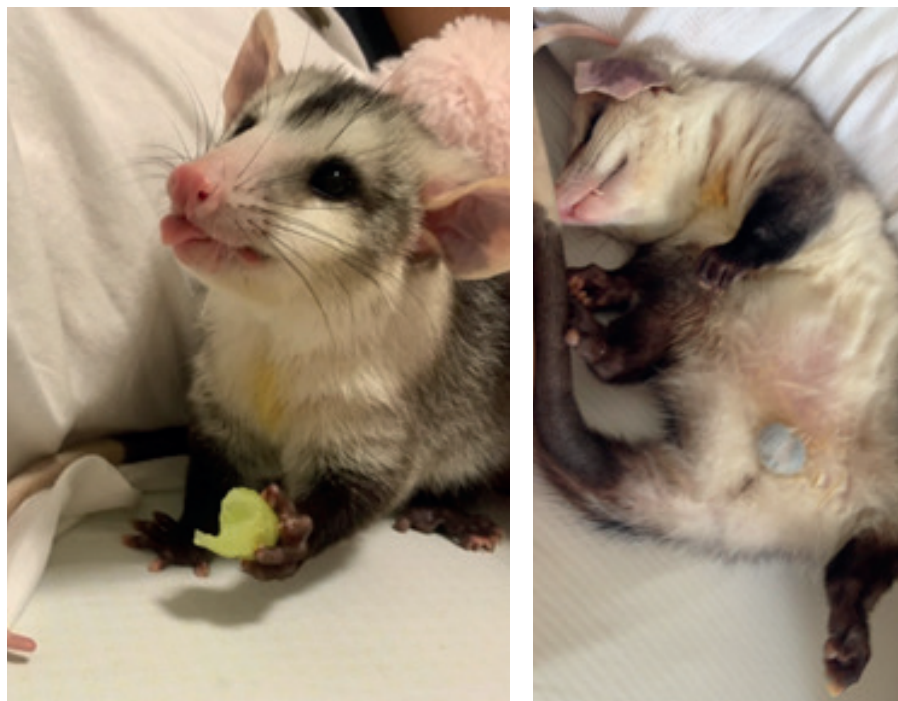


**Image 128.** Oppositional halux in *Didelphis aurita*. Source: photos courtesy of Scorcio for Massari © Copyright. 2020.

The anatomy of the digestive tract of opossums reflects their omnivorous diet. They have a simple stomach and a prominent blind man. The small intestine forms 65.9% of the total gastrointestinal tract. The carnivorous diet is reflected in a mucosa of the esophagus and non-keratinized stomach and in the presence of a large amount of lymphocytic infiltration in the small and large intestine.

While a very prominent blind person demonstrates that he can digest plant material, as well as a large intestine that is highly developed to optimize the water absorption of fruits (Tardieu *et al.*, 2019). *The salivary glands are large mandibular glands and smaller parotid and sublingual and oval submaxillary glands* (Tardieu *et al.*, 2019).

In the ventral cranial portion of the thorax of the males they present with sterling glands, located specifically near the sternum. Such glands secrete, through ducts on the skin and fur, a yellowish fluid with pheromone content for the purpose of sexual attraction. Only male individuals possess such glands, which begin to develop at puberty (Tyndale-Biscoe, 2005).



**Image 129.** Yellowish coat on the thorax due to the pigments present in the secretion of the male sternal glands of *Didelphis albiventris*. Source: Massari © Copyright. 2020.



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## Chapter 7.

# Wildlife diet of possum or common chucha.

About chuchas, possum or common chucha (its scientific name is *D. marsupialis*), it is a marsupial belonging to the order Didelphimorphia. It has a wide range of distribution in Colombia, from sea level to 2,500 m.a.s.l. (Solari *et al.*, 2013). It is a species that can live in a wide variety of habitats, from primary and secondary forests, dry forests, wet forests, gallery forests, savannas, cultivation areas, pastures and urban areas. Therefore, their food preferences may vary according to habitat (Cordero & Nicolás, 1987; Norris *et al.*, 2010). Ignorance of the ecological importance of this species increases its vulnerability since it has suffered direct persecution by human populations, they have even become considered a pest species. For these reasons, an investigative contribution is made on the diet of this marsupial, this being a component of great value for the natural history of the species, since so far there are no studies on their eating habits in the country. To carry out this work, we had the advice of Professor Sergio Solari Torres, professor of the Biology program of the Institute of Biology of the University of Antioquia and director of the Mastozoology Group of the same University.

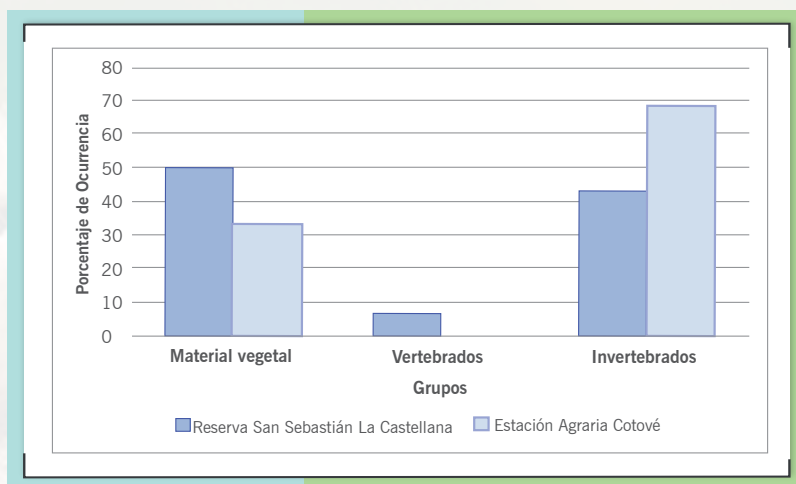
**¿Where was this study conducted?** The study was carried out in Colombia, in two different ecosystems of the department of Antioquia: tropical dry forest, located in the Cotové Agrarian Station owned by the National University of Colombia, Medellín headquarters, in the municipality of Santa Fé de Antioquía, and on the other hand, in the Montano Forest, located in the San Sebastián de la Castellana Ecological Reserve in the municipality of El Retiro. These two ecosystems were chosen due to the degree of threat they present. The San Sebastián de la Castellana Ecological Reserve is of great importance because it is considered one of the last fog forest relics, unique in the Antioquia highlands (Martínez, 2015). The tropical dry forest is also one of the most threatened ecosystems in the country, the few remnants of forests that still persist are surrounded by large matrices of pastures, stubble, crops and livestock activities (Hernández-Camacho *et al.*, 1992; Pizano & García, 2014).



**Image 130.** Opossum or common chucha *Didelphis marsupialis* in wildlife. Zarigüeya Foundation  
Source - FUNDZAR © Copyright. 2020.

**¿What do they eat?** The possum or common chucha can satisfy your nutritional requirements with a variable amount of invertebrates, vertebrates and fruits. In the two study areas, a broad spectrum of trophic items was found, consisting mainly of invertebrates, plant material and, to a lesser extent, vertebrates, the latter was only found in the San Sebastián de la Castellana Ecological Reserve. Among the items consumed most frequently, the cucarrones (Coleoptera order) and the ants (Hymenoptera order) were found, as already reported by some authors for other species of opossums in Brazil (Caceres & Monteiro-Filho, 2001; Pinheiro *et al.*, 2002; Caceres, 2004; Carvalho *et al.*, 2005; Cáceres *et al.*, 2009; Guimaraes Lesa & Nepomuceno da Costa, 2010; Lessa & Geisse, 2014). Also, consumption of cockroaches, spiders, crickets, mary sticks, grasshoppers, snails, bedbugs, fleas and ticks was found, the latter are possibly consumed accidentally while grooming, since this way they can control the infestation of these ectoparasites in her body. The consumption of invertebrates provides very important lipids and proteins for your nutritional requirements (Redford & Dorea, 1984). The consumption of vertebrates such as birds and mammals was also found, however, these were found in smaller quantities.





**Graph 1.** Composition of the diet of *D. marsupialis* in the two study areas A. Forest tropical dry (Santa Fe de Antioquia). B. Montane forest (El Retiro).

The diet of this species also includes fruits, since these also provide a high nutritional value, especially sugars and amino acids (Atramentowicz, 1988; Julien-Laferriere & Atramentowicz, 1990; Herrera, *et al.*, 2002). The possum or common chucha, has a predilection for fruits of highly available species in the study areas. For the montane forest they are referenced: blackberry grass, *Solanum americanum*; dishwasher, *Solanum ovalifolium*; tack, *Solanum sycophanta*; grapefruit, *Solanum vestissimun*; wild morita, *Rubus robustus*; Yarumo, *Cecropia* sp; lulo, *Solanum quitoense*; Cape gooseberry, *Physalis peruviana* and turnip, *Brassica rapa*. For the dry forest, the consumption of guácimo, *Guazuma ulmifolia*; passion fruit, *Passiflora edulis*; mango, *Mangifera indica*; Cordoncillo, *Piper* sp and Alejandra Palm, *Archontophoenix Alexandrae*. In some studies, it has been found that this marsupial can complement your diet with flower nectar, which can contribute to the pollination process of some plant species (Janson *et al.*, 1981; Julien-Laferriere & Atramentowicz, 1990). This suggests that this species has a general diet, which indicates that it can choose between different types of prey, depending on the habitat to which it has to adapt. You can also balance your diet to meet all your nutritional requirements.

**¿What is its importance in ecosystems?** Although in this work the role of the possum or common chucha as a seed dispersant was not evaluated, the consumption of fruits belonging to pioneer plants (very important species in the regeneration of forests) and in addition, it could be evidenced that the excreted seeds did not present apparent damage, which indicates that this species would have a key role in these processes since it can be an important dispersing agent in neotropical forests, as has been observed in previous studies with other Didélfidos (Medellín, 1994; Cáceres, 2002; Caceres & Monteiro-Filho, 2007; Caceres *et al.*, 2009; Guimaraes Lesa & Nepomuceno da Costa, 2010).

Another factor to take into account is the activity pattern that this species presents, as it can forage between forest patches, stubble, primary and secondary forests and areas dominated by exotic species. This behavior allows its permanence in areas strongly transformed by human activities, in which forest fragments prevail (Norris, *et al.*, 2010). Its high movement capacity has also been reported, it was found that it can travel hundreds of meters and even kilometers in a single night (Sunkist, *et al.*, 1987; Medellín, 1994). Therefore, if the species is an effective seed disperser, that is, if the seeds it consumes have a high germination rate, after passing through their digestive tract, movements between patches can contribute to the passive ecological restoration process of intervened areas (forest borders and open areas) (Norris, *et al.*, 2010). Due to the above, this type of research can provide tools to raise awareness in the community about the importance of these marsupials in the ecosystems where they live, as it would allow to know some of the ecosystem services that they can provide. For example, they can become potential controllers of many species considered pests, since their diet usually includes a large number of animal and plant prey.



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## Chapter 9.

### Run over

The increase in road infrastructure plays an important role in the development of nations, as it facilitates socio-political and economic integration at regional and local levels (Alamgir *et al.*, 2017). However, the presence of roads has effects on the environment, such as the fragmentation of habitats, that is, a break in the structural and functional connectivity of the spaces in which animal and plant communities live (Loro *et al.*, 2015; Mimet *et al.*, 2016). The construction of roads affects the decrease in the movement of species and creates a barrier effect (Pallares & Joya, 2018). In addition, it generates an increase in light, sound, chemical and atmospheric pollution (Van der Ree *et al.*, 2015) that adds to the running of wildlife, generated by vehicles that travel along the roads (Coffin, 2007; Monge- Nájera & Seas, 2018).



In relation to the run over of wildlife, the figures speak for themselves; In the United States it is estimated that about 1 (one) million animals are run over daily on their roads (Wollan, 2010), in Europe it is estimated that up to twenty-seven (27) million birds appear on the tracks every year (Erritzoe *et al.*, 2003) and in Brazil, the annual figures reach four hundred seventy-five (475) million dead vertebrates on the tracks (Bager *et al.*, 2016). On the other hand, in Colombia, work is being carried out to establish run-over figures at the country level, however, in the absence of these there are studies such as that carried out in the East of Antioquia (Via Medellín - La Ceja - Rionegro) by the Ecology program of Roads and Green Infrastructure (PECIV) of the Metropolitan Technological Institute (ITM) that sought to determine the effect of road infrastructure on wildlife. This study determined that the

estimated mortality for one year in this area exceeds 500,000 vertebrate animals, in a 150-kilometer route that represents approximately 0.05% of the total roads in the country (Jaramillo *et al.*, To be published).

Additionally, studies carried out in the Colombian road network have shown that the problem of running over wildlife affects a wide variety of vertebrate groups (Delgado, 2007, 2014; Jaramillo *et al.*, 2017; Bedoya *et al.*, 2018; Rincón - Aranguri *et al.*, 2019; Castillo *et al.*, 2015) being some species more vulnerable by biological (Pallares & Joya, 2018), spatial (Rincón-Aranguri *et al.*, 2019), and temporal species (Castillo *et al.*, 2015; Nadjar & De la Ossa - V., 2013; De la Ossa -V & Galván-Guevara, 2015) in the study pathways. In the biological aspect, the mortality by running over can be associated to the body size, the diet or the abundance of the species at the site (Delgado, 2007, 2014; Rincón-Aranguri *et al.*, 2019); As for the spatial conditions, it has been shown that the composition and structure of the landscape surrounding the run-over point affect the frequency of vehicle collisions with vertebrates (Rincon-Aranguri *et al.*, 2019). Regarding the timing of the run-over, it has been observed that the reproductive periods and the migratory periods associated with the rainy and drought seasons affect the possibility of recording mortality events (Castillo *et al.*, 2015; Nadjar & De la Ossa- V., 2013; De la Ossa -V. & Galván-Guevara, 2015; Santos *et al.*, 2017).



**Image 131.** Possum or common pike *Didelphis marsupialis* run over on track. Zarigüeya Foundation  
Source - FUNDZAR © Copyright. 2020.



Several studies have shown that the mammal with the highest number of run-over records on Colombian roads is the possum or common chucha *Didelphis marsupialis* (Jaramillo *et al.*, 2017).

In the department of Antioquia, the study carried out by Delgado (2007, 2014) on the El Escobero road (municipality of Envigado) south-east of the city of Medellín (Antioquia), points to the opossum as the most affected vertebrate during the two periods of sampling; due largely to the fact that this marsupial is very common in the Aburrá Valley. In the Colombian Pacific, censuses carried out in a sector of the Pan-American highway, between Popayán and Patía, showed that the species with the highest number of incidents was the opossum, with 61% of the mortality records.

Similarly, in different studies on the country's road network there has been a greater frequency of running over this marsupial mammal (Bedoya *et al.*, 2018; De la Ossa -V. & Galván -Guevara, 2015). These data are corroborated through the Colombian Network of Tracked Wildlife Tracking (RECOSFA) through the registration of run-ins in the mobile application, App RECOSFA, which indicate that 63.1% of reports of animals run over belong to the genus *Didelphis*, between the period 2015 to 2017 (Jaramillo *et al.*, 2017). In different rural and urban communities of Colombia it is usual for the common opossum to be stigmatized by its appearance, associating it with rodents or with predators of domestic animals. So far, the issue of the intentionality of drivers to consciously and selectively run over certain species because of their appearance, fear or the beliefs or superstitions of people around these animals has been poorly studied. For species considered "little or not charismatic" it has been observed that drivers have different behaviors when seeing one of these species on the road, some of them, getting to divert or accelerate the vehicle with the purpose of running over animals such as snakes, spiders or turtles (Mesquita *et al.*, 2015; Secco *et al.*, 2014). Therefore, studies on the component of intentionality in the running of opossums are required by drivers on national roads.

It is important to note the importance of assessing these violence behaviors directed towards animals, as a catalyst and tool for detecting other violence, such as those directed towards humans, specifically violence towards the couple (mostly women) and antisocial personality disorders (Haden, McDonald, Ascione, & Blakelock, 2018). The FBI and several US security agencies, supported by studies from psychology and crime, point to mistreatment and cruelty to animals as precursors to other violence (National Sheriffs' Association, 2018). In a country with high levels of violence, it is worth understanding why animals are mistreated and what it can mean in terms of safety and coexistence. On the other hand, popular beliefs regarding the feeding of this marsupial mention that it feeds on garbage remains, but it has been observed that the possum or common chucha, is a species with a general diet, consuming from fruits, insects, roots and even meat, so

it is usual to observe it in areas with access to this type of resources. Ecological habits of the species facilitate movement and foraging in anthropic environments, usually close to roadsides, making them more likely to cross roads and increasing the likelihood of interacting with vehicles (Ferreira, 2017).



Zarigüeya & Oliveros



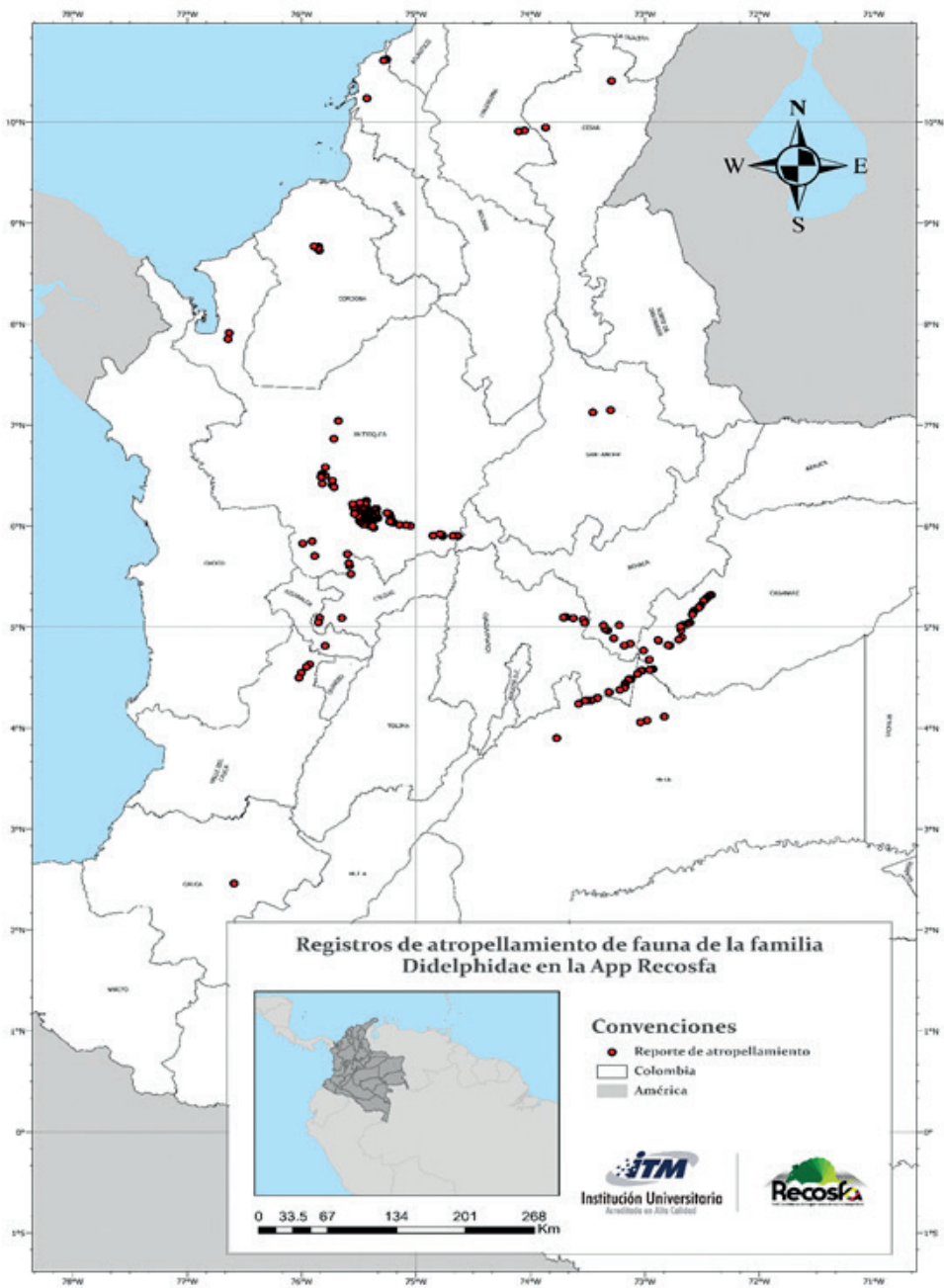
**Image 132.** Posters of wild opossum or common chucha El Escobero road, Envigado, department of Antioquia, and Medellín - Manizales way, department of Caldas. Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020.



