

that a thorough generic revision was needed to determine whether *M. simus* warranted recognition in a separate subgenus.

LaVal (1973) suggested that *Myotis guaycuru* Proença might be the senior synonym for *M. riparius*, but López-González et al. (2001) relegated *guaycuru* to the synonymy of *M. simus*. According to Baud and Menu (1993), at least some of the specimens reported as *M. simus* by Myers (1977) and Myers and Wetzel (1983) from departamento Presidente Hayes, Paraguay, represent *M. ruber*. Baud and Menu (1993) restricted the distribution of *M. simus* to the Amazon basin. Nevertheless, I have mapped Myers and Wetzel's (1979) Paraguayan records, and the Argentine records of Barquez, Mares, and Braun (1999), together with the type locality of *Myotis guaycuru* as a separate southern population. The bats M. E. Thomas (1972:Table 1) listed as *M. simus* from Río Zabaletas, Colombia, represent *M. riparius*. The Bahia, Brazil, record cited by C. O. C. Vieira (1955; not mapped) is considered suspect and may represent *M. ruber*. Clearly, the taxon needs revision. D. C. Carter and Dolan (1978) provided information on and measurements of the holotype of *Myotis simus* O. Thomas.

### Genus *Rhogeessa* H. Allen, 1866

*John W. Bickham and Luis A. Ruedas*

The genus *Rhogeessa*, exclusively Neotropical in distribution, contains ten species (LaVal 1973b; Ramírez 1982; Genoways and Baker 1996), of which three, *R. hussoni*, *R. io*, and *R. minutilla* occur in South America. No fossils are known. This genus includes some the smallest of living mammals (LaVal 1973b); head and body length 36–53 mm, tail length 26–48 mm, forearm length 24.5–35.0 mm, length of skull including incisors 11.0–15.4 mm; adults weigh 3–10 g (Hall 1981; Nowak and Paradiso 1983). Otherwise externally similar to *Nycticeius*, species of *Rhogeessa* have well-developed perinasal glands that give the snout a puffy appearance in life. The lower third incisor lacks a lingual lobe; consequently, it varies from barely smaller than i2 to minute in size. Additional dental characters include tricuspid first and second lower incisors, with the outer cusp much lower than other two cusps; either a bicuspid or unicuspid i3; a well-developed lingual cingulum on the upper canine, usually with accessory cuspules; structures on the M3 are reduced to the parastyle, paracone, protocone, and first and second commissures; maxillary cheek teeth converge anteriorly; and the width of the posterior half of m3 is substantially less than the width of the anterior half. The cranium lacks basisphenoid pits, and the rostrum is narrower than the braincase. Wing and interfemoral

membranes are relatively thin. The penis is short, 3–4 mm, and the baculum extends to within 0.5 mm of its distal end. The baculum varies in length from 0.5 to 0.8 mm; is saddle-shaped at its proximal end, and has well-developed proximal lateral knobs, poorly developed proximal median knob, and a long (usually narrow) shaft, which is circular or elliptical in cross section near its distal end (LaVal 1973b:11). The dental formula is 1/3, 1/1, 1/2, 3/3 × 2 = 30. Czaplewski, Rincón, and Morgan (2005) reported finding late Pleistocene remains of *Rhogeessa* from tar seep deposits in northern Venezuela, but did not allocate them to species.

