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Biogeographical regionalisation of the Neotropical region

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Abstract

A biogeographic regionalisation of the Neotropical region is proposed as a hierarchical classification of sub-regions, dominions, provinces and districts. This regionalisation is based on biogeographic analyses of terrestrial plant and animal taxa, and seeks to provide universality, objectivity and stability, such that it can be applied when describing distributional areas of particular taxa or comparing different biogeographic analyses. The Neotropical region is currently comprised of three sub-regions (Antillean, Brazilian and Chacoan), two transition zones (Mexican and South American), seven dominions (Mesoamerican, Pacific, Boreal Brazilian, Southwestern Amazonian, Southeastern Amazonian, Chacoan and Parana) and 53 provinces. For some of the latter, sub-provinces and districts are recognized. Complete synonymies and brief descriptions of the areas are provided, as well as the endemic taxa that diagnose the different provinces.

Key words: Antilles, biogeographical classification, Central America, Mexico, Neotropics, South America

Introduction

The biogeographical regionalisation of the Neotropical region has had a long and complex history (Rapoport 1968; Sánchez Osés & Pérez-Hernández 1998, 2005; Cox 2001; Pérez-Hernández & Lew 2001; Morrone 2002a, 2010a), with many phytogeographical, zoogeographical, biogeographical and ecoregional schemes proposed for over 150 years for the region as a whole or for some particular countries. The existence of different and conflicting area delimitations in these schemes makes the description and comparison of distributional areas rather subjective. Additionally, there are hundreds of names available for naming areas in the Neotropics. The International Code of Area Nomenclature (herein ICAN; Ebach *et al.* 2008) provides some criteria for accommodating existing and newly named areas.

My objective is to provide a regionalisation of the Neotropical region, with explicit area definitions and a standardised nomenclature following ICAN, so that different area definitions for the same name or the same areas with different names can be avoided. This regionalisation is based on terrestrial taxa, and includes previously defined areas and their names.

General structure

A biogeographical regionalisation is a hierarchical system that categorize geographic areas in terms of their biotas, involving the basic levels of realm, region, dominion, province and district (Ebach *et al.* 2008; Escalante 2009). The regionalisation of the Neotropical region presented herein comprises four basic hierarchical levels: sub-regions, dominions, provinces and districts; in a few cases sub-provinces are recognized. In general I followed the nomenclatural conventions set out in ICAN (Ebach *et al.* 2008, 2013), following the notion of priority for using existing names instead of new names. Sclater (1858) is adopted as the date of the starting point of biogeographical nomenclature, as it constitutes the first widely adopted world biogeographical regionalisation. In a few cases I have kept widely used names instead of older synonyms, applying a criterion analogous to the *nomen oblitum* convention of taxonomical nomenclature. In other cases, when several alternative names were competing but none of them was widely used, I selected the name that I believe would provide better stability.

For each biogeographical unit recognized the valid name is provided, followed by a list of its citations and synonyms and a brief diagnosis. For each province, a list of endemic taxa is provided.

During the compilation of the published information, I found that several authors have recognized smaller units within the provinces. As they may be useful to authors describing particular geographical distributions, I present them herein, categorized as districts. In a few cases, when there were clearly identifiable groups of districts, I classified them in sub-provinces. These sub-provinces and districts should be considered as preliminary and future analyses will corroborate their naturalness.

History of the regionalisation of the Neotropical region

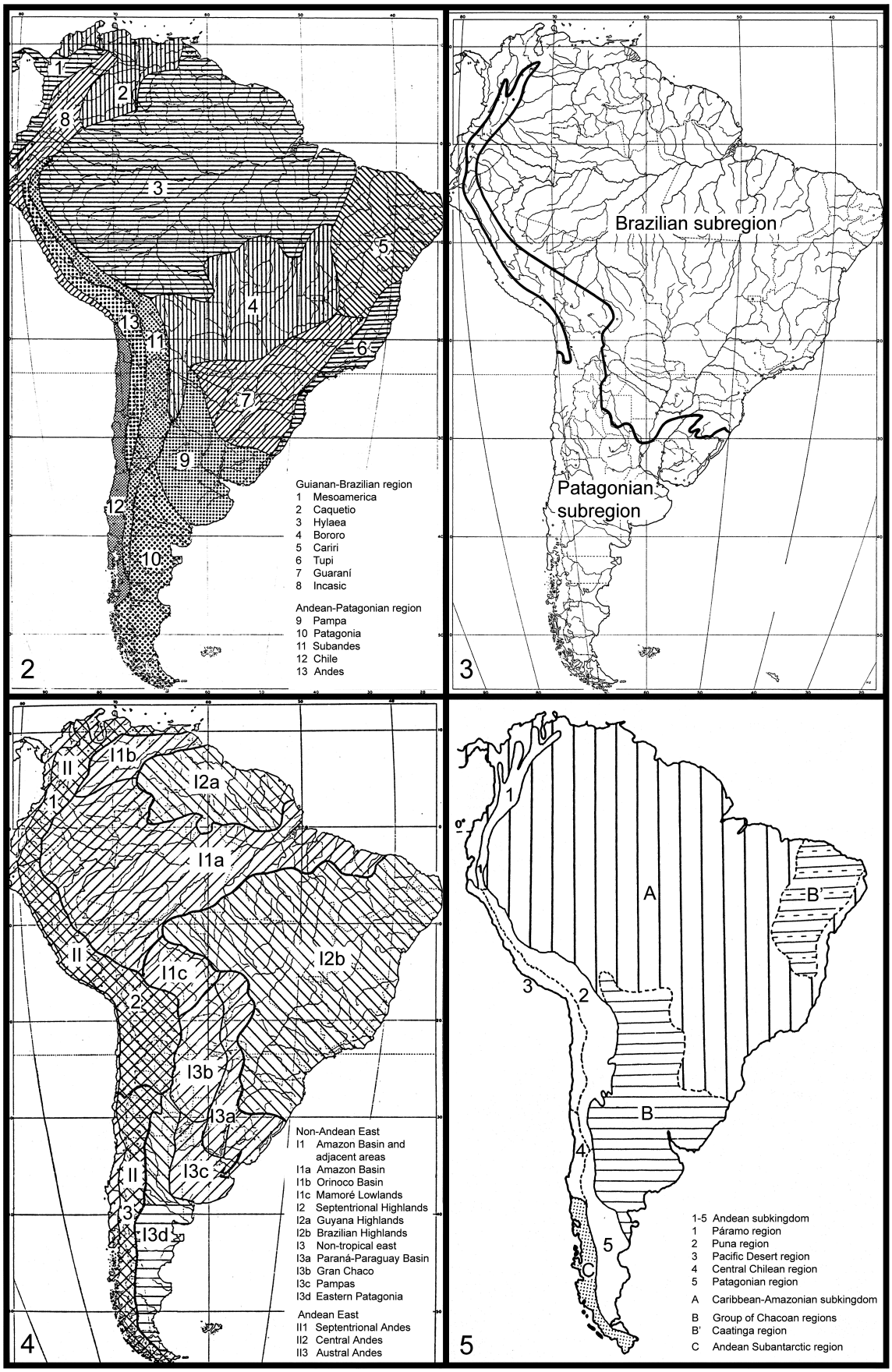
The formal definition of the Neotropical region began with Sclater (1858), who divided the world into six zoogeographic regions, based on bird taxa. Two decades later, Wallace (1876) accepted this scheme and applied it to other vertebrate taxa. According to the Sclater-Wallace system, the Neotropical region comprises South America, Central America and reaches as far north as central Mexico (Fig. 1). This delimitation of the Neotropics was largely accepted, especially by zoogeographers working with vertebrates (Cox 2001). Several phytogeographers and zoogeographers working with invertebrates, however, adopted a more restrictive definition of the Neotropical region, excluding the southern portion and the Andean area of South America, because of their closest links with other Austral areas, mainly Australia, Tasmania, New Guinea, New Zealand and South Africa (Blyth 1871; Engler 1882; Drude 1884; Gill 1885; Allen 1892; Lydekker 1896; Diels 1908; Good 1947; Monrós 1958; Kuschel 1964; Cabrera & Willink 1973; Amorim & Tozoni 1994; Morrone 2002a, 2006; Moreira-Muñoz 2007). In this restricted sense, the Neotropical region corresponds to the tropics of the New World, that is, most of South America, Central America, southern Mexico, and the West Indies. This definition explicitly excludes from the Neotropical region the Andean area of South America, which is assigned to the Andean region (Austral realm) and northern Mexico, which is assigned to the Nearctic region (Holarctic realm). On the other hand, the Mexican transition zone represents the area of overlap between the Nearctic and Neotropical regions, whereas the South American transition zone represents the area of overlap between the Neotropical and Andean regions (Morrone 2004a, 2006, 2010b).

There have been several proposals recognizing sub-regions and dominions within the Neotropical region (Sánchez Osés & Pérez-Hernández 1998; Morrone 2010b). Initially, Wallace (1876) identified four sub-regions (Fig. 1): the Mexican (southern Mexico and Central America), Antillean (West Indies), Brazilian (tropical South America) and Chilean (southern or temperate South America). These sub-regions were subsequently followed during the 19th and 20th centuries. Several authors (Cabrera & Yepes 1940; Fittkau 1969; Hershkovitz 1969; Kuschel 1969; Sick 1969; Rivas-Martínez & Tovar 1983; Smith 1983) have recognized areas in South America that are equivalent to Wallace's sub-regions (Figs. 2–5), naming them Guianan-Brazilian or Brazilian and Andean-Patagonian, Patagonian, Argentinean, Chilean or Austral, respectively. This main division has been also evidenced by more recent biogeographical analyses (Kreft & Jetz, 2010; Procheş & Ramdhani 2012) and also by ecogeographical (Bailey 1998) and macroecological studies (Ruggiero *et al.* 1998; Ruggiero & Ezcurra 2003; Löwenberg-Neto *et al.* 2008).

After some decades of regionalisations based exclusively on plant (phytogeographical) or animal (zoogeographical) taxa, Cabrera & Willink (1973) proposed a biogeographic regionalisation of Latin America based on plant and animal taxa. Within the Neotropical region they recognized five dominions: Caribbean (Mexico, Central America and the Antilles), Amazonian, Guianan, Chacoan and Andean-Patagonian. For North and Central America, Cabrera & Willink (1973) recognized six provinces, which they classified in two regions and three dominions (Fig. 6):

1. Holarctic region
1.1. Pacific North American dominion
1.1.1. Mountain Forest province.
2. Neotropical region
2.1. Caribbean dominion
2.1.1. Mountain Mesoamerican province

FIGURE 1. The Neotropical region and its sub-regions (*sensu* Wallace 1876).



FIGURES 2–5. Four regionalisations of South America. 2, modified from Fittkau (1969); 3, modified from Kuschel (1969); 4, modified from Sick (1969); 5, modified from Rivas-Martínez & Tovar (1983).

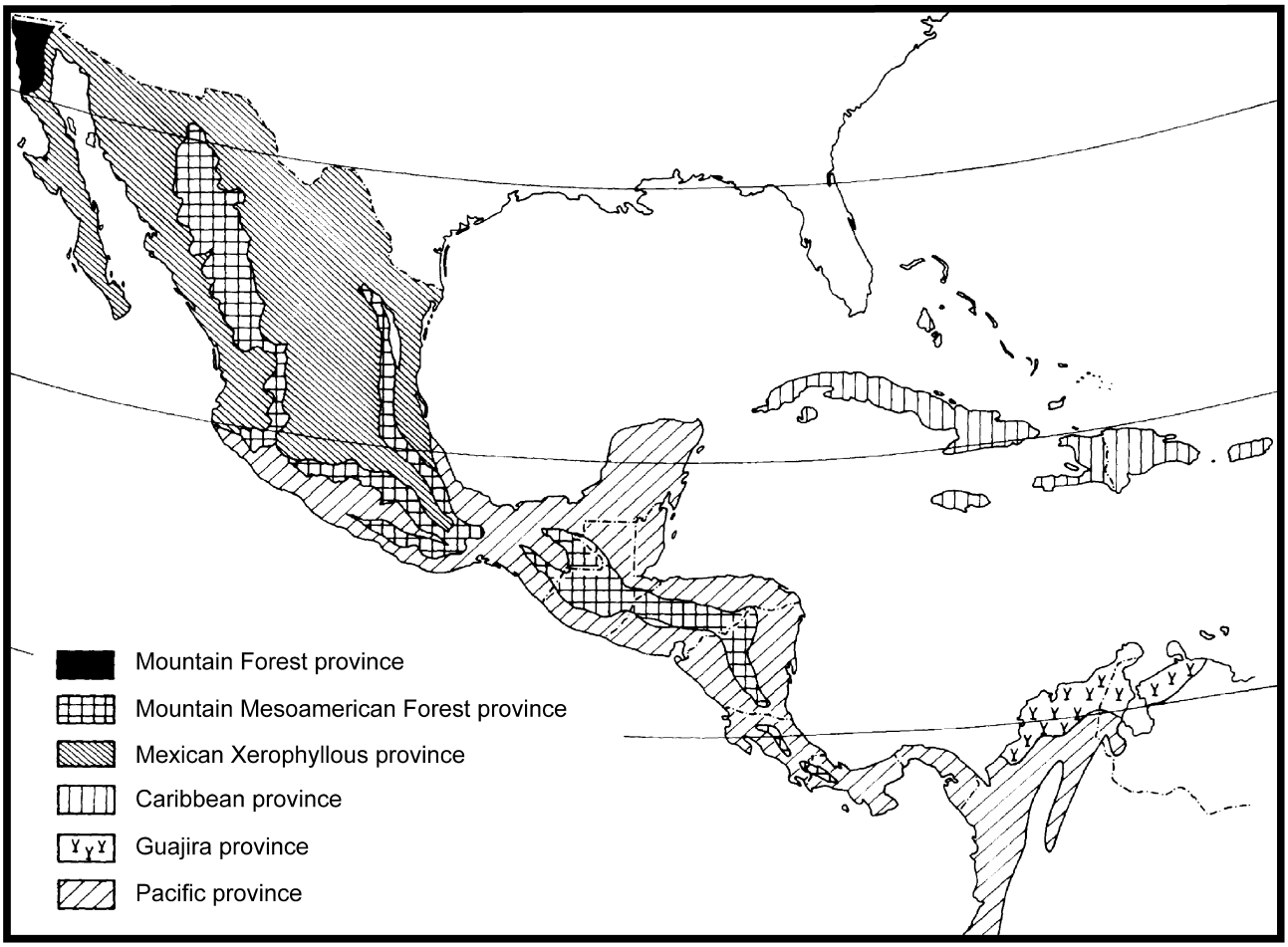


FIGURE 6. Regionalisation of North and Central America (modified from Cabrera & Willink 1973).

2.1.2. Mexican Xerophyllous province.
2.1.3. Caribbean province.
2.1.4. Guajira province.
2.2. Amazonian dominion
2.2.1. Pacific province.

For South America, Cabrera & Willink (1973) recognized 25 provinces, which they classified into two regions and six dominions (Fig. 7):

1. Neotropical region
1.1. Caribbean dominion
1.1.1. Guajira province.
1.1.2. Galápagos Islands province.
1.2. Amazonian dominion
1.2.1. Amazonian province.
1.2.2. Pacific province.
1.2.3. Yungas province.
1.2.4. Venezuelan province.
1.2.5. Cerrado province.
1.2.6. Parana province.
1.2.7. Sabana province.
1.2.8. Atlantic province.

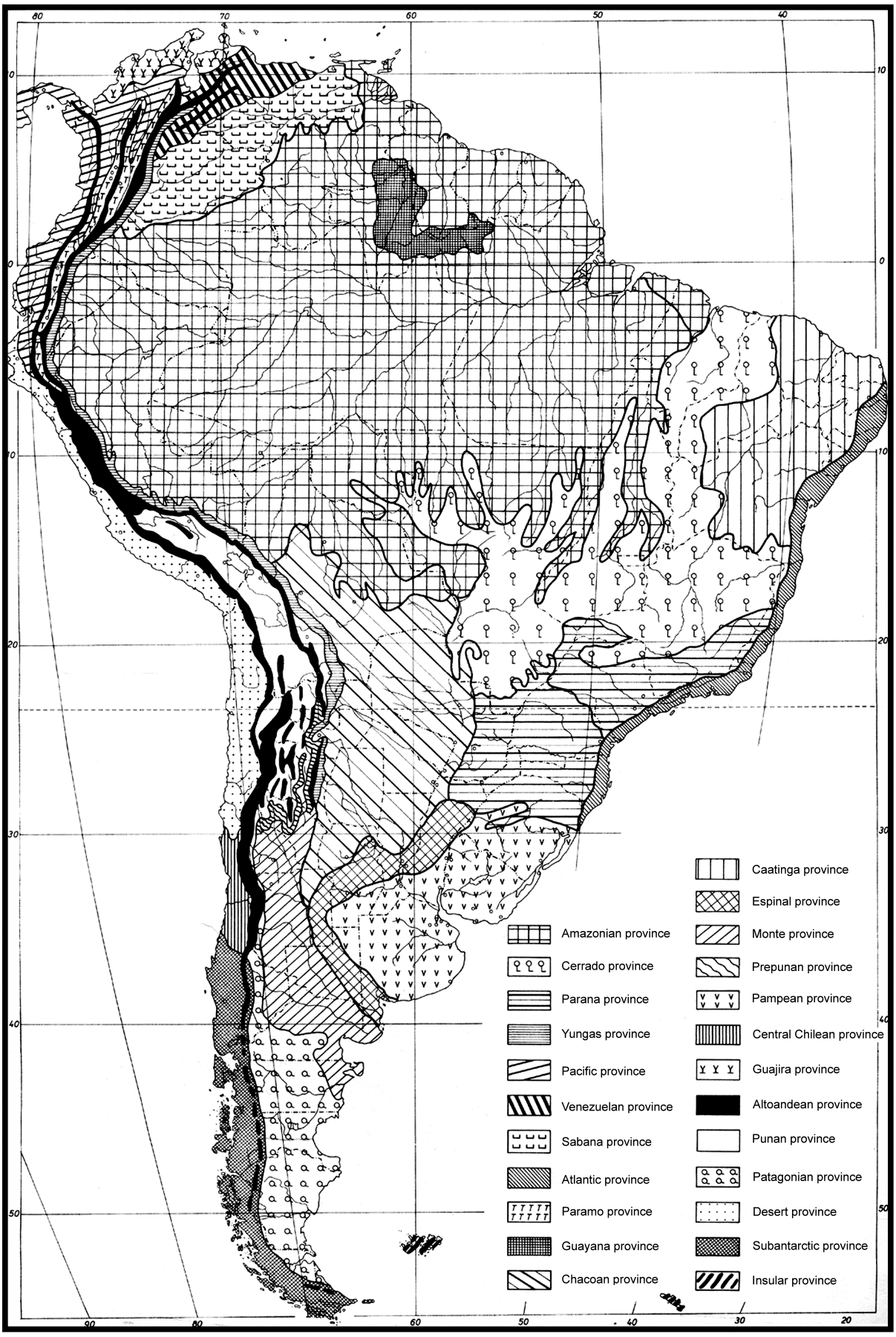


FIGURE 7. Regionalisation of South America (modified from Cabrera & Willink 1973).

1.2.9. Paramo province.
1.3. Guianan dominion
1.3.1. Guyana province.
1.4. Chacoan dominion
1.4.1. Caatinga province.
1.4.2. Chacoan province.
1.4.3. Espinal province.
1.4.4. Prepunan province.
1.4.5. Monte province.
1.4.6. Pampean province.
1.5. Andean-Patagonian dominion
1.5.1. Altoandean province.
1.5.2. Punan province.
1.5.3. Desert province.
1.5.4. Central Chilean province.
1.5.5. Patagonian province.
2. Antarctic region
2.1. Subantarctic dominion
2.1.1. Subantarctic province.
2.1.2. Insular province.

Cabrera & Willink's (1973) Neotropical region does not include the southernmost area of South America, which is assigned to the Antarctic region. This scheme has been widely adopted and has been found to be useful for characterizing and naming geographical areas of many plant and animal taxa.

Müller (1973) analysed the geographical distribution of Neotropical vertebrate taxa. He identified 40 dispersal centres (Fig. 8):

1. Central American Rainforest centre.
2. Central American Montane Forest centre.
3. Yucatán centre.
4. Central American Pacific centre.
5. Coco centre.
6. Costa Rican centre.
7. Talamanca Paramo centre.
8. Barranquilla centre.
9. Santa Marta centre.
10. Sierra Nevada centre.
11. Magdalena centre.
12. Cauca centre.
13. Colombian Montane Forest centre.
14. Colombian Pacific centre.
15. North Andean centre.
16. Catatumbo centre.
17. Venezuelan Coastal Forest centre.
18. Venezuelan Montane Forest centre.
19. Caribbean centre.
20. Roraima centre.
21. Pantepui centre.
22. Guyanan centre.
23. Para centre.
25. Amazon centre.
26. Yungas centre.

FIGURE 8. Dispersal centres of Neotropical vertebrates (modified from Müller 1973).

27. Puna centre.
28. Marañón centre.
29. Andean Pacific centre.
30. Galápagos centre.
31. Caatinga centre.

32. Campo Cerrado centre.
33. Serra do Mar centre.
34. Parana centre.
35. Uruguayan centre.
36. Chaco centre.
37. Monte centre.
38. Pampa centre.
39. Patagonian centre.
40. *Nothofagus* centre.

For each centre, Müller (1973) mapped the distributional areas of several endemic species. Additionally, for several centres, he recognized nested subcentres. Some of these centres and subcentres are coincident with Cabrera & Willink's (1973) provinces, whereas others represent smaller nested units.

Udvardy (1975) introduced an unified system for the world, intended for biogeographical and conservation purposes. He recognized the Palearctic, Nearctic, Africotropical, Indomalayan, Oceanian, Australian, Antarctic and Neotropical realms. Within the Neotropical realm, Udvardy (1975) recognized the following 47 provinces (Fig. 9):

1. Campechean province.
2. Panamanian province.
3. Colombian Coastal province.
4. Guianan province.
5. Amazonian province.
6. Madeiran province.
7. Serra do Mar province.
8. Brazilian Rain Forest province.
9. Brazilian Planalto province.
10. Valdivian Forest province.
11. Chilean *Nothofagus* province.
12. Everglades province.
13. Sinaloan province.
14. Guerreran province.
15. Yucatecan province.
16. Central American province.
17. Venezuelan Dry Forest province.
18. Venezuelan Deciduous Forest province.
19. Ecuadorian Dry Forest province.
20. Caatinga province.
21. Gran Chaco province.
22. Chilean *Araucaria* Forest province.
23. Chilean Sclerophyll province.
24. Pacific Desert province.
25. Monte province.
26. Patagonian province.
27. Llanos province.
28. Campos Limpos province.
29. Babacu province.
30. Campos Cerrados province.
31. Argentinean Pampas province.
32. Uruguayan Pampas province.
33. Northern Andean province.
34. Colombian Montane province.
35. Yungas province.

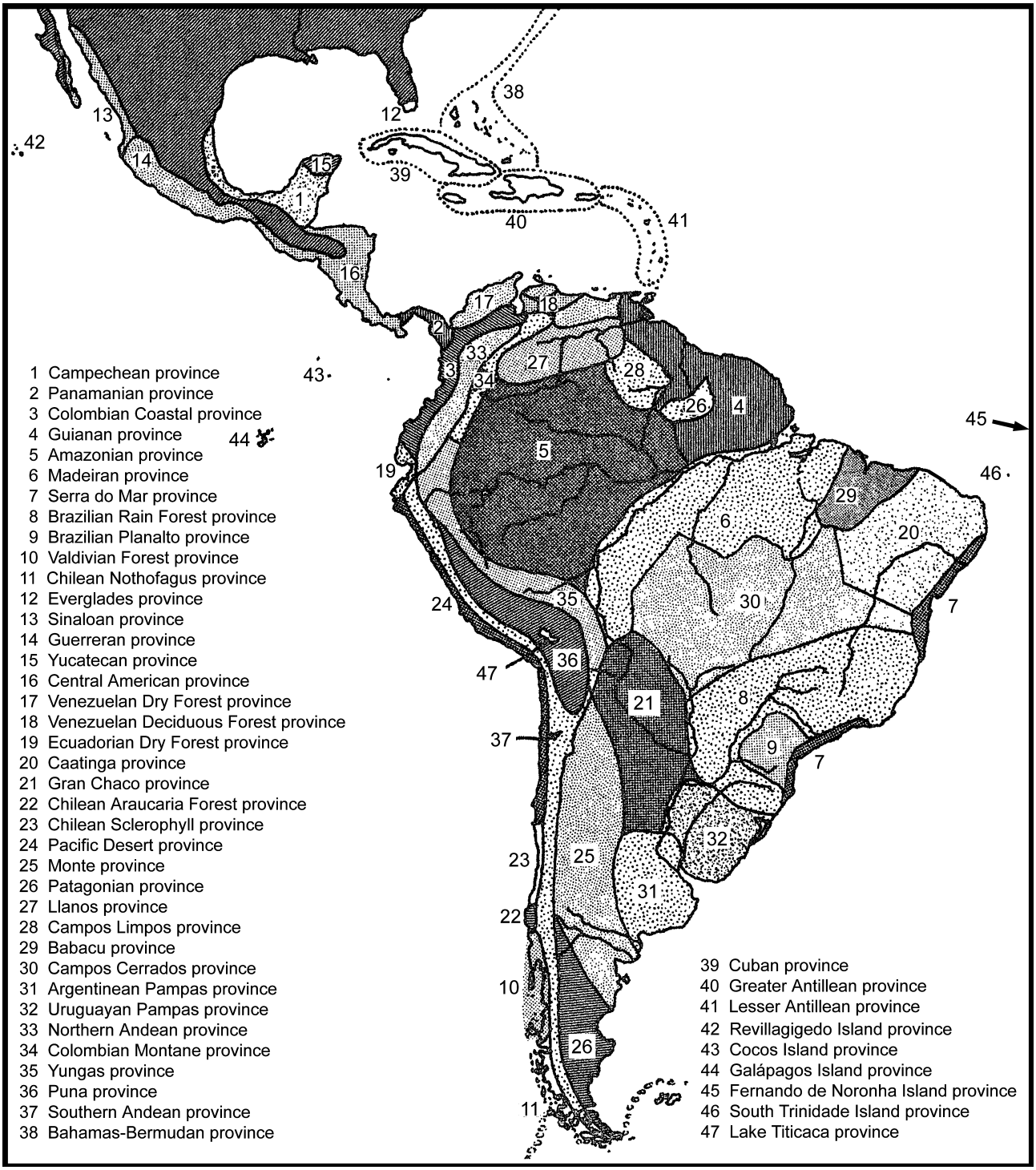


FIGURE 9. Provinces of Latin America (modified from Udvardy 1975).

36. Puna province.
37. Southern Andean province.
38. Bahamas-Bermudan province.
39. Cuban province.
40. Greater Antillean province.
41. Lesser Antillean province.
42. Revillagigedo Island province.
43. Cocos Island province.

44. Galápagos Islands province.
45. Fernando de Noronha Island province.
46. South Trinidade Island province.
47. Lake Titicaca province.

Two decades later, Rivas-Martínez & Navarro (1994) recognized a Neotropical-Austroamerican realm. They classified it into the following sub-realms, regions, sub-regions and provinces (Fig. 10):

1. Neotropical sub-realm
1.1. Caribbeo-Mexican region
1.1.1. Caribbean sub-region
1.1.1.1. Floridan province.
1.1.1.2. Cuban province.
1.1.1.3. Antillean province.
1.1.2. Colombian-Mesoamerican region
1.1.2.1. Mesoamerican province.
1.1.2.2. Colombian province.
1.1.2.3. Ecuatorian province.
1.1.2.4. Galápagos Islands province.
1.1.3. Venezuelan region
1.1.3.1. Septentrional Venezuelan province.
1.1.3.2. Llanos province.
1.1.3.3. Tepuis province.
1.1.4. Amazonian region
1.1.4.1. Western sub-region
1.1.4.1.1. Loreto province.
1.1.4.1.2. Rio Negro province.
1.1.4.1.3. Madeira province.
1.1.4.1.4. Acre-Madre de Dios province.
1.1.4.2. Eastern sub-region
1.1.4.2.1. Roraima-Trombetas province.
1.1.4.2.2. Xingu-Tapajós province.
1.1.4.2.3. Guayanas province.
1.1.4.2.4. Amazon Delta province.
1.1.5. Brazilian-Parana region
1.1.5.1. Cerradoan sub-region
1.1.5.1.1. Cerrado province.
1.1.5.1.2. Tocantins province.
1.1.5.1.3. Beni province.
1.1.5.1.4. Pantanal province.
1.1.5.2. Atlantic-Parana sub-region
1.1.5.2.1. Atlantic province.
1.1.5.2.2. Parana province.
1.1.5.2.3. Caatinga province.
1.1.6. Andean region
1.1.6.1. Punan sub-region
1.1.6.1.1. Peruvian province.
1.1.6.1.2. Bolivian province.
1.1.6.1.3. Argentinean-Atacaman province.
1.1.6.1.4. Monte province.
1.1.6.2. Paramo-Yungan sub-region
1.1.6.2.1. Paramo province.

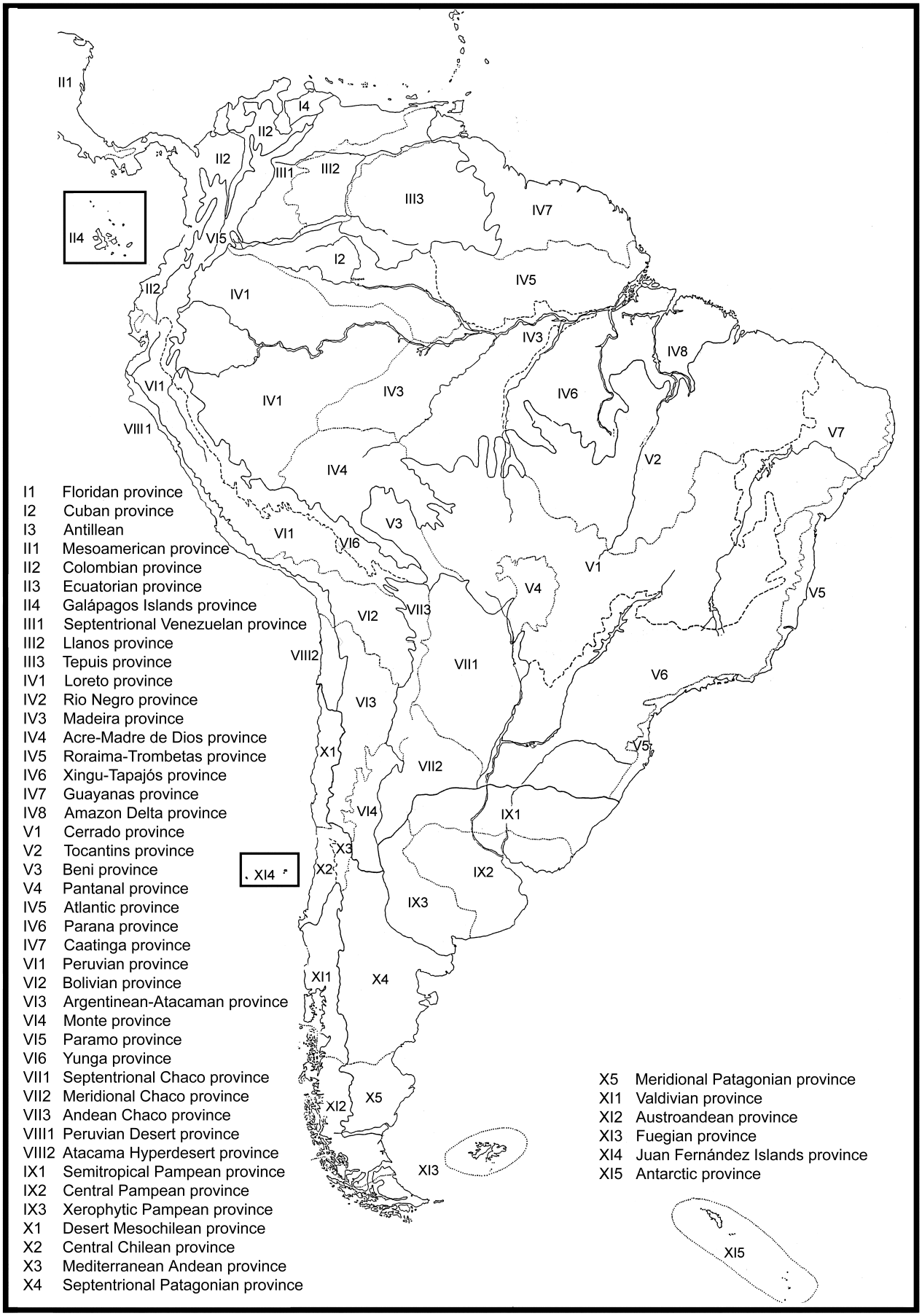


FIGURE 10. Regionalisation of Latin America (modified from Rivas-Martínez & Navarro 1994).

1.1.6.2.2. Yunga province.
1.1.7. Chacoan region
1.1.7.1. Septentrional Chaco province.
1.1.7.2. Meridional Chaco province.
1.1.7.3. Andean Chaco province.
1.1.8. Peruvian Pacific Desert region
1.1.8.1. Peruvian Desert province.
1.1.8.2. Atacama Hyperdesert province.
2. Austroamerican sub-realm
2.1. Pampean region
2.1.1. Semitropical Pampean province.
2.1.2. Central Pampean province.
2.1.3. Xerophytic Pampean province.
2.2. Mesochilean-Patagonian region
2.2.1. Chilean sub-region
2.2.1.1. Desert Mesochilean province.
2.2.1.2. Central Chilean province.
2.2.2. Andean-Patagonian sub-region
2.2.2.1. Mediterranean Andean province.
2.2.2.2. Septentrional Patagonian province.
2.2.2.3. Meridional Patagonian province.
2.3. Valdivian-Magellanic region
2.3.1. Valdivian province.
2.3.2. Austroandean province.
2.3.3. Fuegian province.
2.3.4. Juan Fernández Islands province.
2.3.5. Antarctic province.

Dinerstein *et al.* (1995) proposed a system of ecoregions for Latin America and the Caribbean. These ecoregions were classified based on their major ecosystem types, major habitat types and bioregions as follows (Fig. 11):

1. Tropical broadleaf forests
1.1. Tropical moist broadleaf forests
1.1.1. Caribbean
1.1.1.1. Cuban Moist Forests ecoregion.
1.1.1.2. Hispaniolan Moist Forests ecoregion.
1.1.1.3. Jamaican Moist Forests ecoregion.
1.1.1.4. Puerto Rican Moist Forests ecoregion.
1.1.1.5. Windward Islands Moist Forests ecoregion.
1.1.1.6. Leeward Islands Moist Forests ecoregion.
1.1.2. Central America
1.1.2.1. Oaxacan Moist Forests ecoregion.
1.1.2.2. Tehuantepec Moist Forests ecoregion.
1.1.2.3. Yucatán Moist Forests ecoregion.
1.1.2.4. Sierra Madre Moist Forests ecoregion.
1.1.2.5. Central American Montane Forests ecoregion.
1.1.2.6. Belizean Swamp Forests ecoregion.
1.1.2.7. Central American Atlantic Moist Forests ecoregion.
1.1.2.8. Costa Rica Seasonal Moist Forests ecoregion.
1.1.2.9. Isthmian-Pacific Moist Forests ecoregion.
1.1.2.10. Talamancan Montane Forests ecoregion.

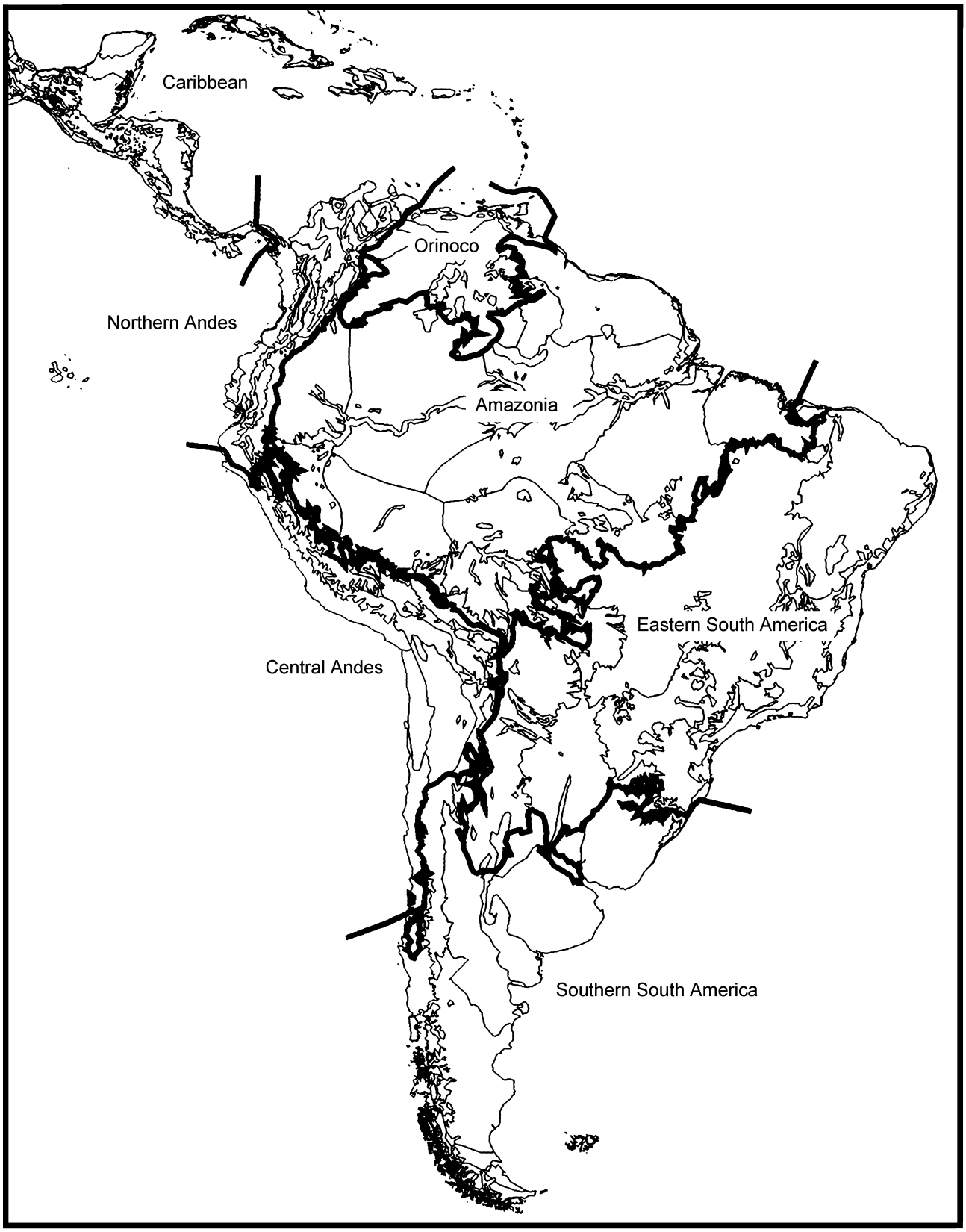


FIGURE 11. Bioregions (modifed from Dinerstein *et al.* 1995).

1.1.3. Orinoco
1.1.3.1. Cordillera La Costa Montane Forests ecoregion.
1.1.3.2. Orinoco Delta Swamp Forests ecoregion.

1.1.3.3. Trinidad & Tobago Moist Forests ecoregion.
1.1.3.4. Guianan Highlands Moist Forests ecoregion.
1.1.3.5. Tepuis ecoregion.
1.1.4. Amazonia
1.1.4.1. Napo Moist Forests ecoregion.
1.1.4.2. Macarena Montane Forests ecoregion.
1.1.4.3. Japura/Negro Moist Forests ecoregion.
1.1.4.4. Uatama Moist Forests ecoregion.
1.1.4.5. Amapá Moist Forests ecoregion.
1.1.4.6. Guianan Moist Forests ecoregion.
1.1.4.7. Paramaribo Swamp Forests ecoregion.
1.1.4.8. Ucayali Moist Forests ecoregion.
1.1.4.9. Western Amazonian Swamp Forests ecoregion.
1.1.4.10. Southwestern Amazonian Moist Forests ecoregion.
1.1.4.11. Juruá Moist Forests ecoregion.
1.1.4.12. Varzea Forests ecoregion.
1.1.4.13. Purus/Madeira Moist Forests ecoregion.
1.1.4.14. Rondônia/Mato Grosso Moist Forests ecoregion.
1.1.4.15. Beni Swamp and Gallery Forests ecoregion.
1.1.4.16. Tapajós/Xingu Moist Forests ecoregion.
1.1.4.17. Tocantins Moist Forests ecoregion.
1.1.5. Northern Andes
1.1.5.1. Chocó/Darién Moist Forests ecoregion.
1.1.5.2. Eastern Panamanian Montane Forests ecoregion.
1.1.5.3. Northwestern Andean Montane Forests ecoregion.
1.1.5.4. Western Ecuador Moist Forests ecoregion.
1.1.5.5. Cauca Valley Montane Forests ecoregion.
1.1.5.6. Magdalena Valley Montane Forests ecoregion.
1.1.5.7. Magdalena/Urabá Moist Forests ecoregion.
1.1.5.8. Cordillera Oriental Montane Forests ecoregion.
1.1.5.9. Eastern Cordillera Real Montane Forests ecoregion.
1.1.5.10. Santa Marta Montane Forests ecoregion.
1.1.5.11. Venezuelan Andes Montane Forests ecoregion.
1.1.5.12. Catatumbo Moist Forests ecoregion.
1.1.6. Central Andes
1.1.6.1. Peruvian Yungas ecoregion.
1.1.6.2. Andean Yungas ecoregion.
1.1.6.3. Eastern South America
1.1.6.4. Brazilian Coastal Atlantic Forests ecoregion.
1.1.6.5. Brazilian Interior Atlantic Forests ecoregion.
1.2. Tropical dry broadleaf forests
1.2.1. Caribbean
1.2.1.1. Cuban Dry Forests ecoregion.
1.2.1.2. Hispaniolan Dry Forests ecoregion.
1.2.1.3. Jamaican Dry Forests ecoregion.
1.2.1.4. Puerto Rican Dry Forests ecoregion.
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1.2.4.2. Trinidad & Tobago Dry Forests ecoregion.
1.2.5. Amazonia
1.2.5.1. Bolivian Lowland Dry Forests ecoregion.
1.2.6. Northern Andes
1.2.6.1. Cauca Valley Dry Forests ecoregion.
1.2.6.2. Magdalena Valley Dry Forests ecoregion.
1.2.6.3. Patía Valley Dry Forests ecoregion.
1.2.6.4. Sinú Valley Dry Forests ecoregion.
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1.2.6.6. Tumbes/Piura Dry Forests ecoregion.
1.2.6.7. Marañón Dry Forests ecoregion.
1.2.6.8. Maracaibo Dry Forests ecoregion.
1.2.6.9. Lara/Falcón Dry Forests ecoregion.
1.2.6. Central Andes
1.2.6.1. Bolivian Montane Dry Forest ecoregion.
2. Conifer/temperate broadleaf forests
2.1. Temperate forests
2.1.1. Southern South America
2.1.1.1. Chilean Winter-rain Forests ecoregion.
2.1.1.2. Valdivian Temperate Forests ecoregion.
2.1.1.3. Subpolar *Nothofagus* Forests ecoregion.
2.2. Tropical and subtropical coniferous forests
2.2.1. Caribbean
2.2.1.1. Cuban Pine Forests ecoregion.
2.2.1.2. Hispaniolan Pine Forests ecoregion.
2.2.1.3. Bahamian Pine Forests ecoregion.
2.2.2. Northern Mexico
2.2.2.1. Sierra Juárez Pine-oak Forests ecoregion.
2.2.2.2. San Lucan Pine-oak Forests ecoregion.
2.2.2.3. Sierra Madre Occidental Pine-oak Forests ecoregion.
2.2.2.4. Central Mexican Pine-oak Forests ecoregion.
2.2.2.5. Sierra Madre Oriental Pine-oak Forests ecoregion.
2.2.2.6. Veracruz Pine-oak Forests ecoregion.
2.2.3. Central America
2.2.3.1. Mexican Transvolcanic Pine-oak Forests ecoregion.
2.2.3.2. Veracruz Montane Forests ecoregion.
2.2.3.3. Sierra Madre del Sur Pine-oak Forests ecoregion.
2.2.3.4. Central American Pine-oak Forests ecoregion.
2.2.3.5. Belizean Pine Forests ecoregion.
2.2.3.6. Miskito Pine Forests ecoregion.

