

# Cryptotis meridensis.

By Neal Woodman and Amelia Díaz de Pascual

Published 15 December 2004 by the American Society of Mammalogists

## *Cryptotis meridensis* (Thomas, 1898)

Mérida Shrew

*Blarina meridensis* Thomas, 1898:457. Type locality “Merida, alt. 2165 m.,” Mérida, Venezuela; corrected to “Montes del Valle Merida 2165 m” by Woodman (2002) based on label of holotype.

*C[ryptotis]. meridensis*: Thomas, 1921:354. First use of current name combination.

*Cryptotis thomasi meridensis*: Cabrera, 1958:48. Part, name combination.

*Cryptotis meridensis meridensis*: Linares, 1998:106. Part, name combination.

**CONTEXT AND CONTENT.** Order Soricomorpha, family Soricidae, subfamily Soricinae, tribe Blarinini, genus *Cryptotis* (Hutterer 1993; Repenning 1967). The species is part of the *Cryptotis thomasi* group (Choate 1970; Woodman 2002). *Cryptotis meridensis* is monotypic (Woodman 2002).

**DIAGNOSIS.** *Cryptotis meridensis* (Fig. 1) is one of the largest members of the genus; length of head and body is typically >83 mm. *C. meridensis* and the Mexican endemic, *C. phillipsii*, are the only species of small-eared shrews in which U4 (dental terminology follows that of Choate [1970] and Choate and Fleharty [1974]) frequently is absent. In *C. meridensis*, U4 is absent on 1 or both sides of cranium in 25% of individuals ( $n = 51$ ), but more typically, U4 is reduced in size (averaging  $19 \pm 7\%$  of surface area of U3,  $n = 48$ ; mean  $\pm SD$ ), often consisting of a simple, rounded peg (Woodman 2002). *C. meridensis* is not sympatric with any other soricid. However, identifying this species with certainty requires suites of characters. *C. meridensis* can be distinguished from its geographically closest congeners along the Cordillera Oriental of Colombia (*C. brachyonyx*, *C. tamensis*, and *C. thomasi*) by the absent or reduced U4. In addition, *C. meridensis* is larger than *C. brachyonyx* (length of head and body < 76 mm), has a relatively shorter tail, and has much paler dorsal and ventral coloration. Cranially, *C. meridensis* typically has a small to medium-sized foramen on posterior edge of tympanic process of 1 or both petromastoids (87%,  $n = 55$ ), in contrast to the huge foramina present in *C. brachyonyx*, and U1–3 in *C. meridensis* are slender with concave posteroventral margins rather than massive with straight or convex margins (Woodman 2003). Compared with *C. tamensis*, *C. meridensis* is distinguished by a higher coronoid process; longer posterior mandible behind m3; typically 3 unicuspid (rather than 4) visible in lateral view of cranium; paler and less extensive dental pigmentation that extends into just the hypoconal basins of P4, M1, and M2 (rather than both hypoconal and protoconal basins); and a typically less complex M3. In contrast to *C. thomasi*, *C. meridensis* has darker pelage, a longer tail (averaging  $34 \pm 3$  mm versus  $24 \pm 2$  mm; mean  $\pm SD$ ), small to medium-sized (rather than huge) petromastoid foramina, less emarginate upper dentition, and simple M3 (Woodman 2002).

**GENERAL CHARACTERISTICS.** *Cryptotis meridensis* has long (4–6 mm), chocolate brown dorsal pelage (classified as Olive Brown or Mummy Brown to Clove Brown—capitalized color terms follow those of Ridgway [1912]) that contrasts subtly with its paler, olive brown venter (Olive Brown to Buffy Brown). Eyes and pinnae are indistinct. Moderately long tail averages  $38 \pm 4\%$  of length of head and body ( $n = 65$ ; mean  $\pm SD$ ). Forepaws are somewhat enlarged and foreclaws are elongate. Lateral glands are indistinct and covered by dense fur even in mature males.

Dentition is bulbous. Posterior borders of P4, M1, and M2 are not recessed or only slightly recessed. Anterior element of ectoloph of M1 reduced relative to posterior element. M3 is simple. Lateral

branch of sinus canal and associated foramen are typically lacking. Posterior limit of zygomatic plate is aligned with mesostyle–metastyle valley of M2 to parastyle of M3. Mandible has moderately high coronoid process and shallow inferior sigmoid notch (Fig. 2). Mandible posterior to m3 is long. Entoconid is lacking from talonid of m3. Humerus is moderately long, robust, and slightly curved; its head is more or less rounded with broad proximal and distal ends and prominent medial epicondyle and teres tubercle. Posterior edge of falciform process of tibia is deeply pocketed (Woodman 2002).

