



DESCRIPTION OF TWO NEW SPECIES OF THE *LEPTONEMA OCCIDENTALE* GROUP (INSECTA: TRICHOPTERA: HYDROPSYCHIDAE) FROM MADAGASCAR

Pavel Chvojka

Department of Entomology, National Museum, Kunratice 1, 148 00 Praha 4, Czech Republic,
entomologie@volny.cz

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Abstract. Two new species of the *Leptonema occidentale* group, *Leptonema hovorkai* sp. n. and *Leptonema kabelaki* sp. n., from Eastern Madagascar, are described and the male genitalia are figured. In addition, the male genitalia of *Leptonema ranomafana* FLINT are illustrated based on new material.

■ Trichoptera, taxonomy, *Leptonema occidentale* group, new species, Madagascar.

INTRODUCTION

Leptonema GUÉRIN (Hydropsychidae: Macronematinae) is a large genus widely distributed above all in the Neotropical and Afrotropical Regions. Altogether 15 species groups were recognized (Flint, McAlpine et Ross 1987), two of them are represented in Madagascar: the endemic *affine* group with eight species (Chvojka et Sykora 1999) and the *occidentale* group with one species described very recently (Flint 2000).

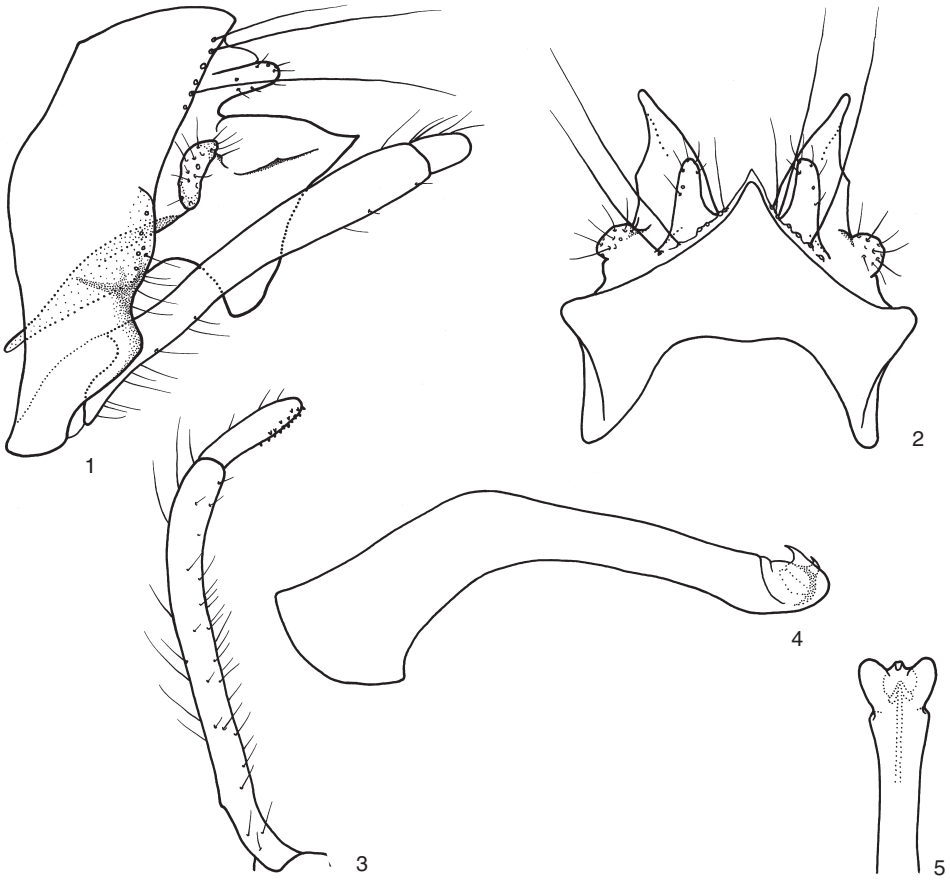
Species of the *Leptonema occidentale* group are known from continental sub-Saharan Africa, where five species are distributed (Flint, McAlpine et Ross 1987) and one other species was discovered on the island of Madagascar only recently (Flint 2000). This species, *Leptonema ranomafana* FLINT, has been known only from the type series collected in the Ranomafana National Park, Fianarantsoa Province, so far. During field collection in the eastern humid evergreen forests in Madagascar in 2000 *L. ranomafana* was obtained from another locality and additional two species were found in Toamasina and Fianarantsoa Provinces and these are described below.

All the three known Madagascan species well correspond with the characteristics of the *occidentale* group (Flint, McAlpine et Ross 1987), they comprise a complex of closely related species, they differ from other species of this species group in the shape of the tenth tergum with a well developed, elongate wart *a* and with a large, conspicuous ventral lobe of lateral lobe.

