

NEUROPTERA OF THE AMAZON BASIN

Part 8 Berothidae

Norman D. Penny *

Summary

A new species of Berothidae is described from the Rio Trombetas, Pará State. This constitutes the first record for this family in Brazil and all of northern South America.

INTRODUCTION

The family Berothidae is a small one, with about 61 species described worldwide, in 22 genera. As adults they are generally of medium size, brown in color, with elongate, often falcate wings and a weak, fluttering flight. Other morphological characteristics are large, hairy tubercles on the head; absence of ocelli; filiform antennae; subequal wings, often with abundant pilosity; and females sometimes bearing wing scales. Trichosors are present along the wing margin. Crossvein cu-a of hindwing is long and oblique, giving the impression that Cu is apically fused, leaving a closed basal cell. In the male genitalia the ninth tergite is fused with the ectoproct (except in *Cyrenoberotha*) and the mediuncus is elongate and sometimes coiled. In more specialized Berothinae, the female ninth gonocoxites bear elongate hypocaustae.

BIOLOGY

Only very recently has the life cycle of Berothidae been elucidated. Eggs are placed on the ends of long stalks, either separately (*Spermophorella*) or in clusters of up to 12 (*Lomamyia*), often on tree trunks (Tjeder, 1959). For *Lomamyia latipennis* Carpenter, egg incubation pe-

riod is seven days. There are three larval instars lasting 12, 3, and 21 days respectively (Taber & Tauber, 1968). First and third instars are active predators of termites, while the second instar is a nonfeeding stage, hanging immobile from the tip of the abdomen (Tauber & Tauber, l. c.). The cocoon is oval and transparent, with adults emerging after 20 days (Tauber & Tauber, l. c.). Almost all records of berothid biology pertain to North American species of *Lomamyia*.

SYSTEMATICS

Two classic papers, one by Tjeder (1959), and the other by MacLeod & Adams (1967) have greatly clarified the phylogeny, morphology and higher classification within this family. A series of recent papers on the Asiatic and European fauna by Aspöck & Aspöck (1980, 1981a, 1981b) promises to give us more knowledge of systematics and morphology of the Old World species.

MacLeod & Adams (1967) divided the Berothidae into four subfamilies: the *Cyrenoberothinae* confined to Chile, the *Rhachiberothinae* confined to southern Africa, the *Nosybininae* confined to southern and central Africa, and the *Berothinae*, which is almost cosmopolitan in tropical and south temperate regions of the world. Furthermore, MacLeod & Adams (l. c.) selected 23 morphological characters which are variable within the Berothidae, and considered of evolutionary importance, and demonstrated a phylogenetic index for eight genera, belonging to all four subfamilies.

* Instituto Nacional de Pesquisas da Amazônia, Manaus.

Within South America, known records of berothids are very few: Luis E. Peña collected 69 specimens of *Cyrenoberotha penai* in northern Chile between 18–27 October, 1957; a collection without date or more specific locality was made of *Naizema* in "Patagonia"; A. C. Jensen-Haarup collected one male and one female of *Naizema* at Santa Rosa (37°S, 64°W) in west-central Argentina in 1905; and P. Jörgensen collected one male of *Naizema* on 29–XII–1907 at Potreros (33°S, 69°W), Argentina.

Thus, it was much to my delight and surprise that on a recent collecting trip to the Rio Trombetas, a northern tributary of the Middle Amazon, I was able to collect one male and one female berothid that belonged to neither of the genera known from South America. These are the first published records for this family for an extensive area from Honduras to central Argentina, although there have been several recent collections of an undescribed, unusual berothid from Costa Rica and Venezuela (Oliver S. Flint, Jr., Phillip A. Adams, F. Fernández-Yépez, personal communications).

LOMAMYIA TROMBETENSIS Penny,
n. sp. — (Figs. 1–8)

Original description based on 1 male, 1 female, pinned with genitalia in glycerin.

Head: Anterior tentorial pits prominent; labrum about twice as broad as long. Face extending only slightly below level of compound eyes. Frons yellow, with small fuscous spots at eye margin and anterior tentorial pits; scattered, erect, dark setae. Maxillary and labial palpi dark brown, with last segment tapering to elongate, acute tip. Compound eyes relatively small, not reaching posterior margin of head. Vertex elevated medially, yellow with mottled dark brown, especially in two medial lines from between antennae to posterior margin of head and

at setal bases; numerous, long yellow and fuscous setae. Antennae consisting of elongate, cylindrical, yellow scape with fuscous spot ventrally, quadrate yellow pedicel, and 94 yellow, moniliform flagellomeres, which are twice as wide as long.