2.2.4. Eastern South America
2.2.4.1. Brazilian *Araucaria* Forests ecoregion.
3. Grasslands/savannas/shrublands
3.1. Grasslands, savannas and shrublands
3.1.1. Northern Mexico
3.1.1.1. Central Mexican Grasslands ecoregion.
3.1.1.2. Eastern Mexican Grasslands ecoregion.
3.1.2. Central America
3.1.2.1. Tabasco/Veracruz Savannas ecoregion.
3.1.2.2. Tehuantepec Savannas ecoregion.
3.1.3. Orinoco
3.1.3.1. Llanos ecoregion.
3.1.4. Amazonia
3.1.4.1. Guianan Savannas ecoregion.
3.1.4.2. Amazonian Savannas ecoregion.
3.1.4.3. Beni Savannas ecoregion.
3.1.5. Eastearn South America
3.1.5.1. Cerrado ecoregion.
3.1.5.2. Chaco Savannas ecoregion.
3.1.5.3. Humid Chaco ecoregion.
3.1.5.4. Córdoba Montane Savannas ecoregion.
3.1.6. Southern South America
3.1.6.1. Argentine Monte ecoregion.
3.1.6.2. Argentine Espinal ecoregion.
3.1.6.3. Pampas ecoregion.
3.1.6.4. Uruguayan Savannas ecoregion.
3.2. Flooded grasslands
3.2.1. Caribbean
3.2.1.1. Cuban Wetlands ecoregion.
3.2.1.2. Enriquillo Wetlands ecoregion.
3.2.2. Northern Mexico
3.2.2.1. Central Mexican Wetlands ecoregion.
3.2.3. Central America
3.2.3.1. Jalisco Palm Savannas ecoregion.
3.2.3.2. Veracruz Palm Savannas ecoregion.
3.2.3.3. Quintana Roo Wetlands ecoregion.
3.2.4. Orinoco
3.2.4.1. Orinoco Wetlands ecoregion.
3.2.5. Amazonia
3.2.5.1. Western Amazonian Flooded Grasslands ecoregion.
3.2.5.2. Eastern Amazonian Flooded Grasslands ecoregion.
3.2.5.3. São Luis Flooded Grasslands ecoregion.
3.2.6. Northern Andes
3.2.6.1. Guayaquil Flooded Grasslands ecoregion.
3.2.7. Eastern South America
3.2.7.1. Pantanal ecoregion.
3.2.7.2. Paran Flooded Savannas ecoregion.
3.3. Montane grasslands
3.3.1. Central America
3.3.1.1. Mexican Alpine Tundra ecoregion.
3.3.1.2. Costa Rican Paramo ecoregion.
3.3.2. Northern Andes

3.3.2.1. Santa Marta Paramo ecoregion.
3.3.2.2. Cordillera de Mérida Paramo ecoregion.
3.3.2.3. Northern Andean Paramo ecoregion.
3.3.3. Central Andes
3.3.3.1. Cordillera Central Paramo ecoregion.
3.3.3.2. Central Andean ecoregion.
3.3.3.3. Central Andean Wet Puna ecoregion.
3.3.3.4. Central Andean Dry Puna ecoregion.
3.3.4. Southern South America
3.3.4.1. Southern Andean Steppe ecoregion.
3.3.4.2. Patagonian Steppe ecoregion.
3.3.4.3. Patagonian Grasslands ecoregion.
4. Xeric formations
4.1. Mediterranean scrub
4.1.1. Northern Mexico
4.1.1.1. California Coastal Sage-chaparral ecoregion.
4.1.2. Central Andes
4.1.2.1. Chilean Matorral ecoregion.
4.2. Desert and xeric scrublands
4.2.1. Caribbean
4.2.1.1. Cuban Cactus Scrub ecoregion.
4.2.1.1. Cayman Islands Xeric Scrub ecoregion.
4.2.1.1. Winward Islands Xeric Scrub ecoregion.
4.2.1.1. Leeward Islands Xeric Scrub ecoregion.
4.2.2. Northern Mexico
4.2.2.1. Baja California Xeric Scrub ecoregion.
4.2.2.2. San Lucan Mezquital ecoregion.
4.2.2.3. Western Mexican Mezquital ecoregion.
4.2.2.4. Sonoran Xeric Scrub ecoregion.
4.2.2.5. Northern Sonoran Cactus Scrub ecoregion.
4.2.2.6. Mexican Interior Chaparral ecoregion.
4.2.2.7. Chihuahuan Xeric Scrub ecoregion.
4.2.2.8. Eastern Mexican Matorral ecoregion.
4.2.2.9. Eastern Mexican Mezquital ecoregion.
4.2.2.10. Central Mexican Cactus Scrub ecoregion.
4.2.3. Central America
4.2.3.1. Pueblan Xeric Scrub ecoregion.
4.2.3.2. Guerreran Cactus Xeric Scrub ecoregion.
4.2.3.3. Motaguan Valley Thornscrub ecoregion.
4.2.4. Orinoco
4.2.4.1. Aruba/Curaçao/Bonaire Cactus Scrub ecoregion.
4.2.4.2. La Costa Xeric Shrublands ecoregion.
4.2.4.3. Araya and París Xeric Scrub ecoregion.
4.2.5. Northern Andes
4.2.5.1. Galápagos Islands Xeric Scrub ecoregion.
4.2.5.2. Guajira/Barranquilla Xeric Scrub ecoregion.
4.2.5.3. Paraguan Xeric Scrub ecoregion.
4.2.6. Central Andes
4.2.6.1. Sechura Desert ecoregion.
4.2.6.2. Atacama Desert ecoregion.
4.2.7. Eastern South America
4.2.7.1. Caatina ecoregion.

4.3. Restingas
4.3.1. Northern Andes
4.3.1.1. Paraguan Restingas ecoregion.
4.3.2. Eastern South America
4.3.2.1. Northeastern Brazil Restingas ecoregion.
4.3.2.2. Brazilian Atlantic Coast Restingas ecoregion.

In addition to these general schemes there are regionalisations for some particular Latin American countries. They refer to Argentina (Cabrera 1951, 1953, 1958, 1971; Ringuelet 1961; Ribichich 2002), Brazil (Mello-Leitão 1937; Fernandes & Bezerra 1990; Fernandes 2006), Chile (Peña 1966a, b; O'Brien 1971; Artigas 1975), Colombia (Hernández *et al.* 1992a-c; Rangel *et al.* 1995a-d), Cuba (León 1946; Panfilov 1970; Voronov 1970; Samek 1973; Borhidi & Muñiz 1986; Del Riso & Vandana 1989; Muñiz 1996), Mexico (Goldman & Moore 1945; Moore 1945; Stuart 1964; West 1964; Rzedowski 1978; Casas-Andreu & Reyna-Trujillo 1990; Ferrusquía-Villafranca 1990; Ramírez-Pulido & Castro-Campillo 1990; Rzedowski & Reyna-Trujillo 1990; Arriaga *et al.* 1997; Escalante *et al.* 1998; Morrone *et al.* 1999, 2002), Peru (Lamas 1982) and Venezuela (Maguire 1979; Huber 1994; Huber & Alarcón 1988; Pérez-Hernández & Lew 2001).

Previously, I have synthesized some of these previous schemes and, mostly based on panbiogeographic analyses of plant and animal taxa, regionalised Latin America and the Caribbean (Morrone 2001e). I divided the Neotropical region into four sub-regions, namely, Caribbean, Amazonian, Chacoan and Parana, and then I identified the Mexican and South American transition zones (Morrone 2004a, 2006, 2010b). This biogeographical classification of Latin America is as follows:

1. Nearctic region
1.1. North American Pacific sub-region
1.1.1. Californian dominion
1.1.1.1. California province.
1.1.1.2. Baja California province.
1.1.2. Continental Nearctic dominion
1.1.2.1. Sonora province.
1.1.2.2. Mexican Plateau province.
1.1.2.3. Tamaulipas province.
2. Mexican transition zone
2.1. Sierra Madre Occidental province.
2.2. Sierra Madre Oriental province.
2.3. Transmexican Volcanic Belt province.
2.4. Sierra Madre del Sur province.
2.5. Chiapas province.
3. Neotropical region
3.1. Caribbean sub-region
3.1.1. Mesoamerican dominion
3.1.1.1. Mexican Pacific Coast province.
3.1.1.2. Mexican Gulf province.
3.1.1.3. Balsas Basin province.
3.1.1.4. Eastern Central America province.
3.1.1.5. Western Panamanian Isthmus province.
3.1.1.6. Yucatan Peninsula province.
3.1.2. Antillean dominion
3.1.2.1. Bahama province.
3.1.2.2. Cuba province.
3.1.2.3. Cayman Islands province.
3.1.2.4. Jamaica province.
3.1.2.5. Hispaniola province.
3.1.2.6. Puerto Rico province.
3.1.2.7. Lesser Antilles province.
3.1.3. Northwestern South American dominion
3.1.3.1. Chocó province.

3.1.3.2. Maracaibo province.
3.1.3.3. Venezuelan Coast province.
3.1.3.4. Trinidad and Tobago province.
3.1.3.5. Magdalena province.
3.1.3.6. Venezuelan Llanos province.
3.1.3.7. Cauca province.
3.1.3.8. Galápagos Islands province.
3.1.3.9. Western Ecuador province.
3.1.3.10. Arid Ecuador province.
3.1.3.11. Tumbes-Piura province.
3.2. Amazonian sub-region
3.2.1. Napo province.
3.2.2. Imerí province.
3.2.3. Guyana province.
3.2.1. Humid Guyana province.
3.2.4. Roraima province.
3.2.5. Amapá province.
3.2.6. Varzea province.
3.2.7. Ucayali province.
3.2.8. Madeira province.
3.2.9. Tapajós-Xingu province.
3.2.10. Pará province.
3.2.11. Pantanal province.
3.2.12. Yungas province.
3.3. Chacoan sub-region
3.3.1. Caatinga province.
3.3.2. Cerrado province.
3.3.3. Chaco province.
3.3.4. Pampa province.
3.4. Parana sub-region
3.4.1. Brazilian Atlantic Forest province.
3.4.2. Parana Forest province.
3.4.3. *Araucaria angustifolia* Forest province.
4. South American transition zone
4.1. North Andean Paramo province.
4.2. Coastal Peruvian Desert province.
4.3. Puna province.
4.4. Atacama province.
4.5. Prepuna province.
4.6. Monte province.
5. Andean region
5.1. Central Chilean sub-region
5.1.1. Coquimbo province.
5.1.2. Santiago province.
5.2. Subantarctic sub-region
5.2.1. Juan Fernández Islands province.
5.2.2. Maule province.
5.2.3. Valdivian Forest province.

5.2.4. Magellanic Forest province.
5.2.5. Magellanic Paramo province.
5.2.6. Malvinas Islands province.
5.3. Patagonian sub-region
5.3.1. Subandean Patagonia province.
5.3.2. Central Patagonia province.

FIGURE 12. Biogeographic regionalisation proposed herein.

In the last two decades, some cladistic biogeographical analyses suggested that the Amazonian and Caribbean sub-regions might not be natural areas (Amorim & Pires 1996; Amorim 2001; Costa 2003; Nihei & Carvalho 2007; Sigrist & Carvalho 2009; Pires & Marinoni 2010; Echeverry & Morrone 2013). More recently, I (Morrone 2014) obtained a general area cladogram, based on the taxon-area cladograms of 36 plant and animal taxa, where the first split separated the Antilles, and the second divided the continental areas into a northwestern and a southeastern component. Within the northwestern component the areas follow the sequence northern Amazonia, southwestern Amazonia, northwestern South America and Mesoamerica, and within the southeastern component the areas follow the sequence southeastern Amazonia, Chaco and Parana. This latter analysis constitutes the basis of this new regionalisation (Fig. 12; Table 1).

TABLE 1. Biogeographic regionalisation of the Neotropical region.

Transition zones/ sub-regions	Dominions	Provinces
Mexican transition zone		Sierra Madre Occidental
		Sierra Madre Oriental
		Transmexican Volcanic Belt
		Sierra Madre del Sur
		Chiapas Highlands
Antillean sub-region		Bahama
		Cuban
		Cayman Islands
		Jamaica
		Hispaniola
		Puerto Rico
		Lesser Antilles
Brazilian sub-region	Mesoamerican	Pacific Lowlands
		Balsas Basin
		Veracruzan
		Yucatán Peninsula
		Mosquito
	Pacific	Guatuso-Talamanca
		Puntarenas-Chiriquí
		Chocó-Darién
		Guajira
		Venezuelan
		Trinidad
		Magdalena
		Sabana
		Cauca
		Galápagos Islands
		Western Ecuador
		Ecuadorian

.....continued on the next page

TABLE 1. (Continued)

Transition zones/ sub-regions	Dominions	Provinces
	Boreal Brazilian	Napo
		Imerí
		Pantepui
		Guianan Lowlands
		Roraima
		Pará
	South Brazilian	Ucayali
		Madeira
		Rondônia
		Yungas
Chacoan sub-region	Southeastern Amazonian	Xingu-Tapajós
	Chacoan	Caatinga
		Cerrado
		Chaco
		Pampean
	Parana	Atlantic
		Parana
		Araucaria Forest
South American transition zone		Paramo
		Desert
		Puna
		Atacama
		Prepuna
		Monte

Area taxonomy

Neotropical region Sclater, 1858

Neotropical region Sclater 1858: 143; Murray 1866: 297; Kirby 1872: 437; Wallace 1876: 78; Sclater 1894: 98; Lydekker 1896: 25; Sclater & Sclater 1899: 52; Bartholomew *et al.* 1911: 9; Newbigin 1913: 221; Mello-Leitão 1937: 221; Orfila 1941: 85; Lane 1943: 409; Cabrera 1951: 24, 1953: 108; Schmidt 1954: 328; Monrs 1958: 143; Halffter 1964: 51 1965: 2; Rapoport 1968: 61; Fittkau 1969: 624; Hershkovitz 1969: 3; Cabrera 1971: 5; Cabrera & Willink 1973: 32; Cabrera 1976: 1; Bănărescu & Boşcaiu 1978: 253; Cadle 1982: 1; Pielou 1992: 6; Vuilleumier 1993: 12; Amorim & Pires 1996: 188; Morrone 1999: 2; Zuloaga *et al.* 1999: 18; Morrone 2001d: 66, 2001e: 25, 2002a: 150; Morrone *et al.* 2002: 91; Lücking 2003: 43; MacDonald 2003: 317; Morrone 2004a: 157; Corona & Morrone 2005: 37; Escalante *et al.* 2005: 202; Morrone 2005: 238; Procheş 2005: 610; Sánchez Osés & Pérez-Hernández 2005: 145; Morrone 2006: 477; Espinosa Organista *et al.* 2008: 58; Löwenberg-Neto *et al.* 2008: 374; Morrone 2010a: 34; Urtubey *et al.* 2010: 505; Procheş & Ramdhani 2012: 263; Holt *et al.* 2013: 77; Morrone 2014: 206.

Austro-Columbian region Huxley 1868: 315.

Columbian region Blyth 1871: 428.

South American realm Engler 1882: 345.

Neotropical realm Heilprin 1887: 73; Diels 1908: 150; Laubenfels 1970: 34; Müller 1973: 6; Udvardy 1975: 41; Rzedowski 1978: 104; Rivas-Martínez & Tovar 1983: 516; Morain 1984: 177; Borhidi & Muñiz 1986: 4; Takhtajan 1986: 250; Muñiz 1996: 283; Brown *et al.* 1998: 31; Olson *et al.* 2001: 934; Beierkuhnlein 2007: 191; Kreft & Jetz 2010: 2044; Moreira-Muñoz 2011: 136.

Tropical American region Blanford 1890: 49.

American Tropical realm Allen 1892: 207.

Neotropical area Clarke 1892: 381.
Tropical region Merriam 1892: 33.
Neogeic realm Lydekker 1896: 64.
Neotropical sub-region Schmidt 1954: 328; Smith 1983: 462; Morrone 1996: 104; Posadas *et al.* 1997: 2.
Latin American region Smith 1983: 462.
Neotropical sub-realm Rivas-Martínez & Navarro 1994: map.
South American region Cox 2001: 519.

Diagnosis. The Neotropical region (Fig. 12) corresponds to the tropical areas of the New World, in most of South America, Central America, southern and central Mexico, and the Antilles (Rapoport 1968; Fittkau 1969; Cabrera & Willink 1973; Morrone 2001e, 2006). Southern Florida has been occasionally assigned to the Neotropical region, although recent analyses seem to indicate that it should be assigned to the Nearctic region (Escalante *et al.* 2013).

Sub-regions and transition zones. The Neotropical region comprises the Antillean, Brazilian and Chacoan sub-regions. In Mexico, the Neotropical region overlaps with the Nearctic region in the Mexican transition zone, whereas in South America it overlaps with the Andean region in the South American transition zone (Morrone 2004a, 2006, 2010b). These transition zones belong simultaneously to the Neotropical region and the Nearctic and Andean regions, respectively.

Mexican transition zone Wallace, 1876

Mexican sub-region (in part) Wallace 1876: 78; Heilprin 1887: 80; Lydekker 1896: 135; Bartholomew *et al.* 1911: 9; Mello-Leitão 1937: 222.
Mexican Highlands region Engler 1882: 345.
Aztec province Engler 1882: 345.
Guatemalan province Engler 1882: 345.
Central American subarea (in part) Clarke 1892: 381.
Central American sub-region (in part) Sclater & Sclater 1899: 65.
Central American-Mexican transition zone Darlington 1957: 456.
Extratropical Highlands realm West 1964: 365.
Tropical Highlands realm West 1964: 365.
Mexican transition zone Halffter 1965: 4, 1974: 229, 1976: 13, 1987: 95; Morrone & Márquez 2001: 636; Márquez & Morrone 2003: 23; Escalante *et al.* 2004: 327; Morrone 2004a: 155; Corona & Morrone 2005: 37; Morrone 2005: 234, 2006: 475; Contreras-Medina *et al.* 2007: 905; Escalante *et al.* 2007a: 562; Halffter *et al.* 2008: 69; Escalante *et al.* 2009: 473; Morrone 2010b: 355; Miguez-Gutiérrez *et al.* 2013: 216; Morrone 2014: 203.
Mountain Mesoamerican province Cabrera & Willink 1973: 32.
Mountain Mesoamerican region Rzedowski 1978: 101.
Central America bioregion (in part) Dinerstein *et al.* 1995: map 1.
Madrean Highlands area Porzecanski & Cracraft 2005: 266.
Mexican Mountain transition zone Espinosa Organista *et al.* 2008: 54.

Diagnosis. Area where the Neotropical and Nearctic regions overlap (Fig. 12). It corresponds basically to the mountainous areas of central and southern Mexico and northern Central America (Halffter 1987; Morrone 2006, 2010b; Espinosa Organista *et al.* 2008) (Fig. 13).

Provinces. The Mexican transition zone comprises the Sierra Madre Occidental, Sierra Madre Oriental, Transmexican Volcanic Belt, Sierra Madre del Sur and Chiapas Highlands provinces.

Sierra Madre Occidental province Goldman & Moore 1945

Sierra Madre Occidental province Goldman & Moore 1945: 253; Moore 1945: 218; Stuart 1964: 350; Rzedowski 1978: 102; Casas-Andreu & Reyna-Trujillo 1990: map; Ferrusquía-Villafranca 1990: map; Ramírez-Pulido & Castro-Campillo 1990: map; Rzedowski & Reyna-Trujillo 1990: map; Arriaga *et al.* 1997: 64; Escalante *et al.* 1998: 285; Campbell 1999: 114; Morrone *et al.* 1999: 510; Espinosa *et al.* 2000: 64; Morrone 2001a: 47, 2001e: 34; Morrone & Márquez 2001: 636; Morrone *et al.* 2002: 91; Corona & Morrone 2005: 38; Escalante *et al.* 2005: 202; Morrone 2005: 234, 2006: 476; Espinosa Organista *et al.* 2008: 56; Morrone 2010b: 358.
Sierra Madre Occidental region West 1964: 368.

Sierra Madre Occidental Pine-oak Forests ecoregion Dinerstein *et al.* 1995: 97.
Madrean province Brown *et al.* 1998: 30.
Sierra Madre Occidental area Katinas *et al.* 2004: 166; Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Western Mexico (states of Chihuahua, Durango, Jalisco, Nayarit, Sinaloa, Sonora and Zacatecas), at an altitude above 1000 m (Morrone 2001a, 2006).

Endemic taxa. LICOPODIOPHYTA. Selaginellaceae: *Selaginella mutica* var. *mutica* (Wagner & Smith 1993). POLYPODIOPHYTA. Dryopteridaceae: *Woodsia philipsii* (Morin 1993); Pteridaceae: *Argyrochosma limitanea* var. *limitanea* and *Cheilanthes arizonica* (Morin 1993; Espinosa *et al.* 2008). CONIFEROPHYTA. Juniperaceae: *Juniperus deppeana* var. *pachyphlaea* (Espinosa *et al.* 2008); Pinaceae: *Pinus engelmanii* and *P. strobiformis* (Morin 1993). MAGNOLIOPHYTA. Ericaceae: *Arbutus madrensis* (González-Elizondo & González-Elizondo 1992); Fagaceae: *Quercus radiata, Q. tarahumara, Q. toumeyi* and *Q. undata* (Espinosa *et al.* 2008). ARTHROPODA. Cleridae: *Enoclerus madrensis* (Rifkind 1994); Lampyridae: *Photinus chihuahuensis* and *P. gorhami* (Zaragoza Caballero 1995); Scarabaeidae: *Coscinocephalus cribrifrons, C. tepehuanus, Hologymnetis argenteola, Homoiosternus beckeri* and *Onthophagus coporoides* (Ratcliffe & Deloya 1992; Lobo & Halffter 1994; Morón 1995; Morón & Ratcliffe 1996; Delgado & Blackaller-Bages 1997); Vaejovidae: *Serradigitus* spp. (Lourenço & Sissom 2000). VERTEBRATA. Ambystomatidae: *Ambystoma rosaceum* (Espinosa Organista *et al.* 2008); Colubridae: *Thamnophis rufipunctatus* (Espinosa *et al.* 2008); Corvidae: *Cyanocorax dickeyi* (Arriaga *et al.* 1997); Cricetidae: *Microtus mexicanus madrensis, Neotoma palatina, Peromyscus aztecus spicilegus* and *P. polius* (Escalante *et al.* 2005; Arriaga *et al.* 1997; Sullivan *et al.* 1997; Espinosa *et al.* 2008; Harris *et al.* 2009); Crotalidae: *Crotalus willardi* (Espinosa *et al.* 2008); Phrynosomatidae: *Phrynosoma douglasi* and *Sceloporus jarrovi jarrovi* (Espinosa Organista *et al.* 2008); Psittacidae: *Rhynchopsitta pachyrhyncha* (Arriaga *et al.* 1997); Sciuridae: *Glaucomys volans madrensis, Sciurus nayaritensis apache, Spermophilus madrensis* and *Tamias bulleri* (Arriaga *et al.* 1997; Escalante *et al.* 2055); Trogonidae: *Euptilotis neoxenus* (Arriaga *et al.* 1997).

Districts. Smith (1941) and Moore (1945) have delimited nested units, which are treated herein as two districts: Apachian and Durangoan. For a preliminary circumscription of both districts, Moore's (1945) Tarahumare and Tepehuane districts (Fig. 14) are considered.

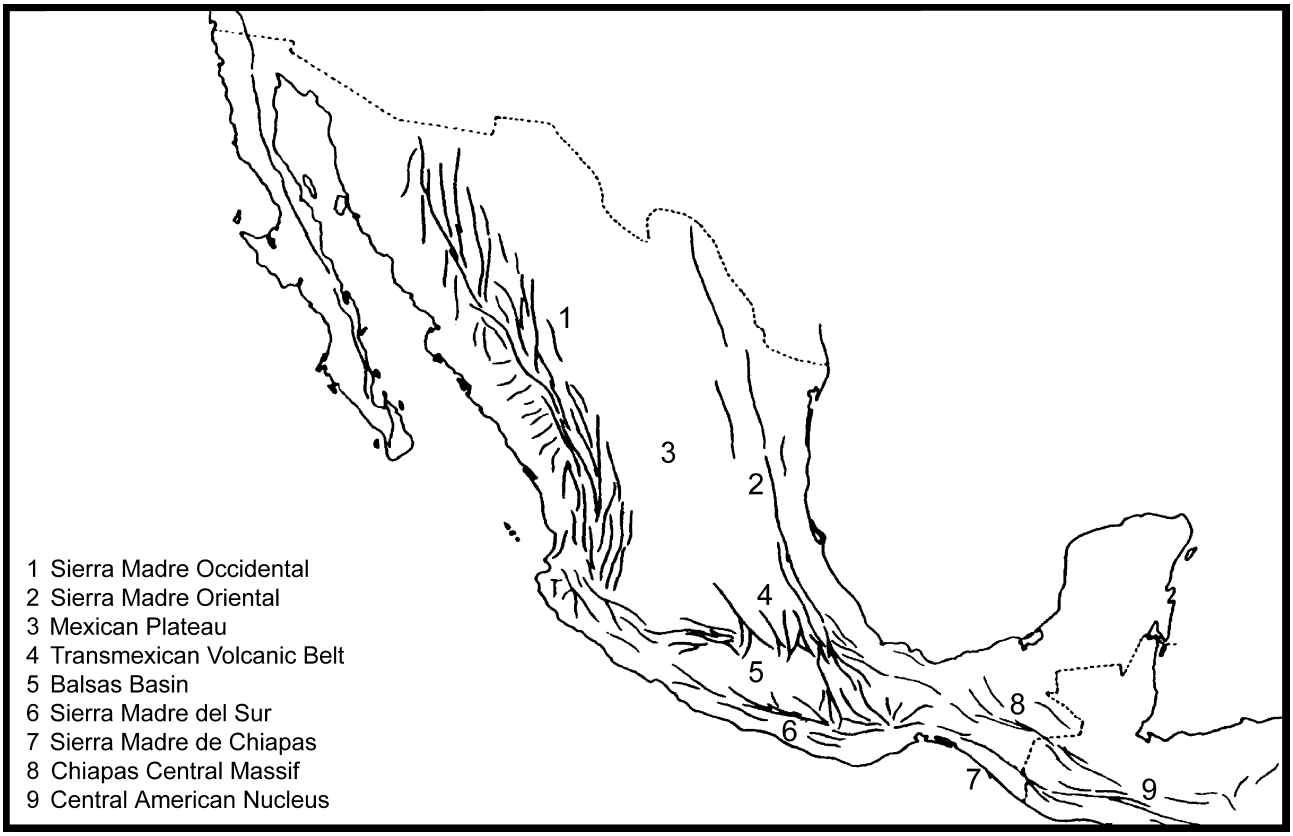


FIGURE 13. Mexican transition (modified from Halffter 1987).

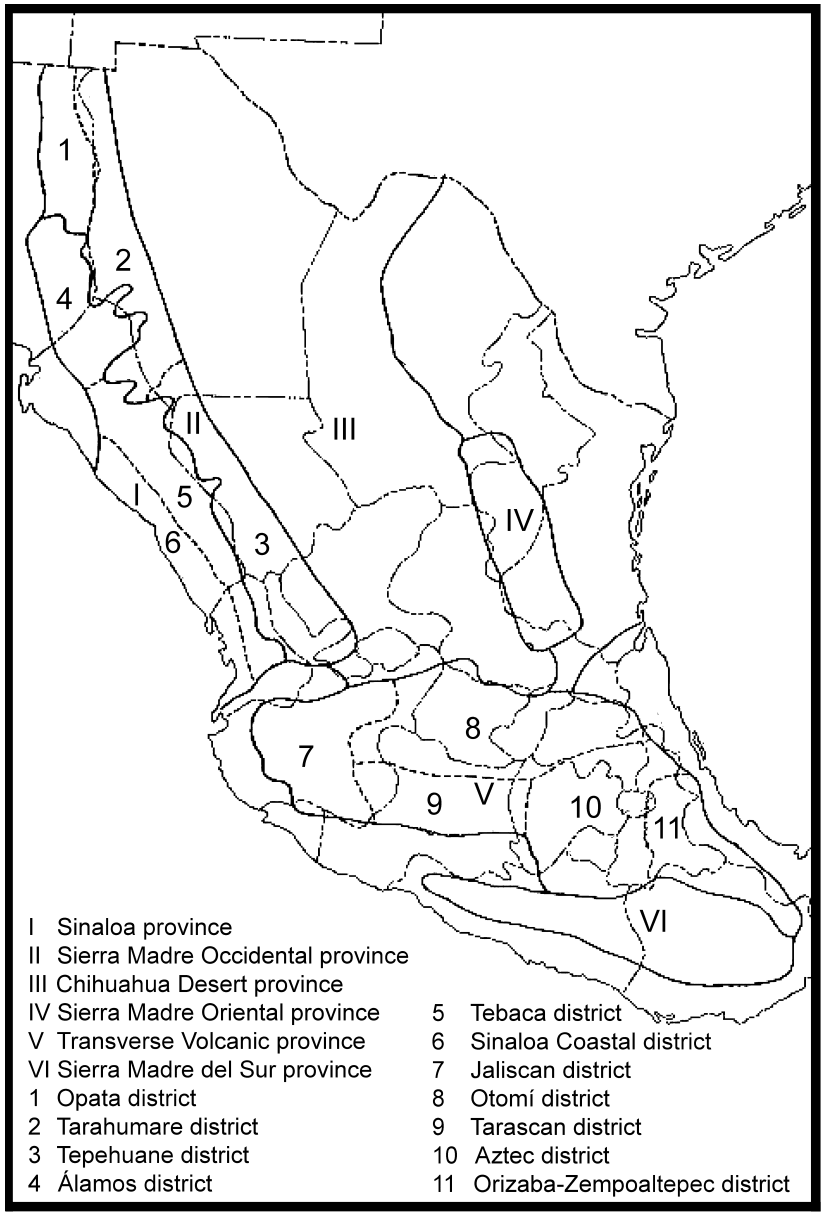


FIGURE 14. Regionalisation of Mexico and Central America (modified from Moore 1945).

Apachian district Smith, 1941, **stat. nov.**
Apachian province Smith, 1941: 108; Dice 1943: 56.
Tarahumare district Moore 1945: 218.
Sierra Madre Occidental-Central Plateau area (in part) Marshall & Liebherr 2000: 205.

Durangoan district Smith 1941, **stat. nov.**
Durangoan province Smith 1941: 109; Dice 1943: 58.
Tepehuane district Moore 1945: 218.
Southern Sierra Madre Occidental area Marshall & Liebherr 2000: 205.

Sierra Madre Oriental province Goldman & Moore 1945

Sierra Madre Oriental province Goldman & Moore 1945: 356; Moore 1945: 218; Stuart 1964: 350; Rzedowski 1978: 103; Casas-Andreu & Reyna-Trujillo 1990: map; Ferrusquía-Villafranca 1990: map; Ramírez-Pulido & Castro-Campillo 1990: map; Rzedowski & Reyna-Trujillo 1990: map; Arriaga *et al.*1997: 64; Escalante *et al.*1998: 285; Campbell 1999: 114;

Morrone *et al.*1999: 510; Espinosa *et al.*2000: 64; Morrone 2001a: 48, 2001e: 35; Morrone & Márquez 2001: 636; Morrone *et al.*2002: 92; Corona & Morrone 2005: 38; Escalante *et al.*2005: 202; Morrone 2005: 235, 2006: 476; Espinosa Organista *et al.*2008: 56; Escalante *et al.*2009: 473; Morrone 2010b: 358.

Sierra Madre Oriental region West 1964: 368.

Sierra Madre Oriental Pine-oak Forests ecoregion Dinerstein *et al.*1995: 97.

Sierra Madre Oriental area Marshall & Liebherr 2000: 206; Katinas *et al.*2004: 166; Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Eastern Mexico (states of Coahuila, Hidalgo, Nuevo León, Puebla, Querétaro, San Luis Potos and Veracruz), at an altitude above 1500 m (Morrone 2001a).

Endemic taxa. Polypodiophyta. *Dryopteridaceae: Elaphoglossum rufescens* (Espinosa *et al.*2008); Pteridaceae: *Cheilanthes decomposita* (Espinosa *et al.*2008). CONIFEROPHYTA. Pinaceae: *Pinus ayacahuite var. veitchii, P. culminicula* and *P. pseudostrobus fo. protuberans* (Espinosa *et al.*2008). MAGNOLIOPHYTA. Asparagaceae: *Agave inaequidens, A. horrida* and *A. tenuifolia* (Zamudio-Ruiz & Sánchez-Martínez 1995; Espinosa *et al.*2008); Fagaceae: *Quercus acutifolia var. xalapensis* and *Q. sinuata breviloba* (Espinosa *et al.*2008); Juglandaceae: *Juglans mollis* (Rzedowski 1978); Styracaceae: *Styrax argenteus* (Carranza-González 1993). ARTHROPODA. Papilionidae: *Pterourus palamedes leontis* (Llorente *et al.*1997); Passalidae: *Odontotaenius zodiacus, Petrejoides laticornis, P. nebulosus, P. orizabae* and *P. silvaticus* (Castillo & Reyes-Castillo 1984; Castillo *et al.*1988); Scarabaeidae: *Anopsiostes pauliani, Cotinis orientalis* and *Homoiosternus setosus* (Delgado & Blackaller-Bages 1997; Delgado & Hernández 1998); Staphylinidae: *Styngetus deyrollei* (Navarrete-Heredia 1997); Superstitionidae: *Typhlochactas spp.* (Louren?o & Sissom 2000). VERTEBRATA. Colubridae: *Rhadinea gaigae* and *Thamnophis exsul* (Arriaga *et al.*1997; Espinosa *et al.*2008); Cricetidae: *Neotoma angustapalata, A. mexicana navus, Peromyscus aztecus aztecus, P. furvus* and *P. ochraventer* (Sullivan *et al.*1997; Escalante *et al.*2005; Espinosa *et al.*2008); Crotalidae: *Crotalus lepidus castaneus, C. lepidus morulus* and *C. pricei miquihuanus* (Espinosa *et al.*2008); Eleutherodactylidae: *Eleutherodactylus longipes* (Espinosa *et al.*2008); Geomyidae: *Cratogeomys neglectus* (Escalante *et al.*2005); Odontophoridae: *Dendrortyx barbatus* (Arriaga *et al.*1997); Phrynosomatidae: *Phrynosoma orbiculare boucardi, P. orbiculare orientale* and *Sceloporus parvus scutulatus* (Espinosa *et al.*2008); Soricidae: *Cryptotis mexicana obscura* (Espinosa *et al.*2008); Strigidae: *Glaucidium sanchezi* (Arriaga *et al.*1997); Xenosauridae: *Xenosaurus newmanorum* and *X. platiceps* (Espinosa *et al.*2008).

Sub-provinces and districts. Espinosa *et al.*(2004, 2008) have delimited two sub-provinces and four districts. The Austral-Oriental sub-province corresponds to the northern portion of the province (Sierra Gorda and Zacualtipán districts) and the Hidalgo sub-province corresponds to its southern portion (Potosí and Saltillo-Parras districts).

Austral-Oriental sub-province Smith 1941, **stat. nov.**
Austral-Oriental province Smith 1941: 108.
Meridional sub-province Espinosa *et al.*2004: 294.

Sierra Gorda district Espinosa *et al.*2004
Sierra Gorda district Espinosa *et al.*2004: 294, 2008: 56.

Zacualtipán district Espinosa *et al.*2004
Zacualtipán district Espinosa *et al.*2004: 294.
Carso Huasteco district Espinosa *et al.*2008: 56.

Hidalgo sub-province Smith, 1941, **stat. nov.**
Hidalgo province Smith 1941: 108.
Septentrional sub-province Espinosa *et al.*2004: 294.

Potosí district Espinosa *et al.*2004
Potosí district Espinosa *et al.*2004: 294.
Gran Sierra Plegada district Espinosa *et al.*2008: 56.

Saltillo-Parras district Espinosa *et al.*2004
Saltillo-Parras district Espinosa *et al.*2004: 294.
Sierras Transversales district Espinosa *et al.*2008: 56.

Transmexican Volcanic Belt province Morrone 2001a

Austral-Western province Smith 1941: 108.
Transverse Volcanic province Goldman & Moore 1945: 356; Moore 1945: 218; Stuart 1964: 351.
Mesa Central area (in part) West 1964: 368.
Meridional Mountains province (in part) Rzedowski 1978: 103; Rzedowski & Reyna-Trujillo 1990: map.
Neovolcanic Axis province Casas-Andreu & Reyna-Trujillo 1990: map; Escalante *et al.*1998: 285; Espinosa Organista *et al.*2008: 56.
Neovolcanic province Ferrusquía-Villafranca 1990: map.
Mexican Transvolcanic Pine-oak Forests ecoregion Dinerstein *et al.*1995: 97.
Mexican Alpine Tundra ecoregion Dinerstein *et al.*1995: 101.
Volcanic Axis province Arriaga *et al.*1997: 64; Morrone *et al.*1999: 510; Espinosa *et al.*2000: 64.
Transvolcanic province Brown *et al.*1998: 29.
Transvolcanic Mountain area Marshall & Liebherr 2000: 206.
Transmexican Volcanic Belt province Morrone 2001a: 48, 2001e: 35; Morrone & Márquez 2001: 636; Morrone *et al.*2002: 93; Corona & Morrone 2005: 38; Escalante *et al.*2005: 202; Morrone 2005: 236, 2006: 477; Corona *et al.*2007: 1008; Escalante *et al.*2007b: 486; Espinosa & Ocegueda 2007: 6; Ferrusquía-Villafranca, 2007: 8; Martínez-Aquino *et al.*2007: 449; Navarro-Sigüenza *et al.*2007: 462; Morrone 2010b: 358; Gámez *et al.*2012: 259; Suárez-Mota *et al.*2013: 94.
Trans-Mexican Volcanic area Katinas *et al.*2004: 166.
Transvolcanic area Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Central Mexico (states of Aguascalientes, Distrito Federal, Guanajuato, Jalisco, Mexico, Michoacán, Oaxaca, Puebla, Tlaxcala and Veracruz), at an altitude above 1800 m (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Montanoa frutescens* (Funk 1982). ARTHROPODA. Buprestidae: *Acmaeodera cuprina, A. rubronotata*, *Agaeocera gigas*, *Agrilus balaenicaudus*, *A. carissimus*, *A. cavatus*, *A. funestus*, *A. furcillatus*, *A. ixcuinae*, *A. nodifrons*, *A. scabrosus*, *Cinyra uniformis, Cyphothorax palleolatus, Chrysobothris capitata, C. melazona, C. merkelii, C. stellifera, Lampetis chalconota, L. granulifera, Taphrocerus orizabae and Tetragonoschema humeralis* (Corona *et al.*2009); Ceratopogonidae: *Culicoides albomaculata, C. bakeri and C. dampfi* (Arriaga *et al.*1997); Formicidae: *Polybia simillina* (Arriaga *et al.*1997); Mydidae: *Mydas oaxacensis* (Arriaga *et al.*1997); Passalidae: *Odontotaenius cuspidatus* (Castillo *et al.*1988); Scarabaeidae: *Golofa globulicornis* and *Onthophagus hippopotamus* (Lobo & Halffter 1994; Morón 1995). VERTEBRATA. Cricetidae: *Neotoma nelsoni, Peromyscus aztecus hylocetes, P. gratus gratus, P. leucotus,P. mekisturus, P. melanophrys zamorae* and *Reithrodontomys chrysopsis* (Arriaga *et al.*1997; Sullivan *et al.*1997; Escalante *et al.*2005; Espinosa *et al.*2008); Crotalidae: *Crotalus polysticus* (Espinosa *et al.*2008); Didelphidae: *Marmosa canescens oaxacae* (Arriaga *et al.*1997); Eleutherodactylidae: *Eleutherodactylus angustidigitorum* (Espinosa *et al.*2008); Fringillidae: *Geothlypis speciosa* (Arriaga *et al.*1997); Leporidae: *Romerolagus diazi* and *Sylvilagus floridanus aztecus* (Arriaga *et al.*1997; Escalante *et al.*2005); Phrynosomatidae: *Phrynosoma orbiculare cortezi*, *Sceloporus dugesi intermedius* and *S. scalaris scalaris* (Espinosa *et al.*2008); Sciuridae: *Spermophilus mexicanus mexicanus* and *S. perotensis* (Arriaga *et al.*1997; Escalante *et al.*2005); Soricidae: *Cryptotis goldmani alticola* and *Sorex vagrans orizabae* (Arriaga *et al.*1997); Trochilidae: *Lampornis amethystinus brevirostris* (Espinosa *et al.*2008).

Sub-provinces and districts. Some units nested within this province that have been identified by several authors (Moore 1945; Rzedowski 1978; Ferrusquía-Villafranca 1990; Escalante *et al.*2007b; Torres Miranda & Luna 2007; Gámez *et al.*2012; Suárez-Mota *et al.*2013) are treated herein as two sub-provinces and five districts: East sub-province (Aztec and Orizaba-Zempoaltepec districts) and West sub-province (Jaliscan, Otomí and Jaliscan districts). As a preliminary delimitation, I consider Torres Miranda & Luna's (2007) districts (Fig. 15).

East sub-province Escalante *et al.*2007b, **stat. nov.**
Meridional sub-province (in part) Ferrusquía-Villafranca 1990: map.
Septentrional sub-province (in part) Ferrusquía-Villafranca 1990: map.

East district Escalante *et al.*2007b: 496; Gámez *et al.*2012: 268.
Eastern zone Suárez-Mota *et al.*2013: 101.

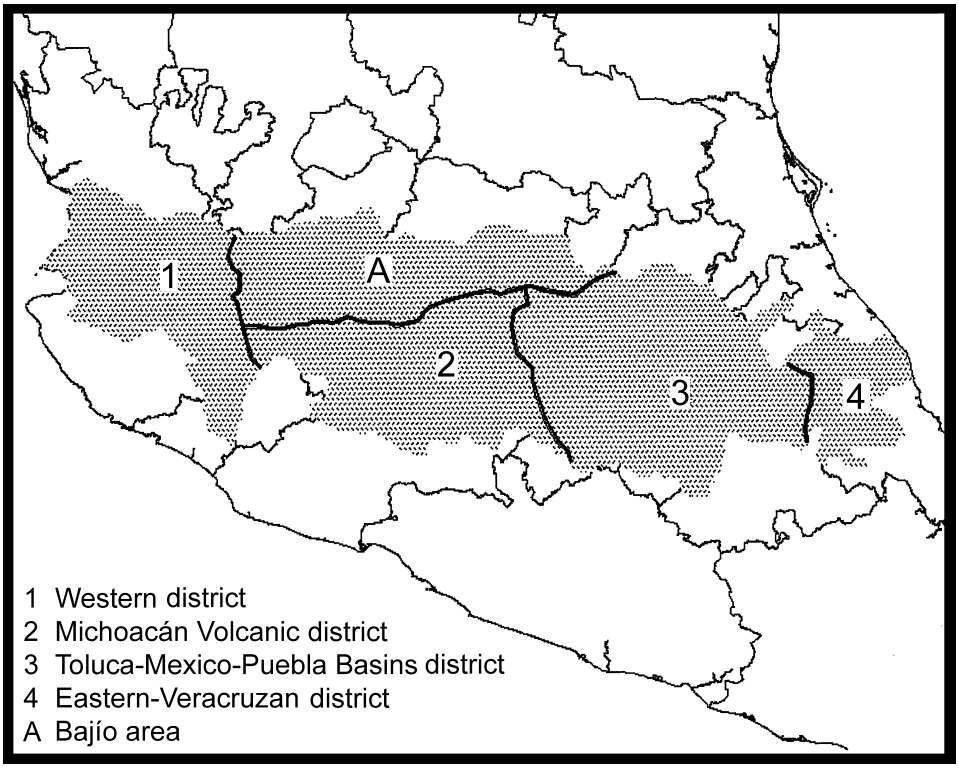


FIGURE 15. Districts of the Transmexican Volcanic Belt province (modified from Torres Miranda & Luna 2007).