SYSTEMATIC PART

Leptonema ranomafana FLINT, 2000
(Figs 1–5)

Diagnosis: This species can be easily recognized from other closely related Madagascan species of the *occidentale* group by the larger size and the morphology of the male

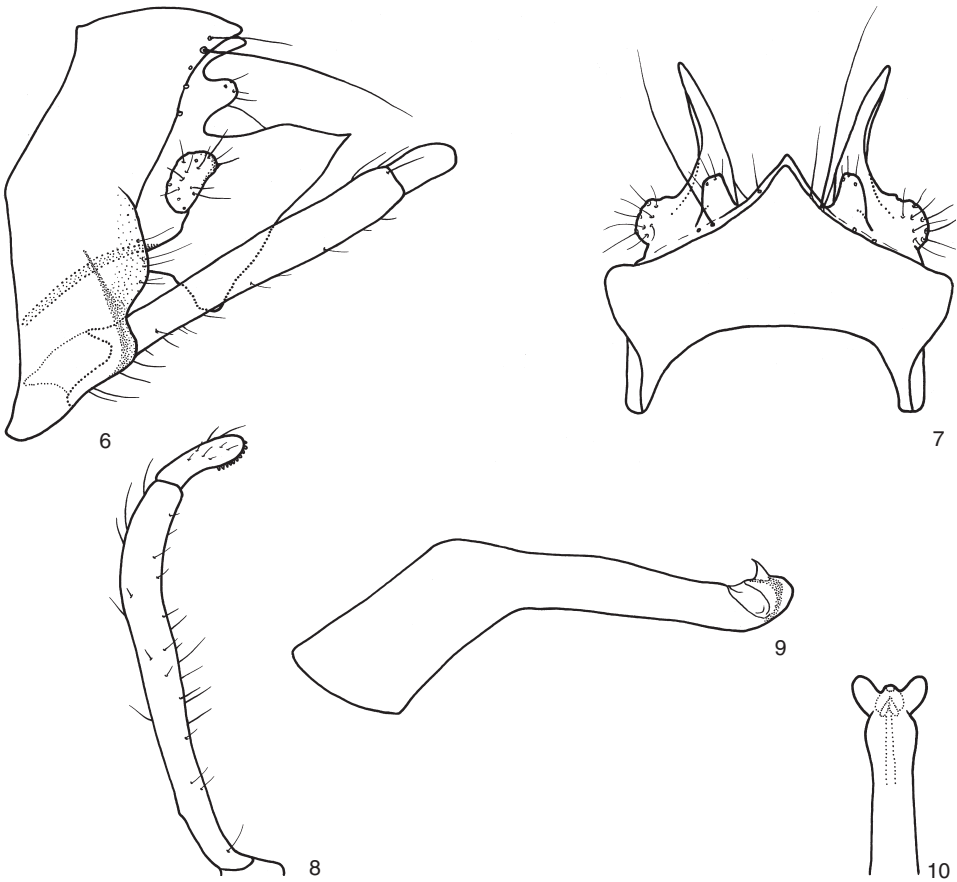


Figs 1–5. *Leptonema ranomafana* FLINT (specimen from Ranomena), male genitalia: (1) lateral view; (2) dorsal view; (3) left inferior appendage, ventrocaudal view; (4) phallus, lateral view; (5) apex of phallus, ventral view.

tenth tergum: in *L. ranomafana* the lateral lobe bears a obliquely set lateral ridge with a small point in the middle; lateral lobe is triangular with a small point on lateral margin in dorsal view; wart a is more than twice longer than broad, markedly exceeds the apex of the ninth tergum.

Description: Male: Length of forewing 10.5–11 mm, hind wing length 7–8 mm. Examined specimens well correspond with the detailed description given by Flint (2000) in all characteristics with the minor exception of the shape of the phallus, which is conspicuously bent; enlarged basal section is at an angle of approximately 130° to stem (Fig. 4).

Material examined: Madagascar, Prov. Fianarantsoa, 7 km W Ranomafana, 900 m, 14–19 March 1990, W. E. Steiner. Malaise trap across stream, montane rain forest. 2 ♂ 1 ♀. (These specimens, labeled as paratypes, come from the type locality, however, specimens from this date are not listed in the type series.) Madagascar, Prov. Fianarantsoa, brook 0.5–1 km SE Ranomena (Iranomena), 47°23'33" E, 21°28'47" S, approx. 1,050 m a.s.l., 8 February 2000, P. Chvojka leg., swept along stream in rain forest, 1 ♂. All in National Museum, Prague.



Figs 6–10. *Leptonema hovorkai* sp. n., male genitalia: (6) lateral view; (7) dorsal view; (8) left inferior appendage, ventrocaudal view; (9) phallus, lateral view; (10) apex of phallus, ventral view.

