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A new species of *Stenobiella* Tillyard (Neuroptera, Berothidae) from Australia

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Abstract

Stenobiella variola **sp. n.**, a new species of beaded lacewing (Neuroptera, Berothidae), is described and figured from south-eastern Australia. A preliminary key to *Stenobiella* species is presented.

Keywords

Berothidae, Neuroptera, lacewing

Introduction

Beaded lacewings (Berothidae) are a small family of Neuroptera comprising approximately 100 species occurring throughout most biogeographical regions. Members of the family are recognised by elongation of the pronotum, female usually with hypocaudae and substantial cubital veins in both wings. The larvae are associated with termites, and undergo a degree of hypermetamorphosis during development (Brushwein, 1987).

Four subfamilies of Berothidae are recognised: Rhachiberothinae, Cyrenoberothinae, Berothinae and Nosybinae (Aspöck, 1986; MacLeod and Adams, 1967; New,

1989). Rhachiberothinae have been considered by some authors as a separate family (Aspöck and Mansell, 1994) or as a subfamily of Mantispidae (Willmann 1990). A fifth subfamily, Nyrminae, was erected by Aspöck (1989) based on a highly autapomorphic species (*Nyrma kervillea* Navás) previously placed in Hemerobiidae. Penny and Winterton (2007) recently rediscovered the enigmatic genus *Ormiscocerus* Blanchard from Chile and placed it in Cyrenoberothinae based on various wing and genitalic characteristics; a placement also supported in phylogenetic analyses by Winterton et *al.* (2010). Like *Nyrma* Navás, *Ormiscocerus* was also previously placed in Hemerobiidae and the wing venation of both species show numerous similarities, indicating that *Nyrma* should be placed in Cyrenoberothinae rather than as a separate subfamily. In a cladistic analysis of Berothidae using morphology Aspöck and Nemeschkal (1998) proposed a major reordering of the internal hierarchy and classification of the family with five subfamilies (Cyrenoberothinae, Trichomatinae, Protobiellinae, Nosybinae and Berothinae).

Stenobiella Tillyard (Berothinae) is an endemic Australian genus originally described based on two species (*S. hirsutissima* Tillyard and *S. gallardi* Tillyard) from Queensland and New South Wales (Tillyard, 1916). Kimmins (1930) described a third species of (*S. pulla* Kimmins) from the Northern Territory and Aspöck and Aspöck (1984) subsequently described seven new species, bringing the total number of species to 10. An eleventh species is described and figured herein (*Stenobiella variola* sp. n.) from western New South Wales. A preliminary key to species is presented.

Methods

Genitalia were macerated in 10% KOH at room temperature for one day to remove soft tissue, then rinsed in distilled water and dilute acetic acid and dissected in 80% ethanol. Preparations were then placed into glycerine, with images made with the aid of a digital camera mounted on a stereomicroscope. Genitalia preparations were placed in glycerine in a genitalia vial mounted on the pin beneath the specimen. Terminology follows MacLeod and Adams (1967) and Aspöck and Aspöck (1984). Specimen images were taken using a digital camera with a series of images montaged using Helicon Focus (©HeliconSoft) and links provided to Morphbank for high-resolution images. All new nomenclatural acts and literature are registered in Zoobank[1] as per the recent proposed amendment to the International Code of Zoological nomenclature for a universal register for animal names (Polaszek et *al.,* 2005a,b; Pyle et *al.,* 2008; ICZN, 2008).

[1] http://www.zoobank.org/

Taxonomy

***Stenobiella variola* sp. n.**
urn:lsid:zoobank.org:act:1F7A88BE-C893-4737-A852-6DD0E569937B
Figs 1–3

Holotype male, AUSTRALIA: New South Wales: Tintinallogy Station, 15.i.2010, light sheet, -31.9994°, 143.01706°, S.L. Winterton & N.B. Hardy, light sheet (Australian National Insect Collection).

Paratypes. AUSTRALIA: New South Wales: 2 males, 1 female, same data as holotype (California Academy of Science Collection).

Diagnosis. Distinctively contrasted variegated wing pattern; numerous white non-tapered setae on wings and body, pale patch basally in pterostigma, darker distally; dark scale-like setae absent from wings and abdomen; dark, elongate setae absent from mid coxa; single R_1-Rs cross-vein; dark, elongate setae along entire posterior margin of both wings; female hypocaudae well developed; male paramere-mediuncus complex relatively large.

Description. Body length = 5.0–6.0 mm (male), 6.1 mm (female). *Head*. Black to light brown; anterior tentorial pits distinct; clypeus with dark band and minute pale pubescence; vertex irregularly covered with elongate, non-tapered white setae, multi-directional and partially appressed; raised lateral tubercle with elongate white setae admixed with several longer and more tapered black setae; antenna dark brown to black, scape covered with elongate white setae admixed with dark setae; pedicel with ring of

Figure 1. *Stenobiella variola* sp. n. Female habitus. Photo credit: Shaun L. Winterton.

Figure 2. *Stenobiella variola* sp. n., **A** forewing **B** hindwing. Scale line = 0.5 mm.

dark setae basally, closely approximating a distal ring of white setae; 51 flagellomeres covered with fine dark setae; mouthparts brown with sparse black setae.

Thorax. Pronotum wider than long, dark brown; two latitudinal depressions extending from midline, each with white setae along length; white setae along midline and around margin; admixed with slightly longer and tapered black setae along lateral and anterior margins; mesonotum light brown, blackish posterolaterally, white setae anteromedially in 'V' pattern, admixed with patch of dark setae; dark area glabrous; metathorax light brown with dark patches laterally, posterior portio with tapered pale setae; pleuron with extensive white, non-tapered setae. *Wing* (Figure 2). Forewing length = 6.1 mm. Hind wing length = 5.2 mm. Forewing hyaline with extensive infuscate mottling; venation brown and tan mottled, numerous dark tapered macrosetae along wing veins with infuscate area around base of each seta; rows of white non-tapered setae extensive along all wing veins, admixed with dark, non-tapered setae, distribution of white and dark non-tapered setae relative to surrounding infuscation (i.e. more white setae in hyaline areas); costal and subcostal areas with extensive infuscation, white areas along costal margin with dark mark basad of pterostigma; pterostigma dark with white either side; dark, elongate along entire posterior margin of wing; single cross-vein between R_1 and anterior trace of Rs; 4–5 gradate series cross-veins; distal CuA-MP cross-vein perpendicular to CuA and originating on anterior branch of distal CuA fork; hindwing hyaline; venation light brown to yellow; macrosetae absent, extensive fine tapered setae on all veins, more numerous in distal

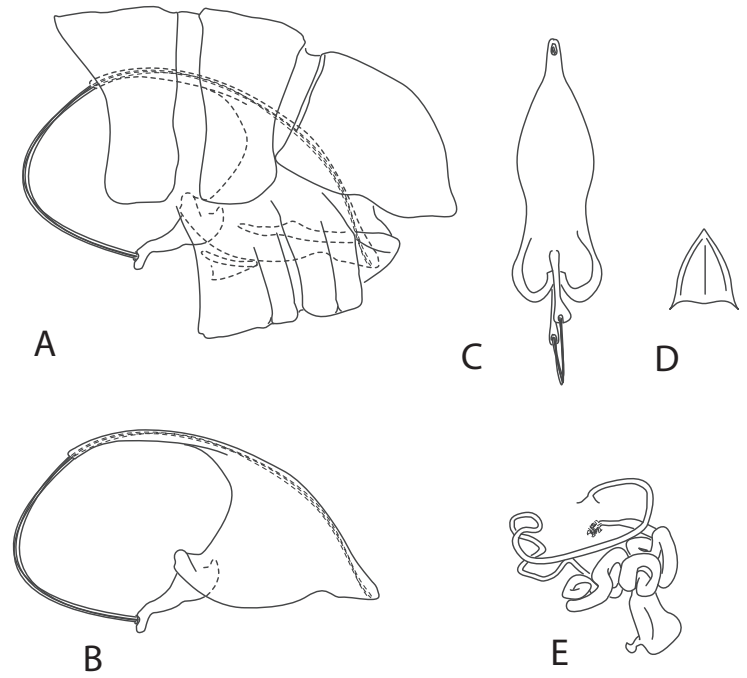

Figure 3. *Stenobiella variola* sp. n., Male genitalia: **A** Genital segments, lateral **B** paramere-mediuncus complex, lateral **C** same, ventral **D** hypandrium internum, ventral. Female genitalia: **E** spermatheca, ventral. Scale line = 0.2 mm.

area of wing and much longer along entire posterior margin of wing. *Legs*. Uniform dark brown with extensive covering of elongate, white setae; setae shorter and darker on tarsomeres.

Abdomen. Uniform brown to light brown; extensive pile of dark setae admixed with white setae, denser on sternites; stripe of white, non-tapered setae laterally from segment one to terminalia

Male genitalia (Fig. 3A–D). Tergite 9 + ectoproct rounded posteriorly, slightly acuminate distally; paramere-mediuncus complex very large with well sclerotised guide; hypandrium internum triangular.

Female genitalia (Fig. 3E). Hypocaudae well developed, elongate; spermatheca large and highly convoluted in shape.

Etymology. The specific epithet is derived from Latin, *variola*; spotted, mottled.

Comments. *Stenobiella variola* sp. n. is a distinctive species based on wing mottling and extensive wing and body covering of white, non-tapered setae. The male genitalia are similar in structure to *S. theischingerorum* Aspöck & Aspöck, to which *S. variola* sp. n. appears to be closely related. No key to species of *Stenobiella* exists. The following key is based largely on the published descriptions by Aspöck & Aspöck

(1984) and examination of additional non-type material in various collections; considering the high likelihood of new species being collected, it should be considered preliminary only. Both sexes are required for the key to work most effectively for some species.

Key to *Stenobiella* species

1. Wing mostly or completely pale; relatively large species (ca. 8.0–10.0 mm forewing length); hypocauda present as a relatively short, blunt process **2**
– Wing dark infuscate to stark maculate; size variable, but usually less than 9.0 mm forewing length; hypocauda as elongate process (rarely greatly reduced to a knob) **3**
2. Wing with costal field dark ..... ***S. kaikai* Aspöck & Aspöck**
– Wing uniformly pale ..... ***S. arrunja* Aspöck & Aspöck**
3. Male paramere-mediuncus complex relatively small (cf. Aspöck & Aspöck 1984: figs 21, 31) **4**
– Male paramere-mediuncus complex relatively large (Fig. 3A–B) **5**
4. Black scale-like setae present on both wings ... ***S. cardaleae* Aspöck & Aspöck**
– Black scale-like setae absent on both wings ..... ***S. muellerorum* Aspöck & Aspöck**
5. Female hypocauda knob-like; spermatheca large; paramere-mediuncus complex shape as in Aspöck & Aspöck (1984: fig. 11) ..... ***S. pindana* Aspöck & Aspöck**
– Female hypocauda elongate; spermatheca smaller; paramere-mediuncus complex shape as in Figure 3 A–C **6**
6. Scales on forewing present ..... ***S. moma* Aspöck & Aspöck**
– Scales on forewing absent **7**
7. Wing largely uniform infuscate but not distinctly maculate ..... ***S. pulla* Kimmins**, ***S. gallardi* Tillyard**, ***S. hirsutissima* Tillyard**
– Wing distinctly maculate **8**
8. Costal field with alternating dark and pale regions to forewing tip (cf. Aspöck & Aspöck 1984: fig. 46–47); hypandrium apex relatively tapered; paramere-mediuncus shape as in Aspöck & Aspöck 1984: figs 3–4 (Northern Territory) ..... ***S. theischingerorum* Aspöck & Aspöck**
– Costal field with alternating dark and pale regions to forewing tip but with distinct pale area midway (Fig. 2A); hypandrium apex not as acutely tapered; paramere-mediuncus shape as in Fig. 3A–C (New South Wales) ..... ***S. variola* sp. n.**

Acknowledgements

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RESEARCH ARTICLE

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The Mycetophagidae (Coleoptera) of the Maritime Provinces of Canada

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Abstract

The Mycetophagidae (hairy fungus beetles) of the Maritime Provinces of Canada are surveyed. Seven species in the genera *Mycetophagus, Litargus,* and *Typhaea* are found in the region. Six new provincial records are reported including *Mycetophagus punctatus* and *Mycetophagus flexuosus,* which are newly recorded in the Maritime Provinces. The distribution of all species is mapped, colour habitus photographs of all species are figured, and an identification key to species is provided. The discussion notes that four of the species found in the region are apparently rare, possibly due to the history of forest management practices in the region; a situation similar to that of a significant proportion of other saproxylic beetles found in the Maritime Provinces.

Keywords

Coleoptera, Mycetophagidae, Mycetophaginae, *Mycetophagus, Litargus, Typhaea,* Maritime Provinces, Canada, biodiversity, fungus beetles, rare species

Introduction

The Mycetophagidae (hairy fungus beetles) are a family of relatively small, fungus-eating beetles. Only five genera and 26 species are known in North America, 15 of which have been recorded in Canada (Bousquet 1991; Young 2002). Parsons (1975) provided the most recent species-level taxonomic revision of the family. Only two species, *Mycetophagus quadriguttatus* Müller and *Typhaea stercorea* (Linnaeus), have previously

been recorded from the Maritime Provinces of Canada (New Brunswick, Nova Scotia, and Prince Edward Island) (Bousquet 1991). Species of *Mycetophagus* are commonly found in the decaying fruiting bodies of mushrooms and fleshy polypores, particularly those that have begun to dehydrate (Young 2002). *Typhaea stercorea* (Linnaeus), an adventive Palaearctic species, is associated with a large variety of moldy substances and is found both outdoors in natural environments, and indoors in association with a variety of stored products (Campbell et al. 1989). The biology of *Litargus* species is poorly known, however, there are records of a number of species associated with fungi, under bark, and in decaying logs (Schwarz 1876; Cline and Leschen 2005; Ulyschen and Hanula 2010). The present study reports the results of an investigation into the biodiversity of this family in the Maritime Provinces.

Methods and conventions

Acronyms (largely following Evenhuis 2010) of collections referred to in the text are:

ACNS Agriculture and Agri-Food Canada, Kentville, Nova Scotia, Canada
ACPE Agriculture and Agri-Food Canada, Charlottetown, Prince Edward Island, Canada
CBU Cape Breton University, Sydney, Nova Scotia, Canada
CGMC Christopher G. Majka Collection, Halifax, Nova Scotia, Canada
CNC Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, Ontario, Canada
DHWC David H. Webster Collection, Kentville, Nova Scotia, Canada
JCC Joyce Cook Collection (now at the New Brunswick Museum, Saint John, New Brunswick, Canada)
JOC Jeffrey Ogden Collection, Truro, Nova Scotia, Canada
KIC Kent Island Collection, Bowdoin College, Brunswick, Maine, USA
NSAC Nova Scotia Agricultural College, Bible Hill, Nova Scotia, Canada
NSMC Nova Scotia Museum, Halifax, Nova Scotia, Canada
NSNR Nova Scotia Department of Natural Resources Insectary, Shubenacadie, Nova Scotia, Canada
RMC Richard Migneault Collection, Edmundson, New Brunswick, Canada

Abbreviations: **FIT**, flight intercept trap.

Identification

An identification key to species [adapted from Young (2002) and Parsons (1975)] found in the Maritime Provinces is provided below. For more detail, elytral patterns, illustrations of antennae, and general species descriptions refer to Parsons (1975).

A. Key to genera

1 Epipleural fold of elytra concave; *Litargus* Erichson ..... ***Litargus tetraspilotus* (Fig. 9)**
– Epipleural fold of elytra horizontal and flat **2**
2 Eyes transverse, sinuate anteriorly ..... ***Mycetophagus* Hellwig**
– Eyes more rounded, not sinuate anteriorly; *Typhaea* Curtis ..... ***Typhaea stercorea* (Fig. 8)**

B. Key to species of *Mycetophagus* Hellwig*

1 Antennae gradually widening towards apex with the last 3, 4, or 5 antennomeres before the apical one more or less serrate and slightly asymmetrical; subgenus *Mycetophagus (s. str.)* **2**
– Antennae with a 4- or 5-segmented club, strongly to feebly differentiated from preceding antennomeres; antennomeres bilaterally symmetrical **4**
2(1) Apical antennomere longer than 2 preceding combined; length 4.6–6.3 mm ..... ***Mycetophagus punctatus* (Fig. 3)**
– Apical antennomere shorter than or as long as 2 preceding combined; length 3.6 mm or less **3**
3(2) Pale elytral markings reaching or crossing suture from basal 1/5 to 1/2 of elytra ..... ***Mycetophagus flexuosus* (Fig. 4)**
– Pale elytral markings not attaining suture .... ***Mycetophagus serrulatus* (Fig. 5)**
4(1) Antennae with a 5-segmented club; subgenus *Ilendus* Casey; length 3.2–4.7 mm ..... ***Mycetophagus pluripunctatus* (Fig. 6)**
– Antennae with a 4-segmented club; subgenus *Parilendus* Casey; length 3.3–4.0 mm ..... ***Mycetophagus quadriguttatus* (Fig. 7)**

***** Note: elytral markings on *Mycetophagus* species are variable.

Results

In the course of this survey 175 specimens of Mycetophagidae were examined – 8 from New Brunswick, 149 from Nova Scotia, and 18 from Prince Edward Island. Included were specimens of seven species in three genera. *Mycetophagus flexuosus* Say is newly recorded in the Maritime Provinces from New Brunswick; *Mycetophagus punctatus* Say is newly recorded in the Maritime Provinces from Nova Scotia; *Mycetophagus serrulatus* Casey is newly recorded in New Brunswick; *Mycetophagus pluripunctatus* LeConte is newly recorded in New Brunswick; *Mycetophagus quadriguttatus* Müller is newly recorded in Nova Scotia; and *Litargus tetraspilotus* LeConte is newly recorded in Prince Edward Island – a total of five new provincial records, two of which are newly recorded

in the region. Four species are known from New Brunswick, six from Nova Scotia, and two from Prince Edward Island (Table 1).

Mycetophagus (*s. str.*) *flexuosus* Say, 1826

Distribution. NEW BRUNSWICK: Madawaska County: Edmundston, 47°22.285'N; 68°14.663'W, 14 August 2010, R. Migneault, in polypore on dead aspen log (1, RMC); Edmundston, 47°22.285'N; 68°14.663'W, 22 August 2010, R. Migneault, in polypore on dead aspen log (1, RMC).

Notes. *Mycetophagus flexuosus* is newly recorded in the Maritime Provinces from New Brunswick (Fig. 1). Cline and Leshen (2005) recorded it from oyster mushroom (*Pleurotus ostreatus*) Fries; Weiss (1920) recorded it from turkey-tail polypore (*Tramates versicolor* (Fr.) Pil.); and Minch (1952) and Pielou and Pielou (1968) recorded it from birch polypore (*Piptoporus betulinus*) (Fr.) Kar.

Mycetophagus (*s. str.*) *punctatus* Say, 1826

Distribution. NOVA SCOTIA: Halifax Co.: Soldier Lake, 7 June 2005, J. Ogden, spruce beetle trap (1, NSNR); **Hants Co.:** Smileys Park, 6 July 2005, J. Ogden, spruce beetle trap (1, NSNR).

Notes. *Mycetophagus punctatus* Say is newly recorded in the Maritime Provinces from Nova Scotia. Both specimens were collected in the central mainland of Nova Scotia (Fig. 1). The species is common under loose bark and on fungi (Downie and Arnett 1996); specifically it has been found on a dead black oak (*Quercus velutina* Lamb.) in Virginia (Robinson 1918); on rooting polypore (*Polyporus radicatus* Schw.) in Iowa (Weiss 1924); on oyster mushroom (*Pleurotus ostreatus*) (Cline and Leshen 2005); and on birch polypore (*Piptoporus betulinus*) growing on gray birch (*Betula populifolia* Marshall) in New York (Minch 1952).

Mycetophagus (*s. str.*) *serrulatus* Casey, 1900

Distribution. NEW BRUNSWICK: Charlotte Co.: Grand Manan archipelago, Kent Island, 23 July 2012, M. Steck, balsam fir forest, sweeping (1, KIC). **NOVA SCOTIA: Annapolis Co.:** Durland Lake, 21 June 2003, P. Dollin, hemlock/balsam fir/black spruce forest (120+ years), bracket fungi on white birch (1, NSMC).

Notes. *Mycetophagus serrulatus* Casey is newly recorded in New Brunswick. The species was reported from Nova Scotia by Dollin et al. (2008) (Fig. 1). Both specimens were found in coniferous forests, one on a polypore fungus growing on a white birch (*Betula papyrifera* Marshall). Cline and Leshen (2005) recorded it from oyster mushroom (*Pleurotus ostreatus*).

Table 1. Mycetophagidae fauna of the Maritime Provinces of Canada

	NB	NS	PE	Distribution in NE North America
Mycetophaginae				
Mycetophagus Hellwig				
subgenus *Mycetophagus* Hellwig				
Mycetophagus flexuosus Say	1			MA, ME, NB, NH, NY, ON, QC, VT
Mycetophagus punctatus Say		1		CT, MA, ME, NH, NS, NY, ON, QC, VT
Mycetophagus serrulatus Casey	1	1		NB, NH, NS, NY, ON, QC, VT
subgenus *Ilendus* Casey				
Mycetophagus pluripunctatus LeConte	1	1		MA, ME, NB, NH, NS, NY, ON, QC, VT
subgenus *Parilendus* Casey				
Mycetophagus quadriguttatus Müller *	1	1		MA, ME, NB, NH, NS, NY, ON, QC, VT
Typhaea stercorea (Linnaeus) †	1	1	1	MA, ME, NB, NH, NS, NY, ON, PE, QC, RI, VT
Litargus tetraspilotus LeConte		1	1	MA, ME, NH, NS, NY, ON, PE, QC, RI, VT
totals	4	6	2	

Notes: * Holarctic species; **†** adventive Palaearctic species; **NB** New Brunswick; **PE** Prince Edward Island; **NS** Nova Scotia.

