

# A new genus for *Argyroploce streblopa* Meyrick, 1936 (Lepidoptera: Tortricidae: Olethreutinae)

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**Abstract:** *Streblopotamia* **gen. nov.** from the Neotropical region is described and illustrated. The new genus includes the type species *S. streblopa* (Meyrick, 1936) **comb. nov.**, which is recorded from Costa Rica, Dominican Republic, Guatemala, Mexico, Panama, Puerto Rico, and Venezuela; and *S. oblita* (Razowski & Becker, 2018) **comb. nov.** from Brazil. Larva of *S. streblopa* have been reared from the fruit of *Protium panamense* (Burseraceae) and *Beilschmiedia pendula* (Lauraceae) in Panama.

**Key words:** Brazil, Costa Rica, Dominican Republic, food plant, Guatemala, Mexico, *Neopotamia*, Neotropical, Panama, Venezuela

## INTRODUCTION

*Argyroploce streblopa* was described by Meyrick (1936) based on three specimens: a female from Panama and two females from Guatemala. Clarke (1958) designated as lectotype one of the females from Guatemala and illustrated the adult and its genitalia. He also transferred the species to *Olethreutes* Hübner, 1822. Powell *et al.* (1995) transferred the species to *Neopotamia* Diakonoff, 1973 without comment, most likely based on similarities of the signa in the female genitalia, and Brown (2005) followed that assignment. It remained the only species of *Neopotamia* recorded outside of Asia until the recent descriptions of two new congeners from South America by Razowski & Becker (2018).

In Asia, *Neopotamia* includes 15 species that are distributed primarily in India, Indonesia, Thailand, and Taiwan (Brown, 2005), and although the signa in the female genitalia of the Neotropical species are remarkably similar to those of Asian *Neopotamia*, forewing shape and pattern and male secondary scales are not. Hence, we describe a new genus to accommodate two of the three Neotropical species; the third is retained provisionally in *Neopotamia*.

## MATERIALS AND METHODS

We examined the lectotype and 21 males and 22 females of *Argyroploce streblopa* at the Natural History Museum, London, U.K. (NHMUK) and the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM). We also examined the holotypes of *Neopotamia oblita* Razowski & Becker, 2018 and *N. niveicollis* Razowski & Becker, 2018 deposited in the collection of Vitor Becker, Camacan, Bahia, Brazil (VBC). Dissection methods followed those summarized by Brown & Powell (1991), except the phallus was left *in situ*. Terms for morphological features follow Razowski (2003),