In addition, it has been observed that this mammal is an opportunistic scavenger that feeds on corpses of previously run over animals, increasing the probability of becoming part of a mortality event (Castillo *et al.* 2015). In some studies, the mortality of this marsupial has been associated with local abundance in urban and peri-urban environments in the Aburrá Valley (Delgado 2007, 2014), a factor that contributes to the risk of colliding with vehicles (Ferreira 2017; Santos 2016). Additionally, it has been observed that the composition and structure of the areas surrounding the road generate differences in the frequency of running over the possum or common chucha (Rincón-Aranguri *et al.*, 2019). Because of this, the Colombian Network of Tracked Wildlife Tracking (RECOFSA) has made a digital record of reports of run-over, associating it with spatial variables (Jaramillo *et al.*, 2017). In the following image and maps the reports of run-over of the genus *Didelphis* are observed.

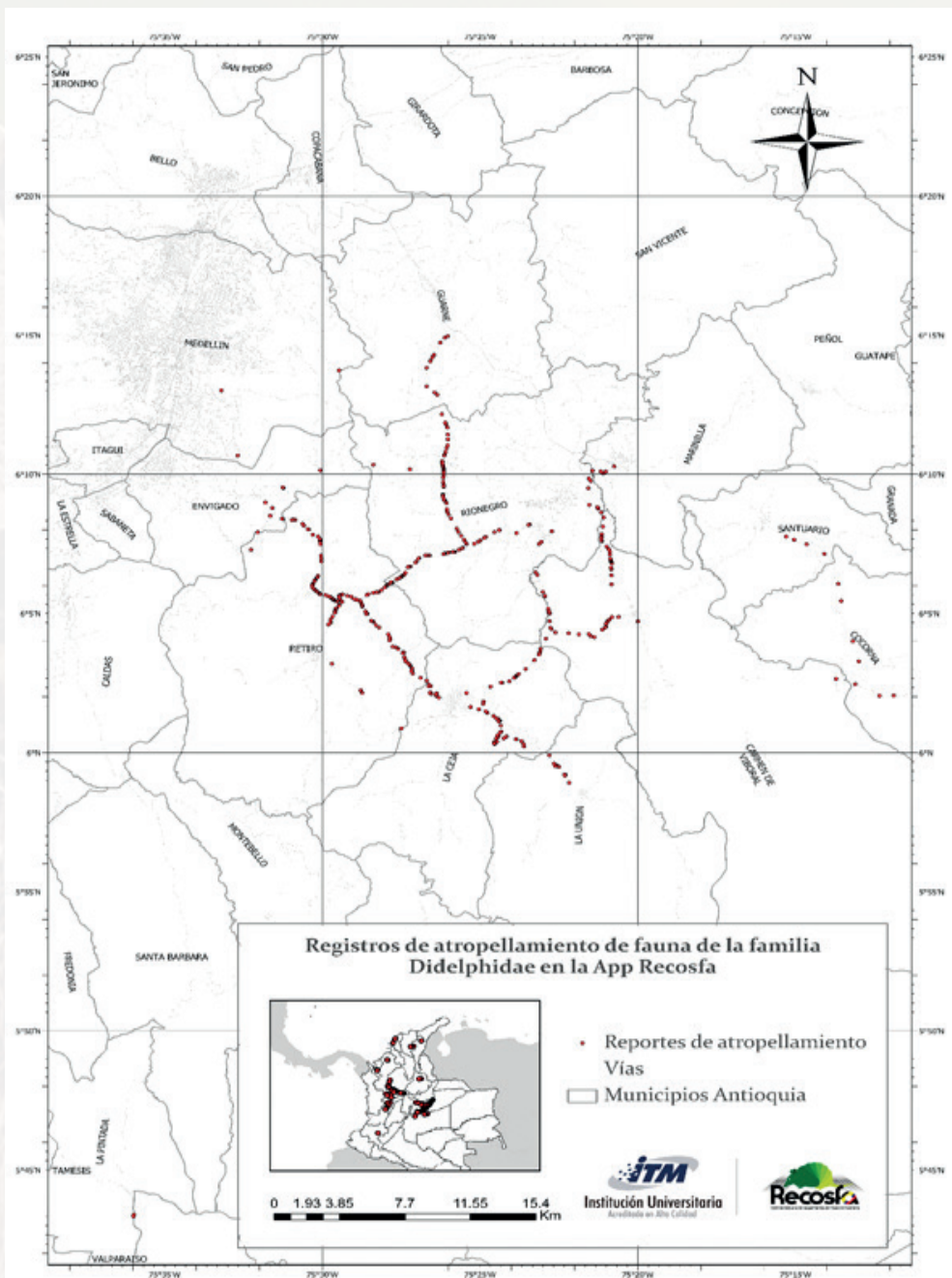


**Image 133.** Statistics of individuals run over on roads in the eastern subregion of the department of Antioquia. Source: <http://reporte.humboldt.org.co/Biodiversidad/2017/cap2/206/index.html#seccion3>. 2017.



**Image 134.** Distribution of reports of run over of the Didelphidae family in the RECOSSA App in Colombia. Source: Highway Ecology and Green Infrastructure Program (PECIV) at Instituto Tecnológico Metropolitano (ITM). © Copyright. 2020.





**Image 135.** Distribution of reports of run over of the Didelphidae family in the RECOSFA App in the department of Antioquia. Source: Highway Ecology and Green Infrastructure Program (PECIV) at Instituto Tecnológico Metropolitano (ITM). © Copyright. 2020.

From the data obtained with the RECOFA App, it was evidenced that 77.96% of the reports of runoff of common opossum or chucha are made in areas with an abundance of crop and pasture mosaics, most of these (97%) in areas close to urban or artificialized centers, which is congruent with the general diet of this species, as reported by (Ferreira, 2017). On the other hand, there are reports of run over of *Didelphis marsupialis* and *D. pernigra*, the run over ratio between both species is from 5.27 to 1. In other monitoring of mammals run over on the road of El Escobero, Envigado (Antioquia) is observed at *Didelphis marsupialis* as the species with the highest frequency of mortality compared to *D. pernigra*, with an average ratio of 10: 1 (Delgado, 2006, 2014).

Reports of run-over of opossums registered with the RECOFA app, are mainly distributed in the Andean region (88%), which is consistent with the information contained for this species in the BioModelos portal of the Alexander Von Humboldt Institute and with other studies that have found a higher intensity of mortality in areas with greater vegetation cover (Castillo *et al.*, 2015). The adaptation to human settlements and their resilience and tolerance to the continuous changes generated in anthropic activities, explain why this species continues to be run over in environments with high intervention. Factors such as the high flow and speed of the vehicles that circulate on the roads are other causes of mortality for this marsupial.

The ignorance of biology, ecology and the state of the populations, makes the possum vulnerable to phenomena such as run-over, which increase with the growth of the kilometers of roads built in the country. The loss of their habitat due to the creation of fourth generation (4G) roads in Colombia, reduces structural connectivity in some areas, hindering the movement of individuals between patches of forests or nesting or foraging sites, threatens the long-term viability of the local populations of this mammal.

The education and de-stigmatization of beliefs around this marsupial will lay the groundwork for reducing drivers' outrages. The joint work between the State, academia and citizens can generate public policies and relevant studies to reduce accidents. The latter can be done through the generation of mitigation measures, after determining the "hot spots" along the country's road network and identifying the factors that generate collisions with cars in these areas.

The ecological importance of the opossum is made by a species to which protection should be provided, this will be possible through the implementation of educational campaigns on roads, educational institutions or other entities. Other measures that can contribute to the reduction of the loss of individuals on national roads are the awareness in driving courses and dialogue with construction companies, entities and road concessionaires so that in their environmental impact studies, they take into account the design of the



measures that facilitate the displacement of the possum or common chucha and other species of animals along the natural corridors of the intervened habitat.

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## Chapter 10.

# Anthropocentric vision of the possum or common chucha.

### Facing the story:

A part of the history of opossums dates back to the discovery of America, from the year 1492, Christopher Columbus traveled from Spain in three caravels: La Santa María, La Pinta and La Niña. The latter had as captain a Spaniard named Vicente Yañez Pinzón who, in the middle of the expedition, discovered the coasts of northern Brazil in January 1500 (Fernández de Navarrete, 1829).



The ancient accounts indicate that Yañez collected the first copies seen of this marsupial and took them to Spain to present them before the Catholic kings Isabel and Fernando de Castilla, who had the opportunity to see the young suckling inside the mother's marsupium (Fernández de Navarrete, 1829).

In 1829, Fernández de Navarrete described the fact as follows, referring to Yañez Pinzón:

*He also led extremely strange animals to Spain, and among them one that had the fox's body and snout, the legs and back feet of jimia, the front ones similar to those of the man, the owl ears, and under the belly another outer one in shape of money, where he hides his little children after having given birth, taking them out only to breastfeed until they can feed themselves and procure food. In the navigation died the little children of this rare animal; but the mother was sent from Seville to Granada to present her to the Kings, and there she died, exciting the curiosity of many and diverse people who saw her.*

Fernández de Navarrete (1829) himself exposes his idea about opossums with these words:



*It is the size of a cat, pious, although with the head almost all white: it has a body covered with long and soft hair, a very cleft mouth, large and naked ears, fifty teeth, tongue bristling, prehensile tail or capable of clinging to some thing, and partly naked; the posterior thumbs without a nail and capable of opposing the other fingers... It is found throughout America; It is fetid and heavy to walk....*

Having taken the possum before the kings of Spain, marked the creation of natural history collections, in which the expeditionaries took animals and plant samples to study and catalog them as part of their travel chronicles (Fernández de Navarrete, 1829).

## Facing the myths:

The myths that have shown the possum or common lollipop as an ugly, dirty animal, very dangerous, very careful because it can be violent, dangerous and can transmit diseases such as rabies, are just that: myths. For this reason, we have worked with environmental education strategies to change this mentality, however, the general ignorance about this marsupial is presented daily in the different cities and departments of our country Colombia, (Zarigüeya Foundation - FUNDZAR, 2019).

Continuing with the myths and stories created towards the possum, El Pbro. Roberto Jaramillo Arango, in his writing Botanical and Zoological Monographs, work carried out between 1944 - 1945, and reprinted in 1986, makes very particular notes on the chucha, where among other important quotes he makes notes on the classification, characters, places that inhabit, ethology, Colombian species, names, folklore and finally a prayer to the chucha. Among others, he cites the description of some authors such as Fernández de Oviedo, one of the chroniclers who accompanied the first conquerors in America:

Prayer to the Chucha:

*Think men of you, animalia of God, when they are served... You smell true, not daisy and lilies, but you bathe the world with the perfume of your maternal love and if it is abominable your stinking you live isolated and run away from people as you know of the person of bad breath should not live in society and that if it*



*were not for your mephitic glands you would be less angry than the man, who from his body all exhales an unbearable stench. The most eminent and deepest churchologians do not fit your dental formula or the way in which your churchicos pass from the vagina to the abdominal pouch, and less than they understand your idiosyncrasy and animal psychology of God.*

And in that same sense,

*In Castilla del Oro, on the mainland, especially in the Darien and many parts of the Cave Tongue, there is a small animal the size of a medium rabbit, the very sharp snout and the fangs and teeth as well, the long tail e the way the mouse has it and the ears very similar.*

Father Sánchez Labrador in his Catholic Paraguay, in 1770 dealing with the South American fauna is one of the authors who most faithfully describes the chucha:

*Another animal is recommended, not for its meat, which is something stinking, although it is not missing who eats it, but rather for a particularity that is observed in it. In his figure, the rats are given an air, but they are exceeded by the size of the body, some are larger than a cat. They have the head like that of the fox, although its snout is longer. The unique thing about this bestezuela is that in the lower part of the belly it has a long bag formed by two skins. In this bag, after giving birth, it encloses the children until they are already thrown out.*

*There is another little animal (writes Herrera) called tlacuatzin, which is like a piglet, the long snout, it has a bag in its belly where it brings the children, stop seven or eight: it enters like a fox at night to hunt chickens has the Long tail without hair.*

As you can read in the previous stories, what the former travelers and chroniclers mainly aroused curiosity, were the stocked species; those that were not, confused them, as many people still confuse them today, with rats and mice.

### Facing common names in Colombia and America:

The chucha has in the American countries different denominations, although not all applicable (rather cultural or similar issues with other animals) that can be applied to the gender rather than to a certain species.

**Biskuña** in Chocó, (Colombia).

**Bosai** between Tadocitos and Dacotó Indians, (Colombia).





**Boxoch** name with which the chucha is designated in the Yucatan region, (México).

**Caiqueichai** (ayoreo).

**Capigi** Santamaría dice: "Small mammal of the Guayanas, which walks in brown herds, dog's nails and pig's snout".

**Carachupa** Quechua Khara-chupa, is in the academy as Peruvian in Chachapoyas, is also used in Bolivia.

**Çarigueia** in Brazil it comes from Brazilian Portuguese.

**Cayopolin** "Raptor of Mexico (says Santamaría) very ugly, little older than a mouse, with bat ears, snake tail and monkey feet, exhales very bad smell.

**Canchul** Chachapoyas in Perú.

**Comadreja** in Uruguay and Argentina, Santa María.

**Cola** pelada in Nicaragua.

**Cuica** cola de rata in Argentina. Cabrera y Yepes.

**Chucha** común in Colombia, Joaquín Antonio Uribe says: "That comes (of chucha) Iberian-Celtic voice with which the croaking of the dogwood and other nocturnal birds of prey is designated, because, as you are, that mammal devours the domestic birds. The name of our Didélfido is plain and simply the chucha voice, which in Quechua means stinking animal".

**Chucho** in Costa Rica. Santamaría.

**Churcha** in Brazil.

**Churi** in some dialects of the Chocó language family (Colombia).

**Fara** in Colombia.

**Farique** in Brazil.

**Faro** in Santamaría, Venezuela.

**Gamba** in Brazil.

**Guazalo** in Venezuela.

**Huarishauca** in Quillabamba Perú.

**Jarique** in El Salvador.

**Jarachupa** (Coast and mountains of Peru) refers to the species *Didelphis pernigra*.

**Jalachupa** (Coast and mountains of Peru) refers to the species *Didelphis pernigra*.

**Karachupa** (guaraní)

**Kadoa** in Chocó (Colombia).

**Llaca** in Chile.

**Maritacaca** in Honduras.

**Mbicuré** cangrejero in Venezuela.

**Mbicru** (guarayo).

**Micurê** in Brazil.

**Muca** in Perú, Quechua voice. P. Lobato defines it this way.: “Animal of the fox family, long and bare tail, the female has a bag in her lap, where she keeps the young, is a thief of chickens and fruits.”

**Mucamuca** in el Salvador.

**Noshobish** (chiquitano).

**Potsai** among the katíos(Colombia).

**Rabo** calato (Coast and mountains of Peru) refers to the species *Didelphis pernigra*.

**Raposa** in Cuba.

**Santa María.** In the Coast of Perú.

**Raposinha** In Brazil.

**Rata de monte** ( North – Eastern Jungle, Peru).

**Runchoin** Colombia, Cundinamarca, Santamaría, following Toro and Gisbert: “*Small amphibious marsupial mammal.*”

**Rucupi** (Coast and mountains of Peru), refers to the species *Didelphis pernigra*.

**Sacha** zorro (North – Eastern Jungle, Peru).

**Sariga** in Perú and Bolivia.

**Sariguê** in Brazil.

**Sarigüeia** in Brazil.

**Saruê** in Brazil.

**Opossum** in the United States – USA.

**Tacuacín** y Tlacuache in Azteca, México.

**Taibí** in Guayana.

**Timbú** in Brazil.

**Unqaqa** in Quillabamba, Perú.

**Yapo** in guaraní, used in Argentina.

**Zariguella** comes from the brazilian carigüeia.

**Zarigüeya** in Colombia.

**Zorra mochilera, zorra chucha, zorro marsupial pelón** Atlántic Coast (Colombia).

### Regarding to folklore:

As for Folklore, “*those chuchas and weasels, as ladinos as carniceras*” Carrasquilla in La Marquesa de Yolombó. “*The Damned chucha she took care of herself with the happy chicken*” F. de P. Rendón, Intimate Drama. According to the Bogotólogo: Uses, disuse and abuse of Spanish spoken in Bogotá, (Colombia). Chucha is:

- ✓ Referring to the bad smell of armpit.



- ✓ It's a chucha: the useless, bad person is said. It's a good for nothing.
- ✓ To pay the chucha is to make the toast when something is released.
- ✓ Simulating a dead chucha, is pretending ailments to get away with it.
- ✓ Chuchero is the peddler, the dog given to hunting for chuchas, the place where they abound.
- ✓ Fetid vaporous emanation from the armpit area. Sobaquina.
- ✓ Bad player of a sport.
- ✓ Weak individual, with few physical skills.
- ✓ Man given to harassment of naive ladies.
- ✓ Let's play "chucha cogida". Children's game in which a child must chase the others until one is caught; This will follow the tracker and so on. Upon leaving school, the children gathered in the square to play "chucha cogida".

In the Dictionary of the CH, by Karl Troller and Eduardo Arias (<http://www.parqueexplora.org/micrositios/chuchas/huele.html>) chucha is defined as (fragment: "Penetrating and unpleasant smell from tobacco, that is, the armpit. Use to refer to a bad smell. "

- ✓ This bus (car and / or vehicle for public transport) smells like chucha.
- ✓ That man has chucha.
- ✓ Mountain animal, typical Colombian.

Chuchería according to Real Academia Española de la Lengua - RAE: something of little importance, but polished and delicate. Short and light food, usually appetizing. Object of little importance, generally of small size and of more sentimental than economic value, especially the gift. (Micrositio zarigüeyas Explora, 2014).

