A Revision of Barrojuba

(Coleoptera: Pselaphidae)

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Abstract

Continuously maintained ultraviolet light traps have produced *Barrojuba albertae* Park and five new species in the genus from Panama: *uliginosa* n. sp., *tuberosa* n. sp., *varia* n. sp., *woldai* n. sp., and *gibbosa* n. sp. Most of the specimens were collected at two sites which both have significant rainfall each month. Only new species, *albertae,* is found in portions of Panama which possess a distinct dry season. Only males are known from Panama.

Introduction

While identifying pselaphid species for a study of seasonality in the tropical insect fauna by Dr. Henk Wolda, several species of *Barrojuba* were encountered. Only a single species, *Barrojuba albertae* Park, has been placed in the genus, and it has been very rarely collected. The continued maintainance of ultraviolet light traps at several sites in Panama has produced good series of this and five new species. Sites where *Barrojuba* have been collected are: 16 km W Almirante (Corriente Grande) and Miramar in Bocas del Toro Province, Fortuna and Alto Lino in Chiriquí Province, Las Cumbres in Panama Province, and Barro Colorado Island in the Canal Zone.

Climatological data for three sites (Fortuna, Las Cumbres, and Barro Colorado Island) were summarized in Wolda and Fisk (1981), and data for Chaguinola, which is near Corriente Grande, is presented in Wolda and Galindo (1981). The traps at Fortuna and Corriente Grande have produced almost all of the specimens of five species. Fortuna is nonseasonal in terms of rainfall, with considerable precipitation each month (McElravy *et al).* Rainfall at Corriente Grande is assumed to be the same as that of Chaguinola, which has an intermediate pattern but still possesses significant precipitation in the months with the least amount of rainfall (about 10 cms/month). Traps at Las Cumbres and Barro Colorado Island have produced only *albertae* (which has been collected also at Miramar and Corriente Grande), with the two sites possessing a distinct dry season. In

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Panama *Barrojuba* appears to favor areas where moisture levels are high throughout the year, with only one species able to exploit those areas of Panama with long periods of little rainfall.

All specimens collected at light have been males. The only females known for *Barrojuba* are of an undescribed species from Brazil in the collection of the Field Museum of Natural History, Chicago. This small series lacks a male, and the species is not described for that reason. Characters of interest in these females are: eyes small and oval, only last three antennomeres enlarged, antebasal pronotal sulcus indistinct lateral to median fovea.

Specimens of all species were dissected and placed on slides. Individuals were first cleared in 5% KOH, placed briefly in 5% acetic acid, and then mounted in Hoyer's medium. Drawings were made from these slides and also from specimens on points. Species diagnoses present first the characteristics of the males, and then specific measurements of the male holotype or redescribed male. All measurements are in millimeters. All holotypes are to be placed at the Field Museum of Natural History, Chicago. This paper is possible due to the kind efforts of Dr. Henk Wolda, Smithsonian Tropical Research Institute, Balboa, Panama, and his two assistants, Miguel Estribí and Saturnino Martínez. I would like to thank Dr. Larry E. Watrous, Field Museum of Natural History, for arranging the loan of the brazilian specimens, and Drs. John F. Burger and R. Marcel Reeves, University of New Hampshire, for reviewing the manuscript.

Generic description

Park (1942: 59) defined the genus from a variety of characters visible on the point-mounted holotype. This definition was quite long and, as a result, quite difficult to find the key characters. The following definition is an extract of this account, and includes characters visible from specimens on slides.

Barrojuba is here defined as those Jubini possessing: 11 antennomeres, vertexal foveae large and on lateral head margins between antennal bases and eyes, head venter with Y-shaped gular suture, stem and arms about same length; pronotum with obsolete transverse antebasal sulcus between lateral foveae and median depressed area, lateral margins with tooth slightly anterior to lateral foveae, prosternum with procoxal foveae; elytra with sutural, discal, and subhumeral fovea; mesothorax with median mesosternal, lateral mesosternal, and lateral mesocoxal foveae; metasternal foveae present, median carina between meso- and metacoxae; legs lacking modifications; tergite I lacking basal foveae, II–III with pair of basolateral foveae, IV with pair of very large basolateral foveae and small apicolateral foveae; sternites II–IV with paired median and basolateral foveae, V with large pair basolateral foveae, VI lacking foveae, with preapical row of flattened setae.