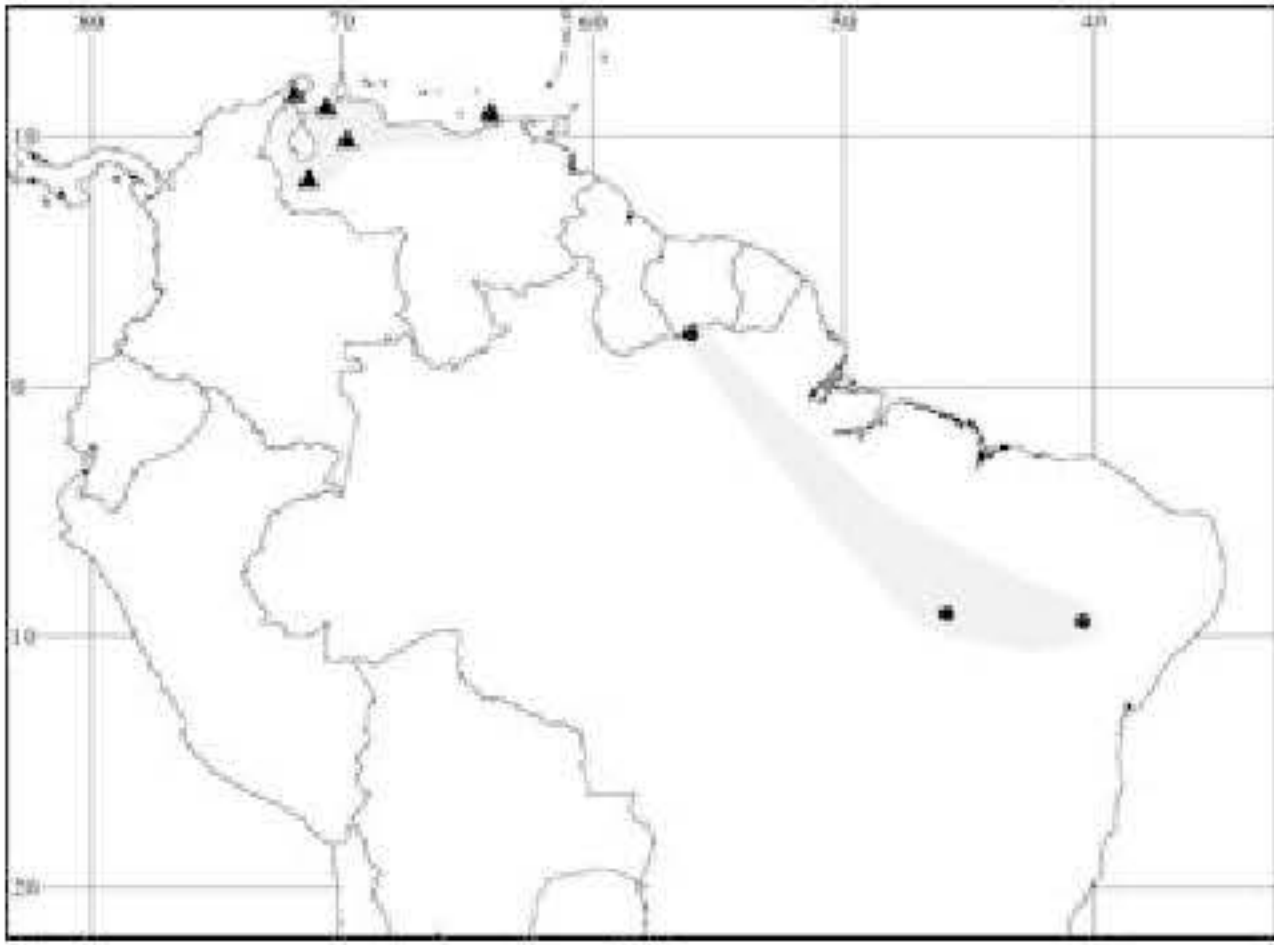
#### SYNONYMS:

