

Proechimys albispinus. By Leila Maria Pessôa and Sérgio Furtado dos Reis

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Proechimys albispinus Geoffroy St. Hilaire, 1838

White-spined Spiny Rat

Proechimys albispinus Geoffroy St. Hilaire, 1838:125. Type locality “Ilha Madre de Deus, Itaparica (near Salvador), Bahia, Brazil.”

CONTEXT AND CONTENT. Order Rodentia, suborder Hystricognathi, family Echimyidae, subfamily Eumysopinae, genus *Proechimys*, with 2 subgenera, *Trinomys* and *Proechimys*. The subgenus *Trinomys* contains 6 species (Moojen 1948; Pessôa et al. 1992; Rocha 1995): *P. dimidiatus*, *P. iheringi*, *P. setosus*, *P. albispinus*, *P. moojeni*, and *P. yonenagae*.

Three subspecies are currently recognized (Moojen 1948, 1952; dos Reis and Pessôa 1995):

P. a. albispinus Geoffroy St. Hilaire, 1838:125, see above.

P. a. minor Reis and Pessôa, 1995:239. Type locality “Morro do Chapéu, Bahia, Brazil.”

P. a. sertoniui Thomas, 1921:142. Type locality “Lamarão (about 70 miles north of Bahia city), Ituiutaba, Bahia, Brazil; altitude 300 meters.”

DIAGNOSIS. *Proechimys albispinus* is a member of the subgenus *Trinomys*, which can be distinguished from the subgenus *Proechimys* primarily by the main fold in cheek teeth, which is shallow and does not reach opposite wall of cheek teeth in *Proechimys* but is deep and extends across crown of cheek teeth in *Trinomys* (Moojen 1948). *P. albispinus* can be distinguished from other species in subgenus *Trinomys* by smaller size of skull and presence of lanceolate and clavate guard hairs on body (Moojen 1948; Pessôa and Strauss 1999). Presence of 2 types of guard hairs in *P. albispinus* is shared with *E. chrysurus* (Zimmermann 1780).

GENERAL CHARACTERS. *Proechimys albispinus* is a small spiny rat with wide, stiff, guard hairs (Fig. 1). Ochraceous-tawny color of upperparts gradually changes to ochraceous-buff on sides. Differentiated light-colored guard hairs occur on back, sides, rump, and at base of tail. Clavate guard hairs with ochraceous-tawny or ochraceous-buff subapical zones are present on back. Underparts of body and inner sides of legs are white. Tail is blackish above, white below, with no white tip. Forefeet and hind feet are white on dorsal parts, with some specimens darker on outer margins of hind feet.

Variation in pelage color has been reported for 1 specimen of *P. albispinus* out of 577 individuals from the neighboring localities, Jaguaquara and Jequié, in Bahia state (Pessôa and dos Reis 1995). In this individual, guard hairs and underfur of middorsal region of body were completely white, forming a conspicuous transverse white stripe ca. 4.0 cm wide. The specimen also displayed a narrow tuff of white hairs on head between ears and on distal 3rd of tail.

Subspecies of *P. albispinus* are distinguished by dental and pelage characteristics (Moojen 1948; Pessôa and Strauss 1999; dos Reis and Pessôa 1995). Incisors of *P. a. albispinus* are orthodont, and P4 can have 1 or 2 folds. Clavate guard hairs in middorsal region have a whitish base that gradually blackens toward tip, but they are interrupted by an ochraceous-tawny subapical zone. Lanceolate guard hairs also have a whitish base that gradually blackens toward tip, but they lack a visible subapical zone; total length varies from 25 to 28 mm, with a maximum width of 1.2 mm. Guard hairs of outer-thigh region show 2 patterns of color: one with a whitish base that gradually blackens toward tip and another that also gradually blackens toward tip but has an ochraceous-tawny color in the distal 5th of hair. In *P. a. sertoniui* some clavate guard hairs in middorsal region have no subapical zone but are black distally.