Park's placement of the vertexal foveae as two minute scars just behind the dorsal base of the antennae is incorrect. The vertexal foveae are readily identified by the large internal apodemes which originate at a point between the antennal bases and the eyes. Since they are in the lateral groove behind the antennal bases they are quite easy to overlook.

The transverse antebasal sulcus of the pronotum is interrupted in five of the six species, but in *gibbosa* n. sp. it can be regarded as complete, although much broader than is normal in pselaphids.

Barrojuba Park

Barrojuba Park 1942: 59; 1952: 42. Generotype *Barrojuba albertae* Park by original designation.

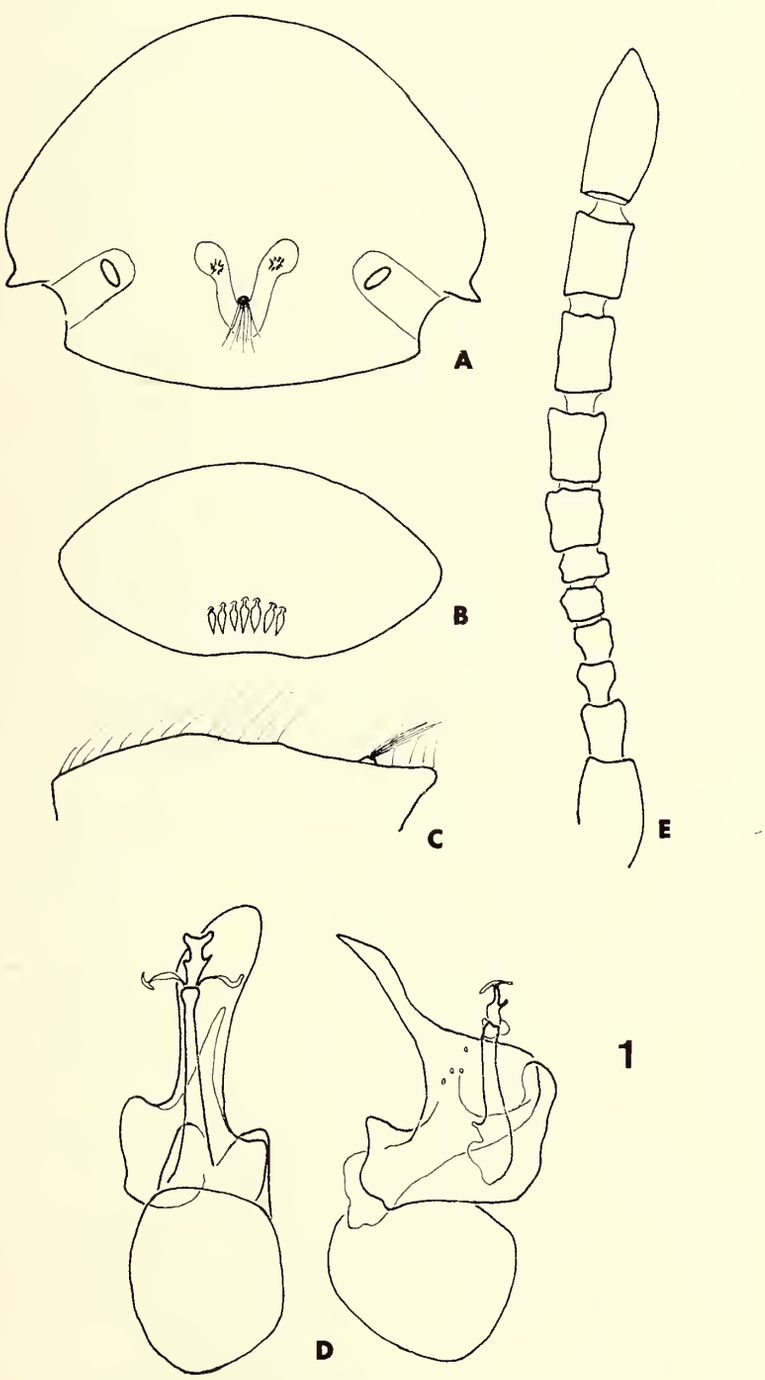

Fig. 1: *B. uliginosa* n. sp., A. dorsal view pronotum, B. ventral view sternite VI, C. left lateral view pronotum, D. dorsal and left lateral view genitalia, E. dorsal view antenna.