Aztec district Moore 1945
Aztec district Moore 1945: 218.
Toluca-Mexico-Puebla Basins district Torres Miranda & Luna 2007: 513.

Orizaba-Zempoaltepec district Moore 1945
Orizaba-Zempoaltepec district Moore 1945: 218.
Tehuacán and Cuicatlán Valley province Rzedowski 1978: 107.
Tehuacán Valley province Rzedowski & Reyna-Trujillo 1990: map.
Oaxacan province (in part) Ferrusquía-Villafranca 1990: map.
Cañadian sub-province Ferrusquía-Villafranca 1990: map.
Mixteco-Zapotecan sub-province Ferrusquía-Villafranca 1990: map.
Oaxaco-Tehuacanan province (in part) Ramírez-Pulido & Castro-Campillo 1990: map.
Oaxacan Dry Forests ecoregion Dinerstein *et al.*1995: 94.
Oaxacan Moist Forests ecoregion Dinerstein *et al.*1995: 87.
Eastern-Veracruzan district Torres Miranda & Luna 2007: 513.

West sub-province Escalante *et al.*2007b, **stat. nov**.
Meridional sub-province (in part) Ferrusquía-Villafranca 1990: map.
Septentrional sub-province (in part) Ferrusquía-Villafranca 1990: map.
West district Escalante *et al.*2007b: 496; Gámez *et al.*2012: 268.
Western zone Suárez-Mota *et al.*2013: 101.

Jaliscan district Moore 1945
Jaliscan district Moore 1945: 218.
Western district Torres Miranda & Luna 2007: 512.

Otomí district Moore 1945
Otomí district Moore 1945: 218.

Tarascan district Moore 1945
Tarascan district Moore 1945: 218.
Michoacán Volcanic district Torres Miranda & Luna 2007: 512.

Sierra Madre del Sur province Goldman & Moore 1945

Sierra Madre del Sur province Goldman & Moore 1945: 358; Moore 1945: 218; Stuart 1964: 351; Casas-Andreu & Reyna-Trujillo 1990: map; Ramírez-Pulido & Castro-Campillo 1990: map; Arriaga *et al.*1997: 65; Campbell 1999: 116; Morrone *et al.* 1999: 510; Espinosa *et al.* 2000: 64; Morrone 2001a: 49, 2001e: 39; Morrone & Márquez 2001: 637; Morrone *et al.* 2002: 95; Corona & Morrone 2005: 38; Escalante *et al.* 2005: 202; Morrone 2005: 237, 2006: 477; Espinosa Organista *et al.* 2008: 57; Escalante *et al.* 2009: 473; Morrone 2010b: 358.
Sierra and Mesa del Sur region West 1964: 368.
Meridional Mountains province (in part) Rzedowski 1978: 103; Rzedowski & Reyna-Trujillo 1990: map.
Sierra Juárez Pine-oak Forests ecoregion Dinerstein *et al.* 1995: 96.
Sierra Madre del Sur Pine-oak Forests ecoregion Dinerstein *et al.* 1995: 97.
Sierra Madre del Sur area Marshall & Liebherr 2000: 206; Katinas *et al.* 2004: 166.
Highlands of Southern Mexico area Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. South Central Mexico, between southern Michoacán and Guerrero and Oaxaca and part of Puebla, at an altitude above 1000 m (Morrone 2001a).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Montanoa grandiflora, M. mollissima* and *M. tomentosa* subsp. *microcephala* (Funk 1982); Chletraceae: *Chletra glaberrima* (Espinosa *et al.* 2008). ARTHROPODA. Curculionidae: *Naupactus virescens, N. stupidus, N, sulfuratus, Pantomorus longulus, P. parvulus, P. picturatus, Phacepholis brevipes* and *P. globicollis* (Rosas *et al.* 2011a); Passalidae: *Petrejoides imbellis* and *P. jalapensis* (Castillo & Reyes-Castillo 1984); Scarabaeidae: *Cotinis ibarrai* and *Onthophagus bassarisus* (Deloya & Ratcliffe 1988; Lobo & Halffter 1994; Deloya 1995); Staphylinidae: *Gansia flavata* (Ashe & Lingafelter 1995). VERTEBRATA. Anguidae: *Abronia mixteca* and *A. oaxacae* (Espinosa *et al.* 2008); Cricetidae: *Microtus umbrosus, Peromyscus aztecus evides, P. gratus zapotecae, P. megalops* and *P. mexicanus putlaensis* (Sullivan *et al.* 1997; Escalante *et al.* 2005; Espinosa *et al.* 2008); Leporidae: *Sylvilagus insonus* (Escalante *et al.* 2005); Phrynosomatidae: *Sceloporus formosus scitulus* and *Urosaurus bicarinatus nelsoni* (Espinosa *et al.* 2008); Plethodontidae: *Pseudoeurycea cochranae* and *P. unguidentis* (Espinosa *et al.* 2008); Soricidae: *Cryptotis goldmani* (Escalante *et al.* 2005); Trochilidae: *Amazilia wagleri*, *Calothorax lucifer, Cynanthus sordidus* and *Eupherusa cyanophrys* (Arriaga *et al.* 1997).

Districts. Some nested units that have been identified within this province (Smith 1941; Ferrusquía-Villafranca 1990; Arriaga *et al.* 1997; Escalante *et al.* 1998) are treated herein as six districts: Central Valleys, Guerrero, Isthmian, Nudo de Zempoaltépetl, Oaxacan and Sierra de Mihuatlán. As a preliminary delimitation of these districts, Ferrusquía-Villafranca's (1990) and Escalante *et al.*'s (1998) schemes can be considered.

Central Valleys district Ferrusquía-Villafranca 1990, **stat. nov.**
Central Valleys sub-province Ferrusquía-Villafranca 1990: map.

Guerrero district Smith 1941, **stat. nov.**
Guerrero province Smith 1941: 108.
Sierra Madre del Sur-Guerrero province Escalante *et al.* 1998: 285.

Isthmian district Ferrusquía-Villafranca 1990, **stat. nov.**
Isthmian sub-province Ferrusquía-Villafranca 1990: map.

Nudo de Zempoaltépetl district Escalante *et al.* 1998, **stat. nov.**
Nudo de Zempoaltépetl province Escalante *et al.* 1998: 285.

Oaxacan Highland district Smith, 1941, **stat. nov.**
Oaxacan Highland province Smith 1941: 107.
Oaxacan province (in part) Ferrusquía-Villafranca 1990: map.
Oaxaca province Arriaga *et al.* 1997: 65; Morrone *et al.* 1999: 510; Espinosa *et al.* 2000: 64; Espinosa Organista *et al.* 2008: 57.
Sierra Madre del Sur-Oaxaca province Escalante *et al.* 1998: 285.

Sierra de Mihuatlán district Escalante *et al.* 1998, **stat. nov.**
Sierra de Mihuatlán province Escalante *et al.* 1998: 285.

Chiapas Highlands province Smith 1941

Chiapas Highlands province Smith 1941: 109; Goldman & Moore 1945: 359; Arriaga *et al.* 1997: 66; Espinosa *et al.* 2000: 64; Espinosa Organista *et al.* 2008: 58.
Chiapas province Barrera 1962: 101; Ferrusquía-Villafranca 1990: map; Ramírez-Pulido & Castro-Campillo 1990: map; Morrone *et al.* 1999: 510; Morrone 2001a: 52, 2001e: 45; Morrone & Márquez 2001: 637; Morrone *et al.* 2002: 99; Escalante *et al.* 2003: 570, 2005: 202; Morrone 2006: 478; Escalante *et al.* 2009: 473; Morrone, 2010b: 358.
Chiapas-Guatemalan Highlands province Ryan 1963: 23; Stuart 1964: 357; Campbell 1999: 116.
Hondurean Upland province Savage 1966: 736.
Central American Montane Forest centre Müller 1973: 14.
Transisthmic Mountains province Rzedowski 1978: 103; Rzedowski & Reyna-Trujillo 1990: map.
Sierra Madre de Chiapas province Casas-Andreu & Reyna-Trujillo 1990: map.
Central American Montane Forests ecoregion Dinerstein *et al.* 1995: 87.
Central American Pine-oak Forests ecoregion Dinerstein *et al.* 1995: 97.
Sierra Madre Moist Forests ecoregion Dinerstein *et al.* 1995: 87.
Guatemalan province Brown *et al.* 1998: 30.
Sierra Norte de Chiapas province Escalante *et al.* 1998: 285.
Chiapan/Guatemalan Highland area Marshall & Liebherr 2000: 206.
Highlands of Chiapas and Guatemala area Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Southern Mexico, Guatemala, Honduras, El Salvador and Nicaragua; basically corresponds to the Sierra Madre de Chiapas, from 500 to 2,000 m altitude (Morrone 2001a, 2006).

Endemic taxa. POLYPODIOPHYTA. Dryopteridaceae: *Elaphoglossum latum* (Espinosa *et al.* 2008). CONIFEROPHYTA. Cupressaceae: *Juniperus comitana* (Espinosa *et al.* 2008). MAGNOLIOPHYTA. Asteraceae: *Chionolaena sartorii, Montanoa echinacea, M. guatemalensis* and *M. pteropoda* (Funk 1982; Freire 1993); Cecropiaceae: *Cecropia sylvicola* (Franco & Berg 1997); Fabaceae: *Leucaena greggii* (Espinosa *et al.* 2000); Fagaceae: *Quercus durantifolia* (Espinosa *et al.* 2008); Gunneraceae: *Gunnera kilipiana* (Rzedowski 1978); Scrophulariaceae: *Tetranema evolutum* (Méndez-Larios & Villaseñor 1995). ARTHROPODA. Caddidae: *Acropsopilio chomulae* (Kury & Cokendolpher 2000); Cerambycidae: *Aneflus poriferus, Eburia schusteri, Megapsyrassa testacea, M. chiapaneca, Oxycoleus piceus, Pachymerola wappesi, Rhodoleptus nigripennis* and *Semanotus australis* (Giesbert 1994); Cleridae: *Enoclerus gabriellae* (Rifkind 1994); Corydalidae: *Platyneuromus honduranus* and *P. reflexus* (Contreras-Ramos 2000); Curculionidae: *Hadromeropsis scintillans, Pantomorus circumcinctus, P. comes, P. dorsalis, P. salvadorensis, P. salvini, P. rudis, P. sobrinus, P. subcinctus* and *Phymatophosus scapularis* (Espinosa *et al.* 2000; Rosas *et al.* 2011a, b); Lygaeidae: *Toonglasa indomita* (Slater & Brailovsky 1994); Miridae: *Atractotomus teopisca* (Stonedahl & Schwartz 1994); Papilionidae: *Baronia brevicornis rufodiscalis*, *Parides panares lycimenes* and *Priamides erostratus erostratus* (Llorente *et al.* 1997); Passalidae: *Ogypes* and *Petrejoides guatemalae* (Castillo & Reyes-Castillo 1984; Schuster & Reyes-Castillo 1990); Pieridae: *Colias alexandra harfordii, C. philodice, Dismorphia eunoe chamula, D. eunoe eunoe, Perrhybris pamela chajuelnsis* and *Pseudopieris nehemia irma* (Llorente *et al.* 1997); Scarabaeidae: *Apeltastes chiapasensis, Geotrupes pilanolensis, Golofa championi*, *Hologymnetis kinichahau, Trigonopletastes glabella* and *Viridimicus aurescens* (Jameson 1990; Ratcliffe & Deloya 1992; Howden 1988, 1994a, b; Morón 1995); Sclerosomatidae: *Geaya lineata* (Kury & Cokendolpher 2000); Staphylinidae: *Bledius strenuus, Gansia andersoni, G. fortemaculata, G. tibialis* and *Styngetus championi* (Ashe & Lingafelter 1995; Navarrete-Heredia 1997; Espinosa *et al.* 2000). VERTEBRATA. Anguidae: *Abronia lythrochila, A. ochoterenai, A. matudai* and *A. smithi* (Arriaga *et al.* 1997;

Espinosa *et al.* 2008); Cricetidae: *Microtus guatemalensis, Neotoma mexicana chamula, Oryzomys saturatior, Peromyscus aztecus oaxacensis, P. mexicanus teapensis, P. mexicanus saxatilis, Tylomys bullaris* and *T. tumbalensis* (Sullivan *et al.* 1997; Escalante *et al.* 2003, 2005, 2009; Espinosa *et al.* 2008); Furnariidae: *Dendrocolaptes picumnus* (Arriaga *et al.* 1997); Heteromyidae: *Heteromys nelsoni* (Escalante *et al.* 2005); Iguanidae: *Enyaliosaurus palearis* (Savage 1982); Muscicapidae: *Turdus plebejus* (Arriaga *et al.* 1997); Picidae: *Picoides pubescens* (Espinosa *et al.* 2000); Phrynosomatidae: *Sceloporus malachitichus* (Savage 1982); Soricidae: *Sorex sclateri* and *S. stizodon* (Escalante *et al.* 2003, 2005); Strigidae: *Otus barbatus* (Arriaga *et al.* 1997).

Districts. Some nested units that have been identified within this province (Ryan 1963; Stuart 1964; Müller 1973; Rzedowski 1978; Ferrusquía-Villafranca 1990; Rzedowski & Reyna-Trujillo 1990) are treated herein as six districts: Comitanian, Guatemalan Highland, Lacandonian, Nicaraguan Montane, Sierra Madrean and Soconusco. Their precise delimitation is not without doubt.

Comitanian district Ferrusquía-Villafranca 1990, **stat. nov.**
Comitanian sub-province Ferrusquía-Villafranca 1990: map.

Guatemalan Highland district Savage 1966, **stat. nov.**
Guatemalan Highland province Savage 1966: 736.
Guatemalan Montane Forest subcentre Müller 1973: 14.

Lacandonian district Ferrusquía-Villafranca 1990, **stat. nov.**
Lacandonian sub-province Ferrusquía-Villafranca 1990: map.

Nicaraguan Montane district Ryan 1963, **stat. nov.**
Nicaraguan Montane province Ryan 1963: 28.
Honduran-Nicaraguan Highlands province Stuart 1964: 357.

Sierra Madrean district Ferrusquía-Villafranca 1990, **stat. nov.**
Sierra Madrean sub-province Ferrusquía-Villafranca 1990: map.

Soconusco district Rzedowski 1978, **stat. nov.**
Soconusco province Rzedowski 1978: 109; Rzedowski & Reyna-Trujillo 1990: map; Arriaga *et al.* 1997: 66; Morrone *et al.* 1999: 510; Espinosa *et al.* 2000: 64; Espinosa Organista *et al.* 2008: 58.

Antillean sub-region Wallace 1876

Antillean sub-region Wallace 1876: 79; Heilprin 1887: 80; Lydekker 1896: 136; Sclater & Sclater 1899: 65; Bartholomew *et al.* 1911: 9; Mello-Leitão 1937: 229; Rapoport 1968: 71; Bănărescu & Boşcaiu 1978: 259; Borhidi & Muñiz 1986: 4; Samek 1988: 29; Del Risco & Vandama 1989: X.2.4; Muñiz 1996: 283; Echeverry & Morrone 2013: 1628; Morrone 2014: 206.
West Indian province Engler 1882: 345.
Central American subarea (in part) Clarke 1892: 381.
Antillean division Merriam 1892: 18.
Caribbean province Mello-Leitão 1937: 246; Cabrera & Willink 1973: 38; Brown *et al.* 1998: 32.
Caribbean region (in part) Good 1947: 232; Rzedowski 1978: 107; Takhtajan 1986: 251; Samek 1988: 26; Rangel *et al.* 1995d: 21; Procheş & Ramdhani 2012: 263.
West Indian sub-region Hershkovitz 1969: 9; Smith 1983: 462; Sánchez Osés & Pérez-Hernández 2005: 168.
Caribbean sub-region (in part) Rivas-Martínez & Navarro 1994: map; Morrone 1999: 2; Morrone *et al.* 1999: 510; Morrone 2001a: 46, 2001e: 30; Corona & Morrone 2005: 38; Morrone 2005: 238; Nihei & Carvalho 2007: 497; Morrone 2010a: 34.
Antillean province Rivas-Martínez & Navarro 1994: map.
Caribbean area Coscarón & Coscarón-Arias 1995: 726.
Caribbean bioregion Dinerstein *et al.* 1995: map 1.
Antillean dominion Morrone 2004a: 157; Corona & Morrone 2005: 38; Morrone 2006: 479.
Caribbean component Nihei & Carvalho 2004: 271.
Greater Antilles area Porzecanski & Cracraft 2005: 266.
Panamanian region (in part) Holt *et al.* 2013: 77.

Diagnosis. Antilles or West Indies (Greater and Lesser Antilles) and the Bahamas Islands (Fig. 12) (Morrone 2004a, 2006).

Provinces. The Antillean sub-region comprises the Bahama, Cuban, Cayman Islands, Jamaica, Hispaniola, Puerto Rico and Lesser Antilles provinces.

Bahama province Morrone 2001a

Bahamas-Bermudan province (in part) Udvardy 1975: 42.
Bermuda, Bahama and Southern Florida province (in part) Samek 1988: 30.
Cuba-Western Bahamas sub-province (in part) de la Cruz 1989: XI.1.4.
Bahama province Morrone 2001a: 53, 2001e: 49, 2006: 479.

Diagnosis. Archipelago of the Bahamas, which comprises the islands of Abaco-Grand Bahama, Andros-Bimini, Cat, Crooked-Mayaguana, Exumas, Inaguas, Long-Ragged Island Range, Mona, New Providence-Eleutheras, San Salvador-Rum Cay, St. Eustatius, St. Kitts, St. Lucia, St. Martin, St. Vincent and Turks and Caicos (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Arecaceae: *Sabal bermudana* (Santiago-Valentin & Olmstead 2004); Burseraceae: *Bursera frenningiae* (Espinosa *et al.* 2006); Rubiaceae: *Erithalis diffusa* and *E. odorifera* (Santiago-Valentin & Olmstead 2004). ARTHROPODA. Carabidae: *Glyptolenus smithi* (Liebherr 1997); Curculionidae: *Decuanellus bahamensis* (Howden 1992); Drosophilidae: *Drosophila antillea, D. insularis, D. vittatifrons, Stegana horae* and *S. tarsalis* (Grimaldi 1988); Lygaeidae: *Bathydema socia*, *Ochrimnus laevus* and *Ozophora octomaculata* (Slater 1988). VERTEBRATA. Boidae: *Epicrates chrysogaster*, *E. exsul* and *A. monensis* (Kluge 1988; Powell *et al.* 1996); Colubridae: *Chironius vincenti, Clelia errabunda* and *Mastigodryas bruesi* (Hedges 1996); Iguanidae: *Cyclura carinata carinata, C. cornuta stejnegeri, C. cychlura cychlura, C. cychlura figginsi* and *C. rileyi ornata* (Malone *et al.* 2000); Leptotyphlopidae: *Leptotyphlops columbi* (Hedges 1996); Teiidae: *Cnemidophorus vanzoi* (Hedges 1996); Viperidae: *Bothrops caribbaeus* and *B. lanceolatus* (Campbell & Lamar 1989).

Districts. Dinerstein *et al.* (1995) recognized two ecoregions, which are treated here as the Bahamian Dry Forests and Bahamian Pine Forests districts.

Bahamian Dry Forests district Dinerstein *et al.* 1995, **stat. nov.**
Bahamian Dry Forests ecoregion Dinerstein *et al.* 1995: 93.

Bahamian Pine Forests district Dinerstein *et al.* 1995, **stat. nov.**
Bahamian Pine Forests ecoregion Dinerstein *et al.* 1995: 96.

Cuban province Udvardy 1975

Cuban province Udvardy 1975: 42; Rivas-Martínez & Navarro 1994: map.
Cuba province Samek 1988: 30; Del Risco & Vandama 1989: X.2.4; Morrone 2001a: 54, 2001e: 49; Morrone & Márquez 2001: 637; Morrone 2006: 479.
Cuba-Western Bahamas sub-province (in part) de la Cruz 1989: XI.1.4.
Cuban Cactus Scrub ecoregion Dinerstein *et al.* 1995: 103.
Cuban Dry Forests ecoregion Dinerstein *et al.* 1995: 93.
Cuban Moist Forests ecoregion Dinerstein *et al.* 1995: 86.
Cuban Pine Forests ecoregion Dinerstein *et al.* 1995: 96.
Cuban Wetlands ecoregion Dinerstein *et al.* 1995: 100.

Diagnosis. Island of Cuba (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Acanthaceae: *Dasytropis* and *Sapphoa* (Francisco-Ortega *et al.* 2007); Arecaceae: *Bactris cubensis* and *Hemithrinax* (Santiago-Valentin & Olmstead 2004; Francisco-Ortega *et al.* 2007); Asteraceae: *Antillanthus, Antillia, Ciceronia* and *Rhodogeron* (Francisco-Ortega *et al.* 2007); Burseraceae: *Bursera shaferi* (Espinosa *et al.* 2006); Celastraceae: *Lyonia* spp. (Santiago-Valentin & Olmstead 2004); Fabaceae:

Behaimia and *Poitea gracilis* (Santiago-Valentin & Olmstead 2004; Francisco-Ortega *et al.* 2007); Nyctaginaceae: *Caribea* (Francisco-Ortega *et al.* 2007); Poaceae: *Lepturidium* (Francisco-Ortega *et al.* 2007); Rhamnaceae: *Doerpfeldia* (Francisco-Ortega *et al.* 2007); Rubiaceae: *Acunaeanthus, Ceuthocarpus* and *Phyllacanthus* (Francisco-Ortega *et al.* 2007); Rutaceae: *Kodalyodendron* (Francisco-Ortega *et al.* 2007); Sapindaceae: *Euchorium* (Francisco-Ortega *et al.* 2007); Scrophulariaceae: *Seymeriopsis* and *Synapsis* (Francisco-Ortega *et al.* 2007); Solanaceae: *Espadea* (Francisco-Ortega *et al.* 2007); Theophrastaceae: *Neomezia* (Francisco-Ortega *et al.* 2007); Thymeleaceae: *Linodendron* (Francisco-Ortega *et al.* 2007); Turneraceae: *Adenoa* (Francisco-Ortega *et al.* 2007). ARTHROPODA. Blaberidae: *Epilampra* spp. (Gutiérrez 1995); Blattellidae: *Nesomylacris* spp. (Gutiérrez 1995); Blatidae: *Eurycotis* spp. (Gutiérrez 1995); Carabidae: *Clivina cubae, Scarites alternans* and *S. cubanus* (Nichols 1988); Cicadidae: *Juanaria* (Ramos 1988); Curculionidae: *Caecossonus decuanus, Decuanellus vinai, Neomastix veritas, Pseudocaecossonus zayasi, Pseudoalaocybites negreai* and *Sicoderus sleeperi* (Vanin 1986; Howden 1992; Clark 1993); Formicidae: *Codioxenus simulans, Dorisidris nitens* (Wilson 1988); Latridiidae: *Metophthalmus cuba* (Andrews 1998); Lygaeidae: *Kleidoceris suffusus, Lygaeus dearmasi*, *L. wygodzinskyi, Melanopleurus tetraspilus* and *Patritius cubensis* (Slater 1988); Membracidae: *Stalotypa* (Ramos 1988); Polycentropidae: *Polycentropus nigriceps* (Hamilton 1988); Scarabaeidae: *Hemiphileurus cribratus* and *H. cubaensis* (Ratcliffe & Ivie 1998); Sphindidae: *Carinisphindus bicolor* (McHugh 1990); Tephritidae: *Anastrephas insulae, A. soroana* (Fernández *et al.* 1997). VERTEBRATA. Boidae: *Epicrates angulifer* (Kluge 1988; Powell *et al.* 1996); Emydidae: *Trachemys decussata angusta* and *T. decussata decussata* (Parham *et al.* 2013); Gekkonidae: *Sphaerodactylus* spp. and *Tarentola americana* (Page & Lydeard 1994; Hedges 1996; Powell *et al.* 1996); Iguanidae: *Chamaeleolis* and *Cyclura nubila nubila* (Guyer & Savage 1986; Malone *et al.* 2000); Xantusiidae: *Cricosaura* (Crother *et al.* 1986).

Sub-provinces and districts. Some authors (León 1946; Panfilov 1970; Voronov 1970; Samek 1973; Borhidi & Muñiz 1986; de la Cruz 1989; Del Riso & Vandana 1989; Muñiz 1996) have recognized nested units, which are treated herein as three sub-provinces and 23 districts: Central-Eastern sub-province (Cascajal, Coastal Trinidad, Guamuhaya Mountains, Lomas de Habana-Matanzas, Motembo, Serpentinic Axis and Sierras Calizas del Norte districts), South-Eastern sub-province (Coastal, Eastern Central Valley, Gran Piedra Mountain, Maisí-Guantánamo Meridional Coast, Pilonense, Sagua-Baracoa and Sierra Maestra districts) and Western sub-province (Cajálbana, Cordillera de los Órganos, Guanahacabibes, Guane-Guajaibón, Northern and Central Pinos Island, Sierra del Rosario, Southern Pinos Island, White Sand Savannah and Zapata districts). Borhidi & Muñiz's (1986) map (Fig. 16) can be considered for a preliminary regionalisation of this province.

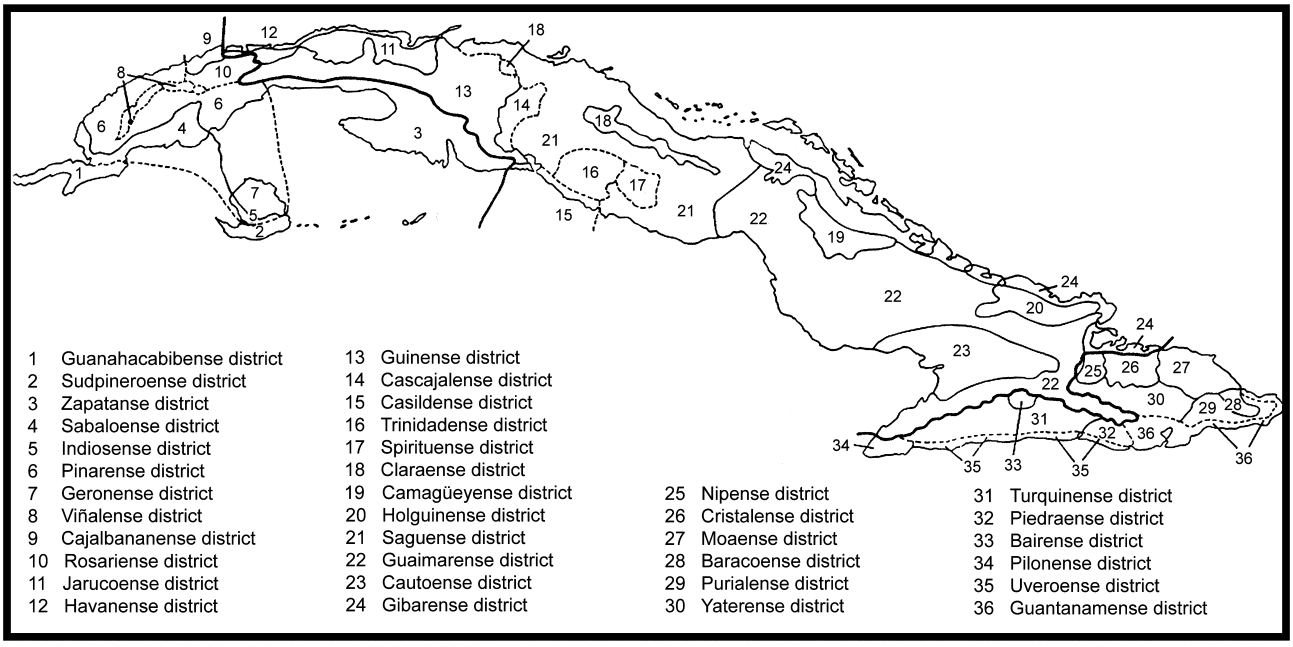


FIGURE 16. Districts of the Cuba province (modified from Borhidi & Muñiz 1986).

Central-Eastern sub-province León 1946, **stat. nov.**
Central-Eastern sector León 1946: 54.
Central-Northeastern region Panfilov 1970: 62.
Camagüey-Holguín sector Panfilov 1970: 62.
Santa Clara-Ciego de Ávila sector Panfilov 1970: 62.
Central Cuba district Voronov 1970: 58; de la Cruz 1989: XI.1.4.
Central Cuba sector Samek 1973: 34.
Central Cuba sub-province Borhidi & Muñiz 1986: 20; Del Risco & Vandama 1989: X.2.4; Muñiz 1996: 321.

Cascajal district Voronov 1970, **stat. nov.**
Cascajal sector Voronov 1970: 58.
Cascajalense district Borhidi & Muñiz 1986: 24; Muñiz 1996: 330.
Guinense district Borhidi & Muñiz 1986: 24; Muñiz 1996: 329.
Llanura Alta Meridional de Pinar del Río sub-district (in part) de la Cruz 1989: XI.1.4.
Cabañas-Casilda subsector (in part) Del Risco & Vandama 1989: X.2.4.
Cajálbana-Bahía Honda subsector Del Risco & Vandama 1989: X.2.4.

Coastal Trinidad district Samek 1973
Coastal Trinidad district Samek 1973: 42.
Casildense district Borhidi & Muñiz 1986: 24; Muñiz 1996: 331.
Cienfuegos-Trinidad Coast sub-district de la Cruz 1989: XI.1.4.
Guamuhaya Mountains district León 1946
Guamuhaya Mountains district León 1946: 55; Cabrera & Willink 1973: 38.
Trinidad-Sancti Spiritus sector Voronov 1970: 58.
Escambray (Guamuhaya) district Samek 1973: 40.
Spirituense district Borhidi & Muñiz 1986: 26; Muñiz 1996: 335.
Trinidadense district Borhidi & Muñiz 1986: 25; Muñiz 1996: 333.
Guamuhaya sub-district de la Cruz 1989: XI.1.4.
Sancti-Spiritus subsector Del Risco & Vandama 1989: X.2.4.
Trinidad subsector Del Risco & Vandama 1989: X.2.4.

Lomas de Habana-Matanzas district León 1946
Lomas de Habana-Matanzas district León 1946: 52; Cabrera & Willink 1973: 38.
Habana-Matanzas sector Voronov 1970: 58.
Anafe district Samek 1973: 32.
Colinas de Bahía Honda-Cabañas district Samek 1973: 32.
Colinas de Habana-Limonar district Samek 1973: 37.
Northern Coast of Habana-Matanzas district Samek 1973: 37.
Havanense district Borhidi & Muñiz 1986: 24; Muñiz 1996: 328.
Jarucoense district Borhidi & Muñiz 1986: 22; Muñiz 1996: 326.
Llanura Alta Meridional de Pinar del Río sub-district (in part) de la Cruz 1989: XI.1.4.
Cabañas-Casilda subsector (in part) Del Risco & Vandama 1989: X.2.4.

Motembo district Samek 1973
Santa Clara-Camagüey-Holguín sector (in part) Voronov 1970: 58.
Motembo district Samek 1973: 38.
Santa Clara Serpentinites district Samek 1973: 43.
Claraense district Borhidi & Muñiz 1986: 28; Muñiz 1996: 338.
Ondulados de Villa Clara sub-district de la Cruz 1989: XI.1.4.
Motembo-Holguín subsector Del Risco & Vandama 1989: X.2.4.

Serpentinic Axis district León 1946
Serpentinic Axis district León 1946: 56; Cabrera & Willink 1973: 39.
Southern Central-Eastern Plain district León 1946: 56; Cabrera & Willink 1973: 39.
Cauto Valley sector Voronov 1970: 58.
Santa Clara-Camagüey-Holguín sector Voronov 1970: 58.
Camagüey Serpentinites district Samek 1973: 43.
Central-Eastern Plains and Hills district Samek 1973: 44.
Holguín Serpentinites district Samek 1973: 43.
Camagüeyense district Borhidi & Muñiz 1986: 29; Muñiz 1996: 339.
Cautoense district Borhidi & Muñiz 1986: 31; Muñiz 1996: 346.
Guaimarense district Borhidi & Muñiz 1986: 30; Muñiz 1996: 345.
Holguinense district Borhidi & Muñiz 1986: 29; Muñiz 1996: 341.
Saguense district Borhidi & Muñiz 1986: 30; Muñiz 1996: 344.
Camagüey sub-district de la Cruz 1989: XI.1.4.
Sagua-Palma Soriano subsector Del Risco & Vandama 1989: X.2.4.

Sierras Calizas del Norte district León 1946
Sierras Calizas del Norte district León 1946: 54; Cabrera & Willink 1973: 38.
Northern Peninsulas and Cays sector Voronov 1970: 58.
Northern Coast district Samek 1973: 43.
Gibarense district Borhidi & Muñiz 1986: 31; Muñiz 1996: 347.
Malagueta-Banes sub-district de la Cruz 1989: XI.1.4.

South-Eastern sub-province León 1946, **stat. nov.**
South-Eastern sector León 1946: 58.
Southeastern region Panfilov 1970: 62.
Sierra Maestra sector Panfilov 1970: 62.
Eastern Cuba district Voronov 1970: 58; de la Cruz 1989: XI.1.4.
Eastern Cuba sector Samek 1973: 45.
Eastern Cuba sub-province Borhidi & Muñiz 1986: 32; Del Risco & Vandama 1989: X.2.4; Muñiz 1996: 349.

Coastal district Samek 1973
Sierra Maestra district (in part) León 1946: 60; Cabrera & Willink 1973: 39.
Sierra Maestra (in part) sector Voronov 1970: 58.
Coastal district Samek 1973: 48.
Uveroense district Borhidi & Muñiz 1986: 42; Muñiz 1996: 378.
Santiago de Cuba sub-district de la Cruz 1989: XI.1.4.

Eastern Central Valley district Samek 1973
Eastern Central Valley district Samek 1973: 51.
Septentrional Border of the Central Valley district Samek 1973: 51.
Yaterense district Borhidi & Muñiz 1986: 38; Muñiz 1996: 364.
Southeastern Coast sub-district de la Cruz 1989: XI.1.4.
Cayo Rey-Los Montes subsector Del Risco & Vandama 1989: X.2.4.
Central Valley subsector Del Risco & Vandama 1989: X.2.4.

Gran Piedra Mountain district Samek 1973
Sierra Maestra district (in part) León 1946: 60; Cabrera & Willink 1973: 39.
Gran Piedra Mountain district Samek 1973: 51.
Piedraense district Borhidi & Muñiz 1986: 41; Muñiz 1996: 372.
Gran Piedra sub-district de la Cruz 1989: XI.1.4.
Maestra subsector Del Risco & Vandama 1989: X.2.4.

Maisí-Guantánamo Meridional Coast district Samek 1973
Maisí-Guantánamo Meridional Coast district Samek 1973: 57.
Guantanamense district Borhidi & Muñiz 1986: 43; Muñiz 1996: 379.
Southeastern Coast sub-district de la Cruz 1989: XI.1.4.
Gran Tierra-Nibujón subsector Del Risco & Vandama 1989: X.2.4.

Pilonense district Borhidi & Muñiz 1986
Sierra Maestra (in part) sector Voronov 1970: 58.
Pilonense district Borhidi & Muñiz 1986: 42; Muñiz 1996: 378.
Niquero-Nima Nima subsector Del Risco & Vandama 1989: X.2.4.
Santiago-Mais subsector Del Risco & Vandama 1989: X.2.4.
Cabo Cruz sub-district de la Cruz 1989: XI.1.4.

Sagua-Baracoa district León 1946
Sagua-Baracoa district León 1946: 58; Cabrera & Willink 1973: 39.
Sierra de Sagua-Baracoa sector Panfilov 1970: 62.
Baracoa-Maisí sector Voronov 1970: 58.
Baracoa district Samek 1973: 57.
Moa-Toa-Baracoa Serpentinites district Samek 1973: 55.
Sierra de Imías district Samek 1973: 58.
Sierra de Nipe district Samek 1973: 53.
Sierra del Cristal district Samek 1973: 54.
Sierra Maestra Promontories district Samek 1973: 49.
Baracoense district Borhidi & Muñiz 1986: 37; Muñiz 1996: 361.
Cristalense district Borhidi & Muñiz 1986: 35; Muñiz 1996: 356.
Moaense district Borhidi & Muñiz 1986: 36; Muñiz 1996: 357.
Nipense district Borhidi & Muñiz 1986: 35; Muñiz 1996: 353.
Purialense district Borhidi & Muñiz 1986: 38; Muñiz 1996: 362.
Baracoa sub-district de la Cruz 1989: XI.1.4.
Sierras de Nipe y Cristal sub-district de la Cruz 1989: XI.1.4.
Mayar-Baracoa subsector Del Risco & Vandama 1989: X.2.4.
Purial-Imías subsector Del Risco & Vandama 1989: X.2.4.

Sierra Maestra district Samek 1973
Sierra Maestra district (in part) León 1946: 60; Cabrera & Willink 1973: 39.
Sierra Maestra (in part) sector Voronov 1970: 58.
Sierra Maestra district Samek 1973: 47.
Turquino Cordillera district Samek 1973: 49.
Bairense district Borhidi & Muñiz 1986: 39; Muñiz 1996: 369.
Turquinense district Borhidi & Muñiz 1986: 39; Muñiz 1996: 369.
Sierra Maestra sub-district de la Cruz 1989: XI.1.4.

Western sub-province León 1946, **stat. nov.**
Western sector León 1946: 50.
Southwestern region Panfilov 1970: 62.
Western region Panfilov 1970: 62.
Western Cuba district Voronov 1970: 58; de la Cruz 1989: XI.1.4.
Western Cuba sector Samek 1973: 24.
Western Cuba sub-province Borhidi & Muñiz 1986: 11; Del Risco & Vandama 1989: X.2.4; Muñiz 1996: 290.

Cajálbana district Samek 1973

Cajálbana district Samek 1973: 31.
Cajalbananense district Borhidi & Muñiz 1986: 18; Muñiz 1996: 316.
Pinar del Río Septentrional Savannah sub-district (in part) de la Cruz 1989: XI.1.4.

Cordillera de los Órganos district León 1946
Cordillera de los Órganos district León 1946: 50; Cabrera & Willink 1973: 38.
Los Mogotes (Sierra de los Órganos) district Samek 1973: 30.
Viñalense district Borhidi & Muñiz 1986: 17; Muñiz 1996: 311.
Sierra de los Órganos sub-district de la Cruz 1989: XI.1.4.
Sierra de los Órganos subsector Del Risco & Vandama 1989: X.2.4.

Guanahacabibes district Voronov, 1970, **stat. nov.**
Llano Sudoccidental district (in part) León 1946: 52; Cabrera & Willink 1973: 38.
Guane sector (in part) Panfilov 1970: 62.
Guanahacabibes subsector Voronov 1970: 58.
Guanahacabibes Peninsula district Samek 1973: 28.
Guanahacabibense district Borhidi & Muñiz 1986: 12; Muñiz 1996: 291.
Guanahacabibes sub-district de la Cruz 1989: XI.1.4.
Guanahacabibes subsector Del Risco & Vandama 1989: X.2.4.

Guane-Guajaibón district Voronov 1970, **stat. nov.**
Llano Sudoccidental district (in part) León 1946: 52; Cabrera & Willink 1973: 38.
Guane sector (in part) Panfilov 1970: 62.
Guane-Guajaibón subsector Voronov 1970: 58.
Alturas de Pizarras district Samek 1973: 29.
Central Meridional Savannah of Pinar del Río district (in part) Samek 1973: 29.
Pinarense district Borhidi & Muñiz 1986: 15; Muñiz 1996: 304.
Pinar del Río Meridional Savannah sub-district de la Cruz 1989: XI.1.4.
Pinar del Río Septentrional Savannah sub-district (in part) de la Cruz 1989: XI.1.4.

Northern and Central Pinos Island district Voronov 1970, **stat. nov.**
Llano Sudoccidental district (in part) León 1946: 52; Cabrera & Willink 1973: 38.
Northern and Central Pinos Island subsector Voronov 1970: 58.
Central Pinos Island district Samek 1973: 33.
White Sands of Pinos Island district Samek 1973: 33.
Geronense district Borhidi & Muñiz 1986: 16; Muñiz 1996: 308.
Indiosense district Borhidi & Muñiz 1986: 15; Muñiz 1996: 301.
Nueva Gerona sub-district de la Cruz 1989: XI.1.4.
Santa Isabel sub-district de la Cruz 1989: XI.1.4.
Juventud Island Highlands subsector Del Risco & Vandama 1989: X.2.4.

Sierra del Rosario district Samek 1973
Eastern Pinar del Río sector (in part) Voronov 1970: 58.
Sierra del Rosario district Samek 1973: 31.
Rosariense district Borhidi & Muñiz 1986: 19; Muñiz 1996: 319.
Sierra del Rosario sub-district de la Cruz 1989: XI.1.4.
Sierra del Rosario subsector Del Risco & Vandama 1989: X.2.4.

Southern Pinos Island district Voronov 1970, **stat. nov.**
Pinos Island sector (in part) Panfilov 1970: 62.
Southern Pinos Island subsector Voronov 1970: 58.
Meridional Pinos Island district Samek 1973: 33.

Sudpineroense district Borhidi & Muñiz 1986: 12; Muñiz 1996: 292.
Southern Juventud Island sub-district de la Cruz 1989: XI.1.4.
Southern Juventud Island subsector Del Risco & Vandama 1989: X.2.4.

White Sand Savannah district Samek 1973
Llano Sudoccidental district (in part) León 1946: 52; Cabrera & Willink 1973: 38.
Central Meridional Savannah of Pinar del Río district (in part) Samek 1973: 29.
White Sand Savannah district Samek 1973: 28.
Sabaloense district Borhidi & Muñiz 1986: 15; Muñiz 1996: 300.
Pinar del Río Meridional Coastal Savannah sub-district de la Cruz 1989: XI.1.4.
Sábalo-Los Indios subsector Del Risco & Vandama 1989: X.2.4.

Zapata district Voronov 1970, **stat. nov.**
Llano Sudoccidental district (in part) León 1946: 52; Cabrera & Willink 1973: 38.
Zapata subsector Voronov 1970: 58; Del Risco & Vandama 1989: X.2.4.
Zapata district Samek 1973: 39.
Zapatense district Borhidi & Muñiz 1986: 13; Muñiz 1996: 294.
Ciénaga de Zapata subdistrict de la Cruz 1989: XI.1.4.

Cayman Islands province Morrone, 2001a

Cayman Islands province Morrone 2001a: 54, 2001e: 50, 2006: 479.
Diagnosis. Archipelago including the Grand Cayman, Little Cayman and Cayman Brac Islands (Morrone 2001a, 2006).

Endemic taxa. ARTHROPODA. Lygaeidae: *Ochrimnus nigriceps, Ozophora miniscula* and *O. pallidifemur* (Slater 1988). VERTEBRATA. Turdidae: *Turdus nugator* (Vázquez-Miranda *et al.* 2007).

Districts. Dinerstein *et al.* (1995) recognized two ecoregions, which are treated here as the Cayman Islands Dry Forests and Cayman Islands Xeric Scrub districts.