Sexes are similar in appearance and difficult to distinguish externally. Consequently, many museum specimens are unsexed or may be incorrectly sexed. Standard external measurements (mm) and mass (g) for *C. meridensis* (sexes combined) are (mean  $\pm SD$  with range in parentheses) total length,  $122 \pm 6$  (100–135,  $n = 67$ ); length of head and body,  $88 \pm 5$  (70–102,  $n = 67$ ); length of tail,  $33 \pm 5$  (25–41,  $n = 67$ ); length of hind foot (including claw),  $15 \pm 1$  (13–17,  $n = 48$ ); and mass,  $12.3 \pm 2.0$  (8.5–18.0,  $n = 48$ ). External and craniomandibular measurements of *C. meridensis* do not consistently differ statistically between the sexes. Measurements for 7 males and 7 females, respectively, are (mean  $\pm SD$ —Durant and Péfaur 1984) total length,  $112 \pm 5$  (108–118),  $114 \pm 8$  (100–128); length of tail,  $34 \pm 1$  (32–36),  $34 \pm 2$  (32–37); length of hind foot,  $16 \pm 2$  (13–18),  $15 \pm 1$  (14–15); and mass,  $11.7 \pm 1.0$  (10.0–13.0),  $11.0 \pm 0.9$  (10.0–12.6).

Statistics for cranial measurements (in mm; measurements follow those of Woodman and Timm [1993, 1999]) from 35 males and females combined are (mean  $\pm SD$ —Woodman 2002) condylobasal length,  $21.5 \pm 0.7$  (20.5–23.5); cranial breadth,  $10.4 \pm 0.3$  (10.0–11.0); breadth of zygomatic plate,  $2.0 \pm 0.2$  (1.6–2.4); interorbital breadth,  $5.0 \pm 0.2$  (4.7–5.4); breadth across 1st unicuspid,  $2.9 \pm 0.1$  (2.6–3.1); breadth across M2s,  $6.4 \pm 0.2$  (6.0–7.0); length of palate,  $9.5 \pm 0.4$  (8.8–10.2); length of upper toothrow (U1–M3),  $8.2 \pm 0.3$  (7.3–8.8); length of unicuspid toothrow,  $2.8 \pm 0.1$  (2.6–3.0); and length of upper molariform toothrow (P4–M3),  $5.8 \pm 0.2$  (5.5–6.3).

**DISTRIBUTION.** *Cryptotis meridensis* is endemic to the Cordillera de los Andes in the states of Trujillo, Mérida, and eastern Táchira, Venezuela (Fig. 3). Specimens from Páramo de Tama pre-



FIG. 1. Adult female *Cryptotis meridensis* consuming an earthworm in the Monte Zerpa cloud forest (8°37'N, 71°10'W), elevation 2,160 m, 3 km N of Mérida, Venezuela. Photograph by Amelia Díaz de Pascual.



FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of an adult female *Cryptotis meridensis* (U.S. National Museum [USNM] 579293) from near Laguna Mucubaji (ca. 8°48'N, 70°48'W), elevation 3,600 m, 3.25 km ESE of Apartaderos, Venezuela. Total length of cranium is 22.7 mm.

viously referred to *C. meridensis* are now recognized as *C. tamensis* (Woodman 2002). Elevational range for *C. meridensis* is 1,640–3,950 m. Contrary to Díaz et al. (1997), Mérida shrews were not reported from 4,100 m at Páramo de Mifafí by Durant et al. (1994). No fossils of *C. meridensis* are known.

**FORM AND FUNCTION.** Pelage color of *C. meridensis* can vary between páramo and cloud forest habitats, but such differences are not always consistent. One study reported that individuals from páramo were paler and grayer dorsally and distinctly paler ventrally compared to those from cloud forest (Durant and Péfaur 1984). Dorsal pelage of Mérida shrews from páramo was long (7.1–8.3 mm), soft, and supple compared to the shorter (4.8–6.1 mm), thicker, and stiffer pelage of Mérida shrews from cloud forest. Mérida shrews from páramo averaged  $4.8 \pm 0.4$  curves per hair versus  $2.7 \pm 0.7$  curves per hair (mean  $\pm$  SD) in those from cloud forest. In páramo, dorsal hairs of Mérida shrews had 3 bands of color, in which the median, dark reddish or pale brown band averaged 28% the total length of the hair and a distal, light gray band averaged 66%. In Mérida shrews from cloud forest, the median band typically was dark gray and comprised 42% of dorsal hair length, whereas the distal gray band occupied ca. 50% (Durant and Péfaur 1984). A 2nd study detected no variation in pelages of Mérida shrews from the 2 habitats (Soriano et al. 1990). A 3rd study indicated that individuals from páramo consistently had longer, paler pelage, whereas Mérida shrews from cloud forest habitats included both individuals with shorter, darker pelages and individuals similar to those from páramo (Woodman 2002). Molting individuals have been collected in March and November in páramo and in October in cloud forest (Durant and Péfaur 1984).

