A NEW GENUS OF BEROTHIDAE FROM TROPICAL AMERICA, WITH TWO NEW SPECIES*

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Previously, the Berothidae of the Western Hemisphere all could be referred to three genera: Naizema Navas and Cyrenoberotha MacLeod and Adams, both restricted to South America, including one species each, and Lomamyia Banks, predominately North American. A generic level discussion of these taxa may be found in MacLeod and Adams, 1967, and in Aspöck, 1986. In material submitted to me for identification are representatives of two species, from Central and northern South America, which belong to a previously undescribed genus. Institutions wherein material has been deposited are abbreviated as follows: DHJ—Daniel H. Janzen Collection; FSCA—Florida State Collection of Arthropods; EGM—Ellis G. MacLeod Collection; IZAV—Instituto de Zoologia Agricola, Universidad Central de Venezuela, Maracay; MCZ—Museum of Comparative Zoology, Harvard University; NHMW—Naturhistorisches Museum, Wien, Austria; USNM—United States National Museum of Natural History, Washington.

Spiroberotha, new genus

Head with lower face barely projecting beyond eyes, mouthparts inconspicuous; vertex tubercles scarcely discernible; scape about as long as six flagellomeres. Pronotum quadrate, with downturned lateral margins. Scales present on fore coxa of female; variably on meso and metapleura; absent from wing.

Forewing (Fig. 3) subfalcate to falcate; recurrent humeral vein represented by basad-directed crossvein, widened anteriorly. SC and R fused apically; 1 radial crossvein; basal piece of MA and RS arises slightly distally of MP fork; stems of RS and M fused basally. Usually one outer gradate crossvein; inner gradates aligned; jugal lobe reduced. Hindwing with C and SC approximate for much of

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their length; 1 or 2 radial crossveins; basal piece of MA arises near fork of MP, crossvein-like (not sinuous); 3 outer gradates.

Obsolete callus cerci bearing small trichobothria present in both sexes. Male ectoproct bearing hooklike projection ventromedially; sternite 8 with two posterolateral, and sternite 9 with two posterior, projections, each bearing apically 1 or 2 large setae or small spurs. Gonocoxites finely setose dorsally, with apical upturned projections. Ventrally to gonarcus a small bilobed sclerite. Mediuncus ribbonlike with fine transverse striations, spirally coiled; margins of ribbon folded toward center of coil. Between mediuncus and gonarcus lie two slender longitudinal sclerites and a median tract of short setae. Hypandrium internum elongate, poorly sclerotized.

Female with lateral tubercles on sternum 7 densely setose; eighth sternite projecting medially; apodemes connect with those of eighth tergite. Copulatory bursa finely setose or microtrichiate internally; bursal duct elongate, spermatheca spherical.

This genus, based upon wing shape, presence of scales, cercal trichobothria and elongate hypocaudae, is referred to Berothinae, and eidoconically resembles *Lomamyia*, from which it can immediately be separated by the single radial crossvein, the seta-bearing projections of the male eighth and ninth sternite, visible even in pinned material, and the spirally coiled mediuncus. While the mediuncus of *Naizema* is also spirally coiled, it appears to consist of longitudinal bristles rather than a ribbon, and the coiling is not so extensive (no more than a single turn). Thus the resemblance seems as likely due to convergence as to synapomorphy. Spiral coiling occurs in the African *Nosybus*, which lacks elaboration of the male sternites, and in the female has elongate gonapophyses laterales articulated at their bases and without hypocaudae; in addition the wings are rounded, with SC and R connected by a crossvein (Aspöck and Aspöck, 1983). *Nosybus* is placed in a separate subfamily, Nosybinae, and cannot be considered related to *Spiroberotha*. The type species of *Spiroberotha* is *S. sanctarosae*.

**Spiroberotha sanctarosae**, new species

Figures 1, 3-9

Head: vertex pale yellow with fuscous spots, frons fuscous with pale area at antennal bases; clypeus, labrum, and palpi fuscous; a pale band at clypeofrontal suture. Scape elongate, pale posteriorly;
anteriorly fuscous and densely fuscous-setose; flagellum pale yellow. Pronotum pale yellow with a few fuscous spots, markings narrowly fuscous. Mesonotum similarly marked, but with fuscous areas at base of scutellum and irregularly elsewhere. Thoracic pleura fuscous, pale marked. Setae of dorsum of scapes, vertex, and pale central thoracic area pale yellow, of dark lateral stripe area, fuscous, of pleurae mostly white. Legs pale, femora lightly spotted, tibiae dark punctate with row of larger dark spots on exterior surface, tarsomeres fuscous-tipped; setae mostly pale, some on tibia and tarsus dark. In females, a dense array of black scales on fore coxa; patches anteriorly on mesopleuron, metapleuron, and sometimes mesocoxa with both black and white scales.