Key to species (males)

1. Antennomere VII twice as large as VI, pronotal tubercle on anterior margin of antebasal impression (Fig. 1) 2

   Antennomeres VII and VI subequal, pronotal tubercle on posterior margin of antebasal impression (FIg. 4) 3

2. Pronotal tubercle long, distinct in lateral view, antebasal impression U-shaped (Fig. 2) . . . . . **tuberosa** n. sp.

   Pronotal tubercle short, barely visible in lateral view, antebasal impression V-shaped (Fig. 1) . . . . . **uliginosa** n. sp.

3. Pronotal disc gibbous, protruding slightly over anterior margin of antebasal impression, transverse sulcus complete (Fig. 6) . . . . . **gibbosa** n. sp.

   Pronotal disc evenly convex, antebasal sulcus interrupted between lateral and median impressions (Fig. 4) 4

4. Antebasal area with slightly raised median diamond-shaped area (Fig. 3) . . . . . **albertae** Park

   Median antebasal area with U-shaped or oval impression, lacking raised diamond-shaped area 5

5. Median pronotal impression oval and deep, sternite VI with preapical row of pointed setae (Fig. 5) . . . . . **woldai** n. sp.

   Median pronotal impression usually U-shaped, may be flattened or a deep oval, sternite VI with preapical row of rectangular setae (Fig. 4) . . . . . **varia** n. sp.

Barrojuba uliginosa n. sp.
(Fig. 1)

Length 2.40–2.48. Head with last five antennomeres enlarged, VI about two-thirds length of VII; pronotum with vague V-shaped impression around antebasal tubercle, small sensory areas in each arm of impression, tubercle short, difficult to see in lateral view, tuft of setae at apex angled posteriorly, pronotal disc evenly rounded; abdomen with sternites II–V medianly convex, sternite VI transversely impressed through width, with preapical row of flattened pointed setae.

Male holotype: 16 km W Almirante, Panama. Head 0.70, antennomere VI 0.04 long, 0.07 wide, antennomere VII 0.10 long, 0.09 wide; pronotum 0.58 long, 0.80 at widest point; elytra 0.94 long.

Specimens examined, 7: Holotype male: Panama: Bocas del Toro: 16 km W Almirante, VI-12-1980, H. Wolda, UV light. Paratypes: 6 males, all with same information except date of collection, III-3-1980, III-18-1980, III-19-1980, IV-19-1980, IV-21-1980, VI-25-1980.

Discussion: Most similar to *tuberosa* by the enlarged apical five antennomeres and the pronotal tubercle present on the apical margin of the pronotal impression. Separated from that species by the pronotal impression being V-shaped and the tubercle short and indistinct in lateral view.

Barrojuba tuberosa n. sp.
(Fig. 2)

Length 2.24–2.72. Head with last five antennomeres enlarged, VI about half length of VII; pronotum with distinct U-shaped impression around antebasal tubercle, small sensory area in each arm of impression, tubercle long, easily visible in lateral view, tuft of setae at apex lying almost horizontally, pronotal disc evenly rounded, abdomen with