Distribution in northeastern North America: for the purposes of this treatment, northeastern North America is taken to consist of the following jurisdictions: **CT** Connecticut; **LB** Labrador; **MA** Massachusetts; **ME** Maine; **NB** New Brunswick; **NF** insular Newfoundland; **NH** New Hampshire; **NS** Nova Scotia; **NY** New York; **ON** Ontario; **PE** Prince Edward Island; **PM** Saint-Pierre et Miquelon; **QC** Québec; **RI** Rhode Island; and **VT** Vermont.

Mycetophagus (*Ilendus*) *pluripunctatus* LeConte, 1856

Distribution. NEW BRUNSWICK: Madawaska County: Edmundston, 47°22.285'N; 68°14.663'W, 22 August 2010, R. Migneault, in polypore on dead aspen log (1, RMC). **NOVA SCOTIA: Antigonish Co.:** Cape George Point, 23 June1993, M. LeBlanc, funnel trap (1, NSMC); Colchester Co.: Kemptown, 1 June 1995, 28 June 1995, C. Corkum, young deciduous forest, FIT (2, NSMC); Upper Bass River, 18 May 1995, C. Corkum, old deciduous forest, FIT (1, NSMC); Upper Bass River, 3 June 1995, C. Corkum, old deciduous forest, FIT (1, NSMC); **Cumberland Co.:** East Leicester, 2 June 1995, C. Corkum, old deciduous forest, FIT (1, NSMC); East Leicester, 14 June 1995, C. Corkum, old deciduous forest, FIT (1, NSMC); East Leicester, 15 June 1995, C. Corkum, old deciduous forest, FIT (1, NSMC); Fox River,

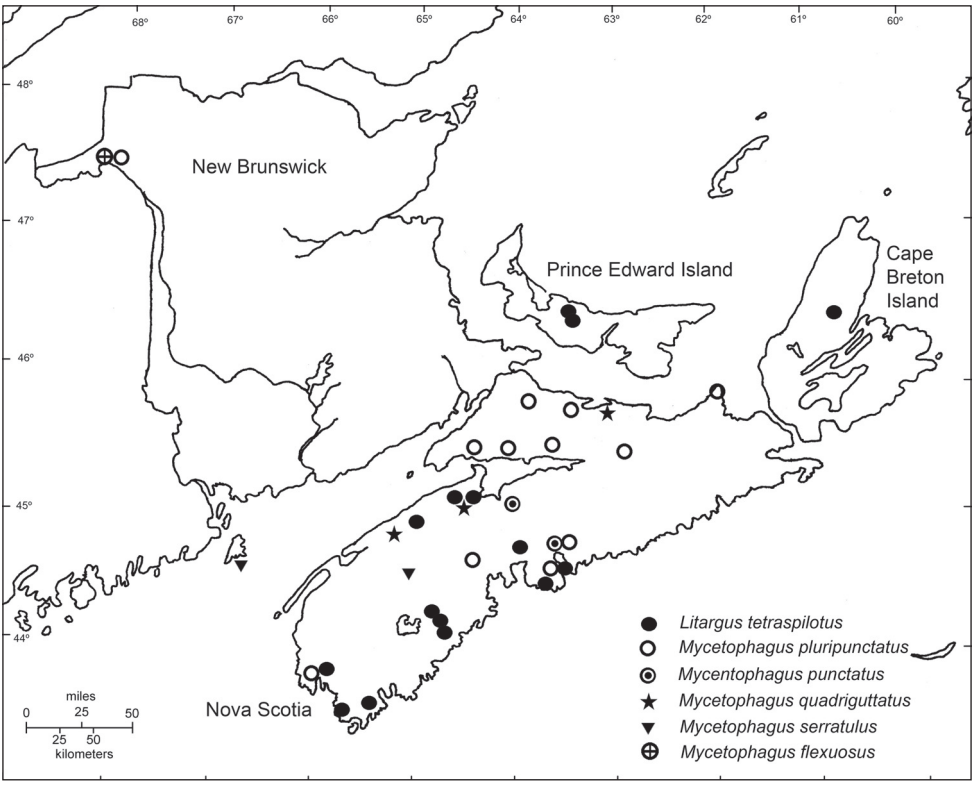

Figure 1. Distribution of *Litargus tetraspilotus, Mycetophagus pluripunctatus, Mycetophagus punctatus, Mycetophagus quadriguttatus, Mycetophagus serrulatus*, and *Mycetophagus flexuosus* in the Maritime Provinces of Canada.

17 May 1995, C. Corkum, young deciduous forest, FIT (1, NSMC); Fox River, 3 June 1995, C. Corkum, young deciduous forest, FIT (1, NSMC); Harrington River, 13 July 1995, C. Corkum, young deciduous forest, FIT (1, NSMC); Wentworth, 21 May-5 July 1965, B. Wright, sugar maple forest, window trap (1, NSMC); **Halifax Co.:** Halifax, 1 December 1986, B. Wright (1, NSMC); Soldier Lake, 30 July 2004, D. MacDonald, spruce beetle trap (1, NSNR); **Lunenburg Co.:** Card Lake, 2-15 June, 1997, D.J. Bishop, red spruce/hemlock forest (old growth), FIT (1, NSMC); **Yarmouth Co.:** Wellington, 23-29 August 1992, J. & F. Cook, mixed forest (1, JCC).

Notes. *Mycetophagus pluripunctatus* LeConte is newly recorded in New Brunswick. The species was reported from Nova Scotia by Bishop et al. (2009) and appears to be distributed throughout much of the mainland of Nova Scotia (Fig. 1). In Nova Scotia, it was collected almost exclusively with flight intercept traps in deciduous forests. Pielou and Pielou (1968) reported it on birch polypore (*Piptoporus betulinus*), Cline and Leshen (2005) recorded it from oyster mushroom (*Pleurotus ostreatus*), and Leschen (1988) recorded it from *Spongipellis unicolor* (Schw.) growing on a fallen white oak (*Quercus alba* L.) in Arkansas. Schwartz (1876) said it was "abundant in fungus" in Michigan.

Mycetophagus (*Parilendus*) *quadriguttatus* Müller, 1821

Distribution. NOVA SCOTIA: Annapolis Co.: Paradise, 11 June 2005, K. Webster, spruce beetle trap (1, NSNR); **Colchester Co.:** Balmoral Mills, 19 June 1974, B. Wright, grist mill (1, NSMC); **Kings Co.:** Kentville, 10 August 2005, D.H. Webster, compost heap, moldy corncobs (1, DHWC).

Notes. *Mycetophagus quadriguttatus* Müller is newly recorded in Nova Scotia (Fig. 1). The species was reported from New Brunswick by Bousquet (1991), however, I have not been able to locate a voucher specimen for this record; it is not present in the CNC nor was it reported from New Brunswick by Campbell et al. (1989). Pending confirmation its status in New Brunswick should be regarded as provisional. In Nova Scotia, one specimen was collected in a grist mill and another in a compost heap. Campbell et al. (1989) reported the species in waste feed, sacked grain, grain elevators, warehouses, flour mills, old flour barrels, fungi at the base of old hay stacks, fungi on trees, a vegetable store, and a corn shop.

Although Hatch (1962) thought it was probably an introduced species, other investigators (Parsons 1975; Bousquet 1991; Downie and Arnett 1996) have classified it as a native Holarctic species. *Mycetophagus quadriguttatus* is widely distributed in Europe having been reported throughout the continent except for Corsica, Crete, Cyprus, Estonia, Ireland, Norway, Portugal, and Sicily (Nikitsky 2010), and is also found across North Africa, in the eastern Palaearctic, Asia, and Australia (Nikitsky 2010).

Typhaea stercorea (Linnaeus, 1758)

Distribution. Eighty-two specimens (NB=6, NS=66, PE=12) were examined. The earliest records from each province are: **NEW BRUNSWICK: Northumberland Co.:** Tabusintac, 13 June 1939, 26 July 1939, W.J. Brown (2, CNC). **NOVA SCOTIA: Colchester Co.:** Truro, 4 March 1919, collector not recorded (8, NSAC). **PRINCE EDWARD ISLAND: Prince Co.:** Central Bedeque, 29 July 1954, F.M. Cannon (1, ACPE).

Notes. *Typhaea stercorea* (Linnaeus) was reported from New Brunswick, Nova Scotia, and Prince Edward Island by Bousquet (1991). The species is widely distributed throughout the Maritime Provinces, including Cape Breton Island (Fig. 2). A majority of specimens were collected outdoors in native habitats. It is an adventive Palaearctic beetle found both outdoors and in association with various stored products. *Typhaea stercorea* has been found in corn fields (on decaying kernels of exposed ears), warehouses, stores, flour mills, mangers, railway boxcars, dwellings, and granaries in stored grain and seeds, tobacco, peanuts, cacao, corn, millet, wheat, apricots, and moldy grape skins, as well as in nests of swans and moorhens (Campbell et al. 1989). In Nova Scotia it was reported in large numbers in dairy barns (Campbell et al. 1989).

The dates of earliest detection are given above: New Brunswick (1939), Nova Scotia (1919), and Prince Edward Island (1954). *Typhaea stercorea* is widespread in Europe, having been recorded in every country and region in the continent (Nikitsky

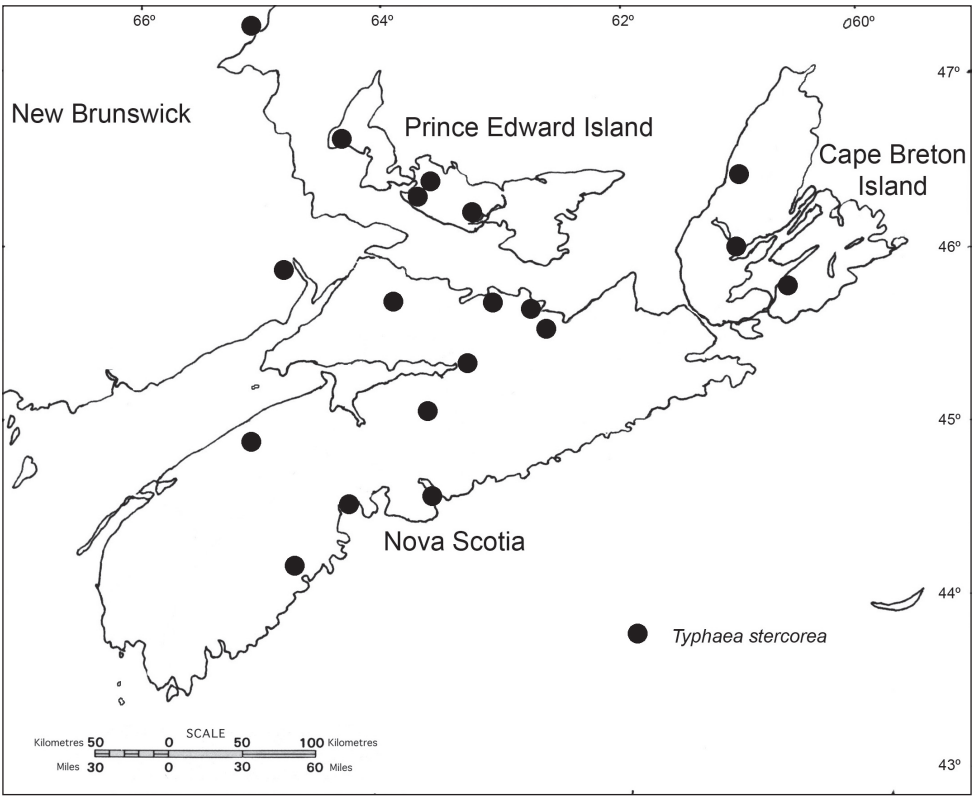

Figure 2. Distribution of *Typhaea stercorea* in the Maritime Provinces of Canada.

2010), and is also virtually cosmopolitan globally, being found in every region of the world except (doubtfully) South and Central America (Nikitsky 2010).

Litargus tetraspilotus LeConte, 1856

Distribution. NOVA SCOTIA: Cape Breton Co.: East Bay, 9 September 2003, C.W. D'Orsay (1, CBU); **Colchester Co.:** Bible Hill, 8 July 2004, K.R. Aikens, pasture, sweep (1, CBU); Bible Hill, 14 June 2005, S.M. Townsend, sweep (3, CBU); Debert, 9 June 1994, J. Ogden (1, NSNR); Masstown, 7 September 2002, C.G. Majka, marshy swamp (1, CGMC); Shubenacadie, 26 August 1997, J. Ogden (1, NSNR); **Digby Co.:** Brier Island, Pond Cove, 9 August 2004, J. Ogden & K. Goodwin, knapweed, sweep (3, JOC); Brier Island, Pond Cove, 10 August 2004, J. Ogden & K. Goodwin, sweep (1, JOC); Brier Island, Westport, 9 August 2004, J. Ogden & K. Goodwin, grassland, sweep (2, JOC); **Halifax Co.:** Big Indian Lake, 16 July 2003, P. Dollin, *Picea rubens* forest (80-120 years), in rotting mushroom (1, NSMC); Point Pleasant Park, 15 August 2000, 7 September 2000, C.G. Majka, mixed forest (2, CGMC); Point Pleasant Park, 9 September 2000, 2 June 2002, 23 July 2002, C.G. Majka, coniferous forest (3,

Figure 3. Dorsal habitus photograph of *Mycetophagus punctatus*. Length: 4.6–6.3 mm. Photo credit: Guy A. Hanley.

Figure 4. Dorsal habitus photograph of *Mycetophagus flexuosus*. Length: 3.0–4.6 mm. Photo credit: Tom Murray.

CGMC); Point Pleasant Park, 12 May 2001, 10 June 2001, 25 May 2002, C.G. Majka, coniferous forest, on *Picea rubens* (6, CGMC); Point Pleasant Park, 19 May 2001, 29 May 2001, C.G. Majka, coniferous forest, on *Pinus strobus* (4, CGMC); 29 July 2001, 18 August 2001, Point Pleasant Park, C.G. Majka, mixed forest (2, CGMC);

Figure 5. Dorsal habitus photograph of *Mycetophagus serrulatus*. Length: 1.3–3.6 mm. Photo credit: Christopher G. Majka.

Figure 6. Dorsal habitus photograph of *Mycetophagus pluripunctatus*. Length 3.2–4.7 mm. Photo credit: Nicholas Gompel.

Point Pleasant Park, 9 May 2002, C.G. Majka, coniferous forest, on *Abies balsamea* (1, CGMC); Point Pleasant Park, 9 June 2002, C.G. Majka, mixed forest, on *Aralia hispida* (1, CGMC); Point Pleasant Park, 7 July 2002, C.G. Majka, seashore (1, CGMC); Point Pleasant Park, 14 September 2002, C.G. Majka, marsh, on herbaceous vegetation (1, CGMC); Point Pleasant Park, 30 June 2004, C.G. Majka, coniferous forest, on *Pinus sylvestris* (2, CGMC); West Dover, 7 September 2003, C.G. Majka, coastal barrens, heaths (1, CGMC); **Kings Co.:** Aldershot, 5 August 1949, 2 August 1949, 10 August 1949, 20 August 1949, 16 May 1950, H.T. Stultz (5, ACNS); Greenwich, 29 May 1958, H.T. Stultz (1, ACNS); Kingston, 30 June 2002, C.G. Majka, sandy pine barren (1, CGMC); **Queens Co.:** Eight Mile Lake, 11 August 2003, P. Dollin, *Picea*

Figure 7. Dorsal habitus photograph of *Mycetophagus quadriguttatus*. Length 3.3–4.0 mm. Photo credit: Christopher G. Majka.

Figure 8. Dorsal habitus photograph of *Typhaea stercorea*. Length: 2.2–3.2 mm. Photo credit: Tim Moyer.

rubens forest (40-80 years), in vegetation, sweep (1, NSMC); Little Ponhook Lake, 1 August 1993, B. Wright, in oak apple galls (3, NSMC); Ponhook Lake nr. Greenfield, 13 July 1993, J. Cook, ultraviolet light trap (2, JCC); **Shelburne Co.:** Clyde River Road, 16 July 1992, S. & J. Peck, forest, car net (1, JCC); Forbes Point, 9 July 2007, R. Gorham, grass/alders (4, CGMC); **Victoria Co.:** Cape Breton Highlands: Kelly Rd, 24 June 2005, J. Ogden, malaise trap (1, NSNR); **Yarmouth Co.:** Moses Lake, 8 km N of Argyle, 17-22 July 1993, J. & T. Cook, mixed forest, FIT (1, JCC). **PRINCE EDWARD ISLAND: Queens Co.:** Cavendish, 19 July 2001, C.G. Majka, coastal vegetation (1, CGMC); Princeton-Wharburton Road, 19 August 2002, C.G. Majka, old field (3, CGMC); St. Patricks, 18 August 2002, C.G. Majka, old field (1, CGMC); St. Patricks, 29 June 2003, C.G. Majka, mixed forest (1, CGMC).

Notes. *Litargus tetraspilotus* LeConte is newly recorded from Prince Edward Island. Klimaszewski and Majka (2007) first reported this species in Nova Scotia. There are

Figure 9. Dorsal habitus photograph of *Litargus tetraspilotus*. Length: 1.8–2.0 mm. Photo credit: Christopher G. Majka.

many records from the southern mainland of Nova Scotia, Cape Breton Island, and Prince Edward Island (Fig. 1). Records from New Brunswick and the northern mainland of Nova Scotia are lacking, but it is probable that it is found throughout the region.

In the Maritime Provinces *L. tetraspilotus* has been collected in many habitats including coniferous, deciduous, and mixed forests, seashores, coastal barrens, grasslands, marshy areas, a sandy pine barren, and an old field ecosystem. Specimens have been collected on the foliage of white pine (*Pinus strobus* L.), jack pine (*Pinus sylvestris* L.), red spruce (*Picea rubens* Sarg.), balsam fir (*Abies balsamea* (L.) Mill.), on deciduous, and herbaceous vegetation, on bristly sarsaparilla (*Aralia hispida* Vent.), and in a rotting mushroom. Klimaszewski and Majka (2007) reported *L. tetraspilotus* as an inquline inhabitant of oak apple galls on red oak (*Quercus rubra* L.) induced by *Andricus (Callirhytis)* sp. (Cynipidae) wasps. Rauf et al. (1985) found it on jack pine, Tucker (1919) found it on American mistletoe (*Phoradendron flavescens* (Pursh) Nutt., and Ulyschen and Hanula (2010) reared it from decomposing loblolly pine (*Pinus taeda* L.) logs in South Carolina.

Discussion

Typhaea stercorea and *Litargus tetraspilotus* are abundant and widely distributed in the Maritime Provinces. *Mycetophagus pluripunctatus* appears to be uncommon but widely distributed on the mainland of Nova Scotia. The other four species of mycetophagids – *Mycetophagus punctatus, M. flexuosus, M. serrulatus,* and *M. quadriguttatus* – are all represented by a handful of specimens or less. They would all appear to qualify as

"apparently rare" saproxylic beetles as defined by Majka (2007b) (i.e., representing < 0.005% of specimens examined from the region). In investigating 283 species of saproxylic beetles from 18 families, Majka (2007b) found that 33% of these fell into this category of apparently rare species. Similarly in examining the Endomychidae and Erotylidae of the Maritime Provinces, two other families of beetles closely associated with fungi, Majka (2007b) found that 40% of the 15 species found in the region are apparently rare. Majka (2007a,b) suggested that this large proportion might be ascribable to the history of forest management practices in the region. These apparently rare species of *Mycetophagus*, three of which are closely associated with saproxylic fungi, may belong to this same suite of insects for similar reasons.

In general, mycetophagids have received rather little attention by researchers in North America, and the bionomics of many species have not been carefully investigated. Certainly this is true in the Maritime Provinces and additional fieldwork in the region is required to ascertain more about their distribution, abundance, bionomics, and ecological role in the habitats that they inhabit.

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RESEARCH ARTICLE

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Description of a new species of the genus *Tribasodites* Jeannel (Coleoptera, Staphylinidae, Pselaphinae) from East China with a key to world species

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Abstract

A remarkable new species of the genus *Tribasodites*, 1960, *T. spinacaritus* **sp. n.** is described and illustrated from Zhejiang Province, East China. A key to world species of the genus is provided. Systematic position of the new taxon is discussed.

Keywords

Coleoptera, Staphylinidae, Pselaphinae, *Tribasodites*, new species, key, East China, taxonomy

Introduction

The genus *Tribasodites* was erected by Jeannel (1960) to accommodate two new species, *T. antennalis* and *T. frontalis*, both described from North India. Twenty-six years later, Nomura (1986) added a third species to the genus, *T. picticornis* collected in a colony of *Paratrechina flavipes* (Smith) in Japan. Afterwards, Nomura (2000) listed eight species of *Tribasodites* based on the materials collected from Yunnan, but without

specific name and description. Then, Nomura (2007a, 2007b) transferred two species *Batrisodes semipunctatus* Raffray, 1912 (Taiwan) and *Batrisodes coiffaiti* Jeannel, 1958 (Japan) to *Tribasodites*. So far, five species of the genus have been known in the world.

The genus *Tribasodites* can be readily distinguished from its allies by a combination of the following characters: 1) male with sexually modified head or antenna; 2) pronotum with a pair of spines or denticles on lateral sides, disc with a median longitudinal sulcus; 3) elytra each with three basal foveae; 4) male metatrochanter spinulate or simple; 5) the first visible tergite (morphologically tergite IV) weakly concave near base, paratergites reduced to a pair of triangular plates demarcated by lateral carinae; 6) aedeagus asymmetrical, usually with a dorsal apophysis well-developed to totally reduced or absent.

During studies on the Chinese *Tribasodites*, some specimens were collected during a short expedition to Tiantongshan Mountain, Zhejiang Province, East China. The examination of the material revealed a remarkable species which is unknown to science.

The purpose of the present paper is to describe this new species under the name of *Tribasodites spinacaritus* sp. n., and to provide a key to all known species. The systematic position of the new species is also discussed.

Material and methods

Specimens were collected from decaying leaf litter of the forest floor by sifting and were killed with ethyl acetate and then dried. Dissections were made in 75% ethanol; genitalia and small parts were mounted in Euparal on plastic slides that were placed on the same pin with the specimens. Photos of habitus were taken by a Canon EOS 40D Camera mounted with an MP-E 65 mm Macro Photo Lens; photos of dissected parts were taken by a Canon G9 camera mounted on an Olympus CX21 microscope; line drawings were made by Adobe Illustrator CS2.