- Rhogeessa* H. Allen, 1866:285; type species *Rhogeessa tumida* H. Allen, 1866, by subsequent designation (Miller 1897a:122).
- Rhogöessa* Marschall, 1873:11; incorrect subsequent spelling of *Rhogeessa* H. Allen.
- Vesperugo* (*Rhogeessa*): Dobson, 1878:183; not *Vesperugo* Keyserling and Blasius, 1839.
- Rhogoësa* Alston, 1879:21; incorrect subsequent spelling of *Rhogeessa* H. Allen.
- Rhogeessa* Elliot, 1905b:489; unjustified emendation of *Rhogeessa* H. Allen.
- Baeodon* Miller, 1906b:85; type species *Rhogeessa alleni* O. Thomas, 1892d, by original designation (valid as a subgenus).
- Rhogeessa* S. Anderson, Koopman, and Creighton, 1982:1; incorrect subsequent spelling of *Rhogeessa* H. Allen.
- Rhogeessa* Koopman, 1982:275; incorrect subsequent spelling of *Rhogeessa* H. Allen.
- Rogheessa* N. R. Reis, Peracchi, Sekiama, and Lima, 2000:697,703; incorrect subsequent spelling of *Rhogeessa* H. Allen.
- Rhogessa* N. R. Reis, Peracchi, Sekiama, and Lima, 2000:698; incorrect subsequent spelling of *Rhogeessa* H. Allen.

**REMARKS:** The most recent review of the genus was by LaVal (1973b) and much of the information provided herein is from his report.

#### KEY TO THE SOUTH AMERICAN SPECIES OF *RHOGEESSA*:

1. Color pale yellowish buff; forearm usually less than 27.6 mm; first phalanx of wing digit IV usually greater than 8.6 mm; cranium with a small, inflated area of the posterior medial parietals at the juncture of the sagittal crest with the lambdoidal crests (referred to as a helmet) . . . . . *Rhogeessa minutilla*
- 1'. Color darker brownish; forearm usually greater than 27.1 mm; first phalanx of digit IV usually less than 8.8 mm; parietals not inflated at juncture of the sagittal crest with the lambdoidal crests (helmet lacking) . . . . . 2



**Map 282** Marginal localities for *Rhogeessa hussoni* ● and *Rhogeessa minutilla* ▲

- 2. Greatest length of skull more than 12.6 mm; length of mandibular tooththrow less than 5.4 mm . . . . . *Rhogeessa hussoni*
- 2'. Greatest length of skull less than 12.6 mm; length of mandibular tooththrow 5.4 mm or more. . . *Rhogeessa io*

*Rhogeessa hussoni* Genoways and Baker, 1996

**Eastern Little Yellow Bat**

**SYNONYMS:**

*Rhogeessa tumida*: LaVal, 1973b:29; part; not *Rhogeessa tumida* H. Allen.

*Rhogeessa tumida*: S. L. Williams and Genoways, 1980a: 232; not *Rhogeessa tumida* H. Allen.

*Rhogeessa hussoni* Genoways and Baker, 1996:85; type locality "Suriname: Nickerie [*sic*, Sipaliwini] District, Sipaliwini Airstrip."

**DISTRIBUTION:** *Rhogeessa hussoni* is known from Suriname and Brazil.

**MARGINAL LOCALITIES** (Map 282; from Genoways and Baker 1996): **SURINAM:** Sipaliwini, Sipaliwini Airstrip (type locality of *Rhogeessa hussoni* Genoways and Baker). **BRAZIL:** Maranhão, Alto Parnaíba; Bahia, Fazenda São Raimundo.

**SUBSPECIES:** We treat *Rhogeessa hussoni* as monotypic.

**NATURAL HISTORY:** The holotype was mistnetted over the Sipaliwini River; vegetation along the bank was secondary tropical forest (S. L. Williams and Genoways 1980a). The karyotype is  $2n = 52$ ,  $FN = 52$  (Genoways and Baker 1996); originally reported by Honeycutt, Baker, and Genoways (1980) under the name *R. tumida*.

*Rhogeessa io* O. Thomas, 1903

**Southern Little Yellow Bat**

**SYNONYMS:**

*Rhogeessa io* O. Thomas, 1903c:382; type locality "Valencia, [Carabobo,] Venezuela."