Lanceolate guard hairs in middorsal region are whitish at base and gradually blacken toward tip; total length varies from 23 to 27 mm, with a maximum width of 1.3 mm. Guard hairs in outer-thigh regions have 2 color patterns: one with a whitish base that gradually blackens toward tip but is interrupted by ochraceous-buff subapical zone and another that is similar but lacks subapical zone. In *P. a. minor* lanceolate guard hairs in dorsal region are whitish at base but gradually blacken toward tip; total length varies from 23 to 25 mm, with a maximum width of 1.0 mm. Clavate guard hairs are also white at base and gradually blacken toward tip but are interrupted by light ochraceous subapical zone. Two patterns of color occur in guard hairs of outer-thigh regions: one with a whitish base that gradually blackens toward tip and the other with a whitish base that gradually blackens toward tip but is interrupted by a buckthorn-brown subapical zone. Guard hairs in *P. a. minor* are thinner than in *P. a. albispinus* and *P. a. sertoniui*, giving a less spiny appearance (Pessôa and Strauss 1999; dos Reis and Pessôa 1995).

Mean external measurements (ranges in parentheses) of each subspecies (sexes combined; from specimens in Museu Nacional, Rio de Janeiro) are: *P. a. albispinus* from Jaguaquara, Bahia ($n = 10$): length of head and body (mm), 176.7 (153–190); length of tail (mm), 165.7 (148–175); length of hind foot (mm), 40 (37–42); length of ear (mm), 26.2 (22–30); and mass (g), 173.1 (120–230); *P. a. minor* from Morro do Chapéu, Bahia: ($n = 3$) length of head and body (mm), 163.0 (152–165); length of tail (mm), 141 (126–160); length of hind foot (mm), 35.6 (34–38); length of ear (mm), 24.6 (23–26); and ($n = 1$) mass (g), 134; *P. a. sertoniui* from Vitória da Conquista, Bahia ($n = 10$): length of head and body (mm), 183.5 (160–205); length of tail (mm), 170.8 (120–180); length of hind foot (mm), 40.3 (38–43); length of ear (mm), 24 (22–28); and mass (g), 184.5 (152–222).

Average cranial (Fig. 2) measurements (in mm; ranges in parentheses) of each subspecies (sexes combined) are: *P. a. albispinus* ($n = 18$): length of skull, 44.99 (37.6–48.9); length of condyloincisive, 40.1 (38.3–41.4); zygomatic breadth, 23.9 (22.8–24.5); length of nasals, 15.9 (13.5–16.8); interorbital constriction, 10.8 (9.7–11.6); length of palate, 15.9 (15.2–16.4); length of toothrow, 7.7 (7.3–8.3—Moojen 1948); *P. a. minor* ($n = 4$): length of skull, 40.8 (39.0–42.5); length of condyloincisive, 34.7 (32.2–36.9); zygomatic breadth, 22.6 (21.5–23.2); length of nasals, 13.9 (13.4–14.8); interorbital constriction, 9.5 (9.1–9.8); length of palate, 14.1 (13.5–14.7); length of toothrow, 7.0 (6.9–7.1—dos Reis and Pessôa 1995); *P. a. sertoniui* ($n = 6$): length of skull, 45.4 (43.8–46.7); length of condyloincisive, 39.3 (37.6–40.6); zygomatic breadth, 23.4 (22.8–24.2); length of nasals, 15.7 (14.7–16.9); interorbital constriction, 10.5 (9.6–11.7); length of palate, 15.6 (14.5–16.1); length of toothrow, 7.3 (7.1–7.5—Moojen 1948). Based on cranial measurements, sexual dimorphism is negligible (Pessôa and dos Reis 1991).



FIG. 1. Photograph of a mounted skin of adult *Proechimys albispinus* from Morro do Chapéu, Bahia, Brazil (Museu Nacional, Universidade Federal do Rio de Janeiro, 44543).

