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Two new species of *Plinachtus* Stål (Hemiptera: Heteroptera: Coreidae: Coreinae: Gonocerini) from Aldabra Atoll and Madagascar

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Abstract

Plinachtus aldabrensis new species, collected in Aldabra Atoll, and *P. contortus* new species, collected in Madagascar are described, and included in the *dubius*-group. The relationships with *P. dubius* Herrich-Schaeffer, and *P. schoutedeni* van Reenen are discussed. The adult dorsal habitus, and drawings of pronotum, and male genital capsule are provided, as is a key to the known species from Madagascar and Aldabra Atoll.

Key words: Hemiptera, Coreidae, Gonocerini, *Plinachtus*, new species, Aldabra Atoll, Madagascar

Introduction

The genus *Plinachtus* Stål, currently known from the Afrotropical Region, is separated into three groups and 16 species. In the *dubius*-group the humeral angles of pronotum are thick at base and taper into sharp or truncated apical spine, the posterior third of antennal segment III is yellow or reddish orange, the abdominal sternite V lacks a black discoidal spot, and the abdominal spiracles are yellow. Included are nine species: *burgeoni* van Reenen, *dubius* Herrich-Schaeffer, *kivuensis* (Schouteden), *lux* van Reenen, *nyamuragirensis* (Schouteden), *pax* van Reenen, *rex* van Reenen, *schoutedeni* van Reenen, and *umbricolus* Linnavuori. In the *falcatus*-group the humeral angles of pronotum are flattened and relatively thin at base, the humeral spines pointing strongly outwards, the posterior third of antennal segment III is yellow or reddish orange, abdominal sternite V has a small black discoidal spot, and the abdominal spiracles are yellow. Included are three species: *falcatus* (Distant), *madagascariensis* (Kiritshenko), and *riparium* van Reenen. The *pungens*-group is characterized by having the posterior third of antennal segment III black, and the abdominal spiracle surrounded by a black spot. Included are four species: *pungens* (Thunberg), *scitulus* Brailovsky and Barrera, *venustus* van Reenen, and

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vermiculus Brailovsky and Barrera (Brailovsky and Barrera 2002; van Reenen 1981).

Brailovsky and Barrera (2002) summarized knowledge of *Plinachtus* characterized by having the head elongate in front of the antenniferous tubercles, the antennal segments slender, the costal margin of corium and posterior margins of humeral angles smooth, unserrated, and the humeral angles usually pointed into a sharp apical spine.

The present paper adds two new species, *P. aldabrensis* from Aldabra Atoll, and *P. contortus* from Madagascar, both in the *dubius*-group by having the humeral angles of pronotum thick at base, abdominal sternite V without black discoidal spots, and the posterior third of antennal segment III and the abdominal spiracle yellow. Previously, three species *P. madagascariensis*, *P. scitulus*, and *P. vermiculus* have been recorded from Madagascar. The new species described here is the first record of *Plinachtus* for the Aldabra Atoll.

Material and methods

Examined specimens belong to the following collections: The Natural History Museum, London, England (BMNH); Museum National D' Histoire Naturelle, Paris, France (MNHN); National Museum, Prague, Czech Republic (MNHP); and Instituto de Biología, Universidad Nacional Autónoma de México (UNAM). Measurements are given in millimeters.

Results

Key to the Madagascar and Aldabra Atoll species of *Plinachtus*

1- Posterior third of antennal segment III black; posterior margin of pleural abdominal sterna II to IV black..... 2
1'- Posterior third of antennal segment III yellow or reddish orange; posterior margin of pleural abdominal sterna II to IV yellow 3
2- Rostral segments II to IV black; posterior third of antennal segment II reddish; basal half of costal margin of corium black; abdominal spiracles yellow ....*P. scitulus* Brailovsky and Barrera
2'- Rostral segments II to IV yellow (apex of IV black); posterior third of antennal segment II black; basal half of costal margin of corium yellow; abdominal spiracles black ..... *P. vermiculus* Brailovsky and Barrera
3- Abdominal sternite V with black discoidal spot; humeral angles of pronotum flattened, and relatively thin at base.....*P. madagascariensis* (Kiritshenko)
3'- Abdominal sternite V without black discoidal spot; humeral angles of pronotum thick at base..... 4