***Leptonema hovorkai* sp. n.**

(Figs 6–10)

Diagnosis: This species is very similar to *L. ranomafana* but can be easily distinguished from it by the shape of the male tenth tergum: the lateral lobe lacks any lateral ridge, lateral lobe is narrow, with concave lateral margin in dorsal view; wart \underline{a} is only slightly longer than broad. *L. hovorkai* is also smaller in comparison with *L. ranomafana*. From *L. kabelaki*, *L. hovorkai* can be separated above all by the shape of the apex of the phallus, in *L. hovorkai* the dorsolateral lobe bears a sharply pointed process directed anterodorsally, while in *L. kabelaki* the dorsolateral lobe is large, semicircular.

Description: Male: Length of forewing 9–9.5 mm, hind wing length 6.2–7 mm. Colour (in alcohol): wings uniformly brown, head and thorax brown, legs, antennae, palpi stramineous. Fifth segment of maxillary palpus 1.5 times longer than basal four segments combined; ratios of maxillary palpus segment lengths: 1 : 2.4 : 1.7 : 2.2 : 11. Tibial spur formula 1, 4, 4. Fifth sternal lobes elongate-oval, 4.5 times longer than broad, set obliquely, about 2/3 length of sternum.

Genitalia: Ninth tergum with V-shaped dorsal keel. Tenth tergum with wart a slightly longer than broad, not exceeding apex of ninth tergum; wart c knob-like; lateral lobe simple, narrow, with concave lateral margin in dorsal view, broad in lateral view, produced ventrad into a large, rounded lobe, apicodorsal tip pointed. Inferior appendage with basal segment long and slender; apical segment less than 1/4 length of basal segment, with short, spine-like setae on distal half of inner surface. Phallus with basal section enlarged and shorter than stem, at an angle of approximately 130° to stem, stem almost straight, apex separated from stem by a membranous region, dorsolateral lobe rounded in lateral view, with dorsal sharply pointed process directed anterodorsally.

Female: unknown (Several females collected together with males of *L. hovorkai* and *L. kabelaki* could not be associated.)

Remarks: *L. hovorkai* is closely related to *L. ranomafana*, however, both species can be reliably distinguished by the absence/presence of a lateral ridge on the lateral lobe of the male tenth tergum. The lateral lobe of *L. hovorkai* is flat laterally, it is narrow, with slightly concave lateral margin in dorsal view, in consequence of the absence of such ridge, while in *L. ranomafana*, the lateral lobe bearing lateral ridge is triangular with a small point on lateral margin in dorsal view. This diagnostic character is stable and occurs in all male specimens available for study.

L. hovorkai and *L. ranomafana* coexist in the stream near Ranomena (Fianarantsoa Province). The specimen of *L. ranomafana* well corresponds to examined specimens from the type locality, while the specimen of *L. hovorkai* is identical with the other specimens of this species collected in Toamasina Province.

Type material: Holotype, male: Madagascar, Prov. Toamasina, brooklet 3.5 km E Amboditafonana, 48°46'12" E, 17°27'32" S, approx. 830 m a.s.l., 30 January 2000, swept along shallow slow-flowing brooklet in rain forest. P. Chvojka leg. In National Museum, Prague. Paratypes: same data, 2 ♂; same, but brook 4 km E Amboditafonana, 48°46'18" E, 17°27'32" S, approx. 840 m a.s.l., 28–29 January 2000, 5 ♂. Madagascar, Prov. Fianarantsoa, brook 0.5–1 km SE Ranomena (Iranomena), 47°23'33" E, 21°28'47" S, approx. 1,050 m a.s.l., 8 February 2000, swept along stream in rain forest, 1 ♂. All P. Chvojka leg. In National Museum, Prague; National Museum of Natural History, Washington, D.C.