The forelimb of *C. meridensis* exhibits some modifications in structure relative to more plesiomorphic members of the genus.

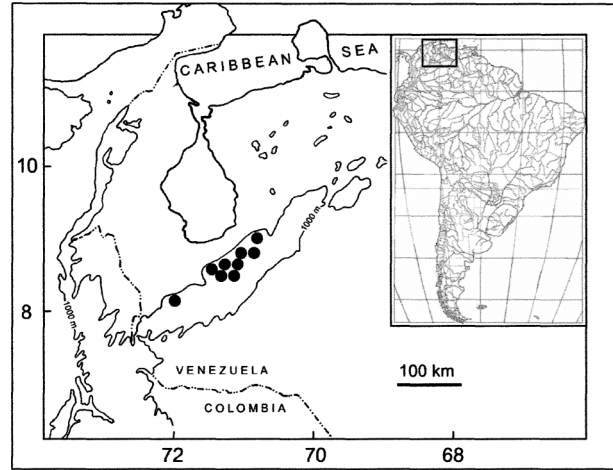


FIG. 3. Geographic distribution of *Cryptotis meridensis*, based on Woodman (2002).

Foreclaws are elongate (but not broadened), and the humerus is more massive, with longer processes and broader proximal and distal ends.

Dental formula of *C. meridensis* varies as a result of the frequent loss of U4 on 1 (19%,  $n = 51$ ) or both (6%) sides of the palate (Woodman 2002) and is  $i\ 1/1$ , unicuspid (Choate 1970)  $3-4/1$ ,  $p\ 1/1$ ,  $m\ 3/3$ , total 28–30.

Flank glands in mature male *C. meridensis* are covered by dense fur and are not distinct (Woodman 2002), unlike Central and North American *Cryptotis* (Woodman and Timm 1993, 1999). Female *C. meridensis* have 2 inguinal pairs of teats.

In a single 24-h laboratory trial, a 14-g female *C. meridensis* fed mealworm (*Tenebrio molitor*) larvae consumed an average of  $0.62 \pm 0.69$  g/h (mean  $\pm$  SD), with a mean total of 15.9 g per 24 h, or ca. 1.14 times its body weight per day (A. Díaz de Pascual, in litt.).

**ONTOGENY AND REPRODUCTION.** Semiannual peaks in captures of *C. meridensis* at 5 sites suggest 2 periods of reproduction (or increased activity), 1 in March–April, and a 2nd, more variably timed peak in abundance sometime from July to December (Durant et al. 1994; Durant and Díaz 1995). Based on numbers of pregnant and lactating females taken each month, reproduction occurs throughout the year in the Monte Zerpa cloud forest, although it is not evenly distributed (A. Díaz de Pascual, in litt.). Pregnant females have been captured in all months except July and December. The largest proportion of pregnant females was in April (6 of 26 females). Lactating females were captured at Monte Zerpa in all months, with the greatest proportion in July (36%,  $n = 28$ ). Males with enlarged testes (determined by mean testicular area) were taken in March, June, July, and October. Juveniles were more abundant from September to February, based on lower monthly means of total external body length.

A litter size of 3 pups is typical for *C. meridensis*. Among 10 pregnant females captured at Monte Zerpa, the number of embryos ranged from 2 to 3 per gravid female. A female captured in subalpine páramo at Mucubaji in July had 4 embryos (Aagaard 1982).

**ECOLOGY.** *Cryptotis meridensis* inhabits cloud forest and páramo vegetational assemblages in the following life zones (Holdridge 1947): Lower Montane Moist Forest, Lower Montane Wet Forest, Montane Wet Forest, Montane Rain Forest, Subalpine Páramo, Subalpine Rain Páramo (Aagaard 1982; Durant and Díaz 1995; Handley 1976), and “Coloradito,” high Andean stands of arborescent *Polylepis* and *Espeletia* in sheltered areas surrounded by páramo (Aagaard 1982; Díaz et al. 1997). The Mérida shrew was present in 4 of 5 vegetational assemblages at >800 m elevation in the Venezuelan Andes (Soriano et al. 1999), including seasonal forest (800–1,700 m elevation), with 20- to 25-m-high canopy, scarce epiphytes and lianas, and a pronounced dry season 1–3 months in duration; cloud forest (1,700–3,000 m), with a 25- to 35-m-high canopy and mean annual precipitation of 1,000–2,600 mm; Andean páramo (2,800–4,000 m), with a maximum canopy height of 0.5–

4.0 m, extreme daily temperature fluctuations, mean monthly temperature range of from  $-4$  to  $10^{\circ}\text{C}$ , and mean annual precipitation of 650–1,800 mm; and evergreen dry forest (1,600–2,700 m), with a 3- to 5-m-tall canopy and mean annual precipitation of 500–1,000 mm. Mérida shrews were not found in thorn shrub in dry basins (mean annual precipitation, 450–550 mm) at elevations below evergreen dry forest (Soriano et al. 1999). Pattern, timing, and amount of precipitation in páramo habitats where *C. meridensis* occurs vary considerably. Annual rainfall distribution may be unimodal, leaving a season of minimal rainfall from December to March, or bimodal, with peaks in precipitation from April to June and from August or September to October or November (Díaz et al. 1997).