The terminology follows Chandler, 2001. '/' slash is used in the text to separate different lines of the label.

Type series are deposited in the Insect Collection of Shanghai Normal University, Shanghai, China (=SHNUC)

Taxonomy

***Tribasodites spinacaritus* Yin, Li & Zhao, sp. n.**
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Figs 1–22

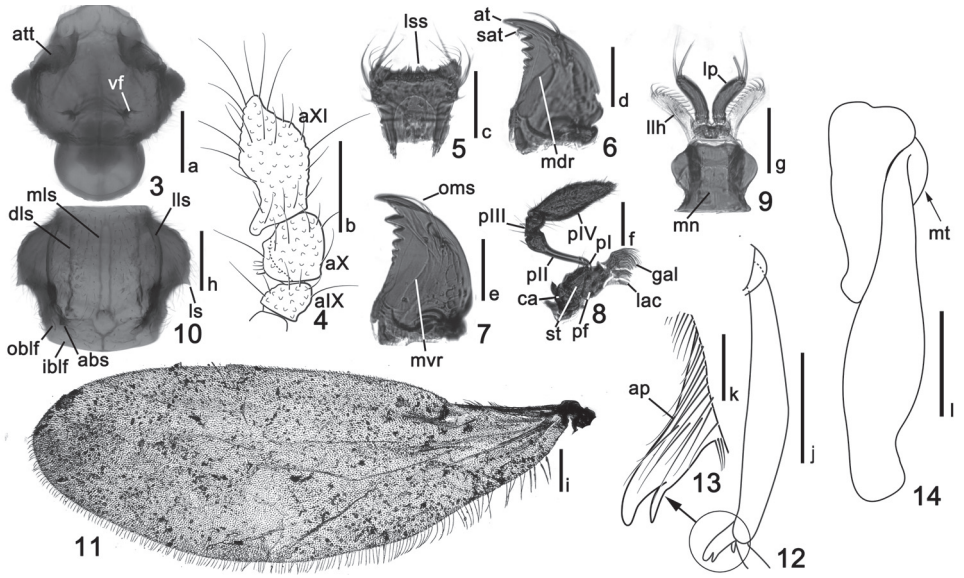
Type locality. East China, Zhejiang Province, Tiantongshan Mountain.

Figures 1–2. Dorsal habitus of *Tribasodites spinacaritus* sp. n. **1** male **2** female.

Type material. HOLOTYPE, male: 'CHINA: ZHEJIANG Prov. / Ning'bo City / Tiantongshan Mt./alt. 350 m, 24–26.iv.2009/Ting FENG leg.' (SHNU). PARATYPES: 4 males, 6 females, same label data as holotype (SHNU)

Description. *Male*. Length 2.2–2.4 mm (Fig. 1). Reddish brown, maxillary palpi and tarsi lighter.

Head (Fig. 3) slightly wider than long, nearly triangular, covered with short hair on dorsal surface. Clypeus arcuate on anterior margin. Labrum (Fig. 5) longer than wide, with rows of long setae anterolaterally, anteromedian margin with four minute specialized setae. Mandible (Figs 6–7) with one large apical tooth and much smaller subapical tooth and row of median teeth on cutting edge; outer margin with long seta in apical one-third. Maxillary palpus (Fig. 8) with palpomere I minute, II pedunculate with anterior third broadened, III nearly triangular, IV predominately large, nearly fusiform. Labium (Fig. 9) slightly wider than long, rounded laterally, labial palpus composed of large basal segment and setae-like terminal segments; lateral lobe setose. Frons depressed between antennal tubercles. Vertex convex, with one pair of vertexal foveae connected by short U-shaped carina and with median keel. Eyes large and prominent, situated in basal two-fifths of head length, not emarginated, multifaceted, each composed of about 55 facets. Postgenae nearly rounded, with pair of lateral carinae extended to antennal



Figures 3–14. Details of *Tribasodites spinacaritus* sp. n. **3** head **4** male antennal club **5** labrum **6** right mandible, dorsal view **7** left mandible, ventral view **8** left maxilla **9** labium **10** pronotum **11** left metathoracic wing **12** mesotibia **13** apical protuberance of mesotibia, enlarged **14** metatrochanter and metafemur. Scales: **a**, **b**, **h**, **i**, **j** and **l** = 0.2 mm, **c**, **d**, **e**, **f**, **g**, and **k** = 0.1 mm. Abbreviations: **abs** = antebasal spine; **ap** = apical protuberance; **at** = apical tooth; **att** = antennal tubercle; **aIX–aXI** = antennomere **IX**–antennomere XI; **ca** = cardo; **dls** = disc longitudinal sulcus; **gal** = galea; **iblf** = inner basolateral foveae; **lac** = lacinia; **llh** = lateral lobe of hypopharynx; **lls** = lateral longitudinal sulcus; **lp** = labial palpus; **ls** = lateral spine; **lss** = labral specialized setae; **mdr** = mandibular dorsal ridge; **mls** = median longitudinal sulcus; **mn** = mentum; **mt**= metatrochanter; **mvr** = mandibular ventral ridge; **oblf** = outer basolateral foveae; **oms** = outer marginal seta; **pf** = palpifer; **pI–pIV** = palpomere I–palpomere IV; **rmt** = row of median teeth; **sat** = subapical tooth; **st** = stipes.

tubercles. Gular area slightly depressed; gular foveae merged into single pit. Gular carina present. Antenna long and elongate, scape large, about 1.5 times as long as wide. Pedicle much smaller than scape, subcylindrical; antennomeres III–VIII each wider than long, transverse; club three-segmented with antennomeres IX–XI (Fig. 4) modified, roughly granulated. X about twice as wide as and 1.5 times as long as VIII, nearly triangular, X slightly longer than wide, inner side strongly concaved, with several short and thick setae; XI the largest, widest in the middle, inner antebasal part strongly protuberant.

Pronotum (Fig. 10) wider than long, lateral sides each with one median spine; with one pair of lateral and one pair of discal longitudinal sulci, one pair of antebasal spines near basal margin of pronotum, one pair of lateral antebasal foveae and two pairs of basolateral foveae distinct.

Elytra (Fig. 17) convex, longer than wide, narrowed toward base. Each tri-foveate; discal stria extended to half of elytral length; sutural stria present. Metathoracic wings (Fig. 11) fully developed, widest at middle, gradually narrowed from middle toward

apex and base, apex rounded. Venter with clear pairs of lateral mesoventral foveae and lateral metaventral foveae.

Legs normal in structure. Mesotibia (Figs 12–13) with apical protuberance. Metatrochanter (Fig. 14) not spinose.

Abdomen with first visible tergite (morphologically tergite IV) largest, mediobasal foveae, basolateral foveae and basomedian cavity present; discal carinae very short; tergites V–VII successively shorter and narrower, each with pair of lateral foveae. Tergite VIII (Fig. 15) transverse, posterior side nearly flattened. Sternites IV–VII each transverse, successively shorter and narrower, each with pair of lateral foveae. Sternite VIII (Fig. 16) transverse, with anterior margin strongly emarginated and posterior margin flattened. Sternite IX (Fig. 18) membranous.

Aedeagus (Figs 20–22) with dorsal apophysis totally absent; parameres reduced, forming a ventral stalk with median lobe; endophallus elongate, very weakly sclerotized, gradually expanded posteriad; basal foramen large; basal bulb round posteriorly.

Female. Body size similar to male (Fig. 2). Antennal club not modified. Eyes smaller than in male. Metathoracic wing slightly smaller than in male. Mesotibiae not protuberant at apex. Tergite VIII (Fig. 17) semispheric. Sternite VIII (Fig. 18) transverse. Sternite IX reduced.

Etymology. The specific name refers to the metatrochanter without any spine or protuberance.

Relationship. The male genitalia of the new species is somewhat similar to that of *Batrisodes* or some species of *Batrisus* genus-group, and the male spine on the hind trochanter is absent in the new species, which makes the new species looks similar to *Batrisodes* in some male sexual characters. But it is still quite different from *Batrisodes*. The new species is placed in *Tribasodites* because of the following reasons: 1) the prothorax of the new species has basic characters (spinulate lateral margins) of the *Tribasodes* genus-group, which never occurs in the *Batrisodes* belonging to *Batrisus* genus-group (both genus-groups were defined by Nomura and Idris 2003), 2) its male genitalia is strictly asymmetrical, which does not match the symmetrical male genitalia of *Batrisodes*.

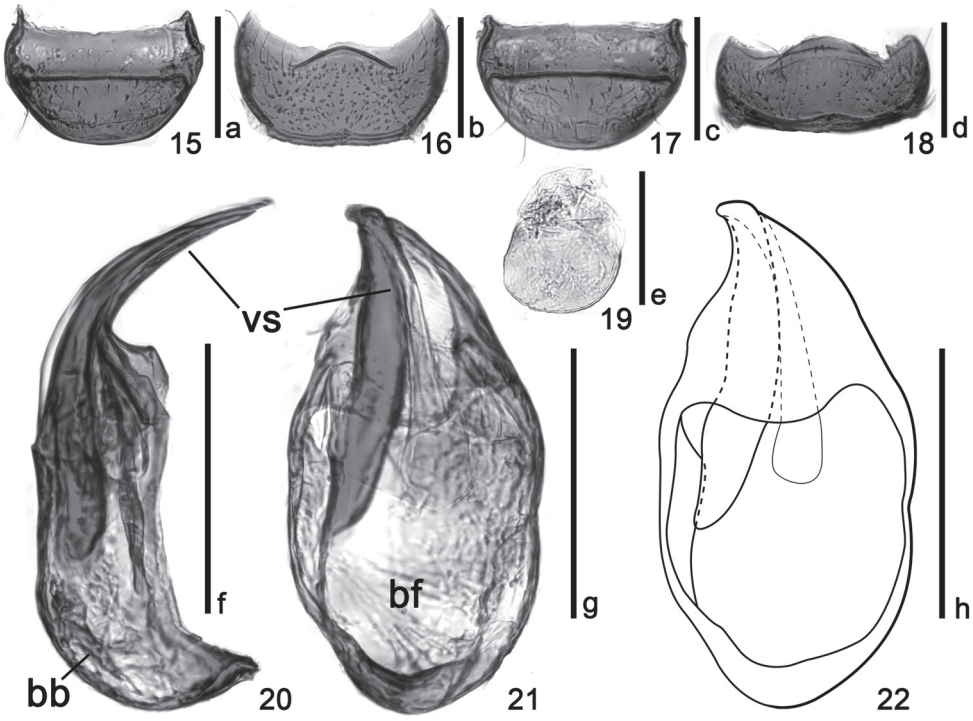
The new species is most close related to *T. picticornis* and *T. antennalis* by relatively large body size and sexually modified antennal club. *T. spinacaritus* can be readily distinguished by the absence of metatrochanteral spine on posterior margin and simple structure of aedeagus, while all the other species have spinulate metatrochanter and aedeagus with fully-developed dorsal apophysis.

Key to species of *Tribasodites* Jeannel

1 Male sexual character presents only on head, head with large excavation on vertex in male **2**

– Male sexual character present only on antenna..... **3**

2 Body medium-sized, less than 2.0 mm in length; head with a short median keel and a pair of acinous patches above postgenae .... ***T. semipunctatus* (Raffray, 1912)** (China: Taiwan)



Figures 15–22. Details of *Tribasodites spinacaritus* sp. n. **15** male tergite VIII **16** male sternite VIII **17** femal tergite VIII **18** female sternite VIII **19** male sternite IX **20** aedeagus, lateral view **21–22** aedeagus in ventral view. Scales: **a**, **b**, **c**, **d**, **f**, **g**, and **h** = 0.2 mm; **e** = 0.1 mm. Abbreviations: **bb** = basal bulb; **bf** = basal foramen; **vs** = ventral stalk.

– Body large-sized, no less than 3.0 mm in length; head lacking median keel and pair of acinous patches above postgenae .... ***T. frontalis*** **Jeannel, 1960** (India: Himachal Pradesh, Uttar Pradesh)

3 Metatrochanter without spine or protuberance on posterior margin .... ***T. spinacaritus*** **Yin et al., sp. n.** (China: Zhejiang)

– Metatrochanter with a spine or a protuberance on posterior margin **4**

4 Body large-sized, no less than 2.5 mm in length; antennomere X nearly triangular, not modified in structure..... ..... ***T. antennalis*** **Jeannel, 1960** (India: Himachal Pradesh, Uttar Pradesh)

– Body medium-sized, less than 2.0 mm in length; antennomere X not triangular, variously modified in structure..... **5**

5 Eyes very small, less than 40 facets; antennomere IX clearly larger than X in male, with a conical protuberance on inner side, slightly smaller than X and symmetrical in female; pronotum without lateral process, but with a pair of small antebasal denticles; each protibia with a large denticle on inner side near the middle in male ..... ***T. coiffaiti*** **(Jeannel, 1958)** (Japan: Kawauchi)

– Eyes developed, more than 50 facets; antennomere IX smaller than X in male, X asymmetrical in male, symmetrical and subglobose in female; pronotum with a pair of large lateral processes and with a pair of antebasal denticles; protibia slender and simple in both sexes .... ***T. picticornis*** **Nomura, 1986** (Japan: Okinawa Island)

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We are most grateful to Dr. Shûhei Nomura (Tokyo, Japan) for his great help to the present study and continuous guidance and encouragement during our work on Chinese pselaphines. We would like to thank Roberto Poggi (Genova, Italy) and Peter Hlaváč (Slovakia) for critically reading the manuscript and providing useful comments. Comments from two anonymous reviewers also improved the paper. The study is supported by the National Natural Science Foundation of China (No. 30870323) and Shanghai Normal University (No. SK200833, No. SK200834).

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RESEARCH ARTICLE

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New species and new records of Mydidae from the Afrotropical and Oriental regions (Insecta, Diptera, Asiloidea)

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Abstract

New Mydidae species are described from the Afrotropical and Oriental regions including the first records of this family from several countries in eastern Africa (Kenya, Tanzania, and Uganda) and Mauritania in western Africa as well as Nepal and Thailand in Asia. The new species are, Leptomydinae: *Leptomydas notos* **sp. n.** (south-western India), *Leptomydas rapti* **sp. n.** (south-central Nepal), *Leptomydas tigris* **sp. n.** (north-central Thailand); Syllegomydinae: Mydaselpidini: *Mydaselpis ngurumani* **sp. n.** (south-eastern Kenya, north-eastern Tanzania), *Vespiodes phaios* **sp. n.** (south-eastern Kenya); Syllegomydinae: Syllegomydini: *Syllegomydas* (*Notobates*) *astrictus* **sp. n.** (Kenya), *Syllegomydas* (*Notobates*) *heothinos* **sp. n.** (Kenya and Uganda), *Syllegomydas* (*Syllegomydas*) *elachys* **sp. n.** (northern Zimbabwe). *Syllegomydas* (*Syllegomydas*) *proximus* Séguy, 1928 is recorded from western Mauritania and re-described. *Syllegomydas* (*Notobates*) *dispar* (Loew, 1852), which was previously listed as *incertae sedis* in the Afrotropical Diptera catalogue, is re-described and illustrated based on examination of the type specimens and several additional specimens from Mozambique. *Cephalocera annulata* Brunetti, 1912 and *Syllegomydas bucciferus* Séguy, 1928, described from north-eastern India and previously unplaced in the Oriental Diptera catalogue, are newly combined with *Leptomydas* Gerstaecker, 1868 and together with *Leptomydas indianus* Brunetti, 1912, also from north-eastern India, placed in Leptomydinae. Comments on the possible synonymy of the genera of Mydaselpidini are made. Illustrations and photographs are provided to support the descriptions and future identification. A provisional dichotomous key to Mydidae genera occurring in eastern

Africa (Kenya, Malawi, Mozambique, Somalia, Tanzania, Uganda) and the Oriental Region is provided. Distribution, occurrence in biodiversity hotspots and high-biodiversity wilderness areas, and seasonal incidence are discussed for all species.

Keywords
Mydidae, Leptomydinae, Syllegomydinae, Afrotropical, Oriental, biodiversity hotspots

Introduction

Mydidae is with 463 species in 66 genera one of the less speciose families of Asiloidea (Diptera: Brachycera). The taxon is distributed in warmer climates throughout the world, but shows the highest species diversity in southern Africa. Although regional faunas are in several instances fairly well known, e.g., North America, Australia, or Chile, there are still many areas where new species will be found and need to be made scientifically known in the future. The aim of this publication is to fill some of the distributional gaps world-wide and report for the first time Mydidae from eastern Africa (Kenya, Tanzania, and Uganda) and Mauritania in the Afrotropical Region and Nepal and Thailand in the Oriental Region. In addition, apparently undescribed species are described from India and Zimbabwe and the placement of several species from the Afrotropical and Oriental regions previously considered as *incertae sedis* is addressed.

Materials and methods

Morphological terminology and abbreviations for setae follow McAlpine (1981) and Dikow (2009) except for the term 'aedeagal epimere', which is used as described by Hesse (1969). Abdominal tergites are abbreviated in the descriptions with 'T,' and sternites are abbreviated with 'S.' Other generalised terms refer to the *Torre-Bueno Glossary of Entomology* (Nichols 1989). The adjective pruinose is used here for short, fine cuticular microtrichia that densely cover certain body parts and reflect light in a different way to that of bare cuticle. The species descriptions are based on composites of all specimens and not exclusively on the holotype and are compiled from a character matrix of 144 features assembled with Lucid Builder (version 3.5) and eventually exported as natural language descriptions. When available, species are fully described in the male sex while females are only described with those features that differ (except for characters relating to the terminalia/genitalia). The descriptions and re-descriptions are very detailed on purpose in order to allow proper identification in the future as it is likely that additional species will be found within the areas covered in this publication.

The female genitalia and male terminalia were first excised and macerated in 10% potassium hydroxide (KOH) at 55°C followed by rinsing in distilled H_2O. They were temporarily stored in 75% ethanol for examination and illustration and eventually sealed in polyethylene genitalia vials containing 100% glycerine and attached to the

specimen's pin. Morphological features were illustrated using a 10×10 ocular grid on a Olympus SZ60 stereo microscope and later digitally redrawn using Adobe Illustrator® software. The vestiture on male terminalia is not shown. Wing length was measured from the tegula to the distal tip of the wing. Photographs of pinned specimens were taken with a Olympus E-30 digital SLR, a 50 mm macro lens (equivalent of 100 mm focal length in 35 mm photography), and a 25 mm extension tube. The specimens were illuminated by a LED ring-light fitted with a dome for even and soft light.

In recording data for type specimens as well as non-type specimens, information is given (where available) in a standard manner, i.e., locality, geographic co-ordinates, elevation, date of collection (month indicated in lower case Roman numerals where hyphens indicate missing entries for day, month, year), habitat information, collector, and depository. Female (♀) and male (♂) symbols indicate the sex while a question mark (?) refers to specimens of indeterminable sex (i.e., with broken or missing abdomen). Each specimen is listed with a unique AAM specimen number that will allow the re-investigation as well as provide a unique identifier (LSID http://lsids.sourceforge.net/) in databases like GBIF (http://www.gbif.org/) in the future. AAM is an abbreviation for 'Apioceridae Asilidae Mydidae' and identifies a record in the specimen database used by the author in this format: AAM-000000. The distribution is illustrated in distribution maps with all localities plotted, for which coordinates were available, and the type locality is plotted with an open symbol. The electronic shape-files of the Biodiversity Hotspots and High-biodiversity Wilderness Areas were obtained from Conservation International (2005).

Institutions providing specimens are listed below, together with the abbreviations used in the text when citing depositories, and the people who kindly assisted: AMGS - Albany Museum, Grahamstown, Eastern Cape, South Africa (A. Kirk-Spriggs, S. Gess); BMNH - The Natural History Museum, London, UK (E. McAlister); CAS - California Academy of Sciences, San Francisco, California, USA (C. Griswold); CNC - Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada (J. Skevington); LACM - Natural History Museum of Los Angeles County, Los Angeles, California, USA (B. Brown); MNHN - Museum national d'Histoire naturelle, Paris, France (C. Daugeron, E. Delfosse); NMSA - Natal Museum, Pietermaritzburg, KwaZulu-Natal, South Africa (J. Londt, G. Davies); NMKE - National Museums of Kenya, Nairobi, Kenya (R. Copeland); TMSA - National Museum of Natural History (Transvaal Museum), Pretoria, Gauteng, South Africa (R. Lyle); ZMHB - Museum für Naturkunde, Berlin, Germany (J. Ziegler, J. Pohl); ZSMC - Zoologische Staatssammlung, München, Bayern, Germany (M. Kotrba).

Taxonomy

This publication deals with a diverse Mydidae fauna, both in terms of geography as species from the Afrotropical and Oriental regions are dealt with as well as in terms of genera as 4 genera from 2 subfamily taxa are included. In order to allow the identification of

the Mydidae genera occurring in India, Kenya, Nepal, Tanzania, Thailand, and Uganda, from which the new species are being described, a provisional generic key is provided below. This key excludes *Nemomydas* Curran, 1934 as it is only known from Taiwan and the Yaeyama Islands of Japan in the far eastern Oriental Region, but comments on this genus are made in the Discussion. For further details about the delimitation of other genera see below and the Discussion. An updated, illustrated identification key to all 11 currently recognized subfamily taxa, which is based on the key by Papavero and Wilcox (1974), can be accessed on this web-site: http://www.mydidae.tdvia.de/online_keys.