Wings (Fig. 1): Forewing only weakly falcate, margin posterior to apex almost straight. Membrane pale to light brown, dark spots at base of RS+MA, crossvein r-rs, and wing tip; gradates dark, barely dark margined; stigma fuscous or pale rufous; most veins pale with dark punctations. Hindwing setae, membrane and veins pale, with some punctations on costa of darkly marked individuals. Three gradates in hindwing.

Abdomen fuscous above, pale below. Male terminalia ivory.

Male ectoproct + tergite 9 bears small medially curved hook on posterovertral margin (Figs. 4, 5). Posterior margins of sternites 8 and 9 bear two pairs of projections, the lateral ones strongly upcurved; each bearing apically a single black spur or seta. Gonocoxites apically bear upcurved hooks. Mediuncus spirally coiled, forming 3 1/2 turns (Fig. 5).
Female sternite 7 with posterolateral tubercle (Fig. 7). Sternite 8 confluent with tergite, subtriangular, with weakly bilobed lateral tubercles (Fig. 8). Tergite 9 + ectoproct produced ventrally as lanceolate process. Gonapophyses laterales or gonoxites 9 bearing long cylindrical hypocaudae. Copulatory bursa elongate-pyriform, bearing internally an anterodorsal field of setae or microtrichia (Fig. 9). Bursal duct elongate, coiled; spermathecal duct elongate, expanded apically; fertilization canal short, arising near apex of spermathecal duct.

Measurements (mm, means in parentheses): forewing length, males, 5.9–(6.0)–6.1; females, 6.5–(6.7)–6.8.


The only other berothid known to me as occurring in Central America is Lomamyia squamosa Carpenter, of which I have seen specimens from Mexico, Belize, and Honduras. It differs from S. sanctarosae in larger size, and in having three radial crossveins, in addition to the genitalic characters distinctive to that genus. The species is named for the type locality, Parque Nacional Santa Rosa, 300m elevation, on the Pacific coastal plain 25 km south of La Cruz, Guanacaste Province, where S. sanctarosae was taken at combined black and fluorescent lights in the understory of primary forest, entirely during the dry season (December–April). The Venezuelan specimen is in fragments, but the wings and male genitalia are preserved.

**Spiroberotha fernandezi**, new species

Figures 2, 10–12

Habitus resembling that of Spiroberotha sanctarosae, wings more strongly falcate (Fig. 2). Male sternite projections short, the lateral ones only slightly bent dorsad, each with two apical black setae (Fig.
Figures 3–9, *Spiroberotha sanctarosae*: 3, wing venation, female; 4, male abdomen, lateral view; 5, same, ventral view; 6, gonarcus complex, ventral view; 7, female abdomen, lateral view; 8, sternite 8, posterior view; 9, bursa and spermatheca complex, right lateral view.

Figures 10–12, *Spiroberotha fernandezi*: 10, male abdomen, lateral view; 11, apex of sternite 9, ventral view; 12 female sternite 8, posterior view.

Explanation of abbreviations: c.b.—copulatory bursa; ect—ectoproct; f.c.—fertilization canal; gcx—gonocoxites or entoproctus; gs—gonarcus; h.i.—hypandrium internum; hyc—hypocaudae; mu—mediuncus; sd—spermathecal duct; sp—spermatheca.
Female sternite 8 more excavated between apical and lateral projections, than in *sanctarosae* (Fig. 12).

Measurements (mm, means in parentheses): forewing length, males, 5.5–(6.1)–7.2; females, 5.7–(7.1)–7.8.


Males of this species, even as pinned specimens, are easily distinguished from those of *sanctarosae* by the double setae on the sternite projections; in both sexes the wings are more strongly falcate. The Sucre and Aragua localities for *fernandezi* are near the north coast of Venezuela, while the Guarico locality is in a savannah region somewhat to the south. Besides the two species of *Spiroberotha*, the only other South American berothid known to have falcate wings is *Lomamyia trombetensis* Penny from Para, Brazil, which has 4–5 radial crossveins and a prominent forewing dark spot posterior to the stigma, between RS3 and RS5. I take pleasure in naming this species after the late Dr. Francisco Fernandez Yepes, of the Universidad Central de Venezuela, the collector of the majority of the specimens.

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