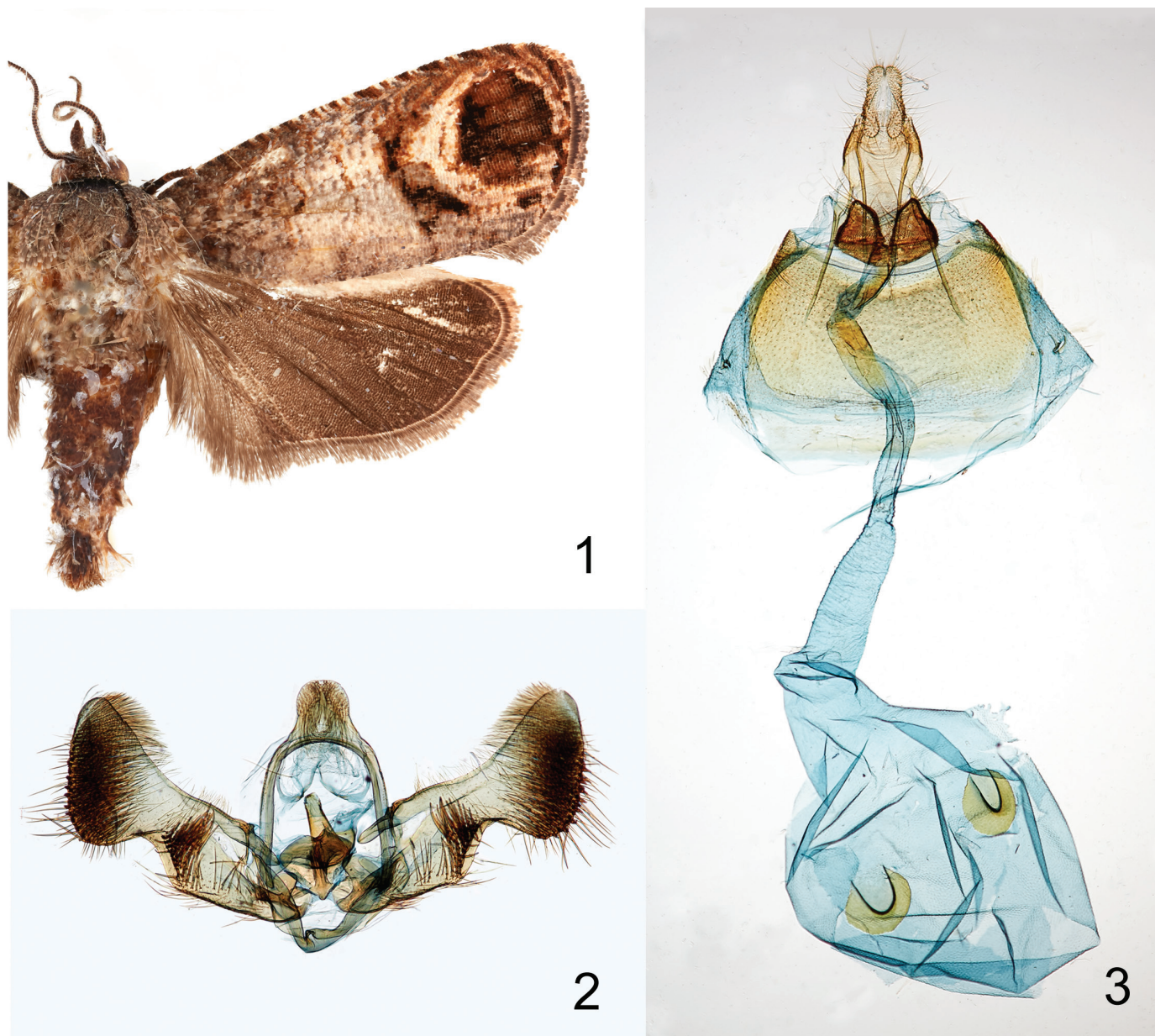
except the term “phallus” is used instead of “aedeagus.” Forewing length was measured from base to apex, including the fringe. In the descriptions, “hind margin” refers to the forewing margin opposite of (nearly parallel to) the costa, frequently called the “dorsum” in the tortricid literature. Slide mounted genitalia were examined using dissecting and compound microscopes. Images of adults and genitalia were captured using a Canon EOS 5D digital SLR (Canon U.S.A., Lake Success, NY) mounted on a Visionary Digital BK Lab System (Visionary Digital, Palmyra, VA).

## RESULTS

### *Streblopotamia* **gen. nov.**

Type species: *Argyroploce streblopa* Meyrick, 1936.

**Diagnosis.** *Streblopotamia* is easily separated from related genera by the distinctive forewing pattern, which includes a large, round, brown blotch occupying most of the distal 0.3 of the wing, and the forewing shape, with a broadly rounded apex and termen. Superficially, the forewing pattern of *Streblopotamia* resembles that of some Asian species of *Sorolopha* Lower, 1901 and the Nearctic *Paralobesia cyclopiana* (Heinrich, 1926), but the genitalia have nothing in common with those genera. In the related genus *Neopotamia* the forewing pattern typically includes a broad triangular patch from the costa, and the forewing has a pointed apex and a nearly straight termen. Males of most *Neopotamia* have a distinctive hairpencil associated with hindwing that is absent in *Streblopotamia*. In the male genitalia of *Streblopotamia*, the uncus is short and broad (rather than long and slender as in *Neopotamia*), the socius is reduced (compared to the broad, densely hairy socii fused with the lateral margin of the tegumen in *Neopotamia*), and the inner edge of the pedunculus bears a broad



**Figs. 1–3.** *Streblopotamia steblopa*. 1. Adult male. 2 Male genitalia, USNM slide 150,271. 3 Female genitalia, USNM slide 150,272.

proximal process for attachment of muscle m4, the latter similar to that of *Neaspasia* Diakonoff, 1989, *Lobesia* Gueneé, 1845, and *Sycacantha* Diakonoff, 1959. The valvae of *Streblopotamia* are much broader than those of *Neopotamia* and more eucosmine-like than the narrow, olethreutine-like valvae of *Neopotamia*. In the female genitalia, the medioposterior part of the sterigma is deeply incised, the ductus seminalis has a posterior origin, and the signa are U-shaped or semicircular, most similar to those of some species of *Neopotamia*. In contrast to the straight antrum of *Neopotamia*, the sclerotized antrum of *Streblopotamia* is distinctly angled to the left as in *Megalota*, *Cosmorrhyncha*, and few other related genera.