Cayman Islands Dry Forests district Dinerstein *et al.* 1995, **stat. nov.**
Cayman Islands Dry Forests ecoregion Dinerstein *et al.* 1995: 93.

Cayman Islands Xeric Scrub district Dinerstein *et al.* 1995, **stat. nov.**
Cayman Islands Xeric Scrub ecoregion Dinerstein *et al.* 1995: 103.

Jamaica province Samek 1988

Greater Antilles province (in part) Udvardy 1975: 42.
Jamaica province Samek 1988: 32; Morrone 2001a: 54, 2001e: 51, 2006: 479.

Diagnosis. Island of Jamaica (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Acanthaceae: *Salpixantha* (Francisco-Ortega *et al.* 2007); Arecaceae: *Bactris jamaicana* (Santiago-Valentin & Olmstead 2004); Asteraceae: *Acanthodesmos, Odontocline* and *Zemisia* (Francisco-Ortega *et al.* 2007); Burseraceae: *Bursera aromatica, B. holickii* and *B. lunanii* (Espinosa *et al.* 2006); Celastraceae: *Lyonia jamaicensis* and *Tetrasiphon* (Santiago-Valentin & Olmstead 2004; Francisco-Ortega *et al.* 2007); Euphorbiaceae: *Dendrocousinia* (Francisco-Ortega *et al.* 2007); Melastomataceae: *Mecranium purpurascens* (Santiago-Valentin & Olmstead 2004); Rubiaceae: *Erithalis harrisii, E. quadrangularis* and *Portlandia* (Santiago-Valentin & Olmstead 2004; Francisco-Ortega *et al.* 2007). ARTHROPODA. Buprestidae: *Agrilus jamaicensis* (Hespenheide 1997); Carabidae: *Ardistomis franki, Glyptlenus latelytra, Platynus cinchonae, P. faber, P. jamaicae* and *P. rastafarius* species groups (Liebherr 1988a, b, 1997; Nichols 1988); Coccinellidae: *Psorolyma sicardi* (Gordon 1994a); Curculionidae: *Pseudoalaocyobites affinis, P. armatus, P. diversesculptus, P.*

inermis, P. jarmilae, P. pacei, P. persimilis, P. stewartii (Howden 1992); Drosophilidae: *Chymomyza jamaicensis, Drosophila paraguttata* (Grimaldi 1988); Formicidae: *Strumigenys jamaicensis* (Lattke & Goitía 1997); Lygaeidae: *Oncopeltus spectabilis* (Slater 1988); Membracidae: Quadrinareini (Ramos 1988); Polycentropidae: *Polycentropus jamaicensis* (Hamilton 1988); Scarabaeidae: *Hemiphileurus jamaicensis* (Ratcliffe & Ivie 1998); Sphindidae: *Carinisphindus platysphinctos* (McHugh 1990); Tenebrionidae: *Archaeoglenes pecki* (Watrous 1982). VERTEBRATA. Boidae: *Epicrates subflavus* (Kluge 1988; Powell *et al.* 1996); Emydidae: *Trachemys terrapen* (Parham *et al.* 2013); Gekkonidae: *Sphaerodactylus parkeri, S. richardsoni* and *S. semasiops* (Page & Lydeard 1994; Powell *et al.* 1996).

Districts. Dinerstein *et al.* (1995) recognized two ecoregions, which are treated here as the Jamaican Dry Forests and Jamaican Moist Forests districts.

Jamaican Dry Forests district Dinerstein *et al.* 1995, **stat. nov.**
Jamaican Dry Forests ecoregion Dinerstein *et al.* 1995: 93.

Jamaican Moist Forests district Dinerstein *et al.* 1995, **stat. nov.**
Jamaican Moist Forests ecoregion Dinerstein *et al.* 1995: 86.

Hispaniola province Samek 1988

Greater Antilles province (in part) Udvardy 1975: 42.
Hispaniola province Samek 1988: 31; Morrone 2001a: 55, 2001e: 52; Corona & Morrone 2005: 38; Morrone 2006: 479.
Enriquillo Wetlands ecoregion Dinerstein *et al.* 1995: 100.
Hispaniolan Dry Forests ecoregion Dinerstein *et al.* 1995: 93.
Hispaniolan Moist Forests ecoregion Dinerstein *et al.* 1995: 86.
Hispaniolan Pine Forests ecoregion Dinerstein *et al.* 1995: 96.

Diagnosis. Island of Hispaniola, which comprises Dominican Republic and Haiti (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Arecaceae: *Sabal domingensis* (Santiago-Valentin & Olmstead 2004); Asteraceae: *Ekmaniopappus, Eupatorina, Fuertesia* and *Salcedoa* (Francisco-Ortega *et al.* 2007); Burseraceae: *Bursera brunea, B. gracilipes, B. ovata* and *B. spiniscens* (Espinosa *et al.* 2006); Celastraceae: *Lyonia* spp. (Santiago-Valentin & Olmstead 2004); Cucurbitaceae: *Anacaona* (Francisco-Ortega *et al.* 2007); Fabaceae: *Arcoa* and *Rhodopis* (Francisco-Ortega *et al.* 2007); Flacourtiaceae: *Priamosia* (Francisco-Ortega *et al.* 2007); Lythraceae: *Haitia* (Francisco-Ortega *et al.* 2007); Malvaceae: *Neobuchia* (Francisco-Ortega *et al.* 2007); Melastomataceae: *Mecranium* spp. (Santiago-Valentin & Olmstead 2004); Onagraceae: *Fuchsia triphylla* and *F. pringsheimii* (Berry 1982); Orchidaceae: *Quisqueya* (Francisco-Ortega *et al.* 2007); Polygonaceae: *Leptogonum* (Francisco-Ortega *et al.* 2007); Rubiaceae: *Exostema acuminata* and *E. nitens* (Santiago-Valentin & Olmstead 2004); Solanaceae: *Coeloneurum* (Francisco-Ortega *et al.* 2007); Theophrastaceae: *Theophrasta* (Francisco-Ortega *et al.* 2007); Urticaceae: *Sarcopilea* (Francisco-Ortega *et al.* 2007). ARTHROPODA. Acrididae: *Amblytropidia* (Pérez *et al.* 1995); Anthribidae: *Phaenotheriopsis tuberculatus, P. umbonatus* and *P. verrucosus* (Valentine 1991); Carabidae: *Antilliscaris darlingtoni, Barylaus puncticeps, Platynus biramosus, P. cristophe, P. jaegeri, P. laeviceps* and *P. transcibao* (Liebherr 1988a, b; Nichols 1988); Coccinellidae: *Bura, Psorolyma doyeni, P. baorucensis* and *P. cyanella* (Gordon 1994a); Curculionidae: *Kuschelaxius discifer, Micromyrmex asclepia*, *Rhinostomus scrutator, Sicoderus championi, S. ramosi* and *S. truncatipennis* (Ivie & Sikes 1995; Vanin 1986; Howden 1992; Morrone & Cuevas 2002); Drosophilidae: *Drosophila nesiota* (Grimaldi 1988); Formicidae: *Hypocryptocerus haemorrhoidalis* (Wilson 1988); Lathridiidae: *Metophthalmus columbusi, M. schusteri* and *M. trilineatus* (Andrews 1994); Lygaeidae: *Melanopleurus maculicorium* and *Pamphantus* spp. (Slater 1988); Micropeplidae: *Peplomicrus iviei* (Campbell 1991); Passandridae: *Catogenus slipinskii* (Thomas 1994); Polycentropidae: *Polycentropus criollo, P. domingensis* and *P. marcanoi* (Hamilton 1988); Scarabaeidae: *Hemiphileurus dispar, H. laeviceps, H. phratrius, H. ryani* and *H. scutellaris* (Ratcliffe & Ivie 1998); Schendylidae: *Ctenophilus nesiotes* (Pereira & Demange 1997); Sphindidae: *Carinisphindus leptosphinctos* (McHugh 1990); Teratembiidae: *Oligembia vetusta* (Szumik 1994); Tibicinidae: *Psallodia* (Ramos 1988). VERTEBRATA. Boidae: *Epicrates fordii* and *E. gracilis* (Kluge 1988; Powell *et al.* 1996); Emydidae: *Trachemys decorata* and *T. stejnegeri vicina* (Parham *et al.* 2013); Gekkonidae: *Sphaerodactylus* spp. (Page & Lydeard 1994); Iguanidae: *Chamaelinorops* and *Cyclura ricordi* (Guyer & Savage 1986; Malone *et al.* 2000); Scindidae: *Mabuya lineolata* (Hedges 1996).

Puerto Rico province Samek 1988

Greater Antilles province (in part) Udvardy 1975: 42.
Puerto Rico province Samek 1988: 32; Morrone 2001a: 56, 2001e: 54, 2006: 479.

Diagnosis. Island of Puerto Rico (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Fabaceae: *Poitea florida* and *P. punicea* (Santiago-Valentin & Olmstead 2004). ARTHROPODA. Anthribidae: *Phaenotheriopsis conciliatus* (Valentine 1991); Carabidae: *Antilliscaris danforthi, A. megacephalus, A. mutchleri, Barylaus estriatus* and *Oxydrepanus coamensis* (Nichols 1988); Cicadidae: *Borencona* (Ramos 1988); Coccinellidae: *Lenasa jayuyai, Neaptera doyeni, N. viridissima* and *Psorolyma maxillosa* (Gordon 1994a, b); Curculionidae: *Decuanellus longirostris, D. pecki* and *Kuschelaxius tomentosus* (Howden 1992); Drosophilidae: *Mayagueza argentifera* (Grimaldi 1988); Lathridiidae: *Metophthalmus rectangulatus* (Andrews 1994); Lygaeidae: *Ochrimnus henryi* (Slater 1988); Membracidae: *Jibarita* (Ramos 1988); Polycentropidae: *Polycentropus zaneta* (Hamilton 1988); Scarabaeidae: *Hemiphileurus puertoricensis* (Ratcliffe & Ivie 1998). VERTEBRATA. Boidae: *Epicrates inornatus* (Kluge 1988; Powell *et al.* 1996); Emydidae: *Trachemys stejnegeri stejnegeri* (Parham *et al.* 2013).

Districts. Dinerstein *et al.* (1995) recognized two ecoregions, which are treated here as the Puerto Rican Dry Forests and Puerto Rican Moist Forests districts.

Puerto Rican Dry Forests district Dinerstein *et al.* 1995, **stat. nov.**
Puerto Rican Dry Forests ecoregion Dinerstein *et al.* 1995: 93.

Puerto Rican Moist Forests district Dinerstein *et al.* 1995, **stat. nov.**
Puerto Rican Moist Forests ecoregion Dinerstein *et al.* 1995: 86.

Lesser Antilles province Samek 1988

Lesser Antilles province Samek 1988: 32; Morrone 2001a: 56, 2001e: 54, 2006: 479.
Leeward Islands Dry Forests ecoregion Dinerstein *et al.* 1995: 94.
Leeward Islands Moist Forests ecoregion Dinerstein *et al.* 1995: 87.
Leeward Islands Xeric Scrub ecoregion Dinerstein *et al.* 1995: 103.
Windward Islands Dry Forests ecoregion Dinerstein *et al.* 1995: 93.
Windward Islands Moist Forests ecoregion Dinerstein *et al.* 1995: 87.
Winward Islands Xeric Scrub ecoregion Dinerstein *et al.* 1995: 103.
Lesser Antilles area Porzecanski & Cracraft 2005: 266.

Diagnosis. Archipelagos of the Lesser Antilles (Antigua, Barbados, Barbuda, Desirade, Dominica, Grenada, Guadeloupe, Marie Galante, Martinique, Montserrat, Nevis and Saba) and the Virgin Islands (Anegada, Culebra, St. Croix, St. John, St. Thomas, Tortola, Vieques and Virgin Gorda) (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Fabaceae: *Poitea carinalis* (Santiago-Valentin & Olmstead 2004); Melastomataceae: *Charianthus* (Francisco-Ortega *et al.* 2007); Rubiaceae: *Erithalis odorifera* (Santiago-Valentin & Olmstead 2004). ARTHROPODA. Carabidae: *Ardistomis atripennis, A. guadeloupensis, Clivina* aff. *latiuscula, C. tuberculata, Glyptolenus simplicicollis, Platynus alternans*, *P. ellipticus, Stratiotes anglicanus* and *S. iracundus* (Liebherr 1988a, b, 1997; Nichols 1988); Curculionidae: *Decuanellus brevicrus, D. buclavatus, D gladiatus, D. muchmorei, D. viti, Sicoderus contiguus, S. delauneyi* and *S. remotus* (Vanin 1986; Howden 1992); Drosophilidae: *Drosophila hypophallus*, *D. insularis* and *D. nigrodunni* (Grimaldi 1988); Geophilidae: *Ityphilus mauriesi, Taeniolinum setosum guadeloupensis* (Demange & Pereira 1985); Lathridiidae: *Methophtha musiviei* and *M. muchmorei* (Andrews 1998); Lygaeidae: *Blissus planus* (Slater 1988); Polycentropidae: *Polycentropus insularis* (Hamilton 1988). VERTEBRATA. Colubridae: *Liophis cursor* species group (Hedges 1996); Gekkonidae: *Phyllodactylus pulcher, Sphaerodactylus fantasticus, S. sabanus* and *S. sputator* (Page & Lydeard 1994; Hedges 1996; Powell *et al.* 1996); Gymnophthalmidae: *Gymnophthalmus pleei* (Hedges 1996); Iguanidae: *Cyclura pinguis* and *Iguana delicatissima* (Hedges 1996; Malone *et al.* 2000); Mimidae: *Cinclocerthia gutturalis* and *Ramphocinclus brachyurus* (Vázquez-Miranda *et al.* 2007); Parulidae: *Dendroica plumbea* (Vázquez-Miranda *et al.* 2007); Tyrannidae: *Myiarchus nugator* (Vázquez-Miranda *et al.* 2007).

Brazilian sub-region Blyth 1871

Brazilian sub-region Blyth 1871: 428; Wallace 1876: 78; Heilprin 1887: 80; Lydekker 1896: 135; Bartholomew *et al.* 1911: 9; Mello-Leitão 1937: 244; Hershkovitz 1969: 3; Kuschel 1969: 710; Bănărescu & Boşcaiu 1978: 258; Almirón *et al.* 1997: 23.
Tropical American region (in part) Engler 1882: 345.
Amazonian sub-region Sclater & Sclater 1899: 65; Morrone 1999: 6, 2000b: 102, 2001e: 67, 2005: 238, 2006: 480, 2010a: 37, 2014: 206.
Amazonian district (in part) Cabrera & Yepes 1940: 14.
Amazonian dominion Orfila 1941: 86.
Guianan-Brazilian sub-region (in part) Mello-Leitão 1943: 128; Ringuelet 1961: 156; Rapoport 1968: 72; Sánchez Osés & Pérez-Hernández 2005: 168.
Amazonian province Schmidt 1954: 328.
Guianan-Brazilian region Fittkau 1969: 636.
Amazonian Basin area Sick 1969: 451.
Non-Andean East area (in part) Sick 1969: 451.
Caribbean dominion (in part) Cabrera & Willink 1973: 32; Zuloaga *et al.* 1999: 18.
Caribbean Amazonian sub-realm (in part) Rivas-Martínez & Tovar 1983: 521.
Caribbean region (in part) Takhtajan 1986: 251; Samek 1988: 26.
Amazonian region Rivas-Martínez & Navarro 1994: map; Rangel *et al.* 1995b: 82.
Amazonian area Coscarón & Coscarón-Arias 1995: 726.
Caribbean sub-region (in part) Morrone 1999: 2, 2001a: 46, 2001e: 30; Corona & Morrone 2005: 38; Morrone 2005: 238, 2006: 478, 2010a: 34.
Northwestern component Nihei & Carvalho 2004: 271.
Amazon dominion Fiaschi & Pirani 2009: 480.
Amazonian component Sigrist & Carvalho 2009: 81.
South American sub-region (in part) Echeverry & Morrone 2013: 1628.

Diagnosis. Southern and central Mexico, Central America and northwestern South America (Fig. 12) (Morrone 2014).

Dominions. The Brazilian sub-region comprises the Mesoamerican, Pacific, Boreal Brazilian and Southwestern Amazonian dominions.

Mesoamerican dominion Savage 1966

Neomeridional sub-region (in part) Blyth 1871: 427.
Mexican sub-region (in part) Wallace 1876: 78; Heilprin 1887: 80; Lydekker 1896: 135; Bartholomew *et al.* 1911: 9; Mello-Leitão 1937: 222.
Central American zone (in part) Engler 1882: 345.
Central American subarea (in part) Clarke 1892: 381.
Central American sub-region (in part) Sclater & Sclater 1899: 65.
Central American centre (in part) Lane 1943: 413.
Caribbean region (in part) Good 1947: 232; Takhtajan 1986: 251; Samek 1988: 26; Rangel *et al.* 1995d: 21; Procheş & Ramdhani 2012: 263.
Tropical Lowlands realm (in part) West 1964: 365.
Mesoamerican region Savage 1966: 736; Ferrusquía-Villafranca 1990: map.
Central American province (in part) Fittkau 1969: 642; Udvardy 1975: 41.
Mesoamerican sub-region Bănărescu & Boşcaiu 1978: 259; Sánchez Osés & Pérez-Hernández 2005: 168; Echeverry & Morrone 2013: 1628.
Central American sub-region (in part) Samek 1988: 27; Rapoport 1968: 71; Procheş & Ramdhani 2012: 263.
Colombian Mesoamerican region (in part) Rivas-Martínez & Navarro 1994: map.
Mesoamerican province Rivas-Martínez & Navarro 1994: map.
Central America bioregion (in part) Dinerstein *et al.* 1995: map 1.
Mesoamerican dominion Morrone 2004a: 157, 2006: 478, 2014: 207.
Panamanian region (in part) Holt *et al.* 2013: 77.

Diagnosis. Lowlands of southern and central Mexico and most of Central America, in Guatemala, Belize, Honduras, El Salvador and northern Nicaragua (Morrone 2014).

Provinces. The Mesoamerican dominion comprises the Pacific Lowlands, Balsas Basin, Veracruzan, Yucatán Peninsula and Mosquito provinces.

Pacific Lowlands province West 1964

Pacific Lowlands region West 1964: 368.
Western Lowlands sub-region Savage 1966: 736.
Mexican Xerophyllous province (in part) Cabrera & Willink 1973: 34.
Central American Pacific centre Müller 1973: 19.
Pacific Coast province Rzedowski 1978: 107; Rzedowski & Reyna-Trujillo 1990: map; Arriaga *et al.* 1997: 62; Morrone *et al.* 1999: 510; Espinosa *et al.* 2000: 64.
Central American Pacific Coast province Samek 1988: 28.
Pacific province Ferrusquía-Villafranca 1990: map; Espinosa Organista *et al.* 2008: 60.
Western Mexican province Casas-Andreu & Reyna-Trujillo 1990: map.
Central American Pacific Dry Forests ecoregion Dinerstein *et al.* 1995: 94.
South Eastern Coast province Escalante *et al.* 1998: 285.
Pacific Lowlands province Campbell 1999: 117.
Mexican Pacific Coast province Morrone 2001a: 51, 2001e: 40; Morrone & Márquez 2001: 637; Morrone *et al.* 2002: 97; Corona & Morrone 2005: 38; Morrone 2006: 478.
Pacific Arid Slope area Porzecanski & Cracraft 2005: 266.
Western Lowlands area (in part) Flores-Villela & Martínez-Salazar 2009: 820.
Pacific Coast of Mexico and Balsas Depression area (in part) Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Narrow strip in the Pacific coast of Mexico (states of Chiapas, Colima, Guerrero, Jalisco, Michoacán, Nayarit, Oaxaca and Sinaloa), El Salvador, Honduras, Nicaragua, Costa Rica and Guatemala, including also the Revillagigedo archipelago (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asparagaceae: *Agave kewensis* (Espinosa *et al.* 2008); Asteraceae: *Montanoa andersonii, M. laskowskii* and *M. standleyi* (Funk 1982); Bromeliaceae: *Tillandsia chiapensis* and *T. juergrutschmannii* (Espinosa *et al.* 2008); Burseraceae: *Bursera arborea*, *B. attenuata, B. excelsa* and *B. longicuspis* (Rzedowski 1978; Kohlman & Sánchez 1984; Espinosa *et al.* 2008); Cactaceae: *Disocactus macdougallii* and *Selenicereus chrysocardium* (Espinosa *et al.* 2008); Poaceae: *Gouninia isabelensis* (Ortiz-Díaz 1993); Ruscaceae: *Beaucarnea goldmanii* (Espinosa *et al.* 2008). ARTHROPODA. Apidae: *Geotrigona acapulconis* (Camargo & Moure 1996); Attelabidae: *Euscelus rufiventris* (Hamilton 1997); Buprestidae: *Acmaeodera alicia, A. impulviata, A. kathyae, A. oaxacae, A. resplendens, A. scalaris, A. trizonalis islamariae, A. wheeleri, Acmaeoderopsis junki, Actenodes calcarata, Agrilus arizonicus, A. catherinae, A. cavifrons, A. detractus, A. frisoni, A. impexus, A. latifrons, A. nodifrons, A. pulchelus, A. rubrovittatus, A. ruginosus, Chrysobothris costifrons costifrons, C. explicationis, C. knulli, C. multistigmosa, C. peninsularis sinaloae, Hippomelas brevipes, H. martini, H. mexicanus, Lampetis auropunctata, Paratyndaris lateralis, Paragrilus burkei, Trypantius infrequens* and *Xenorhipis mexicana* (Corona *et al.* 2009); Curculionidae: *Pantomorus horridus, P. sulfureus, P. viridicans, Phacepholis albicans* and *P. viridicans* (Rosas *et al.* 2011a, b); Papilionidae: *Battus eracon, Mimoides ilus occiduus* and *Pyrrhostica abderus baroni* (Llorente *et al.* 1997); Passalidae: *Petrejoides olmecae* (Castillo & Reyes-Castillo 1984); Pieridae: *Dismorphia amphiona lupita, D. amphiona isolda, D. crisia alvarezi, Enantia lina* ssp., *Pieriballia viardi* and *Prestonia clarki* (Llorente *et al.* 1997); Ropalomeridae: *Mexicoa mexicana* (Ramírez-García & Hernández-Ortiz 1994); Scarabaeidae: *Onthophagus solisi* and *Viridimicus cyanochlorus* (Jameson 1990; Génier & Howden 1999); Simuliidae: *Simulium pseudocallidum* and *S. veracruzanum* (Coscarón *et al.* 1996). VERTEBRATA. Cracidae: *Ortalis wagleri* (Arriaga *et al.* 1997); Cricetidae: *Habromys lepturus* and *Microtus oaxacensis* (Escalante *et al.* 2009); Emydidae: *Trachemys grayi* (Parham *et al.* 2013); Geomyidae: *Orthogeomys grandis* sspp. (Arriaga *et al.* 1997); Odontophoridae: *Callipepla douglasii* (Arriaga *et al.* 1997); Psittacidae: *Amazona finschi* (Arriaga *et al.* 1997); Sciuridae: *Sciurus colliaei* (Arriaga *et al.* 1997); Soricidae: *Cryptotys magna* (Escalante *et al.* 2009); Viperidae: *Crotalus basiliscus* (Campbell & Lamar 1989).

Districts. Some nested units that have been identified within this province (Goldman & Moore 1945; Stuart 1964; West 1964; Rzedowski 1978; Ferrusquía-Villafranca 1990; Ramírez-Pulido & Castro-Campillo 1990; Escalante *et al.* 1998; García-Trejo & Navarro 2004) are treated herein as six districts: Nayarit-Guerrero, Revillagigedo Islands, Sinaloan, Tapachultecan, Tehuanan and Tres Marías Islands. For a preliminary delimitation of these districts, I consider Stuart's (1964) provinces (Fig. 17).

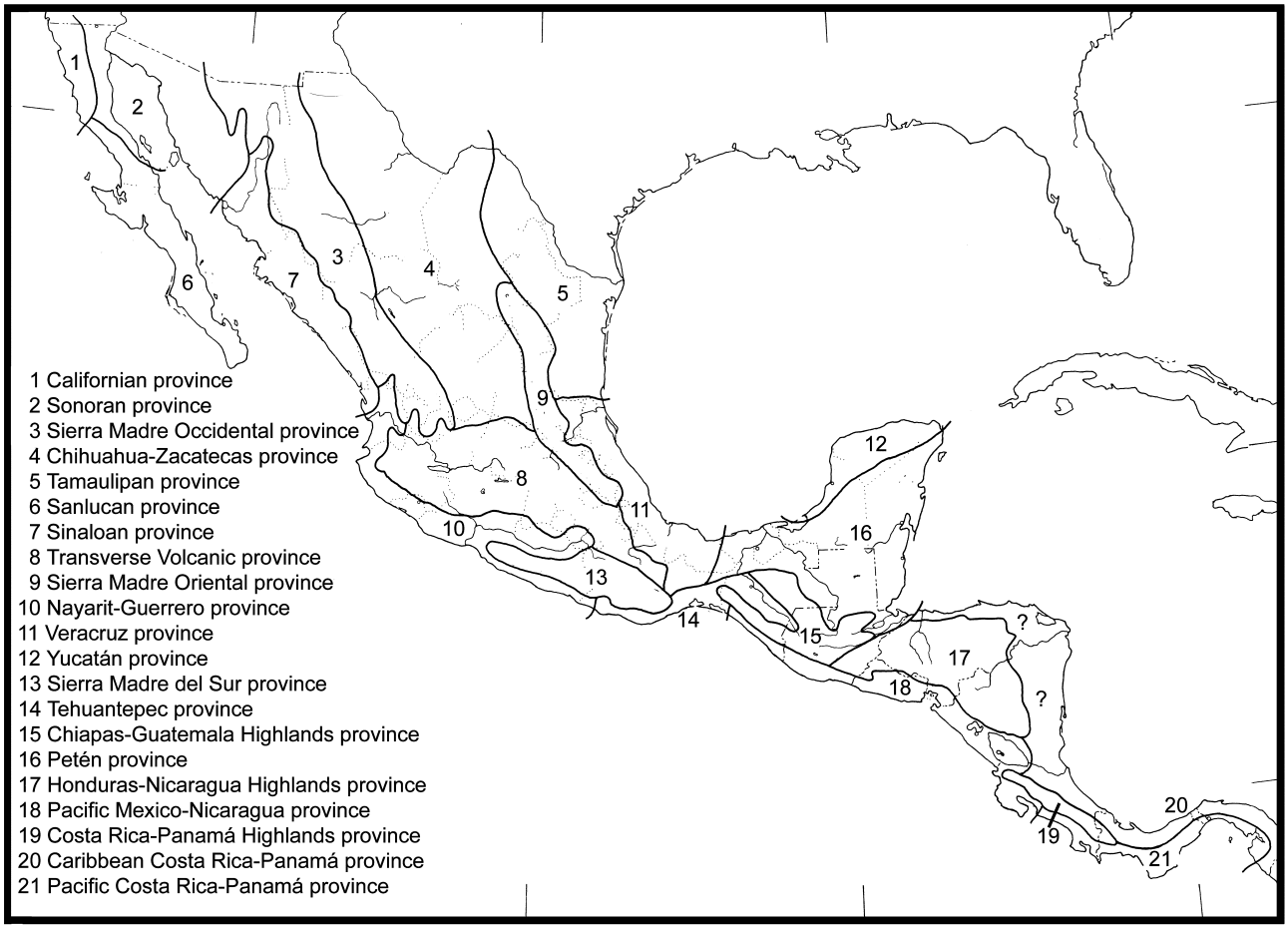


FIGURE 17. Regionalisation of Mexico and Central America (modified from Stuart 1964).

Nayarit-Guerrero district Goldman & Moore 1945, **stat. nov.**
Nayarit-Guerrero province Goldman & Moore 1945: 355; Stuart 1964: 353.
Coastal Lowlands of Nayarit-Sinaloa area West 1964: 368.
Guerreran province Udvardy 1975: 41; Ramírez-Pulido & Castro-Campillo 1990: map; Brown *et al.* 1998: 31.
Nayaritan province Ferrusquía-Villafranca 1990: map; Ramírez-Pulido & Castro-Campillo 1990: map.
Jalisco Dry Forests ecoregion Dinerstein *et al.* 1995: 94.
Jalisco Palm Savannas ecoregion Dinerstein *et al.* 1995: 100.
Nayarit province Brown *et al.* 1998: 28.
Central section García-Trejo & Navarro 2004: 177.

Revillagigedo Islands district Goldman & Moore 1945, **stat. nov.**
Revillagigedo Islands province Goldman & Moore 1945: 352; Udvardy 1975: 42; Rzedowski 1978: 108; Samek 1988: 28; Rzedowski & Reyna-Trujillo 1990: map; Escalante *et al.* 1998: 285; Espinosa Organista *et al.* 2008: 59.

Sinaloan district Goldman & Moore 1945, **stat. nov.**
Sinaloan province Goldman & Moore 1945: 355; Stuart 1964: 353; Udvardy 1975: 41; Brown *et al.* 1998: 32.
Sinaloan Coastal district Moore 1945: 218.
Sinaloan province Ferrusquía-Villafranca 1990: map; Ramírez-Pulido & Castro-Campillo 1990: map.
Sinaloan Dry Forests ecoregion Dinerstein *et al.* 1995: 94.
Northern section García-Trejo & Navarro 2004: 177.

Tapachultecan district Goldman & Moore 1945, **stat. nov.**
Tapachultecan province Smith 1941: 110.

Escuintla-Usulután province Ryan 1963: 24.
Chinandega province Ryan 1963: 27.
Pacific Mexico-Nicaraguan province Stuart 1964: 349.
Volcanic Lowlands of Central America area West 1964: 368.
Nicaraguan province Savage 1966: 736.
West Mexican province (in part) Savage 1966: 736.

Tehuanan district Goldman & Moore 1945, **stat. nov.**
Tehuanan province Smith 1941: 110.
Tehuantepec province Goldman & Moore 1945: 358; Barrera 1962: 101; Stuart 1964: 354.
Coastal Lowlands of Central America area West 1964: 368.
West Mexican province (in part) Savage 1966: 736.
Tehuantepec sub-province Ferrusquía-Villafranca 1990: map.
Isthmian Lowlands province Escalante *et al.* 1998: 285.
Southern section García-Trejo & Navarro 2004: 177.

Tres Marías Islands district Escalante *et al.* 1988, **stat. nov.**
Tres Marías Islands province Escalante *et al.* 1998: 285.

Balsas Basin province Rzedowski 1978

Balsas-Tepalcatepec Basin area West 1964: 368.
Balsas Basin province Rzedowski 1978: 108; Ramírez-Pulido & Castro-Campillo 1990: map; Rzedowski & Reyna-Trujillo 1990: map; Arriaga *et al.* 1997: 62; Escalante *et al.* 1998: 285; Morrone *et al.* 1999: 510; Espinosa *et al.* 2000: 64; Morrone 2001a: 49, 2001e: 38; Morrone & Márquez 2001: 636; Morrone *et al.* 2002: 94; Corona & Morrone 2005: 38; Escalante *et al.* 2005: 202; Morrone 2005: 237, 2006: 477; Espinosa Organista *et al.* 2008: 61; Escalante *et al.* 2009: 473.
Jaliscan-Guerreran province Ferrusquía-Villafranca 1990: map.
Balsas Dry Forests ecoregion Dinerstein *et al.* 1995: 94.
Guerreran Cactus Scrub ecoregion Dinerstein *et al.* 1995: 104.
Pacific Coast of Mexico and Balsas Depression area (in part) Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Central Mexico (states of Guerrero, Jalisco, Mexico, Michoacán, Morelos, Oaxaca and Puebla), at an altitude below 2000 m; it is situated between the Transmexican Volcanic Belt and the Sierra Madre del Sur provinces (Morrone 2001a).

Endemic taxa. POLYPODIOPHYTA. Pteridaceae: *Notholaena lemmonnii* var. *australis* (Espinosa *et al.* 2008). MAGNOLIOPHYTA. Asteraceae: *Montanoa liebmannii* and *M. reveali* (Funk 1982); Burseraceae: *Bursera bolivarii, B. chemapodicta, B. discolor, B. longipes, B. martae, B. mirandae, B. rzedowski, B. sarukhanii, B. submoniliformis, B. suntui, B. trifoliolata, B. trimera, B. vejar-vazquezii* and *B. xochipalensis* (Espinosa *et al.* 2006, 2008); Cactaceae: *Coryphantha bummama* (Espinosa *et al.* 2008); Fabaceae: *Brongniartia montalvoana* (Dorado & Arias 1992). ARTHROPODA. Scarabaeidae: *Cotinis pueblensis* (Deloya & Ratcliffe 1988). VERTEBRATA. Emberizidae: *Aimophila humeralis* (Arriaga *et al.* 1997); Geomyidae: *Orthogeomys grandis* (Arriaga *et al.* 1997); Sciuridae: *Spermophilus adocetus* (Escalante *et al.* 2005); Strigidae: *Otus seductus* (Arriaga *et al.* 1997); Troglodytidae: *Campylorhynchus jocosus* (Arriaga *et al.* 1997).

Districts. Smith (1941) and Ferrusquía-Villafranca (1990) have identified nested units, which are treated herein as the Lower Balsas Basin and Upper Balsas Basin districts. Their preliminary delimitation is based on Smith's (1941) provinces (Fig. 18).

Lower Balsas Basin district Smith, 1941, **stat. nov.**
Lower Balsas Basin province Smith 1941: 110.
Western sub-province Ferrusquía-Villafranca 1990: map.

Upper Balsas Basin district Smith, 1941, **stat. nov.**
Upper Balsas Basin province Smith 1941: 108.
Balsas sub-province Ferrusquía-Villafranca 1990: map.

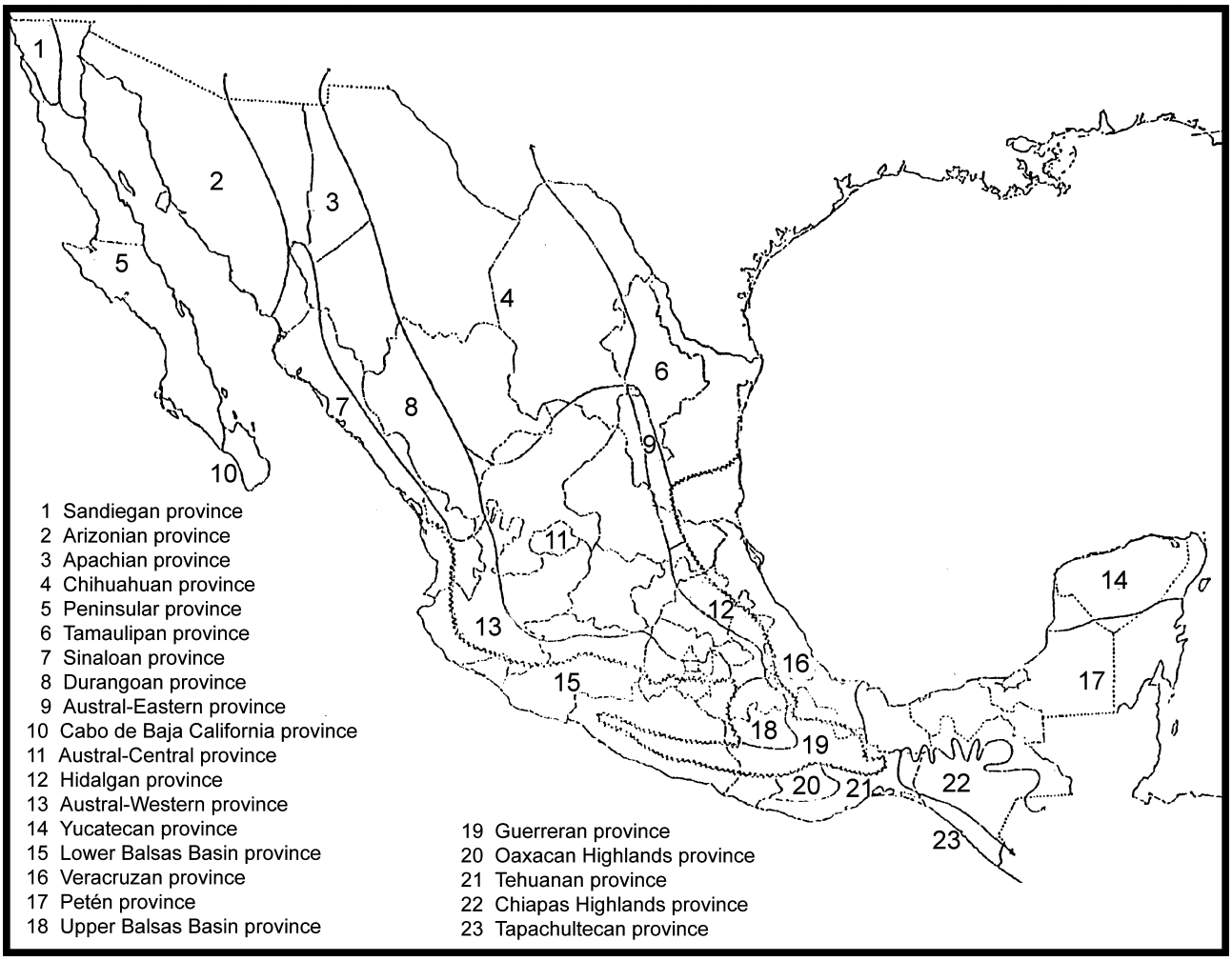


FIGURE 18. Regionalisation of Mexico (modified from Smith 1941).

Veracruzan province Smith 1941

Veracruzan province Smith 1941: 110; Dice 1943: 63; Goldman & Moore 1945: 357; Barrera 1962: 101; Stuart 1964: 355; Savage 1966: 736; Casas-Andreu & Reyna-Trujillo 1990: map; Ferrusquía-Villafranca 1990: map.
Lempira-Tegucigalpa province Ryan 1963: 25.
Caribbean-Gulf Lowlands region (in part) West 1964: 368.
Eastern Lowland sub-region Savage 1966: 736.
Mexican Xerophyllous province (in part) Cabrera & Willink 1973: 34.
Central American Rainforest centre Müller 1973: 10.
Campechean province Udvardy 1975: 41.
Mexican Gulf province Rzedowski 1978: 109; Samek 1988: 28; Rzedowski & Reyna-Trujillo 1990: map; Arriaga *et al.* 1997: 63; Morrone *et al.* 1999: 510; Espinosa *et al.* 2000: 64; Morrone 2001a: 49, 2001e: 42; Morrone & Márquez 2001: 637; Morrone *et al.* 2002: 96; Corona & Morrone 2005: 38; Morrone 2006: 478; Espinosa Organista *et al.* 2008: 61.
Campechean-Petén province (in part) Ferrusquía-Villafranca 1990: map.
Planiciense sub-province Ferrusquía-Villafranca 1990: map.
Tuxtlan sub-province Ferrusquía-Villafranca 1990: map.
Valle-Nacionalianan sub-province Ferrusquía-Villafranca 1990: map.
Gulf province Ramírez-Pulido & Castro-Campillo 1990: map.
Gulf-Caribbean Slope area (in part) Porzecanski & Cracraft 2005: 266.

Diagnosis. Coast of the Gulf of Mexico, in eastern Mexico (states of Campeche, Chiapas, Hidalgo, Oaxaca, Puebla, San Luis Potos, Tabasco, Tamaulipas and Veracruz), Belize and northern Guatemala (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Scrophulariaceae: *Tetranema roseum* (Méndez-Larios & Villaseñor 1995). ARTHROPODA. Attelabidae: *Pilolabus purpureus* and *P. splendens* (Hamilton 1994); Curculionidae: *Caecossonus sylvaticus* (Howden 1992); Heteroceridae: *Heterocerus crossi* (Miller 1995); Papilionidae: *Troilides tolus* (Llorente *et al.* 1997); Pieridae: *Dismorphia eunoe popoluca* (Llorente *et al.* 1997); Pselaphidae: *Eutrichites veracruzensis* (Carlton 1989); Scarabaeidae: *Cotinis punctatostriata* (Deloya & Ratcliffe 1988). VERTEBRATA. Anguidae: *Celestus eneagramus* (Arriaga *et al.* 1997); Caprimulgidae: *Caprimulgus maculicaudus* (Arriaga *et al.* 1997); Cricetidae: *Peromyscus leucopus incensus* abd *Xenomys nelsoni* (Arriaga *et al.* 1997; Escalante *et al.* 2009); Dasyproctidae: *Dasyprocta mexicana* (Müller 1973); Didelphidae: *Caluromys derbianus aztecus* (Arriaga *et al.* 1997); Elapidae: *Micrurus elegans* and *M. limbatus* (Campbell & Lamar 1989); Eleutherodactylidae: *Eleutherodactylus alfredi* (Espinosa *et al.* 2008); Geomyidae: *Cratogeomys fumosus* (Escalante *et al.* 2009); Hylidae: *Hyla ebraccata* and *H. underwoodi underwoodi* (Espinosa *et al.* 2008); Phrynosomatidae: *Sceloporus serrifer plioporus* and *S. variabilis variabilis* (Espinosa *et al.* 2008).

Districts. Nested units identified within this province (West 1964; Escalante *et al.* 1998; Campbell 1999) are treated herein as four districts: Deciduous Forest of Northern Veracruz, Los Tuxtlas, Southern Veracruz-Tabasco Rainforest and Valley of Chiapas. Their preliminary delimitation is based on West's (1964) areas (Fig. 19).

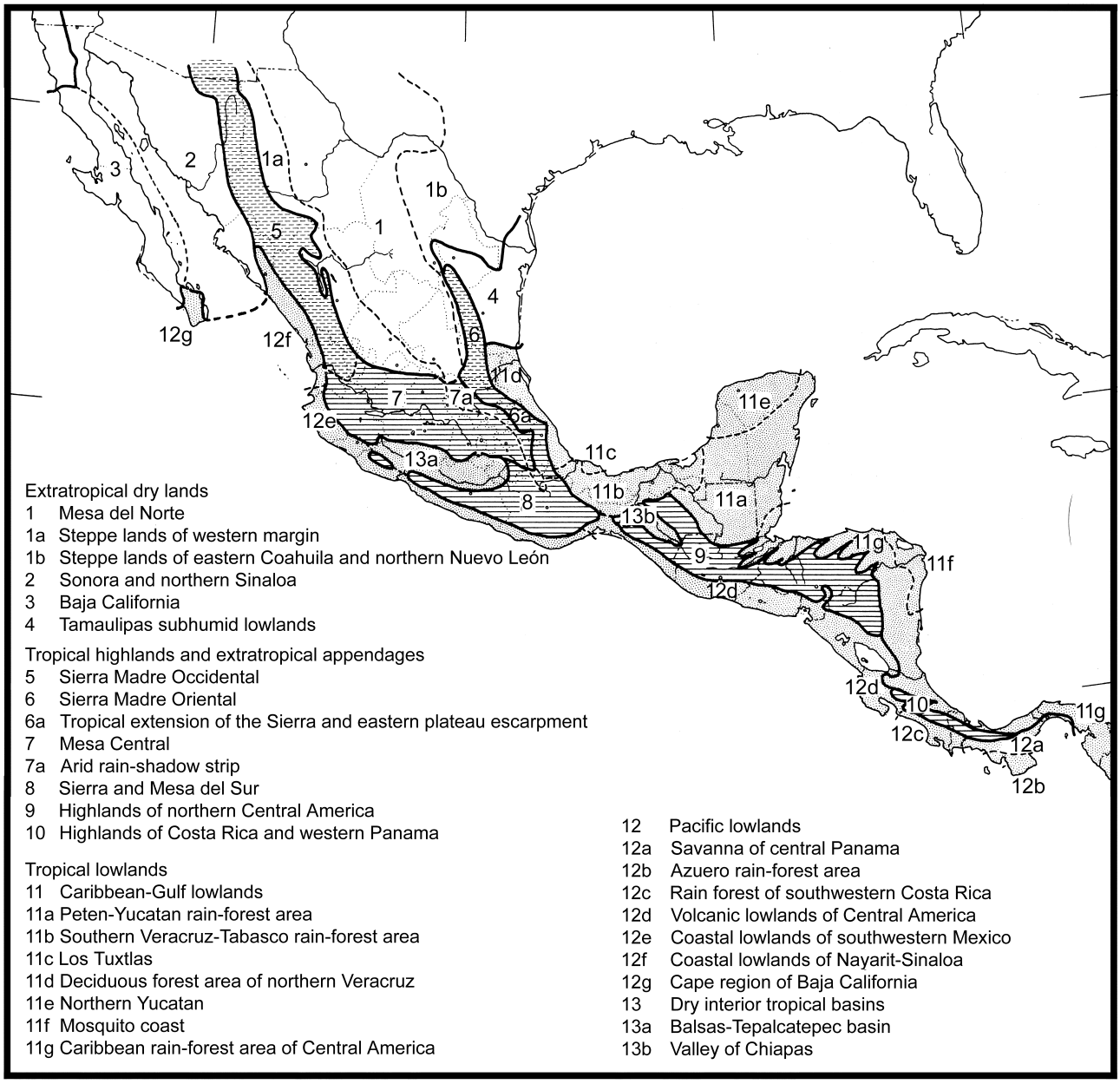


FIGURE 19. Regionalisation of Mexico (modified from West 1964).