1 Specimens from the Oriental Region **5**

– Specimens from eastern Africa (Kenya, Malawi, Mozambique, Somalia, Tanzania, Uganda) **2**

2 Proboscis short or very short, at most ½ the length of oral cavity; metathoracic femora cylindrical, only slightly wider than prothoracic and mesothoracic femora (e.g., Fig. 41); anatergal setae present; supero-posterior anepisternum short or long setose ..... ***Syllegomydas*** **Becker, 1906**

– Proboscis long, reaching or extending beyond fronto-clypeal suture; metathoracic femora distinctly clubbed, much wider than prothoracic and mesothoracic femora; anatergal setae absent; supero-posterior anepisternum asetose ... **3**

3 Alula reduced, nearly straight wing margin (Fig. 43); interocular distance on vertex as wide as at ventral eye margin; ♀ ovipositor with acanthophorite spurs ..... ***Mydaselpis ngurumani*** **sp. n.**

– Alula well-developed (e.g., Fig. 42); interocular distance on vertex larger than at ventral eye margin; ♀ ovipositor without acanthophorite spurs **4**

4 ♂ aedeagal epimere absent ..... ***Mydaselpis*** **Bezzi, 1924**

– ♂ aedeagal epimere present, distally simple and evenly rounded ..... ***Vespiodes*** **Hesse, 1969**

– ♂ aedeagal epimere present, distally bifurcate ..... ***Afromydas*** **Bequaert, 1961**

5 M_3+CuA_1 do not terminate together in C (Fig. 42); metathoracic tibiae without ventral keel; mystax more or less evenly distributed over facial gibbosity, mystax can be sparse medially; ♀ ovipositor with acanthophorite spurs ..... ***Leptomydas*** **Gerstaecker, 1868**

– M_3+CuA_1 terminate together in C, reaching posterior wing margin; metathoracic tibiae with ventral keel proximally; mystax formed by distinct crest of densely arranged macrosetae along fronto-clypeal suture, mystax not developed on dorso-median facial gibbosity; ♀ ovipositor without acanthophorite spurs ..... **(Cacatuopyginae) 6**

6 Alula well-developed, medially reaching scutellum; predominantly black species; scutum either apruinose or entirely black pruinose ..... ***Cacatuopyga*** **Papavero & Wilcox, 1974**

– Alula reduced to small lobe; predominantly brown species; scutum at least laterally grey pruinose ..... ***Charimydas*** **Bowden, 1984**

Leptomydinae

The Leptomydinae comprises 47 valid species in 6 genera primarily distributed in the Northern Hemisphere with *Hessemydas* Kondratieff, Carr and Irwin, 2005 from Madagascar and *Plyomydas* Wilcox and Papavero, 1971 from Peru being the only representatives in the Southern Hemisphere.

***Leptomydas* Gerstaecker, 1868**

Leptomydas has currently 12 valid species distributed in the southern Palaearctic and north-western Oriental regions.

***Leptomydas notos* sp. n.**
urn:lsid:zoobank.org:act:26BD416E-6E07-44FB-9450-9AACE98E9021
Figs 1–3, 30, 42, 46

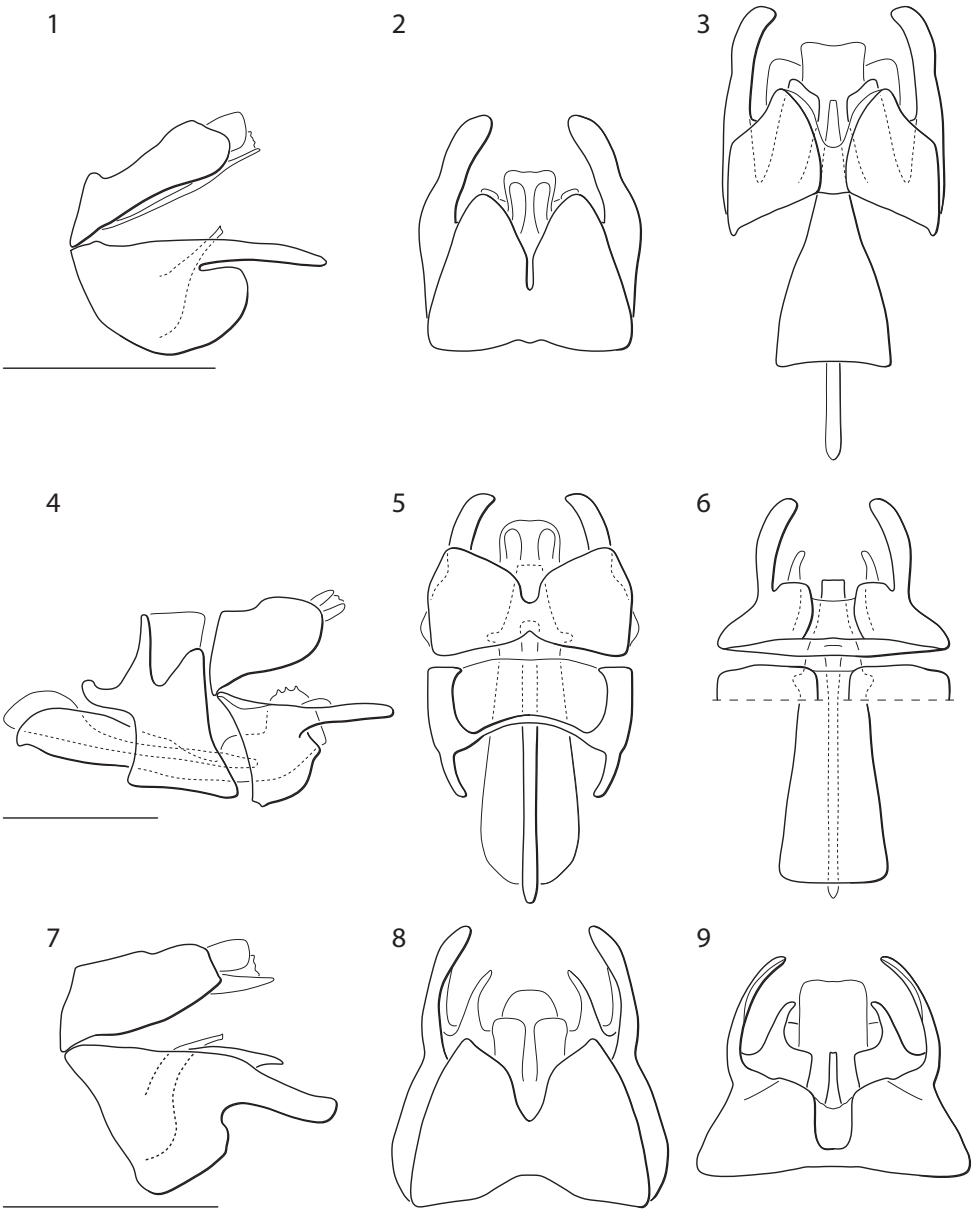
Etymology: *notos* Greek adjective = south. Referring to the apparent distribution in southern India in the state of Tamil Nadu.

Diagnosis: The species is distinguished from congeners by the short proboscis that does not project beyond the fronto-clypeal suture, the short setose brown to bluish-black abdominal tergites with light yellow posterior margins, features of the male terminalia, and its apparent distribution in south-western India.

Description Male: Head: brown, in general white pruinose; width distinctly greater than thorax, interocular distance on vertex larger than at ventral eye margin, vertex between compound eyes slightly depressed, parafacial area less than ½ the width of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax white, covering entire facial gibbosity; frons predominantly apruinose, vertex apruinose, postgenae apruinose; setation: vertex white, frons white, ocp setae white, pocl setae white; ocellar triangle apruinose; proboscis brown, short, about ½ length of oral cavity; labella large, much wider than prementum, as long as prementum, unsclerotised laterally; maxillary palpi cylindrical, brown, about ⅓ the length of proboscis.

Antenna: brown, scape and pedicel white setose dorsally and ventrally; postpedicel cylindrical in proximal ½, symmetrically bulbous in distal ½, ≥ 6.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: brown, scutum predominantly grey pruinose, pleura predominantly apruinose; scutum medially bluish-black, laterally brown, surface entirely smooth, predominantly grey pruinose, only broad sublateral stripes and narrow paramedial stripes (not reaching posterior margin) apruinose, scutal setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and post-



Figures 1–9. ♂ terminalia of *Leptomydas* species. **1–3.** *L. notos* sp. n. **1** lateral **2** dorsal **3** ventral. **4–6.** *L. rapti* sp. n. **4** lateral **5** dorsal **6** ventral. **7–9.** *L. tigris* sp. n. **7** lateral **8** dorsal **9** ventral. Scale lines = 1 mm.

suturally white, acr setae absent, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe light brown, grey pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long white setose; scutellum grey pruinose proximally, apruinose distally, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite grey pruinose, mesopostnotum asetose, anatergite asetose, katatergite

long white setose; katatergite ± flat; anterior anepisternum asetose, supero-posterior anepisternum asetose; posterior anepimeron densely long white setose, katepimeron asetose; metepimeron ± flat, same colour as T1, grey pruinose, long white setose; metepisternum grey pruinose, asetose.

Leg: brown or light brown, setation predominantly white; all coxae apruinose, white and brown setose; met trochanter setose medially; femora brown or light brown, met femora evenly clubbed in distal ¾, in distal ½ macrosetose, 1 antero-ventral and 1 postero-ventral row of macrosetae; all tibiae laterally arched, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 about as long as individual tarsomeres 2, 3, or 4, met tarsomere 1 as long as combined length of tarsomeres 2–3; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = 8.9–9.9 mm; slightly brown stained throughout, veins light brown, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu*p* closed; C terminates at junction with R_1; R_4 terminates in R_1; R_5 terminates in R_1; stump vein (R_3) at base of R_4 present, short not reaching R_2; R_4 and R_5 widest apart medially; r-m indistinct, R_{4+5} and M_1 fused; M_1 straight at r-m (not curving anteriorly), M_1 (or M_1+M_2) terminates in R_1; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula well-developed; halter brown.

Abdomen: brown to bluish-black; setation comprised of scattered white and brown setae, surface entirely smooth; T1–7 brown, yellow posterior margins; T1 and anterior ¼ of T2 long white setose, remaining T2 and T3 brown and white setose; T predominantly apruinose; S1–7 brown, yellow posterior margins; S1 asetose, S2–3 sparsely brown setose; S predominantly apruinose; T2–4 parallel-sided and not constricted waist-like; bullae on T2 brown, oval, surface entirely smooth, T2 surface anterior to bullae smooth.

Male terminalia: T1–7 well-developed, entirely sclerotised, T8 postero-medially weakly sclerotised, with anterior transverse sclerotised bridge connecting lateral sclerites; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 well-developed and simple, not fused to T8 dorso-laterally, entire (undivided) ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), blunt, evenly rounded; subepandrial sclerite without lateral or median protuberances; hypandrium slightly concave, divided ventro-medially by unsclerotised area into 2 separate sclerotised halves, entirely fused with gonocoxite, forming a gonocoxite-hypandrial complex; gonocoxites dorso-ventrally flattened (same height throughout, expanded laterally and medially), with median protuberance, gonocoxal apodeme absent; 1 functional aedeagal prong; aedeagal epimere absent; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventro-median margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath long, sperm sac entirely covered; sperm sac appearing ± heavily sclerotised.

Description Female: unknown.

Material examined: India: Tamil Nadu: 7 ♂ Coimbatore, 10°59'33"N 076°57'41"E, 21.v.1946, on sand dry river bed, P. Nathan (AAM-000776 1 ♂ holotype, AAM-000770–AAM-000775 paratypes, AMNH).

Type locality and distribution: Coimbatore (10°59'33"N 076°57'41"E), India (Fig. 46). Biodiversity hotspot/high-biodiversity wilderness area: Western Ghats and Sri Lanka/-.

***Leptomydas rapti* sp. n.**
urn:lsid:zoobank.org:act:E4EEC8E2-C144-4884-89EF-CC4C369CAA2A
Figs 4–6, 31, 46

Etymology: The specific epithet refers to the Rapti Valley, Nepal in which the type locality is situated and is a noun in apposition.

Diagnosis: The species is distinguished from congeners by the entirely light brown stained wings, the long brown setae on the posterior abdominal sternites, the fusion of abdominal sternite 8 with tergite 8, and its apparent distribution in south-central Nepal.

Description Male: Head: brown, in general grey pruinose; width distinctly greater than thorax, interocular distance on vertex larger than at ventral eye margin, vertex between compound eyes ± horizontally straight, medially only slightly below dorsal eye margin, parafacial area less than ½ the width of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax white, covering only lateral facial gibbosity (asetose medially); frons medially apruinose, laterally grey pruinose, vertex predominantly apruinose, only lateral margins grey pruinose, postgenae apruinose; setation: vertex white, frons white, ocp setae white, pocl setae white; ocellar triangle apruinose; proboscis brown, long, projecting beyond fronto-clypeal suture; labella large, much wider than prementum, as long as prementum, unsclerotised laterally; maxillary palpi cylindrical, brown, shorter than length of pedicel.

Antenna: brown, scape and pedicel white setose dorsally and ventrally; postpedicel cylindrical in proximal ½, symmetrically bulbous in distal ½, ≥ 6.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: brown, scutum predominantly grey pruinose, pleura predominantly apruinose; scutum medially bluish-black, laterally brown, surface entirely smooth, predominantly grey pruinose, only broad sublateral stripes and narrow paramedial stripes (not reaching posterior margin) apruinose, scutal setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and postsuturally white, acr setae absent, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe light brown, grey pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long brown setose or long white setose; scutellum grey pruinose proximally, apruinose distally, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite grey pruinose, mesopostnotum asetose, anatergite asetose, katatergite long white setose; katatergite ± flat; anterior anepisternum asetose, supero-posterior

anepisternum asetose; posterior anepimeron long white setose, katepimeron asetose; metepimeron ± flat, same colour as T1, grey pruinose, long white setose; metepisternum grey pruinose, asetose.

Leg: brown, setation predominantly white; all coxae apruinose, long white setose; met trochanter setose medially; femora brown, met femora evenly clubbed in distal ¾, in distal ½ macrosetose, 1 antero-ventral and 1 postero-ventral row of macrosetae; all tibiae laterally arched, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 about as long as individual tarsomeres 2, 3, or 4, met tarsomere 1 as long as combined length of tarsomeres 2–3; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = 9.0–9.3 mm; slightly brown stained throughout, veins light brown, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu*p* closed except r_5 open; C terminates at junction with M_1 (or M_1+M_2); R_4 terminates in R_1; R_5 terminates in R_1; stump vein (R_3) at base of R_4 present, short not reaching R_2; R_4 and R_5 widest apart medially; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein or indistinct, R_{4+5} and M_1 fused; M_1 curves anteriorly at r-m, M_1 (or M_1+M_2) terminates in C; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula well-developed; halter brown.

Abdomen: brown to bluish-black; setation comprised of scattered white setae, surface entirely smooth; T1–7 brown, yellow posterior margins; T1 and anterior ½ of T2 long white setose, remaining T2 and T3 short white setose; T predominantly apruinose; S1–7 brown, yellow posterior margins; S1 asetose, S2 long white setose, S3 short white setose; S predominantly apruinose; T2–4 parallel-sided and not constricted waist-like; bullae on T2 brown, transversely elongate, surface entirely smooth, T2 surface anterior to bullae smooth.

Male terminalia: T1–7 well-developed, entirely sclerotised, T8 postero-medially weakly sclerotised, with anterior transverse sclerotised bridge connecting lateral sclerites; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 medially divided into two halves, fused to T8 dorso-laterally, divided entirely ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), blunt, evenly rounded; subepandrial sclerite without lateral or median protuberances; hypandrium slightly concave, partially divided ventro-medially, anteriorly with heavily sclerotised transverse bridge, entirely fused with gonocoxite, forming a gonocoxite-hypandrial complex; gonocoxites dorso-ventrally flattened (same height throughout, expanded laterally and medially), with median protuberance, gonocoxal apodeme absent; 1 functional aedeagal prong; aedeagal epimere absent; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventro-median margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath short, sperm sac entirely free; sperm sac appearing ± heavily sclerotised.

Description Female: unknown.

Material examined: Nepal: Bagmati: 1 ♂ Megouli (= Megauli), Rapti Valley, 27°35'00"N 084°14'00"E, 29.iii.–4.iv.1962, 300 m, G. Ebert H. Falkner (AAM-

000113 paratype, ZSMC); 2 ♂ Jhawani, Rapti Valley, 27°35'00"N 084°31'00"E, 200 m, 16.iv.1967, Dierl Forster Schacht (AAM-000115 1 ♂ holotype, AAM-000114 paratype, ZSMC).

Type locality and distribution: Jhawani (27°35'00"N 084°31'00"E), Nepal (Fig. 46). Biodiversity hotspot/high-biodiversity wilderness area: Himalaya/-.

Remarks: The particular shape of the tip of the aedeagus, which is not tapered distally (Fig. 4) as in other members of *Leptomydas*, is generally indicative of a species of *Eremomidas* Semenov, 1896 as suggested by Richter and Ovtshinnikova (1996) and Richter (1997). However, the proboscis of this species is projecting well-beyond the fronto-clypeal suture, a feature considered to be specific to *Leptomydas*. The correct generic placement of this species needs to be established with a phylogenetic analysis of Mydidae genera that is currently in preparation by the author.

Leptomydas tigris sp. n.

urn:lsid:zoobank.org:act:4D8128BB-1F62-431A-8A7B-9F03D664075D
Figs 7–9, 32, 46

Etymology: *tigris* Latin noun = tiger. Referring to the TIGER project (Thailand Inventory Group for Entomological Research) that collected the sole holotype in its extensive malaise trap sampling throughout Thailand.

Diagnosis: The species is distinguished from congeners by the yellow and brown abdominal tergites, features of the male terminalia, and its apparent distribution in Thailand.

Description Male: Head: brown, in general grey pruinose; width distinctly greater than thorax, interocular distance on vertex larger than at ventral eye margin, vertex between compound eyes slightly depressed, parafacial area less than ½ the width of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax white, covering only lateral facial gibbosity (asetose medially); frons medially apruinose, laterally grey pruinose, vertex medially apruinose, laterally grey pruinose, postgenae apruinose; setation: vertex white, frons white, ocp setae white, pocl setae white; ocellar triangle apruinose; proboscis brown, long, projecting well-beyond fronto-clypeal suture, reaching ¼ of length of postpedicel; labella large, much wider than prementum, as long as prementum, unsclerotised laterally; maxillary palpi cylindrical, brown, as long as pedicel.

Antenna: brown, scape and pedicel white setose dorsally and ventrally; postpedicel cylindrical in proximal ½, symmetrically bulbous in distal ½, ≥ 7.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: brown, scutum predominantly grey pruinose, pleura predominantly apruinose; scutum medially bluish-black, laterally brown, surface entirely smooth, predominantly pruinose with a presutural apruinose stripe antero-laterally, median stripe and sublateral stripes sparsely grey pruinose, remaining parts densely grey pruinose, scutal

setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and postsuturally white, acr setae absent, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe brown, grey pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long white setose; scutellum grey pruinose proximally, apruinose distally, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite grey pruinose, mesopostnotum asetose, anatergite asetose, katatergite long white setose; katatergite ± flat; anterior anepisternum asetose, superoposterior anepisternum asetose; posterior anepimeron long white setose, katepimeron asetose; metepimeron ± flat, same colour as T1, grey pruinose, long white setose; metepisternum grey pruinose, asetose.

Leg: brown and yellow, setation black and white; all coxae grey pruinose, white setose; met trochanter setose medially; femora anteriorly brown, posteriorly yellow, met femur proximally yellow, met femora ± cylindrical only slightly wider than pro and mes femora, in distal ½ macrosetose, only a single antero-ventral macroseta distally; all tibiae laterally arched, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 about as long as individual tarsomeres 2, 3, or 4, met tarsomere 1 as long as combined length of tarsomeres 2–3; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = 11.9 mm; slightly brown stained throughout, veins brown, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu*p* closed except r_5 open; C terminates at junction with M_1 (or M_1+M_2); R_4 terminates in R_1; R_5 terminates in R_1; stump vein (R_3) at base of R_4 present, short not reaching R_2; R_4 and R_5 widest apart medially; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein; M_1 curves anteriorly at r-m, M_1 (or M_1+M_2) terminates in C; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula well-developed; halter brown or light brown.

Abdomen: brown and yellow; setation comprised of scattered white and black setae, surface entirely smooth; T1 and T5–7 brown, narrow yellow posterior margins, T2–4 yellow, brown medially and laterally; T1–2 long white setose, T3 short white and black setose; T predominantly apruinose; S1 light brown, S2–5 yellow, brown anteriorly, S6–7 brown with yellow posterior margins; S1 asetose, S2 long white setose, S3 short white setose; S predominantly apruinose; T2–4 parallel-sided and not constricted waist-like; bullae on T2 brown, oval, surface entirely smooth, T2 surface anterior to bullae smooth.

Male terminalia: T1–7 well-developed, entirely sclerotised, T8 postero-medially weakly sclerotised, with anterior transverse sclerotised bridge connecting lateral sclerites; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 well-developed and simple, fused to T8 dorso-laterally, entire (undivided) ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), pointed postero-medially; subepandrial sclerite without lateral or median protuberances; hypandrium slightly concave, partially divided ventro-medially, anteriorly with heavily sclerotised transverse bridge, entirely fused with gonocoxite, form-

ing a gonocoxite-hypandrial complex; gonocoxites laterally compressed, slightly angled medially distally, with median protuberance, gonocoxal apodeme present, short (at most slightly extending hypopygium anteriorly); 1 functional aedeagal prong; aedeagal epimere absent; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventro-median margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath short, sperm sac entirely free; sperm sac appearing ± heavily sclerotised.

Description Female: Unknown.

Material examined: Thailand: Loei: 1 ♂ Phu Kradueng National Park, Forest protection unit Loei .5 (Phakbung), 16°50'32“N 101°41'40“E, T1499, 13–19. ii.2007, malaise trap, Wuthicahi kwanjam (AAM-001138 1 ♂ holotype, LACM).

Type locality and distribution: Phu Kradueng National Park (16°50'32"N 101°41'40"E), Thailand (Fig. 46). Biodiversity hotspot/high-biodiversity wilderness area: Indo-Burma/-.

Syllegomydinae

The Syllegomydinae is the most speciose subfamily taxon of Mydidae with currently 204 valid species in 25 genera. The species are distributed throughout Africa (northern Africa in the Palaearctic Region as well as sub-Saharan Africa in the Afrotropical Region), Israel, Madagascar, and Spain (see placement of representatives of *Cephalocera* Latreille, 1829 and *Syllegomydas* Becker, 1906 from India in the Discussion). It is by far the dominant taxon in southern Africa - the most speciose region for Mydidae worldwide (Hesse 1969, 1972, Bowden 1980).

