

## TRICHOPTERA OF THE FAMILIES GOERIDAE AND LEPIDOSTOMATIDAE FROM SULAWESI, INDONESIA

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### Abstract

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Descriptions of *Goera skiasma* sp. nov. (Goeridae) and three new species of Lepidostomatidae — *Goerodes tectoris* sp. nov., *G. xylochus* sp. nov. and *G. anorhepes* sp. nov. are given. Both families are recorded for the first time from Sulawesi, Indonesia.

### Introduction

This paper is based on material collected at Dumoga-Bone National Park, Northern Sulawesi, by participants of the Project Wallace expedition 1985 and several additional specimens from Lore Lindu National Park, Central Sulawesi. Both families, Goeridae and Lepidostomatidae, although known from Sumatra, Java and New Guinea (Ulmer, 1951; Weaver, 1989) are here reported from Sulawesi for the first time. The family Goeridae is represented by one species, *Goera skiasma* sp. nov., and Lepidostomatidae by three, *Goerodes tectoris* sp. nov., *G. xylochus* sp. nov. and *G. anorhepes* sp. nov. These new species differ clearly from the several lepidostomatids recently reported from Sumatra by Weaver (1989) and those described by Ulmer (1951) from Sunda islands and Kimmins (1962) from New Guinea.

The following abbreviations are used for depositories of material: ANIC, Australian National Insect Collection, Canberra; BMNH, British Museum (Natural History), London; NMV, Museum of Victoria, Melbourne; NTMD, Northern Territory Museum of Art and Sciences, Darwin; RMNH, Rijksmuseum van Natuurlijke Historie, Leiden; ZMB, Zoological Museum, Bogor.

Terminology follows that used by Weaver (1988). All dissected and figured specimens are identified by the author's notebook number with the prefix "PT-".

### Goeridae

#### *Goera skiasma* sp. nov.

Figures 1–7

*Type material.* Holotype ♂, Sulawesi Utara, Dumoga-Bone National Park, Tumpah River and tributary

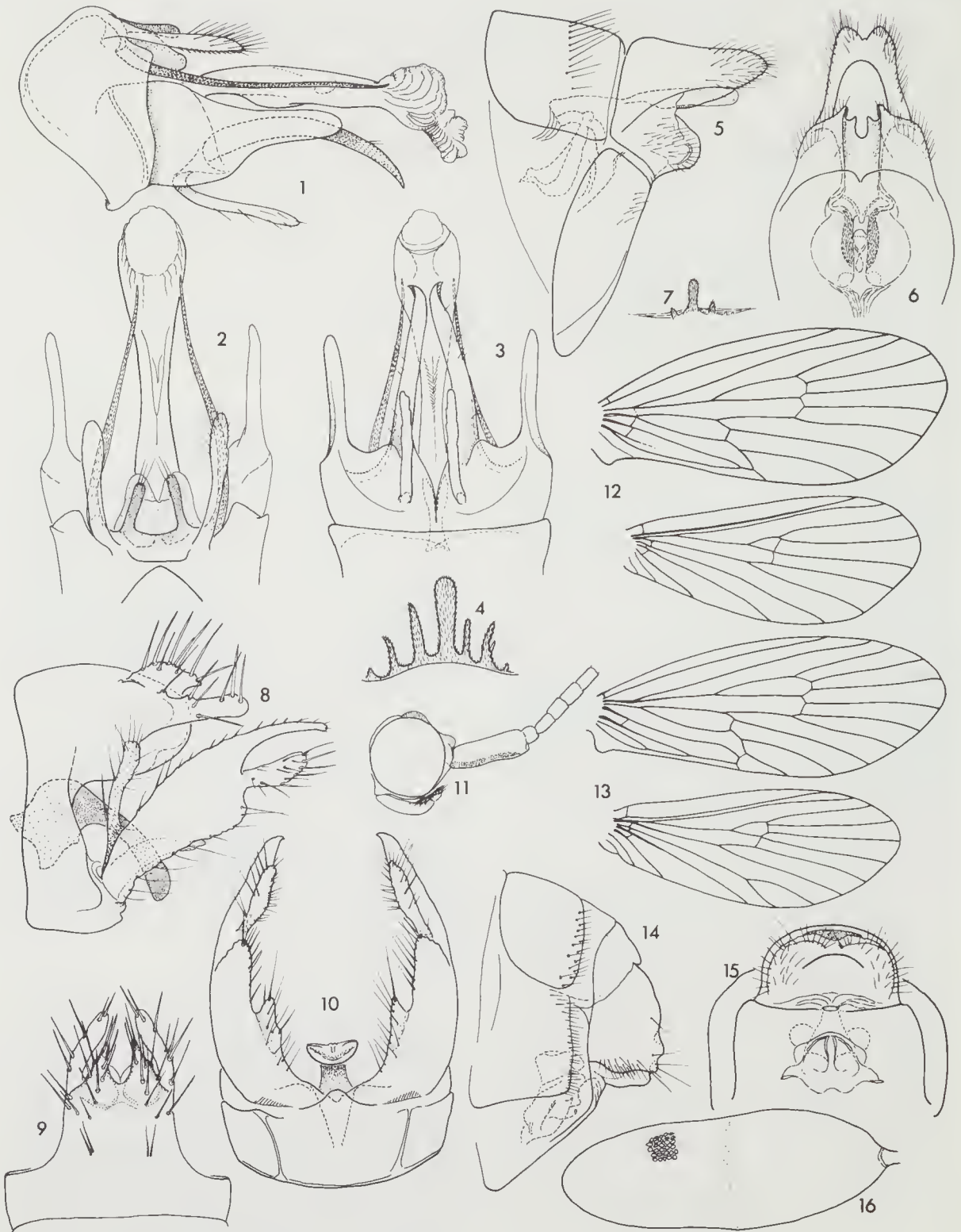
junction, 00°35'N, 123°54'E, 19 May 1985, A. Wells, M. Wilson, M.W. Tan (NMV T-10420).