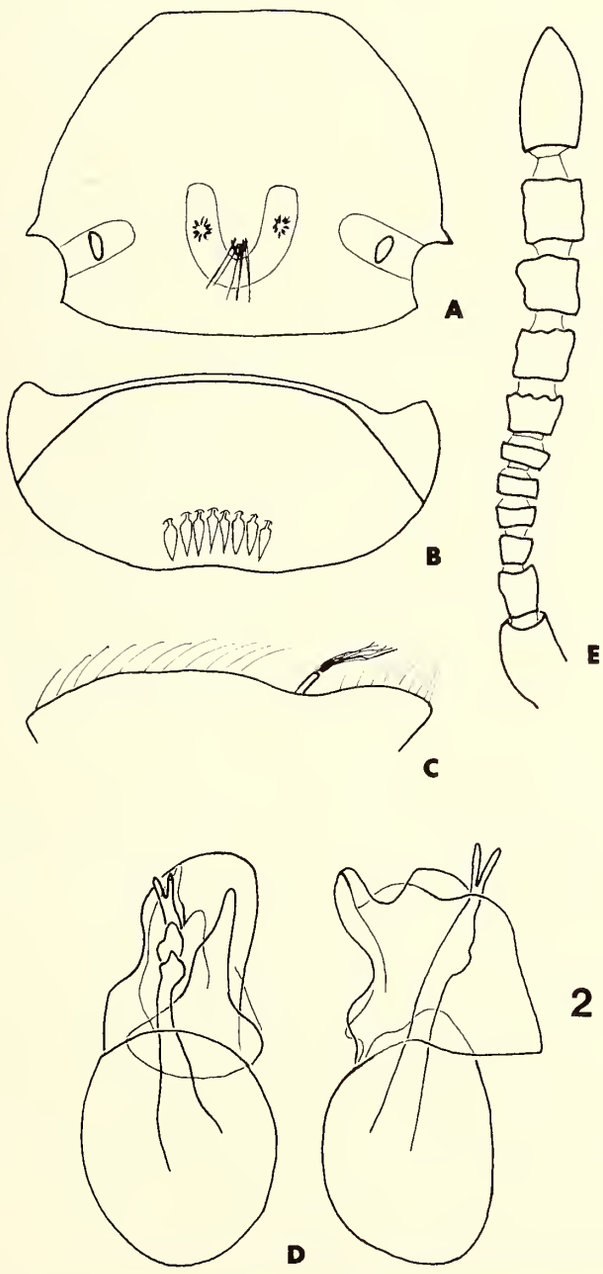

Fig. 2: *B. tuberosa* n. sp., A. dorsal view pronotum, B. ventral view sternite VI, C. left lateral view pronotum, D. dorsal and left lateral view genitalia, E. dorsal view antenna.

sternites I–V convex or with some or all briefly flattened medially, VI transversely impressed through width, impression almost circular, with preapical transverse row of flattened pointed setae.

Male holotype: 16 km W Almirante, Panama. Head 0.56 long, antennomere VI 0.03 long, 0.07 wide, antennomere VII 0.07 long, 0.09 wide; pronotum 0.51 long, 0.64 at widest point; elytra 0.81 long.

Specimens examined, 68: Holotype male: Panama: Bocas del Toro: 16 km W Almirante, III-30-1980, H. Wolda, UV light. Paratypes: 28 males, same data except scattered dates from 1-17-1980 to V-7/13-1980. Chiriquí: 38 males, Fortuna, 8°44′N 82°15′W, scattered dates from VIII-21-1977 to VII-2-1979, H. Wolda, UV light.

Discussion: Distinct by the prominent antebasal tubercle of the pronotum which originates on the anterior margin of a U-shaped impression Closest to *uliginosa* by the pronotal tubercle being on the anterior margin of the impression, and the enlarged five apical antennomeres. Separated from this species by possessing a U- rather than V-shaped impression, and the very prominent pronotal tubercle in lateral view.

Barrojuba albertae Park
(Fig. 3)

Barrojuba albertae Park 1942: 60, plate XVIII, fig. 1. Type locality: Barro Colorado Island, Canal Zone, Panama. Park 1952: 42.

Length 2.16–2.40. Head with last four antennomeres enlarged, VII short, about same length as VI; pronotum with median diamond-shaped raised area just anterior to vague antebasal impression, raised area may be indistinct, with small tubercle on the lateral points of raised area, medial tubercle on posterior margin of antebasal impression, short, difficult to see in lateral view, lacking setae at apex, sensory areas scattered on raised area and in impression; abdomen with sternites II–V convex to sligthly flattened medially, sternite VI impressed through most of width, with preapical row of 5-7- flattened pointed setae.

Redescribed male: 16 km W Almirante, Panama. Head 0.55 long, antennomere VI 0.04 long, 0.07 wide, antennomere VII 0.04 long, 0.07 wide: pronotum 0.49 long, 0.67 at widest point; elytra 0.76 long.