Deciduous Forest of Northern Veracruz district West 1964, **stat. nov.**
Deciduous Forest of Northern Veracruz area West 1964: 368.
Tamaulipas/Veracruz Dry Forests ecoregion Dinerstein *et al.* 1995: 94.
Veracruz Dry Forests ecoregion Dinerstein *et al.* 1995: 94.
Veracruz Montane Forests ecoregion Dinerstein *et al.* 1995: 97.
Veracruz Palm Savannas ecoregion Dinerstein *et al.* 1995: 100.
Veracruz Pine-oak Forests ecoregion Dinerstein *et al.* 1995: 97.

Los Tuxtlas district West 1964, **stat. nov.**
Los Tuxtlas area West 1964: 368.
Sierra de los Tuxtlas province Escalante *et al.* 1998: 285; Campbell 1999: 116.

Southern Veracruz-Tabasco Rainforest district West 1964, **stat. nov.**
Southern Veracruz-Tabasco Rainforest area West 1964: 368.
Belizean Pine Forests ecoregion Dinerstein *et al.* 1995: 97.
Tabasco/Veracruz Savannas ecoregion Dinerstein *et al.* 1995: 98.
Tehuantepec Moist Forests ecoregion Dinerstein *et al.* 1995: 87.
Tehuantepec Savannas ecoregion Dinerstein *et al.* 1995: 98.
Veracruz province Brown *et al.* 1998: 32.

Valley of Chiapas district West 1964, **stat. nov.**
Valley of Chiapas area West 1964: 368.

Yucatán Peninsula province Smith 1941

Yucatán Peninsula province Smith 1941: 110; Goldman & Moore 1945: 360; Ryan 1963: 22; Stuart 1964: 355; Rzedowski 1978: 109; Rzedowski & Reyna-Trujillo 1990: map; Morrone 2001e: 43; Morrone & Márquez 2001: 637; Ibarra-Manríquez *et al.* 2002: 18; Morrone *et al.* 2002: 98; Morrone 2006: 479; Cortés-Ramírez *et al.* 2012: 531; Duno-de Stefano *et al.* 2012: 1053.
Campechean province Savage 1966: 736; Brown *et al.* 1998: 31.
Yucatán province Escalante *et al.* 1998: 285; Morrone *et al.* 1999: 510; Espinosa *et al.* 2000: 64; Morrone 2001a: 51; Espinosa Organista *et al.* 2008: 62.
Petén-Yucatán Rainforest area West 1964: 368.
Eastern Lowland sub-region Savage 1966: 736.
Yucatán centre Müller 1973: 16.
Yucatecan province Udvardy 1975: 41; Casas-Andreu & Reyna-Trujillo 1990: map; Ferrusquía-Villafranca 1990: Ramírez-Pulido & Castro-Campillo 1990: map.
Gulf-Caribbean Slope area (in part) Porzecanski & Cracraft 2005: 266.
Eastern Lowlands area (in part) Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Yucatán Peninsula, in southeastern Mexico (states of Campeche, Quintana Roo, Yucatán) and the northern portions of Guatemala and Belize, below 300 m altitude (Morrone 2001a, 2006; Espadas Manrique *et al.* 2003).

Endemic taxa. MAGNOLIOPHYTA. Acanthaceae: *Carlowrightia myriantha* (Durán *et al.* 1998); Apocynaceae: *Echites cupulifera* and *E. yucatanensis* (Durán *et al.* 1998); Araceae: *Xanthosoma yucatanense* (Durán *et al.* 1998); Arecaceae: *Coccothrinax readii* and *Desmoncus quasillarius* (Durán *et al.* 1998); Asclepiadaceae: *Cynanchum stenomeres* (Durán *et al.* 1998); Asteraceae: *Acmella lundelli, Ageratum munaense, Calea urticifolia, Critoniopsis oolepis* and *Parthenium schottii* (Durán *et al.* 1998); Boraginaceae: *Bourreria pulchra* and *Cordia serratifolia* (Durán *et al.* 1998); Cactaceae: *Mammillaria gaumeri, Nopalea gaumeri* and *N. inaperta* (Durán *et al.* 1998); Celastraceae: *Crossopethalum gaumeri* (Durán *et al.* 1998); Euphorbiaceae: *Acalypha gaumeri, Argythamnia tinctoria, Chamaesyce yucatanensis, Croton icche, Dalechampia shottii* and *Sebastiania adenophora* (Durán *et al.* 1998); Fabaceae: *Acacia cedilloi, Bauhinia erythrocalyx, Caesalpinia gaumeri, Calliandra belizensis, Pithecelobium lanceolatum* and *P. graciliflorum* (Rzedowski 1978; Arriaga *et al.* 1997;

Espinosa *et al.* 2000; Durán *et al.* 1998); Lythraceae: *Cuphea gaunmeri* (Durán *et al.* 1998); Nyctaginaceae: *Neea choriophylla* (Durán *et al.* 1998); Orchidaceae: *Encyclia nematocaulon* (Espinosa *et al.* 2008); Passifloraceae: *Passiflora foetida, P. mayarum* and *P. urbaniana* (Durán *et al.* 1998); Poaceae: *Gouninia latifolia* var. *guatemalensis* and *G. papillosa* (Ortiz-Díaz 1993; Durán *et al.* 1998); Polygonaceae: *Coccoloba cozumelensis* and *C. reflexiflora* (Durán *et al.* 1998); Rubiaceae: *Guettarda gaumeri* and *Hintonia octomera* (Durán *et al.* 1998); Sapindaceae: *Exothea diphylla* and *Serjania adiantoides* (Durán *et al.* 1998); Sapotaceae: *Pouteria amygdalina* and *Syderoxylon foetidissimum* (Durán *et al.* 1998). ARTHROPODA. Carabidae: *Amblygnathus subtinctus* and *Pasimachus purpuratus* (Nichols 1988; Espinosa *et al.* 2000); Chrysomelidae: *Ophraella notullata* (Espinosa *et al.* 2000); Curculionidae: *Caecossonus continuus* (Howden 1992); Elateridae: *Conoderus pilatei* (Johnson 1995); Papilionidae: *Priamides phanases* and *P. rogeri* (Llorente *et al.* 1997; Espinosa *et al.* 2000); Staphylinidae: *Bledius punctatissimus* (Espinosa *et al.* 2000). VERTEBRATA. Caprimulgidae: *Caprimulgus badius* (Espinosa *et al.* 2000); Cebidae: *Alouatta pigra* (Emmons 1990: Cortés-Ortiz *et al.* 2003); Certiidae: *Campylorhynchus yucatanicus* (Espinosa *et al.* 2000); Columbidae: *Leptotila jamaicensis gaumeri* (Arriaga *et al.* 1997); Cricetidae: *Otonyctomys hatti* and *Peromyscus yucatanicus yucatanicus* (Aranda *et al.* 1997; Espinosa *et al.* 2008); Crotalidae: *Crotalus durissus tzabcab* (Espinosa *et al.* 2008); Iguanidae: *Enyaliosaurus defensor* (Arriaga *et al.* 1997); Leporidae: *Sylvilagus floridanus yucatanicus* (Espinosa *et al.* 2008); Odontophoridae: *Colinus nigrogularis* (Arriaga *et al.* 1997); Phasianidae: *Meleagris ocellata* (Arriaga *et al.* 1997); Phrynosomatidae: *Sceloporus cozumelae, S. chrysostictus* and *S. lundelli* (Arriaga *et al.* 1997); Phyllostomidae: *Micronycteris schmidtorum* and *Mimon crenulatum keenani* (Escalante *et al.* 2003); Picidae: *Melenerpes rubricapillus* (Espinosa *et al.* 2000); Procyonidae: *Nasua narica yucatanica* (Arriaga *et al.* 1997); Psittacidae: *Amazona xanthoclora* (Arriaga *et al.* 1997).

Districts. Nested units identified within this province (Casas-Andreu & Reyna-Trujillo 1990; Arriaga *et al.* 1997; Ibarra-Manríquez *et al.* 2002; Espadas Manrique *et al.* 2003; Ramírez-Barahona *et al.* 2009; Cortés-Ramírez *et al.* 2012) are treated herein as the Belizean Swamp Forests, Northern Yucatán, Petén and Rooan districts.

Belizean Swamp Forests district Dinerstein *et al.* 1995, **stat. nov.**
Belizean Swamp Forests ecoregion Dinerstein *et al.* 1995: 87.
Belize area Espadas Manrique *et al.* 2003: 325.

Northern Yucatán district West 1964, **stat. nov.**
Northern Yucatán area West 1964: 368; Cortés-Ramírez *et al.* 2012: 536.
Yucatán Dry Forests ecoregion Dinerstein *et al.* 1995: 94.
Yucatán Moist Forests ecoregion Dinerstein *et al.* 1995: 87.
Yucatán province Barrera 1962: 79; Arriaga *et al.* 1997: 63; Brown *et al.* 1998: 31.
Northwestern district Ibarra-Manríquez *et al.* 2002: 24.
Yucatán area Espadas Manrique *et al.* 2003: 325.
Yucatán Dry Zone area Espadas Manrique *et al.* 2003: 324.
Arid/Dry Yucatán district Ramírez-Barahona *et al.* 2009: 784.
Yucatán district Duno-de Stefano *et al.* 2012: 1063.

Petén district Smith, 1941
Petén province Smith 1941: 110; Barrera 1962: 101; Stuart 1964: 355; Casas-Andreu & Reyna-Trujillo 1990: map; Arriaga *et al.* 1997: 63; Escalante *et al.* 1998: 285; Morrone *et al.* 1999: 510; Espinosa *et al.* 2000: 64; Espinosa Organista *et al.* 2008: 62.
Campechano-Petén province (in part) Ferrusquía-Villafranca 1990: map.
El Petén area Espadas Manrique *et al.* 2003: 325.
El Petén district Ramírez-Barahona *et al.* 2009: 783.
Petén district Duno-de Stefano *et al.* 2012: 1063.
Southern Yucatán area Cortés-Ramírez *et al.* 2012: 536.

Rooan district Ferrusquía-Villafranca 1990, **stat. nov.**
Rooan sub-province Ferrusquía-Villafranca 1990: map.

Quintana Roo Wetlands ecoregion Dinerstein *et al.* 1995: 100.
Cozumel-Islas Mujeres province Escalante *et al.* 1998: 285.
Cozumel Island area Cortés-Ramírez *et al.* 2012: 536.

Mosquito province Ryan 1963

Mosquito province Ryan 1963: 29.
Caribbean Costa Rica-Panama province Stuart 1964: 349.
Caribbean-Gulf Lowlands region (in part) West 1964: 368.
Caribbean Rainforest Central America area West 1964: 368.
Mosquito Coast area West 1964: 368.
Caribbean province Savage 1966: 736.
Panamanian province Savage 1966: 736.
Coco centre Müller 1973: 22.
Mosquito subcentre Müller 1973: 24.
Guatemala-Panama province (in part) Samek 1988: 29.
Central American Atlantic Moist Forests ecoregion (in part) Dinerstein *et al.* 1995: 87.
Miskito Pine Forests ecoregion Dinerstein *et al.* 1995: 98.
Motagua Valley Thornscrub ecoregion Dinerstein *et al.* 1995: 104.
Central American province (in part) Brown *et al.* 1998: 31.
Eastern Central America province (in part) Morrone 2001a: 53, 2001e: 46; Morrone & Márquez 2001: 637; Morrone 2006: 479.
Gulf-Caribbean Slope area (in part) Porzecanski & Cracraft 2005: 266.
Eastern Lowlands area (in part) Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Eastern Central America, between eastern Guatemala and southeastern Nicaragua.

Endemic taxa. ARTHROPODA. Curculionidae: *Hammatostylus criniger, H. exiguus* and *Sicoderus appendiculatus* (Vanin 1986); Passalidae: *Petrejoides subrecticornis* (Castillo & Reyes-Castillo 1984); Pselaphidae: *Eutrichites buscki* and *E. funiculis* (Carlton 1989); Staphylinidae: *Gansia taeniata* (Ashe & Lingafelter 1995); Tenebrionidae: *Archaeoglenes occidentalis* (Watrous 1982).

Districts. Hernández *et al.* (1992a) identified two insular districts within the Colombian portion of this province: Providencia Island and San Andrés Island.

Providencia Island district Hernández *et al.* 1992a
Providencia Island district Hernández *et al.* 1992a: 112.

San Andrés Island district Hernández *et al.* 1992a
San Andrés Island district Hernández *et al.* 1992a: 112.

Pacific dominion Cabrera & Willink 1973

North Brazilian-Guianan province (in part) Engler 1882: 345.
Tropical Andean subarea (in part) Clarke 1892: 381.
Colombian sub-region (in part) Sclater & Sclater 1899: 65.
Caribbean province (in part) Mello-Leitão 1937: 232, 1943: 129.
Incasic district (in part) Cabrera & Yepes 1940: 16.
Sabana district (in part) Cabrera & Yepes 1940: 14.
Incasic dominion (in part) Orfila 1941: 86.
Incasic centre (in part) Lane 1943: 414.
Incasic province (in part) Fittkau 1969: 642.
Pacific province Cabrera & Willink 1973: 52.
Orinoco-Venezuelan dominion Ringuelet 1975: 107.
Pacific area Coscarón & Coscarón-Arias 1995: 726.
Northern Andes bioregion Dinerstein *et al.* 1995: map 1.
Orinoco bioregion Dinerstein *et al.* 1995: map 1.
Northwestern South American dominion Morrone 2004a: 157, 2006: 479, 2014: 207.

Diagnosis. Southern Central America (southeastern Nicaragua and Panama) and northwestern South America (Colombia, Ecuador, Peru, Venezuela and Trinidad and Tobago) and the Galápagos Islands).

Provinces. The Pacific dominion comprises the Guatuso-Talamanca, Puntarenas-Chiriquí, Chocó-Darién, Guajira, Venezuelan, Trinidad, Magdalena, Sabana, Cauca, Galápagos Islands, Western Ecuador and Ecuadorian provinces.

Guatuso-Talamanca province Ryan 1963

Guatuso-Talamanca province Ryan 1963: 31.
Costa Rica-Panama Highlands province Stuart 1964: 358.
Isthmian province Savage 1966: 736.
Talamancan province Savage 1966: 736.
Costa Rican centre Müller 1973: 23.
Talamanca Paramo centre Müller 1973: 26.
Talamanca Montane Forest subcentre Müller 1973: 14.
Guatemala-Panama province (in part) Samek 1988: 29.
Central American Atlantic Moist Forests ecoregion (in part) Dinerstein *et al.* 1995: 87.
Talamancan Montane Forests ecoregion Dinerstein *et al.* 1995: 88.
Costa Rican Paramo ecoregion Dinerstein *et al.* 1995: 101.
Central American province (in part) Brown *et al.* 1998: 31.
Eastern Panama Highlands province Campbell 1999: 116.
Talamancan Cordillera area Marshall & Liebherr 2000: 206.
Eastern Central America province (in part) Morrone 2001a: 53, 2001e: 46, 2006: 479.
Chiriquí-Darién Highlands area Porzecanski & Cracraft 2005: 266.
Talamanca Ridge area Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Eastern Central America, between southeastern Nicaragua and eastern Panama.

Endemic taxa. ARTHROPODA. Apidae: *Geotrigona chiriquiensis* (Camargo & Moure 1996); Curculionidae: *Tyloderma expansum* and *T. lepidogramma* (Wibmer 1989). VERTEBRATA. Cricetidae: *Oryzomys devius* (Müller 1973); Elapidae: *Micrurus multifasciatus* (Campbell & Lamar 1989); Viperidae: *Atropoides picadoi* and *Bothriechis lateralis* (Müller 1973; Campbell & Lamar 1989).

Puntarenas-Chiriquí province Ryan 1963

Puntarenas-Chiriquí province Ryan 1963: 30.
Pacific Costa Rica-Panama province Stuart 1964: 349.
Azuero Rainforest area West 1964: 368.
Rainforest of Southwestern Costa Rica area West 1964: 368.
Savannah of Central Panama area West 1964: 368.
Golfo Dulcean province Savage 1966: 736.
Chiriquí subcentre Müller 1973: 24.
Costa Rican Seasonal Moist Forests ecoregion Dinerstein *et al.* 1995: 88.
Isthmian-Pacific Moist Forests ecoregion Dinerstein *et al.* 1995: 88.
Panamanian Dry Forests ecoregion Dinerstein *et al.* 1995: 94.
Northern sub-region Rangel *et al.* 1995d: 123.
Central American province (in part) Brown *et al.* 1998: 31.
Costa Rica and Western Panama province Campbell 1999: 116.
Western Panamanian Isthmus province Morrone 2001a: 53, 2001e: 48; Morrone & Márquez 2001: 637; Corona & Morrone 2005: 38; Morrone 2006: 479.
Western Lowlands area (in part) Flores-Villela & Martínez-Salazar 2009: 820.

Diagnosis. Western Central America, from Costa Rica to western Panama (Morrone 2001a, 2006).

Endemic taxa. ARTHROPODA. Passalidae: *Petrejoides tenuis* (Castillo & Reyes-Castillo 1984); Scarabaeidae: *Hemiphileurus jamesoni, H. youngi* and *Onthophagus orphnoides* (Ratcliffe 1988; Génier & Howden 1999); Simuliidae: *Simulium panamense* (Coscarón *et al.* 1996); Staphylinidae: *Gansia obscura, G.*

tergopunctata, G. unizonata. Homalolinus gracilis, H. mordax and *H. sharpi* (Ashe & Lingafelter 1995; Márquez & Morrone 2003); Tenebrionidae: *Archaeoglenes bollensis* and *A. puntaensis* (Watrous 1982). VERTEBRATA. Rhamphastidae: *Aulacorhynchus caeruleogularis* (Bonaccorso & Guayassamin 2013).

Chocó-Darién province Ryan 1963

Chocó-Darién province Ryan 1963: 31.
Chocoan province Savage 1966: 736.
Chocó subcentre Müller 1973: 38.
Colombian Pacific centre Müller 1973: 38.
Northern Pacific province Ringuelet 1975: 107.
Colombian Coastal province Udvardy 1975: 41.
Panamanian province Udvardy 1975: 41.
Chocó Rainforest centre (in part) Cracraft 1985: 53.
Chocó area Cracraft 1988: 223; Bates *et al.* 1998: 785.
Chocó-Magdalena province (in part) Hernández *et al.* 1992a: 118.
Chocó sector Hernández *et al.* 1992a: 118.
Chocó/Darién Moist Forests ecoregion Dinerstein *et al.* 1995: 91.
Eastern Panamanian Montane Forests ecoregion Dinerstein *et al.* 1995: 91.
Pacific Coast region Rangel *et al.* 1995a: 21, 1995d: 121.
Colombian province (in part) Rivas-Martínez & Navarro 1994: map.
Chocó province Morrone 1999: 5, 2001a: 58, 2001e: 55, 2006: 479.
Chocó Lowlands area Porzecanski & Cracraft 2005: 266.

Diagnosis. Pacific coast of northern Ecuador, Colombia and Panama (Rangel *et al.* 1995a, d; Morrone 2001a, 2006).

Endemic taxa. CONIFEROPHYTA. Podocarpaceae: *Podocarpus guatemalensis* var. *allenii* (Torres 1988). MAGNOLIOPHYTA. Arecaceae: *Wettinia panamensis* (Bernal 1986); Aristolochiaceae: *Aristolochia colossifolia* and *A. trianae* (González 1990); Connaraceae: *Connarus nervatus*, *C. silvanensis*, *C. williamsi*, *Pseudoconnarus agelaefolius* and *Rourea pittieri* (Forero *et al.* 1983); Cyclanthaceae: *Dicranopygium arusisense, D. gigantea, D. odoratum* and *D. trilobulata* (Tuberquia 1997); Fabaceae: *Crotalaria spectabilis* (Bernal 1986); Gunneraceae: *Gunnera atropurpurea* var. *chocoana* (Mora 1984); Onagraceae: *Fuchsia putumayensis* and *F. sessilifolia* (Berry 1982). ARTHROPODA. Buthidae: *Ananteris gorgonae* (Lourenço & Flores 1989); Scarabaeidae: *Onthophagus barretti* (Génier & Howden 1999); Simuliidae: *Simulium sanguineum* (Coscarón & Coscarón-Arias 1995). VERTEBRATA. Callithrichidae: *Saguinus geoffroyi* (Emmons 1990); Cebidae: *Ateles fuscipes* (Emmons 1990); Columbidae: *Columba goodsoni* and *C. subvinacea berlepschi* (Hernández *et al.* 1992c); Cracidae: *Penelope ortoni* (Müller 1973; Hernández *et al.* 1992c); Didelphidae: *Caluromys derbianus* (Emmons 1990); Elapidae: *Micrurus ancoralis* (Campbell & Lamar 1989); Fringillidae: *Chrysothlypis chrysomelas* and *C. salmoni* (Müller 1973); Furnariidae: *Cranioleuca erythrops griseigularis* (Hernández *et al.* 1992c); Galbulidae: *Galbula ruficauda melanogenia* (Hernández *et al.* 1992c); Phyllostomatidae: *Platyrrhinus chocoensis* (Alberico & Velasco 1994); Thamnophilidae: *Myrmeciza berlepschi* (Müller 1973); Trochilidae: *Androdon aequatorialis*, *Coeligena wilsoni*, *Hylocharis grayi humboldtii* and *Thalurania fannyi* (Müller 1973; Hernández *et al.* 1992c); Trogonidae: *Trogon massena australis* and *T. comptus* (Hernández *et al.* 1992c); Tyrannidae: *Machaeropterus deliciosus* (Müller 1973); Viperidae: *Bothriopsis punctata* (Campbell & Lamar 1989).

Sub-provinces and districts. Hernández *et al.* (1992a) identified 12 districts in the Colombian portion of this province and Rangel *et al.* (1995d) identified sub-regions, which are treated herein as three sub-provinces: Central sub-province (Murr and Sucio River districts), Highlands sub-province (Alto Atrato-San Juan, Acand-San Blas and Tacarcuna districts) and Pacific Basin sub-province (Aspavé-El Limón-Pirre, Baudó, Gorgona, Juradó, Micay, Tumaco and Utria districts).

Central sub-province Rangel *et al.* 1995d, **stat. nov.**
Central sub-region Rangel *et al.* 1995d: 123.

Murrí istrict Hernández *et al.* 1992a
Murrí district Hernández *et al.* 1992a: 123.

Sucio River district Hernández *et al.* 1992a
Sucio River district Hernández *et al.* 1992a: 123.

Highlands sub-province Rangel *et al.* 1995d, **stat. nov.**
Highlands sub-region Rangel *et al.* 1995d: 123.

Alto Atrato-San Juan district Hernández *et al.* 1992a
Alto Atrato-San Juan district Hernández *et al.* 1992a: 124.

Acandí-San Blas district Hernández *et al.* 1992a
Acandí-San Blas district Hernández *et al.* 1992a: 109.

Tacarcuna district Hernández *et al.* 1992a
Tacarcuna district Hernández *et al.* 1992a: 109.

Pacific Basin sub-province Rangel *et al.* 1995d, **stat. nov.**
Pacific Basin sub-region Rangel *et al.* 1995d: 123.

Aspavé-El Limón-Pirre district Hernández *et al.* 1992a
Aspavé-El Limón-Pirre district Hernández *et al.* 1992a: 123.

Baudó district Hernández *et al.* 1992a
Baudó district Hernández *et al.* 1992a: 109.

Gorgona district Hernández *et al.* 1992a
Gorgona district Hernández *et al.* 1992a: 124.

Juradó district Hernández *et al.* 1992a
Juradó district Hernández *et al.* 1992a: 109.

Micay district Hernández *et al.* 1992a
Micay district Hernández *et al.* 1992a: 109.

Tumaco district Hernández *et al.* 1992a
Tumaco district Hernández *et al.* 1992a: 109.

Utria district Hernández *et al.* 1992a
Utria district Hernández *et al.* 1992a: 109.

Guajira province Cabrera & Willink 1973

Guajira province Cabrera & Willink 1973: 46.
Caribe-Guajira Subequatorial dominion Ab'Sáber 1977: map.
Guajiran centre Cracraft 1985: 57.
Meridan Montane centre Cracraft 1985: 58.
Colombia and Northern Venezuela sub-region Samek 1988: 32.
Guajira/Barranquilla Xeric Scrub ecoregion Dinerstein *et al.* 1995: 105.
Paraguan Xeric Scrub ecoregion Dinerstein *et al.* 1995: 105.
Guajira sub-region Rangel *et al.* 1995c: 21.
Barranquilla province Morrone 1999: 4.

Diagnosis. Northern Colombia and northwestern Venezuela (Rangel *et al.* 1995b, c; Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Chionolaena chrysocoma*, *C. columbiana* and *Montanoa josei* (Funk 1982; Freire 1993); Connaraceae: *Rourea antioquensis* (Forero *et al.* 1983); Fabaceae: *Crotalaria vitellina*, *C. verrucosa* and *Prosopis juliflora* (Bernal 1986; Hernández *et al.* 1992b); Passifloraceae: *Passiflora bracteosa*, *P. purdiei*, *P. rugosa* var. *rugosa* and *P. schlimiana* (Escobar 1988); Rhamnaceae: *Condalia henriquezii* (Fernández-Alonso 1997); Zygophyllaceae: *Bulnesia arborea* (Hernández *et al.* 1992b). ARTHROPODA. Curculionidae: *Ludovix bifasciatus*, *Macrostylus beatricis*, *M. lacunitae*, *M. mucuyensis*, *M. valeranus*, *Naupactus rosalesi* and *Sicoderus hirsutus* (Vanin 1986; Bordón 1991, 1997); Schendylidae: *Schendylops colombianus* (Morrone & Pereira 1999); Staphylinidae: *Neobisnius fortis* and *N. vigii* (Frank 1981); Trogidae: *Omorgus badeni* (Scholtz 1990); Stygnidae: *Eutimesius albicinctus*, *Innoxius magnus* and *Stygnus aggerum* (Pinto-da-Rocha 1997). VERTEBRATA. Callithrichidae: *Saguinus oedipus* (Emmons 1990); Columbidae: *Columba corensis* (Hernández *et al.* 1992c); Cracidae: *Crax alberti* (Müller 1973); Cricetidae: *Oryzomys albigularis maculiventer* (Müller 1973); Echimyidae: *Proechimys canicollis* and *P. mincae* (Patton 1987); Elapidae: *Micrurus dissoleucus nigrirostris* (Müller 1973); Erethizontidae: *Coendou sanctamartae* (Müller 1973); Fringillidae: *Anisognathus melanogenys*, *Atlapetes melanocephalus*, *Basileuterus basilicus*, *Catamenia homochroa oreophila*, *Conirostrum rufum* and *Myioborus flavivertex* (Müller 1973); Furnariidae: *Cranioleuca hellmayri*, *Synallaxis candei* and *S. fuscorufa* (Müller 1973); Grallariidae: *Grallaria bangsi* (Müller 1973); Heteromyidae: *Heteromys anomalus jesupi* (Müller 1973); Leporidae: *Sylvilagus brasiliensis sanctamartae* and *S. floridanus superciliaris* (Müller 1973); Momotidae: *Momotus momota spatha* (Hernández *et al.* 1992c); Psittacidae: *Aratinga pertinax pertinax* and *Pyrrhura viridicata* (Müller 1973); Rhamphastidae: *Rhamphastos citreolaemus* (Hernández *et al.* 1992b); Sciuridae: *Sciurus granatensis gerrardi* (Müller 1973); Tinamidae: *Crypturellus erythropus idoneus* (Müller 1973); Trochilidae: *Anthocephala floriceps*, *Campylopterus phainopeplus* and *Coeligena phalerata* (Müller 1973); Troglodytidae: *Campylorhynchus griseus* (Müller 1973); Tyrannidae: *Myiotheretes pernix* and *Myiarchus panamensis* (Müller 1973); Viperidae: *Bothrops lansbergii lansbergii* (Müller 1973).

Districts. Müller (1973) and Hernández *et al.* (1992a) identified nested units, which are treated herein as 15 districts: Alta Guajira, Aracataca, Ariguaní-César, Baja Guajira and Alto César, Barranquilla, Caracolicito, Cartagena, Chundúa, Guachaca, Macuira, Maracaibo, María and Piojó Hills, Marocaso, Santa Marta and Sierra Nevada.

Alta Guajira district Hernández *et al.* 1992a
Alta Guajira district Hernández *et al.* 1992a: 115.

Aracataca district Hernández *et al.* 1992a
Aracataca district Hernández *et al.* 1992a: 117.

Ariguaní-César district Hernández *et al.* 1992a
Ariguaní-César district Hernández *et al.* 1992a: 116.

Baja Guajira and Alto César district Hernández *et al.* 1992a
Baja Guajira and Alto César district Hernández *et al.* 1992a: 115.

Barranquilla district Müller 1973, **stat. nov.**
Barranquilla centre Müller 1973: 28.

Caracolicito district Hernández *et al.* 1992a
Caracolicito district Hernández *et al.* 1992a: 109.

Cartagena district Hernández *et al.* 1992a
Cartagena district Hernández *et al.* 1992a: 109.

Chundúa district Hernández *et al.* 1992a
Chundúa district Hernández *et al.* 1992a: 109.

Guachaca district Hernández *et al.* 1992a
Guachaca district Hernández *et al.* 1992a: 117.

Macuira district Hernández *et al.* 1992a
Macuira district Hernández *et al.* 1992a: 109.

Maracaibo district Müller 1973, **stat. nov.**
Maracaibo subcentre Müller 1973: 57.
Venezuelan subcentre Müller 1973: 57.
Maracaibo province Ringuelet 1975: 107; Morrone 1999: 4, 2001a: 57, 2001e: 57, 2006: 479.
Venezuelan Dry Forest province (in part) Udvardy 1975: 41.
Venezuelan Deciduous Forest province Udvardy 1975: 41.
Atlantic Coast sub-region Rangel *et al.* 1995c: 21.
Maracaibo Dry Forests ecoregion Dinerstein *et al.* 1995: 95.

María and Piojó Hills district Hernández *et al.* 1992a
María and Piojó Hills Hernández *et al.* 1992a: 116.

Marocaso district Hernández *et al.* 1992a
Marocaso district Hernández *et al.* 1992a: 118.

Santa Marta district Müller 1973, **stat. nov.**
Santa Marta centre Müller 1973: 30.
Santa Marta Montane centre Cracraft 1985: 56.
Santa Marta district Hernández *et al.* 1992a: 116.
Santa Marta Montane Forests ecoregion Dinerstein *et al.* 1995: 92.
Santa Marta province Morrone 1999: 4.

Sierra Nevada district Müller 1973, **stat. nov.**
Sierra Nevada centre Müller 1973: 31.
Sierra Nevada de Santa Marta province Hernández *et al.* 1992a: 117.
Sierra Nevada de Santa Marta region Rangel *et al.* 1995b: 107.

Venezuelan province Cabrera & Willink 1973

Venezuelan province Cabrera & Willink 1973: 56.
Venezuelan Coastal Forest centre Müller 1973: 54.
Venezuelan Montane Forest centre Müller 1973: 56.
Caribbean Coast province Ringuelet 1975: 107.
Venezuelan Dry Forest province (in part) Udvardy 1975: 41.
Parian Montane centre Cracraft 1985: 57.
Venezuelan Montane centre Cracraft 1985: 58.
Septentrional Venezuelan province (in part) Rivas-Martínez & Navarro 1994: map.
Araya and Paría Xeric Scrub ecoregion Dinerstein *et al.* 1995: 105.
Aruba/Curaçao/Bonaire Cactus Scrub ecoregion Dinerstein *et al.* 1995: 105.
Cordillera La Costa Montane Forests ecoregion Dinerstein *et al.* 1995: 88.
La Costa Xeric Shrublands ecoregion Dinerstein *et al.* 1995: 105.
Lara/Falcón Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Paraguan Restingas ecoregion Dinerstein *et al.* 1995: 105.
Venezuelan Coast province Morrone 1999: 4, 2001a: 58, 2001e: 58, 2006: 479.

Diagnosis. Northern Venezuela and Colombia, including also the islands of Aruba, Curaçao and Bonaire (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Montanoa fragans* (Funk 1982). ARTHROPODA. Carabidae: *Clivina oblita* (Nichols 1988); Curculionidae: *Macrostylus coloniae*, *M. loscaroniensis*, *M. pittieri*, *M. santanae*, *Naupactus cupreus*, *N. penai*, *N. litoris*, *N. santanae* and *N. venezolanus*, *Pseudoalaocybites elegans*, *P. margheritae*, *P. squamirostris*, *Sicoderus abbreviatus*, *S. bicolor*, *S. cracens* and *S. globulicollis* (Vanin 1986; Bordón 1991, 1997; Howden 1992); Miridae: *Rhinacloa puertoricensis* (Schuh & Schwartz, 1985); Schendylidae: *Schendylops minutus, S. paoletti* and *S. virgingordae* (Morrone & Pereira 1999); Sciaridae: *Rhipidita brevicornis* and *R. vespertilio* (Amorim & Pires 1996); Simuliidae: *Simulium clownsi* and S. *oviedoi* species group (Coscarón *et al.* 1996); Stygnidae: *Stenostygnellus macrochelis*, *Stygnoplus biguttatus*, *S. granulosus*, *S. meinerti* and *S. trilineatus* (Pinto-da-Rocha 1997). VERTEBRATA. Didelphidae: *Gracilinanus marica* (Emmons 1990); Echimyidae: *Proechimys guairae* and *P. urichi* (Patton 1987); Psittacidae: *Amazona barbadensis* (Müller 1973).

Trinidad province Ringuelet 1975

Trinidad province Ringuelet 1975: 107.
Trinidad & Tobago Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Trinidad & Tobago Moist Forests ecoregion Dinerstein *et al.* 1995: 88.
Trinidad and Tobago province Morrone 1999: 4, 2001a: 58, 2001e: 59, 2006: 479.

Diagnosis. Islands of Trinidad and Tobago (Morrone 2001a, 2006).

Endemic taxa. ARTHROPODA. Carabidae: *Nyctostyles planicollis* (Nichols 1988); Coccinellidae: *Nexophallus popei* (Gordon 1982); Curculionidae: *Sicoderus propinquus* and *Tyloderma pallidum* (Vanin 1986; Wibmer 1989); Drosophilidae: *Drosophila bedicheki* (Grimaldi 1988); Glossosomatidae: *Protoptila ignera* (Flint 1996); Stygnidae: *Stygnoplus clavotibialis* (Pinto-da-Rocha 1997). VERTEBRATA. Echimyidae: *Proechimys trinitatus* (Patton 1987).

Magdalena province Müller 1973

Magdalena centre Müller 1973: 32; Cracraft 1985: 56.
Magdalena dominion Ringuelet 1975: 107.
Perijan Montane centre Cracraft 1985: 59.
Chocó-Magdalena province (in part) Hernández *et al.* 1992a: 118.
Magdalena sector Hernández *et al.* 1992a: 125.
Colombian province (in part) Rivas-Martínez & Navarro 1994: map.
Catatumbo Moist Forests ecoregion Dinerstein *et al.* 1995: 92.
Cordillera Oriental Montane Forests ecoregion Dinerstein *et al.* 1995: 92.
Magdalena/Urabá Moist Forests ecoregion Dinerstein *et al.* 1995: 92.
Magdalena Valley Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Magdalena Valley Montane Forests ecoregion Dinerstein *et al.* 1995: 92.
Venezuelan Andes Montane Forests ecoregion Dinerstein *et al.* 1995: 92.
Magdalena province Morrone 1999: 4, 2001a: 60, 2001e: 60, 2006: 479.
Magdalena Valley province Morrone 1999: 5.

Diagnosis. Western Venezuela and northwestern Colombia (Dinerstein *et al.* 1995; Morrone 2001a, 2006).

Endemic taxa. FILICOPHYTA. Plagiogyriaceae: *Plagiogyria semicordata* (Murillo 1988). MAGNOLIOPHYTA. Asteraceae: *Montanoa ovalifolia* subsp. *ovalifolia* (Funk 1982); Cecropiaceae: *Cecropia goudotiana* (Franco & Berg 1997); Gunneraceae: *Gunnera saint-johnii* (Mora 1984); Onagraceae: *Fuchsia petiolaris* and *F. venusta* (Berry 1982); Passifloraceae: *Passiflora adulterina*, *P. cuatrecasasii* and *P. lanata* (Escobar 1988); Zygophyllaceae: *Bulnesia carrapo* (Hernández *et al.* 1992b). ARTHROPODA. Curculionidae: *Ecnomorhinus quasimodus* (Vanin 1986); Nymphalidae: *Actinote anteas*, *A. callianthe*, *Actinote e. equatoria*, *A. eresia*, *A. hylonome*, *A. inaequalis* and *A. melampeplos* (Andrade 1995); Stygnidae: *Eutimesius ornatus*, *Metaphareus albimanum* and *Phareus raptator* (Pinto-da-Rocha 1997). VERTEBRATA. Callithrichidae: *Saguinus leucopus* (Emmons 1990); Columbidae: *Columbina passerina parvula* (Hernández *et al.* 1992c); Echimyidae: *Proechimys magdalenae* (Patton 1987); Leporidae: *Sylvilagus floridanus purgatus* (Müller 1973); Momotidae:

Momotus momota (Hernández *et al.* 1992c); Sciuridae: *Sciurus granatensis norosiensis* (Hernández *et al.* 1992c); Troglodytidae: *Campylorhynchus griseus* (Müller 1973).

Districts. Hernández *et al.* (1992a) identified nine districts in the Colombian portion of this province: Barbacoas, Carare, Catatumbo, La Gloria, Lebrija, Magdalena Delta, Nechí, Sinú-San Jorge and Turbo.

Barbacoas district Hernández *et al.* 1992a
Barbacoas district Hernández *et al.* 1992a: 109.

Carare district Hernández *et al.* 1992a
Carare district Hernández *et al.* 1992a: 109.

Catatumbo district Müller 1973, **stat. nov.**
Catatumbo centre Müller 1973: 52.
Catatumbo district Hernández *et al.* 1992a: 127.

La Gloria district Hernández *et al.* 1992a
La Gloria district Hernández *et al.* 1992a: 109.

Lebrija district Hernández *et al.* 1992a
Lebrija district Hernández *et al.* 1992a: 126.

Magdalena Delta district Hernández *et al.* 1992a
Magdalena Delta district Hernández *et al.* 1992a: 109.

Nechí district Müller 1973
Nechí subcentre Müller 1973: 38.
Nechí Rainforest centre Cracraft 1985: 54.
Nechí area Cracraft 1988: 223.
Nechí district Hernández *et al.* 1992a: 126.

Sinú-San Jorge district Hernández *et al.* 1992a
Sinú-San Jorge district Hernández *et al.* 1992a: 125.
Sinú Valley Dry Forests ecoregion Dinerstein *et al.* 1995: 95.

Turbo district Hernández *et al.* 1992a
Turbo district Hernández *et al.* 1992a: 109.

Sabana province Orfila 1941

Sabana district Orfila 1941: 86.
Caquetio province (in part) Fittkau 1969: 642.
Sabana province Cabrera & Willink 1973: 63.
Orinoquia province Ringuelet 1975: 107; Hernández *et al.* 1992a: 129.
Llanos province Udvardy 1975: 42; Huber & Alarcón 1988: map; Rivas-Martínez & Navarro 1994: map; Morrone 1999: 5.
Llanos de Orinoco dominion (in part) Ab'Sáber 1977: map.
Septentrional Venezuelan province (in part) Rivas-Martínez & Navarro 1994: map.
Llanos ecoregion Dinerstein *et al.* 1995: 98.
Llanos Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Orinoco Wetlands ecoregion Dinerstein *et al.* 1995: 100.
Venezuelan Llanos province Morrone 2001a: 61, 2001e: 60, 2006: 479.
Northern South America area Porzecanski & Cracraft 2005: 266.

Diagnosis. Plains of great part of Venezuela and northwestern Colombia (Cabrera & Willink 1973; Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Aristolochiaceae: *Aristolochia goudotii*, *A. nummularifolia* and *A. pannosoides* (González 1990); Fabaceae: *Centrosema tetragonolobum* (Schultze-Kraft & Williams 1990). ARTHROPODA. Curculionidae: *Loncophorus santarosae*, *Naupactus jolyi, N. sanfilippoi*, *Tyloderma brevisquameum* and *T. variabile* (Clark 1988; Wibmer 1989; Bordón 1997); Nymphalidae: *Actinote amida* (Andrade 1995).

Districts. Hernández *et al.* (1992a) identified six districts in the Colombian portion of this province: Arauca-Apure, Casanare, Maipures, Piedemonte Casanare-Arauca, Piedemonte Meta and Sabanas Altas.

Arauca-Apure district Hernández *et al.* 1992a
Arauca-Apure district Hernández *et al.* 1992a: 129.

Casanare district Hernández *et al.* 1992a
Casanare district Hernández *et al.* 1992a: 129.

Maipures district Hernández *et al.* 1992a
Maipures district Hernández *et al.* 1992a: 109.

Piedemonte Casanare-Arauca district Hernández *et al.* 1992a
Piedemonte Casanare-Arauca district Hernández *et al.* 1992a: 109.

Piedemonte Meta district Hernández *et al.* 1992a
Piedemonte Meta district Hernández *et al.* 1992a: 131.

Sabanas Altas district Hernández *et al.* 1992a
Sabanas Altas district Hernández *et al.* 1992a: 130.

Cauca province Müller 1973

Cauca centre Müller 1973: 33.
Colombian Montane Forest centre Müller 1973: 34.
East Andean subcentre Müller 1973: 35.
West Andean subcentre Müller 1973: 35.
Northern Andes province Udvardy 1975: 42.
Amotape unit Lamas 1982: 345.
Ayabaca unit Lamas 1982: 354.
El Caucho unit Lamas 1982: 343.
Huancabamba unit Lamas 1982: 349.
Marañón unit (in part) Lamas 1982: 345.
Marañón centre Cracraft 1985: 68.
Cauca Valley Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Cauca Valley Montane Forests ecoregion Dinerstein *et al.* 1995: 92.
Guayaquil Flooded Grasslands ecoregion Dinerstein *et al.* 1995: 101.
Marañón Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Northwestern Andean Montane Forests ecoregion Dinerstein *et al.* 1995: 91.
Cauca province Morrone 1999: 5, 2001a: 59, 2001e: 62, 2006: 479.