Paratypes: 1♂, collected with holotype (genitalia prep. PT-1530 figured) (NMV); 1♂, Edwards Camp, Tumpah River, alt. 650 m, MV-light, 28 Apr 1985, J. Martin and M. Horak (NMV); 2♂, 1440 Camp, 00°37'N, 123°51'E, 9–14 May 1985, J. Martin and M. Horak (BMNH, NMV); 1♂, Toraut River, Aug 1985, D. Dudgeon (ZMB); 1♂ 1♀, Beach on Tumpah River, Picnic site, alt. 225 m, MV-light, Oct 1985, M. Malipatil (genitalia prep. PT-1810♀ figured) (NMV); 1♂, Base Camp, Toraut River cleared area, alt. 211 m, MV-light, 4 Oct–8 Nov 1985, M. Malipatil (NTMD); 1♂, Palu, 50 km SE of Lore Lindu National Park, Dongi Dongi shelter, alt. 950 m, 4 Dec 1985, J. van Tol and J. Krikken (RMNH); 1♂, same locality, 9 Dec 1985, J. van Tol and J. Krikken (RMNH).

*Diagnosis.* Adults yellowish-brown to brown, resembling *Goera minor* Mosely of Burma. Males distinguished by broad, bifid, mesolateral lobe of inferior appendages, females by the mesodistally marginate sternite 9 and distinctly excavated distal margin of vulvar plate.

Length of fore wing: ♂ 7.1–8.1 mm, ♀ 8.5 mm.

*Description.* Male: Scape fusiform; maxillary palpi adpressed, apparently 2-segmented, membranous, widest distally, densely covered with closely adherent hairs, an additional membranous branch arises at base. Abdominal sternite 6 with distinct transverse ridge; mesal comb formed of 7 prongs, the central one rounded apically (Fig. 4.). Genitalia (Figs 1–3). Segment 9 in lateral view widest at dorsal third, narrowed ventrally, mid-dorsal excavation broad; dorsomedian lobes digitiform, preanal appendages robust; intermediate appendages long, slender, pointed distally. Segment 10 membranous, short, bilobed distally. Inferior appendages



Figures 1–7. *Goera skiasma* sp. nov., PT-1530: 1, male genitalia lateral. 2, dorsal. 3, ventral. 4, mesal comb of male abdominal sternite 6. PT-1810: 5, female genitalia lateral. 6, ventral. 7, mesal comb of female abdominal sternite 6. ▶

broad at base, expanded mesolaterally into a broad lobe from which arise 2 branches: 1 elongate dorsal branch, tapering to acute apex and shorter ventral branch, curved, digitiform, bluntly rounded at apex. Phallus long, robust, membranous distally.

Female: Abdominal sternite 6 with transverse ridge, mesal comb small, formed of 3 prongs, the central robust, lateral prongs small (Fig. 7). Sternite 8 extended dorsoventrally. Tergites 9 and 10 fused (Fig. 5); supragenital plate sclerotised, rounded apically; sternite 9 short, with distally pronounced mesal margin; distal margin of vulvar plate in ventral view distinctly indented mesally (Fig. 6).

*Distribution.* Sulawesi, Indonesia.

*Etymology.* From *skiasma* (Greek), a shadow, in reference to the species' generally dark appearance.

#### Lepidostomatidae

##### *Goerodes tectoris* sp. nov.

Figures 8–16

*Type material.* Holotype ♂, Sulawesi Utara, Dumoga-Bone National Park, Edwards Camp, Tumpah River, 00°35'N, 123°51'E, alt. 650 m, MV-light, 22 May 1985, A. Wells (NMV T-10426.).