*Cryptotis meridensis* tolerates various degrees of environmental perturbation and occurs in primary closed-canopy cloud forest, disturbed (burned) forest, secondary scrub along streams, disturbed cloud forest–páramo transition, and open páramo (Handley 1976). Habitat and meteorological attributes of specific localities where *C. meridensis* occurs have been described in detail (Díaz et al. 1997; Díaz de Pascual 1993, 1994; Díaz de Pascual and de Ascensão 2000; Durant and Díaz 1995; Durant and Péfaur 1984; Durant et al. 1994). At Monte Zerpa cloud forest, *C. meridensis* was most positively associated with increased density, diameter, and coverage of trees; with higher densities of ferns, palms, and creepers; and with greater thickness of leaf litter (Díaz de Pascual 1993).

*Cryptotis meridensis* is mostly or entirely terrestrial (Aagaard 1982; Handley 1976) and may be epigeal (i.e., surface-dwelling—Durant and Péfaur 1984), although its diet is dominated by hypogeal (underground) invertebrates (Díaz de Pascual and de Ascensão 2000). In páramo, the species requires an extensive, thick ( $\geq 8$ -cm) layer of mosses and lichens, in or under which it constructs tunnel systems and nests (Díaz et al. 1997; Durant et al. 1994; Durant and Péfaur 1984; Linares 1998). Thicker moss cover and lack of open ground may permit higher densities of the Mérida shrew than greater extent of moss cover (Durant et al. 1994). In cloud forest, runways and nests are constructed in soil below leaf litter, rocks, or fallen trees (Linares 1998). Tunnels and nests in moss or soil provide a cool, moist refuge during dry seasons. Nests in páramo have 2 layers, an outer shell built from *Espeletia schultzei* and *Hypericum laricifolium*, and an inner nest woven from grasses and sedges (Díaz et al. 1997; Durant and Péfaur 1984).

*Cryptotis meridensis* feeds on a variety of soil- and surface-dwelling invertebrates, including centipedes, earthworms, pill bugs, snails, spiders, and larval, pupal, and adult insects (Díaz de Pascual and de Ascensão 2000). The Mérida shrew also will feed on vertebrates, at least as an opportunistic scavenger. A Mérida shrew was observed eating the head (including bones and hairs) of an *Oryzomys meridensis* (A. Díaz de Pascual, in litt.), and another cannibalized a conspecific killed in a trap (Aagaard 1982). Generalized reports suggest the Mérida shrew preys on nestling rodents, eggs and chicks of ground-nesting birds, lizards (Díaz et al. 1997; Durant and Péfaur 1984), and small amphibians (Linares 1998).

In the cloud forest at Monte Zerpa, the diet of *C. meridensis* comprised 35 groups of Annelida, Arachnida, Crustacea, Gastropoda, Insecta, and Myriapoda (Díaz de Pascual and de Ascensão 2000). These groups, in order of decreasing frequency ( $n = 727$  prey items from 55 stomachs of Mérida shrews), were Oligochaeta (8.4%), Acrididae (7.0%), Gryllidae (6.7%), scarabaeid larvae (6.3%), undifferentiated lepidopteran pupae (4.4%), Scarabaeidae (4.3%), Blattidae (4.1%), Isopoda (3.9%), elaterid larvae (3.9%), Carabidae (3.9%), Lycosidae (3.7%), undifferentiated dipteran larvae (3.7%), Staphylinidae (3.2%), Scolopendridae (2.9%), Theraphosidae (2.6%), Lampyridae (2.6%), Helicidae (2.3%), sphingid pupae (2.3%), Formicidae (2.2%), Dipluridae (2.1%), Phasmatidae (2.1%), Tenebrionidae (2.1%), Passalidae (1.9%), unidentified Insecta (1.8%), Limacidae (1.7%), Tettigoniidae (1.7%), Acarina (1.5%), undifferentiated lepidopteran larvae (1.5%), undifferentiated Coleoptera (1.5%), Pentatomidae (1.0%), Lucanidae (0.7%), Ctenidae (0.7%), Ichneumonidae (0.7%), Coreidae (0.6%), and Tachinidae (0.3%); no remains of vertebrates were found in the gut contents. The most common categories of food (% frequency,  $n = 55$  stomachs) were Oligochaeta (74.7%), Gryllidae (58.2%), scarabaeid larvae (52.7%), Acrididae (50.9%), Lycosidae (41.8%), lepidopteran pupae (40.0%), Scarabaeidae (40.0%), Blattidae (38.2%), elaterid larvae (36.4%), dipteran larvae (32.7%), Helicidae (30.9%), and Scolopendridae (30.9%).