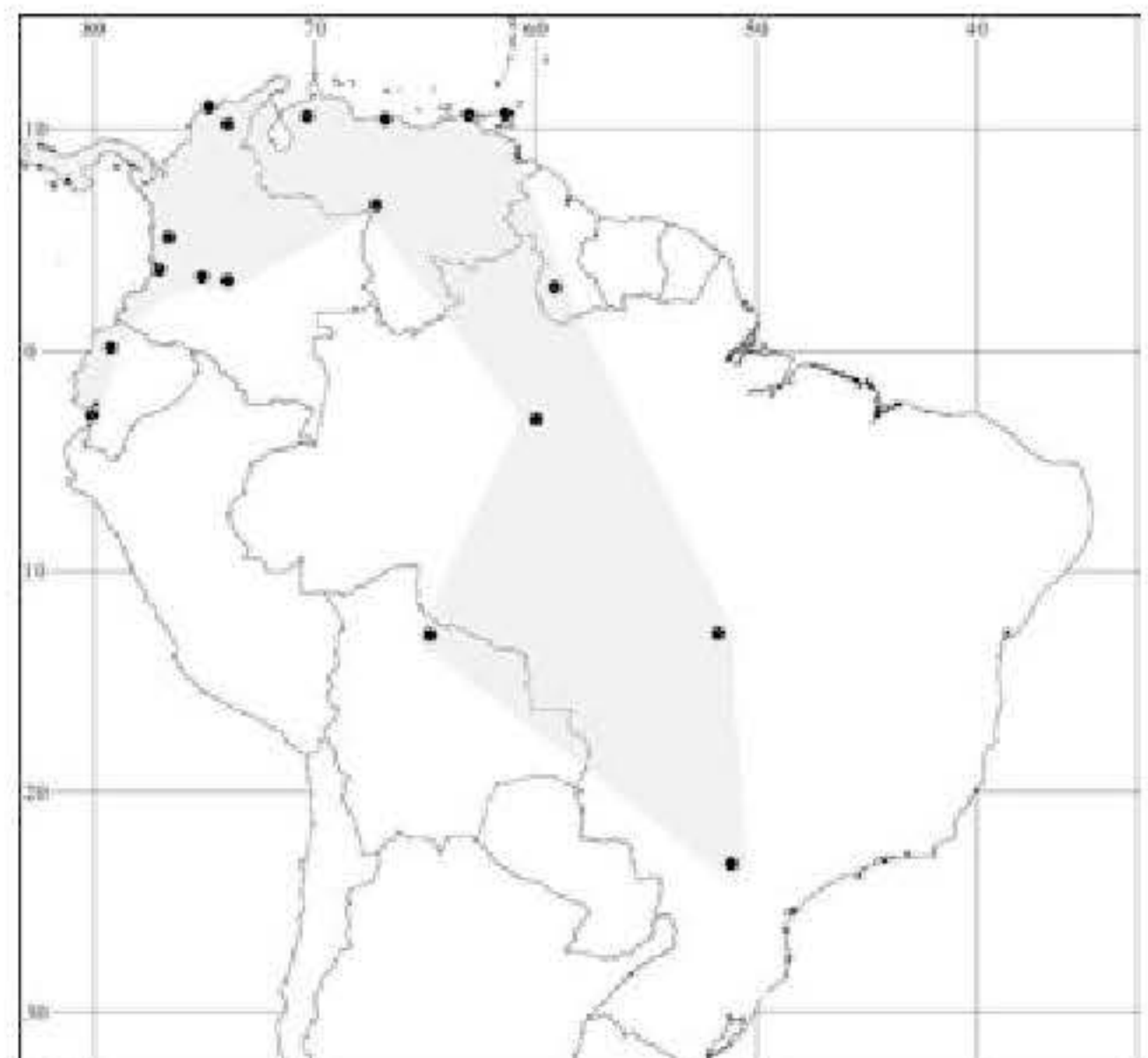
*Rhogeessa velilla* O. Thomas, 1903c:383; type locality "Puná, Puná Island, Gulf of Guayaquil, [Guayas,] Ecuador."

*Rhogeessa bombyx* O. Thomas, 1913d:569; type locality "Condoto, Choco, Colombia. Alt. 300."

*Rhogeessa tumida riparia* Goodwin, 1958c:5; type locality "Cuchivano, 3 miles west of Cumanocoa, Province of Sucre, northeastern Venezuela. Altitude 700 feet."