Mydaselpidini

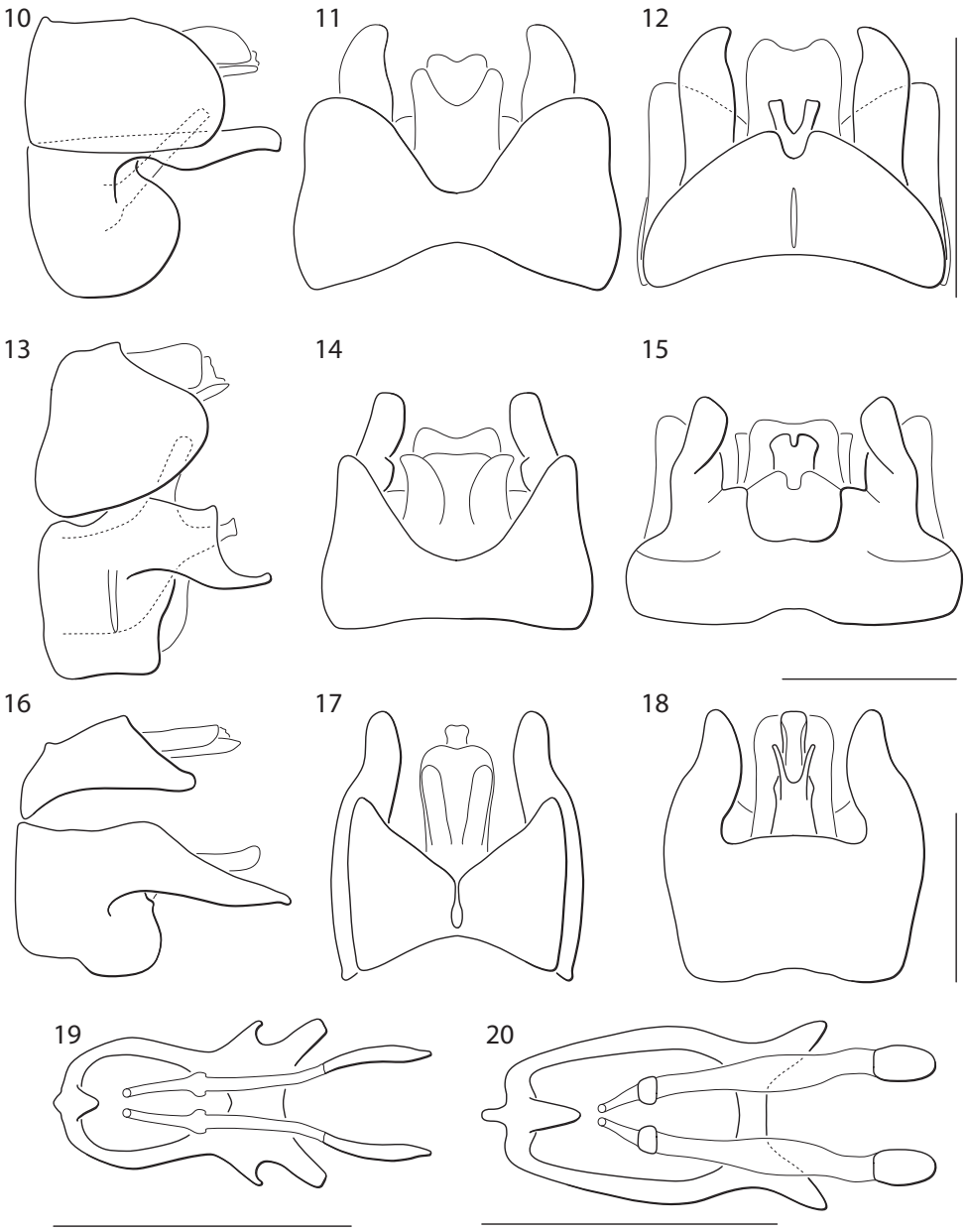
Mydaselpis Bezzi, 1924

General. The genus *Mydaselpis* comprises five valid species distributed in southern Africa (South Africa and Zimbabwe; Bezzi 1924, Hesse 1969, Bowden 1980) and representatives have not been reported from eastern Africa. The latest key to species was published by Hesse (1969: 22).

Mydaselpis ngurumani sp. n.

urn:lsid:zoobank.org:act:0B0B0FDD-643C-4921-979C-CB2B745EDA54
Figs 10–12, 19, 33–34, 43, 47

Etymology: The specific epithet refers to the type locality of the Nguruman Escarpment in the Rift Valley Province, Kenya.



Figures 10–20. ♂ terminalia and ♀ genitalia of *Mydaselpis, Syllegomydas*, and *Vespiodes* species. **10–18.** ♂ terminalia. **10–12.** *Mydaselpis ngurumani* sp. n. **10** lateral **11** dorsal **12** ventral. **13–15.** *Vespiodes phaios* sp. n. **13** lateral **14** dorsal **15** ventral. **16–18.** *Syllegomydas heothinos* sp. n. **16** lateral **17** dorsal **18** ventral. **19–20.** ♀ genitalia (posterior = left). **19** *Mydaselpis ngurumani* sp. n. dorsal **20** *Syllegomydas heothinos* sp. n. dorsal. Scale lines = 1 mm.

Diagnosis: The species is distinguished from congeners by the parallel abdominal tergites 2–4 that do not form a vespiform waist, the reduced alula, the yellow and brown abdominal tergites in the male, the partly hyaline wings, features of the male terminalia, the presence of acanthophorite plates with spurs in the female ovipositor, and its apparent distribution in Kenya and Tanzania.

Description Male: Head: brown, in general silver pruinose; width distinctly greater than thorax, interocular distance on vertex same as at ventral eye margin, vertex between compound eyes slightly depressed, parafacial area less than ½ the width of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax white, covering only lateral facial gibbosity (asetose medially); frons medially apruinose, laterally grey pruinose, vertex apruinose, postgenae lightly silver pruinose; setation: vertex white, frons white, ocp setae white, pocl setae white; ocellar triangle apruinose; proboscis brown, long, reaching fronto-clypeal suture; labella large, much wider than prementum, as long as prementum, unsclerotised laterally; maxillary palpi cylindrical, brown, minute.

Antenna: brown, scape and pedicel white setose dorsally and ventrally; postpedicel cylindrical in proximal ½, symmetrically bulbous in distal ½, ≥ 8.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: brown, predominantly apruinose; scutum medially dark brown, laterally brown, surface microrugose, predominantly apruinose, only lateral margins silver pruinose, scutal setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and postsuturally white, acr setae absent, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe light brown, silver pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long white setose; scutellum silver pruinose proximally, apruinose distally, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite silver pruinose, mesopostnotum asetose, anatergite asetose, katatergite long white setose; katatergite ± flat; anterior anepisternum asetose, supero-posterior anepisternum asetose; posterior anepimeron asetose, katepimeron asetose; metepimeron ± flat, yellow, silver pruinose, white setose; metepisternum silver pruinose, asetose.

Leg: light brown or yellow, setation predominantly brown; pro coxa apruinose, asetose, mes coxa apruinose, asetose, met coxa laterally silver pruinose; met trochanter setose medially; femora light brown or yellow, met femora evenly clubbed in distal ¾, in distal ½ macrosetose, 1 antero-ventral and 1 postero-ventral row of macrosetae; pro and mes tibiae laterally arched, met tibia straight, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 about as long as individual tarsomeres 2, 3, or 4, met tarsomere 1 as long as combined length of tarsomeres 2–3; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = 9.6–12.0 mm; slightly brown stained, darker brown around veins, veins brown, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu*p* closed; C terminates at junction with R_1; R_4 terminates in R_1; R_5 terminates in R_1; stump vein (R_3) at base of

R_4 present, short not reaching R_2; R_4 and R_5 widest apart medially; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein or indistinct, R_{4+5} and M_1 fused; M_1 straight at r-m (not curving anteriorly), M_1 (or M_1+M_2) terminates in R_1; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula entirely reduced (nearly straight wing margin); halter brown.

Abdomen: brown and yellow; setation comprised of scattered brown setae, surface entirely smooth; T1 brown, T2–7 brown with yellow anterior and posterior margins; T1 brown setose, T2 anterior ½ asetose and posterior ½ brown setose, T3 anterior ¼ asetose and posterior ¾ brown setose; T predominantly apruinose; S1 brown, S2–7 brown with yellow anterior and posterior margins; S1 asetose, S2–3 anterior ½ asetose and posterior ½ brown setose; S predominantly apruinose; T2–4 parallel-sided and not constricted waist-like; bullae on T2 brown, transversely elongate, surface entirely smooth, T2 surface anterior to bullae smooth.

Male terminalia: T1–7 well-developed, entirely sclerotised, T8 medially weakly sclerotised, divided into 2 lateral heavily sclerotised sclerites; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 well-developed and simple, not fused to T8 dorso-laterally, entire (undivided) ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), blunt, evenly rounded; subepandrial sclerite without lateral or median protuberances; hypandrium strongly concave, cup-shaped, entirely sclerotised ventrally (forming a single sclerite), entirely fused with gonocoxite, forming a gonocoxite-hypandrial complex; gonocoxites dorso-ventrally flattened (same height throughout, expanded laterally and medially), without median or lateral protuberance, gonocoxal apodeme absent; 2 functional aedeagal prongs, short and wide, medio-distally free, parallel or diverging laterally, distally straight or only diverging slightly laterally; aedeagal epimere absent; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventro-median margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath long, sperm sac entirely covered; sperm sac appearing ± heavily sclerotised.

Description Female: Head: in general densely white pruinose; vertex between compound eyes ± horizontally straight, medially only slightly below dorsal eye margin; postgenae apruinose; pocl setae yellow.

Antenna: scape and pedicel brown setose dorsally and ventrally; postpedicel ≥ 9.0 times as long as combined length of scape and pedicel.

Thorax: scutum uniformly brown, surface entirely smooth, scutal setation comprised of scattered short white setae; proepisternum, lateral postpronotum, and postpronotal lobes short white setose; scutellum apruinose, asetose; metepimeron same colour as T1.

Leg: all coxae apruinose, brown setose; femora light brown; all tibiae laterally arched, pro and mes tarsomere 1 as long as combined length of tarsomeres 2–3.

Wing: length = 12.5–12.7 mm; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein.

Abdomen: brown; T1 entirely brown, T2 brown with anterior and posterior margins yellow, T3–4 brown with posterior margin yellow; T1–3 sparsely brown setose; S1 brown, S2 brown with anterior and posterior margins yellow, S3–4 brown with posterior margin yellow; S1 asetose, S2–3 sparsely brown setose; T2 surface anterior to bullae smooth.

Female genitalia: densely arranged anteriorly directed setae absent, only very few on T8 and S8; T8 with broad anterior rectangular apodeme; T9 formed by wide, rectangular sclerite with median protuberance; T9+10 entirely fused, T10 divided into 2 heavily sclerotised acanthophorite plates, 10 acanthophorite spurs per plate; 2 spermathecae, all equally large, not differentiated from spermathecal ducts, weakly sclerotised; individual spermathecal ducts short; S9 (furca) formed by 1 sclerite, ring-like (joined anteriorly and posteriorly), anterior furcal apodeme present, 2 lateral projections forming divided apodeme, lateral furcal apodeme present, median furcal bridge absent.

Material examined: Kenya: Coast Province: 1 ♂ Watamu Mida Creek, 03°22'00"S 039°57'00"E, 24.i.1987, A. Weaving (AAM-000142 paratype, AMGS); Rift Valley Province: 2 ♀ 2 ♂ Nguruma, 01°50'00"S 036°56'00"E, -.vi.1990, I. Abu-Zinid (AAM-000149–AAM-000152 paratypes, NMSA); 3 ♂ Nguruman, 01°54'00"S 036°02'00"E, 20.vi.1996, R. Copeland (AAM-000146 1 ♂ holotype, AAM-000143 + AAM-000145 paratypes, NMKE); 1 ♂ Nguruman, 2.vii.1996, R. Copeland (AAM-000144 paratype, NMKE); **Tanzania:** Kilimanjaro Region: 2 ♂ Same, 18 km S, 04°13'00"S 037°46'00"E, 15.vii.2001, O. Haji W. Pulawski (AAM-000147–AAM-000148 paratypes, CAS).

Type locality and distribution: Nguruman (01°54'S 036°02'E), Kenya. Kenya, Tanzania (Fig. 47). Biodiversity hotspot/high-biodiversity wilderness area: Coastal Forest of Eastern Africa and Eastern Afromontane/-.

Vespiodes Hesse, 1969

General. To this day, nine species of *Vespiodes* are known from the Afrotropical Region occurring from Ghana in the north-west to north-eastern South Africa in the south (Sack 1935, Bequaert 1940, 1951, Hesse 1969, Bowden 1980), but representatives have not been reported from eastern Africa with the exception of central Malawi from where *Vespiodes nyasae* Hesse, 1969 was described. The latest key to species was published by Hesse (1969: 33).

Vespiodes phaios sp. n.

urn:lsid:zoobank.org:act:F1778548-C8BC-4EE4-A1BF-0CB5923EFD96
Figs 13–15, 35, 48

Etymology: *phaios* Greek adjective = brown. Referring the overall brown coloration of this attractive species.

Diagnosis: The species is distinguished from congeners by the predominantly apruinose and asetose scutum, the asetose abdominal tergites, features of the male terminalia, and its apparent distribution in south-eastern coastal Kenya.

Description Male: Head: brown, in general silver pruinose; width distinctly greater than thorax, interocular distance on vertex larger than at ventral eye margin, vertex between compound eyes slightly depressed, parafacial area less than ½ the width of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax white, covering only lateral facial gibbosity (asetose medially); frons predominantly apruinose, vertex apruinose, postgenae lightly silver pruinose; setation: vertex white, frons white, ocp setae brown or white, pocl setae white; ocellar triangle apruinose; proboscis brown, long, projecting beyond fronto-clypeal suture; labella large, much wider than prementum, about ½ length of prementum, unsclerotised laterally; maxillary palpi laterally compressed (leaflike), brown or light brown, shorter than length of pedicel.

Antenna: brown or orange, scape and pedicel white setose dorsally and ventrally; postpedicel cylindrical in proximal ½, symmetrically bulbous in distal ½, ≥ 11.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: brown, predominantly apruinose; scutum medially dark brown, laterally brown, surface macrorugose, predominantly apruinose, small antero-lateral spots and extreme lateral margins (dorsal to supero-posterior anepisternum) silver pruinose, scutal setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and postsuturally white, acr setae absent, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe light brown, partly silver pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long brown setose or long white setose; scutellum apruinose, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite apruinose, mesopostnotum asetose, anatergite asetose, katatergite long white setose; katatergite ± flat; anterior anepisternum asetose, supero-posterior anepisternum asetose; posterior anepimeron asetose, katepimeron asetose; metepimeron evenly elevated, same colour as T1, grey pruinose, asetose; metepisternum grey pruinose, asetose.

Leg: brown, setation predominantly brown; pro coxa apruinose, short white setose, mes coxa apruinose, short white setose, met coxa grey pruinose, white setose; met trochanter setose medially; femora brown, met femur proximally yellow, met femora distinctly clubbed in distal ⅔, in distal ½ macrosetose, 1 antero-ventral and 1 postero-ventral row of macrosetae; all tibiae laterally arched, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 as long as combined length of tarsomeres 2–3, met tarsomere 1 slightly longer than tarsomere 2, tarsomeres 1 and 2 longer than tarsomeres 3 and 4 combined; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = 15.9 mm; slightly brown stained, darker brown stained anterior to and distal to M veins, veins brown, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu*p* closed; C terminates at junction with R_1; R_4 terminates in R_1; R_5 terminates in R_1; stump vein

(R_3) at base of R_4 present, long but not reaching R_2; R_4 and R_5 widest apart medially; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein; M_1 curves anteriorly at r-m, M_1 (or M_1+M_2) terminates in R_1; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula well-developed; halter brown.

Abdomen: brown and yellow; setation comprised of scattered white and brown setae, surface entirely smooth; T1 brown, T2–4 brown with yellow anterior margins; T1–3 sparsely white setose; T predominantly apruinose; S1 brown, S2–4 brown with yellow anterior margins; S1 asetose, S2–3 sparsely white setose; S predominantly apruinose; T2–4 distinctly narrowed, forming a waist, abdomen vespiform; bullae on T2 brown, transversely elongate, surface entirely smooth, T2 surface anterior to bullae smooth.

Male terminalia: T1–7 well-developed, entirely sclerotised, T8 postero-medially weakly sclerotised, with anterior transverse sclerotised bridge connecting lateral sclerites; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 well-developed and simple, not fused to T8 dorso-laterally, entire (undivided) ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), blunt, evenly rounded; subepandrial sclerite without lateral or median protuberances; hypandrium strongly concave, cup-shaped, entirely sclerotised ventrally (forming a single sclerite), partially fused with gonocoxite anteriorly; gonocoxites dorso-ventrally flattened in distal ½, higher in proximal ½, without median or lateral protuberance, gonocoxal apodeme present, short (at most slightly extending hypopygium anteriorly); 2 functional aedeagal prongs, short and wide, medio-distally connected; aedeagal epimere present, distally simple, evenly rounded; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventromedian margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath long, sperm sac entirely covered; sperm sac appearing ± heavily sclerotised.

Description Female: Unknown.

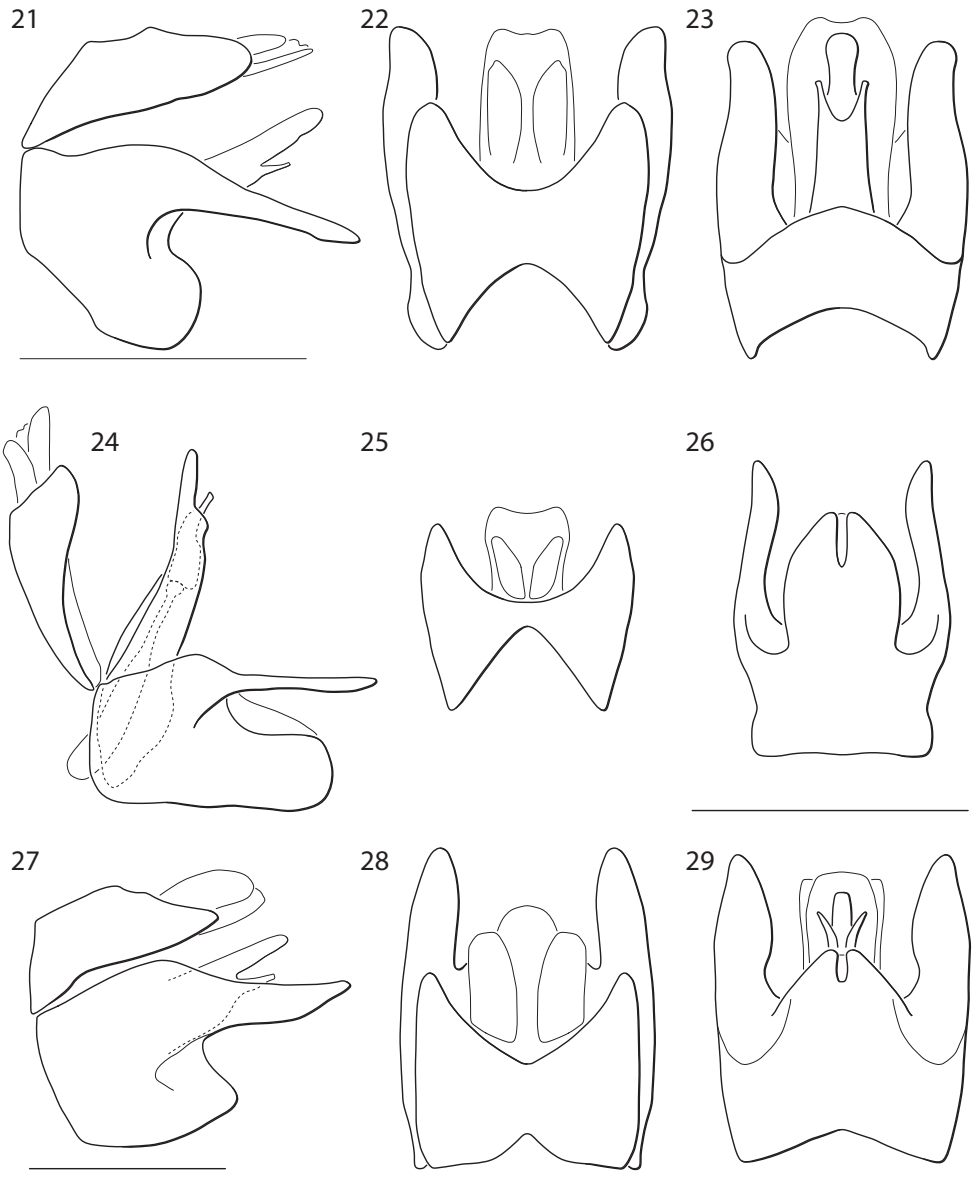
Material examined: Kenya: Coast Province: 1 ♂ Muhaka Forest, 04°19’29"S 039°31’27"E, 3.iii.2000, R. Copeland (AAM-000153 1 ♂ holotype, NMKE).

Type locality and distribution: Muhaka Forest (04°19’29"S 039°31’27"E), Kenya (Fig. 48). Biodiversity hotspot/high-biodiversity wilderness area: Coastal Forest of Eastern Africa/-.