Diagnosis. Western Colombia, northern Peru and Ecuador (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Bombacaceae: *Matisia longiflora* (Fernández & Cogollo 1992); Cecropiaceae: *Cecropia megastachya* (Franco & Berg 1997); Fabaceae: *Crotalaria brevidens*, *C. juncea* and *C. paulina* (Bernal 1986); Gunneraceae: *Gunnera atropurpurea* var. *sibundoya*, *G. cuatrecasii*, G. *manicata* and *G. tamarensis* (Mora 1984); Onagraceae: *Fuchsia dependen*s and *F. loxenis* species groups, *F. pallescens* and *F. orientalis* (Berry 1982); Passifloraceae: *Passiflora antioquensis*, *P. fimbriatistipula*, *P. flexipes* and *P. parritae* (Escobar 1988). ARTHROPODA. Miridae: *Rhinacloa incaicus* (Schuh & Schwartz 1985); Nymphalidae: *Actinote desmiala* (Andrade 1995); Oxyopidae: *Peucetia cauca* (Lourenço 1990); Polycentropidae:

Polycentropus cuspidatus (Hamilton 1988); Pompilidae: *Pompilocalus ruminahui* and *P. vinicolor* (Roig-Alsina 1989); Schendylidae: *Schendylops andesicola* and *S. dentifer* (Morrone & Pereira 1999); Stygnidae: *Nomoclastes quasimodo, Stygnus gertschi* (Pinto-da-Rocha 1997). VERTEBRATA. Apodidae: *Cypseloides lemosi* (Müller 1973); Cervidae: *Pudu mephistophiles* (Müller 1973); Cracidae: *Ortalis guttata guttata* (Müller 1973); Leporidae: *Sylvilagus brasiliensis andinus* (Müller 1973); Picidae: *Picumnus granadensis* (Müller 1973); Procyonidae: *Nasuella olivacea* (Müller 1973); Rhamphastidae: *Aulacorhynchus griseigularis* (Bonaccorso & Guayassamin 2013); Sciuridae: *Sciurus pucheranii* (Müller 1973); Tinamidae: *Nothocercus julius* (Müller 1973).

Galápagos Islands province Mello-Leitão 1937

Galápagos Islands sub-region Mello-Leitão 1937: 240.
Galápagos Islands province Cabrera & Willink 1973: 46; Udvardy 1975: 42; Rivas-Martínez & Navarro 1994: map; Morrone 1999: 5, 2001a: 62, 2001e: 63, 2006: 479.
Galápagos centre Müller 1973: 106.
Galápagos Islands Xeric Scrub ecoregion Dinerstein *et al.* 1995: 105.

Diagnosis. Archipelago of Colón, in the Pacific ocean, 950 km west of the coast of Ecuador, that is comprised of 15 major and several smaller islands (Kuschel 1961; Peck & Kukalová-Peck 1990; Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Burseraceae: *Bursera malacophylla* (Espinosa *et al.* 2006); Cactaceae: *Opuntia galapageia* (Cabrera & Willink 1973). ARTHROPODA. Acrididae: *Halmenus* spp. (Cigliano & Lange 1998); Anobiidae: *Blairinus* (Peck 1991); Anthribidae: *Ormiscus variegatus* (Peck & Kukalová-Peck 1990); Buprestidae: *Chrysobothris williamsi* (Peck & Kukalová-Peck 1990); Carabidae: *Bembidion galapagoensis*, *Calosoma galapageium*, *C. granatense*, *C. leleuporum*, *C. linelli*, *Cicindela galapagoensis* and *Selenophorus obscuricornis* (Desender *et al.* 1991, 1992a, b; Peck 1991); Cerambycidae: *Nesoeme* (Peck 1991); Chilenophilidae: *Pachymerium pereirai* (Shear & Peck 1992); Chrysomelidae: *Docema* and *Scutobruchus ceratioborus* (Peck & Kukalová-Peck 1990); Cleridae: *Pelonium longfildae* (Peck & Kukalová-Peck 1990); Coccinelidae: *Diomus galapagoensis* (Peck & Kukalová-Peck 1990); Cryptotidae: *Cryptops beebei* (Shear & Peck 1992); Cucujidae: *Cathartosilvanus tropicalis* (Peck & Kukalová-Peck 1990); Curculionidae: *Anchonus galapagoensis*, *Galapaganus* spp., *Lembodes subcostatus*, *Neopentarthrum mutchleri* and *Pagiocerus frontalis* (Lanteri 1992; Peck & Kukalová-Peck 1990; Rosas *et al.* 2011b); Dolichopodidae: *Amblypsilopus depilis*, *Asyndetus bursericola*, *A. cavagnaroi*, *A. maelfaiti*, *A. versicolor*, *Chrysotus baerti*, *C. brevicornis*, *Cymatopus setosus*, *Medereta galapagensis* and *Thinophilus hardyi* (Bickel & Sinclair 1997); Dytiscidae: *Copelatus galapagoensis* and *Thermoncetes basillaris galapagoensis* (Peck & Kukalová-Peck 1990); Elateridae: *Conoderus galapagoensis* (Peck & Kukalová-Peck 1990); Formicidae: *Strumigenys longispinosa* and *S. marginiventris* (Lattke & Goitía 1997); Geophilidae: *Pachymerium pereirai* (Pereira *et al.* 1997); Gnaphosidae: *Camillina galapagoensis*, *C. isabela*, *C. pecki*, *C. isla*, *C. sandrae*, *Neozimiris pinta*, *N. pinzon*, *Poecilochroa bifasciata*, *Trachyzelotes kulckzynskii* and *Zelotes reformans* (Baert 1994); Hydrophilidae: *Galapagodacnum*, *Enochrus obscurus* and *Tropisternus lateralis* (Peck & Kukalová-Peck 1990); Miridae: *Rhinacloa insularis*, *R. longirostris*, *R. mella*, *R. rubescens* and *R. usingeri* (Schuh & Schwartz 1985); Mordellidae: *Mordellistena galapagoensis* (Peck & Kukalová-Peck 1990); Mycetophagidae: *Litargus balteatus* (Peck & Kukalová-Peck 1990); Nitidulidae: *Acribus* (Peck 1991; Peck & Kukalová-Peck 1990); Phalacridae: *Phalacrus darwini* (Peck & Kukalová-Peck 1990); Scarabaeidae: *Nesoryctes* (Peck 1991); Rhizophagidae: *Bactridium insularis* (Peck & Kukalová-Peck 1990); Schendylidae: *Nannopodellus purpurascens*, *Nesondyla nealota*, *Pectiniunguis albermarlensis* and *P. krausi* (Pereira *et al.* 1997); Scolopendridae: *Scolopendra galapagoensis* (Shear & Peck 1992); Staphylinidae: *Neolinus* and *Pinostygus* (Campbell & Peck 1989; Peck 1991); Tenebrionidae: *Blapstinus, Pedoneces* and *Stomion* (Peck 1991); Trogidae: *Omorgus indigenus* (Scholtz 1990). VERTEBRATA. Cricetidae: *Oryzomys galapagoensis* (Nowak 1991); Fringillidae: *Camarhynchus crassirostris*, *C. heliobathes*, *C. pallidus*, *C. parvulus*, *C. pauper*, *C. psittacula*, *Geospiza conirostris*, *G. difficilis*, *G. fortis*, *G. fuliginosa*, *G. magnirostris* and *G. scandens* (Müller 1973); Gekkonidae: *Phyllodactylus* spp. (Müller 1973); Iguanidae: *Amblyrhynchus cristatus* and *Tropidurus albermarlensis* (Müller 1973; Sites *et al.* 1996); Laridae: *Creagrus furcatus* and *Larus fuliginosus* (Müller 1973); Otariidae: *Arctocephalus galapagoensis* (Müller 1973); Phalacrocoracidae: *Phalacrocorax harrisi* (Müller 1973); Spheniscidae: *Spheniscus mendiculus* (Müller 1973);

Sturnidae: *Nesomimus macdonaldi*, *N. melanotis*, *N. parvulus* and *N. trifasciatus* (Müller 1973); Testudinidae: *Chelonoidis* spp. (Müller 1973).

Western Ecuador province Morrone 1999

Guayas province (in part) Ringuelet 1975: 107.
Ecuadorian Dry Forest province (in part) Udvardy 1975: 41.
Pacific Equatorial dominion (in part) Ab'Sáber 1977: map.
Chocó Rainforest centre (in part) Cracraft 1985: 53.
Tumbesan centre (in part) Cracraft 1985: 66.
Ecuadorian province (in part) Rivas-Martínez & Navarro 1994: map.
Ecuadorian Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Western Ecuador Moist Forests ecoregion Dinerstein *et al.* 1995: 91.
Arid Ecuador province Morrone 1999: 6, 2001e: 65, 2006: 479.
Western Ecuador province Morrone 1999: 6, 2001a: 61, 2001e: 64, 2006: 479.
Dry Ecuador province Morrone 2001a: 62.

Diagnosis. Western Ecuador and southwestern Colombia (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Cactaceae: *Cleistocactus sepium var. morleyanus, C. sepium var. sepium, C. sepium var. ventimigliae, Echinopsis pachanoi, Opuntia cylindrica, O. quitensis, O. soederstromiana* and *O. pubescens* (Loaiza & Morrone 2011); Onagraceae: *Fuchsia macrostigma, F. polyantha* and *F. sylvatica* (Berry 1982). ARTHROPODA. Apidae: *Geotrigona leucogastra* (Camargo & Moure 1996); Curculionidae *Galapaganus femoratus* species group and *G. propinquus* (Lanteri 1992); Ditomyiidae: *Rhipidita pleciodes* (Amorim & Pires 1996). VERTEBRATA. Echimyidae: *Proechimys decumanus* (Patton 1987).

Ecuadorian province Müller 1973

Ecuadorian subcentre Müller 1973: 101.
Guayas province (in part) Ringuelet 1975: 107.
Ecuadorian Dry Forest province (in part) Udvardy 1975: 41.
Illescas unit Lamas 1982: 352.
Piura unit Lamas 1982: 352.
Tumbesan centre (in part) Cracraft 1985: 66.
Ecuadorian province Rivas-Martínez & Navarro 1994: map.
Tumbes/Piura Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Tumbes-Piura province Morrone 1999: 6, 2001a: 63, 2001e: 66, 2006: 479.
Equatorial Pacific area Porzecanski & Cracraft 2005: 266.

Diagnosis. Southern Ecuador and northern Peru (Morrone 2001a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Montanoa ovalifolia* subsp. *australis* (Funk 1982); Onagraceae: *Fuchsia andrei*, *F. ayavacensis* and *F. scherffiana* (Berry 1982). ARTHROPODA. Stygnidae: *Stygnus mediocris* (Pinto-da-Rocha 1997). VERTEBRATA. Corvidae: *Cyanocorax mystacalis* (Müller 1973); Echimyidae: *Proechimys decumanus* species group and *P. rosa* (Patton 1987); Fringillidae: *Carduelis siemiradzkii*, *Piezorhina cinerea*, *Saltator albicollis* and *Sicalis taczanowskii* (Sibley & Monroe 1990); Viperidae: *Bothrops barnetti* (Campbell & Lamar 1989).

Boreal Brazilian dominion Clarke 1892, stat. nov.

Boreal Brazilian subarea Clarke 1892: 381.
Hyléa province (in part) Mello-Leitão 1937: 246; Fittkau 1969: 642.
Cariba, Guianan or Amazonian centre (in part) Lane 1943: 414.
Amazonian province (in part) Mello-Leitão 1943: 129; Cabrera & Willink 1973: 48; Ringuelet 1975: 107; Udvardy 1975: 41; Fernandes & Bezerra 1990: 77; Fernandes 2006: 46.

Amazon region Good 1947: 235.
Amazonian dominion (in part) Cabrera 1971: 6, 1976: 3.
Amazonian Equatorial dominion (in part) Ab'Sáber 1977: map.
Amazonian region (in part) Takhtajan 1986: 251.
Amazonia bioregion (in part) Dinerstein *et al.* 1995: map 1.
Northwest Amazonia sub-region (in part) Nihei & Carvalho 2007: 497.
Northern Amazonian dominion Morrone 2014: 206.

Diagnosis. Amazonian forest, basically north of the Amazon river (Fig. 12) (Morrone 2014).

Provinces. The Boreal Brazilian dominion comprises the Napo, Imerí, Pantepui, Guianan Lowlands, Roraima and Pará provinces.

Napo province Müller 1973

Napo subcentre Müller 1973: 83.
El Cóndor unit Lamas 1982: 349.
Napo unit Lamas 1982: 343.
Napo centre Beven *et al.* 1984: 386.
North Amazon (Napo) centre Cracraft 1985: 69.
Northwestern Amazonian area Cracraft 1988: 223.
Western or Andean sector Fernandes & Bezerra 1990: 94; Fernandes 2006: 61.
Amazonian province Hernández *et al.* 1992a: 138.
Loreto province (in part) Rivas-Martínez & Navarro 1994: map.
Eastern Cordillera Real Montane Forests ecoregion Dinerstein *et al.* 1995: 92.
Napo Moist Forests ecoregion Dinerstein *et al.* 1995: 89.
Varzea Forests ecoregion (in part) Dinerstein *et al.* 1995: 90.
Amazonian region (in part) Rangel *et al.* 1995b: 82.
Napo area Silva & Oren 1996: 430; Bates *et al.* 1998: 785; Ron 2000: 387; Racheli & Racheli 2003: 36, 2004: 347; Silva *et al.* 2005: 692.
Napo province Morrone 1999: 7, 2000b: 109, 2001e: 70, 2006: 480.
Varzea province (in part) Morrone 1999: 7, 2000b: 112, 2001e: 76, 2006: 480.

Diagnosis. Northern Peru, southwestern Colombia and eastern Ecuador (Morrone 2000b, 2006).

Endemic taxa. MAGNOLIOPHYTA. Burmanniaceae: *Gymnosiphon capitatus* (Maas & Maas-van de Kamer 1988). ARTHROPODA. Chelodesmidae: *Tuberodesmus* (Shelley 1981). VERTEBRATA. Bucconidae: *Nonnula amaurocephala* (Müller 1973); Callithrichidae: *Saguinus nigricollis* and *S. tripartitus* (Emmons 1990); Cebidae: *Pithecia aequatorialis* (Emmons 1990); Echimyidae: *Echimys saturnus* and *Proechimys quadruplicatus* (Patton 1987; Emmons 1990); Rhamphastidae: *Selenidera reinwardtii* (Cracraft & Prum 1988); Tyrannidae: *Heterocercus flavivertex* (Müller 1973).

Districts. Hernández *et al.* (1992a) identified six districts in the Colombian portion of this province: Alto Putumayo, Caguan, Florencia, Huitoto, Kofán and Ticuna.

Alto Putumayo district Hernández *et al.* 1992a
Alto Putumayo district Hernández *et al.* 1992a: 138.

Caguan district Hernández *et al.* 1992a
Caguan district Hernández *et al.* 1992a: 138.

Florencia district Hernández *et al.* 1992a
Florencia district Hernández *et al.* 1992a: 138.

Huitoto district Hernández *et al.* 1992a
Huitoto district Hernández *et al.* 1992a: 109.

Kofán district Hernández *et al.* 1992a
Kofán district Hernández *et al.* 1992a: 109.

Ticuna district Hernández *et al.* 1992a
Ticuna district Hernández *et al.* 1992a: 109.

Imerí province Beven *et al.* 1984

Imerí centre Beven *et al.* 1984: 386; Cracraft 1985: 69.
Imerí refuge Lourenço 1986: 580.
Imerí area Cracraft 1988: 223; Silva & Oren 1996: 430; Bates *et al.* 1998: 785; Ron 2000: 387; Racheli & Racheli 2003: 36, 2004: 347; Silva *et al.* 2005: 692.
Rio Negro province Huber & Alarcón 1988: map; Rivas-Martínez & Navarro 1994: map.
Guianan province Hernández *et al.* 1992a: 131.
Amazonian region (in part) Rangel *et al.* 1995b: 82.
Loreto province (in part) Rivas-Martínez & Navarro 1994: map.
Amazonian Savannas ecoregion Dinerstein *et al.* 1995: 99.
Japura/Negro Moist Forests ecoregion Dinerstein *et al.* 1995: 89.
Macarena Montane Forests ecoregion Dinerstein *et al.* 1995: 89.
Varzea Forests ecoregion (in part) Dinerstein *et al.* 1995: 90.
Imerí province Morrone 1999: 7, 2000b: 110, 2001e: 71, 2006: 480.
Varzea province (in part) Morrone 1999: 7, 2000b: 112, 2001e: 76, 2006: 480.

Diagnosis. Southern Venezuela, southwestern Colombia, northeastern Peru and northern Brazil (Morrone 2000b, 2006).

Endemic taxa. MAGNOLIOPHYTA. Burmanniaceae: *Burmannia grandiflora*, *B. dasyantha* and *B. vaupesana* (Maas & Maas-van de Kamer 1988); Connaraceae: *Pseudoconnarus rhynchosioides*, *Rourea cuspidata* and *R. neglecta* (Forero *et al.* 1983); Passifloraceae: *Passiflora coccinea* and *P. involucrata* (Escobar 1988). ARTHROPODA. Buthidae: *Microtityus vanzolinii* (Lourenço 1986); Chactidae: *Chactopsis anduzei* and *C. sujirima* (Lourenço 1986). VERTEBRATA. Callithrichidae: *Saguinus inustus* (Emmons 1990); Psittacidae: *Pionopsitta barrabandi* (Cracraft & Prum 1988); Rhamphastidae: *Pteroglossus flavirostris* and *Selenidera nattereri* (Cracraft & Prum 1988).

Districts. Hernández *et al.* (1992a) identified five districts in the Colombian portion of this province: Ariari-Guayabero, Macarena, Northern Guaviare Forests, Vaupes Complex and Yarí-Miritί.

Ariari-Guayabero district Hernández *et al.* 1992a
Ariari-Guayabero district Hernández *et al.* 1992a: 131.

Macarena district Hernández *et al.* 1992a
Macarena district Hernández *et al.* 1992a: 132.

Northern Guaviare Forests district Hernández *et al.* 1992a
Northern Guaviare Forests district Hernández *et al.* 1992a: 131.

Vaupes Complex district Hernández *et al.* 1992a
Vaupes Complex district Hernández *et al.* 1992a: 134.

Yarí-Miritί district Hernández *et al.* 1992a
Yarí-Miritί district Hernández *et al.* 1992a: 137.

Pantepui province Mayr & Phelps 1967

Region of Venezuela and Guiana (in part) Good 1947: 235.
Pantepui area Mayr & Phelps 1967: 276.
Highlands of Guiana and Brazil area (in part) Sick 1969: 454.
Guianan dominion Cabrera & Willink 1973: 67.
Guianan province Cabrera & Willink 1973: 67; Ringuelet 1975: 107; Morrone 1999: 6, 2001e: 72, 2006: 480.
Pantepui centre Müller 1973: 64; Cracraft 1985: 59.
Campos Limpos province Udvardy 1975: 42.
Roraima-Guianan dominion (in part) Ab'Sáber 1977: map.
Roraima Sandstone formation Maguire 1979: 223.
Duida subcentre Cracraft 1985: 60.
Great Savannah subcentre Cracraft 1985: 60.
Guianan Highlands province Huber & Alarcón 1988: map.
Septentrional or Guianan sector (in part) Fernandes & Bezerra 1990: 92; Fernandes, 2006: 59.
Pantepui province Huber 1994: 53; Costa *et al.* 2014: 200.
Tepuis province Rivas-Martínez & Navarro 1994: map.
Guianan area (in part) Coscarón & Coscarón-Arias 1995: 726; Bates *et al.* 1998: 785.
Guianan Highlands Moist Forests ecoregion Dinerstein *et al.* 1995: 88.
Tepuis ecoregion Dinerstein *et al.* 1995: 88.
Uatama Moist Forests ecoregion Dinerstein *et al.* 1995: 89.
Guianan province Morrone 2000b: 106.
Tepuis area Porzecanski & Cracraft 2005: 266.
Guiana area (in part) Silva *et al.* 2005: 692.
Pantepui region De Marmels, 1007: 117; Désamoré *et al.* 2010: 255.

Diagnosis. Northwestern South America, in the Guianan Shield, between Venezuela, Colombia, Guyana, Suriname and northern Brazil, where there are sandy plateaus or tepuis higher than 2,000 m altitude (Morrone 2000b, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Stenopadus* (Bremer 1993). ARTHROPODA. Apidae: *Partamona mourei* (Camargo & Pedro 2003); Coenagrionidae: *Tepuibasis* (De Marmels 2007); Curculionidae: *Naupactus bohumilae* and *N. viloriai* (Bordón 1997); Elmidae: *Stenhelmoides mimicus* and *S. variabilis* (Spangler & Perkins 1989); Lycaenidae: *Gigantofalca duida* and *Parides phosphorus laurae* (Costa *et al.* 2013); Nymphalidae: *Actinote anteas pierrei, A. genitrix costae, A. pellenea fernandezi, A. romeroi, Antirrhea ulei, Callithomia lenea bella, Dircenna adina stevei, D. dero christopheri, Episcada doto paquito, Eresia carme judithae, Eretris agata, Eutresis hypereia imeriensis, Forsterinaria hannieri, Heliconius elevatus Roraima, Hypanartia lethe rosamariae, Hyposcada dujardini humboldti,H. zarepha bonplandi, Hypothyris ninonia lema,H. ninonia connexa, Junonia evarete oscura, J. genoveva vivida, Mechanitis lysimnia bipuncta, Melinaea lilis kayei, Memphis montesino, M. viloriae, Mesotaenia vaninka delafuentei, Oleria boyeri, Opsiphanes invirae roraimaensis, Oxeoschistus romeo, Pagyris renelichyi, Pedaliodes chaconi, P. demarmelsi, P. roraimae, P. terramaris, P. yutajeana, Perisama tepuiensis, Protopedaliodes kukenani, P. profauna, P. ridouti, Pteronymia alissa dorothyae,P. alissa marjorieae, P. alicia* and *P. peteri* (Costa *et al.* 2013); Papilionidae: *Parides phosphorus laurae* (Costa *et al.* 2013); Pieridae: *Catasticta duida, C. sisamnus ayanganna, Dismorphia crisia roraimae, D. crisia neblina, D. zathoe proserpina Lienix nemesis christa Pereute lindemannae lindemannae, P. lindemannae pemona, P. lindemannae piaroa* and *Pseudopieris viridula mimaripa* (Costa *et al.* 2013); Riodinidae: *Parides phosphorus laurae* and *Parides phosphorus laurae* (Costa *et al.* 2013). VERTEBRATA. Cricetidae: *Rhipidomys macconelli* (Müller 1973); Crotalidae: *Bothrops lichenosus* (Müller 1973); Didelphidae: *Monodelphis brevicaudata orinoci* (Müller 1973); Furnariidae: *Synallaxis macconelli* and *Xiphocolaptes promeropirhynchus promeropirhynchus* (Müller 1973); Muscicapidae: *Turdus olivater* (Müller 1973); Rhamphastidae: *Aulacorhynchus whitelianus* (Bonaccorso & Guayassamin 2013); Teiidae: *Arthrosaura versteegii* (Müller 1973); Thamnophilidae: *Herpsilochmus roraimae* and *Myrmotherula behni* (Müller 1973); Trochilidae: *Amazilia viridigaster* and *Polytmus milleri* (Müller 1973); Tyrannidae: *Knipolegus poecilurus* (Müller 1973).

Guianan Lowlands province Huber & Alarcón 1988

Guianan centre Müller 1973: 69.
Guianan province (in part) Udvardy 1975: 41.

Roraima-Guianan dominion (in part) Ab'Sáber 1977: map.
Guiana centre Beven *et al.* 1984: 386.
Guianan centre (in part) Cracraft 1985: 68.
Eastern Guianan refuge Lourenço 1986: 580.
Imataca refuge Lourenço 1986: 580.
Western Guianan refuge Lourenço 1986: 580.
Northwestern Amazonian area (in part) Cracraft 1988: 223.
Guianan Lowlands province Huber & Alarcón 1988: map.
Septentrional or Guianan sector (in part) Fernandes & Bezerra 1990: 92; Fernandes 2006: 59.
Guyanas province Rivas-Martínez & Navarro 1994: map.
Guianan area (in part) Coscarón & Coscarón-Arias 1995: 726; Bates *et al.* 1998: 785; Silva *et al.* 2005: 692.
Guianan Moist Forests ecoregion Dinerstein *et al.* 1995: 89.
Orinoco Delta Swamp Forests ecoregion Dinerstein *et al.* 1995: 88.
Paramaribo Swamp Forests ecoregion Dinerstein *et al.* 1995: 89.
Humid Guyana province Morrone 1999: 7, 2000b: 108, 2001e: 74, 2006: 480.
Amazonia North area (in part) Porzecanski & Cracraft 2005: 266.

Diagnosis. Southwestern Venezuela, northern Brazil, Suriname and Guyana (Morrone 2000b, 2006).

Endemic taxa. MAGNOLIOPHYTA. Cecropiaceae: *Cecropia granvilleana* and *C. obtusa* (Franco & Berg 1997). ARTHROPODA. Buthidae: *Ananteris coineaui, A. pydanieli* and *A. venezuelensis* (Lourenço 1986); Carabidae: *Amblygnathus lucidus* (Ball & Maddison 1987); Chactidae: *Brotheas gervaisi, B. granulatus, Broteochactas fravalae, B. gaillardi* and *B. scorzai* (Lourenço 1986); Curculionidae: *Naupactus vilmae*, *Pileophorus procerus*, *Prosicoderus gyllenhali*, *Sicoderus guyanensis* and *S. nodieri* (Vanin & Reichardt 1977; Vanin 1986; Bordón 1997); Ditomyiidae: *Rhipidita primogenita* (Amorim & Pires 1996); Elmidae: *Stenhelmoides beebei*, *S. grandis*, *S. grouvellei* and *S. guyanensis* (Spangler & Perkins 1989); Polycentropidae: *Polycentropus surinamensis* (Hamilton 1988); Scarabaeidae: *Amblyoproctus boondocksius* (Ratcliffe 1988); Schendylidae: *Schendylops labbanus, S. lesnei, S. tropicus* and *S. verhoeffi* (Morrone & Pereira 1999); Staphylinidae: *Cylindroxystus concavoperculus* (Herman 1991); Simuliidae: *Simulium pintoi* (Coscarón & Coscarón-Arias 1995); Stygnidae*: Actinostygnoides carus*, *Stenostygnoides cosmetitarsus*, *Stygnidius guerinii* and *Stygnoplus longipalpus* (Pinto-da-Rocha 1997). VERTEBRATA. Cebidae: *Alouatta macconelli* (Cortés-Ortiz *et al.* 2003); Cracidae: *Penelope marail* (Müller 1973); Echimyidae: *Proechimys cherriei* and *P. warreni* (Patton 1987); Psittacidae: *Pyrilia caica* (Müller 1973; Cracraft & Prum 1988); Rhamphastidae: *Selenidera culik* (Cracraft & Prum 1988); Tyrannidae: *Rupicola rupicola* (Müller 1973).

Roraima province Müller 1973

Roraima centre Müller 1973: 62.
Guianan province (in part) Udvardy 1975: 41.
Roraima-Guianan dominion (in part) Ab'Sáber 1977: map.
Guianan centre (in part) Cracraft 1985: 68.
Northwestern Amazonian area (in part) Cracraft 1988: 223.
Amazonas Delta province (in part) Rivas-Martínez & Navarro 1994: map.
Roraima-Trombetas province Rivas-Martínez & Navarro 1994: map.
Amapá Moist Forests ecoregion Dinerstein *et al.* 1995: 89.
Eastern Amazonian Flooded Grasslands ecoregion Dinerstein *et al.* 1995: 101.
Varzea Forests ecoregion (in part) Dinerstein *et al.* 1995: 90.
Guiana area (in part) Silva & Oren 1996: 430; Ron 2000: 387; Silva *et al.* 2005: 692.
Guianan area (in part) Bates *et al.* 1998: 785; Racheli & Racheli 2003: 36, 2004: 347.
Amapá province Morrone 1999: 7, 2000b: 111, 2001e: 75, 2006: 480.
Roraima province Morrone 1999: 6, 2000b: 110, 2001e: 75, 2006: 480.
Varzea province (in part) Morrone 1999: 7, 2000b: 112, 2001e: 76, 2006: 480.
Amazonia North area (in part) Porzecanski & Cracraft 2005: 266.

Diagnosis. Northern Brazil, southeastern Venezuela, Suriname and Guyana (Morrone 2000b, 2006).

Endemic taxa. MAGNOLIOPHYTA. Cecropiaceae: *Cecropia silvae* (Franco & Berg 1997). ARTHROPODA. Buthidae: *Ananteris dekeyseri* (Lourenço 1986); Chactidae: *Broteochactas sissomi* (Lourenço 1986);

Curculionidae: *Sicoderus petilus* (Vanin 1986); Staphylinidae: *Cylindroxystus cavus*, *Neolindus hamatus*, *N. lodhii* and *N. sinuatus* (Herman 1991). VERTEBRATA. Callithrichidae: *Saguinus bicolor* (Emmons 1990); Caprimulgidae: *Caprimulgus longirostris roraimae* (Müller 1973); Cricetidae: *Podoxymys* (Müller 1973); Didelphidae: *Monodelphis emiliae* (Emmons 1990); Echimyidae: *Proechimys arabupu* and *P. vacillator* (Patton 1987); Fringillidae: *Emberizoides duidae* and *Roraimia adusta* (Sibley & Monroe 1990); Furnariidae: *Automolus roraimae* (Sibley & Monroe 1990); Tyrannidae: *Myiophobus roraimae roraimae* (Sibley & Monroe 1990).

Pará province Müller 1973

Pará centre Müller 1973: 75; Cracraft 1985: 71.
Babacu province Udvardy 1975: 42.
Belém centre Beven *et al.* 1984: 386.
Belém (Maranhão) centre Cracraft 1985: 72.
Southwestern Amazonian area (in part) Cracraft 1988: 223.
Eastern or Northern sector Fernandes & Bezerra 1990: 96; Fernandes 2006: 64.
Amazonas Delta province (in part) Rivas-Martínez & Navarro 1994: map.
Belém area Silva & Oren 1996: 430; Bates *et al.* 1998: 785; Ron 2000: 387; Racheli & Racheli 2003: 36, 2004: 347; Silva *et al.* 2005: 692.
Pará province Morrone 1999: 8, 2000b: 115, 2001e: 80, 2006: 481.

Diagnosis. Northwestern Brazil, limiting to the north and west with the Tocantins and Araguaia rivers, to the south with the Serra do Gurupi and the Grajau river and to the east with the Guana river (Morrone 2000b, 2006).

Endemic taxa. ARTHROPODA. Apidae: *Geotrigona aequinoctialis, Partamona chapadicola* and *P. seridoensis* (Camargo & Moure 1996; Camargo & Pedro 2003); Chactidae: *Brotheas paraensis* (Lourenço 1986); Scarabaeidae: *Palaeophileurus marcusoni* (Ratcliffe 1988); Staphylinidae: *Stereocephalus ruhus* (Herman 1979). VERTEBRATA. Conopophagidae: *Conopophaga roberti* (Müller 1973); Cracidae: *Ortalis superciliaris* (Müller 1973); Echimyidae: *Proechimys leioprimma*, *P. nesiotes* and *P. oris* (Patton 1987); Fringillidae: *Gymnostinops bifasciatus* (Müller 1973); Psittacidae: *Aratinga guarouba* and *Pyrrhura perlata* (Müller 1973); Rhamphastidae: *Pteroglossus bitorquatus* (Cracraft & Prum 1988); Tyrannidae: *Pipra iris* and *Xipholena lamellipennis* (Müller 1973).

South Brazilian dominion Engler 1882, stat. nov.

South Brazilian province Engler 1882: 345.
Austral Brazilian subarea (in part) Clarke 1892: 381.
Cariba, Guianan or Amazonian centre (in part) Lane 1943: 414.
South Brazilian region Good 1947: 235.
Amazonian dominion (in part) Cabrera 1971: 6, 1976: 3.
Amazonian province (in part) Cabrera & Willink 1973: 48; Ringuelet 1975: 107; Udvardy 1975: 41; Fernandes & Bezerra 1990: 77; Fernandes 2006: 46.
Amazon centre (in part) Müller 1973: 80.
Amazonian Equatorial dominion (in part) Ab'Sáber 1977: map.
Meridional or Brazilian sector (in part) Fernandes & Bezerra 1990: 93; Fernandes 2006: 61.
Amazonia bioregion (in part) Dinerstein *et al.* 1995: map 1.
Northwest Amazonia sub-region (in part) Nihei & Carvalho 2007: 497.
Southwestern Amazonian dominion Morrone 2014: 206.

Diagnosis. Amazonian forest, southwest of the Amazon river (Fig. 12) (Morrone 2014).

Provinces. The South Brazilian dominion comprises the Ucayali, Madeira, Rondônia and Yungas provinces.

Ucayali province Müller 1973

Ucayali subcentre Müller 1973: 83.
Carpish unit Lamas 1982: 351.

Chachapoyas unit Lamas 1982: 351.
Huallaga unit Lamas 1982: 347.
Huánuco unit Lamas 1982: 354.
La Peca unit Lamas 1982: 354.
Marañón unit (in part) Lamas 1982: 345.
Molinopampa unit Lamas 1982: 354.
Tocache unit Lamas 1982: 343.
Loreto province (in part) Rivas-Martínez & Navarro 1994: map.
Tocantins Moist Forests ecoregion Dinerstein *et al.* 1995: 91.
Ucayali Moist Forests ecoregion Dinerstein *et al.* 1995: 90.
Varzea Forests ecoregion (in part) Dinerstein *et al.* 1995: 90.
Western Amazonian Flooded Grasslands ecoregion Dinerstein *et al.* 1995: 100.
Western Amazonian Swamp Forests ecoregion Dinerstein *et al.* 1995: 90.
Ucayali province Morrone 1999: 7, 2000b: 112, 2001e: 77, 2006: 480.
Varzea province (in part) Morrone 1999: 7, 2000b: 112, 2001e: 76, 2006: 480.

Diagnosis. Eastern Peru, northern Bolivia and western Brazil (Morrone 2000b, 2006).

Endemic taxa. ARTHROPODA. Chactidae: *Chactopsis insignis* (Lourenço 1986); Curculionidae: *Prosicoderus bohemani* (Vanin 1986); Stygnidae: *Innoxius magnus* and *Stygnus klugi* (Pinto-da-Rocha 1997). VERTEBRATA. Bucconidae: *Malacoptila semicincta* (Müller 1973); Echimyidae: *Proechimys brevicauda* and *P. semispinosus hilda* (Patton 1987); Galbulidae: *Brachygalba albogularis*, *Galbalcyrhynchus leucotis*, *Galbula cyanescens* and *G. pastazae* (Müller 1973); Psittacidae: *Aratinga weddelli* (Müller 1973); Tinamidae: *Crypturellus bartletti* and *C. strigulosus* (Müller 1973); Trochilidae: *Leucippus chlorocercus* and *Phaetornis philippii* (Müller 1973); Tyrannidae: *Heterocercus linteatus* and *Muscisaxicola fluviatilis* (Müller 1973).

Madeira province Müller 1973

Madeira centre Müller 1973: 80.
Madeiran province (in part) Udvardy 1975: 41.
Loreto unit (in part) Lamas 1982: 352.
Yurimaguas unit Lamas 1982: 343.
Inambari centre Beven *et al.* 1984: 386.
South Amazon (Inambari) centre Cracraft 1985: 69.
Southwestern Amazonian area (in part) Cracraft 1988: 223.
Madeira province Rivas-Martínez & Navarro 1994: map; Morrone 1999: 8, 2000b: 114, 2001e: 77, 2006: 481.
Juruá Moist Forests ecoregion Dinerstein *et al.* 1995: 90.
Purus/Madeira Moist Forests ecoregion Dinerstein *et al.* 1995: 90.
Rondônia/Mato Grosso Moist Forests ecoregion Dinerstein *et al.* 1995: 90.
São Luis Flooded Grasslands ecoregion Dinerstein *et al.* 1995: 101.
Varzea Forests ecoregion (in part) Dinerstein *et al.* 1995: 90.
Inambari area Silva & Oren 1996: 430; Bates *et al.* 1998: 785; Ron 2000: 387; Racheli & Racheli 2003: 36, 2004: 347; Silva *et al.* 2005: 692.
Varzea province (in part) Morrone 1999: 7, 2000b: 112, 2001e: 76, 2006: 480.
Amazonia South area Porzecanski & Cracraft 2005: 266.

Diagnosis. Southwestern Brazil, limiting to the north with the Amazon river, to the west with the Madeira and Beni rivers, to the east with the Xingu river and to the west with the eastern cordillera of Bolivia (Morrone 2000b, 2006).

Endemic taxa. ARTHROPODA. Apidae: *Geotrigona subgrisea subfulva* and *Partamona batesi* (Camargo & Moure 1996; Camargo & Pedro 2003); Simuliidae: *Araucnephia montana* (Coscarón & Coscarón-Arias 1995). VERTEBRATA. Callithrichidae: *Callithrix humeralifera* and *Saguinus labiatus* (Emmons 1990); Cebidae: *Callicebus moloch* and *Chiropotes albinasus* (Emmons 1990); Certhiidae: *Odontorchilus cinereus* (Müller 1973); Conopophagidae: *Conopophaga melanogaster* (Müller 1973); Cracidae: *Penelope pileata* (Müller 1973); Furnariidae: *Dendrocolaptes concolor* (Müller 1973); Psittacidae: *Pionopsitta aurantigera* and *Pyrrhura rhodogaster* (Müller 1973; Cracraft & Prum 1988); Rhamphastidae: *Pteroglossus sturmii* (Cracraft & Prum 1988); Thamnophilidae: *Myrmotherula sclateri* and *Skutchia borbae* (Müller 1973); Tyrannidae: *Pipra nattereri* (Müller 1973).

Rondônia province Beven *et al.* 1984

Rondônia centre Beven *et al.* 1984: 386; Cracraft 1985: 71.
Guapore refuge Lourenço 1986: 580.
Southwestern Amazonian area (in part) Cracraft 1988: 223.
Acre-Madre de Dios province Rivas-Martínez & Navarro 1994: map.
Beni province Rivas-Martínez & Navarro 1994: map.
Pantanal province Rivas-Martínez & Navarro 1994: map; Morrone 1999: 9, 2000b: 116, 2001e: 80, 2006: 481.
Beni Savannas ecoregion Dinerstein *et al.* 1995: 99.
Beni Swamp and Gallery Forests ecoregion Dinerstein *et al.* 1995: 91.
Bolivian Lowland Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Pantanal ecoregion Dinerstein *et al.* 1995: 101.
Patía Valley Dry Forests ecoregion Dinerstein *et al.* 1995: 95.
Southwestern Amazonian Moist Forests ecoregion Dinerstein *et al.* 1995: 90.
Rondônia area Silva & Oren 1996: 430; Bates *et al.* 1998: 785; Ron 2000: 387; Racheli & Racheli 2003: 36 2004: 347; Silva *et al.* 2005: 692.
Rondônia province Morrone 1999: 8.
Inambari area (in part) Silva *et al.* 2005: 692.

Diagnosis. Southern and Central Brazil, southern Peru, northwestern Bolivia and northern Paraguay (Morrone 2000b, 2006).

Endemic taxa. ARTHROPODA. Apidae: *Geotrigona fulvatra, G. fulvohirta* and *Partamona subtilis* (Camargo & Moure 1996; Camargo & Pedro 2003); Buthidae: *Ananteris mariaterezae* (Lourenço 1986); Curculionidae: *Prosicoderus xingu* (Vanin 1986); Stygnidae: *Protimesius albilineatus*, *Stygnus marthae* and *S. weyrauchi* (Pinto-da-Rocha 1997). VERTEBRATA. Cebidae: *Alouatta sara* (Cortés-Ortiz *et al.* 2003); Cricetidae: *Calomys* sp. (Almeida *et al.* 2007); Echimyidae: *Proechimys rattinus* and *P. steerei* (Patton 1987); Sciuridae: *Sciurus ignitus* and *S. sanborni* (Emmons 1990).

Districts. Lamas (1982) identified 11 units within the Peruvian portion of this province, which are treated herein as districts: Apurímac, Atalaya, Chachapoyas, Chanchamayo, Loreto, Madre de Dios, Marcapata, Oxapampa, Quincemil, Titicaca and Unini.

Apurímac district Lamas 1982, **stat. nov.**
Apurímac unit Lamas 1982: 355.

Atalaya district Lamas 1982, **stat. nov.**
Atalaya unit Lamas 1982: 345.

Chachapoyas district Lamas 1982, **stat. nov.**
Chachapoyas unit Lamas 1982: 351.

Chanchamayo district Lamas 1982, **stat. nov.**
Chanchamayo unit Lamas 1982: 347.

Loreto district Lamas 1982, **stat. nov.**
Loreto unit Lamas 1982: 352.

Madre de Dios district Lamas 1982, **stat. nov.**
Madre de Dios unit Lamas 1982: 352.

Marcapata district Lamas 1982, **stat. nov.**
Marcapata unit Lamas 1982: 352.

Oxapampa district Lamas 1982, **stat. nov.**
Oxapampa unit Lamas 1982: 345.

Quincemil district Lamas 1982, **stat. nov.**
Quincemil unit Lamas 1982: 349.

Titicaca district Lamas 1982, **stat. nov.**
Titicaca unit Lamas 1982: 355.

Unini district Lamas 1982, **stat. nov.**
Unini unit Lamas 1982: 355.

Yungas province Cabrera 1971

Subtropical formation Holmberg 1898: 440.
Hygrophyllous Subtropical Forests area Hauman 1920: 46.
Tucumán-Bolivian Forest province Hauman 1931: 60; Castellanos & Pérez-Moreau 1944: 98.
Tucumán-Bolivian Forest area Parodi 1934: 171; Castellanos & Pérez-Moreau 1941: 379; Parodi 1945: 127.
Western Subtropical province Cabrera 1951: 24, 1953: 109.
Montane district Cabrera 1953: 113.
Oranense district Cabrera 1953: 110.
Tucumán district Cabrera 1953: 112.
Tucumán-Bolivian Forests sub-region Hueck 1957: 40.
Tucumán-Oranense Forest area Ragonese 1967: 121.
Yungas province Cabrera 1971: 8; Cabrera & Willink 1973: 54; Udvardy 1975: 42; Cabrera 1976: 3; Rivas-Martínez & Navarro 1994: map.Morales *et al.* 1995: 163; Morrone 1999: 8, 2001e: 81, 2006: 481; Zuloaga *et al.* 1999: 37; Morrone 2000b: 105; Navarro *et al.* 2009: 517.
Marañón centre Müller 1973: 97.
Yungas centre Müller 1973: 89.
Equatorial Andes dominion Ab'Sáber 1977: map.
Ancash unit Lamas 1982: 351.
Chuquibamba unit Lamas 1982: 351.
Cutervo unit Lamas 1982: 349.
Huamachuco unit Lamas 1982: 354.
Lima unit Lamas 1982: 351.
Mantaro unit Lamas 1982: 354.
Pampas unit Lamas 1982: 354.
Parinacochas unit Lamas 1982: 355.
Santa Ana unit Lamas 1982: 354.
Yunga province Rivas-Martínez & Navarro 1994: map.
Yungas area Coscarón & Coscarón-Arias 1995: 726.
Andean Yungas ecoregion Dinerstein *et al.* 1995: 93.
Bolivian Montane Dry forests ecoregion Dinerstein *et al.* 1995: 96.
Bolivian Yungas ecoregion Dinerstein *et al.* 1995: 92.
Peruvian Yungas ecoregion Dinerstein *et al.* 1995: 92.

Diagnosis. Western slopes of the Andes, between 300 and 3500 m altitude, from northern Peru to northwestern Argentina (Cabrera & Willink 1973; Morrone 2000b, 2006).