A saying is a popular saying or phrase of very common use that always carries a teaching or message in its content. In Colombia, sayings are used almost daily to complement the events of the daily life. Generally, we use them as a warning or advice for any situation that arises. Some popular sayings in the department of Antioquia are sent directly to the possum or common lollipop in the collective imagination and in the said paisas.

- ✓ Hijo de tigre sale pintado, hijo de **chucha** rabipelao.
- ✓ Veá, a este le metieron **chucha** por guagua.

### Regarding urban tribes:

The term urban art or street art refers to all street art, often illegal. However, it must be said that in Colombia and the world, some urban artists have made their own with the chucha (we do not mean the bad smell in the armpit). They have shaped their art in the avenues of big cities such as Detroit, Michigan in the United States and Medellin, Antioquia in Colombia.



**Image 136.** Graffiti of the *Virginian* opossum *Didelphis*, in Detroit, Michigan, United States. Source: <https://www.facebook.com/FUNDZAR/>. © Copyright. 2020.



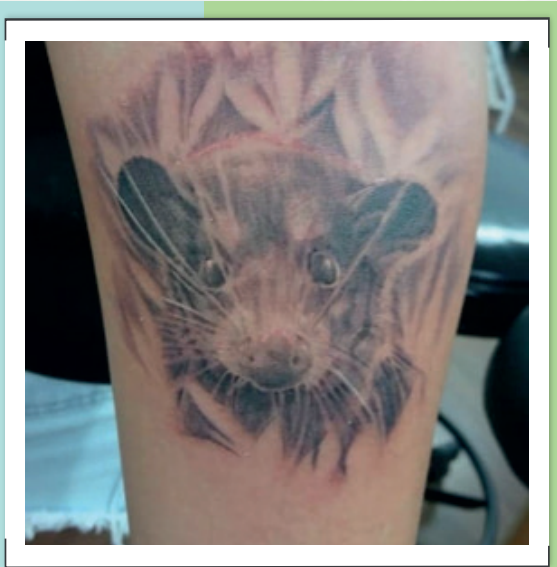


**Image 137.** Graffiti of opossum or common chucha, located at Santa Fé Zoo in the city of Medellín - Colombia. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

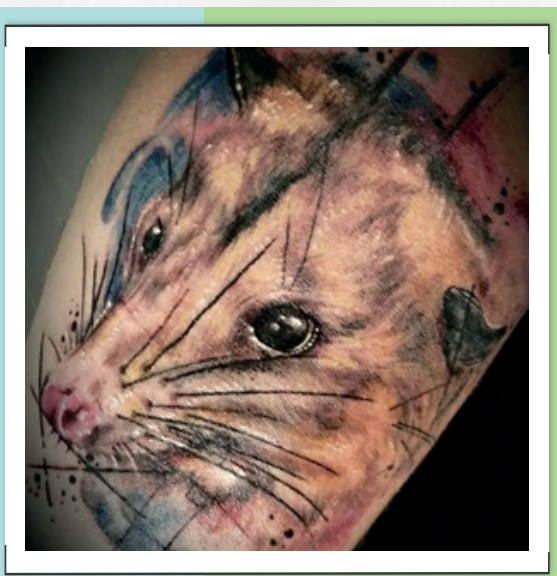


**Image 138.** Opossum or common chucha graffiti, located on the Metro viaduct in the city of Medellín - Colombia. Graffiti for the protection and conservation of the opossum or common chucha made in a campaign in the city of Cali, Colombia by a group of young animalists. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

Other manifestations at the individual level have led some people to want to tattoo these individuals of wildlife anywhere in the body.



**Image 139.** Possum tattoo. Source: <https://web.facebook.com/groups/1559837174299862/> - Gambás brasileiros, Opossums & Possums. © Copyright. 2020.

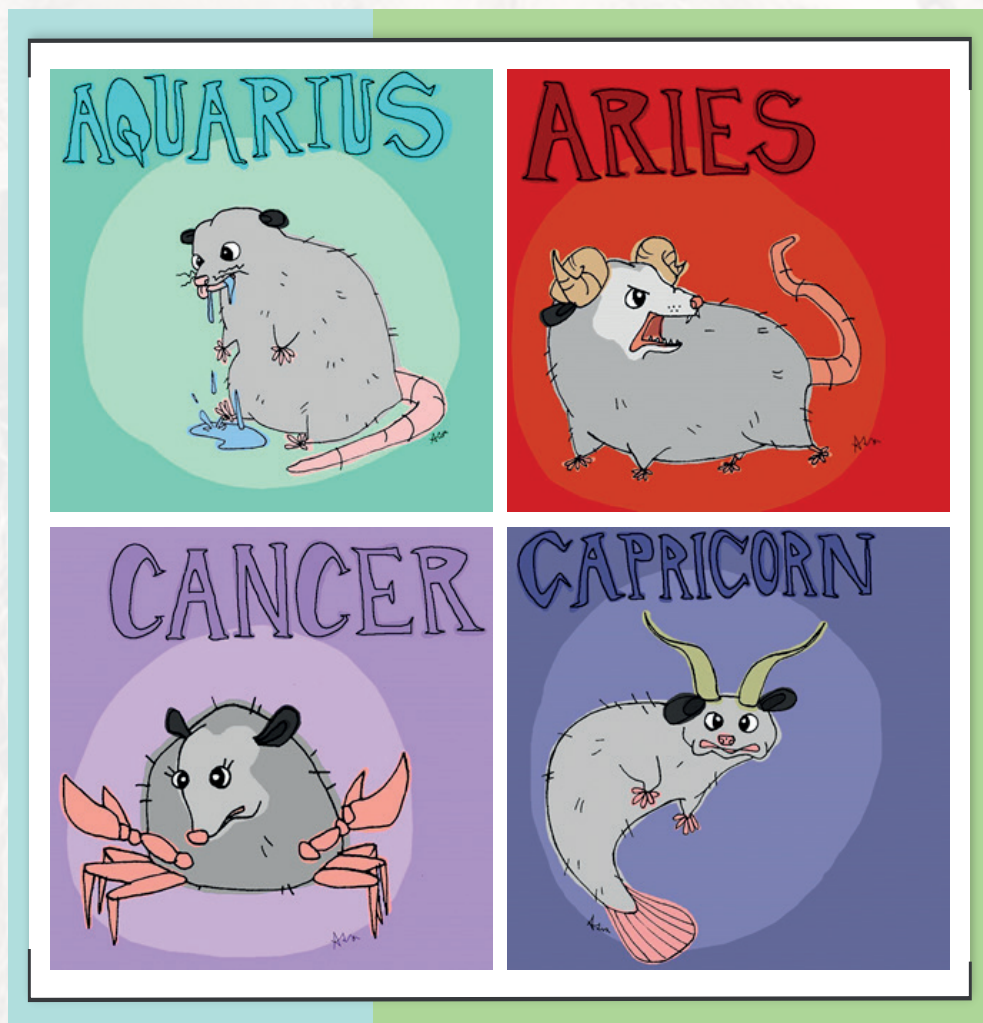


**Image 140.** Possum tattoo. Source: Davis Travis / Deybi Beltrán Cerón / La Casita del Bosque. © Copyright. 2020.



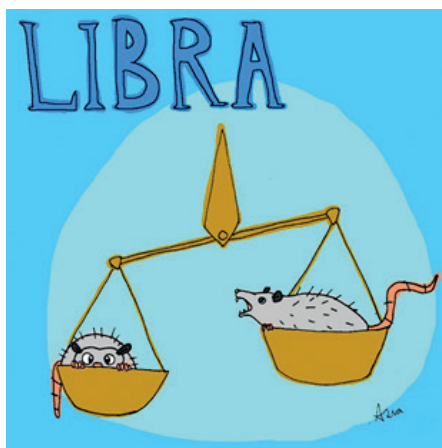
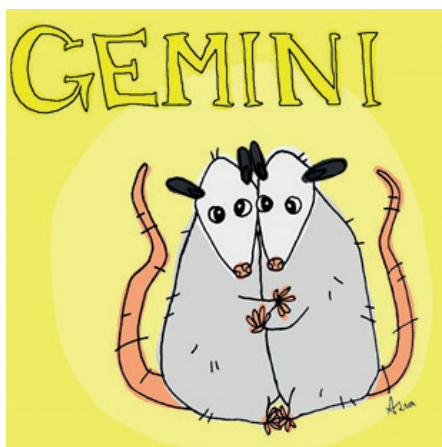
## Regarding the zodiac signs:

Any strategy that aims to protect and / or conserve an individual from wildlife is valid. Moreover, if this strategy has a component of humor or esoteric immersed (as is the case here), it will have even more understanding and acceptance within the collective imaginary. We present this crazy, fun, entertaining and very original environmental education strategy, which we were sent from Argentina and that only seeks a new vision of our marsupial in America and whose author we reference in each of the images.



**Image 141.** Signs of the zodiac (Zary-zodiac). Author: Asia. <https://www.facebook.com/pg/FUNDZAR/posts/> / © Copyright. 2020.

The representations of animals were born from the time of prehistory and can be seen in cave paintings. It was there that humans began to believe in divinities, which were represented by animals. Prehistorians have estimated that 80% of these paintings are animal-shaped and, in fact, their representation refers more to a religious devotion than purely aesthetic issues.



**Image 142.** Signs of the zodiac (Zary-zodiac). Author: Asia. <https://www.facebook.com/pg/FUNDZAR/posts/> / © Copyright. 2020.

Later, the Greeks gave names of animals and heroes of their mythology to the constellations in space, imagining their forms while observing them. And that was how the zodiac had its origin, although it should be noted that this word was originally proposed by the



Babylonians. However, the reason that they are animals is due to the fact that each one has specific qualities and defects that also coincide with the characteristics that distinguish each sign.



**Image 143.** Signs of the zodiac (Zary-zodiac). Author: Asia. <https://www.facebook.com/pg/FUNDZAR/posts/> / © Copyright. 2020.

## Facing the legends

**The legend of the Tlacuache and the fire of the gods :** Fire was not a human invention, as is obvious, but a discovery of the primitive man who explored his surroundings. In all civilizations there is a myth about the origin of fire, which is usually stolen or given to men. The most famous myth is that of Prometheus, however, in Mexico the fire was stolen by a Tlacuache.

These gods disappeared little by little, but the Tlacuache, worshiped as a deity at the height of the jaguar, the rabbit or the eagle, survived.

The Tlacuache was a divine animal for many Mesoamerican cultures. It seems that his fame spread due to the healing properties of his tail, with which he is assured, he stole the fire, privilege of the gods, and put it in his marsupium to deliver it to our ancestors. After the conquest it was also said that the Tlacuache had performed that feat because the son of the virgin Mary, a cold night needed heat. He was then in front of the Old Greedy and asked to warm himself in his campfire; in an oversight he stole the fire to give it to the savior.



In the same sense, a Nahuatl legend says that one day, the fire was released from a star until it fell on the earth, causing a fire. Then the ancient mountain giants guarded the fire and did not let it go extinct. Commissions were appointed that were responsible for cutting trees, plants, animals and everything that was within reach to quench hunger from fire.

Although the myth of the Tlacuache (from the Nahuatl Tlacuatzin) has many versions, in almost all of them the Tlacuache appears as head of the world, the cunning one that faces the power of the jaguars and at the same time is a joker, thief, partisan and drunk.

But this has a historical and morphological explanation, since the Tlacuache is the only marsupial that exists in the Mexican territory, it is one of the few animals that remains unchanged since it appeared on our planet, more or less 60 million years ago. It is an omnivorous animal and among its tastes is the mead of the magueyes, so it can be said that in addition to being a "thief", it is also a "drunk" and when it meets a predator its strategy is to "become the dead".



**The legend of Tlacuache in Mexican culture:** The Legend of Tlacuache has many versions, and with each version various qualities are added.

The Tlacuache has its representation in several archaeological remains throughout the country. In the Zapotec region, representations of the classical period have been found that allow to affirm its divinity. In a workshop located north of the citadel, in Teotihuacán, some molds of small figures of the Tlacuache appeared that were possibly attached to cult figures.



In Tlapacoyan, a clay figure was discovered that represents it, dated to the year 1000 before our era. Some codices such as Dresden and the Vatican relate it to the ball game, decapitation, the moon, the pulque, the New Year ceremonies and the crossroads. Even in various communities, his figure hung in temples and shacks can be found today and his spoils are used as medicines.

Nor is it possible to distance the Tlacuache much from the western version of Prometheus, where a furious titan full of heroism and love for men, gives them the fire after stealing it from Zeus. This is possible to read through Alfredo López Austin, one of the most renowned students of pre-Columbian Mexico, an expert in Mesoamerican worldview and Mexican indigenous peoples who, in his book, *Los Mitos del Tlacuache* is dedicated to exploring all the variants of those mythical stories whose central figure is the Tlacuache.



### Facing the stories:

In a truly large and parallel universe, tales about possums have had boom and acceptance. Mexico, unquestionably has the leadership on publications of this animal. However, in the count cited in this book, we have learned that in other latitudes, the possum has played a leading role, culturally speaking. Some of these works are sent below, seeking to make known that the possum or common chucha, is also a participant in this collective imagination and the culture of the people of Colombia and America.

- ✓ The Toad and the Opossum, published on October 2, 2012. Source: <https://leyendascortas.wordpress.com/2012/10/02/el-sapo-y-la-zarigüeya/>
- ✓ La zarigüeya mágica, Possum Magic. Author: Mem Fox. Source: <http://librosinfantiles.net/a-partir-de-3-anos-edad/item/324-la-zarigüeya-magica>
- ✓ Mother Opossum. Source: <http://bibgloriafuertes.blogspot.com/2011/04/mama-zarigüeya.html>
- ✓ A possum in my backpack. Author: Érica Marcela Zepeda Montañez. Source: <https://www.youtube.com/watch?v=SP5oXQLFqjI>
- ✓ Don't laugh Pepe. Author: Keiko Kasza. Source: <https://www.youtube.com/watch?v=5k1uIdO74QY>
- ✓ The adventures of a possum. Authors: Kathy MacDonald, Kevin Steinberg MacDonald; ilustraciones de Germán Arce Quesada. Source: Las aventuras de una zarigüeya / Kathy MacDonald, Kevin Steinberg MacDonald; ilustraciones de Germán Arce Quesada
- ✓ The secrets of animals, their behavior and life in society, possum or chucha. La Vaca Colorada Publishing house.

To close this chapter, Claudia González accompanies us from Mexico, Puerto Mórelo - Tlacuatitlán, with the following story.

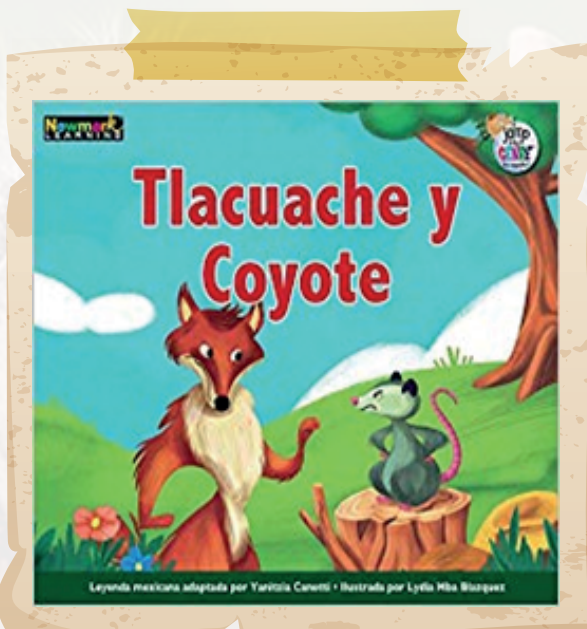
### Coyote and Tlacuache, (In Coyotl huan in Tlacuatl)

This happened one day... Once the Coyote went to the presence of God and asked permission to eat the men; God answered the Coyote: first you have to fast. If you manage to fast, you will be able to eat my children. God called the Tlacuache and said: Coyote is going to fast, don't leave it; do whatever it takes so you don't fast.

The Coyote was around with his fast, when he heard that he was being called: Hey, you, Coyote, come here (he was called by the Tlacuache who was sitting in a maguey) come here and drink some mead. Coyote replies: No, I will not drink. God told me so; he wants me to fast



to allow me to eat his children, men. The Tlacuache again tells him: come and drink; God will not see you, nor will I accuse you. Coyote, since he was already very thirsty, said: Yes, I am going to drink. The Coyote approached and drank some mead; when he was going to put his head in the maguey again to drink, the Tlacuache pushes him and gets stuck in his head in the bowl of the maguey. The Tlacuache runs and runs away. The Coyote had his head stuck in the maguey, was writhing trying to get away, but he was very stuck. When he managed to dodged it, Coyote was very angry, and said: wherever I find it, I eat it.



Coyote is wandering again; There he goes, looking for Tlacuache. When he finds it, he's pushing a rock. Coyote approaches and says: now I am going to eat you Tlacuache, why are you cheating on me? When I was going to drink the mead, you pushed me into the maguey. The Tlacuache answers: I am not that one. The one who stuck you in the maguey, that is the Tlacuache of mead. Look, here I am stopping this boulder so it doesn't fall. I am the Tlacuache of the rock. The Coyote looked up and thought the rock was falling; this is because when the clouds moved, they gave that impression. The Tlacuache yells: Help me, help me, so that the rock does not fall on us. The Coyote believed that the rock would fall on them, and hurries to push the rock strongly. The Tlacuache tells him: he pushes strong, but very strong; Coyote makes his best effort, and even closes his eyes with so much effort. The Tlacuache at this time flees. Coyote keeps pushing, with all his strength, but he starts to get tired, opens his eyes and no longer sees anyone. But since he was very tired, he slowly released the rock and nothing happened. Then, he realizes that it is only the clouds that move, and give the appearance that the rock falls. The Coyote feels cheated again, and gets very angry, and exclaims: now, wherever he finds it; I eat it, yes, I eat it; Well, he already cheated on me so many times.

Again he pursues it everywhere. Find the Tlacuache and claim it. The Tlacuache responds: I am not that, that is the Tlacuache of the rock. Look, here I am the Tlacuache of the sheep; I take care of sheep. Why don't you eat one of my sheep? I would like to eat one, but I can't; I told God that I would fast. The Tlacuache tells him: well, I'm leaving. Here I leave you my



sheep; I give them all to you. If you want one, just catch it. Coyote, as he was already very hungry, said: now I will eat very tasty. He began to chase them, and suddenly, they leave him very angry. They were not sheep, but dogs. Again, the Tlacuache tricked the Coyote. Coyote says to himself: now yes, where I find it, I eat it; Yes, I eat it. I will no longer continue to do this. Coyote keeps walking, there it goes.