4- Mesopleura with small black discoidal spot; posteroventral edge of male genital capsule with lateral arms wider, stout, gently conical, and large u-shaped concavity (Fig. 4) .....*P. aldabrensis* **n. sp.**

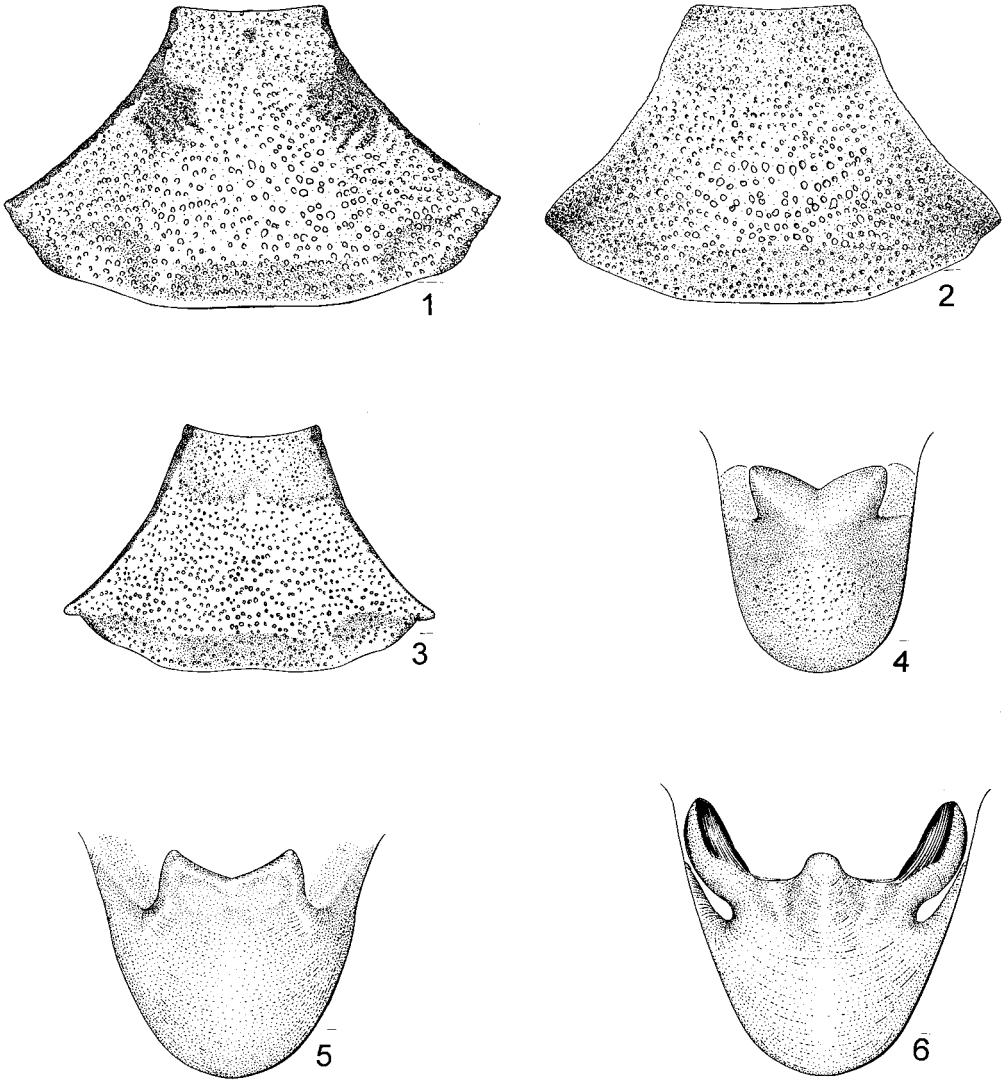
4'- Mesopleura without black discoidal spot; posteroventral edge of male genital capsule differentiated into prominent asymmetrical arms; inner arms with large setae-like hairs (Fig. 6).....*P. contortus* **n. sp.**