**Description.** Adult. *Head:* Frons and vertex rough scaled; length of labial palpus (all segments combined) ca. 1.2 times diameter of compound eye; ocellus present, small; antenna slightly less than 0.5 length of costa of forewing, sensory setae short in both sexes, ca. 0.1 times width of flagellomere. *Thorax:* Dorsum smooth scaled.

Legs unmodified. Forewing (Fig. 1) length 8.0–11.0 mm (mean = 10.8 mm; n = 10), all veins present and separate;  $R_5$  intersects termen just below apex; distance between bases of  $M_3$ - $CuA_1$  about twice that between  $CuA_1$ - $CuA_2$ ; latter opposite less than mid-distance between bases of  $R_1$ - $R_2$ ; trace of chorda more proximal than latter; M-stem atrophied; costal strigulae conspicuous. Hindwing with  $Rs$ - $M_1$  stalked to beyond 0.33 length, distances between bases of  $M_2$ - $M_3$  and  $M_3$ - $CuA_1$  similar; cubital pecten conspicuous in both sexes. *Abdomen:* Male genitalia (Fig. 2) with uncus broadly subrectangular (*S. steblopa*) or broadly ovate (*S. oblita*), hairy ventrally; socius reduced or absent; gnathos ill-defined, mostly membranous; tuba analis membranous; pedunculus of tegumen with long proximal process for attachment of muscle m4; basal half of valva broad; cucullus large, with moderate ventral lobe, separated from sacculus by a ventral incision of valva, densely spined with row of larger spines along outer margin; large area of spines near proximal edge of ventral incision of valva edged by a fine fold; costa of valva weakly undulate; sacculus nearly straight along ventral margin; phallus simple with one minute subterminal dent ventrally, cornuti absent. Female genitalia (Fig. 3) with ovipositor short; papillae anales and apophyses slender; sterigma with two broad, rhomboidal, minutely spined posterior lobes; ostium bursae median; antrum angled to left, with rather weak sclerite accompanied by proximal sclerite of ductus bursae (a long weak cingulum) protecting base of ductus seminalis; ductus bursae long,

ca. 2.0 times length of corpus bursae, gradually widened anteriorly; corpus bursae ovoid, signa two semicircular plates with well-defined, rounded inner margins.

Pupa (based on one exuvium of *S. streblopa*). Typically olethreutine, fusiform, ca. 11 mm in length, 2.8 mm in width (at widest point). No special modifications of head or thorax. Abdominal segment 1 without dorsal spines; double row of dorsal spines on A2–A7; A8–A9 with one row. Posterior end of abdomen bluntly rounded; cremaster absent; a crown of short thorns on A10, with four slender hook-tipped setae.

**Distribution and Biology.** *Streblopotamia* is recorded from Brazil, Costa Rica, Dominican Republic, Guatemala, Mexico, Panama, Puerto Rico, and Venezuela. Larvae have been reared from *Protium panamense* (Burseraceae), which is known from Costa Rica and Panama (Mitré, 1998), and *Beilschmiedia pendula* (Lauraceae), which is known from Costa Rica, Panama, and the West Indies. Given the broad geographic range of the genus, other food plants must be utilized elsewhere. At Rancho Grande, Venezuela (1100 m), adults of *S. streblopa* were collected in January, June, July, August, October, and November, suggesting continual broods. In the Dominican Republic (500 m) adults were collected in late May.

**Etymology.** The name refers to the name of the type species and the related genus *Neopotamia*, and it is considered feminine.

*Streblopotamia streblopa* (Meyrick, 1936), **comb. nov.**  
(Figs. 1–3)

*Argyroploce streblopa* Meyrick (1936: 614).

*Olethreutes streblopa*: Clarke (1958: 551).

