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New records of *Galictis vittata* (Schreber, 1776) for the western slope of the Andes, Pacific region of Colombia

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Galictis vittata (Greater Grison) is distributed from Mexico through Central and South America down to northern Argentina and southern Brazil, from sea level up to 1,500 masl. In Colombia, this species is widely distributed along the Caribbean and Andean regions, and to a lesser extent in the Orinoquia and Pacific regions. Specimens of *G. vittata* were fortuitously captured in the municipality of Quibdó. This finding, along with an observation in the municipality of Río Quito and a literature survey in international databases and published records of the species, were used to draw a map of current localities of the species in our country. A new record of *G. vittata* is reported for Colombia based on two voucher specimens deposited in the Colección Teriológica del Chocó. These specimens correspond to two females, one adult and one juvenile preserved as skins. This finding is the fourth report of the species from the western Andean zone of Colombia in the Pacific Region and the first for the Department of Chocó. It is a significant addition to the geographical and ecological distribution of *G. vittata* in the Chocó, a region currently facing various diversity and conservation issues that threaten its survival, such as loss of habitat and changes of land use.

Galictis vittata (hurón o grison mayor) se distribuye en la parte norte de América Latina, desde México a través de Centro y Suramérica, hasta el norte de Argentina y el sur de Brasil desde el nivel del mar hasta los 1,500 m, ocurriendo con más frecuencia por debajo de 500 m. En Colombia, esta especie presenta una amplia distribución a lo largo del Caribe, los Andes y, en menor proporción, en las regiones de la Orinoquía y Pacífica. Especímenes de *G. vittata* fueron obtenidos de manera ocasional en el municipio de Quibdó, estos junto a una observación obtenida en el municipio de Río Quito, más la revisión de la información disponible en bases de datos internacionales y registros publicados de la especie en la literatura fueron usados para alimentar un mapa de localidades actual de la especie en nuestro país. Se reporta un nuevo registro de *G. vittata* para Colombia, basado en dos especímenes testigos, depositados en la Colección Teriológica del Chocó. Los especímenes de *G. vittata* corresponden a dos hembras, una adulta y otra juvenil preservados como piel. Este hallazgo, constituye el cuarto reporte de la especie para el occidente de los Andes de Colombia en la Región Pacífica y el primero para el departamento del Chocó, el cual representa una adición significativa en la distribución geográfica y ecológica de este taxón en la región del Chocó, donde su diversidad enfrenta problemas de conservación por factores que amenaza su supervivencia, como la pérdida de hábitat y la transformación en el uso de la tierra.

Keywords: Colombia; greater grison; Pacific region.

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Introduction

The genus *Galictis* belongs to the family Mustelidae and groups together a number of species distributed throughout tropical and subtropical areas of North America, including two species: *G. cuja* (Molina 1782) and *G. vittata* (1776) *sensu* Wozencraft Schreber (2005) and Bornholdt *et al.* (2013). *Galictis cuja* (lesser grison) is distributed in southern Latin America, from the southern tip of Peru, southern Bolivia and northeastern Brazil to southern Chile and Argentina (Yensen and Tarifa 2003; Cuarón *et al.* 2008; Bornholdt *et al.* 2013). *G. vittata* (greater grison) thrives across the northern part of Latin America, from Mexico through Central and South America down to northern Argentina and southern Brazil, from sea level up to 1,500 masl, being more abundant at altitudes below 500 masl (Timm *et al.* 1989; Yensen and Tarifa 2003; Cuarón *et al.* 2008; Monjeau *et al.* 2009; Bornholdt *et al.* 2013).

In Colombia, the great grison (*G. vittata*) has been recorded for the Caribbean, the Andes and the Orinoquia (Solari *et al.* 2013); unconfirmed references are also available for the Amazon, such as Alberico *et al.* (2000), and

Muñoz-Saba and Alberico (2004). According to current lists of mammals for the country, this species inhabits the Caribbean region in the Departments of Atlántico, Bolívar, Cesar, Córdoba, La Guajira (Jimenez-Alvarado *et al.* 2016), Magdalena and Sucre (Cuervo *et al.* 1986; Alberico *et al.* 2000; Solari *et al.* 2013). In the Andean region, it has been reported in the Departments of Antioquia, Cundinamarca, Caldas and northern Santander (Castaño 2012; Solari *et al.* 2013; Jimenez-Alvarado *et al.* 2016); in Orinoquia, in the Departments of Casanare, Meta and Vichada (Alberico *et al.* 2000; Solari *et al.* 2013). In the Pacific region, in the Departments of Cauca (Alberico *et al.* 2000; Ramírez-Chaves and Perez 2011) and Nariño (Ramírez-Chaves and Noguera-Urbano 2010, Figure 1). However, despite of this broad range, no accurate information is currently available about its ecology, distribution and conservation status (González-Maya *et al.* 2011; Calderon-Capote *et al.* 2015; Jimenez-Alvarado *et al.* 2016).