***Plinachtus contortus* n. sp.**
(Figs. 1, 6)

Description. Holotype male. Head length 1.70; width across eyes 1.75; interocular space 0.97; preocular distance 1.10; interocellar distance 0.44; antennal segments length: I, 2.50; II, 3.15; III, 2.00; IV, 2.10. Pronotal length 2.60; maximal width of posterior lobe including humeral spine 4.10. Scutellar length 1.20; width 1.40. Body length 12.40. Head. Wider than long; antennal segment I cylindrical, thickest, slightly curved outward; segments II and III cylindrical, slender, and IV fusiform; rostrum reaching posterior margin of metasternum. Thorax. Pronotum. Wider than long, declivent; humeral angles thick at base, slightly exposed, and apically truncated; posterior lobe of pronotal disk strongly punctate, anterior lobe including calli scarcely punctate (Fig. 1). Scutellum. Wider than long; apically rounded. Genital capsule. Posteroventral border laterally differentiated into prominent asymmetrical arms; inner arms covered by large, stout, castaneous orange seta-like hairs; middle third with stout short lobe (Fig. 6). *Dorsal color.* Shiny orange with following areas black: head with two longitudinal stripes running between eye and ocellus, ocellar tubercle, space between antenniferous tubercle and eye, inner face of postocular tubercle, anterolateral margins of pronotum, humeral projections, middle third of anterior lobe of pronotal disk, lateral area of upper third of posterior lobe of pronotal disk, and apex of scutellum; antennal segments I to III shiny orange; IV dull orange suffused with brown, basal and apical thirds pale orange yellow; humeral expansion reddish orange; anterior half of costal margin of corium pale yellowish; basal quarter to half of costal margin border medially by a brownish black stripe; hemelytral membrane pale translucid yellow, basal angle darker; connexival segments pale yellow; dorsal abdominal segments shiny orange yellow. *Ventral color.* Pale yellow with large black discoidal spot on metapleura; rostral segment I pale yellow, II and III shiny orange, IV shiny orange with apex black; coxa, trochanter, femur pale yellow; tibia pale yellow with distal half shiny orange; tarsus shiny orange.

Female. Head length 1.72; width across eyes 1.72; interocular space 0.97; preocular distance 1.08; interocellar distance 0.42; antennal segments length: I, 2.25; II, 2.70; III, 1.87; IV, 1.72. Pronotal length 2.60; maximal width of posterior lobe including humeral spine 4.05. Scutellar length 1.30; width 1.60. Body length 11.85. Head as longer as wide; apex of antennal segment III barely expanded. Color. Similar to male holotype.

Connexival segments VIII and IX pale yellow, posterior margins shiny orange; abdominal segments VII to IX shiny orange yellow, lateral margins black; genital plates yellow.



FIGURES. 1–6. *Plinachtus* spp. **1–3**. Pronotum. **1**, *P. contortus* **n. sp. 2**, *P. schoutedeni* Van Reenen. **3**, *P. aldabrensis* **n. sp. 4–6.** Male's genital capsule. Caudal view. **4**, *P. aldabrensis* **n. sp. 5**, *P. schoutedeni* Van Reenen. **6**. *P. contortus* **n. sp.**

Variation. 1. Head dorsally shiny orange, black longitudinal stripes hard to see. 2. Rostral segment II pale yellow. 3. Upper third of pronotal disk laterally shiny orange. 4. Basal quarter to half of costal margin border medially by a shiny orange stripe or incomplete brownish black stripe. 5. Costal margin entirely pale yellow. 6. Tibia yellow with distal joint shiny orange.

Types. Holotype male, **Madagascar:** Ambanja (without data) (MNHP). **Paratypes.**

Madagascar: 4 males, 7 females, Sicard 1930 (without data) (MNHN, UNAM); 1 male, Region du Sud, Vallee du Mandrare, Ampasimpolaka, XI-1901, Ch. Alluaud (MNHN); 1 female, Region du Sud, Andrahomana, XI-1901, Ch. Alluaud (MNHN); 1 female, Tulear Pr., St. Augustin S. L., 29-III-1968, K. M. G. y P. D. (BMNH).