Syllegomydini

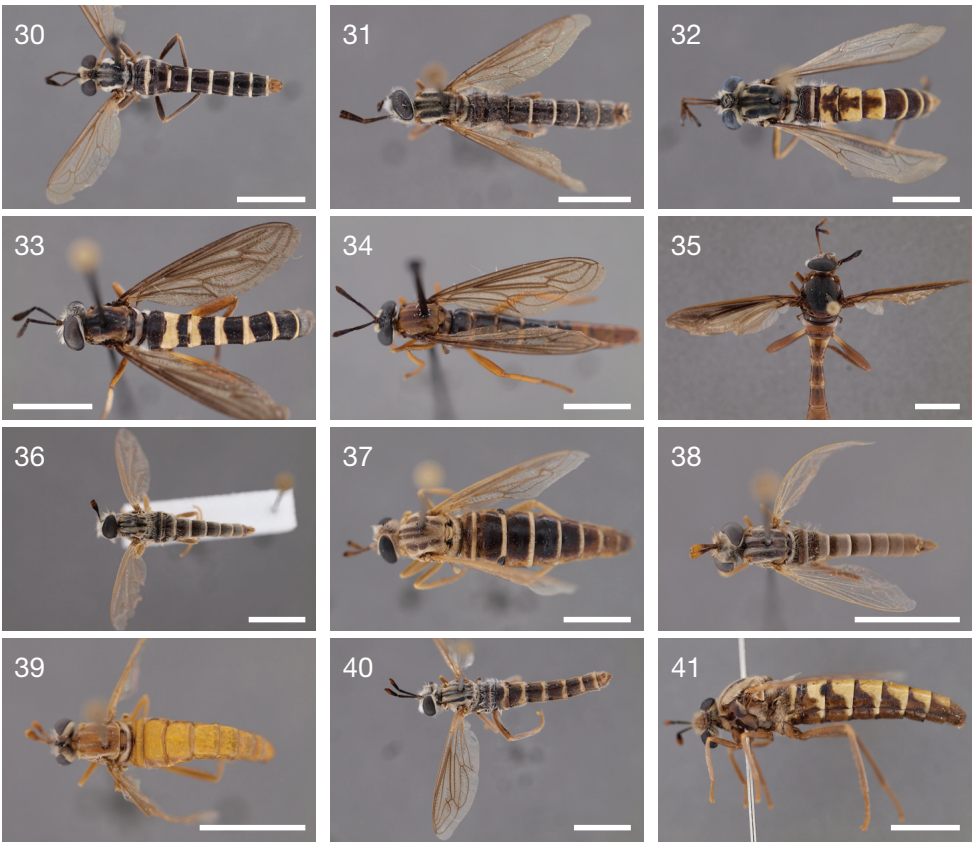
Syllegomydas Becker, 1906

General. The genus *Syllegomydas* comprises 24 valid species distributed primarily in northern Africa, with a few species in sub-Saharan Africa (Chad, Mali, Malawi, Mozambique, Niger, Zimbabwe), as well as Afghanistan, Israel, and Spain (e.g., Arias



Figures 21–29. ♂ terminalia of *Syllegomydas* species. **21–23.** *S. astrictus* sp. n. **21** lateral **22** dorsal **23** ventral. **24–26.** *S. elachys* sp. n. **24** lateral **25** dorsal **26** ventral. **27–29.** *S. dispar* **27** lateral **28** dorsal **29** ventral. Scale lines = 1 mm.

1914a,b, Bezzi 1924, Séguy 1941, Bequaert 1951, 1961, Hesse 1969, Bowden 1980, Carles-Tolrá 2006, see placement of *Syllegomydas bucciferus* Séguy, 1928 from India in the Discussion). The subgenus *Syllegomydas* (*Notobates*) Hesse, 1969 has been described for 2 species from southern Africa (Mozambique and Zimbabwe).



Figures 30–41. Photographs of newly described species. **30** *Leptomydas notos* sp. n. (♂ holotype, AAM-000776, AMNH) **31** *Leptomydas rapti* sp. n. (♂ holotype, AAM-000115, ZSMC) **32** *Leptomydas tigris* sp. n. (♂ holotype, AAM-001138, LACM) **33** *Mydaselpis ngurumani* sp. n. (♂ holotype, AAM-000146, NMKE) **34** *Mydaselpis ngurumani* sp. n. (♀ paratype, AAM-000152, NMSA) **35** *Vespiodes phaios* sp. n. (♂ holotype, AAM-000153, NMKE) **36** *Syllegomydas* (*Notobates*) *astrictus* sp. n. (♂ holotype, AAM-000164, NMKE) **37** *Syllegomydas* (*Notobates*) *astrictus* sp. n. (♀ paratype, AAM-000156, CAS) **38** *Syllegomydas* (*Syllegomydas*) *elachys* sp. n. (♂ paratype, AAM-001124, ZSMC) **39** *Syllegomydas* (*Syllegomydas*) *elachys* sp. n. (♀ paratype, AAM-001118, ZSMC) **40** *Syllegomydas* (*Notobates*) *heothinos* sp. n. (♂ holotype, AAM-001126, NMKE) **41** *Syllegomydas* (*Notobates*) *heothinos* sp. n. (♀ paratype, AAM-000138, BMNH). Scale lines = 5 mm.

Syllegomydas (Syllegomydas) astrictus sp. n.

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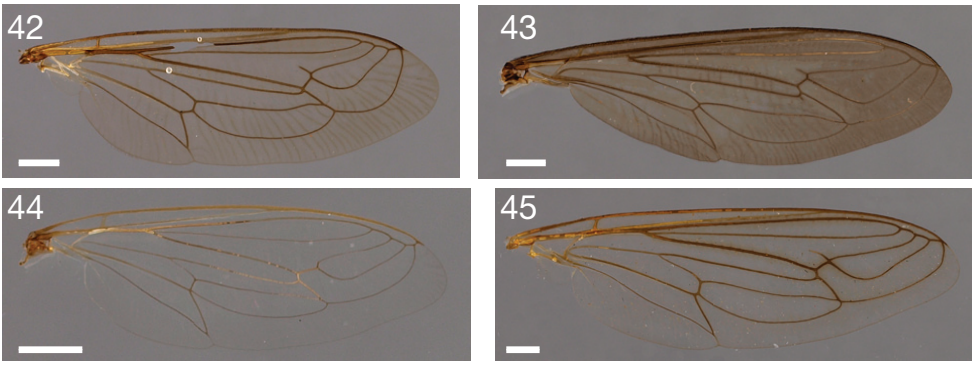
Figs 21–23, 36–37, 47

Etymology: *astrictus* Latin adjective = drawn together. Referring to the narrow postgenae so that the compound eyes nearly touch each other ventrally.

Diagnosis: The species is distinguished from congeners by the very narrow postgenae in the male so that the compound eyes nearly touch each other ventrally, the



Figures 42–45. Photographs of wings. **42** *Leptomydas notos* sp. n. (♂ paratype, AAM-000770, AMNH) **43** *Mydaselpis ngurumani* sp. n. (♂ paratype, AAM-000145, NMKE) **44** *Syllegomydas* (*Syllegomydas*) *elachys* sp. n. (♂ paratype, AAM-001114, ZSMC) **45** *Syllegomydas* (*Notobates*) *heothinos* sp. n. (♂ paratype, AAM-001104, BMNH). Scale lines = 1 mm.

long white acrostichal setae in the male, the overall brown coloration in the female, the presence of lateral furcal apodemes in females, and its apparent distribution in Kenya.

Description Male: Head: black, facial gibbosity light brown, in general densely white pruinose; width distinctly greater than thorax, interocular distance on vertex distinctly larger than at ventral eye margin, postgenae very narrow and eyes nearly touching ventrally, vertex between compound eyes slightly depressed, parafacial area about as wide as ½ the width of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax white, covering entire facial gibbosity; frons medially apruinose, laterally grey pruinose, vertex medially apruinose, laterally grey pruinose, postgenae grey pruinose; setation: vertex white, frons white, ocp setae white, pocl setae white; ocellar triangle apruinose; proboscis light brown, short, about ½ length of oral cavity; labella small, as wide as prementum, only forming distal tip of proboscis, unsclerotised laterally; maxillary palpi cylindrical, light brown, minute.

Antenna: brown or orange, scape and pedicel white setose dorsally and ventrally; postpedicel cylindrical in proximal ½, symmetrically bulbous in distal ½, ≥ 4.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: brown, predominantly grey pruinose; scutum medially bluish-black, laterally brown, surface entirely smooth, predominantly grey pruinose, broad sublateral stripes (interrupted postsuturally) and narrow paramedial stripes (merging postsuturally) apruinose, scutal setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and postsuturally white, acr setae present, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe light brown, grey pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long white setose; scutellum grey pruinose proximally, apruinose distally, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite grey pruinose, mesopostnotum

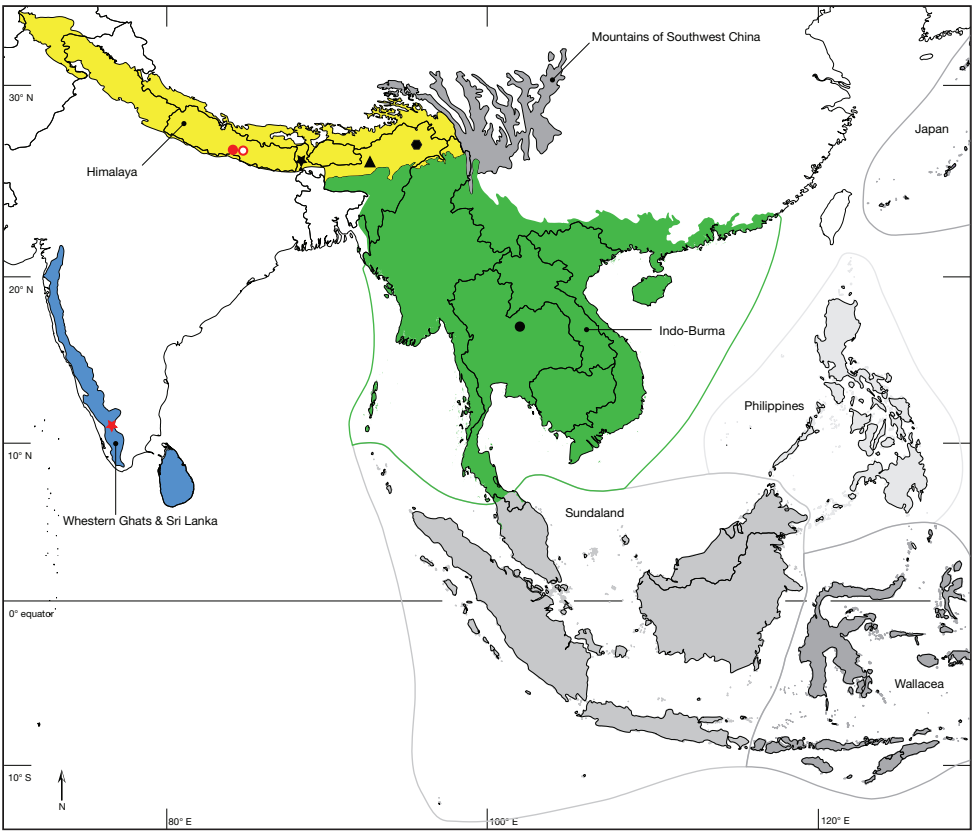


Figure 46. Map of the Oriental Region with biodiversity hotspots showing distribution of eastern species of *Leptomydas*. *Leptomydas annulata* comb. n. (black triangle), *Leptomydas bucciferus* comb. n. (black star), *Leptomydas indianus* (black pentagon), *Leptomydas notos* sp. n. (red star), *Leptomydas rapti* sp. n. (red circles, open circle = type locality), and *Leptomydas tigris* sp. n. (black circle).

laterally (close to anatergite) long white setose, anatergite long white setose, katatergite long white setose; katatergite ± flat; anterior anepisternum asetose, supero-posterior anepisternum long white setose; posterior anepimeron long white setose, katepimeron white setose; metepimeron ± flat, same colour as T1, grey pruinose, long white setose; metepisternum grey pruinose, asetose.

Leg: light brown, setation predominantly white; all coxae grey pruinose, white setose; met trochanter setose medially; femora light brown, met femora evenly clubbed in distal ¾, in distal ½ macrosetose, 1 antero-ventral and 1 postero-ventral row of macrosetae; all tibiae laterally arched, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 about as long as individual tarsomeres 2, 3, or 4, met tarsomere 1 as long as combined length of tarsomeres 2–3; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = 7.3–8.3 mm; hyaline throughout, veins light brown, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu_p closed; C terminates at junction with R_1; R_4 terminates

in R_1; R_5 terminates in R_1; stump vein (R_3) at base of R_4 present, short not reaching R_2; R_4 and R_5 widest apart medially; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein; M_1 straight at r-m (not curving anteriorly), M_1 (or M_1+M_2) terminates in R_1; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula well-developed; halter light yellow.

Abdomen: brown; setation comprised of scattered white setae, surface entirely smooth; T1–7 brown, yellow posterior margins; T1–2 and anterior ⅓ of T3 long white setose, remaining T3 brown setose; T brown pruinose proximally, grey pruinose distally; S1–7 light brown; S1 asetose, S2 long white setose, S3 short brown setose; S entirely grey pruinose; T2–4 tapering slightly posteriorly; bullae on T2 brown, transversely elongate, surface entirely smooth, T2 surface anterior to bullae smooth.

Male terminalia: T1–8 well-developed; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 well-developed and simple, not fused to T8 dorso-laterally, entire (undivided) ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), blunt, evenly rounded; subepandrial sclerite without lateral or median protuberances; hypandrium strongly concave, cup-shaped, entirely sclerotised ventrally (forming a single sclerite), entirely fused with gonocoxite, forming a gonocoxite-hypandrial complex; gonocoxites dorso-ventrally flattened (same height throughout, expanded laterally and medially), without median or lateral protuberance, gonocoxal apodeme absent; 2 functional aedeagal prongs, short and wide, medio-distally free, parallel or diverging laterally, distally straight or only diverging slightly laterally; aedeagal epimere present, distally simple, evenly rounded; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventro-median margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath long, sperm sac entirely covered; sperm sac appearing ± heavily sclerotised.

Description Female: Head: brown, in general grey pruinose; interocular distance on vertex larger than at ventral eye margin, vertex between compound eyes ± horizontally straight, medially only slightly below dorsal eye margin; parafacial area more than ½ the width of central facial gibbosity; mystax white, covering only lateral facial gibbosity (asetose medially); postgenae apruinose; pocl setae yellow.

Antenna: scape and pedicel white and yellow setose dorsally and ventrally.

Thorax: light brown, scutum medially brown, laterally light brown, predominantly grey pruinose, broad sublateral stripes (interrupted postsuturally) and narrow paramedial stripes (not reaching posterior margin) apruinose, scutal setation comprised of scattered short white setae; proepisternum, lateral postpronotum, and postpronotal lobes short white setose; supero-posterior anepisternum short white setose; anatergite short white setose; katatergite short white setose.

Leg: met femora ± cylindrical only slightly wider than pro and mes femora; pro and mes tibiae laterally arched, met tibia straight; met tarsomere 1 longer than combined length of tarsomeres 2–4; pulvilli reduced, half length of well-developed claws.

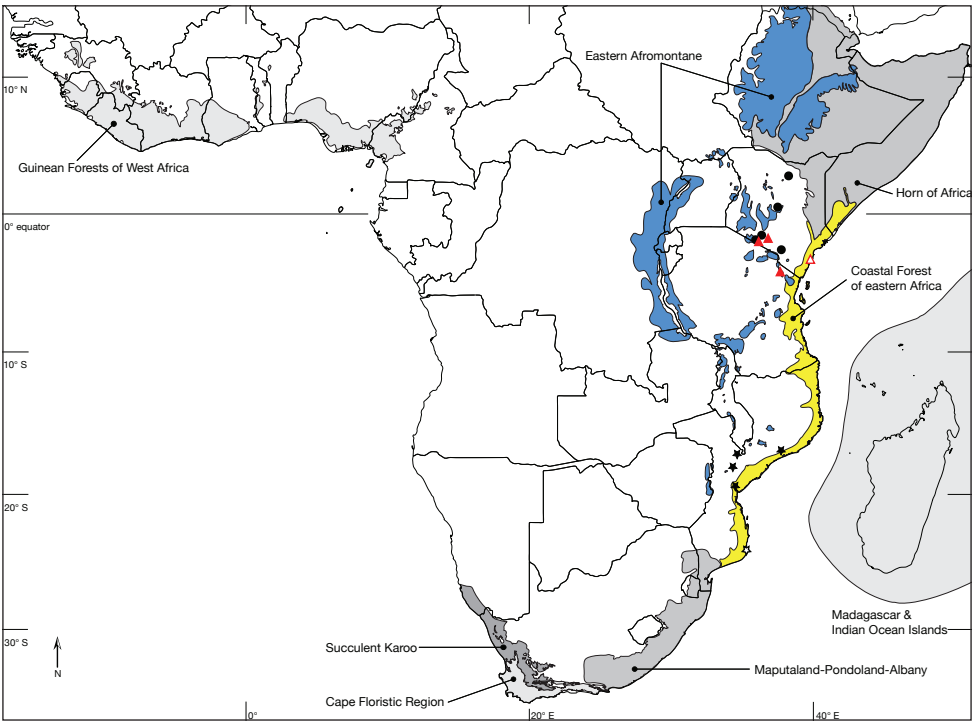


Figure 47. Map of the Afrotropical Region with biodiversity hotspots showing distribution of *Mydaselpis ngurumani* sp. n. (red triangle), *Syllegomydas dispar* (black star), *Syllegomydas astrictus* sp. n. (black circle). Type localities with open symbols.

Wing: length = 9.3–10.6 mm; slightly brown stained, darker brown around veins; halter light brown.

Abdomen: setation comprised of sparsely scattered short yellow setae, T1–3 sparsely yellow setose; T predominantly apruinose; S1 asetose, S2–3 sparsely yellow setose; S predominantly apruinose; T2–4 parallel-sided and not constricted waist-like; bullae on T2 brown, oval.

Female genitalia: densely arranged anteriorly directed setae present on T5–8 and S5–8; T8 with broad anterior rectangular apodeme; T9 formed by wide, rectangular sclerite with median protuberance; T9+10 entirely fused, T10 divided into 2 heavily sclerotised acanthophorite plates, 10 acanthophorite spurs per plate; 2 spermathecae, all equally large, formed by ± expanded weakly sclerotised ducts; individual spermathecal ducts short; S9 (furca) formed by 1 sclerite, ring-like (joined anteriorly and posteriorly), anterior furcal apodeme present, 2 lateral projections forming divided apodeme, lateral furcal apodeme present, median furcal bridge absent.

Material examined: Kenya: Eastern Province: 2 ♂ Isiolo, 5 km NNE, 00°24'18"N 037°35'42"E, 8–10.vi.2000, M. Bourbon V. Lee W. Pulawski (AAM-000154–AAM-000155 paratypes, CAS); 1 ♂ Athi River, 02°38'31"N 038°21'59"E, Malaise Trap, 5–10.vii.1999, R. Copeland (AAM-000170 paratype, NMKE); 1 ♀ Nguruman near

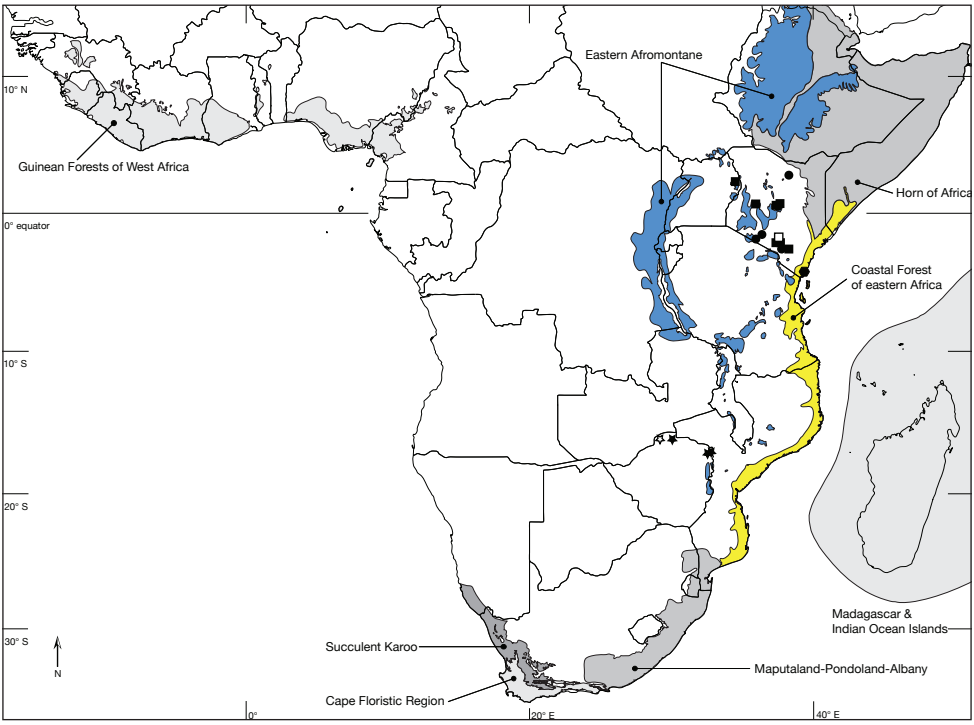


Figure 48. Map of the Afrotropical Region with biodiversity hotspots showing distribution of *Syllegomydas elachys* sp. n. (star), *Syllegomydas heothinos* sp. n. (square), and *Vespiodes phaios* sp. n. (pentagon). Type localities with open symbols.

Sampu River, 01°54'04"S 036°02'53"E, 753 m, 17.vi.1997, R. Copeland (AAM-001125 paratype, NMKE); 9 ♂ Nguruman near Sampu River, Malaise Trap near Nguruman Escarpment, 4–18.viii.2007, R. Copeland (AAM-000164 1 ♂ holotype, AAM-000161–AAM-000163, AAM-000165–AAM-000169 paratypes, NMKE); Rift Valley Province: 1 ♀ Magadi Road, 46 air km SW Nairobi, 01°34'00"S 036°27'24"E, 29.vi.1999, W. Pulawski J. Schweikert (AAM-000156 paratype, CAS); 4 ♂ Chyulu Hills, 02°36'00"S 037°51'00"E, Malaise Trap, 1–8.vii.2006, R. Copeland (AAM-000157–AAM-000160 paratypes, NMKE).

Type locality and distribution: Nguruman near Sampu River (01°54'04"S 036°02'53"E), Kenya (Fig. 47). Biodiversity hotspot/high-biodiversity wilderness area: -/-.