**DISTRIBUTION:** *Rhogeessa io* is in Colombia and Venezuela, with isolated records from Guyana, Surinam, Brazil, Bolivia, and Ecuador. Elsewhere, the species is known in Central America from Panama north into eastern Nicaragua (Genoways and Baker 1996).

**MARGINAL LOCALITIES** (Map 283; from LaVal 1973b [as *R. tumida*], except as noted): **COLOMBIA:** Atlántico, Barranquilla (Nicéforo-María 1947); El Cesar, Colonia Agrícola Caracolcito. **VENEZUELA:** Zulia, 30 mi E of Maracaibo; Miranda, near El Encantado (Handley 1976); Sucre, Manacal (Handley 1976). **TRINIDAD AND TOBAGO:** Trinidad, Maracas. **GUYANA:** Upper Takutu-Upper Essequibo, near Shea. **BRAZIL:** Mato Grosso, Serra do Roncador, 264 km (by road) N of Xavantina; Paraná, Londrina (N. R. Reis et al. 1998). **BOLIVIA:** Beni, Caravana (S. Anderson, Koopman, and Creighton 1982). **BRAZIL:** Amazonas, Manaus (Mok, Luizão, and Silva 1982). **VENEZUELA:** Apure, Hato Caribén (Handley 1976). **COLOMBIA:** Meta, Municipio de San Juan de Arama (Sánchez-Palomino and Rivas-Pava 1993); Huila, 16 km NE of Villavieja. **ECUADOR:** Guayas, San Ramón; Pichincha, Río Toachi (Albuja 1999). **COLOMBIA:** Valle de Cauca, Río Raposo; Chocó, Condoto (type locality of *Rhogeessa bombyx* O. Thomas).



**Map 283** Marginal localities for *Rhogeessa io* ●

**SUBSPECIES:** *Rhogeessa io* probably consists of two or more definable subspecies or species (see Remarks), but in this account we treat the taxon as monotypic.

**NATURAL HISTORY:** *Rhogeessa io* is the most widely distributed South American *Rhogeessa*. The species is known from every vegetation zone within an elevational range from sea level to approximately 1,500 m. These aerial insectivores have been netted along forest trails, over streams and pools of water, and in clearings, indicating that they forage for insects, often within a few meters of the ground and that they rely on streams and pools as sources of water. Their roosting habits are unknown, although they are presumed to roost in trees.

Pregnant females are known from February through April, and lactating females from March to July. Flying juveniles have been collected during May through August. Sperm production probably takes place during October to December (LaVal 1973, under *R. tumida*). Samples of populations from Trinidad and Venezuela have  $2n = 30$  chromosomes (Bickham and Baker 1977).

**REMARKS:** Genoways and Baker (1996) applied the name *R. io* to the South American and southern Central American populations that LaVal (1973b), Bickham and Baker (1977), and Honeycutt, Baker, and Genoways (1980) had treated as southern populations of *R. tumida*. Genoways and Baker (1996) based their action on the high degree of morphological and chromosomal variability demonstrated by the population units they identified within the *tumida*-group. Muñoz (2001) recognized three species (*R. minutilla*, *R. parvula*, and *R. tumida*) as occurring in Colombia, and Castaño et al. (2003) listed two (*R. minutilla*, and *R. tumida*) in Departamento Caldas. Clearly, this species and other South American *Rhogeessa* are overdue for revision. D. C. Carter and Dolan (1978) provided notes on and measurements of the holotypes of *Rhogeessa io* O. Thomas, *Rhogeessa velilla* O. Thomas, and *Rhogeessa bombyx* O. Thomas.

*Rhogeessa minutilla* Miller, 1897

**Tiny Yellow Bat**

**SYNONYMS:** See under Subspecies.

**distribution:** *Rhogeessa minutilla* is on Isla Margarita, Venezuela, and in northeastern Colombia and northwestern Venezuela.