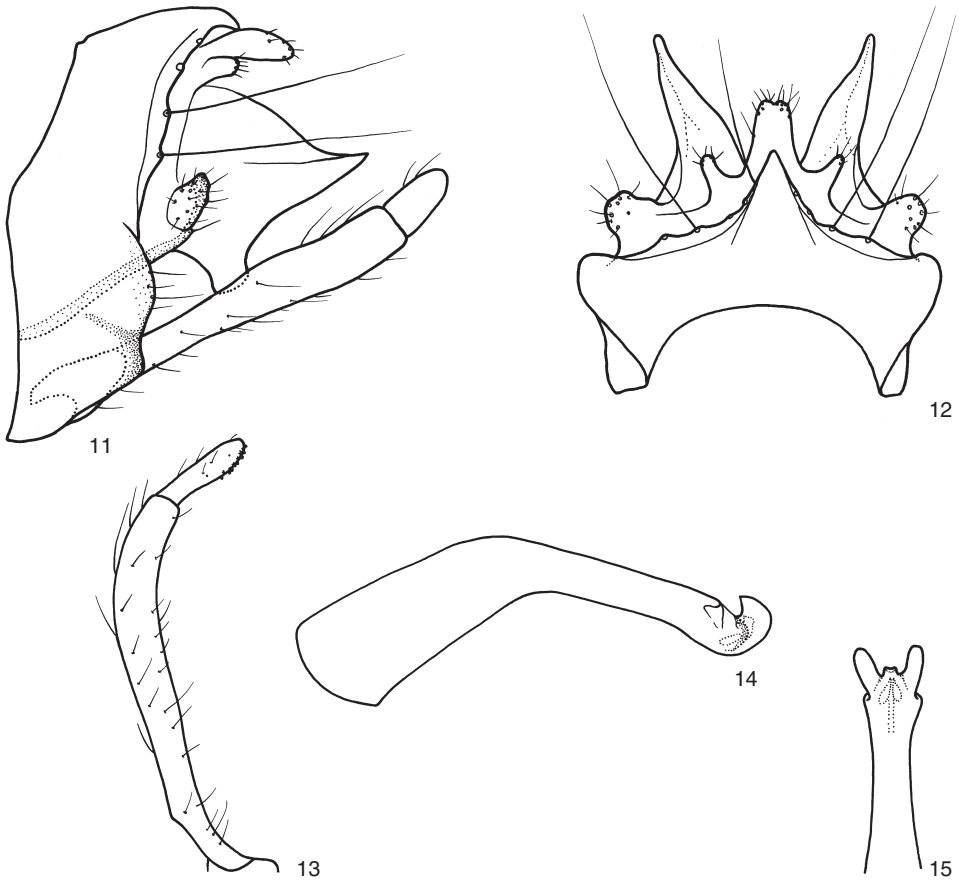
Etymology: This species is dedicated to my friend, Oldřich Hovorka, with thanks for his help in field collections.

***Leptonema kabelaki* sp. n.**

(Figs 11–15)

Diagnosis: *L. kabelaki* differs conspicuously from other Madagascan species, *L. ranomafana* and *L. hovorkai*, in the shape of the phallus. The phallus of *L. kabelaki* is bent in the middle and the apex bears large, semicircular dorsolateral lobes. From *L. marlieri* FLINT, MCALPINE et ROSS from Zaire with similar phallus, *L. kabelaki* is most easily recognized by a large, conspicuous ventral lobe of lateral lobe and well developed wart a, which are characteristic for all Madagascan species.

Description: Male: Length of forewing 8.5–9.5 mm, hind wing length 6–7 mm. Colour (in alcohol): wings uniformly brown, head and thorax brown; legs, antennae, palpi stramineous. Fifth segment of maxillary palpus 1.5 times longer than basal four segments combined; ratios of maxillary palpus segment lengths: 1 : 2.8 : 1.8 : 2.3 : 12.4. Tibial spur formula 1, 4, 4. Fifth sternal lobes elongated, about 2/3 length of sternum, narrow with parallel margins, 6–7 times longer than broad, set obliquely.



Figs 11–15. *Leptonema kabelaki* sp. n., male genitalia: (11) lateral view; (12) dorsal view; (13) left inferior appendage, ventrocaudal view; (14) phallus, lateral view; (15) apex of phallus, ventral view.

Genitalia: Ninth tergum with V-shaped dorsal keel. Tenth tergum with wart a well developed; dorsally, between warts a, long weakly sclerotized unpaired process directed posteriorly, with slightly bilobed setose apex in dorsal view; wart c knob-like; lateral lobe simple, narrow in dorsal view; in lateral view broad, apex elongated, pointed, slightly upturned, posterior margin moderately excised and produced ventrad into a conspicuous quadrangular lobe. Inferior appendage with basal segment long, slender basally, slightly broadening distally; apical segment longer than 1/4 of basal segment, with short, spine-like setae on distal half of inner surface. Phallus with basal section broadened, approximately the same length as stem, at an angle of 130° to stem, stem almost straight, apex separated from stem by a membranous region, with large, semicircular dorsolateral lobes in lateral view.

Female: unknown (Several females collected together with males of *L. kabelaki* and *L. hovorkai* could not be associated.)

Type material: Holotype, male: Madagascar, Prov. Toamasina, brooklet 3.5 km E Amboditafonana, 48°46'12" E, 17°27'32" S, approx. 830 m a.s.l., 30 January 2000,

swept along shallow slow-flowing brooklet in rain forest. P. Chvojka leg. In National Museum, Prague. Paratypes: same data, 13 ♂; same, but brook 4 km E Amboditafonana, 48°46'18" E, 17°27'32" S, approx. 840 m a.s.l., 28–29 January 2000, 1 ♂. All P. Chvojka leg. In National Museum, Prague; National Museum of Natural History, Washington, D.C.

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