Jimenez-Alvarado *et al.* (2016) report the existence of 161 documents related to *G. vittata* in Colombia. A detailed revision detected an error in this figure, as according to

the information reported by these authors, the total number of references adds up to only 157 documents. Of this, 78 records correspond to the Colombian Caribbean, with 54 new records for this region, which is one of the most important approximations to the distribution of *G. vittata* in northern Colombia. However, besides the references just mentioned, 38 additional mentions for the Colombian territory are available, making a total of 195 recounts. Of these, 58.5 % ($n = 114$) correspond to references in interviews; 27.7 % ($n = 54$), direct observations; 9.2 % ($n = 18$), specimens in scientific collection; and 4.6 % ($n = 9$), photographic records. Of all records, 86.2 % were considered to be poorly reliable (interviews and observations), while the remaining 13.8 % were deemed high reliable, corresponding to photographs and collection specimens. The few mentions for the Colombian Pacific region are reliable, as these refer to geo-referenced evidence on the presence of the species related to collection specimens and photographic records.

Recent studies (Escobar-Lasso and Guzman-Hernández 2014; Jimenez-Alvarado *et al.* 2016) confirm that there are few specimens deposited in Colombian scientific collections. A total of 18 specimens are currently recorded in collections, distributed in the Institute of Natural Sciences at Universidad Nacional de Colombia (ICN), the Museum of Natural History at Universidad del Cauca (MHNC), the Collection of Mammals at Instituto Alexander von Humboldt (IAvH-M), the Collection of Mammals at Universidad del Valle (CM-VC), and the Museum of Natural History at Universidad de Caldas, Manizales-Colombia (MHN-UC), in addition to some international museums in the U.S., including the Field Museum of Natural History, Chicago (FMNH), the National Museum of Natural History, the Smithsonian Institution (USNM), and the American Museum of Natural History (AMNH, Table 1).

From this study, the Collection of Mammals of Chocó at Universidad Tecnológica del Chocó (CMCH) is also included as having specimens of *G. vittata* from the Pacific region of Colombia. Furthermore, data were obtained about the presence of this species in our country from the Global

Biodiversity Information Facility database (GBIF; <http://data.gbif.org>), and from literature records of the species that, together with the records reported herein, were used to elaborate a map of the current distribution of *G. vittata* in Colombia using all record localities; data involving location inconsistencies were excluded. A layer of the national system of natural parks (PNN) was used as an input in this map in order to identify the populations covered by protected areas in our country.

New Records of Great Grison for the Central Biogeographic Chocó: The material reported herein for the western Cordillera of the Andes, specifically in the Department of Chocó, was obtained incidentally in the vicinity of a farm located in the district of Flores de Buenaños, municipality of Quibdó (5° 40' 55.2" N, -76° 38' 27.6" W 54 masl). Two female specimens of *G. vittata* were hunted by dogs on a farm (apparently in the early morning hours), leading to their immediate death; these specimens were recovered by the farm owner and delivered to S. Mosquera-Mosquera on 6 August 2012 (Figure 1). An additional record refers to an observation on October 2014 (Figure 2) by E. Yair Cuesta-Ríos at the jurisdiction of La Soledad, municipality of Rio Quito (5° 32' 17.11"N, -76° 46' 47.34"W, 55 masl).

The two Quibdó specimens were prepared and preserved following the protocol of Vargas-Sandoval (1994) and deposited in the Collection of Mammals of Chocó at Universidad Tecnológica del Chocó (CMCH) under collection numbers CMCH003011 and CMCH003012. The specimens collected match the descriptions of the species by Yensen and Tarifa (2003) and Tirira (2007), including short legs, slender body, small and flattened head exhibiting a diagonal stripe that reaches the shoulders, grayish dorsum, short and thick tail, and a long neck. The measurements of the specimens as based on skins are shown in Table 2; the skulls of these specimens are currently missing.

These new records of *G. vittata* confirm the presence of the species in the Pacific region of Colombia, approximately 85 km west from the nearest record in the Department of

Table 1. Complete list of localities of *Galictis vittata* in Colombia, based on data from the literature and international museums. *International collections.