Endemic taxa. CONIFEROPHYTA. Podocarpaceae: *Podocarpus parlatorei* (Cabrera 1971; Covas 1995a). MAGNOLIOPHYTA. Asteraceae: *Holocheilus fabrisii*, *Jungia pauciflora*, *J. polita*, *J. sordida*, *Perezia carduncelloides*, *Trixis grisebachii* and *T. ragonesei* (Katinas 1995); Onagraceae: *Fuchsia boliviana*, *F. decussata* species group, *F. fontinalis* and *F. pilosa* (Berry 1982). ARTHROPODA. Acrididae: *Chlorus bolivianus* (Cigliano & Lange 2007); Apidae: *Partamona yungarum* (Camargo & Pedro 2003); Curculionidae: *Hammatostylus inhumeralis* and *Sicoderus tringa* (Vanin 1986); Formicidae: *Probolomyrmex brujitae* (Agosti 1994); Simuliidae: *Gigantodax horcotiani* (Wygodzinky & Coscarón 1989). VERTEBRATA. Cervidae: *Mazama chunyi* (Müller 1973); Cricetidae: *Calomys fecundus* (Almeida *et al.* 2007); Didelphidae: *Gracilinanus aceramarcae* (Müller 1973); Echimyidae: *Proechimys boliviensis*, *P. hendeei* and *P. simonsi* (Patton 1987); Fringillidae: *Atlapetes fulviceps*, *Hemispingus trifasciatus* and *Saltator albicollis* (Müller 1973); Rhamphastidae: *Aulacorhynchus caeruleicintis* (Bonaccorso & Guayassamin 2013); Rhinocryptidae: *Melanopareia maranonica* (Müller 1973); Tinamidae: *Nothocercus nigrocapillus* (Müller 1973).

Districts. Cabrera (1971, 1976) identified three districts within the Argentinean portion of this province: Montane Forests, Montane Jungles and Transition Forests.

Montane Forests district Cabrera 1971
Montane Forests district Cabrera 1971: 10, 1976: 9.

Montane Jungles district Cabrera 1971
Montane Jungles district Cabrera 1971: 9, 1976: 8.

Transition Forests district Cabrera 1971
Transition Forests district Cabrera 1971: 8, 1976: 7.

Chacoan sub-region Cabrera 1951

Tropical American region (in part) Engler 1882: 345.
Austral Brazilian subarea (in part) Clarke 1892: 381.
South Brazilian sub-region (in part) Sclater & Sclater 1899: 65.
Chacoan dominion Cabrera 1951: 32, 1971: 15, 1976: 18; Cabrera & Willink 1973: 69.
East Brazilian province (in part) Schmidt 1954: 328.
Guianan-Brazilian sub-region (in part) Ringuelet 1961: 156; Rapoport 1968: 72.
Guianan-Brazilian region (in part) Fittkau 1969: 636.
Brazilian sub-region (in part) Hershkovitz 1969: 3; Kuschel 1969: 710.
Non-Andean East area (in part) Sick 1969: 451.
Caribbean Amazonian sub-realm (in part) Rivas-Martínez & Tovar 1983: 521.
Central Brazilian region (in part) Takhtajan 1986: 251.
Brazilian Parana sub-region (in part) Rivas-Martínez & Navarro 1994: map.
Eastern South America bioregion (in part) Dinerstein *et al.* 1995: map 1.
Chacoan sub-region Morrone 1999: 9, 2000a: 52, 2001e: 83, 2005: 238, 2006: 481; Nihei & Carvalho 2007: 497; Navarro *et al.* 2009: 509; Morrone 2010a: 37; Ramos & Melo 2010: 449; Morrone 2014: 207.
Southeastern component Nihei & Carvalho 2004: 271.
Atlantic Forest component Sigrist & Carvalho 2009: 81.
South American sub-region (in part) Echeverry & Morrone 2013: 1628.

Diagnosis. Southeastern South America (Fig. 12) (Morrone 2014).

Dominions. The Chacoan sub-region comprises the Southeastern Amazonian, Chacoan and Parana dominions.

Southeastern Amazonian dominion Morrone 2014

Cariba, Guianan or Amazonian centre (in part) Lane 1943: 414.
Amazonian dominion (in part) Cabrera 1971: 6; Cabrera 1976: 3
Amazonian province (in part) Cabrera & Willink 1973: 48.
Madeiran province (in part) Udvardy 1975: 41.
Amazonia bioregion (in part) Dinerstein *et al.* 1995: map 1.
Southeast Amazonia sub-region (in part) Nihei & Carvalho 2007: 497.
Southeastern Amazonian dominion Morrone 2014: 207.

Diagnosis. Amazonian forest, southeast of the Amazon river (Fig. 12) (Morrone 2014).

Provinces. The Southeastern Amazonian dominion comprises only the Xingu-Tapajós province.

Xingu-Tapajós province Rivas-Martínez & Navarro 1994

Pará centre (in part) Cracraft 1985: 71.
Southwestern Amazonian area (in part) Cracraft 1988: 223.
Pantanal province (in part) Rivas-Martínez & Navarro 1994: map; Morrone 1999: 9, 2000b: 116, 2006: 481.
Xingu-Tapajós province Rivas-Martínez & Navarro 1994: map.
Tapajós/Xingu Moist Forests ecoregion Dinerstein *et al.* 1995: 91.

Varzea Forests ecoregion (in part) Dinerstein *et al.* 1995: 90.
Pará area Silva & Oren 1996: 430; Bates *et al.* 1998: 785; Ron 2000: 387; Racheli & Racheli 2003: 36, 2004: 347.
Tapajós-Xingu province Morrone 1999: 8, 2000b: 115, 2001e: 78, 2006: 481.
Varzea province (in part) Morrone 1999: 7, 2000b: 112, 2001e: 76, 2006: 480.
Tapajós area Silva *et al.* 2005: 692.
Xingu area Silva *et al.* 2005: 692.

Diagnosis. Northwestern Brazil (Morrone 2000b, 2006).

Endemic taxa. ARTHROPODA. Apidae: *Partamona gregaria* (Camargo & Pedro 2003); Chactidae: *Broteochactas goujei* (Lourenço 1986); Curculionidae: *Achia bondari* (Burke & Kovarik 1986); Scarabaeidae: *Hemiphileurus brasiliensis* and *H. insularis* (Ratcliffe 1988); Simuliidae: *Simulium guianense* (Coscarón & Coscarón-Arias 1995). VERTEBRATA. Psittacidae: *Pionopsitta vulturina* (Cracraft & Prum 1988); Rhamphastidae: *Pteroglossus reichenowi* (Cracraft & Prum 1988).

Chacoan dominion Cabrera 1951

Argentinean subarea (in part) Clarke 1892: 381.
Bororó province (in part) Mello-Leitão 1937: 246.
Tropical district (in part) Cabrera & Yepes 1940: 14.
Carirí-Bororó province (in part) Mello-Leitão 1943: 129.
Chacoan dominion Cabrera 1951: 32, 1971: 15, 1976: 18; Cabrera & Willink 1973: 69; Zuloaga *et al.* 1999: 18; Morrone 2014: 207.
Non-tropical East area (in part) Sick 1969: 457.
Group of Chacoan regions Rivas-Martínez & Tovar 1983: 521.
La Plata sub-region Procheş & Ramdhani 2012: 263.

Diagnosis. Northern and central Argentina, southern Bolivia, western and central Paraguay, Uruguay and central and northeastern Brazil (Fig. 12) (Morrone 2000a, 2006).

Provinces. The Chacoan dominion comprises the Caatinga, Cerrado, Chaco and Pampean provinces.

Caatinga province Cabrera & Willink 1973

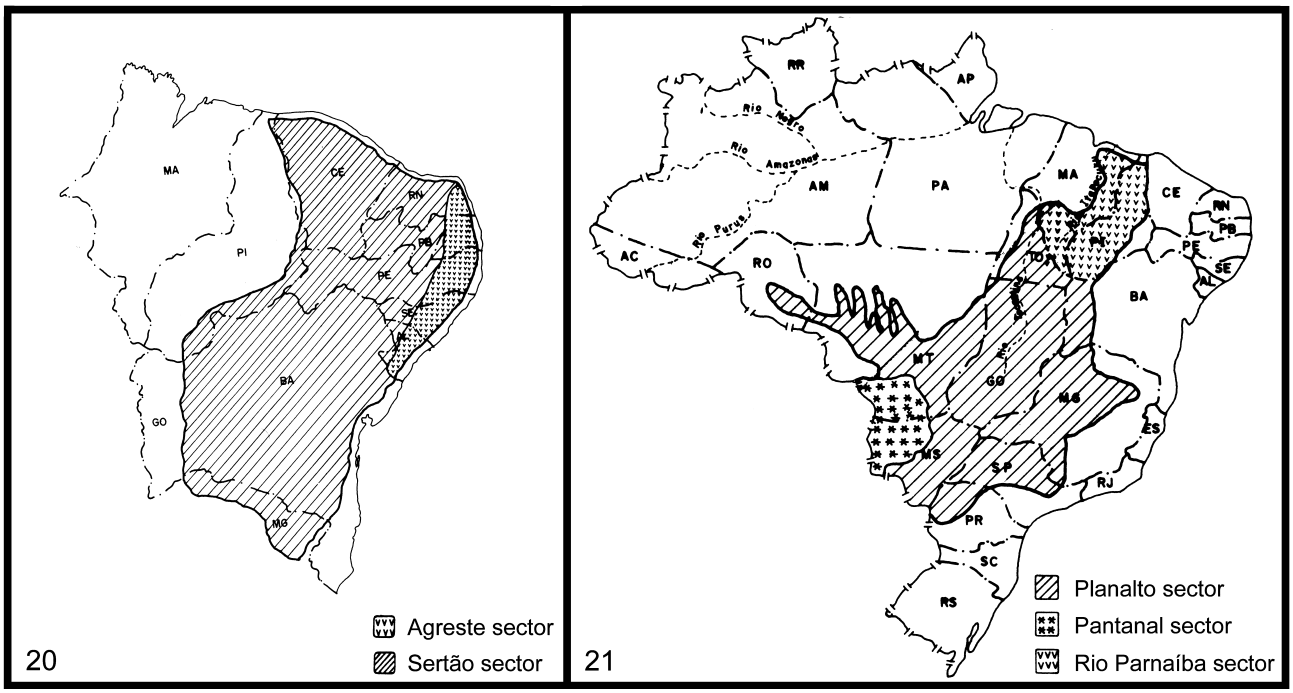
Gê province Mello-Leitão 1937: 246.
Carirí province Fittkau 1969: 642.
Caatinga province Cabrera & Willink 1973: 70; Udvardy 1975: 41; Rivas-Martínez & Navarro 1994: map; Morrone 1999: 10, 2000a: 54, 2001e: 86, 2006: 481.
Caatinga centre Müller 1973: 115; Cracraft 1985: 75.
Northeastern Brazil province Ringuelet 1975: 107.
Caatingas dominion Ab'Sáber 1977: map.
Caatinga region Rivas-Martínez & Tovar 1983: 521.
Caatingas province Fernandes & Bezerra 1990: 159; Fernandes 2006: 131.
Caatinga ecoregion Dinerstein *et al.* 1995: 105.
Northeastern Brazil Restingas ecoregion Dinerstein *et al.* 1995: 106.
Caatinga dominion Fiaschi & Pirani 2009: 485.

Diagnosis. Northeastern Brazil, in the states of Alagoas, Bahia, Ceara, Minas Gerais, Paraiba, Pernambuco, Piaui, Rio Grande do Norte and Sergipe (Morrone 2000a, 2006).

Endemic taxa. LICOPHYTA. Selaginellaceae: *Selaginella convoluta* (Fernandes & Bezerra 1990). MAGNOLIOPHYTA. Anacardiaceae: *Schinopsis brasiliensis* (Prado & Gibbs 1993); Asteraceae: *Chionolaena jeffreyi* (Freire 1993); Burseraceae: *Bursera leptophloeos* (Fernandes & Bezerra 1990); Cactaceae: *Cereus variabilis* (Fernandes & Bezerra 1990); Fabaceae: *Caesalpinia bracteosa* and *Mimosa caesalpiniaefolia* (Fernandes & Bezerra 1990); Nepenthaceae: *Nepenthes* (Ellsmore 1991). ARTHROPODA. Apidae: *Geotrigona xanthopoda, Parapsaenythia lanata* and *P. littoralis* (Camargo & Moure 1996; Ramos & Melo 2010); Bothriuridae: *Bothriurus asper* and *B. rochai* (Maury 1982b); Curculionidae: *Sicoderus brevirostris* (Vanin 1986);

Miridae: *Rhinacloa fernandoana* (Schuh & Schwartz 1985); Reduviidae: *Melanolestes goiasensis* (Coscarón & Morrone 1997); Stygnidae: *Stygnus polyacanthus* (Pinto-da-Rocha 1997). VERTEBRATA. Fringillidae: *Carduelis yarrellii* (Müller 1973); Furnariidae: *Xiphocolaptes falcirostris* (Müller 1973); Psittacidae: *Forpus xanthopterygius flavissimus* (Darrieu 1983b); Tinamidae: *Nothura boraquira* (Müller 1973); Trochilidae: *Anopetia gounellei* (Müller 1973).

Districts. Fernandes & Bezerra (1990) and Fernandes (2006) identified sectors, which are treated herein as the Agreste and Sertão districts (Fig. 20).



FIGURES 20–21. Regionalisation of Brazil (modified from Fernandes & Bezerra 1990). 20, Caatingas province; 21, Cerrados province.

Agreste district Fernandes & Bezerra 1990, **stat. nov.**
Agreste sector Fernandes & Bezerra 1990: 184; Fernandes 2006: 173.

Sertão district Fernandes & Bezerra 1990, **stat. nov.**
Sertão sector Fernandes & Bezerra 1990: 181.
Carrasco sector Fernandes 2006: 172.
Chapada Diamantina sector Fernandes 2006: 170.
Meridional Sertão sector Fernandes 2006: 170.
Raso da Catarina sector Fernandes 2006: 174.
São Franciscio River Dunes sector Fernandes 2006: 175.
Septentrional Sertão sector Fernandes 2006: 168.

Cerrado province Cabrera & Willink 1973

Central Plateau, Brazilian Plateau, Central Brazilian Plateau, Chapada or Bororó centre (in part) Lane 1943: 414.
Bororó province (in part) Fittkau 1969: 642.
Cerrado province Cabrera & Willink 1973: 56; Rivas-Martínez & Navarro 1994: map; Morrone 1999: 10, 2000a: 55, 2001e: 87, 2006: 481.
Campo Cerrado centre Müller 1973: 120; Cracraft 1985: 75.
Campos Cerrados province Udvardy 1975: 42.
Cerrados dominion Ab'Sáber 1977: map.
Cerrados province Fernandes & Bezerra 1990: 125; Fernandes 2006: 95.

Cerrado sub-region Rivas-Martínez & Navarro 1994: map.
Tocantins province Rivas-Martínez & Navarro 1994: map.
Cerrado area Coscarón & Coscarón-Arias 1995: 726.
Cerrado ecoregion Dinerstein *et al.* 1995: 99.
Central South America area Porzecanski & Cracraft 2005: 266.
Cerrado dominion Fiaschi & Pirani 2009: 482.

Diagnosis. South central Brazil (states of Goias, Maranhao, Mato Grosso, Minas Gerais, Parana, Piaui and São Paulo), northeastern Paraguay and Bolivia (Morrone 2000a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Cecropiaceae: *Cecropia saxatilis* (Franco & Berg 1997); Labiatae: *Eriope* and *Hyptis* sect. *Hypenia* (Harley 1988). ARTHROPODA. Acrididae: *Chlorus attenuatus, Parapellodon instabilis*, *Parascopas chapadensis*, *P. flavipes*, *P. peltarius*, *Propedies auricularis*, *P. dilatus*, *P. hebardi*, *P. juani* and *P. lobipennis* (Ronderos 1982; Ronderos & Sánchez 1983; Carbonell 1995; Cigliano & Lange 2007); Anthomyiidae: *Coenosopsia ferrari* (Nihei & Carvalho 2004); Curculionidae: *Achia obesa*, *Aramigus pilosus*, *Ericydeus sedecimpunctatus*, *Loncophorus costalimai* and *Sicoderus parallelus* (Burke & Kovarik 1986; Vanin 1986; Clark 1988; Lanteri & Díaz 1994; Lanteri 1995); Reduviidae: *Sirthenea peruviana gracilis* (Morrone & Coscarón 1996); Scarabaeidae: *Coprophaneus ensifer* and *Oplognathus* (Jameson 1990; Edmonds & Zidek 2013); Sciomyzidae: *Sepedonea barbosai* and *S. canabravana* (Freidberg *et al.* 1991); Stygnidae: *Stygnus multispinosus* (Pinto-da-Rocha 1997). VERTEBRATA. Apodidae: *Cypseloides senex* (Olrog 1984); Cricetidae: *Calomys expulsus* and *C. tocantinsi* (Almeida *et al.* 2007); Echimyidae: *Proechimys roberti* (Patton 1987); Felidae: *Leopardus braccatus braccatus* (García-Perea 1994); Leptodactylidae: *Physalaemus* (Müller 1973); Picidae: *Colaptes campestris* (Müller 1973); Psittacidae: *Amazona aestiva xanthopteryx* (Darrieu 1983a); Rhinocryptidae: *Melanopareia torquata* (Müller 1973); Thraupidae: *Charitospiza eucosma* and *Poospiza cinerea* (Müller 1973).

Districts. Fernandes & Bezerra (1990) recognized three sectors, which are treated herein as the Mato Grosso Depression, Parnaiba Basin and Planalto districts (Fig. 21).

Mato Grosso Depression district Fernandes & Bezerra 1990, **stat. nov.**
Mato Grosso Depression sector Fernandes & Bezerra 1990: 154; Fernandes 2006: 128.

Parnaiba Basin district Fernandes & Bezerra 1990, **stat. nov.**
Parnaiba Basin sector Fernandes & Bezerra 1990: 150; Fernandes 2006: 126.

Planalto district Fernandes & Bezerra 1990, **stat. nov.**
Planalto sector Fernandes & Bezerra 1990: 147; Fernandes 2006: 124.

Chaco province Holmberg 1898

Chaco formation Holmberg 1898: 447.
Subtropical Forests and Savannas area Hauman 1920: 46.
Chaco Forests and Savannas province Hauman 1931: 59.
Gran Chaco region Shannon 1927: 5.
Chacoan Park area Parodi 1934: 171, 1945: 128.
Subtropical district Cabrera & Yepes 1940: 15.
Chacoan province Castellanos & Pérez-Moreau 1944: 79; Cabrera 1951: 32, 1953: 107, 1958: 200; Morello 1958: 131; Cabrera 1971: 15; Cabrera & Willink 1973: 72; Udvardy 1975: 41; Cabrera 1976: 18; Morrone 1999: 9; Zuloaga *et al.* 1999: 38; Morrone 2000a: 56.
Chacoan Forest area Bölcke 1957: 2.
Chacoan region Hueck 1957: 40; Rivas-Martínez & Navarro 1994: map.
Subtropical dominion Ringuelet 1961: 160.
Gran Chaco area Sick 1969: 452.
Chaco centre Müller 1973: 143; Cracraft 1985: 75.
Central Chaco dominion Ab'Sáber 1977: map.
Chaco province Morrone 2001e: 88, 2006: 481.

Diagnosis. Southern Bolivia, western Paraguay, southern Brazil and central north Argentina (Morrone 2000a, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Trixis antimenorhoea* var. *discolor* (Katinas 1995). ARTHROPODA. Acrididae: *Chlorus borellii,Meloscirtus*, *Parascopas obesus*, *Propedies bilobus*, *P. bipunctatus*, *P. boliviensis*, *P. brevifacies*, *P. gracilis*, *Pseudoscopas nigrigena*, *P. viridis* and *Scotussa brachyptera* (Ronderos 1982, 1985; Ronderos & Sánchez 1983; Cigliano & Ronderos 1994; Carbonell 1995; Cigliano & Lange 2007); Apidae: *Geotrigona argentina* and *Parapsaenythia carinulata* (Camargo & Moure 1996; Ramos & Melo 2010); Baetidae: *Cloeodes irvingi* (Domínguez 1998); Bothriuridae: *Bothriurus chacoensis*, *Brachistosternus ferrugineus* and *Timogenes elegans* (Maury 1982a; Roig-Juñent 1994; Acosta & Maury 1998); Carabidae: *Barypus comechingonensis* (Roig-Juñent 1992); Curculionidae: *Achia affinis*, *Aramigus planioculus*, *Enoplopactus brunneomaculatus*, *E. ortizi*, *E. sulfureovittatus*, *Ericydeus argentinensis*, *Erodiscus proximus*, *Lamprocyphosis*, *Listroderes wagneri*, *Naupactus cinereidorsum, N. cyphoides*, *N. obrieni*, *N. prasinus*, *Priocyphopsis humeridens*, *Priocyphus inops*, *P. kuscheli*, *Sicoderus latifrons* and *Tyloderma glabrescens* (Burke & Kovarik 1986; Vanin 1986; Wibmer 1989; Lanteri 1990b, c, 1995; Lanteri & Loiácono 1990; Lanteri *et al.* 1991; Morrone 1993a; Lanteri & Díaz 1994; Rosas *et al.* 2011b); Gnaphosidae: *Echemoides giganteus*, *E. mauryi* and *E. penicillatus* (Platnick & Shadab 1979); Gonyleptidae: *Neopucroliella mesembrina* (Acosta 1990); Polymitarcyidae: *Campsurus paraquarius* (Domínguez 1998); Pompilidae: *Poecilopompilus eurymelus*, *Tachypompilus erubescens* and *T. xanthopterus* (Correa 1987, 1992); Reduviidae: *Melanolestes minutus* and *Sirthenea ferdinandi* (Morrone & Coscarón 1996; Coscarón & Morrone 1997); Scarabaeidae: *Coprophaneus bonariensis* (Edmonds & Zidek 2013); Schendylidae: *Schendylops borelli, S. paraguayensis* and *S. placii* (Morrone & Pereira 1999); Tenebrionidae: *Entomoderes borealis*, *E. cellulosus* and *E. draco* (Flores & Roig-Juñent 1997); Trogidae: *Polynoncus pampeanus* and *P. pedestris* (Scholtz 1990); Simuliidae: *Simulium chaquense* (Coscarón & Coscarón-Arias 1995); Sphecidae: *Chlorion schrottkyi* and *Hemidula burmeisteri* (Genise 1989); Termitidae: *Constrictotermes cyphergaster* and *Diversitermes diversimiles* (Torales 1998). VERTEBRATA. Anatidae: *Callonetta leucophrys* (Olrog 1984); Cariamidae: *Chunga burmeisteri* (Müller 1973; Olrog 1984); Caviidae: *Dolichotis salinicola* (Redford & Eisenberg 1992); Cracidae: *Ortalis canicollis* (Müller 1973; Olrog 1984); Cebidae: *Alouatta caraya* (Cortés-Ortiz *et al.* 2003); Cricetidae: *Abrothrix olivaceus*, *Andalgalomys pearsoni*, *Calomys callosus*, *C. venustus, Oryzomys chacoensis*, *Pseudoryzomys* and *Scapteromys* (Müller 1973; Redford & Eisenberg 1992; Almeida *et al.* 2007); Ctenomyidae: *Ctenomys conoveri* (Müller 1973); Dasypodidae: *Cabassous chacoensis* and *Chlamyphorus retusus* (Redford & Eisenberg 1992); Dendrocolaptidae: *Cranioleuca pyrrophia, Lepidocolaptes angustirostris* and *Phacellodomus sibilatrix* (Müller 1973); Echimyidae: *Proechimys longicaudatus* (Patton 1987); Falconidae: *Spiziapteryx circumcinctus* (Olrog 1984); Fringillidae: *Embernagra platensis olivascens*, *Poospiza melanoleuca* and *Thraupis bonariensis bonariensis* (Müller 1973); Furnariidae: *Furnarius cristatus* (Müller 1973; Olrog 1984); Passeridae: *Anthus chacoensis* (Müller 1973; Olrog 1984); Picidae: *Colaptes campestris campestroides*, *C. melanochloros* and *Picumnus cirratus pilcomayensis* (Müller 1973); Psittacidae: *Amazona aestiva aestiva*, *Forpus xanthopterygius flavescens* and *Myiopsitta monachus* (Müller 1973; Darrieu 1983a, c); Strigidae: *Strix rufipes* (Müller 1973); Tayassuidae: *Catagonus wagneri* (Redford & Eisenberg 1992); Tinamidae: *Eudromia formosa* and *Nothura chacoensis* (Müller 1973; Olrog 1984); Tyrannidae: *Elaenia spectabilis*, *Myiarchus swainsoni swainsoni* and *Pseudocolopteryx dinellianus* (Müller 1973; Olrog 1984).

Districts. Cabrera (1971, 1976) and Rivas-Martínez & Navarro (1994) recognized nested units, which are treated herein as the Eastern Chacoan and Western Chacoan districts.

Eastern Chacoan district Cabrera 1951
Mesopotamic formation Holmberg 1898: 464.
Mesopotamic Park area Parodi 1934: 171, 1945: 128.
Eastern Chacoan district Cabrera 1951: 34, 1971: 15, 1976: 21.
Septentrional Chaco province (in part) Rivas-Martínez & Navarro 1994: map.
Humid Chaco ecoregion Dinerstein *et al.* 1995: 99.
Llanos district Mattoni & Acosta 1997: 67.

Western Chacoan district Cabrera 1951
Western Chacoan district Cabrera 1951: 36, 1971: 17, 1976: 27.

Montane Chacoan district Cabrera 1971: 17, 1976: 25.
Savannas district Cabrera 1971: 18, 1976: 27.
Andean Chaco province Rivas-Martínez & Navarro 1994: map.
Meridional Chaco province Rivas-Martínez & Navarro 1994: map.
Septentrional Chaco province (in part) Rivas-Martínez & Navarro 1994: map.
Chaco Savannas ecoregion Dinerstein *et al.* 1995: 99.
Córdoba Montane Savannas ecoregion Dinerstein *et al.* 1995: 99.

Pampean province Blyth 1871

Pampean sub-region Blyth 1871: 428.
Pampa formation Holmberg 1898: 403.
Pampean Prairie area Hauman 1920: 62.
Pampas region Shannon 1927: 5; Good 1947: 237; Takhtajan 1986: 251.
Pampean Grassland province Hauman 1931: 59; Bölcke 1957: 2.
Pampean Steppe area Parodi 1934: 171, 1945: 130.
Guaraní province (in part) Mello-Leitão 1937: 246.
Pampasic district Cabrera & Yepes 1940: 15.
Pampas area Hueck 1957: 40; Sick 1969: 452; Coscarón & Coscarón-Arias 1995: 726; Porzecanski & Cracraft 2005: 266.
Pampasic dominion Ringuelet 1961: 160.
Pampa area Hueck 1966: 3.
Pampa province Fittkau 1969: 642; Morrone 2000a: 58, 2001e: 91, 2006: 481.
Pampean province Cabrera 1951: 42, 1953: 107, 1958: 200, 1971: 24; Cabrera & Willink 1973: 79; Cabrera 1976: 42; Morrone 1999: 10; Zuloaga *et al.* 1999: 35.
Pampean region Rivas-Martínez & Navarro 1994: map.
Pampas ecoregion Dinerstein *et al.* 1995: 99.

Diagnosis. Central western Argentina between 30 and 39 south latitude, Uruguay and southern portion of the Brazilian state of Rio Grande do Sul (Morrone 2000a, 2006).

Endemic taxa. GNETOPHYTA. Ephedraceae: *Ephedra tweediana* (Hunziker 1995). MAGNOLIOPHYTA. Asteraceae: *Criscia*, *Panphalea bupleurifolia* and *P. heterophylla* (Katinas 1994, 1995); Onagraceae: *Epilobium hirtigerum* (Solomon 1982). ARTHROPODA. Acrididae: *Borellia alejomesai*, *Dichroplus maculipennis*, *Leiotettix flavipes*, *L. politus*, *Neopedies orientalis*, *Pseudoscopas campestris*, *P. elegans*, *Scotussa daguerrei*, *S. lemniscata* and *S. liebermanni* (Ronderos 1991; Cigliano & Ronderos 1994; Roig-Juñent 1994); Aphilodontidae: *Aphilodon spegazzinii* (Pereira 1998); Baetidae: *Baetis alcyoneus*, *B. coveloe*, *B. inops*, *B. yaro* and *Cloeodes aymara* (Domínguez 1998); Bothriuridae: *Brachistosternus psammophilus*, *Bothriurus flavidus*, *B. prospicuus*, *B. voyati*, *Urophonius iheringi* and *U. mahuidensis* (Roig-Juñent 1994); Buthidae: *Zabius birabeni* (Roig-Juñent 1994); Carabidae: *Barypus aequicostis*, *A. pulchellus*, *B. rivalis*, *B. speciosus*, *Cicindela confluentesignata*, *C. melanoleuca*, *C. nivea orbignyi*, *C. patagonica cherubin*, *Notiobia latiuscula* and Notiokasiini (Noonan 1981a, b; Kavanaugh & Nègre 1982; Roig-Juñent 1992, 1994); Chrysomelidae: *Xenochalepus tandiliensis* (Roig-Juñent 1994); Clubionidae: *Trachelopachys cingulipes* (Platnick 1975); Curculionidae: *Cyrtomon glaucus*, *Entimus sastrei*, *Hyperoides fragariae*, *Listroderes elegans*, *L. uruguayensis*, *Priocyphus bosqi*, *Tyloderma aeneum* and *T. longisquameum* (Wibmer 1989; Lanteri 1990a, b; Morrone 1993a-c, 2002b); Dytiscidae: *Hydaticus tuyuensis* (Trémouilles 1996); Isotomidae: *Isotoma antenalis* and *Isotomina thermophila* (Trémouilles 1995); Geophilidae: *Apogeophilus bonariensis* and *Dinogeophilus pauropus* (Pereira 1998); Gnaphosidae: *Echemoides argentinus* (Platnick & Shadab 1979); Leptophlebiidae: *Homothraulus larensis* (Domínguez 1998); Miridae: *Antias bonariensis*, *Collaria manoloi*, *Melanotrichus bonaerensis* and *Pycnoderes albipes* (Carvalho and Carpintero 1989, 1990); Mutillidae: *Tallium buonoae* (Roig-Juñent 1994); Pompilidae *Caliadurgus sigillipes* (Roig-Juñent 1994); Nemesiidae: *Acanthogonatus tacuariensis*, *Pycnotele auronitens*, *Stenoterommata crassistilum* and *S. tenuistylum* (Goloboff 1995); Oripodidae: *Pseudopirnodus* (Baranek 1985); Polymitarcyidae: *Athenopus gilliensi* and *Tricorythodes arequita* (Domínguez 1998); Reduviidae: *Apiomerus costalimai*, *Cricetopareis tucumana orientalis*, *Daraxa nigripes*, *Melanolestes argentinus* and *Rocconota bruchi* (Coscarón & Morrone 1997; Coscarón 1998); Scarabaeidae: *Dichotomius haroldi* (Roig-Juñent 1994); Schendylidae: *Schendylops anamariae, S. interfluvius, S. madariagensis* and *S. pampeanus* (Morrone & Pereira 1999); Simuliidae: *Simulium delponteianum* (Coscarón &

Coscarón-Arias 1995); Sminthuridae: *Sminthurides hospes* and *S. spegazzinii* (Trémouilles 1995); Staphylinidae: *Bledius bonariensis* species group (Herman 1986); Tenebrionidae: *Mitragenius nudus* and *Nyctelia saundersi* (Roig-Juñent 1994); Theraphosidae: *Homocomma uruguayensis* (Roig-Juñent 1994); Theridiidae: *Anelosimus misiones* (Agnarsson 2005; Sigrist & Carvalho 2009); Trogidae: *Omorgus borrei* and *Polynoncus patriciae* (Scholtz 1990). VERTEBRATA. Cricetidae: *Akodon kempi*, *Calomys musculinus*, *Hololichus magnus*, *Oryzomys delticola* and *Scapteromys tumidus* (Redford & Eisenberg 1992); Ctenomyidae: *Ctenomys australis*, *C. azarae*, *C. pearsoni*, *C. porteousi* and *C. talarum* (Redford & Eisenberg 1992); Felidae: *Leopardus braccatus munoai* (García-Perea 1994); Fringillidae: *Carduelis chloris*, *Gubernatrix cristata*, *Paroaria coronata* and *Sporophila palustris* (Müller 1973; Olrog 1984); Furnariidae: *Asthenes hudsoni*, *Cranioleuca sulphurifera*, *Limnornis curvirostris* and *Spartonoica maluroides* (Müller 1973; Olrog 1984); Rallidae: *Porzana spiloptera* (Olrog 1984); Trochilidae: *Hylocharis cyanus* (Peña 1994).

Districts. Cabrera (1971, 1976) and Cabrera & Willink (1973) have identified four districts (Austral Pampean, Eastern Pampean, Uruguayan and Western Pampean), to which the Espinal (Fig. 22) is added.

Austral Pampean district Cabrera 1951
Austral Pampean district Cabrera 1951: 47, 1971: 27; Cabrera & Willink 1973: 81; Cabrera 1976: 49.
Pampa centre (in part) Müller 1973: 148.
Argentinean Pampas province (in part) Udvardy 1975: 42.
Pampean area (in part) Roig-Juñent 1994: 184.

Eastern Pampean district Cabrera 1951
Eastern Pampean district Cabrera 1951: 45, 1971: 26; Cabrera & Willink 1973: 81; Cabrera 1976: 44.
Pampa centre (in part) Müller 1973: 148.
Argentinean Pampas province (in part) Udvardy 1975: 42.
Central Pampean province (in part) Rivas-Martínez & Navarro 1994: map.
Semitropical Pampean province (in part) Rivas-Martínez & Navarro 1994: map.
Pampean area (in part) Roig-Juñent 1994: 184.
Paran Flooded Grasslands ecoregion Dinerstein *et al.* 1995: 101.

Espinal district Cabrera 1951, **stat. nov.**
Pampean Forest area Parodi 1945: 128.
Espinal province Cabrera 1951: 37, 1953: 107, 1958: 200; Morello 1958: 131; Cabrera 1971: 18; Cabrera & Willink 1973: 75; Cabrera 1976: 28.
Algarrobo district Cabrera 1951: 38, 1971: 20; Cabrera & Willink 1973: 76; Cabrera 1976: 32.
Caldén district Cabrera 1951: 39, 1971: 20; Cabrera & Willink 1973: 76; Cabrera 1976: 33.
Ñandubay district Cabrera 1951: 38, 1971: 19; Cabrera & Willink 1973: 75; Cabrera 1976: 28.
Xerophytic Pampean province Rivas-Martínez & Navarro 1994: map.
Argentine Espinal ecoregion Dinerstein *et al.* 1995: 99.

Uruguayan district Hauman 1931
Uruguayan province Hauman 1931: 59.
Uruguayan district Cabrera 1951: 44, 1971: 25; Cabrera & Willink 1973: 80; Cabrera 1976: 43.
Uruguayan centre Müller 1973: 140.
Uruguayan Pampas province Udvardy 1975: 42.
Uruguayan area Roig-Juñent 1994: 184.
Coxilhas dominion Ab'Sáber 1977: map.
Southern province Fernandes & Bezerra 1990: 184.

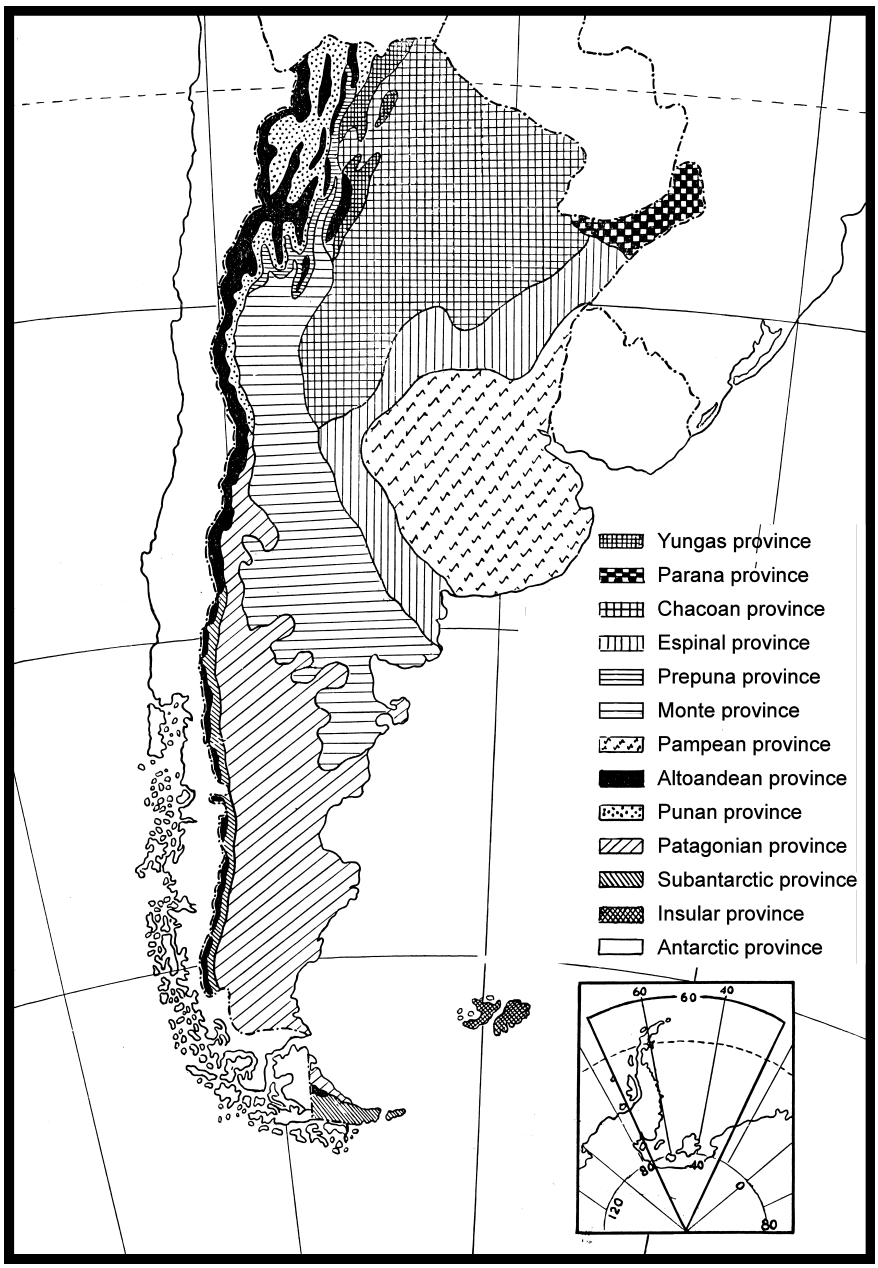


FIGURE 22. Regionalisation of Argentina (modified from Cabrera 1971).

Central Depression sector Fernandes & Bezerra 1990: 195.
Pampas sector Fernandes & Bezerra 1990: 191.
Southern Mountains sector Fernandes & Bezerra 1990: 197.
Central Pampean province (in part) Rivas-Martínez & Navarro 1994: map.
Semitropical Pampean province (in part) Rivas-Martínez & Navarro 1994: map.
Uruguayan Savannas ecoregion Dinerstein *et al.* 1995: 100.
Western Pampean district Cabrera 1951
Western Pampean district Cabrera 1951: 46, 1971: 27; Cabrera & Willink 1973: 81; Cabrera 1976: 47.
Tala district Cabrera 1951: 39.
Argentinean Pampas province (in part) Udvardy 1975: 42.
Tala subdistrict Cabrera 1976: 32.
Pampa centre (in part) Müller 1973: 148.
Central Pampean province (in part) Rivas-Martínez & Navarro 1994: map.
Pampean area (in part) Roig-Juñent 1994: 184.

Parana dominion Morrone 1999

Guaraní province (in part) Mello-Leitão 1937: 246.
Tupí district (in part) Cabrera & Yepes 1940: 15.
Tupí, Araucariland or Tupí-Guaran centre (in part) Lane 1943: 414.
Southeastern Brazil Subtropical Forests region Hueck 1957: 40.
Atlantic-Parana sub-region Rivas-Martínez & Navarro 1994: map.
Southern Brazil Mountains area Coscarón & Coscarón-Arias 1995: 726.
Parana sub-region Morrone 1999: 10, 2001e: 97, 2005: 238, 2006: 482; Nihei & Carvalho 2007: 497; Navarro *et al.* 2009: 509; Morrone 2010a: 37, 2001b: 1.
Atlantic Forest dominion Fiaschi & Pirani 2009: 483.
Parana dominion Morrone 2014: 207.

Diagnosis. Northeastern Argentina, eastern Paraguay, southern Brazil west of the Serra do Mar and toward central Rio Grande do Sul and eastern Brazil, between 7 and 32 south latitude (Fig. 12) (Morrone 2001b, 2006).

Provinces. The Parana dominion comprises the Atlantic, Parana and *Araucaria* Forest provinces.

Atlantic province Cabrera & Willink 1973

Tupí province Mello-Leitão 1937: 246; Fittkau 1969: 642.
Atlantic province Cabrera & Willink 1973: 64; Rivas-Martínez & Navarro 1994: map; Fernandes & Bezerra 1990: 99; Fernandes 2006: 67.
Serra do Mar centre Müller 1973: 125; Cracraft 1985: 72.
Serra do Mar province Udvardy 1975: 41.
Atlantic Tropical dominion Ab'Sáber 1977: map.
Southeastern Brazil area Cracraft 1988: 223.
Litoral or Coastal sub-province Fernandes & Bezerra 1990: 114; Fernandes 2006: 84.
Brazilian Atlantic Coast Restingas ecoregion Dinerstein *et al.* 1995: 106.
Brazilian Coastal Atlantic Forests ecoregion Dinerstein *et al.* 1995: 93.
Brazilian Atlantic Forest province Morrone 1999: 11, 2001e: 98, 2006: 482.
Brazilian Atlantic Coast province Morrone 2001b: 2.
Serra do Mar area Silva *et al.* 2004: 88.
Atlantic Forest area Porzecanski & Cracraft 2005: 266.