***Syllegomydas (Syllegomydas) elachys* sp. n.**
urn:lsid:zoobank.org:act:9A0DBEE7-3AF1-404D-95DB-E0440AA07719
Figs 24–26, 38–39, 44, 48

Etymology: *elachys* Greek adjective = little, small. Referring to the small size of this species.

Diagnosis: The species is distinguished from congeners by the very small size, the entirely grey pruinose abdominal tergites, the overall light brown coloration in females, the relatively short antennae, the very short proboscis, the parallel longitudinal ridges on the bullae, the presence of lateral furcal apodemes in females, and its apparent distribution in northern Zimbabwe.

Description Male: Head: brown, in general densely grey pruinose; width distinctly greater than thorax, interocular distance on vertex larger than at ventral eye margin, vertex between compound eyes ± horizontally straight, medially only slightly below dorsal eye margin, parafacial area more than ½ the width of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax light brown, covering entire facial gibbosity or white, covering entire facial gibbosity; frons entirely grey pruinose, vertex entirely grey pruinose, postgenae apruinose or lightly silver pruinose; setation: vertex light brown or white, frons light brown or white, ocp setae white, pocl setae white; ocellar triangle apruinose; proboscis light brown, very short, vestigial, knob-like; labella small, as wide as prementum, only forming distal tip of proboscis, unsclerotised laterally; maxillary palpi cylindrical, light brown, slightly longer than proboscis.

Antenna: brown or orange, scape and pedicel brown setose dorsally and ventrally; postpedicel cylindrical in proximal ½, symmetrically bulbous in distal ½, ≥ 4.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: brown, predominantly grey pruinose; scutum medially bluish-black, laterally brown, surface entirely smooth, predominantly grey pruinose, asetose median and sublateral stripes sparsely grey pruinose, setose areas densely grey pruinose, scutal setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and postsuturally white, acr setae absent, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe light brown, grey pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long white setose; scutellum entirely grey pruinose, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite grey pruinose, mesopostnotum asetose, anatergite long white setose, katatergite long white setose; katatergite ± flat; anterior anepisternum asetose, superoposterior anepisternum long white setose; posterior anepimeron long white setose, katepimeron white setose; metepimeron ± flat, same colour as T1, grey pruinose, long white setose; metepisternum grey pruinose, asetose.

Leg: light brown or yellow, setation predominantly white; all coxae grey pruinose, white setose; met trochanter setose medially; femora brown or light brown, met femora ± cylindrical only slightly wider than pro and mes femora, in distal ½ macrosetose, 1 antero-ventral and 1 postero-ventral row of macrosetae; all tibiae laterally arched, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 as long as combined length of tarsomeres 2–3, met tarsomere 1 as long as combined length of tarsomeres 2–4; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = 5.6–7.5 mm; hyaline throughout, veins light brown, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu*p* closed; C terminates at junction with R_1; R_4 terminates

in R_1; R_5 terminates in R_1; stump vein (R_3) at base of R_4 present, short not reaching R_2; R_4 and R_5 ± parallel medially; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein; M_1 straight at r-m (not curving anteriorly), M_1 (or M_1+M_2) terminates in R_1; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula well-developed; halter light brown.

Abdomen: brown; setation comprised of scattered white setae, surface entirely smooth; T1–7 brown, yellow posterior margins; T1 and anterior ¼ of T2 long white setose, remaining T2 and T3 brown and white setose; T entirely grey pruinose; S1–7 brown; S1 asetose, S2–3 sparsely yellow setose; S entirely grey pruinose; T2–4 parallel-sided and not constricted waist-like; bullae on T2 brown, transversely elongate, surface with parallel longitudinal ridges, T2 surface anterior to bullae smooth.

Male terminalia: T1–8 well-developed; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 well-developed and simple, not fused to T8 dorso-laterally, entire (undivided) ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), rounded postero-laterally; subepandrial sclerite without lateral or median protuberances; hypandrium strongly concave, cup-shaped, entirely sclerotised ventrally (forming a single sclerite), entirely fused with gonocoxite, forming a gonocoxite-hypandrial complex; gonocoxites dorso-ventrally flattened in distal ½, higher in proximal ½, without median or lateral protuberance, gonocoxal apodeme absent; 2 functional aedeagal prongs, short and wide, medio-distally free, parallel or diverging laterally, distally straight or only diverging slightly laterally; aedeagal epimere present, distally simple, evenly rounded; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventro-median margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath long, sperm sac entirely covered; sperm sac appearing ± heavily sclerotised.

Description Female: Head: brown, facial gibbosity light brown; parafacial area about as wide as ½ the width of central facial gibbosity.

Antenna: postpedicel ≥ 3.0 times as long as combined length of scape and pedicel.

Thorax: scutum uniformly brown; proepisternum, lateral postpronotum, and post-pronotal lobes short white setose; anatergite short white setose; katatergite short white setose; supero-posterior anepisternum asetose; posterior anepimeron short white setose.

Leg: brown, setation brown and white; all coxae grey pruinose, brown setose; pro and mes tarsomere 1 longer than tarsomere 2, but less than combined length of tarsomeres 2–3.

Wing: length = 8.9–9.2 mm; slightly brown stained throughout, veins brown; halter brown.

Abdomen: setation comprised of sparsely scattered short brown setae, T1–7 brown; T1–3 sparsely brown setose; T predominantly apruinose; S1–3 asetose; S predominantly apruinose; bullae on T2 light brown, transversely elongate.

Female genitalia: densely arranged anteriorly directed setae absent, only few on T7–8 and S7–8; T8 with broad anterior rectangular apodeme; T9 formed by wide,

rectangular sclerite with median protuberance; T9+10 entirely fused, T10 divided into 2 heavily sclerotised acanthophorite plates, 5–7 acanthophorite spurs per plate; 2 spermathecae, all equally large, formed by ± expanded weakly sclerotised ducts and spherical weakly sclerotised reservoirs; individual spermathecal ducts short; S9 (furca) formed by 1 sclerite, ring-like (joined anteriorly and posteriorly), anterior furcal apodeme present, 2 lateral projections forming divided apodeme, lateral furcal apodeme present, median furcal bridge absent.

Material examined: Zimbabwe: Mashonaland East: 1 ♂ Kotwa, Broken Causeway, 17°03'00"S 032°46'00"E, 7.ix.1986, M. Lillig S. Potel (AAM-001111 paratype, ZSMC); 1 ♂ Kotwa, Broken Causeway, 8.ix.1986, M. Lillig S. Potel (AAM-001112 paratype, ZSMC); 1 ♂ Kotwa, Broken Causeway, 31.viii.1986, M. Lillig S. Potel (AAM-001113 paratype, ZSMC); 1 ♂ Kotwa, Broken Causeway, 25.viii.1986, M. Lillig S. Potel (AAM-001114 paratype, ZSMC); 1 ♀ Kotwa, Chimana Causeway, 17°06'00"S 032°38'00"E, 26.viii.1986, M. Lillig S. Potel (AAM-001115 paratype, ZSMC); Mashonaland West: 1 ♀ 3 ♂ Rukommetje Research Station, 16°06'00"S 029°15'00"E, -.viii.1988, J. Weyrich (AAM-001117 1 ♂ holotype, AAM-001116, AAM-001118–AAM-001119 paratypes, ZSMC); 1 ♂ Rukommetje Research Station, -.viii.1988, J. Weyrich (AAM-001120 paratype, ZSMC); 4 ♂ SE Angwe Bridge, 16°05'00"S 030°09'00"E, -.viii.1988, J. Weyrich (AAM-001121–AAM-001124 paratypes, ZSMC).

Type locality and distribution: Rukommetje Research Station (16°06'00"S 029°15'00"E), Zimbabwe (Fig. 48). Biodiversity hotspot/high-biodiversity wilderness area: -/Miombo-Mopane Woodlands and Savannas.

Remarks: This species does not belong to the subgenus *Notobates* as defined by Hesse (1969: 274) and it might therefore present the southernmost distribution of the primarily Palaearctic subgenus *Syllegomydas*. The monophyly of *Syllegomydas* (*Notobates*) needs to be investigated and will be tested with a phylogenetic study of Mydidae currently in preparation by the author.

Syllegomydas (Syllegomydas) proximus Séguy, 1928

Diagnosis: The species is distinguished from congeners by the overall dark coloration in the male, the narrow yellow bands on the posterior margin of the abdominal tergites, the dark patterning of the female abdominal tergites, and its apparent distribution on the southern and western edges of the Sahara.

Re-description Male: Head: brown, in general grey pruinose; width distinctly greater than thorax, interocular distance on vertex larger than at ventral eye margin, vertex between compound eyes slightly depressed, parafacial area less than ½ the width of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax white, covering entire facial gibbosity; frons medially apruinose, laterally grey pruinose, vertex medially apruinose, laterally grey pruinose, postgenae apruinose; setation: vertex white, frons white, ocp setae white, pocl setae yellow; ocellar triangle apruinose; proboscis light brown, very short, vestigial, knob-like; labella small,

as wide as prementum, only forming distal tip of proboscis, unsclerotised laterally; maxillary palpi cylindrical, light brown, slightly longer than proboscis.

Antenna: brown, scape and pedicel white setose dorsally, brown setose ventrally; postpedicel cylindrical in proximal ½, symmetrically bulbous in distal ½, ≥ 3.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: light brown, predominantly grey pruinose; scutum uniformly brown, surface entirely smooth, predominantly grey pruinose, broad sublateral and median stripes (not reaching posterior margin) brown pruinose, scutal setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and postsuturally white, acr setae absent, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe yellow, white pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long white setose; scutellum entirely grey pruinose, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite grey pruinose, mesopostnotum laterally (close to anatergite) long white setose, anatergite long white setose, katatergite long white setose; katatergite ± flat; anterior anepisternum asetose, supero-posterior anepisternum long white setose; posterior anepimeron long white setose, katepimeron white setose; metepimeron ± flat, yellow, grey pruinose, long white setose; metepisternum grey pruinose, asetose.

Leg: brown, setation brown and white; all coxae grey pruinose, brown setose; met trochanter setose medially; femora brown, met femora ± cylindrical only slightly wider than pro and mes femora, in distal ½ macrosetose, 1 antero-ventral and 1 postero-ventral row of macrosetae; pro and mes tibiae laterally arched, met tibia straight, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 longer than tarsomere 2, but less than combined length of tarsomeres 2–3, met tarsomere 1 as long as combined length of tarsomeres 2–4; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = 9.0–9.7 mm; hyaline throughout, veins light brown or light yellow, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu*p* closed; C terminates at junction with R_1; R_4 terminates in R_1; R_5 terminates in R_1; stump vein (R_3) at base of R_4 absent or only very short; R_4 and R_5 widest apart medially; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein; M_1 straight at r-m (not curving anteriorly), M_1 (or M_1+M_2) terminates in R_1; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula well-developed; halter light brown.

Abdomen: brown; setation comprised of scattered white and brown setae, surface entirely smooth; T1–T7 brown with narrow yellow posterior margins; T1 and anterior ½ of T2 long white setose, remaining T2 and T3 brown setose; T lightly grey pruinose; S1–7 brown, yellow posterior margins; S1 asetose, S2–3 sparsely brown setose; S predominantly apruinose; T2–4 parallel-sided and not constricted waist-like; bullae on T2 light brown, small and circular, surface entirely smooth, T2 surface anterior to bullae smooth.

Male terminalia: T1–7 well-developed, entirely sclerotised, T8 postero-medially weakly sclerotised, with anterior transverse sclerotised bridge connecting lateral scle-

rites; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 well-developed and simple, not fused to T8 dorso-laterally, entire (undivided) ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), rounded postero-laterally; subepandrial sclerite without lateral or median protuberances; hypandrium strongly concave, cup-shaped, entirely sclerotised ventrally (forming a single sclerite), entirely fused with gonocoxite, forming a gonocoxite-hypandrial complex; gonocoxites dorso-ventrally flattened in distal ½, higher in proximal ½, without median or lateral protuberance, gonocoxal apodeme absent; 2 functional aedeagal prongs, short and wide, medio-distally free, parallel or diverging laterally, distally straight or only diverging slightly laterally; aedeagal epimere present, distally simple, evenly rounded; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventro-median margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath long, sperm sac entirely covered; sperm sac appearing ± heavily sclerotised.

Re-description Female: Head: in general densely grey pruinose; vertex between compound eyes ± horizontally straight, medially only slightly below dorsal eye margin; parafacial area more than ½ the width of central facial gibbosity; mystax white, covering entire facial gibbosity, sparse; pocl setae white.

Antenna: scape and pedicel white setose dorsally and ventrally; postpedicel ≥ 4.0 times as long as combined length of scape and pedicel.

Thorax: scutum uniformly light brown; mesopostnotum laterally (close to anatergite) short white setose; anatergite short white setose; katatergite short white setose; posterior anepimeron short white setose; supero-posterior anepisternum short white setose; metepimeron same colour as T1, white pruinose, short white setose.

Leg: light brown, setation predominantly white; all coxae grey pruinose, white setose; femora light brown or yellow; pulvilli reduced, half length of well-developed claws.

Wing: length = 11.2–11.5 mm; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein.

Abdomen: light brown; setation comprised of sparsely scattered short yellow setae, T1 light brown, T2–7 light brown with brown lateral longitudinal and sublateral circular markings; T1–3 sparsely yellow setose; T1–2 anteriorly lightly grey pruinose, T3–7 apruinose; S1 brown, S2–7 light brown with brown lateral longitudinal and median circular markings; S1–3 asetose.

Female genitalia: densely arranged anteriorly directed setae present on T7–8 and S7–8; T9 formed by wide, rectangular sclerite with median protuberance; T9+10 entirely fused, T10 divided into 2 heavily sclerotised acanthophorite plates, 6–8 acanthophorite spurs per plate; 2 spermathecae, all equally large, formed by ± expanded weakly sclerotised ducts and spherical weakly sclerotised reservoirs; individual spermathecal ducts short; S9 (furca) formed by 1 sclerite, ring-like (joined anteriorly and posteriorly), anterior furcal apodeme present, 2 lateral projections forming divided apodeme, lateral furcal apodeme present, median furcal bridge absent.

Material examined: Niger: Niamey: 1 ♂ Niamey, 13°31'00"N 002°07'00"E, -.xii.1938, L. Chepard (AAM-001219, MNHN); 3 ♂ Niamey, 16.xi.1977, millet field, J. Ritchie (AAM-000140, AAM-000663–AAM-000664, BMNH); Zinder: 3 ♀ 4 ♂ Dungass (= Dengas), 13°04'05"N 009°20'23"E, -.xi.1910, R. Gaillard (1 ♂ holotype, AAM-001220–AAM-001225, MNHN); **Mauritania:** Trarza: 1 ♂ Nouakchott, 153 km NE, 18°59'45"N 015°13'56"W, 20.x.1993, W. Pulawski (AAM-000116, CAS).

Distribution: Niger, Mauritania. Biodiversity hotspot/high-biodiversity wilderness area: -/-.

Remarks: The ♂ specimen (AAM-000116) of this small species from the western edges of the Sahara represents the first Mydidae species recorded from Mauritania. The species is primarily known from specimens collected in southern Niger (see material examined above that was first mentioned by Séguy 1928, 1941). It has also been recorded from Mali (Bowden 1980: 333) and North Africa (Sack 1934: 26). The specimen that Bowden based his assessment on has not been found in the BMNH so that I cannot verify the record from Mali. The northern African distribution is also questionable as this species has not been listed in the Palaearctic catalogue (Richter and Zaitzev 1988).

Syllegomydas (Notobates) Hesse, 1969

Hesse (1969: 274) described the subgenus *Notobates* to accommodate two species, *Syllegomydas arnoldi* Bequaert, 1938 and *Syllegomydas rhodesiensis* Bequaert, 1938, from Mozambique and Zimbabwe and provided a key to the species. He did not place *Syllegomydas dispar* (Loew, 1852), also from Mozambique, in this subgenus, because he had not studied specimens of this species. Having studied the type specimens of *Syllegomydas dispar* at the ZMHB as well as additional specimens from several collections, it becomes clear that this species should also be placed in *Syllegomydas* (*Notobates*) based, for example, on the undulating vein A_1 and the long antennae (longer than scutum). Both Hesse (1969: 295) and Bowden (1980: 333) listed *Syllegomydas dispar* as Syllegomydini *incertae sedis*. Therefore, this species is here re-described and illustrated to allow identification in the future.

Syllegomydas (Notobates) dispar (Loew, 1852), comb. n.

Figs 27–29, 47

Diagnosis: The species is distinguished from congeners by the brown and yellow abdominal tergites in males and females, the long antennae, the presence of long acrostichal setae, the yellow metepimeron, which is coloured differently than the adjacent abdominal tergite 1, the absence of lateral furcal apodemes in females, and its apparent distribution in south-eastern lowland and coastal Mozambique.

Re-description Male: Head: brown, in general grey pruinose; width distinctly greater than thorax, interocular distance on vertex larger than at ventral eye margin, vertex between compound eyes ± horizontally straight, medially only slightly below dorsal eye margin, parafacial area less than ½ the width of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax white, covering entire facial gibbosity; frons medially apruinose, laterally grey pruinose, vertex medially apruinose, laterally grey pruinose, postgenae apruinose; setation: vertex white, frons white, ocp setae white, pocl setae white; ocellar triangle apruinose; proboscis light brown, very short, vestigial, knob-like; labella small, as wide as prementum, as long as prementum, unsclerotised laterally; maxillary palpi cylindrical, light brown, slightly longer than proboscis.

Antenna: brown, scape and pedicel white setose dorsally and ventrally; postpedicel cylindrical in proximal ⅔, symmetrically bulbous in distal ⅓, ≥ 7.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: dark brown to bluish-black, predominantly grey pruinose; scutum medially bluish-black, laterally brown, surface entirely smooth, predominantly grey pruinose, only broad sublateral stripes and narrow paramedial stripes (not reaching posterior margin) apruinose, scutal setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and postsuturally white, acr setae present, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe light brown, grey pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long white setose; scutellum apruinose, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite partly grey pruinose, anatergite and katatergite apruinose, mesopostnotum entirely long white setose, anatergite long white setose, katatergite long white setose; katatergite ± flat; anterior anepisternum asetose, supero-posterior anepisternum long white setose; posterior anepimeron long white setose, katepimeron white setose; metepimeron ± flat, yellow, apruinose, long white setose; metepisternum grey pruinose, asetose.

Leg: brown or light brown, setation predominantly white; all coxae apruinose, long white setose; met trochanter setose medially; femora brown, met femora ± cylindrical only slightly wider than pro and mes femora, in distal ½ macrosetose, 1 antero-ventral and 1 postero-ventral row of macrosetae; pro and mes tibiae laterally arched, met tibia straight, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 about as long as individual tarsomeres 2, 3, or 4, met tarsomere 1 as long as combined length of tarsomeres 2–3 or less than combined length of tarsomeres 2–3; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = 9.5–11.8 mm; slightly brown stained throughout, veins brown, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu*p* closed; C terminates at junction with R_1; R_4 terminates in R_1; R_5 terminates in R_1; stump vein (R_3) at base of R_4 present, short not reaching R_2; R_4 and R_5 widest apart medially; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein; M_1 straight at r-m (not curving anteriorly), M_1 (or M_1+M_2) terminates in R_1; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally);

M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula well-developed; halter light brown.

Abdomen: brown and yellow; setation comprised of scattered white and brown setae, surface entirely smooth; T1 brown, narrow yellow posterior margin, T2–7 brown, broad yellow posterior margins, expanding antero-laterally particularly on T2–3; T1 and anterior ½ of T2 long white setose, remaining T2 and T3 brown setose; T predominantly apruinose; S1–7 brown, yellow posterior margins; S1 asetose, S2 long white setose, S3 short white setose; S predominantly apruinose; T2–4 parallel-sided and not constricted waist-like; bullae on T2 brown, oval, surface entirely smooth, T2 surface anterior to bullae smooth.

Male terminalia: T1–7 well-developed, entirely sclerotised, T8 postero-medially weakly sclerotised, with anterior transverse sclerotised bridge connecting lateral sclerites; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 well-developed and simple, not fused to T8 dorso-laterally, entire (undivided) ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), pointed postero-laterally; subepandrial sclerite without lateral or median protuberances; hypandrium strongly concave, cup-shaped, entirely sclerotised ventrally (forming a single sclerite), entirely fused with gonocoxite, forming a gonocoxite-hypandrial complex; gonocoxites dorso-ventrally flattened in distal ½, higher in proximal ½, without median or lateral protuberance, gonocoxal apodeme absent; 2 functional aedeagal prongs, short and wide, medio-distally free, parallel or diverging laterally, distally straight or only diverging slightly laterally; aedeagal epimere present, distally simple, evenly rounded; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventro-median margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath long, sperm sac entirely covered; sperm sac appearing ± heavily sclerotised.

Re-description Female: Head: parafacial area about as wide as ½ the width of central facial gibbosity; maxillary palpi brown.

Thorax: brown, scutum medially brown, laterally light brown, predominantly grey pruinose, broad sublateral stripes (interrupted postsuturally) and narrow paramedial stripes (not reaching posterior margin) apruinose, scutal setation comprised of distinct rows of short dorsocentral setae and lateral scutal setae; proepisternum, lateral postpronotum, and postpronotal lobes short white setose; katatergite short white setose; supero-posterior anepisternum short white setose; metepimeron light brown.

Leg: all tibiae laterally arched.

Wing: length = 10.2 mm.

Abdomen: T1 brown, narrow yellow posterior margin, T2–7 brown, broad yellow posterior margins that are widest medially; T1 and anterior ¼ of T2 long white setose, remaining T2 and T3 sparsely white setose; S1–7 brown; S1 asetose, S2–3 sparsely yellow setose.

Female genitalia: densely arranged anteriorly directed setae present on T7–8 and S7–8; T8 with broad anterior rectangular apodeme; T9 formed by wide, rectangular sclerite with median protuberance; T9+10 entirely fused, T10 divided into 2 heavily

sclerotised acanthophorite plates, 7–8 acanthophorite spurs per plate; 2 spermathecae, all equally large, formed by ± expanded weakly sclerotised ducts; individual spermathecal ducts short; S9 (furca) formed by 1 sclerite, ring-like (joined anteriorly and posteriorly), anterior furcal apodeme present, 2 lateral projections forming divided apodeme, lateral furcal apodeme absent, median furcal bridge absent.