Comments. This new species belongs to the *dubius*-group (van Reenen 1981) characterized by having the posterior third of antennal segments II and III shiny orange or reddish orange (never black), the abdominal sterna without black spots surrounding the abdominal spiracles, the humeral angles thick at base, and the male genital capsule usually with prominent lateral arms. This group includes: *P. burgeoni* van Reenen, *P. dubius* Herrich-Schaeffer, *P. kivuensis* (Schouteden), *P. lux* van Reenen, *P. nyamuragirensis* (Schouteden), *P. pax* van Reenen, *P. rex* van Reenen, and *P. schoutedeni* van Reenen.

Plinachtus contortus **n. sp.**, like *P. schoutedeni* recorded from South Africa, has the humeral angles almost blunt, never ending as sharp spines (Figs. 1–2), ventrally pale yellow with only one large black discoidal spot on the metapleuron, and head dorsally with two black longitudinal stripes running between eye and ocellus.

In *P. schoutedeni* the anterolateral margins of the pronotum are pale yellow to pale yellowish orange, and the posteroventral margin of the male's genital capsule has a median lobe more or less rectangular, its lateral angles short, and the external shoulders conical without seta-like hairs (Fig. 5). In *P. contortus* recorded from Madagascar, the anterolateral margins of pronotum are black to dark brown, and the posteroventral margin of male genital capsule is laterally differentiated into prominent asymmetrical arms, the inner arms are covered with large, stout, castaneus orange seta-like hairs, and the middle third has stout, short lobe (Fig. 6).

Plinachtus dubius is recognized by having the anterolateral margins of the pronotum pale yellow to pale orange, the ventral surface pale yellow with one black discoidal spot on the mesopleuron, and metapleuron, and the posteroventral margin of the male genital capsule laterally differentiated into prominent asymmetrical arms, each arm lacking seta-like hairs, and the middle third lacking a stout short lobe.

Etymology. The name refers to the peculiar contorted shape of the male genital capsule.

***Plinachtus aldabrensis* n. sp.**
(Figs. 3–4, 7)

Description. Holotype male. Head length 1.45; width across eyes 1.60; interocular space 0.85; preocular distance 0.90; interocellar distance 0.43; antennal segments length: I, 1.55; II, 2.00; III, 1.45; IV, 1.75. Pronotal length 1.90; maximal width of posterior lobe including humeral spine 3.10. Scutellar length 1.07; width 1.15. Body length 9.65. Head. Wider than long; antennal segment I cylindrical, thickest, slightly curved outward; segment II cylindrical; III cylindrical, apically weakly expanded; and IV fusiform;

antennal segment II the longest, III the shortest or subequal to I, and IV longer than I and than III; rostrum reaching middle third of metasternum. Thorax. Pronotum. Wider than long, declivent; humeral angles thick at base; humeral spine tapering into short and robust spine, pointing outward, slightly backward, not upward or forward; pronotal disk strongly punctate, except for calli, these with a few scattered punctures (Fig. 3). Scutellum. Wider than long, scarcely punctate; apically subtruncated. Abdomen. Posterior angle of connexival segment VI with stout spine. Genital capsule. Posteroventral border with lateral arms wide, stout, gently conical, with large u-shaped medial concavity, and outer shoulders relatively small (Fig. 4). *Dorsal color.* Head, pronotum, scutellum pale yellow with following areas black to dark brown: head lateral to mid line with two longitudinal stripes running between eye and ocellus, ocellar tubercle, space between antenniferous tubercle and eye, inner face of postocular tubercle, anterolateral margins of pronotum, and almost all punctures of posterior lobe of pronotal and scutellar disk; antennal segments I and II orange, III orange with apical third suffused with pale brown; IV orange with middle third suffused with pale brown; clavus and corium dark yellow suffused with reddish orange, punctures dark brown; anterior half of costal margin of corium pale yellow; basal quarter to half of costal margin bordered medially by brownish black stripe; hemelytral membrane translucent, basal angle pale brown; connexival segments pale yellow; dorsal abdominal segments pale yellowish orange, anterior angle of segments III to VII black. *Ventral color.* Pale yellow with large black discoidal spot on mesopleuron and metapleuron; rostral segment I yellow, II to IV pale orange (apex of IV black); legs pale yellow, apical third of tibiae and tarsi pale orange.