Specimens examined, 72: Panama: Canal Zone: Barro Colorado Island, Snyder-Molino traps I & III, VII-20-1977 to II-8-1978, H. Wolda, UV light. Panama: Las Cumbres, I-3-1975 to VII-24-1975, H. Wolda, UV light. Chiriquí: Fortuna, 8°44′N 82°15′W, V-7-1978, H. Wolda, UV light. Bocas del Toro: Miramar, 9°N 82°15′W, V-25-1979, I-24-1980, H. Wolda, UV light; 16 km W Almirante, I-7-1980 to V-13-1980, H. Wolda, UV light.

Discussion: Distinct in the genus by the raised area anterior to antebasal impression and the pronotal tubercle lacking a tuft of setae at the apex. Closest to *tuberosa* and *uliginosa* by the sternites being medially convex or slightly flattened, and sternite VI possess-

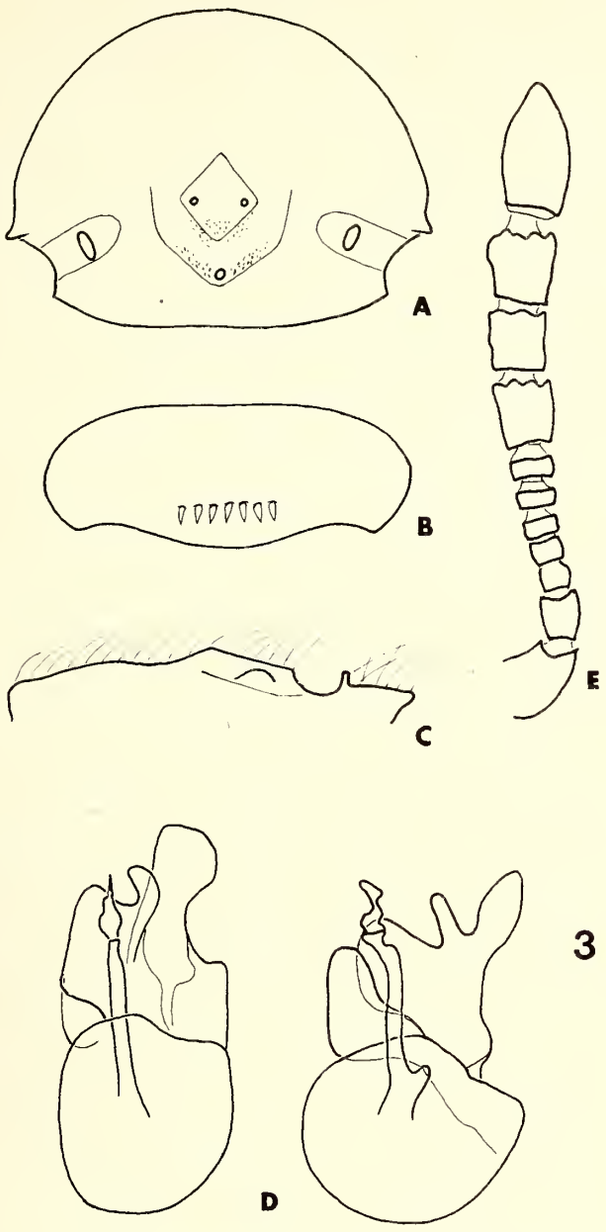

Fig. 3: *B. albertae* Park, A. dorsal view pronotum, B. ventral view sternite VI, C. left lateral view pronotum, D. dorsal and left lateral view genitalia, E. dorsal view antenna.

ing a preapical row of flattened pointed setae. Similar to the other three species in possessing four rather than five enlarged apical antennomeres.

Barrojuba varia n. sp.
(Fig. 4)

Length 2.40–2.64. Head with last four antennomeres enlarged, VII short, about same length as VI, pronotum with antebasal impression variable, impression may be indistinctly U-shaped to very deeply impressed with only a suggestion of the median area which separates the arms of the U, small sensory areas in each arm of impression, antebasal tubercle on posterior rim of impression, tubercle short and difficult to see in lateral view, tuft of setae at apex easy to see in lateral view, upright or angled anteriorly; abdo-