Thorax: Pronotum longer than wide; mottled yellow and fuscous, being darker along midline and setal bases; numerous long, erect, yellow and fuscous setae in female, abundant short yellow setae in male. Meso- and metanota and pleural regions also mottled yellow and fuscous with long yellow and fuscous setae.

Legs: All legs yellowish with numerous small fuscous spots; numerous long yellow and fuscous setae. Fuscous setae becoming pale apically. Forelegs not modified for grasping. Two tarsal claws and arolium present.

Wings: (Fig. 2) Forewing elongate; infusate, becoming darker at apex; apically falcate. Pterostigma reddish-brown. Costal area without recurrent humeral crossvein. Most costal crossveins branched. Radial sector seven-branched. Longitudinal veins alternating yellow and fuscous in narrow bands. Four or five r-rs crossveins. Outer gradate series of two or three crossveins below pterostigma, broadly margined with fuscous. Inner gradate series of four crossveins, the first and last being broadly margined with fuscous. First fork of CuA swollen at bifurcation. Abundant setae along all veins. Distinctive dark pigment spot along crossveins below pterostigma. Hindwing elongate; transparent, except infusate below pterostigma, along inner gradate veins, and at wing apex; apically somewhat falcate. Pterostigma reddish brown. Costal area very narrow; crossveins simple. Three r-rs crossveins. Three inner gradate crossveins, no outer gradate veins. Basal piece of MA vertical, straight. Cup not developed. **Abdomen:** Dark brown with numerous, long yellow and fuscous setae, with fuscous se-



Fig. 1 *Lomamyia trombetensis* Penny, n. sp. general aspect.

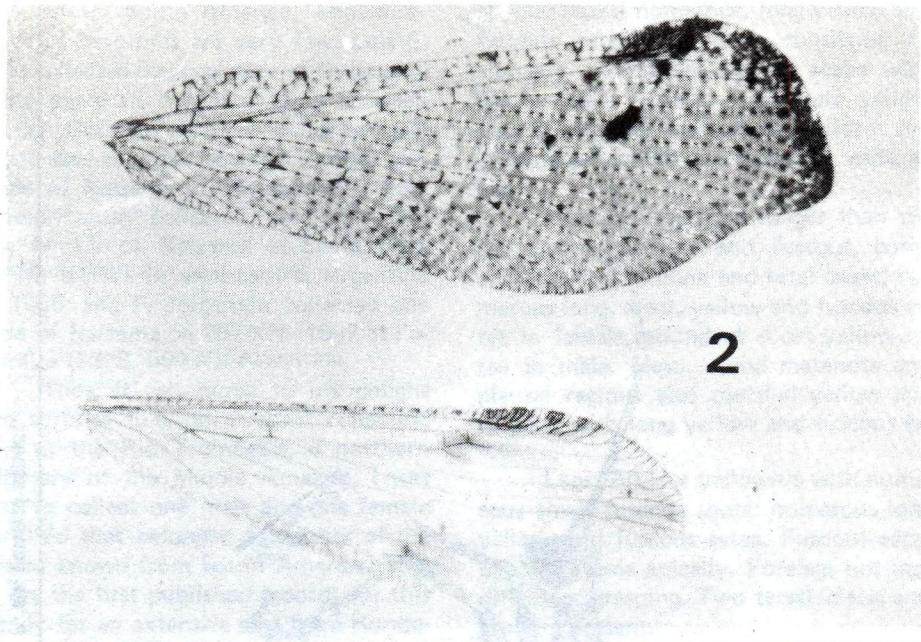


Fig. 2 *Lomamyia trombetensis* Penny, n. sp. right fore — and hindwings.