Soon he finds the Tlacuache; Tlacuache is on a cactus, eating prickly pears. Coyote tells him: now I am going to eat you; You just fool me. You told me they were sheep, and it turned out they were dogs nothing more. Look Coyotito, the one who cheated you is the Tlacuache of the sheep. Look, I am the Tlacuache of the prickly pears, I have very tasty prickly pears; They are very sweet. Eat one. Well, if you give it to me. The Tlacuache strips a prickly pear and tells the Coyote: close your eyes and open your snout. The Coyote obeys, and it does so: it opens its snout and closes its eyes. The Tlacuache throws the prickly pear in his mouth; Coyote tastes it and exclaims: yes, it is very tasty, very sweet. He eats it willingly. The Tlacuache tells him again: do you want another one? Yes. The Tlacuache strips another prickly pear, and throws it into Coyote; He also eats it with pleasure. Well, it's very tasty, very sweet. The Tlacuache cuts another prickly pear, and says: close your eyes, and open your mouth. The confident Coyote does it, but this time the Tlacuache did not peel the prickly pear, threw it with thorns. Coyote spines its snout; screams a lot of pain: Oh, oh, oh! It hurts me a lot! It scratches, tries to remove the spines. Meanwhile, the Tlacuache flees. When he is replenished, Coyote exclaims: he has already done many things to me, that Tlacuache; Now, wherever I find it, I eat it, I eat it.

The Coyote was already very angry; keep walking in search of Tlacuache. This time it didn't take long to find him. Now, the Tlacuache is sitting; He is knitting a duffel bag. Coyote tells him: now I am going to eat you, because you are just cheating on me. You said you were going to peel a prickly pear, and you threw it at me like that, with thorns. He replies: that is not me. Look, here I am the Tlacuache de los petates; The one who cheated you is the Tlacuache of the prickly pears. Look, here I am, rushing to finish a duffel bag because the rain and hail are coming. Coyote tells him: now I know how. Yes, you are the one who cheated on me. The Tlacuache answers: no, I am not. I already told you that he is another Tlacuache. We are a lot. I am another. Look, forget that. Sit here; I'm going to show you how to make a backpack. When the duffel bag is finished, the Tlacuache tells Coyote: Get in and sit down. Then I tie you up so you don't get wet, and you get numb. The Coyote entered and sat inside the rolled duffel bag. The Tlacuache ties him from the ends and hung him on a tree and said: Listen, a heavy rain with hail is coming. The Tlacuache gathered a pile of stones, and began to stone the Coyote. He was screaming, he hit him a lot. He screamed a lot of pain. The tie broke and the Coyote that was wrapped in the duffel bag fell to the floor; He wallowed in pain. Meanwhile, the Tlacuache has already escaped. Again Coyote says: now, wherever I find it, I eat it; Yes I eat it, yes, yes. Coyote keeps walking in search of Tlacuache. As Coyote was fasting, he felt very weak.



Quick found the Tlacuache. Now the Tlacuache was again taking care of animals; He had a lot of turkey. Coyote tells him: now I am going to eat you; Now, I don't let you escape anymore. The Tlacuache tells him: the one who cheated on you is the Tlacuache of the petates. Look, here I am the Tlacuache de los guajolotes. It looks like you're very hungry. The Coyote replied: Yes, God told me to fast, and if I succeed, he will let me eat the men. The Tlacuache says: Look, I'm leaving; there I leave you all my turkey gifts, and the Tlacuache went fast. Coyote, as he was already very hungry, said: Yes, I will eat well. I will eat them all; How delicious, I will eat. He began to chase them, but he couldn't grab any. Run a lot and run out. Suddenly, they grab him by the legs and start beating him with his wings, for they are not really turkey. What the Tlacuache left were buzzards. The Coyote gets very angry again; Well, the Tlacuache had already fooled him again. He says: yes, where I find it I eat it; Yes, I eat it. Not far away finds it. The Tlacuache is sitting on the floor. Coyote tells him: now I will eat you; You will not escape. The Tlacuache tells him: if you're going to eat me, at least let me say goodbye to the land. Where the Coyote was sitting there was a hole. Now the Tlacuache turns and tells the Coyote: Wait for me a little. He entered his hole. The Coyote waited and waited; but the Tlacuache never left. So Coyote cannot eat men because he did not fulfill his fast; The Tlacuache did not let him do it.

# Chapter 10.

## ABC of first aid

In case of finding an injured or defenseless animal, please try to follow the following recommendations. However, always go to the environmental authority of your municipality or department, Regional Autonomous Corporation (CAR), DAGMA, Ministry of Environment or Environmental Police. For no reason leave it abandoned, or otherwise stay with him as a companion animal, this will be sanctioned by the environmental law of Colombia. Decree Law 1608 of 1978, Law 1774 of 2016, Law 99 of 1993.

### Recommendations and considerations.

In the case of running over or witnessing his run over, finding him in an injured place or witnessing any type of vulnerability situation to a wildlife animal, it is very important to take into account a series of considerations so that our action does not further harm to the animal. Moreover, acting well can be, on many occasions, the difference between saving or not saving the life of the injured animal. We tell you what you should know:

- ✓ **Calm and security:** as in any other type of situation, in case of finding the individual in a state of vulnerability or helplessness, the first thing we must do is keep calm, think cold and organize.
- ✓ **Assess the health of the animal** is the next thing we should do, try to approach the animal to check its state of health, if it breathes, if there is any bleeding, if it can move, however, it is warned, "Always very carefully, because he will surely be in shock and frightened, so his reaction may be to defend himself."
- ✓ **Immediately** be aware of a wildlife animal in a state of emergency, environmental authorities should be notified so that their veterinary doctors go to the place to rescue it (in this chapter we offer the information with the link to access the page website of the environmental authority where you are, city or municipality). The animal must always be attended by a veterinarian, however, while medical assistance and environmental authority arrives, it is possible to safeguard the animal's life.
- ✓ **First of all**, before carrying out a rescue, the site must be evaluated, the critical risk points must be analyzed, both for the animal and for the rescuer. It is necessary to



determine the safety before a rescue, although time is short and you cannot wait for a wildlife specialist, it is essential to take care of the integrity of both (animal, human being).

- ✓ **An injured, scared,** sore or vulnerable animal will have a tendency to bite to defend itself. That is why it is necessary to have rescue equipment such as carnaza gloves, thick blankets, with this we avoid bites and keep the animal and our own integrity safe.
- ✓ **After removing** it from the place of risk and putting it in a safe space, the body should be observed, looking for cuts, wounds, obvious bleeding, if the limbs are in their normal positions. If there are fractures or badly positioned legs, for no reason should you try to manipulate and place the parts in the original position. Remember that you will promote a good state of the individual while professional help arrives.
- ✓ **To transport it,** be sure to put it in a box or guacal, it is the ideal way so that the animal does not suffer more sudden movements that can cause more wounds or pain or worse, aggravate its situation.
- ✓ **Ideally,** take it to a veterinary center for medical evaluation and stabilization, while the environmental authority picks it up. In case of not finding one, and it is necessary to take it with you to a house, while the environmental authority arrives, try to drive slowly and calmly to avoid sudden braking that can cause pain to the animal, in addition, avoid loud music on the radio so you do not cause you more stress.
- ✓ **While the help of the environmental authority** arrives you can shelter the animal in a warm environment, with blankets and bottles of warm water to maintain its body temperature. If the animal is conscious and awake, supply water and fruit at will, do not handle it to force it to eat, it can generate more pain and cause serious injuries.
- ✓ **Finally,** in the case of opossums hit by tracks or attacked by canines or felines, evaluate very well if the individual is female or male. In the case that it is female, it is suggested to evaluate the perimeter where the individual was found so that the puppies that are with the mother are rescued and are not abandoned. It is very common to find them in a perimeter not far away. Evaluate the bag or marsupium in order to rule out whether or not there are puppies in the bag and thus ensure their survival.

Always go to the environmental authority, they are trained and have the professional staff to deal with emergencies with wildlife. For no reason to stay with the individual as a companion animal, it is prohibited and will be sanctioned by law.

Welcome the help you can give this individual. Keep in mind that hydration and temperature are the first factors that you should evaluate when finding opossum offspring or even an adult. Depending on how they are in regard to these aspects, first aid should be given to rehydrate, maintain blood flow, avoid hypothermia and improve the mood of individuals.

Count on this as very important information. Opossums are not pets; they are marsupial mammals cataloged by Colombian legislation as wildlife (Decree Law 1608 of 1978, Law 99 of 1993). Its place is in the ecosystems where it is naturally found.



**Image 144.** Attention to an individual of the wild opossum or common chucha *Didelphis marsupialis*, attacked by canine. First aid before being handed over to the environmental authority Metropolitan Area of the Aburrá Valley. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.



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As an appendix to this chapter, the contacts of the environmental authorities present throughout the national territory of Colombia will be provided, this in order that the illegal possession of wildlife, commercialization, and hunting or any individual who is injured or in a state of defenselessness. They will come immediately to pay attention in the place of their jurisdiction.

## Directory of environmental authorities in Colombia.

The Ministry of Environment, and Sustainable Development, MADS, was created by Law 99 of December 22, 1993, as the governing body for the management of the environment and renewable natural resources, responsible for promoting a relationship of respect and harmony of the man with the nature, use and exploitation of renewable natural resources and the environment of the Nation in order to ensure sustainable development.

*The Ministry of Environment, and Sustainable Development, MADS*

37 Street 8-40, Bogotá, Colombia

PBX: +57 1 3323434

Government on line: +57 1 5953525 – National free line: 018000952525

Web page <http://www.minambiente.gov.co/>

## Urban Environmental Units

Through the Urban Environmental Units, municipalities, districts or metropolitan areas, whose urban population is equal to or greater than one million inhabitants (large urban centers), exercise the same functions attributed to the Regional Autonomous Corporations within the urban perimeter. In addition to the environmental licenses, concessions, permits and authorizations that correspond to them for the exercise of activities or the execution of works within the territory of their jurisdiction, the municipal, district or metropolitan authorities have the responsibility to carry out the control of spills and emissions pollutants, disposal of solid wastes and toxic and hazardous waste, dictate measures to correct or mitigate environmental damage and carry out sanitation and decontamination projects.

*SDA – District Secretary of Environment – Bogotá*

14th Career 54-38, Bogotá D.C., Colombia

PBX: +57 1 3778899

Web page: <http://www.secretariadeambiente.gov.co/>

*AMVA – Aburrá Valley Metropolitan Area – Medellín*

41 Street 53-07, Medellín, Antioquia – Colombia

PBX: +57 4 3856000 ext. 127

Web page: <http://www.metropol.gov.co/>

*DAGMA – Administrative Department of Environmental Management – Cali*

5AN Avenue 20N-08, Cali, Valle – Colombia

PBX: +57 2 6680580

Web page: <http://www.cali.gov.co/dagma/>

*DAMAB – Technical-Administrative Department of the Environment of Barranquilla*

58th Career No. 68 – 140, Barranquilla, Atlántico – Colombia

PBX: +57 5 3680244

Web page: <http://www.damab.gov.co/>

*DADMA – Santa Marta District Administrative Department of the Environment*

17 Street No. 3-120, Santa Marta, Magdalena – Colombia

PBX: +57 5 4321000

Web page: <http://www.dadma.gov.co/>

*EPA – Public Environmental Establishment – Cartagena*

Manga Real Street 19-26

PBX: +57 5 6644119

Web page: <http://www.epacartagena.gov.co/>

## **Regional Autonomous Corporations**

Regional autonomous corporations are public entities, created by law, integrated by territorial entities that, by their characteristics, constitute the same ecosystem geographically or form a geopolitical, biogeographic or hydrogeographic unit, endowed with administrative and financial autonomy, heritage own and legal status, entrusted by the law to administer, within the area of its jurisdiction, the environment and renewable natural resources and tend for its sustainable development, in accordance with the legal provisions and policies of MADS.

*Alto Magdalena Regional Autonomous Corporation – CAM*

1st Career 60-79, Neiva, Huila – Colombia

PBX: +57 8 8765017

Web page: <http://www.cam.gov.co/>



*Regional Autonomous Corporation of Cundinamarca – CAR*  
7th Career 36-45, Bogotá D.C., Colombia  
PBX +57 1 3209000  
Web page: <http://www.car.gov.co/>

*Risaralda Regional Autonomous Corporation – CARDER*  
46 Street with Las Américas Avenue, Pereira, Risaralda – Colombia  
PBX r: +57 6 3141455  
Web page: <http://www.carder.gov.co/>

*Regional Autonomous Corporation of Canal Del Dique – CARDIQUE*  
Transversal 52 17-150, Cartagena, Bolívar – Colombia  
PBX: +57 5 6694666  
Web page: <http://www.cardique.gov.co/>

*Sucre Regional Autonomous Corporation – CARSUCRE*  
25th Career 25-101, Avenida Ocala, Sincelejo, Sucre – Colombia  
PBX: +57 5 2749995  
Web page: <http://www.carsucre.gov.co/>

*Santander Regional Autonomous Corporation – CAS*  
10th Career 13-78, San Gil, Santander, Colombia  
PBX: +57 7 7238925  
Web page: <http://www.cas.gov.co/>

*Regional Autonomous Corporation for the Defense of the Bucaramanga Plateau –CDMB*  
23rd Career 37-63, Bucaramanga, Santander – Colombia  
PBX: +57 7 634.6100  
Web page: <http://www.cdm.gov.co/>

*Regional Autonomous Corporation of the Center of Antioquia – CORANTIOQUIA*  
65th Career 44A-32, Medellín, Antioquia – Colombia  
PBX +57 4 4938888  
Web page: <http://www.corantioquia.gov.co/>

*Regional Autonomous Corporation of the Negro and Nare River Basins – CORNARE*  
34 kilometer, Medellín – Bogotá freeway, El Santuario, Antioquia – Colombia  
PBX: +57 4 5461616  
Web page: <http://www.cornare.gov.co/>

*Autonomous Regional Corporation of Magdalena – CORPAMAG*  
Libertador Avenue 32-201, Santa Marta, Magdalena – Colombia  
PBX: +57 5 4211395  
Web page: <http://www.corpamag.gov.co/>

*Regional Autonomous Corporation of Boyacá – CORPOBOYACA*  
Old way to Paipa 53-70, Tunja, Boyacá – Colombia  
PBX: +57 8 7432073  
Web page: <http://www.corpoboyaca.gov.co/>

*Regional Autonomous Corporation of Caldas – CORPOCALDAS*  
21 Street 23-22, Manizales, Caldas – Colombia  
PBX: +57 6 8830038  
Web page: <http://www.corpocaldas.gov.co/>

*Cesar Regional Autonomous Corporation – CORPOCESAR*  
9th Career 9-88, Valledupar, Cesar – Colombia  
PBX: +57 5 5748960  
Web page: <http://www.corpocesar.gov.co/>

*Chivor Regional Autonomous Corporation – CORPOCHIVOR*  
5th Career No. 9 -125, Garagoa, Boyacá – Colombia  
PBX: +57 8 7500661  
Web page: <http://www.corpochivor.gov.co/>

*La Guajira Regional Autonomous Corporation – CORPOGUAJIRA*  
7th Career 12-25, Riohacha, La Guajira – Colombia  
PBX: +57 5 7272581  
Web page: <http://www.corpoguajira.gov.co/>

*Guavio Regional Autonomous Corporation – CORPOGUAVIO*  
7th Career 1A-52, Gachalá, Cundinamarca – Colombia  
PBX: +57 1 8538511  
Web page: <http://www.corpoguavio.gov.co/>

*Regional Autonomous Corporation of Nariño – CORPONARIÑO*  
25 Street 7 East 84, Farm Lope - La Carolina Way, Pasto, Nariño – Colombia  
PBX: +57 2 7309282  
Web page: <http://www.corponarino.gov.co/>



*Regional Autonomous Corporation of the Northeast Border – CORPONOR*

13 Street 3E-278, Cúcuta, Norte de Santander – Colombia

PBX: +57 7 5828484

Web page: <http://www.corponor.gov.co/>

*Regional Autonomous Corporation of the Orinoquia – CORPORINOQUIA*

23rd Career 18-31, Yopal, Casanare – Colombia

PBX: +57 8 6358588

Web page: <http://www.corporinoquia.gov.co/>

*Tolima Regional Autonomous Corporation – CORTOLIMA*

Ferrocarril Avenue, 44 Street Corner, Ibagué, Tolima – Colombia

PBX: +57 8 2654555

Web page: <http://www.cortolima.gov.co/>

*Atlántico Regional Autonomous Corporation – CRA*

66 Street 54-43, Barranquilla, Atlántico – Colombia

PBX: +57 5 3492454

Web page: <http://www.crautonomia.gov.co/>

*Regional Autonomous Corporation of Cauca – CRC*

7th Career 1N-28, Popayán, Cauca – Colombia

PBX: +57 2 8203232

Web page: <http://www.crc.gov.co/>

*Quindío Regional Autonomous Corporation – CRQ*

19 Street North 19-55, Armenia, Quindío – Colombia

PBX: +57 6 7460600

Web page: <http://www.crq.gov.co/>

*Regional Autonomous Corporation of the South of Bolívar – CSB*

16th Career 10-27, Avenida Colombia, Magangué, Bolívar – Colombia

PBX: +57 5 687 8800

Web page: <http://www.csbcor.gov.co/>

*Valle del Cauca Regional Autonomous Corporation – CVC*

56th Career 11-36, Cali, Valle – Colombia

PBX: +57 2 3310100

Web page: <http://www.cvc.gov.co/>

*Autonomous Regional Corporation of the Sinú and San Jorge Valleys – CVS*  
29 Street 2-43, Montería, Córdoba – Colombia  
PBX: +57 4 7829951  
Web page: <http://www.cvs.gov.co/>

## **Regional Autonomous Corporations for Sustainable Development**

In addition to the functions of the regional autonomous corporations (CAR), they have as their main task promoting knowledge of renewable natural resources and the environment of the region; carry out activities to promote scientific research and technology transfer; direct the regional land use planning process to mitigate or deactivate inappropriate exploitation pressures of the territory; promote the integration of the traditional communities that inhabit the region and their ancestral methods of taking advantage of nature to the process of conservation, protection and sustainable use of resources, and to promote, with the cooperation of national and international entities, the generation of appropriate technologies for the use and conservation of the resources of the region.