*Neopotamia streblopa*: Powell *et al.* (1995: 152); Brown (2005: 430); Razowski & Becker (2018: 36).

**Diagnosis.** *Streblopotamia streblopa* is superficially most similar to *S. oblita*, but it can be distinguished by its slightly larger size and darker hindwing coloration. The male genitalia of *S. streblopa* differ from those of *S. oblita* by the presence of a much deeper concavity along the ventral margin of the valva (only slightly indented in *S. oblita*); a much larger, more pronounced cucullus (only weakly differentiated from the basal portion of the valva in *S. oblita*); and a broad, subrectangular uncus (more ovate in *S. oblita*).

**Molecular data.** Barcodes are available for three specimens of *S. streblopa*, two from Costa Rica and one from Panama. In a neighbor-joining tree the three specimens form a tight cluster [BIN: BOLD: ABV2183] with <0.3% divergence.

**Types.** Lectotype ♀, Guatemala, Chejel, “8.35” [Aug 1935] (NHMUK). Paralectotypes. GUATEMALA: Chejel, “8.35” [Aug 1935] (1♀), W. Schaus (NHMUK). PANAMA: Trinidad R., Sept [no year] (1♀), A. Busck (NHMUK).

**Additional material examined.** COSTARICA: Guanacaste, Área de Conservación Guanacaste, Estación Pitilla, Sector Pitilla, 10.98931, -85.42581, 675 m, 13 Nov 2012 (1♀), 12-SRNP-105724, 14 Nov 2012 (1♂), 12-SRNP-105608, S. Rios & H. Cambrero (USNM). DOMINICAN REPUBLIC: El Seibo Province, 15 km S Miches, ca. 500 m, 31 May 1973 (1♂, 1♀), D. & M. Davis (USNM). MEXICO: Chiapas, Jul (1♂), T. Escalante (USNM). PANAMA: Canal Zone, Barro Colorado Island, 26 Oct (1♂), 30 Oct (1♂), 31 Oct (1♀), 10 Nov (1♂), 15 Nov (3♀), 16 Nov (1♀), 23 Nov (1♂), 14 Dec (1♂), 12 Jan (1♀), all M. Bates (USNM), 11 Apr 1935 (1♀), A. Friedman (USNM), 10–17 Jun 1964 (2♀), W. D. & S. S. Duckworth

(USNM), “3598” in fruit of *Protium panamense*, no date (2♂), Zetek (USNM). “Linc”, 800 m, no date (1♀), Fassl (USNM), from fruit of *Beilschmiedia pendula*, 1 Feb 2011, em: 4 Mar 2011 (1♂), I. Simon (USNM). Porto Bello, May 1913 (1♂), A. Busck (USNM). VENEZUELA: Aragua, Rancho Grande, 1100 m, 17–20 Jan 1978 (1♀), 21–25 Jun 1981 (2♂), 1–5 Jul 1981 (1♂), 11–15 Jul 1981 (1♂), all J. Heppner (USNM), 16–23 Oct 1966 (4♀), 1–5 Nov 1966 (2♂, 1♀), 1–7 Jun 1967 (1♂), 22–31 Jul 1967 (2♂, 1♀), 8–14 Aug 1967 (1♀), all R. W. Poole (USNM).

**Remarks.** Subtle variation in the size and shape of the signa and sterigma in the female genitalia, and in the width of the uncus and the neck of the valva in the male genitalia, suggest that two or more species may be concealed under this name. In particular, the two specimens from the Dominican Republic may warrant description as distinct from *S. streblopa*, but additional material is necessary to assess this variation in a more meaningful context. Also, the two examined specimens from Costa Rica have a shorter forewing length than other specimens examined.

Two specimens in the USNM are labeled “co-type” by August Busck, but they were not among the specimens listed by Meyrick in his description, and hence they have no nomenclatural standing. However, Meyrick (1936) does acknowledge correspondence with Busck in which Busck mentions the two specimens and provides the host data.

*Streblopotamia oblita* (Razowski & Becker, 2018), **comb. nov.**

*Neopotamia oblita* Razowski & Becker (2018: 37).