Specimen	Department	Municipality/Locality	Coordinates	Reference	Quantity
IAvH-M- 5459, 5547	Sucre	Colosó/Ricaurte	9.5 -75.35	Collection of Mammals at Instituto Alexander von Humboldt (IAvH-M)	4
IAvH-M-3111	Magdalena	Santa Marta/PN Tayrona	-		
IAvH-M- 5381	Meta	-	-		
ICN 1423		Villavicencio	4.141 -73.626	Institute of Natural Sciences at Universidad Nacional de Colombia (ICN)	3
ICN1894		Restrepo	4.1584 -73.444		
ICN 9925	Cauca	El Tambo	2.437 -76. 8133		
CM-VC 08105, 08106	Vichada	Puerto Carreño	5.775 -68.184	Collection of Mammals at Universidad del Valle (CM-VC)	2
CMCH 003011	Chocó	Quibdó	6.682 -76.641	Choco Teriologica Collection at Universidad Tecnológica del Chocó (CMCH)	2
CMCH 003012		Rio Quito	5.538 -76.779		
MHN-UC 1156	Caldas	Marquetalia	5.2905 -75.007	Collection of Mammals at the Museum of Natural History, Universidad de Caldas, Manizales - Colombia (MHN-UC)	1
FMNH 68906	Sucre	Colosó/Ricaurte	9.5 -75.35	Field Museum of Natural History, Chicago-EE.UU (FMNH)*	2
USNM 544420	Sucre	Sitio Nuevo /La Trinidad	10.851 -74.6188	National Museum of Natural History, the Smithsonian Institution (USNM)*	2
AMNH-142246	Meta	Villavicencio	-	American Museum of Natural History (AMNH)*	2



Figure 1. Specimens of *G. vittata* (A=CMCH00301, adult female; B=CMCH003012, juvenile female), collected at Flores de Buenanos, municipality of Quibdó.

Antioquia, and 360 km north of the record in the Department of Cauca, in addition to confirming the presence of this species in the Department of Chocó (Figure 3). Nonetheless, its presence in this area was expected, given the ecological continuity of the landscape and the Chocoano tropical forest between southwestern Colombia and northwestern Ecuador (Tirira 2008); in addition, this species has been recorded previously by Handley (1966) as *G. allamandi* in the Darien-Panamá region at the northwest end of the Biogeographic Chocó.

Furthermore, Asprilla-Perea et al. (2013) mention the presence of *G. vittata* in the Department of Chocó, based on a lot of specimens confiscated by Corporación Autónoma Regional para el Desarrollo Sostenible del Chocó (Regional Autonomous Corporation for the Sustainable Development of Chocó, CODECHOCO); although the original site of capture of that individual was not established. Thus, the

Table 2. External measurements of the specimens of *G. vittata* recorded in the municipality of Quibdó, Department of Chocó, Colombia

Measurements	CMCH003011 (mm)	CMCH003012 (Juvenil) (mm)	Yensen and Tarifa (2003)	Tirira (2007)
LT	680	427	600–760	600–747
LC	153	94	135–195	135–195
LCC	525	340	450–600	450–600
LP	80	47	-	66–97
LO	23	16	20–32	20–32

LT: total length; LC: tail length; LCC: head-body length; LP: foot length; LO: ear length.

records reported here are remarkable because they fill the information gap in the distribution range of the species, for being located in an area representative of the Chocó-Manabí conservation corridor and the most important strip in terms of the conservation hotspot or the of Tumbes-Chocó Magdalena Priority Terrestrial Ecoregion (ETP). It is worth stressing that this region had not been previously considered within the known distribution of the species, either by Solari et al. (2013) or by Jimenez-Alvarado et al. (2016), although Muñoz-Saba and Alberico (2004) did mention the presence of the species from observations (without reporting the precise locality) in the municipality of Tumaco, while Ramírez-Chaves and Noguera-Urbano (2010) confirmed its presence at La Cruz, jurisdiction of Plazuelas, Department of Nariño. This record in the region suggests that the tropical rain forest (bp-T) located in the central area of the Biogeographic Choco of Colombia should be included within the habitats of the species, in addition to those already described by other researchers (e. g., Yensen and Tarifa 2003; Tirira 2008; Bornholdt et al. 2013).

There is currently scarce information about the biology, ecology and distribution of this rare species (*G. vittata*) in Colombia (Calderon-Capote et al. 2015). As it is rarely observed, it has been listed as a priority species in the research of small carnivores in Colombia (González-Maya et al. 2011; Suarez-Castro and Ramirez-Chaves 2015). The profound transformation of natural ecosystems in Colombia — particularly in the Pacific region currently under deg-



Figure 2. Photographic record of *G. vittata* in the jurisdiction of La Soledad, municipality of Rio Quito (Photographs: Eric Yair Cuesta Ríos).