*Corporation for Sustainable Development of the North and the Amazon East – CDA*  
26 Street 11-131, Puerto Inírida, Guainía – Colombia  
PBX: +57 8 5656351  
Web page: <http://www.cda.gov.co/>

*Regional Autonomous Corporation for the Sustainable Development of Chocó – CODECHOCO*  
1st Career 22-96, Quibdó, Chocó – Colombia  
PBX: +57 4 6711602  
Web page: <http://www.codechoco.gov.co/>

*Corporation for the Sustainable Development of the Archipelago of San Andrés, Providencia and Santa Catalina – CORALINA*  
San Luis Bighth Career Km 26, San Andrés, San Andrés y Providencia – Colombia  
PBX: +57 8 5120080  
Web page: <http://www.coralina.gov.co/>

*Corporation for the Sustainable Development of the Special Management Area of La Macarena – CORMACARENA*  
35th Career 25-57, Villavicencio, Meta – Colombia  
PBX: +57 8 6730420  
Web page: <http://www.cormacarena.gov.co/>



*Corporation for the Sustainable Development of the Southern Amazon – CORPOAMAZONIA*

17th Career 14-85, Mocoa, Putumayo – Colombia

PBX: +57 8 4296641

Web page: <http://www.corpoamazonia.gov.co/>

*Corporation for the Sustainable Development of La Mojana and El San Jorge – CORPOMOJANA*

21st Career 21A-44, San Marcos, Sucre – Colombia

PBX: +57 5 2954869

Web page: <http://www.corpomojana.gov.co/>

*Corporation for the Sustainable Development of Urabá – CORPOURABA*

92 Street 98-39, Apartadó, Antioquia – Colombia

PBX: +57 4 8280977

Web page: <http://www.corpouraba.gov.co/>

*Regional Autonomous Corporation of the Rio Grande de la Magdalena – CORMAGDALENA*

Carrera 1 52-10 Sector Muelle, Barrancabermeja, Santander – Colombia

PBX: +57 7 6214442

Web page: <http://www.cormagdalena.com.co/>

## Chapter 11.

# Chuchas for Colombia and the world

**D**uring all these years, the possum or common chucha has grown from the hand of all its followers in the world, it has been a newspaper to trash in social networks carrying information, showing actions, doing activism, exchanging information and denouncing throughout the world. all of Colombia and America mistreatment towards this individual of the wildlife of our continent. Currently, the possum or common chucha has an approximate number of one million (1,000,000) followers in its own networks and friendly networks. It is important to highlight each of the people who help us in Colombia, to make bailouts, complaints, and to work hand in hand with the environmental authorities and CAR. This chapter is aimed at making known this large group of people who help us in this work, and incidentally to make this marsupial more visible not only in Colombia but also in America.

Davis Travis director and creator of the Casita del Bosque, Pipe Drummer, Melissa Delgado, Lisińska (falta apellido), veterinary doctor, Dosman Patricia Radio Animal Connection, all of them in the city of Cali. Arelis San y Luisa Ortiz in the city of Popayán. Claudia Brieva, Carolina Sastre Corredor, Pantera Mambo, veterinary doctors, Juanita Estrada, Marcos Otto Parra Klusman, Λύλη 'Αγγελος,, all of the city of Bogotá D.C., to the journalist Gustavo Chiki Ospina, to the undergraduate student of veterinary medicine at the University of Antioquia Виктор Фотографий, Janeth Bedoya, to the engineer Valeria Amaya Gallo, Etilvia Vallejo Santana veterinary doctor, Paula Andrea Zapata Vélez, Adriana Builes, Luz Stella Uribe, Lina Marcela Yepes Cano, Lina Mor, Lina Macias, Shalom Castaño, Diego M Pistols, Diana Amazon, to the journalist Mónica Álvarez, Dani Vanegas, Patricia Aguirre, to the journalist Mauricio Galeano Quiroz, Astrid Arboleda, to the lawyer María Cecilia Restrepo Yepes, to the SENA teacher Gustavo Builes, Caryto Reynales, Carolina Jimenez, María Patricia Álvarez Escobar, Felipe Molina Metaute, Lulú Mejía veterinary doctors, Silvia Ospina, Gustavo Adolfo Ardila Gil, Tomoe Yukishiro, Paola Andrea Hurtado Henao, Julia Lema, Caro Caro, John Mejía, to the journalist Alex Bermudez, to the Anorí Antioquia Environmental Bureau group, Yaned Gómez García, José Luis Castaño, to the artista Camilo Valencia, Alexandra Florez, all of them in the city of Medellín, Andrés Arenas in the city of Pereira. On the other hand, we cite the different groups around the world, of which the possum's social networks are part and have allowed us to reach more people and followers. Areametropol, Cornare, Gambás brasileiros Opossums & Zarigüeyas, Antioquia's Society of Ornithology, (SAO), SCIENCE, COLOMBIAN



MASTOZOOLOGIST-, Mastozoology Group, National University, Colombia, ANTIOQUIA's UNIVERSITY UdeA Assembly, UdeA General Students Assembly, SEIVA UdeA, Wildlife Library, Rescuing Zarigueyas, Zarigüeya Zarigüeyas Medellín, Opossum Care and Rescue (OCAR), Cortolima Cortolima. Next, we publish in this chapter the articles sent by our contacts in the United States, Brazil, Mexico, Ecuador and Argentina, all of them with whom we have shared experiences, information and research around the opossum in America.

## DEYBI BELTRÁN CERÓN

Davis Travis as they know me. I am from the city of Cali, capital of the Valle del Cauca in western Colombia. All my life I have lived in the countryside, as a child I dedicated myself more to rescue animals than to play in the mud or with my friends. While watching everyone have fun and the animals died for human ignorance, I decided to start fighting for these beings. I graduated as a photographer from the Popular Institute of Culture of the city of Cali - Colombia, I am also a musician, and I start working in a zoo without knowing much, just wanting to learn everything.



Five possums were enough to completely change a life. I had already tried to save many, but they all died and when they arrived, after losing a cat shelter, I began to dedicate all my time to preserving the lives of these animals that, under the name of 'chuchas', are persecuted, even butchered. This is how **Davis Travis** became the "possum man" and dedicated his life to the protection of forgotten animals. (He recounts amid laughter).

I have learned a lot, among other things, from the diets that each animal should have, thanks to the fact that I lived my whole life in the countryside. It was also at that time that I found support from an American foundation, which when I saw my work immediately shared information and sent me milk and other supplies to give a healthy life to the possums. I have a shelter in Cali, where I have different animals such as dogs, cats, chickens, a Vietnamese pig and a crazy goat, which I decided to adopt because they were not loved by their previous owners. As an anecdote, I saved a *Coragyps atratus* hen from death in a market place in my city, this pigeon was going to be sold for witchcraft and witchcraft rites. We rescue him with a friendly veterinary doctor, his name is Abelardo and today he flies free through the skies of my city and occasionally comes to my house to visit me. Finally, today I lead a plan called "Dad and moms kangaroo", people who I train and deliver all the tools to be part of this mission to assist the multiple cases of orphaned possums that report to our lifeline.

### "LA CASITA DEL BOSQUE, HOME AND REFUGE OF THE OPOSSUMS"



#### DEYBI BELTRÁN CERÓN

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<https://www.facebook.com/davis.bc.9>

Cali Valle de Cauca - Colombia



## GRACIELA PAOLONI

Initial level teacher. I live in Argentina, a small town in the center of the country called Cruz Alta, in the province of Córdoba.

This is an agricultural area, where native areas were almost completely destroyed. Everything is wired for cattle and planted with corn, soy and wheat. There are almost no trees in this infinite plain.

My town is my place in the world, along with many wonderful beings such as opossums or weasels as we say in Argentina.



I consider myself a rescuer from the heart. I already lost count of the number of battles won by LIFE. Birds, reptiles, dogs and cats. Everyone who knows me knows it. 3 years ago I had my first experience with a beautiful possum boy. About 2 months old. Then came the second and then the 3 babies. I had to research and learn a lot about them. The best diet, the healthiest, what they really needed to grow healthy and strong.

Unfortunately in my country not much is done for them. There are no entities that defend them. They are killed, run over and mistreated! They have the stigma of being!

*"The terror of the chicken coop"*

And although, almost no one has them, due to ignorance, ignorance of their importance in the food chain, they are recognized as disgusting and despicable beings and therefore killed.

My mission is to provide my grain of sand for its PROTECTION. From my page to raise awareness so that your life is VALUED as these beings deserve SO BEAUTIFUL.

<https://www.facebook.com/Julito-y-su-Legado-1087689281357325/?ref=bookmarks>

Thank you so much.



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## **RICHARD TEMPLE-BURR y MIRIAM OLIVERA-BURR**

Possum Posse, Miami Florida, USA, +13057984663

### **Versión en español:**

Possum Posse ha estado trabajando con la vida silvestre desde el año 2008 con el descubrimiento de 5 bebés opossum (los llamamos Yard Angels) en una calle de los Estados Unidos de América. Trabajamos muy duro para salvar las vidas de los bebés a nuestro cuidado. Cuatro de los cinco joey sobrevivieron y tres fueron liberados. Uno se quedó con nosotros durante su vida y comenzó nuestro viaje con y por la vida silvestre.

Desde entonces, Miriam y Richard han rescatado y liberado muchas especies de vida silvestre que han llamado nuestra atención, entre ellas: zarigüeyas, mapaches, armadillos, ardillas, murciélagos, reptiles, tortugas y muchas aves.

También, nos hemos ofrecido como voluntarios para ayudar a otros, incluyendo leones, tigres, pumas, monos y animales de granja en los santuarios del sur de la Florida. Hemos dado muchos espectáculos de vida silvestre en hospitales, escuelas, hogares de ancianos y hogares privados para que la educación del público beneficie a la vida silvestre.

Si bien liberamos cualquier vida salvaje rescatada, hay muchos que no pueden volver a la naturaleza. Cuidamos aquellos que no pueden volver a la naturaleza y los tratamos como a nuestra propia familia. Mimi #NoFeet, Sparkle, Shemp, Yogi, Chumley, Coco, Spanky y Bubbles son nuestros animales de compañía permanente permitidas o con licencia por el gobierno americano. Possum Posse no aboga por la vida salvaje de animales salvajes como mascotas, sin embargo, sí disfrutamos de tener animales no liberables como mascotas de la casa por la duración de sus vidas muy cortas. Las zarigüeyas (opossum) son un eslabón importante en la cadena ecológica. Por favor trate la vida silvestre nativa con respeto. Si encuentras bebés llama a un rehabilitador de vida silvestre. Las donaciones para Possum Posse son muy apreciadas, encuéntrenos en: <https://www.paypal.me/possumposse>.

### **English version:**

Possum Posse has been working with the wildlife since 2008 with the discovery of 5 baby opossum (we call them Yard Angels) in the street. We worked very hard to save the lives of





the babies in our care. Four of the joeys survived and three were released. One stayed with us for her lifetime and began our journey with the wildlife.

Since that time Miriam and Richard have rescued and released many species of wildlife that has come to our attention including: opossums, raccoons, armadillos, squirrels, bats, reptiles, turtles and many birds. We have also volunteered to help others including lions, tigers, cougars, monkeys and farm animals in the sanctuaries of South Florida. We have given many wildlife shows in hospitals, schools, nursing homes and private homes for the education of the public to benefit the wildlife.

While we release any healthy rescued wildlife there are many that can not return to the wild. We keep those that can not go back to nature and treat them as our own family. Mimi #NoFeet, Sparkle, Shemp, Yogi, Chumley, Coco, Spanky and Bubbles are our permitted or licensed pets.

Possum Posse doesn't advocate healthy wild born wildlife as pets but we do enjoy having the non-releasable as house pets for duration of their very short lives. Opossums are an important link in the eco-chain. Please treat native wildlife with respect. If you find babies call a wildlife rehabber. Donations for Possum Posse are greatly appreciated <https://www.paypal.me/possumposse>.



**RICHARD TEMPLE-BURR, MIRIAM OLIVERA-BURR**

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## LUIS EUGENIO RIVERA-CERVANTES

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TEN YEARS RESCUING ZARIGÜEYAS OR Tlacuaches (MAMMALIA: DIDELPHIMORPHIA), IN THE COSTA SUR REGION OF JALISCO, MEXICO.

In most of Mexico, opossums are commonly known as “tlacuaches,” while in the states of the Yucatan Peninsula and Chiapas they are called “foxes” or “foxes,” possibly because of their (cunning) behavior. impersonate “the dead” or some characteristics of his snout. Despite being the only marsupial in the country (and America), most of the population does not know it. This marsupial is widely distributed throughout Mexico, with six species registered to date. We have from the smallest, the mouse tlacuache (*Marmosa mexicana*), the aquatic tlacuachillo (*Chironectes minimus*), the common tlacuache (*Didelphis marsupialis*), the northern tlacuache (*Didelphys virginiana*), the golden tlacuache (*Caluromys derbianus*), and the tlacuache from four eyes (*Philander opossum*) (Campos, 2019). Today two of the six existing species are protected under NOM-059-SEMARNAT-2010, as endangered species, although this does not mean that it is in danger of extinction.

The word tlacuache comes from the Nahuatl tlacuatzin, which means “the little one who eats fire.” The old Mesoamerican legend tells that it was the Tlacuache that brought fire to man, when he was exclusive to the gods. To do this, he stole a fathom from the bonfire, hid it inside the marsupium and handed it to the man. But during his feat the tail was burned and therefore has no hair in it. Hence, it is considered as the Mexican Prometheus (Notimex, 2018). On the other hand, tlacuaches have been used since pre-Hispanic times, not only for their skin, but also for their meat and fat, which is used in traditional medicine to control or combat different diseases such as arthritis, serious stomach infections and to purify blood, notwithstanding the foregoing, is prohibited from marketing them (Campos, 2019).

The main problems faced today by the Tlacuaches, like many species of wild animals in the world, are their clash with the growth of urban stains, the extension of the domain of man





over natural areas, the indiscriminate use of pesticides and the that he is still considered a rat and therefore dangerous. The South Coast region of Jalisco, is located southwest of the state of Jalisco and is part of western Mexico, an area with a rich biological diversity due to its topographic, geological, and environmental characteristics. In this important region, where natural environments are very large and the human population is not as large as in other regions of the country, the presence of tlacuaches is very common. However, they are not exempt from suffering some type of direct or indirect damage due to man, and if this happens, there is no institution or government agency that comes to their rescue. That is why in 2009 we began with the rescue, relief, upbringing, liberation and, in some cases, the adoption of tlacuaches, which due to their physical situation cannot be released in nature. The main hazards detected that affect the populations of tlacuaches in this region of western Mexico are:

- ✓ Misinformation among the population when considered among other things: giant rats, rabies carriers, poultry farm poultry or poultry, etc., which causes them to be killed or poisoned.
- ✓ Run over the roads or streets of the towns in the region.
- ✓ Dog attacks in urban or suburban centers.
- ✓ Pesticide use poisoning in agricultural fields.

Our strategy to reverse these dangers against tlacuaches has had different fronts; on the one hand the scientific diffusion on the importance of the tlacuaches to the population, through radio interviews, written press, social networks (Facebook: Wildlife Rescue of the South Coast of Jalisco, in the CU South Coast), and Our Itinerant Biological Collection (we usually have orphaned foster tlacuaches), which visits schools and main squares in the region. We also go to houses, schools, companies, etc., where we are informed about the presence of tlacuaches that are causing a problem and the same population asks that they be relocated so that they are not killed. To do this, trap traps are placed that do not harm the animal and then relocated to a natural site, away from urban centers.

In the facilities of the University Center of the South Coast, we receive or go to where there are beaten, wounded, shot, poisoned tlacuaches, etc., to provide first aid. In case of their full recovery they are subsequently released in nature. If they are left with any physical limitation that does not make their survival in nature viable, they are adopted and if they are very badly injured, they are slaughtered as humanely as possible (to avoid further suffering).

Between the months of April to June, we have a high rate of orphan tlacuaches or lost pups that cannot yet fend for themselves in nature. In this case we proceed to raise them until they reach the minimum age necessary to be released in the bush, always away from the population centers.

Unfortunately, in the last four years we have seen more cases of young tlacuaches with malformations in their hind limbs, which makes us pose a serious problem due to the indiscriminate use in this agricultural region of more than 25 highly toxic pesticides, many of them banned in Europe or North America and that they are still used here without any control, so we will soon begin an investigation to corroborate our hypothesis that tlacuaches bring pesticides into their blood and that these are the cause of these malformations.

To date, we have helped more than 30 injured Tlacuaches, have relocated to more than 50 outside urban centers, and have raised more than a hundred offspring. This work has been possible thanks to the support of my co-workers: Dr. Irma Ruán Tejeda and her daughter Nohemi Arana Ruán and the M.C. Edith García Real, Mrs. Frida Ximena Michel Uribe, as well as my students of the Natural and Agricultural Resources Engineering degree taught at the University Center of the South Coast.

There is currently greater awareness among the population. However, the road is still very long, there is still a lot to do and raise awareness, and more institutional support is required to have better infrastructure, equipment, materials, vehicles, etc. To date, there is no financial resource available for the development of this activity, which still takes ten years.

Our commitment and our struggle is for the permanence, tolerance and respect for these beautiful, incredible and important animals, which despite being on our planet for more than 60 million years, are still misunderstood, despised, isolated and often killed.



**LUIS EUGENIO RIVERA CERVANTES M.C.**

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## CLAUDIA GONZÁLEZ

lives in Puerto Morelos Quintana Roo, Mexico.

Since 2011 I started working on the protection of opossums, this because the species is surrounded by myths that demonize it, such as the belief that they are from the underworld, mutant animals and that they are a carrier plague of many diseases as the case of rabies, which in 40 years, perhaps a little less, has not registered a case in humans in this country, at least recognized by the Ministry of Health.



When we realized the damage caused to the species and the lack of information, education and culture, we took on the task of helping. At first he was rescuing some specimens that crossed the road, either run over or tortured by people. As time went by we changed the way we work. Talking with my team we concluded that the best way to help was to work at the root of the problem, through education and awareness, inviting people to empathize with the fauna of our environment.

It was then, when we designed a strategy to knock on doors in public and private schools and talk to children, youth and adults about the importance of preservation, not only of this species, but of Mexican wildlife in general, the importance to take care of our environment and sensitize children through music and games. Likewise, we work giving medical attention to the animals that arrive every day, focusing on the rescue, rehabilitation and reintegration of wildlife.

A year ago we opened a very small space in the jungle of Puerto Morelos, which we call Tlacuatitlán (place of tlacuaches) this name arises maintaining its pre-Hispanic origin since it is Nahuatl language, Tlacuatzin. Since then we have focused more on lesser wildlife since for years we work with pets (dogs and cats), which now have many people working on it. The Tlacuache cause, as we call it in Mexico, has grown a lot throughout these eight years, we have had support from the media as social networks and more and more people are inviting us to their companies and schools to collaborate with the draft. The road has not been easy. We had to knock on many doors, go through many sad situations with the mistreatment of this species, but it has also been full of wonderful people who have extended their hands to move forward with this project, hence the Mote de Mamá Tlacuache.

The same happens in all of Mexico. The lack of information and empathy generates unnecessary deaths. Following the work we show in social networks, more people from the interior of the Mexican Republic are joining and learning, since we are seeing that they have become too sensitized and now the problem is that they want to own a copy at home, which is contraindicated. Now we emphasize that they are not pets. If you love them, leave them free and you will preserve the species.

Thanks from Mexico, Thanks from Tlacuatitlán.



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## ILUSKA SILVA MAGALHÃES

**I studied** Veterinary Medicine at the UFF, in 2014 I created the first Facebook group in Brazil - Rio de Janeiro Brazilian prawns, *Opossums & Opossums*, about possums (Prawns in Portuguese). I also manage a large group in the United States of care and rescue, study and research of possums (*Opossum* in English) many years ago.



Since the creation of the group I have been in contact with people from different countries, always in order to help in the proper management of opossums. I coordinate rescues and perform the rehabilitation and release of individuals, always emphasizing the importance of correctly applying parental care to orphaned babies, since it is of utmost importance for them to survive.