**Diagnosis.** *Neopotamia oblita* was described from two males from Brazil and illustrated by Razowski & Becker (2018: fig. 7). It is superficially very similar to *S. streblopa*, but it is slightly smaller and has a paler hindwing (pale gray vs. dark brown in *S. streblopa*). The male genitalia of *S. oblita* (see Razowski & Becker, 2018: fig. 18) can be distinguished by the reduced indentation (i.e., neck) of the valva; the smaller, more rounded cucullus; and the somewhat ovate uncus.

Although characters of the female genitalia provide the most compelling evidence of assignment to *Streblopotamia*, *S. oblita* is convincingly assigned to the genus on the basis of its superficial and morphological similarity to males of the type species of the genus.

**Types.** Holotype ♂, Brazil, Minas Gerais, Caraca, 1300 m, 25 Oct 1994, V. O. Becker & K. S. Sattler, Becker No. 93574 (VBC). Paratype ♂. Same data as holotype.

*Neopotamia niveicollis* Razowski & Becker, 2018

*Neopotamia niveicollis* Razowski & Becker (2018: 38).

**Remarks.** *Neopotamia niveicollis* is known only from the holotype female from Ecuador. Although placed in *Neopotamia* by Razowski & Becker (2018), it is unlikely that it is congeneric with Asian *Neopotamia*. In addition, it is dissimilar to *Streblopotamia* in forewing shape and pattern, indicating that it is unlikely to be congeneric with *S. streblopa* and *S. oblita*. Also, the female genitalia lack the angled antrum typical of *Streblopotamia* and many other members of the *Neopotamia* group of genera. The only character that argues for its assignment to *Neopotamia* is the configuration of the signa,

which is similar to that of *N. tornocarpa* Diakonoff, 1972. Hence, until additional material becomes available, we retain it provisionally in *Neopotamia*.

**Type.** Holotype ♀, Ecuador, Pastaza, Mera, 1300 m, Dec 1992, V. O. Becker, Becker No. 100712 (VBC).

## DISCUSSION

The subtribe Neopotamiae (Olethreutini) was proposed by Diakonoff (1973) for 11 genera: *Pseudohedya* Falkovitsh, 1972; *Nyctidea* Diakonoff, 1973 (= *Diakonoffiana* Koçak, 1981); *Meiligma* Diakonoff, 1973; *Megalota* Diakonoff, 1966; *Costosa* Diakonoff, 1968; *Neopotamia* Diakonoff, 1973; *Pseudosciaphila* Obratsov, 1966; *Saliciphaga* Falkovitsh, 1962; *Phaecadophora* Walsingham, 1900; *Apsidophora* Diakonoff, 1973; and *Temnolopha* Lower, 1901. He remarked that the subtribe is “A group of large and robust species with the general appearance of *Argyroploce* and with a series of plesiomorphic characters beside some recent adaptations.” Diakonoff (1983) later added *Xenopotamia* Diakonoff, 1983. Aarvik (2004) described six new genera (i.e., *Afrocostosa* Aarvik, 2004; *Afroploce* Aarvik, 2004; *Afrothreutes* Aarvik, 2004; *Geita* Aarvik, 2004; *Neorrhyncha* Aarvik 2004; and *Paraeccopsis* Aarvik, 2004) and added four other genera (i.e., *Basigonia* Diakonoff, 1983; *Cosmorrhyncha* Meyrick, 1913; *Eccopsis* Zeller, 1852; *Metendothenia* Diakonoff, 1973) to the subtribe. Horak (2006) associated several of the same genera in the Australian fauna, and Razowski (2008) added *Zellereccopsis* Razowski 2008, *Promodra* Razowski, 2008, and *Rufeccopsis* Razowski, 2008, and subsequently, *Taiteccopsis* Razowski 2012. Most recently, Aarvik & Agassiz (2014) added *Neaspasia* Diakonoff, 1989 and *Conaspasia* Aarvik & Agassiz, 2014.

The paired, sclerotized, U-shaped signa of *Streblopotamia* are highly reminiscent of those of *Neopotamia tornocrosa* Diakonoff, 1973, and the short, broad uncus with long setae is characteristic of many genera in the *Neopotamia* group (e.g., Diakonoff, 1973; Aarvik, 2004). On the basis of these two features, *Streblopotamia* is assigned unambiguously to the *Neopotamia* group of genera.