Female. Head length 1.75; width across eyes 1.85; interocular space 0.95; preocular distance 0.97; interocellar distance 0.52; antennal segments length: I, 1.60; II, 2.30; III, 1.62; IV, 1.75. Pronotal length 2.40; maximal width of posterior lobe including humeral spine 3.67. Scutellar length 1.35; width 1.60. Body length 11.50. Color. Similar to male holotype. Rostral segments I to III pale yellow and IV orange with apex black; anterolateral margins of pronotum black, outer margin and humeral spines pale reddish orange; abdominal segments II to IX brownish black, middle irregular longitudinal stripe yellow; connexival segments III to IX , and genital plates pale yellow.

Types. Holotype male, **Aldabra South Island:** Frigate Pool, 20-I-1968, B. Cogan and A. Hutson (Aldabra Atoll Royal Expedition, 1967-68, BM) (BMNH). **Paratypes. Aldabra South Island:** 1 male, Frigate Pool, 20-I-1968, B. Cogan and A. Hutson (Aldabra Atoll Royal Expedition, 1967-68, BM) (UNAM); 1 female, Anse Cedre, 17-19-I-1968, B. Cogan and A. Hutson (Aldabra Atoll Royal Expedition, 1967-68, BM) (BMNH); 1 female, Takamaka, 1-17-II-1968, B. Cogan and A. Hutson (Aldabra Atoll Royal Expedition, 1967–68, BM) (BMNH).

Comments. This species also belongs to the *dubius*-group (van Reenen 1981) and like *P. shoutedeni* van Reenen (1981), has humeral angles almost blunt, never ending in sharp spine; and on the posteroventral border of the male genital capsule the median exposed lobe is more or less rectangular (Figs. 4–5).