*Gambás brasileiros, Opossums & Zarigüeyas*  
<https://www.facebook.com/groups/1559837174299862/>

I have traveled many miles through my country Brazil to rescue possums that need help. I give educational conferences in schools and universities here in Rio de Janeiro. I rarely advise them to be sent to municipal, state and / or federal agencies called "competent" because, unfortunately, in my country the laws regarding possums are very outdated and poorly articulated with the institutions that have permission to work with them. So I advise the people who rescue them, who take care of them until they are rehabilitated and released, I guide them step by step, with rehabilitation and release techniques, all these techniques are in the archives of my group.

**Version en portugués:** " Em 2014 foi criado por mim o primeiro grupo do Facebook do Brasil sobre gambás, também administro um grande grupo americano sobre cuidados e resgates, estudo e pesquisa os gambás faz muitos anos, a partir da criação do grupo tenho estado em contato com pessoas de diversos países, sempre com o intuito de ajudar no correto manejo com os gambás.

*Opossum care and rescue (ocar)*  
[https://www.facebook.com/search/top/?q=opossum%20care%20and%20rescue%20\(ocar\)&epa=SEARCH\\_BOX](https://www.facebook.com/search/top/?q=opossum%20care%20and%20rescue%20(ocar)&epa=SEARCH_BOX)

Coordeno resgates e faço a reabilitação e soltura da espécie, ressaltando a importância de aplicar corretamente os cuidados parentais com os bebês órfãos, porque é de suma importância para que sobrevivam. Já percorri quilômetros Brasil afora para resgatar gambás necessitados de ajuda.

Faço palestras educativas em escolas e universidades aqui no Rio de Janeiro. Raramente no meu grupo oriento para que sejam encaminhados para órgãos municipais, estaduais e/ou federais ditos “competentes” porque infelizmente a máquina pública que rege essas leis em relação aos gambás está muito defasada e mal articulada, com as instituições que recebem autorização para funcionarem, sendo essas instituições fechadas a cada vez que se denuncia os maus tratos e incompetência, os gambás ficam assim sem lugares confiáveis para serem entregues, por isso oriento para que quem resgatou que cuide deles até que sejam reabilitados e soltos, oriento passo à passo as técnicas de reabilitação e soltura, todas estas técnicas estão nos arquivos do meu grupo.”

Citas favoritas “todos sabemos que cada dia que nasce é o primeiro para uns, e será o último para outros, e que, para a maioria, será apenas mais um dia.” (José Saramago).



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Brasil





## CRISTIAN GUZMÁN TORRES

I was born in the megadiverse Ecuador, I have two amazing and beautiful children. Nature and its biodiversity are my passion and therefore its conservation, something like a life mission, which I have deeply rooted in me.

I live in the rural parish of Puéllaro in the Metropolitan District of Quito, Ecuador, now I work in hardware stores, but for an exercise in reflection I believe that I am dedicated to the conservation of the environment and its biodiversity.



Five years ago I created a group on Facebook that began by calling itself “Puéllaro Biodiverso”. However, shortly afterwards it was necessary to change it to “Puéllaro, Perucho, Chavezpamba, Atahualpa and San José de Minas Biodiversos” in reference to the five parishes to which the group’s information is mainly directed. Almost on par with the creation of this group and through the same social network I met Francisco Javier Flórez Oliveros, and the group “Chuchas possums and marsupials” and I began to follow, admire, applaud and thank their work.

From Puéllaro and everywhere I find myself trying to make people aware of the importance of caring for the environment and biodiversity. I have had to rescue, confiscate (and deliver them to the respective authority), give first aid and care to different animals (not counting the domestic ones), mostly birds such as hummingbirds, thongs, mockingbirds, parakeets, an owl, a carpenter, a turtle, a lora, a pair of snakes and fortunately only one possum, which was relocated to a nearby protected area, to protect it from humans and their pets.

Thanks to that passion, which is part of me, I have been collaborating with PUCE biologists a couple of years ago, with information and field work for the description of a possible species of Amarilidaceae of Puéllaro, which I have tried to identify more of 4 years; something similar occurs with a Catasetum expansum orchid, which I have been following for approximately 3 years and now with the support of biologists from the JBQ, we are trying to take actions for its conservation since its apparently small population is at an extraordinary altitude even Not documented scientifically.

I have tried to collaborate with the different people and related institutions, for example, managing the donation of books on biodiversity and environment for teachers of schools and schools in Puéllaro and San José de Minas and books of different themes for all

around 20 rural parishes from the province of Pichincha; also the donation of calves with the Andean Bear Foundation for a compensation program for the bear-human conflict in the Cayambe-Coca National Park. Together with my friend Jairo Celorio we collaborate with information for the discovery of an Andean eagle nest *Spizaetus isidori*, a highly threatened and very poorly studied species, so we collaborate with the Andean Condor Foundation.

I have also worked for five years with different authorities to create an ACUS (Conservation and Sustainable Use Area) that encompasses the five parishes mentioned above, a dream that is getting closer to becoming a reality.

In my opinion, the greatest threats at the local level to the possum or raposa as we know it here in Ecuador, is ignorance when relating them to rodents, also the attack of domestic animals such as dogs, the run-over on the roads and the destruction of their habitat. I am an ally of the Zary and we are going to save the approximately 22 species that inhabit Ecuador, changing the wrong image that the dominant species has on the planet, on it.



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## CAROLINA VIVAS SERNA.

In recent years we have been told that, rather than leaving a better world for our children, we must leave better children for this world.

Let's understand children like childhood: those in formation who, from birth, learn from our example and whose actions (in most cases) will be carried out by imitation.

As a biologist I have always worried about transmitting a conservation message. What would nature be without us? Many films illustrate a renewed, replenished, recovered planet.



But what would be of us without nature? I know everyone has the answer.

From my work in the field and in the laboratory, I learned to collect data and interpret it as valuable information for the knowledge and management of certain species of mammals. In my research experience I managed to understand how our actions, often selfish, take species to limits for those who are not "prepared." That is how I learned about local extinctions or species that once were specialists and, over the years, were reported as opportunists.

In the classroom, I always expressed my concern about doing something else. That's how I saw university students excited to meet the famous "chucha", which they had never heard of. However, in some cases, I heard stories of young people telling me about how opossums entered their grandparents' farms and "sent the dogs" to take them out (at best).

In more colorful classrooms, with preschool and elementary students, I understood that it is there, just in early childhood, where we as a society must educate in the love for our Earth, the fauna and flora that inhabit it. But it must be a joint work between family, school and society. We must act as a team!

Valentina and María José inherited my respect for life. One afternoon in the park, we were playing and some bees arrived. They got excited and told me: they are sure they are making trips full of pollen so that we never lack the food!, right, mom? At the same time, and on the contrary, a little girl next to them took out her rain boot to smash a less fortunate bee against the ground and end, with it, one of the most important roles conferred on these winged beings.

It was a less fortunate bee, because we have not been educated in courage and compassion. We have been taught that we are above other beings, and we have been instilled in the misconception that humans are to dominate. The truth is that, instead, we must think about caring, hugging, looking after everything that exists.

May the possum illustrations continue to decorate walls! Let his knowledge about them be so great that he portray them on postcards. And that they are so dear and respected, that one day they teach about them in schools and do not rise against them any threat.



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## FRANCISCO JAVIER FLÓREZ OLIVEROS.

I am from the city of Medellín, located in the department of Antioquia, Colombia. Father of five (5) beautiful children (dogs) called the titos (Tito, Tara, Aldo, Canela and Chicharita) I am known with the alias of the opossum. I was born to eat all kinds of goodies (food that does not feed) and play video games, I do not tolerate bad spelling and the light way of writing or speaking, I less tolerate animal abuse; protector of wildlife and fauna in general, I am a way of life based on caffeine, wine, cinema, and academy, anti-bullfighting by conviction, music collector, chatter about online marketing for business and spiritual growth, businessman (ha ha ha, kidding) little or rather nothing happy with my name. I am a way of life that evolved to live from movies, strange music, comics, junk food and snacks.



College professor. I guide environmental and social issues, however, I am a professional in the environmental area, I work as a consultant on environmental, forestry and wildlife issues for entities of the national order in Colombia. I am an evaluator of scientific articles for a scientific journal of a public university in subjects related to the possum or common chucha, I write chronicles and articles of environment, development, flora and fauna, for a virtual news portal, I volunteer in a Foundation that protects the chucha in Colombia and America and, finally and when I have time, I am an amateur photographer of faces, fauna, flora, and landscapes.

In this year 2019, about to release this publication (the book of the possum) for Medellín, Antioquia, Colombia, America and the world, I begin to write these bold lines about a crazy, daring and hidden heroine of our American wildlife, under the premise that the possum (common chucha) had never taught me so much about resilience, adaptability and ways of life little loved by man. I have worked with my friend and for my friend the chucha for some years now, being the pillar of animal protection the first and strongest that I implemented, then doing environmental education and pedagogy work (talks, presentations, plays, video and photography) aimed at the conservation of wildlife (especially the possum or common chucha) and finally I have worked on the pillar of scientific research, around this important individual of wildlife in Colombia and America, identifying and establishing its role in the dynamics, rehabilitation and restoration of natural forests in the department of Antioquia.

The luck of the chucha in Colombia is not far from the American reality, being the one that gave us the fire and took us out of all kinds of unsatisfied basic needs (according to legend). It is and has been cruelly treated. Now, I do not think that for most people it seems a giant rodent, is executed at the mercy of his executioner with any blunt object, even with any blinding term or word. We are far from ensuring that this animal is respected and considered of vital importance (as well as all wildlife) for our survival as human beings on this planet. Then, sometimes I think we are not doing anything to control situations of abuse towards her. However, I believe that what we are achieving is to make this cruel treatment more visible and for the same people to report the facts, when this never happened before.

The general ignorance about this individual, the popular beliefs, the collective imagination, have made the chucha the delights of adults and children (not for the good of the chucha of course). Stories that are interwoven and that make believe that this individual is not of this world, but if it is of this world. The outrages show her as the individual of the wildlife that most frequently is a victim of this situation in Colombia, now: Can a population of wildlife such as opossums withstand such a strong anthropic pressure? I do not know. I only know that we must continue fighting for the conservation, protection and care of this important individual of wildlife. It is possible that in fifty (50) years we will achieve it. I wait it is not too late.

*“However, from the tragic ashes we will ascend, to greet the beginning of the new era, in which the man and the possum or common chucha will unite in a great and glorious future”*

And remember that almost all sweets that we must take care of, preserve and protect in this world, have not yet been born.

**¡Long live the chuchas, possums and marsupials in Colombia and America!**



**FRANCISCO JAVIER FLÓREZ OLIVEROS**

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## Chapter 12.

# A chucha for eternity

Opossums (common chucha) are one of the first groups of mammals that originated on earth. Their fossil Cretaceous record suggests that they managed to live in the same geological time of dinosaurs. This antiquity gives scientists clues about kinship relationships between species and their evolution. The discovery of America marked a milestone worldwide based on the biodiversity of the continent. Since then, possums have been one of the representatives of our wildlife. However, that recognition has lost strength over the years. Highlight that these mammals are marsupial as well as koalas, kangaroos and wallaby, could lead to their being recognized as charismatic species and thus be included in the implementation of conservation plans at local, regional, national and continental levels.



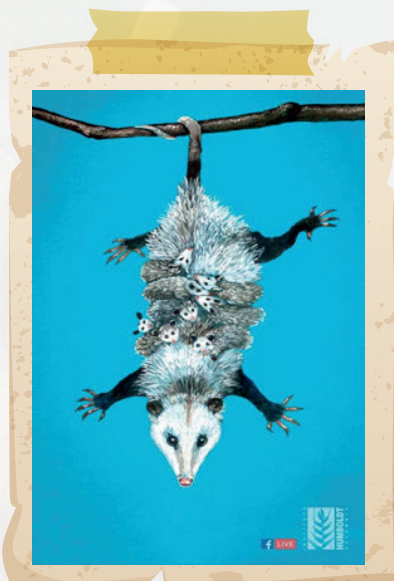
**Image 145.** Opossum or common chucha *Didelphis marsupialis*. Source: Davis Travis / Deybi Beltrán Cerón / La Casita del Bosque © Copyright. 2020.

In this way, if we have a whole regulatory and legal framework for the protection and conservation of our wildlife, follow it would be the implementation of an investigative model, which articulates the existing legislation regarding the protection of our biodiversity, with Research on the state of resources in our country. Research models such as those proposed by many researchers, where the role of a native species in the natural regeneration of forests is identified, know what this role is like and respond to the statements with which this writing begins.

Recent research suggests that they are resistant to the bite of some snakes; they are reservoirs of some parasites that would be lethal to other species, including man and survived the last glaciations.

Additionally, they are known to be seed dispersers, so they play an important role in the restoration and passive rehabilitation of natural forests (FUNDZAR, 2019).

It is important to conserve possums or chuchas for their work as potential seed dispersers and their contribution to reforestation (Cáceres, 2002; Cantor *et al.*, 2010; Guimaraes and da Costa, 2010) in addition to this, they also control insect and rodent populations like rats and mice, they are a source of food for eagles, hawks and large carnivores such as felines and foxes. Taking into account the richness of marsupial species and their diverse lifestyles in the Neotropics (Emmons and Feer, 1990), their role in dispersal must be analyzed and in forest rehabilitation. All of the above makes opossums into mammals that must be investigated, as they have been discovered attributes that are important for various areas of knowledge. In some citations consulted, it is referenced that opossums have the potential to be dispersers in the different ecosystems they inhabit. They can travel long distances to do this task. They can consume fruits that are otherwise food for beetles or rodents that act as seed predators, because by feeding on them they destroy them. They can also disperse them through other places that walk eliminating competition with parental plants (Olmos, 1997), avoiding crowding with other seedlings. Therefore, they must be considered efficient dispersers within their habitats and if they are affected in their well-being as a species, it is highly likely that various plant species associated with them suffer these same effects. The anatomy of the possums allows the seeds not to be damaged when passing through their digestive tract and the feces serve as a protective layer and allow better germination.





The purpose of the next research studies is to generate more information on the ecological roles of opossums, especially their role in the rehabilitation of natural forests and better document their role as seed dispersers in many natural environments, including those exposed to overexploitation and anthropogenic impacts. It is also important to document the experience of working in the field with a real biology and conservation project, in this case, focused on a species of great importance, but little understood and appreciated in the semi-urban environments where it lives.

Finally, it is important to document the effect that roads have on wildlife. For the above, it is necessary to develop a permanent program of registration of overwhelmed mammals, which should consider aspects such as that most mammals are nocturnal and crepuscular, so it is presumable that a large percentage of the abuses occur in the night. For this reason, the routes in search of corpses should be carried out at night and in the early morning, trying to avoid or reduce the probability that the corpses are eaten or removed by other animals (Rodda, 1990) or continuously trampled by vehicles that they transit daily, making them difficult to find and identify. In the medium term, the different road sections (reflective notices, with drawings of the different individuals of the wildlife) must be signaled so that the drivers notice the presence of wildlife crossing the road permanently.



**Image 146.** Possum or Common Chucha illustration. Author: Donna Fritz.  
Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020.

## Chapter 13.

### In summary



- ✓ Opossums and all the species described in this book are the only marsupials in America.
- ✓ Like the charismatic Australian marsupials, some species of possums also have a belly bag known as marsupium.
- ✓ It is about 30 to 50 million years old on earth and dates from the time of dinosaurs.
- ✓ Legend has it that in times past the possum pulled the fire from the coals with its tail, put it in the marsupium and gave it to the man, so it is rabipelada.



- ✓ America has a little more than one hundred species, Colombia has about 50 species of the marsupial order and the Metropolitan Area of the Aburrá Valley in the department of Antioquia has 12 species.
- ✓ Chuchas are not primates, yet they have opposable thumbs like humans.
- ✓ They have prehensile tail like some primates, which makes it easier for them to climb trees and move around the branches.
- ✓ They are important seed dispersers and play other vital roles in ecosystems.
- ✓ They are part of the food chain as a predator and as a prey.
- ✓ Not all species of the order Didelphimorphia have marsupium. The species of small opossums such as marmosas, colicortos and a species of large size (the four brown-eyed chucha) do not have the marsupial bag.
- ✓ Common chucha, or possum, has the ability to enter into a state of involuntary coma when feeling threatened. People call it: **"play dead."**
- ✓ The common chucha or possum *D. marsupialis* has developed resistance to the venom of several species of snakes and has been referred to as an important wild reservoir of *Trypanosoma cruzi* (Astúa, 2015).
- ✓ They control the proliferation of other populations such as rodents and insects, reptiles, amphibians, because they are part of their diet.
- ✓ Opossums are not pets; they are marsupial mammals cataloged by Colombian legislation as wildlife (Decree Law 1608 of 1978, Law 99 of 1998, Decree / Law 1608 of 1978). Its place is in the ecosystems where it is naturally found. Take care of them, protect them and keep them in their habitat.
- ✓ Among the main causes of his death in Colombia and America are widespread ignorance about his biology and ecology, run-ins and attacks by domestic animals such as dogs and cats.

# Glossary

**Adaptation:** anatomical, behavioral or functioning feature of the body that allows a living being to survive in an environment or habitat.

**Infectious agent:** any organism capable of producing an infection, such as viruses, bacteria, fungi or parasites.

**Arborícola:** Organism adapted to live in trees. Belonging or relative to the tree.

**Disturbed area:** Area that has suffered a disturbance, that is, an event capable of altering the ecological functions of the species that are presented there. Examples are logging, forest fires and pollution.

**Soil seed bank:** Viable seeds present in or in the soil (Nathan-Muller, Landau, 2000).

**Biodiversity:** "Variability among living organisms, including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and ecosystems "(Convention on Biological Diversity in 1992).

**Carrion:** Remains of dead animals (corpses) that serve as food for other animals. The organisms that feed on carrion are scavengers.

**Hunting:** It is understood by hunting every act aimed at capturing wild animals either by killing them, mutilating them or trapping them alive and collecting their products. It is understood under the generic action of hunting all means of searching, chasing, harassing, apprehending or killing individuals or specimens of wildlife or collecting their products.

**Commercial hunting:** It is that which is carried out by natural or legal persons to obtain economic benefit. The concept of commercial hunting applies to both the generic hunting action and the activities related to its exercise (Decree 1608 of 1978. Article 59).

**Scientific hunting:** It is the one that is practiced only for research purposes or studies carried out within the country (Decree 1608 of 1978. Article 87).

**Sports hunting:** It is one that is practiced as recreation and exercise, with no other purpose than its realization; therefore, it cannot have any lucrative purpose (Decree 1608 of 1978. Article 94).

**Control hunting:** It is that which is carried out with the purpose of regulating the population





of a species of wildlife when required by social, economic or ecological circumstances (Decree 1608 of 1978. Article 116).

**Foster hunting:** Foster hunting is understood to be that which is carried out with the sole purpose of acquiring individuals or specimens of wildlife for the establishment of animal husbandry or hunting grounds (Decree 1608 of 1978. Article 125).

**Conservation:** Maintenance and recovery of the components of biological diversity at the level of genotypes, populations, wild species and natural ecosystems, through the implementation of management measures in situ and / or ex situ conditions.

**Courtship:** Patterns of behavior of a living being that has the objective of attracting the attention of another individual with which to mate.