Paratypes: 2♂ 1♀, collected with holotype (NMV); 1♂ 7♀, same locality, 28 Apr 1985, J. Martin and M. Horak (genitalia prep. PT-1539♂, PT-1805♀ figured) (NMV); 6♂, same locality, 8 May 1985, J. Martin (ANIC, BMHN, ZMB); 2♂, same locality, alt. 664 m, 22–23 Oct 1985, M. Malipatil (NTMD); 1♂, Tumpah River tributary, first fall, 00°36'N, 123°54'E, 4 May 1985, A. Wells (NMV); 1♂, Hog's Back Camp, 00°35'N, 123°52'E, alt. 492 m, MV-light, 2 Oct–4 Nov 1985, M. Malipatil (NMV); 1♂, Motolanga River Dolodua-Malibagu Road, 00°28'N, 123°58'E, 7 May 1985, A. Wells (NMV).

*Diagnosis.* Adults pale yellowish; fore wings broad, rounded apically without folds, venation differing between sexes in Cu-A region (Figs 12, 13). Male genitalia similar to other *Goerodes* species described from Java and Sumatra, but differ in the short, robust and coarsely spinose segment 10.

Length of fore wing: ♂ 4.7–5.3 mm; ♀ 5.5–6.2 mm.

*Description.* Male: Scape about as long as the diameter of cyc (Fig. 11), cylindrical, mesofron-

tal surface more or less darkly pigmented. Maxillary palpi 2-segmented, adpressed to face, segment 2 very short, apical half of inner surface setose. Genitalia (Figs 8–10). Segment 9 annular, slightly produced midventrally. Segment 10 short, robust, spinose dorsally; lateral processes symmetrical, short, rounded apically, in dorsal view converging distally; dorsomesal processes short, subtriangular in dorsal view. Inferior appendages in ventral view broad-based, in lateral view widest at distal two thirds, bilobed apically; apicodorsal lobe slightly curved, tapering distally, apex blunt; apicoventral lobe robust, setose, rounded apically; basidorsal process digitiform, rather robust. Phallus without parameres, phallicata at about right angle with base.

Female: (Figs 14, 15) Abdomen terminating bluntly. Segment 8 with shallow lateral depressions; spermathecal sclerite subtriangular in ventral view; spermatheca (Fig. 16) elongate-ovoid, anterior half with scale-like microstructure, denser and more distinct towards the anterior end.

*Distribution.* Sulawesi, Indonesia.

*Etymology.* From *tector* (Latin), a coverer, referring to the adpressed maxillary palpi in the male.

##### *Goerodes xylochus* sp. nov.

Figures 17–21

*Type material.* Holotype ♂, Sulawesi Utara, Dumoga-Bone National Park, Edwards Camp, Tumpah River, 00°35'N, 123°51'E, alt. 650 m, MV-light, 28 Apr 1985, J. Martin and M. Horak (NMV T-10441.).

Paratypes: 2♂, collected with holotype (genitalia prep. PT-1540 figured) (NMV); 1♂, same locality, alt. 664 m, 22–23 Oct 1985, M. Malipatil (NTMD).

*Diagnosis.* Adults pale yellowish; fore wings broad, rounded apically without folds, venation regular (Fig. 21). Closely similar to *Goerodes tectoris* sp. nov. from Sulawesi, but distinguished by mesolaterally excavated scape and large, densely setose maxillary palps.

Length of fore wing: ♂ 5.3–5.5 mm.

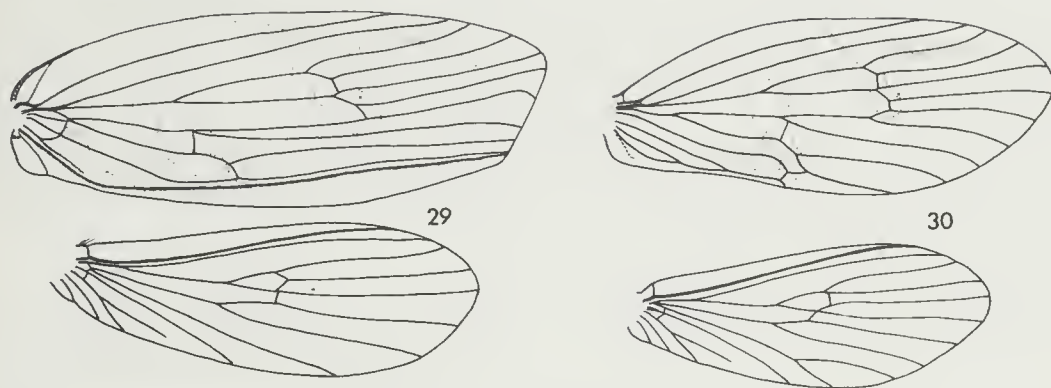
*Description.* Male: Scape about 1.5 times as long as the diameter of eye; mesofrontal cavity elongate, darkly pigmented, densely covered with long, dark hair (Fig. 20). Maxillary palpi long,

← Figures 8–16. *Goerodes tectoris* sp. nov., PT-1539: 8, male genitalia lateral. 9, dorsal. 10, ventral. 11, male head lateral. 12, male wing venation. PT-1805: 13, female wing venation. 14, female genitalia lateral. 15, ventral. 16, spermatheca.