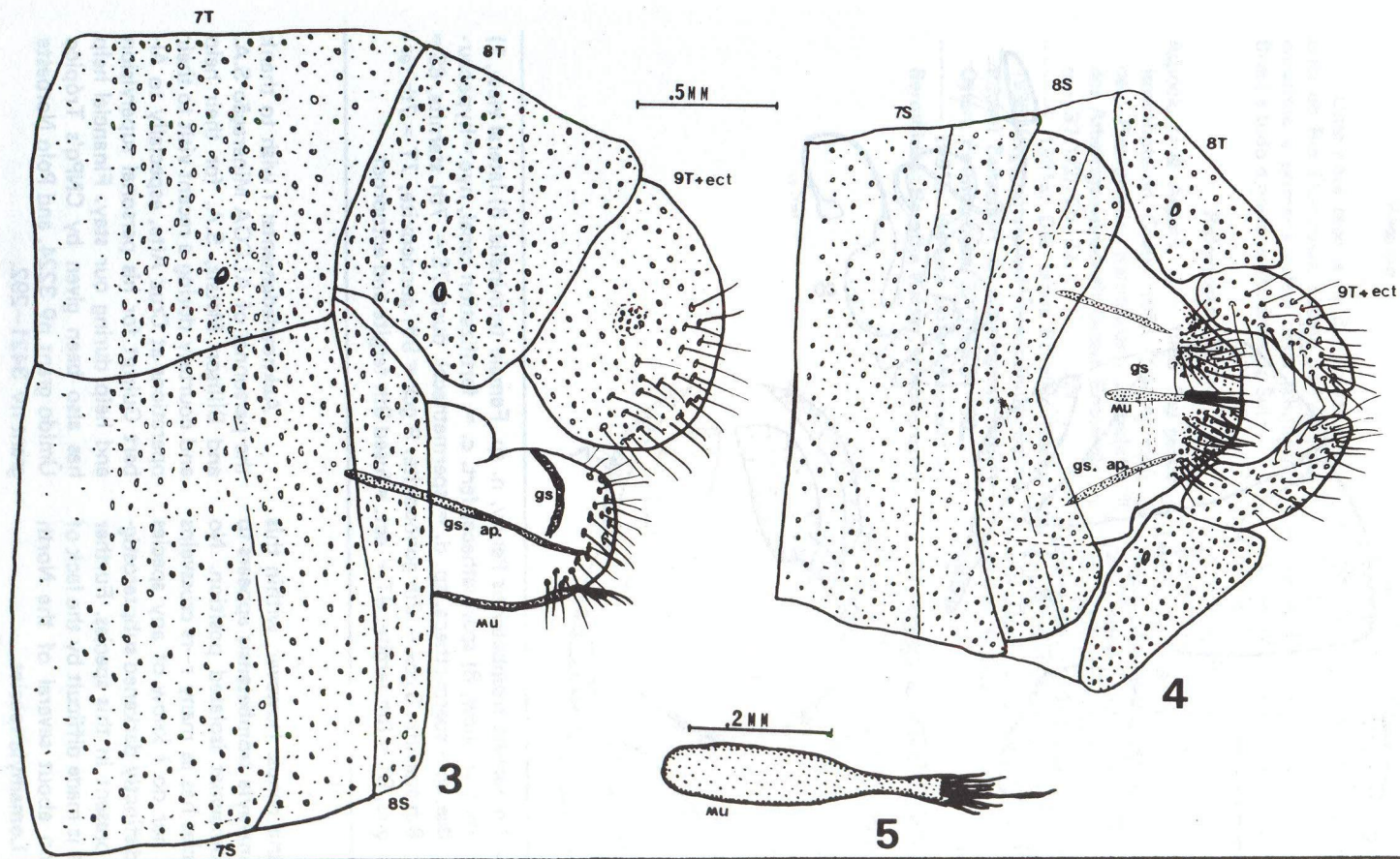
tae apically pale. All sternites with transverse suture on caudal third, giving the appearance of pseudo-segmentation. Male ninth tergite and ectoprocts fused (Fig. 3). Callus cerci very weakly formed, with trichobothria very difficult to detect. Ninth sternite a narrow band, tenth sternite absent. Gonarcus desclerotized medially (Fig. 4). Mediuncus a short, central shaft, with long, simple terminal setae (Fig. 5). Female seventh sternite weakly sclerotized medially, except for small medial protuberance, and two triangular lateral plates (Fig. 7). Sclerite connecting seventh and eighth sternites lacking. Eighth sternite narrow, heavily sclerotized transverse band, broader laterally. Eighth gonocoxite small, medial sclerotized band. Ninth tergite and ectoproct fused (Fig. 6), extending ventro-anteriorly as narrow band. Ninth gonocoxites with elongate, narrow hypocaustae. Spermatheca caudally swollen into sphere, with long, thin spermathecal duct (Fig. 8).

Length of Body: male, 7 mm; female, 7 mm.