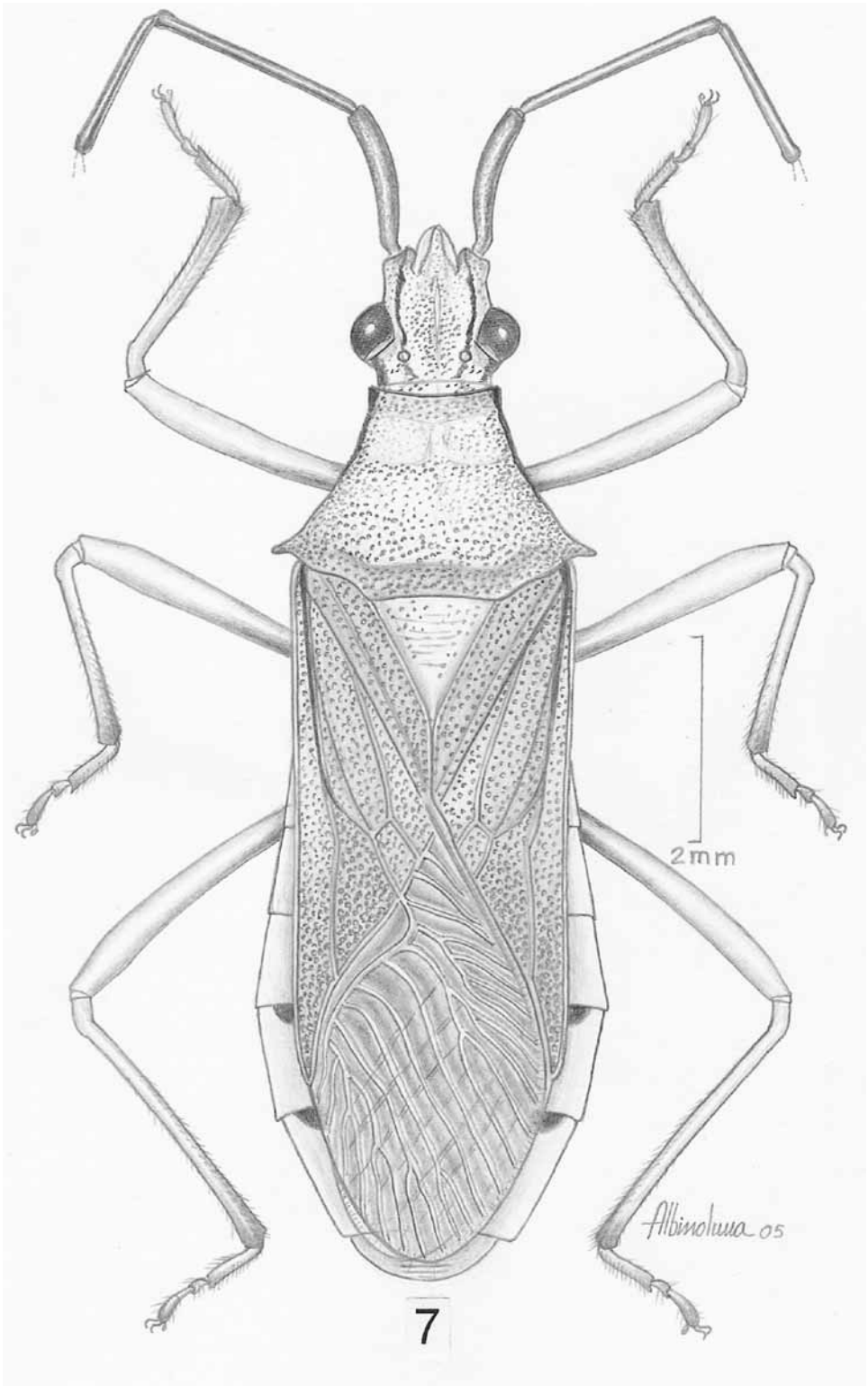


FIGURE. 7. *Plinachtus aldabrensis* **n. sp.** Male, habitus.

In *P. aldabrensis* **n. sp.**, the anterolateral margins of the pronotum are black, the posterior angle of connexival segment VI is projected in a robust spine, the humeral spine is stout and directed backward, the apex of the scutellum is yellow, and abdominal segments III to VI yellow with strong black to brownish black marks. *Plinachtus schoutedeni* recorded from South Africa has the anterolateral margins of the pronotum pale yellow to orange, the posterior angle of connexival segment VI unarmed, the humeral spine tiny, the apex of the scutellum black, and abdominal segments III to VI shiny yellowish orange without black or brownish black marks.

Zoogeographical comments

Representatives of the genus *Plinachtus* Stål are known so far only from the tropical and subtropical areas of Africa. The species belonging to the *dubius*-group are distributed in Ethiopia, Kenya, Rwanda, South Africa, and Zaire, and here we add Aldabra Atoll, and Madagascar. The species included in the *falcatus*-group are known from Madagascar, South Africa, South West Africa, Zaire, and Zimbabwe. Members of the *pungens*-group are cited from Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, South Africa, Sudan, Uganda, Zaire, and Zambia (Brailovsky and Barrera 2002, Linnavuori 1978, van Reenen 1981).

The species richness, morphological diversity, great similarity in external features of some species versus the dissimilarity of their genitalia, and also the fact that several species can live sympatrically in one locality are evidence that the evolutionary center of the genus was in Africa.

A preliminary biogeographical analysis, based on the known distributional data, revealed that several species are widespread throughout the tropical and subtropical areas of Africa: (e.g., *P. falcatus* (South Africa, South West Africa, Zaire, Zimbabwe) , and *P. pungens* (Ethiopia, Eritrea, Kenya, Rwanda, South Africa, Sudan, Zaire, Zambia); whereas others are known from only two places: *P. dubius* (Ethiopia, South Africa), *P. pax* (Kenya, Zaire), and *P. rex* (Rwanda, Zaire); and some are known from a single locality: *P. aldabrensis* (Aldabra Atoll), *P. burgeoni* (Rwanda), *P. kivuensis* (Zaire), *P. nyamuragirensis* (Zaire), *P. lux* (South Africa), P. *riparium* (South Africa), *P. schoutedeni (*South Africa*), P. scitulus (*Madagascar*), P. umbricolus* (Ethiopia), *P. venustus* (Zaire), and *P. vermiculus* (Madagascar).

Examination of the species composition in the most speciose localities reveals that often three or more species can live sympatrically in a small area. South Africa and Zaire were the species-richest, with as many as six species, and Madagascar with as many as four collected species.

Despite our fragmentary knowledge, it seems likely that the African Continent represents the evolutionary center of *Plinachtus*, which subsequently entered the insular areas particularly, the very large island of Malagasy, and recently the Aldabra Atoll.

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