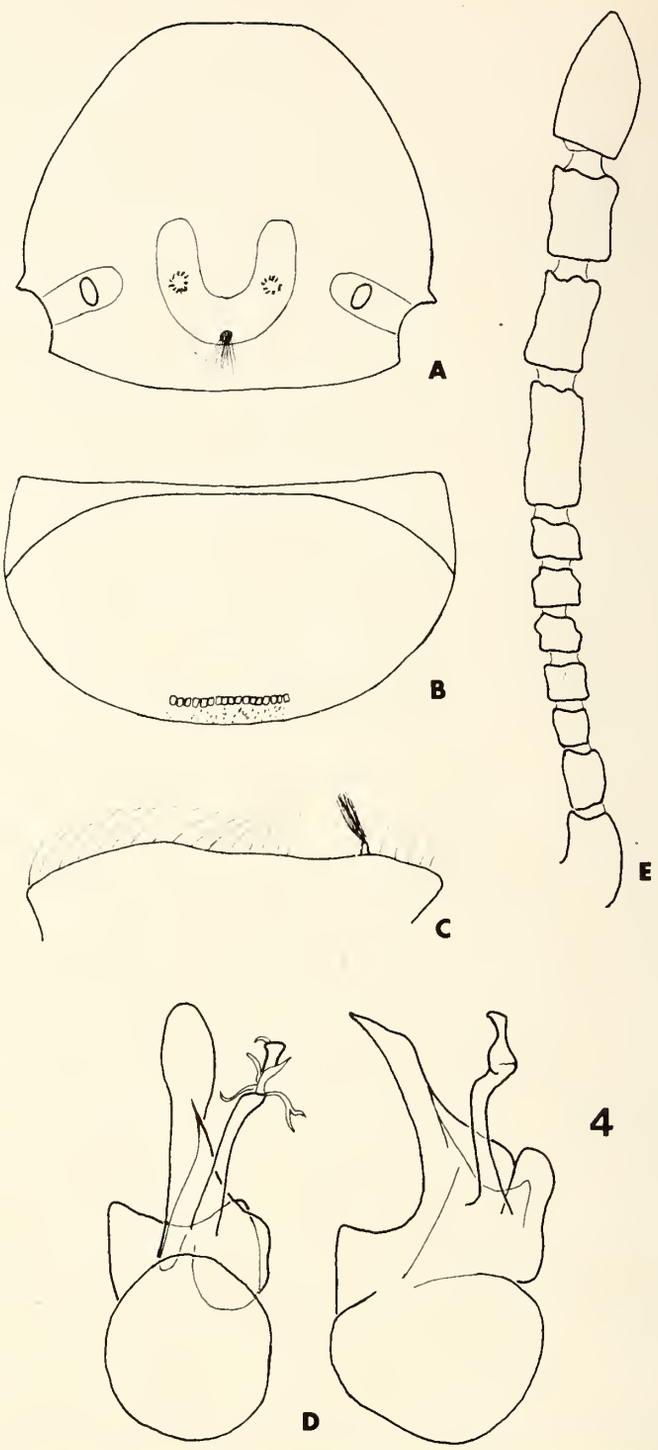

Fig. 4: *B. varia* n. sp., A. dorsal view pronotum, B. ventral view sternite VI, C. left lateral view pronotum, D. dorsal and left lateral view genitalia, E. dorsal view antenna.

men with sternite II narrowly flattened medially, III–VI convex medially, abdomen excavate in lateral view, sternite VI with preapical row of 12–25 flattened almost square setae.

Male holotype: Fortuna, Panama. Head 0.57 long, antennomere VI 0.05 long, 0.06 wide, antennomere VII 0.05 long, 0.06 wide; pronotum 0.53 long, 0.63 at widest point; elytra 0.80 long.

Specimens examined, 69: Holotype male: Panama: Chiriquí: Fortuna, 8°44′N 82°15′W, VI-23-1978, H. Wolda, UV light. Paratypes: 60 males, same data except

scattered dates from VIII-20-1976 to IX-14-1978; 8 males, Alto Lino, 3 km NE Boquete, VIII-20-1976 to IX-14-1978, H. Wolda, UV light.

Discussion: Distinct by the small, almost square flattened setae in a wide row on sternite VI. Most similar to *woldai* and *gibbosa* by the last four enlarged antennomeres and the medially excavate sternites. The antebasal impressions varies from a medial flattened area with only a suggestion of an impression to a deep oval with a slightly raised area extending from the anterior margin. Dissected specimens with these variations are indistinguishable from the specimens with a distinct U-shaped impression. One specimen collected at Fortuna on V-10-1979 possesses a ventral lobe of the aedeagus which is twice as wide as those in the other specimens, but this feature has been invariable in all the other specimens dissected. This aberrant specimen is not designated as a paratype.