**Twilight:** Organism that is most active during sunrise or sunset. Kangaroos are nocturnal and twilight.

**Predator:** Animal that captures and kills other animals to feed on them.

**Weaning:** Completion of the lactation stage of a young, that is, when the mother stops feeding her with breast milk.

**Embryonic diapause:** reproductive strategy that consists of “pausing” the development of an embryo. This is not implanted or fixed in the uterus, but remains dormant and without growth until at some point the state of diapause is interrupted and the embryo begins to develop. This strategy allows the female to give birth in more appropriate seasons, such as when there is an abundance of food or when the previous breeding has already been weaned.

**Diaspora:** It is the unit of a plant that is actually being dispersed (Howe and Smallwood, 1982).

**Sexual dimorphism:** Set of differences in size, shape, color or structure between males and females of a species. In kangaroos there is sexual dimorphism, since males tend to be larger than females.

**Seed disperser:** It is an animal that removes and transports the seeds (the possum or common lick, for example) of a parental plant, through space at different distances in relation to the mother plant or adult conspecifics (Herrera, 2002).

**Distribution:** Geographic area in which a species lives.

**Effectiveness in dispersion:** It refers to how effective a mutualistic organism is in the dispersal of seeds of a particular species and has two components: a quantitative one, that is, the number of seeds that a mutualistic animal and a qualitative one can potentially disperse. It refers to the quality or treatment given by a mutualistic animal to the seeds, as well as the quality in the deposition of seeds. Both components determine the quality or effectiveness of a disperser for a species of plant and ultimately, its incidence or effect on the reproductive fitness of an individual or population. (Schupp, 1993; Jordano and Schupp, 2000).

**Effectiveness of the disperser:** The relative contribution that a disperser makes in the fitness of the plants (Herrera and Jordano, 1981; Schupp, 1993).

**Embryo:** It is the first phase of the development of a multicellular living being.

**Endemic:** Native and exclusive species of a specific region. Opossums are endemic to America.

**Endozooecoria:** Dispersion of seeds through the interiors of animals (digestive tract) due to accidental ingestion or contamination of the animal with the seeds, is considered the primary mode of dispersion by vertebrates (Herrera, 2002).

**Ornitocoría:** It is the dispersion of seeds mediated by birds. (Wheelwright, 1985; Fleming *et al.*, 1987; Jordano, 1993).

**Mastozoocoria:** It is the dispersion of seeds mediated by mammals (Fleming *et al.*, 1987).

**Species:** A group of organisms that have genotypic and phenotypic characteristics in common, and that can reproduce among them.

**Threatened species:** Those whose natural populations are at risk of disappearing, since their habitat, distribution area, ecosystems that support them or population size have been affected by natural factors and / or anthropic intervention. This connotation includes species categorized as: Critically Endangered (CR), Endangered (EN) and Vulnerable (VU), indicated from highest to lowest threat hierarchy (Resolution 584 of 2002. Article 1).

**Charismatic species:** Species whose characteristics are attractive to people.

**Critically Endangered Species (CR):** It is that threatened species that faces a very high probability of extinction in the wild in the immediate future, due to a drastic reduction of its natural populations and a severe deterioration of its range (Resolution 584 of 2002. Article 1).

**Endangered Species (EN):** It is that threatened species on which a high probability of extinction looms in the wild state in the near future, because there is a tendency to reduce its natural populations and deterioration of its area of distribution (Resolution 584 of 2002. Article 1).

**General species:** A highly adaptable species, and that is why it is able to live in different places, have a variety of diets, withstand various environmental conditions, among others.

**Introduced species:** Species that reaches an area that is not native, adapts and stays to live there. Some species are introduced by humans.

**Opportunistic species:** A species capable of taking advantage of resources according to their availability, both in non-intervened ecosystems and in degraded areas.

**Vulnerable Species (VU):** It is that endangered species that is not in imminent danger of extinction in the near future, but it could become so if the reduction of its natural populations and the deterioration of its distribution area continue (Resolution 584 of 2002. Article 1).





**Specimen:** Any organism of living or dead biological diversity or any of its identifiable products, parts or derivatives (Resolution 438 of 2001. Article 1).

**Epizootic:** Unusual increase in a communicable or non-communicable disease, acute or chronic or of an event in animal health, which clearly exceeds the expected normal incidence, at a specific time and place (Decree 2257 of 1886. Article 2).

**Extinct:** Species that no longer exists or whose population characteristics indicate that it is close to extinction. For example, a species of mammal of which there is only one male and that no longer has females to reproduce

**Fruiting Phenology:** Refers to the biological times or rhythms in which a plant or a population of plants produce fruits at a particular season or time of the year or through the years (Sakai, 1995; Herrera, 1998).

**Fleshy fruits:** Those fruits that are composed of a digestible portion (pulp) and a non-digestible portion (seed or seeds) (Herrera, 1981).

**Fruit:** It is the mature gymnoceum with or without other floral organs or parts of organs (Howe and Smallwood, 1982). It can also be defined as the package or cover that covers the seeds, in addition to the accessory nutritional tissues that are used as food for animals (Herrera, 2002).

**Greenhouse gases:** Group of gases that exist naturally in the Earth's atmosphere and whose concentration regulates the temperature, allowing life on our planet. However, when they are also emitted in large quantities by human activities, they trap infrared energy from the sun and return it to the surface of the earth, causing the so-called greenhouse effect.

**Gestation:** It is the development of a living being inside the female. Kangaroos have a very short gestation period.

**Habitat:** Geographic, environmental or ecological area that a species occupies. Habitats provide food, shelter and an adequate climate for animal development.

**Implantation:** Phase in which the embryo adheres to the wall of the uterus.

**Seed limitation:** Refers to the fact that the distribution of plant species is mainly limited by the availability of seeds at a local scale (Munztbergova and Berten, 2005).

**Dispersion limitation:** This is when the distribution of plant species is mainly limited by the availability of seeds at a landscape scale (Munztbergova and Berten, 2005).

**Rain of seeds:** Flow of seeds of the reproductive plants without considering the space explicitly (Nathan-Muller, Landau, 2000). However, it can also be defined more explicitly as the quantity of seeds received by a habitat during a certain period of time (López de Melo *et al.*, 2006).

**Marsupial:** mammal that belongs to the Infraclass Metatheria. They are characterized by completing their development in their mother's bag, and living only in Oceania and some parts of America. It includes kangaroos, koalas, wallaby, possums and common chuchas.

**Marsupio:** it is the structure, also called bag, that is present in the females of some marsupials.

**Microclimate:** Climate determined for a particular geographic area or space.

**Density-dependent mortality:** Refers to dense dependent processes where a higher density of individuals is directly related to a higher mortality of these (Janzen, 1984).

**Niche:** It is the role that each species plays. It is defined by biotic and abiotic factors. For example, the niche of *Didelphis marsupialis* is the role she plays in the ecosystem; It includes its function as prey and predator, the dispersion of seeds, the temperature range in which it lives, among others.

**Dispersion core:** It is the function that describes the probability of seed dispersal at different distances (Nathan, 2006).

**Parasite:** An organism that lives on another without causing any benefit and affecting its body condition; It can cause death. If you live inside your host, it is called an endoparasite or internal parasite. If you live outside, such as fleas and ticks, it is called an ectoparasite or external parasite.

**Patch:** Fragment or portion of ecosystem whose continuity has been interrupted by human activities or natural phenomena. For example, a tropical rainforest is divided into several patches or fragments due to the establishment of agricultural and livestock systems.

**Seed dispersal pattern:** It is the spatial pattern of seed distribution, that is, the sum of the seed shadows of all resource trees. (Nathan-Muller, Landau, 2000).

**Population:** In biology, it is the group of individuals of the same species that lives in a specific geographical area.

**Polygamy:** Reproduction system whereby individuals mate with several individuals.

**Seed predator:** It is an animal that consumes the seeds (rodents) without dispersing them (Janzen, 1970).

**Pulp:** Refers to the fleshy or digestible portion of a fruit that is consumed by fruit-eating animals (Howe and Smallwood, 1982).

**Biological resource:** They are genetic resources, organisms or parts of them, populations, or any other type of biotic component of ecosystems of real or potential value or utility for humanity (Resolution 68 of 2002. Article 1).

**Genetic resource:** Any material of a biological nature that contains genetic information of real or potential value or utility (Resolution 68 of 2002. Article 1).

**Recruitment:** It is the process during which a germinated seed takes root, uses parental provision and assumes independent growth as a seedling (Howe and Smallwood, 1982).



**Trophic network:** Complex set of consumer interactions within a biological community. It involves the roles of producer, consumer, herbivore, frugivorous, omnivorous, carnivorous, prey and predator, among others.

**Regurgitation:** It is the return of food from the stomach to the mouth. Kangaroos regurgitate their food so that the final digestion is carried out later.

**Mutualist relationship:** It is a type of interspecific ecological interaction (between species) in which both parties obtain mutual benefits that are measured by the impact on the fitness of each member of the mutualism (Herrera, 2002).

**Crop removal:** Refers to the number of fruits or seeds or the proportion of seeds extracted or consumed by a single tree disperser (Howe, 1977; Herrera and Jordano, 1981).

**Repopulation:** Faunal repopulation is understood as any act that leads to the reimplantation of populations of native wildlife species or subspecies in areas where they exist or existed (Decree 1608 of 1978. Article 129).

**Biological risk:** Threat that represents an individual or group of genetically contaminating a population or having an invasive effect on a habitat.

**Ethological risk:** Threat that represents an individual or group of animals for the physical behavior or integrity of a natural, human or domestic population.

**Epidemiological risk:** Threat that represents an individual or group of animals due to the possibility of transmission of infectious diseases.

**Extinction risk:** Tendency that a species has to become extinct. According to the impacts that affect it and the characteristics of its populations, a species can be found in a category that implies a lower or greater risk or danger of extinction.

**Seed:** It is a homogeneous genetic or reproductive unit of a plant (Howe and Smallwood, 1982).

**Fruit syndrome:** A particular combination of traits of a fruit that occurs disproportionately more frequently in nature than other combinations (Herrera, 2002).

**Synonym:** In taxonomy, a synonym is one of several scientific names under which the same species is registered.

**Seed shade:** The spatial distribution of dispersed seeds from a single plant (Nathan-Muller, Landau, 2000).

**Crop size:** It is the net production of fruits per individual, measured as the number of fruits per individual in a given time and space (Howe, 1977).

**Taxonomy:** Science responsible for classifying and organizing living organisms in different categories, according to their characteristics.



**Illegal tenure:** Refers to the maintenance as pets of live wild animals.

**Transmissible:** Those diseases that, by their nature, generally of an infectious type, can be transmitted to people, animals or plants (Decree 2257 of 1886. Article 2).

**Sustainable use:** It is the use and / or exploitation that is made of the components of biological diversity as a conservation strategy, in a way and at a pace that does not cause its long-term decline and that allows to meet the needs and aspirations of current and future generations (Resolution 584 of 2002. Article 1).

**Vibrisas:** Hairs or “whiskers” whose function is sensory.

**Belly:** Area of the body of an animal opposite the back; usually refers to the thorax and abdomen.

**Zoocriadero:** Area of public or private property that is intended for the maintenance, promotion and exploitation of wildlife species for scientific, commercial, industrial or restocking purposes, whether these activities are carried out extensively, semi-extensively or intensively, provided that whether in a certain area (Decree 1608 of 1978. Article 142).

**Zoocoria:** Type of seed dispersal mediated by animals of any taxonomic group (Howe and Smallwood, 1982).

**Zoonosis:** A disease that, in natural conditions, is transmitted from vertebrate animals to man and vice versa (Decree 2257 of 1886. Article 2).

**Zoo:** A group of public or private property facilities, where individuals of wildlife are kept in confinement or semi-confinement for display and for educational purposes and in which biological research is carried out on captive species, activities that are advanced without purposes commercial, although fees are charged to the public for admission to the zoo (Decree 1608 of 1978. Article 180).



# Listado de imágenes

<b>Image 1.</b>	Play Mrs. Zary, a committed heroine, Tironeta Theater, Book Fair. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 .....24
<b>Image 2.</b>	Reader: "Guidelines for the management of baby opossums in a defenseless state. Zarigüeya Foundation "Source: Zarigüeya Foundation FUNDZAR © Copyright. 2020. ....26
<b>Image 3.</b>	Forests of Northeast Antioquia. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 ..... 30
<b>Image 4.</b>	<i>Didelphis marsupialis</i> opossum or common chucha in wildlife. Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020 .....36
<b>Image 5.</b>	<i>Didelphis marsupialis</i> . Source: Cuartas-Calle & Muñoz-Arango (2003), drawing made by Gloria Mora, based on an illustration by Cox (1988). © Copyright ..... 38
<b>Image 6.</b>	Footprints of the anterior and posterior limbs of <i>Didelphis marsupialis</i> . Source: Aranda. © Copyright. (2012) .....38
<b>Image 7.</b>	Footprints of opossum or common chucha, <i>Didelphis marsupialis</i> . Source: Gabriel Camilo Jaramillo Giraldo - biologist University of Antioquia © Copyright. 2020 ..... 40
<b>Image 8.</b>	Size of excreta of <i>Didelphis marsupialis</i> . Source: Aranda. © Copyright. (2012)..... 41
<b>Image 9.</b>	Feces size of a 2.5-month-old opossum or common chucha <i>Didelphis marsupialis</i> . Source: Corporación Autónoma Regional Rionegro Nare - CORNARE. © Copyright. 2020..... 41
<b>Image 10.</b>	Opossum or common (adult) chucha <i>Didelphis marsupialis</i> feces. Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020 .....42
<b>Image 11.</b>	<i>Didelphis marsupialis</i> (juvenile) opossum or common chucha, associated with urban environments. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 220 .....43
<b>Image 12.</b>	Natural habitats preferred by the opossum or common chucha. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 .....44
<b>Image 13.</b>	Urban natural environments preferred by the opossum or common chucha, Laureles second park, Medellín, Antioquia. Source: Zarigüeya Foundation - FUNDZAR © Copyright.2020 .....45
<b>Image 14.</b>	Marsupium present in the species <i>Didelphis marsupialis</i> . Source: TBF Semedo, ASM -MIL. © Copyright. 2020..... 50

<b>Image 15.</b>	The breasts, teats or nipples in the species <i>Didelphis marsupialis</i> . Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 .....	51
<b>Image 16.</b>	Prehensile tail in <i>Didelphis marsupialis</i> . Source: Davis Travis / Deybi Beltrán Cerón / La Casita del Bosque. © Copyright. 2020 .....	52
<b>Image 17.</b>	Prehensile tail in <i>Didelphis marsupialis</i> . Source: Zarigüeya Foundation - FUNDZAR. © Copyright. 2020 .....	53
<b>Image 18.</b>	Anterior limb (front) and posterior limb (rear) of the species <i>Didelphis marsupialis</i> and <i>D. aurita</i> . Source: Zarigüeya Foundation - FUNDZAR, <a href="https://web.facebook.com/groups/1559837174299862">https:// web.facebook.com/ groups/1559837174299862</a> /Gambás brasileiros, Opossums & Zarigüeyas © Copyright. 2020 .....	54
<b>Image 19.</b>	Anterior limb (front) and posterior limb (rear) of the species <i>Didelphis marsupialis</i> . Source: Zarigüeya Foundation - FUNDZAR. © Copyright. 2020.....	66
<b>Image 20.</b>	Puppy or neonate of an opossum or common pike <i>Didelphis marsupialis</i> , with an age close to 10 or 12 days. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020. ....	55
<b>Image 21.</b>	Fur present in different individuals of opossum or common chucha, <i>Didelphis marsupialis</i> . Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 .....	56
<b>Image 22.</b>	Vibrissas in opossum or common chucha <i>Didelphis marsupialis</i> . Source: Zarigüeya Foundation - FUNDZAR. © Copyright. 2020 .....	57
<b>Image 23.</b>	<i>Didelphis marsupialis</i> , opossum or common chucha. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 .....	60
<b>Image 24.</b>	Distribution of <i>Didelphis marsupialis</i> . Source: IUCN (International Union for Conservation of Nature) 2008. <i>Didelphis marsupialis</i> . The IUCN Red List of Threatened Species. Version 2019-1. July 2019 .....	61
<b>Image 25.</b>	Conservation status IUCN (International Union for Conservation of Nature) LC, <i>Didelphis marsupialis</i> . Date of consultation July 2019.....	62
<b>Image 26.</b>	<i>Didelphis pernigra</i> opossum or common white-eared chucha. Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020 .....	63
<b>Image 27.</b>	Distribution of <i>Didelphis pernigra</i> . IUCN (International Union for Conservation of Nature) 2008. <i>Didelphis pernigra</i> . The IUCN Red List of Threatened Species. Version 2019-. July 2019. ....	64
<b>Image 28.</b>	Conservation status IUCN (International Union for Conservation of Nature) LC, <i>Didelphis pernigra</i> . Date of consultation September 2019.....	65
<b>Image 29.</b>	<i>Chironectes minimus</i> , water chucha. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020. ....	66
<b>Image 30.</b>	<i>Chironectes minimus</i> , water chucha, forelimb. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 .....	67



- Image 31.** Distribution of *Chironectes minimus* IUCN (International Union for Conservation of Nature) 2008. *Chironectes minimus*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019..... 68
- Image 32.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Chironectes minimus*. Date of consultation July 2019. .... 69
- Image 33.** *Caluromys lanatus*, woolly chucha, butter chucha . Source: <https://www.facebook.com/groups/chuchaszarigüeyasymarsupiales/?ref=bookmarks>. © Copyright. 2020.....70
- Image 34.** Distribution of *Caluromys lanatus* IUCN (International Union for Conservation of Nature) 2008. *Caluromys lanatus*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 71
- Image 35.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Caluromys lanatus*. Date of consultation July 2019.....72
- Image 36.** *Caluromys derbianus*. Source: © Diego G. Tirira. 2019. <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Caluromys%20derbianus>. © Copyright. 2020.....73
- Image 37.** Distribution of *Caluromys derbianus*. IUCN (International Union for Conservation of Nature) 2008. *Caluromys derbianus*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.....74
- Image 38.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Caluromys derbianus*. Date of consultation July 2019.....75
- Image 39.** *Metachirus nudicaudatus*, four brown eyes chucha. Source: Corporación Autónoma Regional Rionegro Nare- CORNARE © Copyright. 2020.....76
- Image 40.** Distribution of *Metachirus nudicaudatus* IUCN (International Union for Conservation of Nature) 2008. *Metachirus nudicaudatus*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019. .... 77
- Image 41.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Metachirus nudicaudatus*. Date of consultation September 2019. ....78
- Image 42.** *Philander opossum*, juvenile, four gray eyes chucha. Source: Claudia González, México D.F. © Copyright. 2020.....79
- Image 43.** Distribution of *Philander opossum* IUCN (International Union for Conservation of Nature) 2016. *Philander opossum*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 .....81
- Image 44.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Philander opossum*. Date of consultation July 2019. ....82
- Image 45.** *Philander andersoni*. Source: Carlos Boada © Copyright. 2019. <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Philander%20andersoni>. 2020. ....83