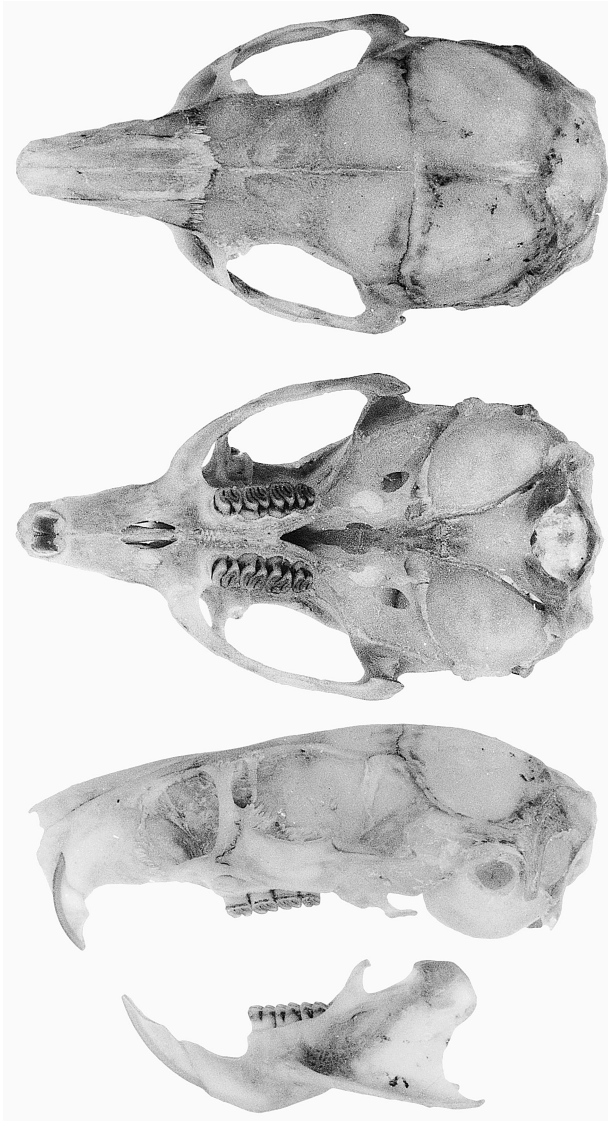


FIG. 2. Dorsal, ventral, and lateral views of the cranium and lateral view of mandible of an adult male of *Proechimys albispinus* (Museu Nacional, Universidade Federal do Rio de Janeiro, 44543, from Morro do Chapéu, Bahia, Brazil). Greatest skull length 41.3 mm.

DISTRIBUTION. *Proechimys albispinus* occurs in the states of Sergipe, Bahia, and Minas Gerais in northeastern and southeastern Brazil (Fig. 3). Type locality for *P. a. albispinus* is Island Madre de Deus, Itaparica (13°00'S, 38°42'W), Bahia. *P. a. sertoniui* is known primarily from the type locality at Lamarão, Itaiutuba (11°47'S, 38°54'W) Bahia, at 300 m (Moojen 1948, 1952). Several localities in Bahia and 1 in Sergipe (Cristinápolis, 100 km north of Lamarão) have been reported for this subspecies (Pessôa and Strauss 1999). *P. a. minor* is known from the type locality in Morro do Chapéu (11°33'S, 41°09'W), Bahia, at 800 m, with a 2nd record from Fazenda Canoas, Juramento, Minas Gerais (Pessôa and Strauss 1999). No fossils are known.

FORM AND FUNCTION. Skull is short, smooth, and somewhat flattened in frontal region; postorbital process of zygoma is well developed and involves both jugal and squamosal. Molariform teeth have only 1 counterfold, with orthodont or proodont incisors.

Baculum in *P. albispinus* has dorsoventral curvature and slightly tapered lateral indentations near midshaft. Proximal end is paddle-shaped and pointed. Distal end has well-developed apical wings with pronounced median depression (Pessôa and dos Reis 1992). Bacular morphology is similar among subspecies of *P. albispinus* (Pessôa and Strauss 1999).