Figures 17–21. *Goerodes xylochus* sp. nov., PT-1540: 17, male genitalia lateral. 18, dorsal. 19, ventral. 20, male head lateral. 21, wing venation. ▶



Figures 29, 30. *Goerodes anorhepes* sp. nov. wing venation. 29, male. 30, female.

densely setose, basal setae somewhat elongate spatulate; apical segment extends above the frons and correspondingly matches the curvature of the elongate cavity of the scape. Genitalia (Figs 17–19). Segment 9 annular with small projection midventrally. Segment 10 robust, spinose dorsally; lateral processes symmetrical, short, rounded apically, in dorsal view slightly curved, converging distally; dorsomesal processes short, subtriangular in dorsal view. Inferior appendages in ventral view broad based, in lateral view widest medially, bilobed apically; apicodorsal lobe slightly curved, apex truncate in lateral view; apicoventral lobe widest at basal third, setose, rounded apically, shorter than apicodorsal lobe; basidorsal process digitiform, slender. Phallus without parameres, phallicata at about right angle with base.

Female: unknown.

*Distribution.* Sulawesi, Indonesia.

*Etymology.* From *xylochos* (Greek), a thicket, referring to dense coverage of hairs on scape and maxillary palps.

### *Goerodes anorhepes* sp. nov.

Figures 22–30

*Type material.* Holotype ♂, Sulawesi Utara, Dumoga-Bone National Park, Edwards Camp, Tumpah River, 00°35'N, 123°51'E, alt. 650 m, MV-light, 28 Apr 1985, J. Martin and M. Horak (NMV T-10444.).

Paratypes: 7♂ 3♀, collected with holotype (genitalia prep. PT-1541♂, PT-1809♀ figured) (NMV); 1♂ 4♀, same locality, 8 May 1985, J. Martin (NMV); 3♂ 2♀,

same locality, alt. 664 m, 22–23 Oct 1985, M. Malipatil (BMNH, NTMD); 1♀, Barney's Camp, alt. 302 m, 4 Oct–8 Nov 1985, M. Malipatil (NTMD); 2♂, Hog's Back Camp, 00°35'N, 123°52'E, alt. 492 m, 21 Oct–4 Nov 1985, M. Malipatil (NTMD); 2♂ 6♀, 1440 Camp, 9–14 May 1985, J. Martin and M. Horak (ANIC, NMV); 1♂, Tumpah River, Aug 1985, D. Dudgeon (ZMB).

*Diagnosis.* Adults greyish-brown, fore wings with pale, oblique band at apicocostal margin and at anastomoses. Male fore wing (Fig. 29) unlike those of other Sunda Island species, obliquely truncate apically, female rounded (Fig. 30). Scape of male antenna with with distinct, darkly pigmented, setose depression.

Length of fore wing: ♂ 8.1–8.8 mm; ♀ 7.2–7.6 mm.

*Description.* Male: Scape slightly longer than twice the diameter of eye (Fig. 25), widest at distal quarter; mesofrontal cavity ovoid, darkly pigmented, bearing numerous erect setae; inner margin elevated to short, apically truncate protuberance. Maxillary palp 2-segmented, slender, adpressed to face, apex fitting within the depression of the scape; apical segment semi-membranous, covered with long, dense hair. Genitalia (Figs 22–24). Segment 9 annular, slightly wider ventrally. Segment 10 short, symmetrical; lateral processes slender, shorter than dorsomesal pair, both tapering distally. Inferior appendages in lateral view widest at apical third; apices bilobed; apicoventral lobe robust, rounded, apically densely setose; apicodorsal lobe tapering distally, slightly curved downward; a small,

slightly clavate mesal process at right angles to the inferior appendage; basidorsal process expanded distally. Phallus without parameres, slightly curved.

Female: Sternite 8 laterally (Fig. 26) with internal longitudinal ridge, venter somewhat flattened with a narrow strongly sclerotised transverse bar situated near anterior margin; spermathecal sclerite broad in ventral view (Fig. 27); spermatheca (Fig. 28) elongate ovoid, anterior half covered with scale-like microstructure, more distinct at apex.

*Distribution.* Sulawesi, Indonesia.

*Etymology.* From *rhepo* (Greek), an incline or slope, referring to the obliquely truncate tip of the male fore wing.

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