The diet is dominated by hypogeal invertebrates (69.4% of

prey items) such as beetle larvae, cockroaches, earthworms, fly larvae, isopods, moth larvae and pupae, and snails, with smaller proportions of epigeal prey (27.2%), such as crickets, grasshoppers, and spiders and indeterminate or cosmopolitan prey (3.4%). Food habits did not differ statistically either between males and females or between wet and dry seasons (Díaz de Pascual and de Ascensão 2000).

Food preference trials were carried out using a 14-g field-captured female *C. meridensis* maintained in a 25 by 50 cm aquarium with leaf litter on the floor. Three to 4 times per day for 1 month, this individual was provided a choice among an earthworm, a dish containing mealworm larvae, a large scarabaeid larva, a scarabaeid adult, and a group of adult mealworms. The Mérida shrew consistently sought and consumed, in order, the earthworm 1st, the mealworm larvae, and the mealworm adults, leaving behind their wings and legs. Scarabaeid larvae and adults were ignored. Foraging runs followed nearly identical, circular patterns, and audible sounds were emitted at the beginning of each run. Active periods (search, attack, and handling and consumption of prey) lasted for 10–15 min, followed by 45–50 min of rest under the leaf cover (A. Díaz de Pascual, in litt.). The Mérida shrew has been captured during daylight and nighttime hours (Aagaard 1982).

*Cryptotis meridensis* typically is abundant relative to other small mammals with which it occurs in páramo and cloud forest. In removal studies in the Monte Zerpa cloud forest between 1988 and 1998, the Mérida shrew was the 3rd most captured of 12 species of small mammals, comprising 8% of captures in pitfalls ( $n = 6,037$  total captures—A. Díaz de Pascual, in litt.). Elsewhere in cloud forest, in samples ranging from 21 to 101 small mammals, Mérida shrews constituted 1–21% of captures in snap traps (Aagaard 1982) or live traps (Durant and Díaz 1995; Durant et al. 1994). They accounted for 25% of captures ( $n = 57$ ) in snap traps in Coloradito vegetation (Aagaard 1982), and 8–64% of captures in snap traps (Aagaard 1982) and in live traps and pitfalls (Durant and Díaz 1995; Durant et al. 1994) in páramo ( $n = 15$ –118).

The highest density reported was 4.5 individuals/ha in live traps in páramo at 3,890 m at Páramo “Los Guaches” (Durant et al. 1994). Absolute and relative numbers of captures of *C. meridensis* fluctuate throughout the year (Aagaard 1982; Durant et al. 1994) and from year to year (A. Díaz de Pascual, in litt.). Significantly more Mérida shrews (80% of 35 individuals) were trapped during the dry season than during the rainy season (Aagaard 1982). Captures were negatively correlated with number of h of precipitation and total precipitation, and positively correlated with increasing temperature and humidity (Aagaard 1982). Among 5 sites in páramo and cloud forest, total captures of *C. meridensis* were lowest (6%,  $n = 52$  total captures) in May–June, and highest (35%) in November–December (Durant et al. 1994). Across several localities, total captures of *C. meridensis* were highest (30%,  $n = 33$  total captures) in March–April and lowest in May–June (9%) and July–August (9%—Durant and Díaz 1995).

In the Monte Zerpa cloud forest, 471 individuals were captured over 11 years. Individuals were taken in every month of the year. Mean numbers of individuals taken per month varied from lows of 2 per month in October and November to a high of 6 per month in March, May, and July (A. Díaz de Pascual, in litt.).

Sex ratios of captures may be slightly female-biased. Females represented 18 of 33 captures in snap traps in páramo and Coloradito habitats during a 9-month study in Sierra Nevada National Park (Aagaard 1982). Similarly, livetrapping at 5 sites from 1984 to 1988 yielded 11 females of 20 total captures of Mérida shrews in páramo and 8 females of 13 captures in cloud forest (Durant and Díaz 1995).