The male genitalia of many of these genera share a variety of similarities (e.g., a digitate process from the costa of the valva sub-basally; a broad, hairy uncus, often bilobed; and a sacculus with varying degrees of asymmetry). Female genitalia, likewise, share a number of features, but have remarkably diverse signa. Diakonoff (1973) recognized three signa types, but within each he also recognized a high degree of variation. For example, for type 2 he indicated “(2) Signa two, large about equal, of diverse shape: banana peel, oblong basket, etc., or sack-shaped with two tops.” The most common signa in the subtribe are comprised of one or more stout, slightly spindle-shaped pegs such as those found in *Megalota*, *Eccopsis*, *Cosmorrhyncha*, *Neorrhyncha*, and others. However, the signa of a few genera deviate considerably from this typical form.

Among the genera currently included in the subtribe, *Neopotamia*, *Streblopotamia*, and *Costosa* all share a similar pair of plate-like signa, at least one of which is semicircular or horseshoe-shaped, and this signum type is highly divergent from that of other members of the subtribe. This character appears to link these three

genera. Alternatively, Aarvik (personal communication) suggests that *Streblopotamia* may be the sister group to *Neaspasia* and *Conaspasia*, together with the Asian *Diakonoffiana*, based on the similarity of the female signa. Aarvik & Agassiz (2014) describe the signa in *Neaspasia* as a curved oval plate with a large rounded opening at the base, and that illustrated for *N. orthacta* (Meyrick, 1908) (Aarvik & Agassiz, 2014: fig. 30) is quite similar to that of *Streblopotamia*. However, the signa of other species of *Neaspasia* (illustrated by Aarvik & Agassiz, 2014: figs. 33–35) appear to be large hollow “horns” similar to those of *Cryptaspasma* Walsingham, 1900 (Microcorsini) and some Eucosmini. In *Neopotamia* and *Streblopotamia* the horseshoe-shaped signa are flat and platelike, not horn-like. The signa in *Conaspasia* are very different, more typically eucosmine with two small slender thorns. And the signa in *Diakonoffiana* appear to be large, hollow, and pouchlike. Also, the antrum in the female genitalia of *Neaspasia*, *Conaspasia*, and *Diakonoffiana* is always straight and never angled to the left as in *Streblopotamia*, *Megalota*, *Cosmorrhyncha* and a few other related genera.

In general, *Streblopotamia* can be distinguished from *Neaspasia* and *Conaspasia* by the very different forewing shape and pattern, the absence of abdominal dorsal pits (present in *Neaspasia* and *Conaspasia*), the absence of an anal roll in the male hindwing (present in *Neaspasia* and *Conaspasia*), and many features of the male genitalia, in particular the shape of the uncus: broad and subrectangular in *Streblopotamia* and subtriangular in *Neaspasia* and *Conaspasia*.

Although neighbor-joining (NJ) trees based on DNA barcodes (cytochrome oxidase I) are of limited value for understanding phylogenetic relationships at deeper levels, they often portray at least some relationships suggested by morphology. To explore this possibility, we constructed an NJ tree that included *Neaspasia* (12 sequences of *N. orthacta*), *Diakonoffiana* (10 sequences of *D. tricolorana* (Meyrick), three of *D. vindemians* (Meyrick), and one of an undetermined species), *Costosa* (two sequences of *C. rodantha* (Meyrick) and two of an undetermined species), *Neopotamia* (two sequences of *N. armatana* Kuznetsov and two of an undetermined species), and *Streblopotamia* (three sequences of *S. streblosa*). In the resulting tree, *Streblopotamia* is portrayed as sister to the cluster that includes (*Costosa*+*Neopotamia*)+*Diakonoffiana*. In turn, all of these taxa form a cluster that is sister to *Neaspasia*. Although this arrangement is unlikely to accurately reflect all phylogenetic relationships of these taxa, it provides insight into some of the potential relationships among them.

In the New World, Neopotamiae is represented by four genera, all of which are restricted to the Neotropics: *Streblopotamia* (two species), *Cosmorrhyncha* (two described and several undescribed species), *Megalota* (32 described species; Brown, 2009, Razowski & Becker, 2011, Brown *et al.*, 2018), and *Eccopsis* (four described species; Brown, 2014). However, it is likely that New World members of the last represent an undescribed genus distinct from Afrotropical *Eccopsis* (Vargas *et al.*, 2017).

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