**MARGINAL LOCALITIES** (Map 282; from LaVal 1973b, except as noted): **COLOMBIA:** La Guajira, 119 km N and 32 km W of Maracaibo, Venezuela. **VENEZUELA:** Falcón, Capatárida; Nueva Esparta, 2 km N and 30 km W of Porlamar; Lara, Caserío Boro; Mérida, 3 km SE of San Juan de Lagunillas (Sosa, de Ascensão, and Soriano 1996).

**SUBSPECIES:** We recognize two subspecies of *R. minutilla*.

*R. m. minutilla* Miller, 1897

**SYNONYMS:**

*Rhogeessa minutilla* Miller, 1897b:139; type locality "Margarita Island, Venezuela."

*Rhogeessa parvula minutilla*: Goodwin, 1958c:7; name combination.

This subspecies is in the Guajira Peninsula of Colombia and Venezuela and elsewhere in Venezuela north of the state of Mérida.

*R. m. cautiva* Soriano, Naranjo, and Fariñas, 2004

**SYNONYM:**

*R. m. cautiva* Soriano, Naranjo, and Fariñas, 2004:442; type locality "Laguna de Caparú, 3 km SE San Juan de Lagunillas, Mérida state, Venezuela."

This subspecies is known only from the xeric intermontane basin of the rios Chama and Nuestra Señora, Mérida, Venezuela.

**NATURAL HISTORY:** *Rhogeessa minutilla* is known from sea level to over 900 m elevation in arid desert scrub and thorn forest, although one individual was captured in a mangrove swamp (Musso 1962). *Rhogeessa m. cautiva* occurs in xeric thorn-shrub forest in the Chama and Nuestra Señora river basin (Sosa, de Ascensão, and Soriano 1996; Soriano, Naranjo, and Fariñas 2004). Day roosts of this subspecies have been found in cavities in dead branches of columnar cacti; day roosts of *R. m. minutilla* are unknown. Sosa, de Ascensão, and Soriano (1996) found pregnant females in February and March (1 of 3) and in April and May (5 of 5), lactating females in June and July (1 of 1) and August and September (1 of 9). Elsewhere, juveniles have been observed in late June through the middle of July. Molting occurs in June and July. Sosa, de Ascensão, and Soriano (1996) recorded the remains of flying insects representing 29 families and 10 orders in their analysis of fecal samples from *R. m. cautiva* netted the vicinity of San Juan de Lagunillas. The four most common insect orders in their samples were Diptera, Hymenoptera, Lepidoptera, and Coleoptera. Frequency of occurrence at both the ordinal and family level showed strong seasonal variation, which could be interpreted as variation in either dietary preference or insect availability.

LaVal (1973b) illustrated the bacula, and stated that they resembled some bacula of *R. tumida*. However, in his comparison with bacula of South American "*R. tumida*" (= *R. io*), LaVal (1973b:37) described the bacula of *R. minutilla* as shorter, narrower, and with the lateral knobs extended at a higher angle from shaft, approaching a right angle in some specimens. *Rhogeessa minutilla* is most similar to, and presumably closely related to, *R. tumida*; even though Goodwin (1958c) considered *R. minutilla* to be a subspecies of *R. parvula*. The karyotype is not known.

REMARKS: Although the type locality is Margarita Island, off the coast of Venezuela, the greater part of the range of *R. minutilla* is along the mainland coast of northeastern Colombia and adjacent Venezuela. Ruedas and Bickham (1992), based on the examination of ten specimens each of *R. minutilla* and *R. tumida*, were able to readily distinguish the two species morphometrically. The question remains, however, as to whether *R. minutilla* is a distinct species or

a subspecies of *R. tumida*, as suggested by J. D. Smith and Genoways (1974). An answer to this question will require larger samples of both putative species, and may have to rely heavily on chromosomal and molecular data, because *Rhogeessa* is such a morphologically complex group and includes cryptic species (R. J. Baker, 1984; also see Bickham and Baker 1977; R. J. Baker, Bickham, and Arnold 1985).