In the Monte Zerpa cloud forest during 1988–1998, *C. meridensis* was a member of a community of small mammals that included 2 didelphimorph marsupials (*Gracilinanus dryas* and *Marmosops fuscatus*) and 9 rodents (*Aepeomys lugens*, *Akodon urichi*, *Chilomys instans*, *Ichthyomys hydrobates*, *Microrozomys minutus*, *Oligoryzomys fulvescens*, *Oryzomys meridensis*, *Rhipidomys venustus*, and *Thomasomys laniger*—Díaz de Pascual 1993, 1994). Elsewhere in cloud forest, small mammal associates of the Mérida shrew include several rodents (*Akodon bogotensis*, *Heteromys anomalous*, *Olallamys edax*, *Sciurus granatensis*, and *Thomasomys vestitus*) and a carnivore (*Mustela frenata*—Aagaard 1982; Durant and Díaz 1995; Soriano et al. 1990). In Coloradito vegetation, *C. meridensis* occurs with *Ae. lugens*, *M. minutus*, and *T. laniger* (Aagaard 1982). In páramo, *C. meridensis* is found with *Ae. lugens*,

*Ak. bogotensis*, *Ak. urichi*, *M. minutus*, and the lagomorph *Sylvilagus brasiliensis* (Aagaard 1982; Durant and Díaz 1995; Soriano et al. 1990).

*Cryptotis meridensis* is consumed by Barn Owls (*Tyto alba*—Araujo and Molinari 2000). It may fall prey to Black-and-White Hawk-Eagles (*Spizastur melanoleucus*), White-rumped Hawks (*Buteo leucorrhous*), white-eared opossums (*Didelphis albiventris*), southern opossums (*Didelphis marsupialis*), long-tailed weasels (*M. frenata*), and mountain coatis (*Nasuella olivacea*—Díaz et al. 1997; Durant and Péfaur 1984).

*Cryptotis meridensis* is a primary host for the trombiculid chiggers *Eutrombicula wolfenbargeri* (Brennan and Reed 1974, 1975) and *Hoffmannina mahuensis* (Brennan and Goff 1977), and a unique form of the widespread laelapid mite, *Androlaelaps fahrenholzi* (Furman 1972). Other external parasites from *C. meridensis* include ixodid ticks (*Ixodes* prob. *luciae* and *Ixodes* indet.—Guerrero 1996; Jones et al. 1972), the laelapid mite *Hirstionyssus dorsolatus* (Herrin and Yunker 1975), and the trombiculid chigger *Eutrombicula variabilis* (Brennan and Reed 1974, 1975). In addition, the Mérida shrew was reported as an accidental or occasional host of the laelapid mites *Gigantolaelaps tiptoni*, *Laelaps castroi*, and *L. dearmasi* (Furman 1971, 1972), the ceratophyllid fleas *Pleochaetis dolens quitanus* and *Pleochaetis smiti*, and the Stephanocircid flea *Plocopsylla ulysses* (Tipton and Machado-Allison 1972). Some of these latter records probably represent contamination of samples (B. M. O'Connor, in litt.). The parasitic trichostrongyloid nematode *Longistriata torrealbai* was described from the intestine of *C. meridensis* (Guerrero 1983).

*Cryptotis meridensis* has been taken in páramo and cloud forest in traplines that included Sherman and Longworth live traps (Durant and Péfaur 1984), Museum Special mouse traps, and Victor rat traps (Aagaard 1982). Open-topped pitfall traps (Barber traps) have been particularly successful at capturing this species (Díaz de Pascual 1993; Linares 1998). Pitfall arrays linked by drift fences are the most successful arrangement for capturing soricids (Handley and Varn 1994; Kirkland and Sheppard 1994). A number of museum specimens represent individuals found dead on trails or roads (e.g., Durant and Péfaur 1984). As bait in snap traps, sardines were more successful (all 26 captures) than peanut butter for capturing *C. meridensis* in the dry season, but peanut butter was more successful (5 of 6 captures) in the rainy season (Aagaard 1982). As with most shrews, live captures are rare and fortuitous.

**CONSERVATION STATUS.** *Cryptotis meridensis* is one of the most common small mammals in páramo and cloud forest (Aagaard 1982; Díaz de Pascual 1993, 1994), including disturbed habitats and secondary scrub (Handley 1976). The Mérida shrew was 1 of 2 species classified as “abundant” among 25 species of mammals of the Venezuelan páramos (Díaz et al. 1997). Despite its abundance, the species is ranked as “susceptible” because of its limited distribution and the increasing fragmentation of the high-altitude forests it inhabits (Linares 1998). *C. meridensis* is not listed as a species of concern under any of the risk assessment categories of the International Union for the Conservation of Nature and Natural Resources (2003).

**REMARKS.** The generic name *Cryptotis* is formed from the Greek *crypt(os)* for hidden or concealed and *otis*, the feminine Greek noun for eared creature, and is feminine in gender (Woodman 1993). The specific name *meridensis* is derived from Mérid(a) and *ensis*, a Latin suffix denoting place, in reference to its type locality. Spanish vernacular names for the Mérida shrew include musaraña, musgaño, ratón ciego, and topo.