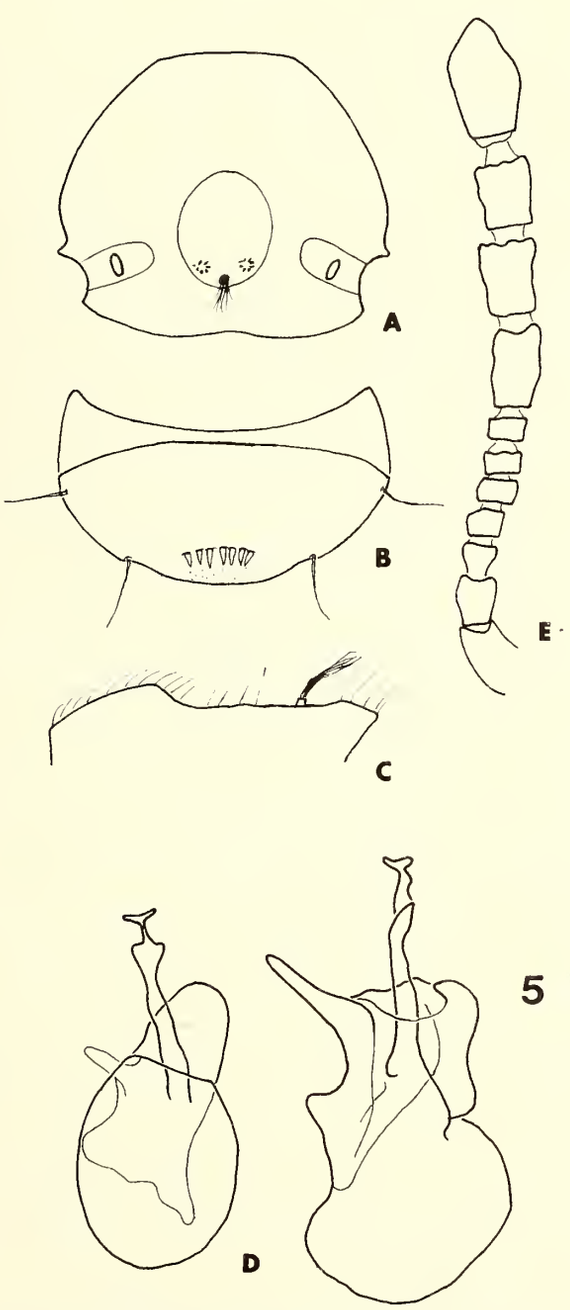

Fig. 5: *B. woldai* n. sp., A. dorsal view pronotum, B. ventral view sternite VI, C. left lateral view pronotum, D. dorsal and left lateral view genitalia, E. dorsal view antenna.

Barrojuba woldai n. sp.
(Fig. 5)

Length 1.92–2.32. Head with last four antennomeres enlarged, VII short, about same length as VI; pronotum with deep circular antebasal impression, medial tubercle on posterior rim of impression, small sensory area on each side slightly anterior to tubercle, tubercle short and difficult to see in lateral view, tuft of setae at apex angled posteriorly; abdomen with sternite II flattened medially, III–VI concave medially with VI concave through entire width, abdomen appearing excavate in lateral view, sternite VI with preapical row of flattened pointed setae.

Male holotype: 16 km W Almirante, Panama. Head 0.68 long, antennomere VI 0.04 long, 0.06 wide, antennomere VII 0.05 long, 0.06 wide; pronotum 0.45 long, 0.55 at widest point; elytra 0.70 long.

Specimens examined, 4: Holotype male: Panama: Bocas del Toro: 16 km W Almirante, I-22-1980, H. Wolda, UV light. Paratypes: 3 males, same data except date, one each with, I-18-1980, I-21-1980, I-29-1980.

Discussion: Very similar in appearance to the few specimens of *varia* which have the deepest impression on the pronotum. Separated by the deep oval antebasal impression which lacks any suggestion of a medially raised area; and the short preapical row of pointed flattened setae on sternite VI. Closest to *varia* and *gibbosa* by the enlarged last four antennomeres and the medially excavate sternites.