- Image 46.** Distribution of *Philander andersoni*. IUCN (International Union for Conservation of Nature) 2008. *Philander andersoni*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 84
- Image 47.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Philander andersoni*. Date of consultation July 2019. ....85
- Image 48.** Gender *Marmosa* sp. Source: <https://www.facebook.com/groups/chuchaszarigueyasymarsupiales/>. © Copyright. 2020 .....85
- Image 49.** *Marmosa* sp. Chucha gray shaggy butter. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 ..... 86
- Image 50.** *Marmosa xerophila*, high and medium Guajira - Colombia. Source: Marleny Jaramillo - Biologist Ornithologist. © Copyright. 2020.....87
- Image 51.** Distribution of *Marmosa xerophila*. IUCN (International Union for Conservation of Nature) 2008. *Marmosa xerophila*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 88
- Image 52.** Conservation status IUCN (International Union for Conservation of Nature) VU, *Marmosa xerophila*. Date of consultation July 2019. .... 89
- Image 53.** *Marmosa robinsoni*, western butter chucha. Source: [www.fotonatural.org](http://www.fotonatural.org) © Copyright. 2020. .... 90
- Image 54.** Distribution of *Marmosa robinsoni* IUCN (International Union for Conservation of Nature) 2012. *Marmosa robinsoni*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 90
- Image 55.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa robinsoni*. Date of consultation July 2019 .....91
- Image 56.** *Marmosa lepida*. Source: Paúl Sarmiento Bermúdez © Copyright. 2019. [https://bioweb.bio/faunaweb / mammaliaweb / FichaEspecie / Marmosa% 20lepida](https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Marmosa%20lepida). © Copyright. 2020 .....92
- Image 57.** Distribution of *Marmosa lepida*. IUCN (International Union for Conservation of Nature) 2016. *Marmosa lepida*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 .....93
- Image 58.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa lepida*. Date of consultation July 2019. ....94
- Image 59.** *Marmosa regina*. Source: Carlos Boada © Copyright. 2019. [https://bioweb.bio/ faunaweb / mammaliaweb / FichaEspecie / Marmosa% 20regina](https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Marmosa%20regina). © Copyright. 2020 ..... 94
- Image 60.** Distribution of *Marmosa regina* IUCN (International Union for Conservation of Nature) 2011. *Marmosa regina*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 .....95
- Image 61.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa regina*. Date of consultation September 2019..... 96



- Image 62.** *Murine Marmosa*. Source: Photo 12948748, Cameron Rutt, some rights reserved (CC BY-NC) © Copyright. 2020 ..... 97
- Image 63.** *Marmosa murina*. Source: <http://insolitanaturaleza.blogspot.com/2014/12/marmosa-marmosa-murina.html>. © Copyright. 2020..... 97
- Image 64.** Distribution of *Marmosa murina* IUCN (International Union for Conservation of Nature) 2008. *Marmosa murina*. The IUCN Red List of Threatened Species. Version 2019-. July 2019..... 98
- Image 65.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa murina*. Date of consultation July 2019 ..... 99
- Image 66.** *Marmosa demerarae*, Chucha gray woolly churn. Source: Museum of Vertebrate Zoology, University of California, Berkeley © Copyright. 2020..... 100
- Image 67.** Distribution of *Marmosa demerarae* Distribution International Union for the Conservation of Nature 2015. *Marmosa demerarae*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 100
- Image 68.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa demerarae*. Date of consultation July 2019 ..... 101
- Image 69.** *Marmosa alstoni*. Source: Michigan Science Art © Copyright. [https://animaldiversity.org/site/resources/Grzimek\\_mammals/Didelphimorphia/Marmosa\\_alstoni.jpg/view.html/](https://animaldiversity.org/site/resources/Grzimek_mammals/Didelphimorphia/Marmosa_alstoni.jpg/view.html/). © Copyright. 2020..... 102
- Image 70.** Distribution of *Marmosa alstoni* IUCN (International Union for Conservation of Nature) 2011. *Marmosa alstoni*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 103
- Image 71.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosa alstoni*. Date of consultation July 2019 ..... 104
- Image 72.** *Gender Marmosops*, slim butter Little chucha. Source: [https://www.google.com/search?Q=Genero+Marmosops&source=lnms&tbn=isch&sa=X&ved=0ahUKEwj9wfSXLKnjAhUNuVkkKHQqiCaAQ\\_AUIECgB&biw=1366&bih=657#imgsrc=nW1qdo](https://www.google.com/search?Q=Genero+Marmosops&source=lnms&tbn=isch&sa=X&ved=0ahUKEwj9wfSXLKnjAhUNuVkkKHQqiCaAQ_AUIECgB&biw=1366&bih=657#imgsrc=nW1qdo) © Copy right. 2020 ..... 105
- Image 73.** *Marmosops cauae*. Slim butter little chucha. Source: Photo by Jorge Brito © Copyright. 2019. <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Marmosops%20cauae>. © Copyright. 2020..... 106
- Image 74.** Distribution of *Marmosops cauae* IUCN (International Union for Conservation of Nature) 2017. *Marmosops cauae*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 107
- Image 75.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Marmosops cauae*. Date of consultation July 2019. .... 108

- Image 76.** *Marmosops handleyi*. Source: Juan Fernando Díaz Nieto Ph. D. © Copyright. 2020 109
- Image 77.** Distribution of *Marmosops handleyi* IUCN (International Union for Conservation of Nature) 2008. *Marmosops handleyi*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 109
- Image 78.** Conservation status IUCN (International Union for Conservation of Nature) CR, *Marmosops handleyi*. Date of consultation July 2019..... 110
- Image 79.** *Marmosops chucha*. Source: <http://www.eafit.edu.co/escuelas/ciencias/noticias/Paginas/nuevos-chuchas-colombia-marsupiales.aspx> © Copyright. 2020..... 111
- Image 80.** *Marmosops magdalenae*. Source: <http://www.eafit.edu.co/escuelas/ciencias/noticias/Paginas/nuevos-chuchas-colombia-marsupiales.aspx> © Copyright 2020 ..... 111
- Image 81.** *Marmosops fuscatus*. <http://www.mammalogy.org/marmosops-fuscatus-006#requ estFullSizeImageWebformCont> © Copyright. 2020 ..... 112
- Image 82.** Distribution of *Marmosops fuscatus*. Distribution IUCN (International Union for Conservation of Nature) 2011. *Marmosops fuscatus*. The IUCN Red List of Threatened Species. Version 2019-1: July 2019 ..... 112
- Image 83.** Conservation status IUCN (International Union for Conservation of Nature) DD, *Marmosops fuscatus*. Date of consultation July 2019 ..... 113
- Image 84.** Gender *Monodelphis*. <https://www.brazilianfauna.com/chestnut-striped-shorttailed-opossum-monodelphis-rubida/> © Copyright. 2020 ..... 114
- Image 85.** Gender *Monodelphis*. Source: [https://www.google.com/search?q=monodelphis&source=lnms&tbm=isch&sa=X&ved=0ahUKEwj72\\_qX7a3jAhXukoAKHZYJCc4Q\\_AUIECgB&biw=1366&bih=657#imgc=Copyright:10kIMIQOV2020](https://www.google.com/search?q=monodelphis&source=lnms&tbm=isch&sa=X&ved=0ahUKEwj72_qX7a3jAhXukoAKHZYJCc4Q_AUIECgB&biw=1366&bih=657#imgc=Copyright:10kIMIQOV2020) ..... 115
- Image 86.** *Monodelphis adusta* (juvenile) Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 ..... 116
- Image 87.** *Monodelphis adusta*. Source: Janina Bonilla <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Monodelphis%20adusta> © Copyright. 2020 ..... 117
- Image 88.** Distribution of *Monodelphis adusta* International Union for the Conservation of Nature 2015. *Monodelphis adusta*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 118
- Image 89.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Monodelphis adusta*. Date of consultation July 2019..... 119



- Image 90.** *Monodelphis brevicaudata*. Source: <http://www.mammalogy.org/monodelphisbrevicaudata-1396> © Copyright. 2020 ..... 120
- Image 91.** Distribution of *Monodelphis brevicaudata* IUCN (International Union for Conservation of Nature) 2008. *Monodelphis brevicaudata*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 120
- Image 92.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Monodelphis brevicaudata*. Date of consultation July 2019 ..... 121
- Image 93.** *Gracilinanus agilis*. Source: Lucas Amílcar Retamosa, <http://www.ecoregistros.org/> LucasAmilcarRetamosa © Copyright. 2020 ..... 122
- Image 94.** *Gracilinanus agilis*. Source: <http://www.mammalogy.org/gracilinanus-agilis-480> © Copyright. 2020 ..... 123
- Image 95.** Distribution *Gracilinanus dryas* IUCN (International Union for Conservation of Nature) 2016. *Gracilinanus dryas*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 123
- Image 96.** Distribution *Gracilinanus emiliae* IUCN (International Union for Conservation of Nature) 2016. *Gracilinanus emiliae*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 124
- Image 97.** Distribution of *Gracilinanus marica* IUCN (International Union for Conservation of Nature) 2016. *Gracilinanus marica*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019 ..... 124
- Image 98.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Gracilinanus dryas*. Date of consultation July 2019 ..... 125
- Image 99.** Conservation status IUCN (International Union for Conservation of Nature) DD, *Gracilinanus dryas*. Date of consultation July 2019 ..... 126
- Image 100.** Conservation status IUCN (International Union for Conservation of Nature) LC, *Gracilinanus marica*. Date of consultation July 2019 ..... 127
- Image 101.** Gender *Glironia*. Source: Paulo Sergio Bernado © Copyright. 2020 ..... 128
- Image 102.** *Glironia venusta*. Source: Photo by Luis Gualavisi © Copyright. 2019. <https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Glironia%20venusta>. © Copyright. 2020 ..... 129
- Image 103.** Distribution *Glironia venusta* IUCN (International Union for Conservation of Nature) 2016. *Glironia venusta*. The IUCN Red List of Threatened Species. Version 2019-1 ..... 130

<b>Image 104.</b>	Conservation status IUCN (International Union for Conservation of Nature) LC, <i>Glironia venusta</i> . Date of consultation July 2019 .....	131
<b>Image 105.</b>	Gender <i>Lutreolina</i> . Source: <a href="http://cerrito.gob.ar/reservalovera/?p=1938">http://cerrito.gob.ar/reservalovera/?p=1938</a> . © Copyright. 2020 .....	132
<b>Image 106.</b>	<i>Lutreolina crassicaudata</i> . Source: J. Simón Tagtachian. © Copyright. 2020 .....	133
<b>Image 107.</b>	Distribution of <i>Lutreolina crassicaudata</i> IUCN (International Union for Conservation of Nature) 2016. <i>Lutreolina crassicaudata</i> . The IUCN Red List of Threatened Species. Version 2019-1. July 2019 .....	134
<b>Image 108.</b>	Conservation status IUCN (International Union for Conservation of Nature) LC, <i>Lutreolina crassicaudata</i> . Date of consultation July 2019 .....	135
<b>Image 109.</b>	Distribution of the species of the gender <i>Didelphis</i> in America. Source: <a href="https://commons.wikimedia.org/wiki/File:Didelphis.png">https://commons.wikimedia.org/wiki/File:Didelphis.png</a> . © Copyright. 2020 .....	136
<b>Image 110.</b>	<i>Didelphis marsupialis</i> opossum or common chucha in wildlife. Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020 .....	137
<b>Image 111.</b>	<i>Didelphis virginiana</i> , opossum of North America. Source: Claudia González, Jecka Gomez Canul. Puerto Morelos, Acapulco, Mexico © Copyright. 2020 .....	138
<b>Image 112.</b>	Distribution of <i>Didelphis virginiana</i> . IUCN (International Union for Conservation of Nature) 2008. <i>Didelphis virginiana</i> . The IUCN Red List of Threatened Species. Version 2019-1. July 2019 .....	139
<b>Image 113.</b>	Conservation status for <i>Didelphis marsupialis</i> LC - Least Concern. Source: IUCN Red List of Threatened Species. July 2019 .....	140
<b>Image 114.</b>	<i>Didelphis albiventris</i> in wildlife. Source: Graciela Paoloni © Copyright. 2020. Córdoba Province, Argentina .....	141
<b>Image 115.</b>	<i>Didelphis albiventris</i> in wildlife. Source: Graciela Paoloni © Copyright. 2020. Córdoba Province, Argentina .....	142
<b>Image 116.</b>	Distribution of <i>Didelphis albiventris</i> IUCN (International Union for Conservation of Nature) 2008. <i>Didelphis albiventris</i> . The IUCN Red List of Threatened Species. Version 2019-1. July 2019 .....	142
<b>Image 117.</b>	Conservation status for <i>Didelphis albiventris</i> LC - Least Concern. Source: IUCN Red List of Threatened Species. July 2019 .....	143
<b>Image 118.</b>	<i>Didelphis pernigra</i> opossum or common white-eared chucha. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 .....	144



- Image 119.** *Didelphis aurita*. Brazilian opossum. Source: <https://www.facebook.com/groups/1559837174299862/> - Iluska Magalhães - © Copyright, Rio de Janeiro - Brazil. © Copyright. 2020.....145
- Image 120.** Distribution of *Didelphis aurita* International Union for the Conservation of Nature 2015. *Didelphis aurita*. The IUCN Red List of Threatened Species. Version 2019-1. July 2019.....145
- Image 121.** Conservation status for *Didelphis aurita* LC - Least Concern. Source: IUCN Red List of Threatened Species. July 2019..... 146
- Image 122.** *Imperfect Didelphis* - white-eared opossum of the Guyanas. Source: <https://esacademic.com/dic.nsf/eswiki/348992>. © Copyright. 2020 ..... 146
- Image 123.** Conservation status for *Imperfect Didelphis* LC - Least Concern. Source: IUCN Red List of Threatened Species. July 2019.....147
- Image 124.** Distribution of *Imperfect Didelphis* IUCN (International Union for Conservation of Nature) 2011. *Imperfect Didelphis*. The IUCN Red List of Threatened Species. Version 2019-1. 2019..... 147
- Image 125.** White-eared opossum *Didelphis albiventris* in the interior of the State of São Paulo, Brazil. Source: Massari © Copyright. 2020 ..... 151
- Image 126.** Bifid glans in *Didelphis albiventris*. Source: Massari © Copyright. 2020.....153
- Image 127.** Epipubic bone (thin arrows) and absence of patella (thick arrow) in *Didelphis marsupialis*. Source: Tamayo-Arango and Sepúlveda (unpublished data). © Copyright. 2020.....154
- Image 128.** Oppositional halux in *Didelphis aurita*. Source: photos courtesy of Scorcio for Massari © Copyright. 2020 .....155
- Image 129.** Yellowish coat on the thorax due to the pigments present in the secretion of the male sternal glands of *Didelphis albiventris*. Source: Massari © Copyright. 2020..156
- Image 130.** Opossum or common chucha *Didelphis marsupialis* in wildlife. Zarigüeya Foundation Source - FUNDZAR © Copyright. 2020 ..... 158
- Image 131.** Possum or common pike *Didelphis marsupialis* run over on track. Zarigüeya Foundation Source - FUNDZAR © Copyright. 2020 .....162
- Image 132.** Posters of wild opossum or common chucha El Escobero road, Envigado, department of Antioquia, and Medellín - Manizales way, department of Caldas. Source: Zarigüeya Foundation -FUNDZAR © Copyright. 2020 ..... 164

- Image 133.** Statistics of individuals run over on roads in the eastern subregion of the department of Antioquia. Source: <http://reporte.humboldt.org.co/Biodiversidad/2017/cap2/206/index.html#seccion3>. 2017 ..... 165
- Image 134.** Distribution of reports of run over of the Didelphidae family in the RECOFA App in Colombia. Source: Highway Ecology and Green Infrastructure Program (PECIV) at Instituto Tecnológico Metropolitano (ITM). © Copyright. 2020 ..... 166
- Image 135.** Distribution of reports of run over of the Didelphidae family in the RECOFA App in the department of Antioquia. Source: Highway Ecology and Green Infrastructure Program (PECIV) at Instituto Tecnológico Metropolitano (ITM). © Copyright. 2020..... 167
- Image 136.** Graffiti of the Virginian opossum *Didelphis*, in Detroit, Michigan, United States. Source: <https://www.facebook.com/FUNDZAR/>. © Copyright. 2020 ..... 176
- Image 137.** Graffiti of opossum or common chucha, located at Santa Fé Zoo in the city of Medellín - Colombia. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 ..... 177
- Image 138.** Opossum or common chucha graffiti, located on the Metro viaduct in the city of Medellín - Colombia. Graffiti for the protection and conservation of the opossum or common chucha made in a campaign in the city of Cali, Colombia by a group of young animalists. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 ..... 177
- Image 139.** Possum tattoo. Source: <https://web.facebook.com/groups/1559837174299862/> - Gambás brasileiros, Opossums & Possums. © Copyright. 2020 ..... 178
- Image 140.** Possum tattoo. Source: Davis Travis / Deybi Beltrán Cerón / La Casita del Bosque. © Copyright. 2020 ..... 178
- Image 141.** Signs of the zodiac (Zary-zodiac). Author: Asia. <https://www.facebook.com/pg/FUNDZAR/posts/> © Copyright. 2020 ..... 179
- Image 142.** Signs of the zodiac (Zary-zodiac). Author: Asia. <https://www.facebook.com/pg/FUNDZAR/posts/> © Copyright. 2020 ..... 180
- Image 143.** Signs of the zodiac (Zary-zodiac). Author: Asia. <https://www.facebook.com/pg/FUNDZAR/posts/> © Copyright. 2020 ..... 181
- Image 144.** Attention to an individual of the wild opossum or common chucha *Didelphis marsupialis*, attacked by canine. First aid before being handed over to the environmental authority Metropolitan Area of the Aburrá Valley. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 ..... 190



**Image 145.** Opossum or common chucha *Didelphis marsupialis*. Source: Davis Travis / Deybi Beltrán Cerón / La Casita del Bosque © Copyright. 2020 ..... 217

**Image 146.** Possum or Common Chucha illustration. Author: Donna Fritz. Source: Zarigüeya Foundation - FUNDZAR © Copyright. 2020 ..... 219

# List of tables

**Table 1.** Calculation of the age of a neat and opossum cub *D. marsupialis* in its first 120 days of life based on their morphological description (Petrides, 1949; Reynolds, 1952). Complements the Zarigüeya Foundation information, images FUNDZAR © Copyright. 2020..... 46

**Table 2.** Animals of the Gender *Didelphis* present in Brazil. Source: Tardieu *et al.*, 2017; gives Rocha *et al.* (2017); Delciellos (2016); Santos *et al.*, (2016); Lessa and Geise, 2010).. 50

# List of graphics

**Graph 1.** Composition of the diet of *D. marsupialis* in the two study areas A. Forest tropical dry (Santa Fe de Antioquia). B. Montane forest (El Retiro). ..... 159

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- Acevedo-Quintero, J.F; Zamora-Abrego, J.G. (2016).** The role of mammals in the dispersal and predation processes of *Mauritia flexuosa* (Arecaceae) seeds in the Colombian Amazon. *Tropical Biology Review*, 64: 5-15.
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