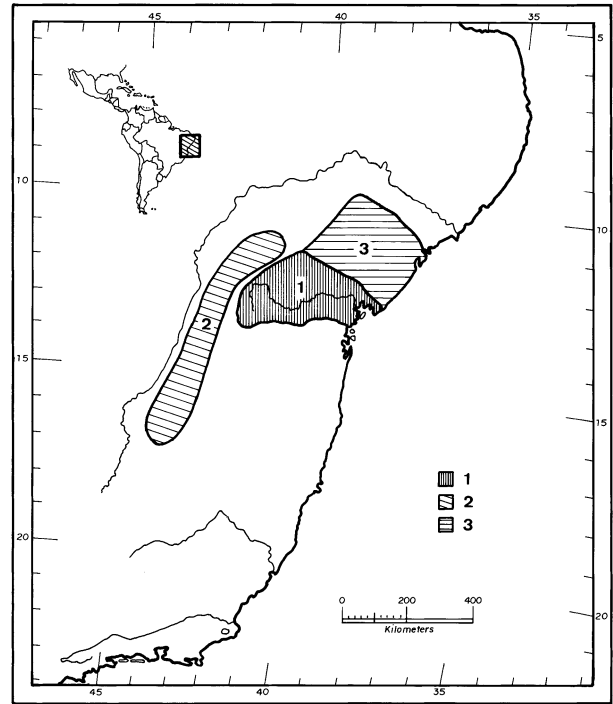


FIG. 3. Geographic distribution of *Proechimys albispinus*: 1, *P. a. albispinus*; 2, *P. a. minor*; 3, *P. a. sertoniui*. Map modified from Moojen (1948).

ONTOGENY AND REPRODUCTION. Museum labels indicate that females are pregnant between January and June, and numbers of embryos vary from 2 to 4 (J. A. Oliveira, pers. comm.). Postontogenetic growth contributes to cranial metric traits (Pessôa and dos Reis 1992). Based on tooth eruption and surface wear criteria, individuals were assigned to 8 age classes. Variation in skull characters was partitioned into age and residual components in adults of age classes 6–8. An average of 17.34% of the variation in skull traits was attributable to age in 3 combined age classes (6–8—Pessôa and dos Reis 1992).

Small skull and body sizes, thinner guard hairs in middorsal region, and lack of an ochraceous subapical zone on guard hairs are found in juveniles of *P. a. albispinus* and *P. a. sertoniui* and suggest paedomorphosis or neoteny in the evolution of *P. a. minor* (Pessôa and Strauss 1999).

ECOLOGY AND BEHAVIOR. *Proechimys albispinus* is one of the most specialized forms of the genus for drier habitats (Moojen 1948). *P. a. albispinus* occurs in climax forest with a moderate percentage of deciduous trees (Moojen 1948). *P. a. sertoniui* inhabits typical “caatinga” forest, a climax of mainly deciduous trees. This habitat is part of the caatingas biome and is characterized by unpredictable rainfall and semiarid conditions, with vegetation including plants of the families Cactaceae and Bromeliaceae (Ab’Saber 1974). *P. a. minor* occurs in the Morro do Chapéu at the northern edge of the Espinhaço range in the state of Bahia, an area characterized by rock formations produced by a geosynclinal of pre-Cambrian age, which is 800–2,000 m above sea level. From 800 to 1,000 m, the vegetation is characteristically savannah, which grades into grasslands between 1,000 and 1,100 m.

GENETICS. For *P. a. minor*, $2n = 60$, and the number of autosomal arms is 116 (Leal-Mesquita et al. 1992). Autosomes are metacentric, submetacentric, or subtelocentric. Sex chromosomes are morphologically distinguishable, with the X chromosome being a large submetacentric and the Y chromosome a small acrocentric. Autosomal pair number 10 has a secondary constriction, which is the nucleolar organizer region (Leal-Mesquita et al. 1992). G-banding allows the pairing of all chromosomes. C-bands occur in the pericentromeric regions of some autosomes, whereas other autosomes display little or no C-bands. A conspicuous pericentric C-band is evident in the X chromosome, whereas the Y chromosome has weak uniform staining.

REMARKS. Based on dental morphology and biogeographic data, Rocha (1995) proposed that *P. albispinus* is closer to *P. yonenagae*. However, multivariate statistical analyses of cranio-metric traits and qualitative bacular features suggest that *P. albispinus* is not morphologically closest to *P. yonenagae* and that the latter shares morphological affinities with the *P. iheringi* complex (Pessôa et al. 1998). Estimates of molecular distance based on 726 base pairs of the cytochrome-*b* gene show that *P. albispinus* is the most divergent of all taxa in the subgenus *Trinomys*, with the observed percent sequence difference varying from 13.1 to 17.1 (Lara and Patton 2000). Phylogenetic analysis of the same data set also indicates that *P. albispinus* is not a sister taxon to *P. yonenagae* and has no close relationships with other taxa in the subgenus *Trinomys* (Lara and Patton 2000).

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