#### LITERATURE CITED

- AAGAARD, E. M. J. 1982. Ecological distribution of mammals in the cloud forests and páramos of the Andes, Mérida, Venezuela. Ph.D. dissertation, Colorado State University, Fort Collins, xix + 274 pp.
- ARAUJO, A., AND J. MOLINARI. 2000. Presas de *Tyto alba* (Aves, Strigiformes) en una selva nublada Venezolana. Pp. 217–222 in Ecología Latinoamericana. Acta del III Congreso Latinoamericano de Ecología (J. E. Péfaur, ed.). Universidad de Los Andes, Mérida, Venezuela.
- BRENNAN, J. M., AND M. L. GOFF. 1977. The Neotropical genus *Hoffmannina*: 4 new species and other records from Mexico, Panama, and Venezuela (Acarina: Trombiculidae). Journal of Parasitology 63:908–914.
- BRENNAN, J. M., AND J. T. REED. 1974. The genus *Eutrombicula* in Venezuela (Acarina: Trombiculidae). Journal of Parasitology 60:699–711.
- BRENNAN, J. M., AND J. T. REED. 1975. A list of Venezuela chiggers, particularly of small mammalian hosts (Acarina: Trombiculidae). Brigham Young University Science Bulletin Biological Series 20(1):45–75.
- CABRERA, A. 1958. Catálogo de los mamíferos de América del Sur. Volume 1. Revista del Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” 4:1–307.
- CHOATE, J. R. 1970. Systematics and zoogeography of Middle American shrews of the genus *Cryptotis*. University of Kansas Publications, Museum of Natural History 19:195–317.
- CHOATE, J. R., AND E. D. FLEHARTY. 1974. *Cryptotis goodwini*. Mammalian Species 44:1–3.
- DÍAZ, A., J. E. PÉFAUR, AND P. DURANT. 1997. Ecology of South American páramos with emphasis on the fauna of the Venezuelan páramos. Pp. 263–310 in Ecosystems of the world 3. Polar and alpine tundra (F. E. Wielgolaski, ed.). Elsevier, New York.
- DÍAZ DE PASCUAL, A. 1993. Caracterización del habitat de algunas especies de pequeños mamíferos de la selva nublada de Monte Zerpa, Mérida. Ecotropicos 6:1–9.
- DÍAZ DE PASCUAL, A. 1994. The rodent community of the Venezuelan Andes. Polish Ecological Studies 20:155–161.
- DÍAZ DE PASCUAL, A., AND A. A. DE ASCENÇÃO. 2000. Diet of the cloud forest shrew *Cryptotis meridensis* (Insectivora: Soricidae) in the Venezuelan Andes. Acta Theriologica 45:13–24.
- DURANT, P., AND A. DÍAZ. 1995. Aspectos de la ecología de roedores y musarañas de las cuencas hidrográficas Andino-Venezolanas. Caribbean Journal of Science 31:83–94.
- DURANT, P., A. DÍAZ, AND A. DÍAZ DE PASCUAL. 1994. Pequeños mamíferos alto-andinos Mérida–Venezuela. Revista Forestal Latinoamericana 14/94:103–131.
- DURANT, P., AND J. E. PÉFAUR. 1984. Sistemática y ecología de la Musaraña de Mérida. Soricidae: Insectivora. *Cryptotis thomasi*. Revista de Ecología, Conservación y Ornitología Latinoamericana 1(2):3–14.
- FURMAN, D. P. 1971. New species of *Gigantolaelaps* (Acarina: Laelapidae) from Venezuela. Journal of Medical Entomology 8:707–712.
- FURMAN, D. P. 1972. Laelapid mites (Laelapidae: Laelapinae) of Venezuela. Brigham Young University Science Bulletin Biological Series 17(3):1–58.
- GUERRERO, R. 1983. Trichostrongyloidea (Nematoda) parásitos de mamíferos silvestres de Venezuela. I. Los generos *Bradystrostrongylus* Price, 1928; *Longistriata* Schulz, 1926 y *Durettestrostrongylus* n. gen. Acta Biológica Venezolana 11:111–131.
- GUERRERO, R. 1996. Las garrapatas de Venezuela (Acarina: Ixodoidea). Listado de especies y claves para su identificación. Boletín de la Dirección de Malariología y Saneamiento Ambiental 36:1–24.
- HANDLEY, C. O., JR. 1976. Mammals of the Smithsonian Venezuelan Project. Brigham Young University Science Bulletin, Biological Series 20(5):1–91.
- HANDLEY, C. O., JR., AND M. VARN. 1994. The trapline concept applied to pitfall arrays. Pp. 285–287 in Advances in the biology of shrews (J. F. Merritt, G. L. Kirkland, Jr., and R. K. Rose, eds.). Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, Special Publication 18.
- HERRIN, C. S., AND C. E. YUNKER. 1975. Systematics of Neotropical *Hirstionyssus* mites with special emphasis on Venezuela (Acarina: Mesostigmata). Brigham Young University Science Bulletin, Biological Series 20(2):91–127.
- HOLDRIDGE, L. R. 1947. Determination of world plant formations from simple climatic data. Science 105:367–368.
- HUTTERER, R. 1993. Order Insectivora. Pp. 69–130 in Mammal species of the world (D. E. Wilson and D. M. Reeder, eds.). Second edition. Smithsonian Institution Press, Washington, D.C.
- INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE AND NATURAL RESOURCES. 2003. 2003 IUCN red list of threatened species. Available at: <http://www.redlist.org>. Accessed 12 July 2004.
- JONES, E. K., C. M. CLIFFORD, J. E. KEIRANS, AND G. M. KOHLS. 1972. The ticks of Venezuela (Acarina: Ixodoidea) with a key