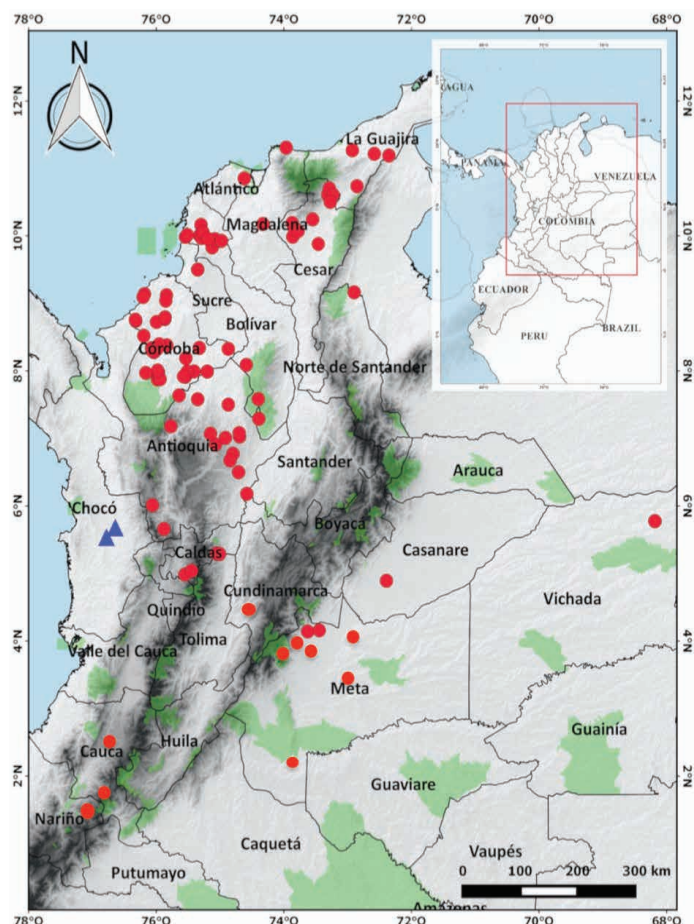


Figure 3. Geographical location of records of *G. vittata* in Colombia: Red circles = records in GBIF (<http://data.gbif.org>), ICN, MHNC, or in the literature: Escobar-Lasso and Guzmán-Hernández, (2014), Jiménez-Alvarado *et al.* (2016). Blue triangles = New records for the Pacific region of Colombia reported here. Green = System of Natural Parks.

radation processes due to open-pit gold and platinum mining, wood logging, hunting and the Tumbes crop system — have all converted the original forest into a number of landscapes, becoming a factor that affects this species and jeopardizes the viability of its local populations.

According to our map, this species is currently located outside the conservation areas in the National System of National Parks (PNN, Figure 1). Ecological macro-analyses involving mammals of the Biogeographic Chocó (e. g., Mantilla-Meluk and Jimenez-Ortega 2006) suggest the creation of a conservation area in the Chocó central area, a proposal that we support, as it is one of the most suitable areas for the conservation of this and other species. *G. vittata* is likely covered by the protected areas of Colombia; however, further sampling is required to confirm its presence in those areas to preserve its populations. This species is considered as threatened with extinction in Costa Rica (Timm *et al.* 1989) due to the loss of habitats through deforestation; its preservation in this country is regulated by the Law on Wildlife Conservation No. 7317, the Organic Law of the Environment No. 7554, and the Decree No. 26435-MINAE. In Belize, *G. vittata* is protected by the Law of Wildlife Protection, and in Nicaragua, hunting of this species is prohibited (Fuller *et al.* 1987). According to the IUCN Red List, *G. vittata* (greater grison) is listed as Least Concern-LC (Cuarón

et al. 2016), and is included in Appendix III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). However, it is not included in the list of threatened species of Colombia (Resol. 1912 of 2017).

Given the huge knowledge gap on *G. vittata* in Colombia, this record for the lowlands in the western Cordillera of the Andes is remarkable, as it broadens its geographic and ecological range in the Pacific region of Colombia, in addition to increasing the number of mammal species recorded for the Department of Chocó. It further highlights the importance of forest conservation in the central area of the Biogeographic Chocó to preserve the diversity of mammals distributed in this portion of the territory.

The information reported here could be used for the development of conservation plans according to data-based analyses on the ecology and conservation status supplemented with distribution maps of this species in the country. This will lead to the identification of priority conservation areas, considering the intensive transformation processes of natural ecosystems in Colombia, particularly in the Colombian Pacific region (Kattan and Naranjo 2008).

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