Barrojuba gibbosa n. sp.
(Fig. 6)

Length 2.16–2.41. Head with last four antennomeres long, antennomere VI about same length as VII; pronotum circularly excavate before antebasal tubercle, impression laterally carinate on posterior margin, disc medially tumid at anterior margin of impression, sensory areas elongate and just anterior to lateral carinae of impression, impression extending laterally to antebasal foveae, tubercle not visible in lateral view, tuft of setae at apex upright; abdomen with sternites II–V medially concave, in lateral view abdomen appearing excavate, sternite VI concave through width, with transverse preapical row of rectangular setae.

Male holotype: Fortuna, Panama. Head 0.60 long, antennomere VI 0.05 long, 0.07 wide, antennomere VII 0.06 long, 0.07 wide; pronotum 0.52 long, 0.68 at widest point; elytra 0.82 long.

Specimens examined, 71: Holotype male: Panama: Chiriquí: Fortuna, 8°44′N 82°15′W, V-10-1979, H. Wolda, UV light. Paratypes: 70 males, same data except scattered dates from VIII-26-1977 to V-23-1979.

Discussion: Distinct in the genus by the complete antebasal transverse sulcus and tumid pronotal disc of the pronotum, and the medially excavate sternites.

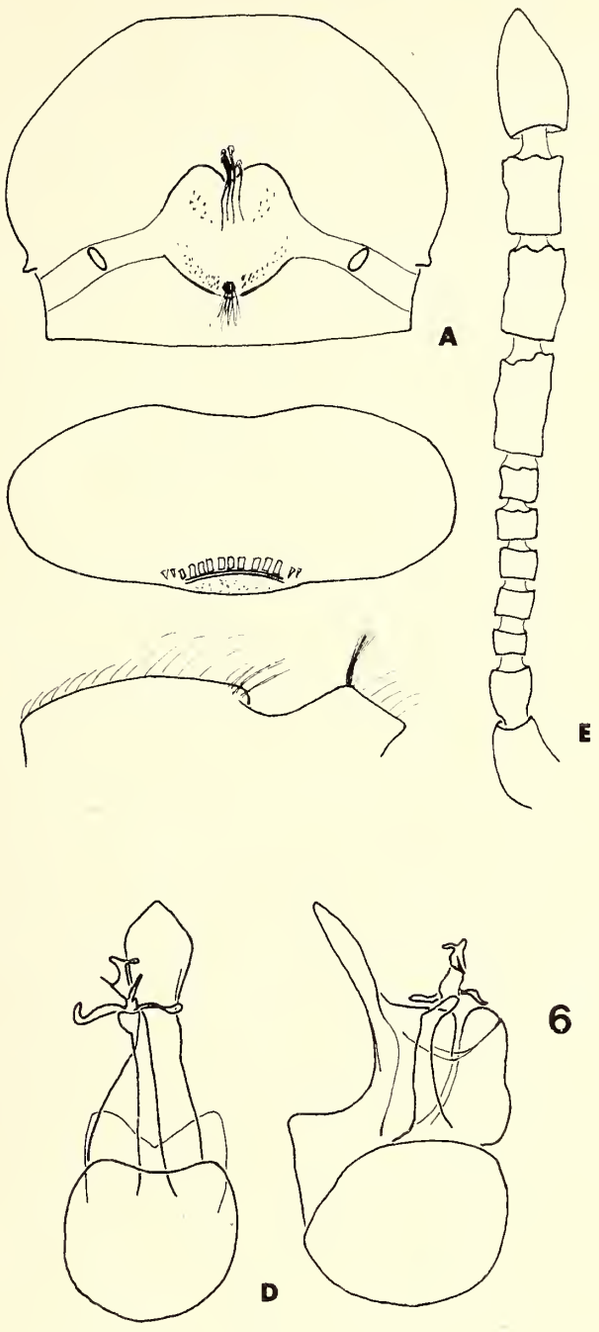

Fig. 6: *B. gibbosa* n. sp., A. dorsal view pronotum, B. ventral view sternite VI, C. left lateral view pronotum, D. dorsal and left lateral view genitalia, E. dorsal view antenna.

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