- to the species of *Amblyomma* in the Western Hemisphere. Brigham Young Science Bulletin Biological Series 17(4):1–40.
- KIRKLAND, G. L., JR., AND P. K. SHEPPARD. 1994. Proposed standard protocol for sampling small mammal communities. Pp. 277–283 in *Advances in the biology of shrews* (J. F. Merritt, G. L. Kirkland, Jr., and R. K. Rose, eds.). Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, Special Publication 18.
- LINARES, O. J. 1998. Mamíferos de Venezuela. Sociedad Conservacionista Audubon de Venezuela, Caracas.
- REPENNING, C. A. 1967. Subfamilies and genera of the Soricidae. Geological Survey Professional Paper 565:1–74.
- RIDGWAY, R. 1912. Color standards and color nomenclature. Published privately by the author, Washington, D.C.
- SORIANO, P. J., A. DÍAZ DE PASCUAL, J. OCHOA G., AND M. AGUILERA. 1999. Biogeographic analysis of the mammal communities in the Venezuelan Andes. *Interciencia* 24:17–25.
- SORIANO, P. J., A. UTRERA, AND M. SOSA. 1990. Inventario preliminar de los mamíferos del Parque Nacional General Cruz Carrillo (Guaramacal), Estado Trujillo, Venezuela. *Biollania* 7: 83–99.
- THOMAS, O. 1898. On seven new small mammals from Ecuador and Venezuela. *Annals and Magazine of Natural History, Series* 7,1:451–457.
- THOMAS, O. 1921. New *Cryptotis*, *Thomasomys*, and *Oryzomys* from Colombia. *Annals and Magazine of Natural History, Series* 9,8:354–357.
- TIPTON, V. J., AND C. E. MACHADO-ALLISON. 1972. Fleas of Venezuela. Brigham Young University Science Bulletin, Biological Series 17(6):1–115.
- WOODMAN, N. 1993. The correct gender of mammalian generic names ending in *-otis*. *Journal of Mammalogy* 74:544–546.
- WOODMAN, N. 2002. A new species of small-eared shrew from Colombia and Venezuela (Mammalia: Soricomorpha: Soricidae: genus *Cryptotis*). *Proceedings of the Biological Society of Washington* 115:249–272.
- WOODMAN, N. 2003. A new species of small-eared shrew of the *Cryptotis nigrescens*-group from Colombia (Mammalia: Soricomorpha: Soricidae). *Proceedings of the Biological Society of Washington* 116:853–872.
- WOODMAN, N., AND R. M. TIMM. 1993. Intraspecific and interspecific variation in the *Cryptotis nigrescens* species complex of small-eared shrews (Insectivora: Soricidae), with the description of a new species from Colombia. *Fieldiana: Zoology (New Series)* 1452:1–30.
- WOODMAN, N., AND R. M. TIMM. 1999. Geographic variation and evolutionary relationships among broad-clawed shrews of the *Cryptotis goldmani*-group (Mammalia: Insectivora: Soricidae). *Fieldiana: Zoology (New Series)* 1497:1–35.

Associate editors of this account were GAIL MICHENER and PAMELA OWEN. Editor was VIRGINIA HAYSEN.

NEAL WOODMAN, USGS PATUXENT WILDLIFE RESEARCH CENTER, NATIONAL MUSEUM OF NATURAL HISTORY, MRC-111, SMITHSONIAN INSTITUTION, P.O. BOX 37012, WASHINGTON, D.C. 20013-7012, UNITED STATES. AMELIA DÍAZ DE PASCUAL, DEPARTAMENTO DE BIOLOGÍA, FACULTAD DE CIENCIAS, UNIVERSIDAD DE LOS ANDES, MÉRIDA 5101, VENEZUELA.