Material examined: Mozambique: Inhambane: 2 ♀ 1 ♂ Inhambane, 23°51'54"S 035°22'60"E, -.-.-, Peters (♂ lectotype, ♀ paralectotypes, ZMHB); Sofala: 1 ♀ 3 ♂ 1? Beira, 19°50'37"S 034°50'20"E, 2.ix.1961, G. Heinrich (AAM-000185–AAM-000189, CAS, CNC); 1 ♀ 1 ♂ Beira, 10.vii.1973, R. Erasmus (AAM-000287–AAM-000288, NMSA); 1 ♂ Beira, -.viii.1903, P. Krantz (AAM-000549, TMSA); 1 ♂ Beira, -.vi.1932, J. Ogilvie (AAM-000713, BMNH); 1 ♀ Upper Nhamapaza river, forest S Maringue, 17°57'52“S 034°23'26“E, 11.vi.1929, P. Lesne (AAM-003272, MNHN); 1 ♀ 2 ♂ Nova Chupanga, 17°07'32“S 034°51'34“E, 27.x.-, J. Surcouf (AAM-003268–AAM-003270, MNHN); Zambezia: 1 ♀ near Sone, 16°46'17“S 037°45'16“E, 24.v.1928, P. Lesne (AAM-003271, MNHN).

Distribution: Mozambique (Fig. 47). Biodiversity hotspot/high-biodiversity wilderness area: Coastal Forest of Eastern Africa/-.

Remarks: In order to preserve taxonomic stability and make more universal the use of this specific name, the ♂ specimen from the syntype series deposited in the ZMHB is here designated as the lectotype, making the two remaining ♀ specimens paralectotypes. The specimen from Beira deposited in the TMSA (AAM-000549) has been studied by Hesse (1969: 277) and was identified as *Syllegomydas arnoldi*. I believe that it is a representative of the smaller species *S. dispar* as this species appears to inhabit the coastal and lowland parts of Mozambique while the larger species *S. arnoldi* appears to inhabit higher elevation areas within Zimbabwe (although 2 specimens from the Lowveld of South Africa from Kruger National Park are deposited in the SANC (South African National Collection of Insects, Pretoria, AAM-000088–AAM-000089)).

***Syllegomydas (Notobates) heothinos* sp. n.**
urn:lsid:zoobank.org:act:C970D338-728B-4F9A-8B68-232C5BEEF33F
Figs 16–18, 20, 40–41, 45, 48

Etymology: *heothinos* Greek adjective = eastern. Referring to the distribution in eastern Africa.

Diagnosis: The species is distinguished from congeners by the relatively large size, the brown and yellow abdominal tergites in males and even more pronounced in females, the absence of lateral furcal apodemes in females, and its apparent distribution in Kenya and Uganda.

Description Male: Head: black, facial gibbosity light brown, in general grey pruinose; width distinctly greater than thorax, interocular distance on vertex larger than at ventral eye margin, vertex between compound eyes ± horizontally straight, medially only slightly below dorsal eye margin, parafacial area less than ½ the width

of central facial gibbosity; facial gibbosity distinct, well-developed and discernible in lateral view; mystax white, covering entire facial gibbosity; frons medially apruinose, laterally grey pruinose, vertex predominantly apruinose, only lateral margins grey pruinose, postgenae apruinose; setation: vertex white, frons white, ocp setae white, pocl setae white; ocellar triangle apruinose; proboscis light brown, short, about ½ length of oral cavity; labella small, as wide as prementum, as long as prementum, unsclerotised laterally; maxillary palpi cylindrical, light brown, longer than ½ the length of proboscis.

Antenna: brown or orange, scape and pedicel white setose dorsally and ventrally; postpedicel cylindrical in proximal ⅔, symmetrically bulbous in distal ⅓, ≥ 7.0 times as long as combined length of scape and pedicel; apical ‚seta-like' sensory element situated apically in cavity on postpedicel.

Thorax: dark brown to bluish-black, predominantly grey pruinose; scutum medially bluish-black, laterally brown, surface entirely smooth, predominantly grey pruinose, broad sublateral stripes (interrupted postsuturally) and narrow paramedial stripes (not reaching posterior margin) apruinose, scutal setation comprised of distinct rows of long dorsocentral setae and lateral scutal setae; dc setae pre- and postsuturally white, acr setae present, lateral scutal setae white, npl, spal, and pal setae absent; postpronotal lobe light brown, grey pruinose; proepisternum, lateral postpronotum, and postpronotal lobes long white setose; scutellum silver pruinose proximally, apruinose distally, asetose, apical scutellar setae absent; mesopostnotum, anatergite, and katatergite grey pruinose, mesopostnotum entirely long white setose, anatergite long white setose, katatergite long white setose; katatergite ± flat; anterior anepisternum asetose, supero-posterior anepisternum long white setose; posterior anepimeron long white setose, katepimeron white setose; metepimeron ± flat, yellow, grey pruinose, long white setose; metepisternum grey pruinose, asetose.

Leg: brown or light brown, setation predominantly white; all coxae grey pruinose, white setose; met trochanter setose medially; femora brown or light brown, met femora ± cylindrical only slightly wider than pro and mes femora, in distal ½ macrosetose, 1 antero-ventral and 1 postero-ventral row of macrosetae; all tibiae laterally arched, met tibia cylindrical, ventral keel absent; pro and mes tarsomere 1 about as long as individual tarsomeres 2, 3, or 4, met tarsomere 1 as long as combined length of tarsomeres 2–3; pulvilli well-developed, as long as well-developed claws, and as wide as base of claws; empodium absent.

Wing: length = (10.5–)12.0–12.5 mm; hyaline throughout, slightly brown stained along veins, veins brown, microtrichia absent; cells r_1, r_4, r_5, m_3, + cu*p* closed; C terminates at junction with R_1; R_4 terminates in R_1; R_5 terminates in R_1; stump vein (R_3) at base of R_4 present, short not reaching R_2; R_4 and R_5 widest apart medially; r-m distinct, R_{4+5} and M_1 apart, connected by crossvein; M_1 straight at r-m (not curving anteriorly), M_1 (or M_1+M_2) terminates in R_1; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); M_3+CuA_1 do not terminate together in C; A_1 undulating, cell a_1 wide, A_1 and wing margin further apart proximally than distally, alula well-developed; halter light brown.

Abdomen: brown and yellow; setation comprised of scattered white and brown setae, surface entirely smooth; T1 brown, narrow yellow posterior margin, T2–7 brown, broad yellow posterior margins, expanding antero-laterally particularly on T2–3; T1 and anterior ½ of T2 long white setose, remaining T2 and T3 brown setose; T predominantly apruinose; S1–7 brown; S1 asetose, S2 long white setose, S3 short brown setose; S predominantly apruinose; T2–4 parallel-sided and not constricted waist-like; bullae on T2 brown, oval, surface entirely smooth, T2 surface anterior to bullae smooth.

Male terminalia: T1–7 well-developed, entirely sclerotised, T8 postero-medially weakly sclerotised, with anterior transverse sclerotised bridge connecting lateral sclerites; T7–8 anteriorly with 2 lateral apodemes; S6 regular, without any special setation postero-medially, S8 well-developed and simple, not fused to T8 dorso-laterally, entire (undivided) ventro-medially; epandrium formed by single sclerite (fused medially ± entirely), pointed postero-laterally; subepandrial sclerite without lateral or median protuberances; hypandrium strongly concave, cup-shaped, entirely sclerotised ventrally (forming a single sclerite), entirely fused with gonocoxite, forming a gonocoxite-hypandrial complex; gonocoxites dorso-ventrally flattened in distal ½, higher in proximal ½, without median or lateral protuberance, gonocoxal apodeme absent; 2 functional aedeagal prongs, short and wide, medio-distally free, parallel or diverging laterally, distally straight or only diverging slightly laterally; aedeagal epimere present, distally simple, evenly rounded; lateral ejaculatory processes absent; ejaculatory apodeme formed by single dorso-ventrally oriented plate; ventro-median margin of dorsal aedeagal sheath heavily sclerotised (appearing entirely closed); dorsal aedeagal sheath long, sperm sac entirely covered; sperm sac appearing ± heavily sclerotised.

Description Female: Head: brown, facial gibbosity light brown; parafacial area about as wide as ½ the width of central facial gibbosity; vertex medially apruinose, laterally grey pruinose.

Antenna: postpedicel ≥ 5.0 times as long as combined length of scape and pedicel.

Thorax: scutum brown, postero-medially bluish-black, scutal setation comprised of distinct rows of short dorsocentral setae and lateral scutal setae; proepisternum, lateral postpronotum, and postpronotal lobes short white setose; scutellum grey pruinose proximally, apruinose distally, asetose; supero-posterior anepisternum short white setose; metepimeron light brown.

Leg: all coxae apruinose, short white setose; met tarsomere 1 as long as combined length of tarsomeres 2–4.

Wing: length = 14.3–16.3 mm; slightly brown stained, darker brown around veins.

Abdomen: T1–7 yellow, narrow brown anterior margins that are widest laterally and medially; T1 and anterior ¼ of T2 long white setose, remaining T2 and T3 sparsely white setose; S1–7 brown, yellow postero-laterally; S1 asetose, S2–3 sparsely brown setose.

Female genitalia: densely arranged anteriorly directed setae present on T7–8 and S7–8; T8 with broad anterior rectangular apodeme; T9 formed by wide, rectangular sclerite with median protuberance; T9+10 entirely fused, T10 divided into 2 heavily sclerotised acanthophorite plates, 9–10 acanthophorite spurs per plate; 2 spermathecae, all equally large, formed by ± expanded heavily sclerotised ducts; individual sper-

mathecal ducts short; S9 (furca) formed by 1 sclerite, ring-like (joined anteriorly and posteriorly), anterior furcal apodeme present, 2 lateral projections forming divided apodeme, lateral furcal apodeme absent, median furcal bridge absent.

Material examined: Kenya: Eastern Province: 1 ♂ Archers Post, 00°39'00"N 037°41'00"E, 5.v.1976, I. Bampton (AAM-001137 paratype, NMSA); 3 ♂ Athi River, 02°38'31"S 038°21'59"E, 5–10.vii.1999, R. Copeland (AAM-001126 1 ♂ holotype, AAM-001127–AAM-001128 paratypes, NMKE); 1 ♂ Athi River, 2–9.viii.1999, R. Copeland (AAM-001129 paratype, NMKE); 2 ♂ Athi River, 24–27.v.1999, R. Copeland (AAM-001130–AAM-001131 paratypes, NMKE); 1 ♂ Athi River, 19–24.vii.1999, R. Copeland (AAM-001132 paratype, NMKE); 1 ♂ Lake Baringo, 00°37'05"N 036°01'35"E, -.xii.1994, R. Copeland (AAM-001133 paratype, NMKE); 1 ♂ Samburu National Park, near Eawso Ng'iro River, 00°34'05"N 037°32'08"E, 874 m, Malaise Trap, riverine forest next to headquarters, 29.v.–12.vi.2007, R. Copeland (AAM-001134 paratype, NMKE); 2 ♂ Samburu National Park, near Eawso Ng'iro River, 874 m, Malaise Trap, riverine forest next to headquarters, 12–16.vi.2007, R. Copeland (AAM-001135–AAM-001136 paratypes, NMKE); 2 ♀ Samburu National Park, near Eawso Ng'iro River, 874 m, 26.vi.–10.vii.2007, R. Copeland (coll. Copeland); 1 ♀ 1 ♂ Kiboko, 02°10'00"S 037°43'00"E, 16.vii.1981, R. Markham (AAM-000138–AAM-000139 paratypes, BMNH); 1 ♀ 5 ♂ Kiangeni River, Simba, 02°08'46"S 037°36'28"E, -.vii.1958, B. Pearsons (AAM-001101–AAM-001106 paratypes, BMNH); 1 ♂ Makueni, 01°48'00"S 037°37'00"E, -.-.1957, B. Pearsons (AAM-001108 paratype, BMNH); 1 ♀ British East Africa, -.-.-, S. Neave (AAM-001107 paratype, BMNH); **Uganda:** Karamoja: 1 ♂ Atumatak Catchment Area, 02°14'00"N 034°38'00"E, in dry + sandy flume bed, -.xi.1960 (AAM-001109 paratype, BMNH).

Type locality and distribution: Athi River (02°38'31"S 038°21'59"E), Kenya. Kenya, Uganda (Fig. 48). Biodiversity hotspot/high-biodiversity wilderness area: -/-.

Remarks: This species was first recognised as new by me based on material made available by R. Copeland in 2002. However, when I visited the BMNH in February 2010, I found several specimens labelled as types of a yet unpublished name by J. Bowden. Bowden had divided the species into three subspecies, the nominal subspecies based on the material from the Kiangani River and Makueni, one subspecies based on the single female from 'British East Africa', and another subspecies based on the single male from Uganda. The material from Kiboko collected in 1981 was interestingly not included by J. Bowden in his type material. I regard all these specimens as well as all other listed material as belonging to the same species. This species represents the first Mydidae known from Uganda (Fig. 48) and also the northernmost distribution of the subgenus *Notobates*.

Discussion

The present paper provides descriptions of new species from areas from which Mydidae were not known before and therefore gives us a much better picture of the actual

distribution of these interesting but rare flies world-wide. Eastern Africa, which was previously an empty spot on the map for Mydidae, actually harbours an interesting diversity of Mydidae species. Southern Africa has by far the greatest Mydidae diversity world-wide, but new collecting expeditions to western Africa will surely discover new species. The distribution of Leptomydinae within the Oriental Region (Fig. 46 and see below) has been expanded and the occurrence gap between the south-eastern Palaearctic Region (Afghanistan and Iran) and the eastern Oriental Region (Taiwan and the Yaeyama Islands of Japan) has been closed. For regularly updated distribution maps for all Mydidae species based on specimen occurrence data see http://www.mydidae.tdvia.de/mydidae_specimen_map.

Oriental species of *Leptomydas*

The generic placement of the three new species of *Leptomydas* from the Oriental Region is not without question. Nagatomi and Tawaki (1985) reported for the first time *Nemomydas* Curran, 1934 from the north-eastern Oriental Region placing in it *Nemomydas gruenbergi* Hermann, 1914 known from Taiwan and the Yaeyama Islands of Japan. *Nemomydas* is otherwise only known from the Nearctic and northern Neotropical regions from south-western Canada in the north to Panama in the south (Hardy 1950, Steyskal 1956, Kondratieff and Welch 1990, Welch and Kondratieff 1991, 1994). *Leptomydas* on the other hand is widely distributed in the southern Palaearctic Region and in north-eastern India in the Oriental Region (Bequaert 1961, Richter 1997).

Curran's (1934) original description of *Nemomydas* and also the added generic characters by Wilcox and Papavero (1971) do also apply to *Leptomydas* species studied by me, i.e., the type species *L. lusitanicus* (Wiedemann, 1820) from Spain, *L. sardous* (Costa, 1884) from Italy, and *L. turcicus* Bowden, 1983 from Turkey. The only morphological differences I can find among Old World and New World species, are male terminalia characters (particularly the development of median gonocoxal appendages). These small morphological differences of the male terminalia should, in my view, not be used to delineate separate genera. I therefore place the three new species in *Leptomydas*, which is the older name and exhibits a more-or-less uninterrupted distribution from Portugal in the west to central Thailand in the east.

Three species, *Cephalocera annulata* Brunetti, 1912, *Leptomydas indianus* Brunetti, 1912, and *Syllegomydas bucciferus* Séguy, 1928, from north-eastern India have been listed as unplaced species by Papavero and Knutson (1975). Based on the descriptions and wing venation, all of these species can be placed in Leptomydinae and do not belong to Cacatuopyginae (see key above), which is the other subfamily taxon distributed in the Oriental Region. The type specimens of *Cephalocera annulata* and *Leptomydas indianus* are supposed to be deposited in NZSI (Zoological Survey of India, Calcutta, India), but were unavailable for study. The type specimens of *Syllegomydas bucciferus* are deposited in the MNHN and have been studied. *Cephalocera annulata* and *Syllegomydas bucciferus* can therefore also be newly combined with *Leptomydas*.

***Leptomydas annulata* (Brunetti, 1912), comb. n.**
***Leptomydas bucciferus* (Séguy, 1928), comb. n.**

With the addition of these species, *Leptomydas* has now 17 valid species. *Nemomydas gruenbergi* might also need to be placed in *Leptomydas*, which will be tested with a phylogenetic study of Mydidae currently in preparation by the author.

Mydaselpidini genera

The Mydaselpidini is a tribal taxon limited to the Afrotropical Region with currently three assigned genera, i.e., *Afromydas* Bequaert, 1961 (1 species), *Mydaselpis* (6 species), and *Vespiodes* (10 species) (Hesse 1969, Bowden 1980). Species of *Mydaselpis*, which are now known from southern Africa and Kenya, are morphologically very similar to *Vespiodes*, which is much more widely distributed in sub-Saharan Africa (see above). *Afromydas guichardi* Bequaert, 1961 is only known from the type locality in north-western Somalia. The three genera can at present only be distinguished by means of the male terminalia and in particular by the presence and shape of the aedeagal epimere that is absent in *Mydaselpis*, present and distally simple and evenly rounded in *Vespiodes*, and present and distally bifurcate in *Afromydas*. Hesse (1969: 31) described *Vespiodes* and distinguished it from *Mydaselpis* based on a more wasp-like and conopid-like appearance and the mentioned aedeagal characters and also highlighted that *Afromydas* might be a senior synonym of this genus (Hesse 1969: 41).

The monotypic genus *Neolaparopsis* Hesse, 1969, originally based on two female type specimens from Ndumo Game Reserve in north-eastern KwaZulu-Natal, South Africa, might need to be placed in Mydaselpidini as well. The morphological similarity of the females of *Mydaselpis* and *Neolaparopsis* was highlighted by Hesse (1969: 234), but he believed that *Neolaparopsis* is more similar to *Arenomydas* Hesse, 1969 and *Nomoneura* Bezzi, 1924, genera not placed by him in Mydaselpidini. Although *Neolaparopsis puncturatus* Hesse, 1969 does not show the wasp-like constriction of the abdomen that is present in several known *Mydaselpis* species (but not, for example, in a female specimen of *Mydaselpis peringueyi* Bezzi, 1924 in the SAMC) and *Vespiodes*, this constriction is also absent in females of *Mydaselpis ngurumani* sp. n. In addition, the female ovipositor possesses acanthophorite spurs as do females of *Mydaselpis ngurumani* sp. n., but as far as we know these spurs are reduced in other species of Mydaselpidini. Until recently, only female specimens of *Neolaparopsis* were known, but I received unidentified Mydidae specimens of both sexes for examination from J. Bosák (Olomouc, Czech Republic) that were collected in Tembe Elephant Park close to Ndumo Game Reserve and represent *Neolaparopsis puncturatus* (AAM-001143–AAM-001146). The male aedeagus possesses an aedeagal epimere that is laterally flattened and therefore of different shape than in nales of *Afromydas* and *Vespiodes*. Therefore, *Neolaparopsis* shows an interesting mixture of character states in regards to other Mydaselpidini genera. Future taxonomic research including a revision of the genus *Vespiodes* and phylogenetic analyses of the

Mydaselpidini genera including *Neolaparopsis*, currently in preparation by the author, will shed light on the possible synonymy and placement of the discussed genera.

Seasonal incidence

The following seasonality can be summarised from the studied material: *Leptomydas notos* sp. n.: May; *Leptomydas rapti* sp. n.: March–April; *Leptomydas tigris* sp. n.: February; *Mydaselpis ngurumani* sp. n.: January, June–July; *Vespiodes phaios* sp. n.: March; *Syllegomydas astrictus* sp. n.: June–August; *Syllegomydas dispar*: May–October; *Syllegomydas elachys* sp. n.: August–September; *Syllegomydas heothinos* sp. n.: May–August, November–December; *Syllegomydas proximus*: October–December. *Mydaselpis ngurumani* and *Syllegomydas heothinos* seem to exhibit two distinct flight periods each year whereas all other species have only been collected during a particular time of the year.

Biodiversity hotspots and high-biodiversity wilderness areas

The biodiversity hotspots *sensu* Conservation International (Myers et al. 2000) are areas of high plant endemism in which the habitat has been destroyed to a considerable extant and which are under threat of more destruction. The high-biodiversity wilderness areas (Mittermeier et al. 2003) highlight those land masses that are largely undisturbed and have a very low population density. Evaluating the presence/absence of Diptera species in these priority areas earmarked for conservation can determine whether these species will also be preserved when funding is made available for their protection (e.g., Dikow et al. 2009). Of the 13 species dealt with in this contribution, of which 12 are mapped in Figs 46–48, 6 are endemic to one biodiversity hotspot. *Vespiodes phaios* sp. n. is endemic to the Coastal Forest of Eastern Africa hotspot and all species studied from the Oriental Region are endemic to a particular biodiversity hotspot, i.e., *Leptomydas annulata* comb. n., *L. bucciferus* comb. n., *L. indianus*, and *L. rapti* sp. n. are endemic to the Himalaya, *Leptomydas tigris* sp. n. to Indo-Burma, and *Leptomydas notos* sp. n. to the Western Ghats and Sri Lanka. *Syllegomydas* (*Notobates*) *dispar* occurs in the Coastal Forest of Eastern Africa hotspot, but also outside of it in lowland habitats of central Mozambique. *Mydaselpis ngurumani* sp. n. does occur in the Eastern Afromontane hotspot, but does primarily occur outside of this patchy biodiversity hotspot. While *Syllegomydas elachys* sp. n. is the only species that occurs in and is endemic to the high-biodiversity wilderness area Miombo-Mopane Woodland and Savannas, several known localities of *Syllegomydas dispar* do also occur within the boundaries of this vast high-biodiversity wilderness area. *Syllegomydas astrictus* sp. n., distributed throughout Kenya, and *Syllegomydas proximus,* distributed on the southern edge of the Sahara, do not occur in any biodiversity hotspot or high-biodiversity wilderness area *sensu* Conservation International.

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