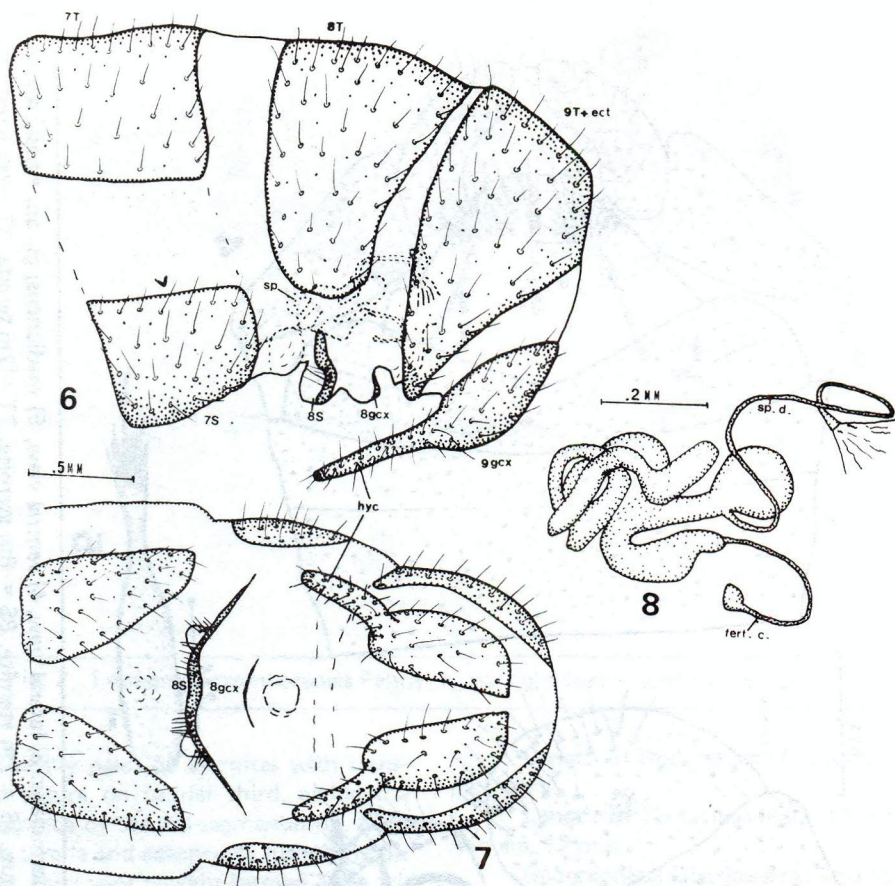
Length of Forewing: male, 11 mm; female, 12 mm.

Geographical Distribution: This species has only been collected at BRAZIL: Pará, Rio Trombetas, Mineração Rio Norte, km 22, N.D. Penny, in the INPA Systematic Entomology Collection, holotype male on 26-XI-1982, and allotype female on 20-XI-1982.

Phylogeny: This species is clearly among the derived groups of Berothinae. The falcate wings, fused ninth tergites and ectoprocts, elongate hypocaustae of the ninth gonocoxites and elongate, thin spermathecal duct all indicate a close relationship with *Lomamyia*. In fact, of the 23 characters listed by MacLeod and Adams (1967), all character states are identical with *Lomamyia*, except that squamae are not present on the wings, which is also the case for some *Lomamyia* species. Thus, this species falls within the varia-



Figs. 3-5. *Lomamyia trombetensis* Penny, n. sp. male terminalia. 3) lateral view, 4) ventral view, 5) mediuncus; gs. ap. = basal apodeme of gonarcus, gs = gonarcus, mu = mediuncus, 7S = 7th sternite, 8S = 8th sternite, 7T = 7th tergite, 8T = 8th tergite, 9T + ect = 9th tergite and ectoproct.



Figs. 6-8. *Lomamyia trombetensis* Penny, n. sp. Female terminalia. 6) lateral view, 7) ventral view, 8) spermatheca, fert. c. = fertilization canal, hyc = hypocaustae, sp = spermatheca, sp. d. = spermathecal duct, 7S = 7th sternite, 8S = 8th sternite, 8gcx = 8th gonocoxite, 9gcx = 9th gonocoxite, 7T = 7th tergite, 8T = 8th tergite, 9T + ect. = fused 9th tergite and ectoproct.

bility of this genus. However, within this genus *Lomamyia trombetensis* appears to hold a somewhat isolated position. No other species has as many r-rs crossveins (4 to 5), nor do I know of any species with the distinctly darkened subpterostigmal spot present in this species. Further placement is made difficult by the lack of information about several of the North American *Lomamyia* species.

Acknowledgments: I wish to thank the personnel of ALCOA Mineração S.A. and Billiton Metais, S.A. for their help and courtesy during a recent visit to their operations at Cruz Alta, especially to Albert Guirret for his personal supervision and help during our stay. Financial help has also been given by CNPq's Trópico Úmido grant nº 3224, and Polo Noroeste grant nº 3421-292.

Resumo

Uma nova espécie de Berothidae é descrita do Rio Trombetas, Estado do Pará. Isto constitui a primeira coleta desta família no Brasil e todo o norte de América do Sul

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(Aceito para publicação em 20/6/83).