Diagnosis. Narrow strip along the Brazilian Atlantic coast east of the coastal cordillera, between 7-32 south latitude (Morrone 2001b, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Chionolaena capitata*, *C. isabellae*, *C. phylicoides* and *C. wittigiana* (Freire 1993); Cecropiaceae: *Cecropia hololeuca* (Franco & Berg 1997); Elaeocarpaceae: *Crinodendron brasiliense* (Coode 1987); Onagraceae: *Fuchsia alpestris*, *F. brevilobis*, *F. glazioviana* and *F. regia* subsp. *serrae* (Berry 1989). ARTHROPODA. Carabidae: *Amblygnathus braziliensis* (Ball & Maddison 1987); Corixidae: *Sigara denseconscripta* (Bachmann 1981); Curculionidae: *Ericydeus bahiensis*, *Erodiscus denticollis*, *E. caruaru*, *Lancearius longirostris*, *Pimelerodius ardea*, *P. birai*, *P. elongatulus*, *P. gryphus*, *P. obsoletus*, *P. pascoei*, *P. sulcatipennis*, *Prosicoderus crassipes*, *Sicoderus analis*, *S. apicalis*, *S. bondari*, *S. ciconia*, *S. distinguendus*, *S. prolatus* and *S. subcoronatus* (Vanin 1986; Lanteri 1995); Ditomyiidae: *Calliceratomyia pectinata* (Amorim & Pires 1996); Elmidae: *Stenhelmoides submaculatus* (Spangler & Perkins 1989); Membracidae: *Nicomia interrupta* and *N. monticola* (Albertson & Dietrich 2005; Sigrist & Carvalho 2009); Miridae: *Rhinacloa carvalhoi* (Schuh & Schwartz 1985); Mycetophilidae: *Cluzobra* spp. (Amorim & Oliveira 2008); Nepidae: *Curicta bilobata*, *C. lenti* and *C. longimanus* (Keffer 1996); Pholcidae: *Carapoia crasto, C. genitalis, C. ubatuba* and *C. una* (Huber 2005; Sigrist & Carvalho 2009); Reduviidae: *Rasahus grandis* and *Sirthenea atra* (Morrone & Coscarón 1996); Scarabaeidae: *Coprophaneus bellicosus* (Edmonds & Zidek 2013); Schendylidae: *Schendylops coscaroni, S. iguapensis, S. olivaceus, S. parahybae, S. perditus* and *S. luederwaldi* (Morrone & Pereira 1999); Sciaridae: *Rhynchosciara americana* (Amorim & Pires 1996); Sciomyzidae: *Sepedonea incipiens*, *S. neffi* and *S. veredae* (Freidberg *et al.* 1991); Simuliidae: Simuliidae *Simulium brachycladum* (Coscarón & Coscarón-Arias 1995); Staphylinidae: *Neolindus schubarti*, *N. unilobus* (Herman 1991); Stenomidae: *Setiostoma argyrobasis* (Duckworth 1971); Stygnidae: *Pickeliana capito* and *P. pickeli* (Pinto-da-Rocha 1997). VERTEBRATA. Accipitridae:

Leucopternis lacernulatus and *L. polionota* (Müller 1973); Bradypodidae: *Bradypus torquatus* (Emmons 1990); Callithrichidae: *Brachyteles arachnoides*, *Callithrix jacchus aurita* and *Leontopithecus* spp. (Emmons 1990; Amorim & Pires 1996); Caprimulgidae: *Eleothreptus anomalus* and *Macropsalis creagra* (Müller 1973); Conopophagidae: *Conopophaga melanops* (Müller 1973); Cricetidae: *Delomys* spp. and *Phaenomys ferrugineus* (Emmons 1990); Didelphidae: *Monodelphis iheringi* (Emmons 1990); Echimyidae: *Nelomys dasythrix*, *N. thomasi* and *Proechimys (Trinomys)* (Emmons 1990); Fringillidae: *Orchesticus abeillei*, *Orthogonys chloricterus*, *Pyrrhocoma ruficeps* and *Stephanophorus diadematus* (Müller 1973); Furnariidae: *Anabazenops fuscus*, *Cichlocolaptes leucophrus*, *Heliobletus contaminatus* and *Schizoeca moreirae* (Müller 1973); Galbulidae: *Jacamaralcyon tridactyla* (Müller 1973); Psittacidae: *Pionopsitta pileata* and *Triclaria malachitacea* (Müller 1973; Cracraft & Prum 1988); Rhamphastidae: *Baillonius bailloni* (Müller 1973); Rhinocryptidae: *Merulaxis ater*, *M. stresemanni* and *Psilorhamphus guttatus* (Müller 1973); Thamnophilidae: *Batara cinerea*, *Biatas nigropectus*, *Hypoedaleus guttatus*, *Mackenziaena cinerea* and *Rhopornis ardesiaca* (Müller 1973); Trochilidae: *Aphanotochroa cirrochloris*, *Clytolaema rubricauda*, *Leucochloris albicollis*, *Melanotrochilus fuscus*, *Ramphodon naevius* and *Stephanoxis lalandi* (Müller 1973); Tropidophiidae: *Tropidophis battersbyi* and *T. grapiuna* (Curcio *et al.* 2012); Tyrannidae: *Alectrurus risora*, *Calyptura cristata*, *Carpornis cucullatus*, *C. melanocephalus*, *Culicivora caudacuta*, *Hemitriccus furcatus*, *Ilicura militaris*, *Muscipipra vetula*, *Phibalura flavirostris* and *Tijuca atra* (Müller 1973).

Districts. Müller (1973) and Silva *et al.* (2004) identified nested units, which are treated herein as three districts: Bahia, Paulista and Pernambuco.

Bahia district Müller 1973, **stat. nov.**
Bahia subcentre Müller 1973: 131.
Central Bahia area Silva *et al.* 2004: 88.
Coastal Bahia area Silva *et al.* 2004: 88.

Paulista district Müller 1973, **stat. nov.**
Paulista subcentre Müller 1973: 132.

Pernambuco district Müller 1973, **stat. nov.**
Pernambuco subcentre Müller 1973: 131.
Pernambuco area Silva *et al.* 2004: 88.

Parana province Cabrera 1971

Misiones formation Holmberg 1898: 451.
Austral Brazil Forests and Savannas province Hauman 1931: 59.
Misiones Subtropical Forest area Parodi 1934: 171.
Misiones-Brazilian Forest area Castellanos & Pérez-Moreau 1941: 378.
Misiones province Castellanos & Pérez-Moreau 1944: 90.
Misiones Forest area Parodi 1945: 127.
Eastern Subtropical province Cabrera 1951: 28, 1953: 114.
Parana province Cabrera 1971: 11, 1976: 10; Cabrera & Willink 1973: 60; Rivas-Martínez & Navarro 1994: map.
Brazilian Rainforest province Udvardy 1975: 41.
Montane sub-province Fernandes & Bezerra 1990: 114; Fernandes 2006: 72.
Meridional Planalto sector (in part) Fernandes & Bezerra 1990: 114; Fernandes 2006: 79.
Forests province Morrone 1999: 10.
Brazilian Interior Atlantic Forests ecoregion Dinerstein *et al.* 1995: 93.
Parana Forest province Morrone 2001b: 2, 2001e: 99, 2006: 482.

Diagnosis. Southeastern Brazil, northeastern Argentina and eastern Paraguay (Morrone 2001b, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Chionolaena arbuscula*, *C. lychnophorioides*, *Holocheilus illustris*, *Jungia floribunda*, *J. sellowii* and *Panphalea missionum* (Freire 1993; Katinas 1995); Onagraceae: *Fuchsia bracelinae*, *F. coccinea* and *F. regia* subsp. *regia* (Berry 1989). ARTHROPODA. Acrididae: *Borellia saezi* and *Neopedies megacercis* (Ronderos 1991; Carbonell 1995); Apidae: *Geotrigona subterranea* (Camargo & Moure

1996); Cicadellidae: *Balacha caparao, B. distincta, B. lepida* and *B. rubripennis* (Takiya & Mejdalani 2004; Sigrist & Carvalho 2009); Curculionidae: *Achia hustachei, Aramigus globoculus* and *A. intermedius* (Burke & Kovarik 1986; Lanteri & Díaz 1994); Schendylidae: *Schendylops demartini, S. demelloi, S. gounellei, S. longitarsis, S. paulistus* and *S. sublaevis* (Morrone & Pereira 1999); Staphylinidae: *Neobisnius brasilianus* (Frank 1981); Nemesiidae: *Rachias timbo*, *Stenoterommata iguazu* and *S. uruguai* (Goloboff 1995); Reduviidae: *Melanolestes lugens* (Morrone & Coscarón 1996; Coscarón & Morrone 1997); Sciaridae: *Rhynchosciara hollaenderi* (Amorim & Pires 1996).

Districts. Cabrera (1971, 1976) and Cabrera & Willink (1973) identified three districts: Campos, Mixed Forests and Montane.

Campos district Cabrera 1951
Campos district Cabrera 1951: 31, 1971: 14, 1976: 17; Cabrera & Willink 1973: 61.
Campos area Hueck 1953: 16.
Southern Grasslands dominion Fiaschi & Pirani 2009: 486.

Mixed Forests district Cabrera 1951
Mixed Forests district Cabrera 1951: 29, 1971: 12.
Forests district Cabrera & Willink 1973: 60.

Montane district Cabrera 1951
Montane district Cabrera & Willink 1973: 61.

Araucaria Forest province Hueck 1953, stat. nov.

Araucaria Forest area Hueck 1953: 16.
Southeastern Brazil *Araucaria* Forests region Hueck 1957: 40.
Araucaria angustifolia Forest province Aubreville 1962: 46; Morrone 2001b: 5, 2001e: 101, 2006: 482.
Pine forests province Cabrera & Willink 1973: 61; Morrone 1999: 11.
Paran centre Müller 1973: 138; Cracraft 1985: 73.
Brazilian Planalto province Udvardy 1975: 41.
Araucaria Planaltos dominion Ab'Sáber 1977: map.
Meridional Planalto sector Fernandes & Bezerra 1990: 114; Fernandes 2006: 79.
Araucaria subsector Fernandes & Bezerra 1990: 111.
Brazilian *Araucaria* Forests ecoregion Dinerstein *et al.* 1995: 98.

Diagnosis. Southern Brazil and northeastern Argentina, between 600 and 1800 m altitude (Morrone 2001b, 2006).

Endemic taxa. CONIFEROPHYTA. Araucariaceae: *Araucaria angustifolia* (Covas 1995b). MAGNOLIOPHYTA. Onagraceae: *Fuchsia hatschbachii* and *F. regia* subsp. *reitzii* (Berry 1989). ARTHROPODA. Curculionidae: *Araucarius brasiliensis*, *A. ruehmi*, *Pandeleteius colatus* and *P. torosus* (Kuschel 1966; Howden 1996); Ditomyiidae: *Rhipidita nigra* (Amorim & Pires 1996); Nemonychidae: *Brarus* and *Rhynchitoplesius* (Morrone *et al.* 1996; Kuschel & May 1997); Sciomyzidae: *Sepedonea trichotypa* (Freidberg *et al.* 1991); Theridiidae: *Anelosimus rabus* (Agnarsson 2005; Sigrist & Carvalho 2009). VERTEBRATA. Furnariidae: *Cinclodes pabsti* and *Leptasthenura setaria* (Müller 1973).

South American transition zone Morrone 2004a

Peruvian sub-region (in part) Blyth 1871: 428.
Tropical Andean subarea (in part) Clarke 1892: 381.
Argentinean subarea (in part) Clarke 1892: 381.
Patagonian sub-region (in part) Sclater & Sclater 1899: 65; Kuschel 1964: 447; Hershkovitz 1969: 8; Kuschel 1969: 712.
Andean region (in part) Shannon 1927: 3; Good 1947: 236; O'Brien 1971: 198; Morain 1984: 178; Rivas-Martínez & Navarro 1994: map; Morrone 2001d: 70, 2001e: 103, 2006: 483; Procheş & Ramdhani 2012: 263.
Andean dominion (in part) Hauman 1931: 60; Cabrera 1951: 48; Orfila 1941: 86; Cabrera 1957: 335.
Andean-Patagonian sub-region (in part) Mello-Leitão 1937: 232, 1943: 129; Ringuelet 1961: 156; Rapoport 1968: 75; Fittkau 1969: 639.

Andean district (in part) Cabrera & Yepes 1940: 16.
Subandean district Cabrera & Yepes 1940: 15.
Altoandean province Cabrera 1951: 49, 1953: 107, 1957: 337, 1958: 200; Cabrera & Willink 1973: 84.
Andean province (in part) Fittkau 1969: 642.
Subandean province (in part) Fittkau 1969: 642.
Central Andes area Sick 1969: 463.
Andean-Patagonian dominion (in part) Cabrera 1971: 29, 1976: 50; Cabrera & Willink 1973: 83; Zuloaga *et al.* 1999: 18.
Andean sub-realm (in part) Rivas-Martínez & Tovar 1983: 516.
Argentine sub-region (in part) Smith 1983: 462.
Austroamerican sub-realm (in part) Rivas-Martínez & Navarro 1994: map.
Central Andes bioregion Dinerstein *et al.* 1995: map 1.
Neotemperate region (in part) Amorim & Pires 1996: 187.
Andean sub-region (in part) Morrone 1996: 105; Posadas *et al.* 1997: 2.
Austral sub-region (in part) Almirón *et al.* 1997: 23.
Paramo-Punan sub-region Morrone 1999: 11, 2001c: 1, 2001e: 106.
South American transition zone Morrone 2004a: 158, 2004b: 42, 2006: 482; Roig *et al.* 2009: 164; Morrone 2010a: 37; Urtubey *et al.* 2010: 505; Morrone 2014: 203.

Diagnosis. Highlands of the Andes between western Venezuela and northern Chile and central western Argentina (Fig. 12) (Morrone 2006).

Provinces. The South American transition zone comprises the Paramo, Desert, Puna, Atacama, Prepuna and Monte provinces.

Paramo province Cabrera 1957

Incasic province (in part) Mello-Leitão 1943: 130; Fittkau 1969: 642.
Paramo province Cabrera 1957: 335; Cabrera & Willink 1973: 66; Rivas-Martínez & Navarro 1994: map; Morrone 1996: 108; Posadas *et al.* 1997: 2; Morrone 1999: 13.
Northern Andes area (in part) Sick 1969: 461; Porzecanski & Cracraft 2005: 266.
North Andean centre Müller 1973: 45; Cracraft 1985: 62.
Bogotá subcentre Müller 1973: 46.
Peruvian Andes subcentre Müller 1973: 46.
Colombian Montane province Udvardy 1975: 42.
Paramo region Rivas-Martínez & Tovar 1983: 516.
Peruvian Andean centre Cracraft 1985: 64.
East Peruvian Andean subcentre Cracraft 1985: 64.
South Peruvian Andean subcentre Cracraft 1985: 64.
West Peruvian Andean subcentre Cracraft 1985: 64.
North Andean area Coscarón & Coscarón-Arias 1995: 726.
Cordillera Central Paramo ecoregion Dinerstein *et al.* 1995: 102.
Cordillera de Mérida Paramo ecoregion Dinerstein *et al.* 1995: 102.
Northern Andean Paramo ecoregion Dinerstein *et al.* 1995: 102.
Santa Marta Paramo ecoregion Dinerstein *et al.* 1995: 101.
North Andean Paramo province Morrone 2001c: 3, 2001e: 107, 2006: 483; Urtubey *et al.* 2010: 506.

Diagnosis. High cordilleras of Venezuela, Colombia, Ecuador and Peru, above 3000 m altitude (Morrone 2001c, 2006).

Endemic taxa. FILICOPHYTA. Dicksoniaceae: *Dicksonia stuebelii* (Murillo 1988). MAGNOLIOPHYTA. Alstroemeriaceae: *Bomarea angustipetala, B. bredemeyerana, B. carderi, B. difracta, B. granatensis, B. hazenii, B. hispida* and *B. holtoni* (Alzate *et al.* 2008); Asteraceae: *Coespeletia spicata*, *Espeletia*, *Espeletiopsis corymbosa* and *Ruilopezia atropurpurea* (Sturm 1990); Brassicaceae: *Draba arauquensis* (Santana 1995); Gunneraceae: *Gunnera antioquensis* and *G. caucana* (Mora 1984); Passifloraceae: *Passiflora truxillensis* (Escobar 1988); Poaceae: *Muhlenbergia cleefi* (Laegaard 1995); Scrophulariaceae: *Aragoa* (Fernández 1991). ARTHROPODA. Acrididae: *Bogotacris*, *Chibchacris* and *Timotes* (Ronderos & Cerda 1982; Ronderos & Cigliano 1991); Agromyzidae: *Liriomyza bogotensis*, *L. cirriformis*, *L. mariaecamilae*, *L. menthavora*, *L. mosquerensis*, *L. santafecina*, *L. subachoquensis*, *Ophiomyia flocusa*, *O. punctohalterata* and *O. sulcata* (Sanabria de Arévalo 1993a, b); Curculionidae: *Howdeniola nitidipennis*, *H. sulcipennis*, *Minetes*, *Phyllothrox aristidis* and *Rupanius*

(Osella 1980; Voisin 1986, 1991; Howden 1992; Morrone 1995); Simuliidae: *Gigantodax cervicornis*, *G. paramorum* and *G. siberianus* (Wygodzinky & Coscarón 1989); Staphylinidae: *Polylobus belen*, *P. chingaza*, *P. chisaca* and *P. monserrateae* and *Pseudopsis wygodzinkyi* (Klimaszewski & Sturm 1991). VERTEBRATA. Anatidae: *Anas cyanoptera borreroi* and A. *georgica niceforei* (Hernández *et al.* 1992c); Bufonidae: *Atelopus tamaense* (Marca *et al.* 1989); Caviidae: *Cavia porcellus anolaimae* (Hernández *et al.* 1992c); Certhiidae: *Campylorhynchus griseus bicolor* and *Cistothorus meridae* (Müller 1973; Hernández *et al.* 1992c); Cricetidae: *Thomasomys paramorum* (Müller 1973); Momotidae: *Momotus momota olivaresii* (Hernández *et al.* 1992c); Podicipedidae: *Podiceps andinus* (Hernández *et al.* 1992c); Rallidae: *Fulica americana colombiana* (Hernández *et al.* 1992c); Sciuridae: *Sciurus granatensis variabilis* (Hernández *et al.* 1992c); Tinamidae: *Crypturellus kerriae* and *C. saltuarius* (Hernández *et al.* 1992c).

Districts. Hernández *et al.* (1992a) identified 43 districts in the Colombian portion of this province: Alto Cauca Highland, Alto Patía, Alto Patía Subandean, Andalucía, Andean Forest, Awa, Cañón Chicamocha, Cañón del Cauca, Cañón del Dagua, Cauca and Valle Western Cordillera Andean Forest, Cauca Pacific Slope Subandean Forest, Catatumbo Mountains, Cauca-Huila Eastern Subandean Forests, Cauca-Huila-Valle-Tolima Andean Forests, Cauca-Huila-Valle-Tolima Páramos, Cauca-Valle Cordillera Subandean Forests, Central Cordillera Southeastern Subandean, Citara, Dabeiba, Eastern Andean, Eastern Cordillera Cloud Forests, Eastern Cordillera Páramos, Eastern Nariño Andean Forests, Farallones de Cali, Frontino, Nariño-Putumayo Páramos, Paramillo del Sin, Perijá, Perijá Páramos, Quindío Andean Forests, Quindío-Antioquia Central Cordillera Subandean Forests, Quindío Páramo, San Agustín, San Juan Cloud Forest, San Lucas Mountains, Southern Perijá, Tachira, Tolima, Tolima Central Cordillera Subandean Forests, Western Cordillera Eastern Subandean Forests, Western Cordillera Northern Andean Forests, Western Cordillera Northern Subandean Forests and Western Nariño Andean Forests.

Alto Cauca Highland district Hernández *et al.* 1992a
Alto Cauca Highland district Hernández *et al.* 1992a: 111.

Alto Patía district Hernández *et al.* 1992a
Alto Patía district Hernández *et al.* 1992a: 147.

Alto Patía Subandean district Hernández *et al.* 1992a
Alto Patía Subandean district Hernández *et al.* 1992a: 110.

Andalucía district Hernández *et al.* 1992a
Andalucía district Hernández *et al.* 1992a: 144.

Andean Forest district Hernández *et al.* 1992a
Andean Forest district Hernández *et al.* 1992a: 110.

Awa district Hernández *et al.* 1992a
Awa district Hernández *et al.* 1992a: 110.

Cañón Chicamocha district Hernández *et al.* 1992a
Cañón Chicamocha district Hernández *et al.* 1992a: 143.
Cañón del Cauca district Hernández *et al.* 1992a
Cañón del Cauca district Hernández *et al.* 1992a: 111.

Cañón del Dagua district Hernández *et al.* 1992a
Cañón del Dagua district Hernández *et al.* 1992a: 149.

Cauca and Valle Western Cordillera Andean Forest district Hernández *et al.* 1992a
Cauca and Valle Western Cordillera Andean Forest district Hernández *et al.* 1992a: 149.

Cauca Pacific Slope Subandean Forest district Hernández *et al.* 1992a

Cauca Pacific Slope Subandean Forest district Hernández *et al.* 1992a: 149.

Catatumbo Mountains district Hernández *et al.* 1992a
Catatumbo Mountains district Hernández *et al.* 1992a: 110.

Cauca-Huila Eastern Subandean Forests district Hernández *et al.* 1992a
Cauca-Huila Eastern Subandean Forests district Hernández *et al.* 1992a: 110.

Cauca-Huila-Valle-Tolima Andean Forests district Hernández *et al.* 1992a
Cauca-Huila-Valle-Tolima Andean Forests district Hernández *et al.* 1992a: 110.

Cauca-Huila-Valle-Tolima Páramos district Hernández *et al.* 1992a
Cauca-Huila-Valle-Tolima Páramos district Hernández *et al.* 1992a: 110.

Cauca-Valle Cordillera Subandean Forests district Hernández *et al.* 1992a
Cauca-Valle Cordillera Subandean Forests district Hernández *et al.* 1992a: 111.

Central Cordillera Southeastern Subandean district Hernández *et al.* 1992a
Central Cordillera Southeastern Subandean district Hernández *et al.* 1992a: 110.

Citara district Hernández *et al.* 1992a
Citara district Hernández *et al.* 1992a: 110.

Dabeiba district Hernández *et al.* 1992a
Dabeiba district Hernández *et al.* 1992a: 110.

Eastern Andean district Hernández *et al.* 1992a
Eastern Andean district Hernández *et al.* 1992a: 110.

Eastern Cordillera Cloud Forests district Hernández *et al.* 1992a
Eastern Cordillera Cloud Forests district Hernández *et al.* 1992a: 144.

Eastern Cordillera Páramos district Hernández *et al.* 1992a
Eastern Cordillera Páramos district Hernández *et al.* 1992a: 110.

Eastern Nariño Andean Forests district Hernández *et al.* 1992a
Eastern Nariño Andean Forests district Hernández *et al.* 1992a: 110.

Farallones de Cali district Hernández *et al.* 1992a
Farallones de Cali district Hernández *et al.* 1992a: 110.

Frontino district Hernández *et al.* 1992a
Frontino district Hernández *et al.* 1992a: 110.

Nariño-Putumayo Páramos district Hernández *et al.* 1992a
Nariño-Putumayo Páramos district Hernández *et al.* 1992a: 110.

Paramillo del Sin district Hernández *et al.* 1992a
Paramillo del Sin district Hernández *et al.* 1992a: 149.

Perijá district Hernández *et al.* 1992a

Perijá district Hernández *et al.* 1992a: 139.

Perijá Páramos district Hernández *et al.* 1992a
Perijá Páramos district Hernández *et al.* 1992a: 110.

Quindío Andean Forests district Hernández *et al.* 1992a
Quindío Andean Forests district Hernández *et al.* 1992a: 110.

Quindío-Antioquia Central Cordillera Subandean Forests district Hernández *et al.* 1992a
Quindío-Antioquia Central Cordillera Subandean Forests district Hernández *et al.* 1992a: 148.

Quindío Páramo district Hernández *et al.* 1992a
Quindío Páramo district Hernández *et al.* 1992a: 110.

San Agustín district Hernández *et al.* 1992a
San Agustín district Hernández *et al.* 1992a: 144.

San Juan Cloud Forest district Hernández *et al.* 1992a
San Juan Cloud Forest district Hernández *et al.* 1992a: 149.

San Lucas Mountains district Hernández *et al.* 1992a
San Lucas Mountains district Hernández *et al.* 1992a: 147.

Southern Perijá district Hernández *et al.* 1992a
Southern Perijá district Hernández *et al.* 1992a: 110.

Tachira district Hernández *et al.* 1992a
Tachira district Hernández *et al.* 1992a: 142.

Tolima district Hernández *et al.* 1992a
Tolima district Hernández *et al.* 1992a: 145.

Tolima Central Cordillera Subandean Forests district Hernández *et al.* 1992a
Tolima Central Cordillera Subandean Forests district Hernández *et al.* 1992a: 110.

Western Cordillera Eastern Subandean Forests district Hernández *et al.* 1992a
Western Cordillera Eastern Subandean Forests district Hernández *et al.* 1992a: 110.

Western Cordillera Northern Andean Forests district Hernández *et al.* 1992a
Western Cordillera Northern Andean Forests district Hernández *et al.* 1992a: 149.

Western Cordillera Northern Subandean Forests district Hernández *et al.* 1992a
Western Cordillera Northern Subandean Forests district Hernández *et al.* 1992a: 149.

Western Nariño Andean Forests district Hernández *et al.* 1992a
Western Nariño Andean Forests district Hernández *et al.* 1992a: 110.

Desert province Cabrera & Willink 1973

Desert province Cabrera & Willink 1973: 89; Morrone 1999: 12.
Andean Pacific centre Müller 1973: 100.
Peruvian subcentre Müller 1973: 101.
Salares zone Artigas 1975: 20.

Pacific Desert province Udvardy 1975: 41.
Pacific Coastal Deserts dominion Ab'Sáber 1977: map.
Arequipa unit Lamas 1982: 353.
Callao unit Lamas 1982: 352.
Mollendo unit Lamas 1982: 353.
Porculla unit Lamas 1982: 353.
Surco unit Lamas 1982: 353.
Pacific Desert region Rivas-Martínez & Tovar 1983: 516.
Peruvian Arid Coastal centre Cracraft 1985: 68.
Peruvian Pacific Desert region Rivas-Martínez & Navarro 1994: map.
Desert area (in part) Coscarón & Coscarón-Arias 1995: 726.
Sechura Desert ecoregion Dinerstein *et al.* 1995: 105.
Coastal Peruvian Desert province Morrone 2001c: 4, 2001e: 110, 2006: 483; Urtubey *et al.* 2010: 506.

Diagnosis. Narrow strip along the Pacific ocean coast, from northern Peru to northern Chile (Morrone 2001c, 2006).

Endemic taxa. ARTHROPODA. Carabidae: *Notiobia moffetti* (Noonan 1981a, b); Curculionidae: *Galapaganus lacertosus* and *G. squamosus* (Lanteri 1992); Gnaphosidae: *Echemoides aguilari* and *E. penai* (Platnick & Shadab 1979); Hydrophilidae: *Enochrus waterhousei* (Fernández 1997); Miridae: *Rhinacloa cajamarca* and *R. peruana* (Schuh & Schwartz 1985); Simuliidae: *Simulium blancasi* (Coscarón & Coscarón-Arias 1995). VERTEBRATA. Cricetidae: *Abrothrix mollis* and *Phyllotis gerbillus* (Müller 1973; Patton & Smith 1992); Furipteridae: *Amorphochilus schnablii* (Redford & Eisenberg 1992); Iguanidae: *Tropidurus peruvianus* (Müller 1973); Mustelidae: *Conepatus rex inca* (Müller 1973); Phyllostomidae: *Sturnira bogotensis* (Pacheco & Patterson 1992); Teiidae: *Dicrodon heterolepis* (Müller 1973).

Districts. Cabrera & Willink (1973) have delimited the Cardonales and Coastal Desert districts.

Cardonales district Cabrera & Willink 1973
Cardonales district Cabrera & Willink 1973: 91.

Coastal Desert district Cabrera & Willink 1973
Coastal Desert district Cabrera & Willink 1973: 90.

Puna province Holmberg 1898

Puna formation Holmberg 1898: 433.
Puna province Cabrera 1951: 52, 1953: 107, 1957: 336, 1958: 200, 1971: 32; Cabrera & Willink 1973: 87; Udvardy 1975: 42; Cabrera 1976: 59; Posadas *et al.* 1997: 2; Morrone 1996: 108, 2001c: 5, 2001e: 111, 2006: 483; Urtubey *et al.* 2010: 506.
Northern Andean Cordillera region Peña 1966a: 5, 1966b: 213.
Altoandean province (in part) Cabrera 1971: 30.
Quechua Altoandean district Cabrera 1971: 30, 1976: 52.
Puna centre Müller 1973: 92.
Altiplanic zone Artigas 1975: 20.
Puna zone Artigas 1975: 20.
Cuyan Subandean province Ringuelet 1975: 107.
Titicaca province Ringuelet 1975: 107.
Lake Titicaca province Udvardy 1975: 42.
Punas dominion Ab'Sáber 1977: map.
Cajamarca unit Lamas 1982: 355.
Huancapata unit Lamas 1982: 355.
Pasco Lamas 1982: 355.
Shimbe unit Lamas 1982: 355.
Vilcanota unit Lamas 1982: 355.
Puna region Rivas-Martínez & Tovar 1983: 516.
Austral Andean centre Cracraft 1985: 65.
Punan sub-region Rivas-Martínez & Navarro 1994: map.
Bolivian province Rivas-Martínez & Navarro 1994: map.
Peruvian province Rivas-Martínez & Navarro 1994: map.

Puna area Coscarón & Coscarón-Arias 1995: 726.
Central Andean Dry Puna ecoregion Dinerstein *et al.* 1995: 102.
Central Andean Puna ecoregion Dinerstein *et al.* 1995: 102.
Central Andean Wet Puna ecoregion Dinerstein *et al.* 1995: 102.
Arid Puna province Morrone 1999: 12.
Central Puna province Morrone 1999: 12.
Humid Puna province Morrone 1999: 12.
Central Andes area Porzecanski & Cracraft 2005: 266.

Diagnosis. Bolivia, northern Argentina and Chile and southern Peru (Morrone 2001c, 2006).

Endemic taxa. MAGNOLIOPHYTA. Alstroemeriaceae: *Bomarea brachysepala, B. brevis, B. campilophylla, B. cernua, B. cornuta, B. crocea, B. dulces, B. engleriana, B. fiebrigiana, B. lanata, B. petrea, B. sanguinea, B. tarmensis* and *B. zosterifolia* (Alzate *et al.* 2008); Asteraceae: *Chuquiraga atacamensis* and *C. kuscheli* (Ezcurra *et al.* 1997); Onagraceae: *Epilobium fragile, E. pedicellare, Fuchsia austromontana*, *F. bolivianus*, *F. cochabamba* species group, *F. simplicicaulis* and *F. tincta* species group, Berry 1982; Solomon 1982). ARTHROPODA. Carabidae: *Notiobia schnusei* (Noonan 1981a, b); Clubionidae: *Trachelopachys bidentatus*, *T. machupicchu* and *T. tarma* (Platnick 1975); Lycaenidae: *Terra altilineata* (Johnson 1992); Miridae: *Rhinacloa betanzos* and *R. juli* (Schuh & Schwartz 1985); Nepidae: *Curicta peruviana* (Keffer 1996); Simuliidae: *Gigantodax awa*, *G. chacabamba*, *G. patihuaycensis* and *G. punapi* (Wygodzinky & Coscarón 1989); Staphylinidae: *Neobisnius semirufus* (Frank 1981); Tristiridae: Atacamacridinae (Cigliano 1989). VERTEBRATA. Formicaridae: *Grallaria andicola* (Fjeldså 1992).

Districts. Martínez Carretero (1995) identified four districts within the Argentinean portion of this province: Bolivian, Central, Cuyan and Jujuyan.

Bolivian district Martínez Carretero 1995
Bolivian district Martínez Carretero 1995: 30.

Central district Martínez Carretero 1995
Central district Martínez Carretero 1995: 30.

Cuyan district Martínez Carretero 1995
Cuyan district Martínez Carretero 1995: 29.

Jujuyan district Martínez Carretero 1995
Jujuyan district Martínez Carretero 1995: 30.

Atacaman province O'Brien 1971

High Plateau region Peña 1966a: 4, 1966b: 212.
Atacaman sub-region O'Brien 1971: 199.
Coquimban district (in part) Cabrera & Willink 1973: 91.
Chilean subcentre Müller 1973: 101.
Atacaman area (in part) Artigas 1975: 20.
Argentinean-Atacaman province (in part) Rivas-Martínez & Navarro 1994: map.
Atacama Hyperdesert province Rivas-Martínez & Navarro 1994: map.
Desert area (in part) Coscarón & Coscarón-Arias 1995: 726.
Atacama Desert ecoregion Dinerstein *et al.* 1995: 105.
Atacama province Morrone 1999: 12, 2001c: 6, 2001e: 112, 2006: 483; Urtubey *et al.* 2010: 506.
Subtropical Pacific area (in part) Porzecanski & Cracraft 2005: 266.

Diagnosis. Northern Chile, between 18 and 28 south latitude (Morrone 2001c, 2006).

Endemic taxa. MAGNOLIOPHYTA. Asteraceae: *Chuquiraga ulicina* (Ezcurra *et al.* 1997). ARTHROPODA. Ammotrechidae: *Chileotracha* (Maury 1987); Dipluridae: *Chilehexops platnicki* (Coyle 1986); Carabidae: *Notaphus aricensis* and *Nothocys marcidus* (Jeannel 1962); Curculionidae: *Listroderes robustior* (Morrone 1993);

Miridae: *Polymerus atacamensis* and *Rhinacloa azapa* (Schuh & Schwartz 1985); Nemesiidae: *Acanthogonatus alegre* and *Flamencopsis* (Goloboff 1995); Simuliidae: *Gigantodax cortesi*, *G. eremicus*, *G. jatunchuspi*, *G. praealtus*, *Simulium hectorvargasi*, *S. putre* and *S. tenuipes* (Wygodzinky & Coscarón 1989; Coscarón 1991, 1998); Tristiridae: Elasmoderini (Cigliano 1989). VERTEBRATA. Ctenomyidae: *Ctenomys robustus* (Müller 1973; Contreras & Yáñez 1995); Leptodactylidae: *Telmatobius halli* (Müller 1973); Octodontidae: *Octodon degus* (Müller 1973); Rhinocryptidae: *Pteroptochos megapodius* (Müller 1973); Sturnidae: *Mimus thenca* (Müller 1973).

Districts. Peña (1966a, b), Di Castri (1968) and Artigas (1975) identified nested units, which are treated herein as five districts: Interior Desert, Northern Andean, Northern Coast, Northern Precordilleran and Tamarugal. Their preliminary delimitation is based on Artigas' (1975) map.

Interior Desert district Di Castri 1968
Northern Desert region (in part) Peña 1966a: 7, 1966b: 214.
Interior Desert region Di Castri 1968: 18.
Mediterranean Desert zone Artigas 1975: 20.

Northern Andean district Artigas 1975, **stat. nov.**
Northern Andean zone Artigas 1975: 20.

Northern Coast district Peña 1966a
Northern Coast region Peña 1966a: 8, 1966b: 214.
Littoral Desert region Di Castri 1968: 18.
Littoral Desert zone Artigas 1975: 20.

Northern Precordilleran district Artigas 1975
Northern Desert region (in part) Peña 1966a: 7, 1966b: 214.
Northern Precordilleran zone Artigas 1975: 20.

Tamarugal district Artigas 1975
Northern Desert region (in part) Peña 1966a: 7, 1966b: 214.
Tamarugal zone Artigas 1975: 20.

Prepuna province Cabrera 1951

Prepuna province Cabrera 1951: 40, 1953: 107, 1958: 200, 1971: 21; Cabrera & Willink 1973: 76; Cabrera 1976: 34; Morrone 1999: 12; Zuloaga *et al.* 1999: 38; Morrone 2001e: 112, 2006: 483; Urtubey *et al.* 2010: 506.
Subandean province (in part) Fittkau 1969: 642.
Altoandean province (in part) Cabrera 1971: 30.
Cuyan Altoandean district Cabrera 1971: 31, 1976: 55.
Southern Andean province Udvardy 1975: 42; Morrone 1996: 108, 2001c: 5, 2006: 483.
Argentinean-Atacaman province (in part) Rivas-Martínez & Navarro 1994: map.
Southern Andean Steppe ecoregion Dinerstein *et al.* 1995: 102.

Diagnosis. Central and northwestern Argentina, from Jujuy to northern Mendoza (Morrone 2001c, 2006).

Endemic taxa. MAGNOLIOPHYTA. Apiaceae: *Azorella cryptantha* (Martínez 1989); Asteraceae: *Chuquiraga echegarayi*, *C. erinacea* subsp. *hystrix*, *C. ruscifolia*, *Dolichlasium*, *Proustia cuneifolia* var. *cuneifolia* and *P. cuneifolia* var. *mollis* (Katinas 1995; Ezcurra *et al.* 1997). ARTHROPODA. Ammotrechidae: *Pseudocleobis andinus* and *P. puelche* (Maury 1983); Bothriuridae: *Bothriurus olaen*, *Brachistosternus borellii*, *B. pentheri*, *B. montanus*, *Timogenes haplochirus* and *T. sumatranus* (Acosta & Maury 1998); Carabidae: *Barypus calchaquensis* (Roig-Juñent 1992); Culicidae: Simuliidae: *Gigantodax cilicinus* (Wygodzinky & Coscarón 1989); Staphylinidae: *Neobisnius omnirufus* (Frank 1981); Tenebrionidae: *Entomoderes zupay* (Flores & Roig-Juñent 1997). VERTEBRATA. Furnariidae: *Asthenes steinbachi* (Olrog 1984).

Monte province Holmberg 1898

Monte formation Holmberg 1898: 419.
Monte area Hauman 1920: 54; Hueck 1957: 40, 1966: 3; Roig-Juñent 1994: 183; Coscarón & Coscarón-Arias 1995: 726.
Monte province Hauman 1931: 60; Soriano 1950: 33; Cabrera 1951: 41, 1953: 107; Morello 1955: 386; Cabrera 1958: 200; Morello 1958: 131; Cabrera 1971: 22; Cabrera & Willink 1973: 77; Cabrera, 1976: 36; Udvardy 1975: 41; Stange *et al.* 1976: 78; Rivas-Martínez & Navarro 1994: map; Morrone 1999: 9; Zuloaga *et al.* 1999: 37; Morrone 2000a: 61, 2001e: 94; Roig-Juñent *et al.* 2001: 78; Morrone 2006: 483; Roig *et al.* 2009: 164; Urtubey *et al.* 2010: 506.
Xerophyllous Forests area Parodi 1934: 171.
Central Xerophyllous Forest area Castellanos & Pérez-Moreau 1941: 382.
Western Monte area Parodi 1945: 130; Bölcke 1957: 2.
Central province Soriano 1949: 198.
Central or Subandean dominion Ringuelet 1961: 160.
Monte centre Müller 1973: 146.
Monte with Cactaceae dominion Ab'Sáber 1977: map.
Argentina Monte ecoregion Dinerstein *et al.* 1995: 99.

Diagnosis. Central Argentina, between 24 and 43 south latitude, from Salta to northeastern Chubut (Morello 1958; Morrone 2000a, 2006; Roig-Juñent *et al.* 2001; Roig *et al.* 2009).

Endemic taxa. GNETOPHYTA. Ephedraceae: *Ephedra boelckei* (Hunziker 1995). MAGNOLIOPHYTA. Asteraceae: *Chuquiraga rosulata* (Ezcurra *et al.* 1997). ARTHROPODA. Anthophoridae: *Doeringiella bipunctata*, *D. crassicornis* and *D. joergenseni* (Roig-Juñent 1994); Bothriuridae: *Urophonius brachycentrus* (Roig-Juñent 1994); Carabidae: *Barypus mendozensis*, *Cnemalobus desmaresti*, *Notiobia tucumana* (Noonan 1981a, b; Roig-Juñent & Cicchino 1989; Roig-Juñent 1994); Bradynobaenidae: *Bradynobaenus chubutinus* and *B. subandinus* (Genise 1986); Chrysomelidae: *Amblycerus caryoboriformis* (Roig-Juñent 1994); Curculionidae: *Cyrtomon hirsutus*, *Enoplopactus catamarcensis*, *E. hylula*, *E. lizeri*, *E. sanjuaninus* and *Listroderes bruchi* (Lanteri 1990b, c; Lanteri & Morrone 1991; Morrone 1993c); Gnaphosidae: *Echemoides balsa* (Platnick & Shadab 1979); Miridae: *Mendozaphilus mendocinus* (Carvalho & Carpintero 1991); Nemesiidae: *Acanthogonatus birabeni* (Goloboff 1995); Pompilidae: *Caliadurgus fasciatellus fraternus*, *C. pulchellus*, *Pompilocalus constrictus* and *P. fraternus* (Roig-Alsina 1989; Roig-Juñent 1994); Scarabaeidae: *Eucranium arachnoides* and *Phaneus imperator* (Roig-Juñent 1994); Sicaridae: *Sicarius rupestris* (Roig-Juñent 1994); Staphylinidae: *Neobisnius fraternus* and *N. paracepunctatus* (Frank 1981); Tenebrionidae: *Entomoderes infernalis*, *E. pustulosus* and *E. subauratus* (Flores & Roig-Juñent 1997); Tiphiidae: *Calchaquila* (Genise 1984). VERTEBRATA. Crotalidae: *Bothrops ammodytoides* (Müller 1973); Psittacidae: *Myiopsitta monachus catita* (Darrieu 1979).

Districts. Roig *et al.* (2009) identified the Eremean, Northern and Southern districts within this province (Fig. 23).

Eremean district Roig *et al.* 2009
Eremean district Roig *et al.* 2009: 166.

Northern district Roig-Juñent *et al.* 2001
Central area Roig-Juñent *et al.* 2001: 87.
Northern area Roig-Juñent *et al.* 2001: 86.
Uspallata-Callingasta Valley area Roig-Juñent *et al.* 2001: 87.
Northern district Roig *et al.* 2009: 168.
Central subdistrict Roig *et al.* 2009: 168.
Pampa subdistrict Roig *et al.* 2009: 168.
Tucumán-Salta subdistrict Roig *et al.* 2009: 168.

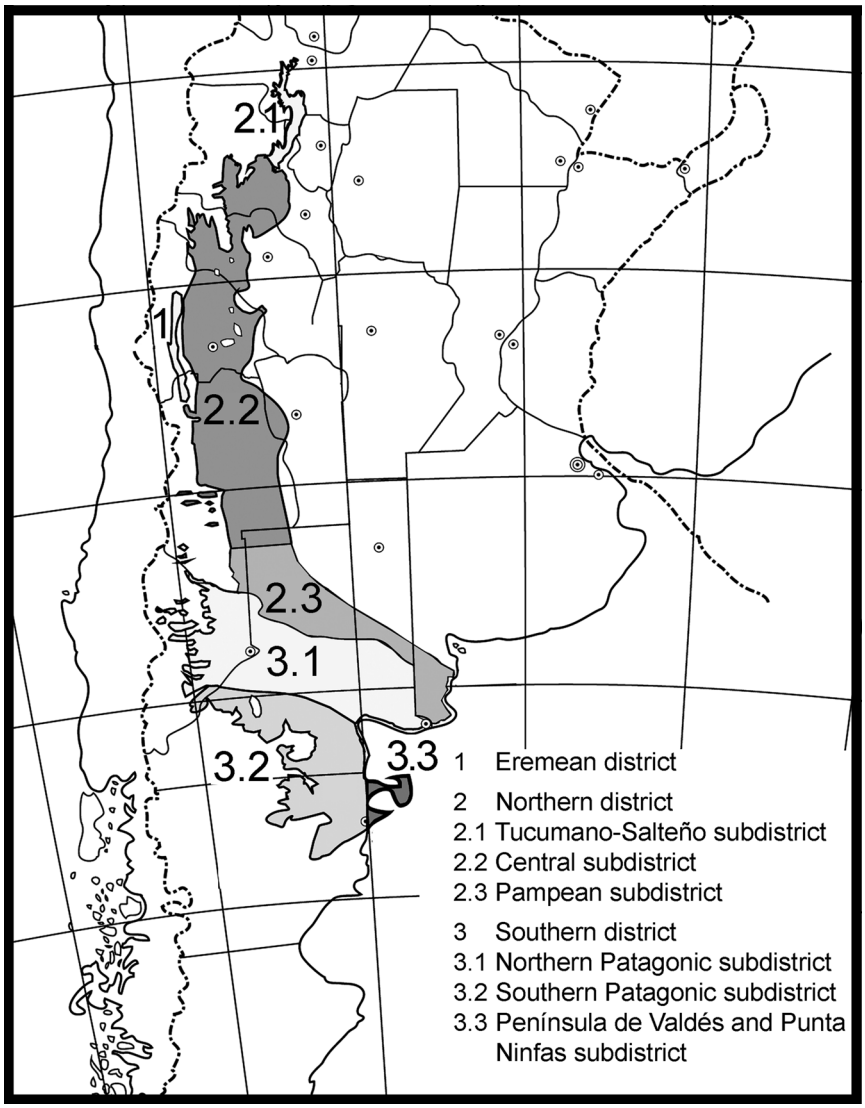


FIGURE 23. Regionalisation of the Monte province (modified from Roig *et al.* 2009).

Southern district Roig-Juñent *et al.* 2001
Península de Valdés area Roig-Juñent *et al.* 2001: 87.
Southern area Roig-Juñent *et al.* 2001: 87.
Southern district Roig *et al.* 2009: 168.
Northern Patagonic subdistrict Roig *et al.* 2009: 168.
Península de Valdés and Punta Ninfas subdistrict Roig *et al.* 2009: 168.
Southern Patagonic subdistrict Roig *et al.* 2009: 168.

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