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Description of a New Species of *Tokyosoma* Verhoeff, 1932 from Taiwan, with a Key to the Species of the Genus Occurring in Taiwan (Diplopoda, Chordeumatida, Diplomaragnidae)

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노래기강(Chordeumatida: Diplomaragnidae)의 *Tokyosoma* Verhoeff, 1932 신종 기재와 대만산 종 분류

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ABSTRACT

Tokyosoma tortum sp. nov. is being described from Taiwan. It differs from congeners mainly by the subcircular coiled lateral coxal branch of the posterior gonopod, as well as by the peculiar, unciform process of male coxa 10. A key is given to all 11 species of *Tokyosoma* presently known to occur in Taiwan.

Key words : Millipede, *Tokyosoma*, Taxonomy, New species, Key, Taiwan

INTRODUCTION

The diplomaragnid fauna of Taiwan has recently been reviewed, keyed and mapped, also shown to be dominated by species of the genus *Tokyosoma* Verhoeff, 1932 (Mikhaljova *et al.*, 2010). At present *Tokyosoma* is known to encompass 16 species confined to Japan (Honshu, Shikoku and Kyushu), Korea and Taiwan. However, it is Taiwan that supports the greatest number of congeners, all ten being restricted to mid- to high-montane habitats above 1000 m a.s.l.

Among the samples kept in the Taiwan Forestry Research Institute, Taipei (TFRI), one more new species of this genus has been located. The present contribution is devoted to its description, with a key given to all 11 species of *Tokyosoma* encountered in Taiwan.

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MATERIALS AND METHODS

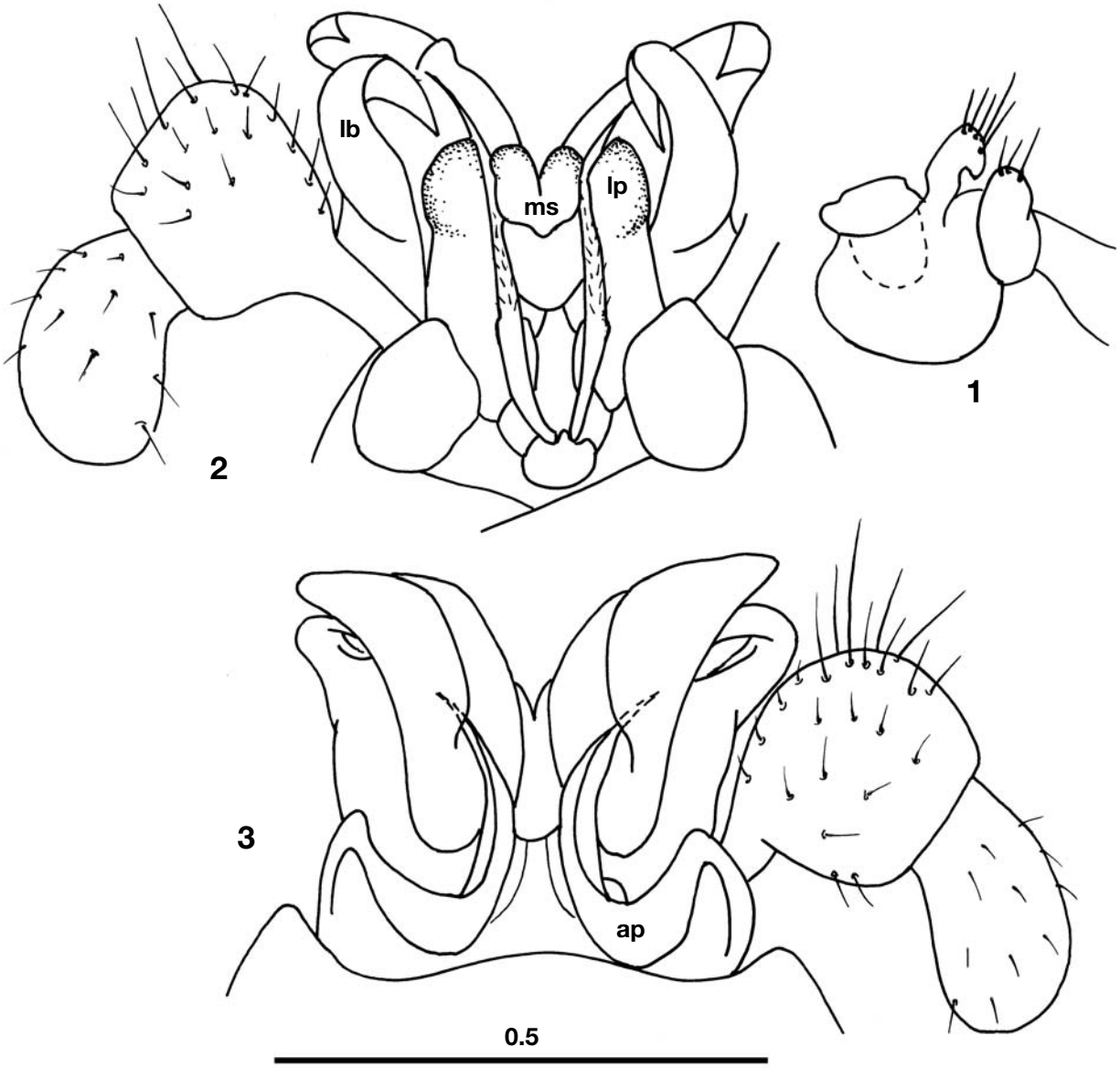
The holotype has been returned to the TFRI collection. It was collected in 70-75% ethanol. During the study, the gonopods and some other parts were dissected and mounted in glycerin as temporary micropreparations. The specimen was studied and illustrated using standard stereomicroscopic and drawing equipment.

DESCRIPTION

***Tokyosoma tortum* sp. nov. (Figs 1-3)**

Material examined. *Holotype* ♂ (incomplete, with only head and 16 anterior body segments retained, partly somewhat flattened dorsoventrally), Taiwan, Ilan County, Jialuohu, Datong, near Jialuohu Lakes, 2250 m a.s.l., 4.VI.2003, leg. Y. M. Chen.

Diagnosis. Differs from congeners mainly by the subcircular coiled lateral coxal branch of the posterior gonopod, as well



Figs. 1-3. *Tokyosoma tortum* sp. nov., male holotype. 1. coxa and trochanter 10, front view; 2. gonopods, caudal view; 3. gonopods, front view; ms-mesal sheath processes of posterior gonopod colpocoxites; lp-lateral sheath process of posterior gonopod colpocoxite; lb-lateral coxal branch of posterior gonopod; ap-anterior process of posterior gonopod angiocoxite. Scale in mm.

as the unciform process of male coxa 10.

Description. Male. Length of anterior body fragment ca 5 mm, width with paraterga 1.0 mm. Coloration in alcohol brown. Venter pale brown. Legs pale brown with marbled brown distal parts. Antennae brown. Ocellaria black.

Head covered with relatively long and sparse setae. Each eye patch composed of at least 34 ocelli. Collum semi-circular. Beginning from somite 4, paraterga normally developed. Metazonital macrochaetae long, pointed apically, all three subequal in length.

Leg pairs 3-7 somewhat enlarged. Pregonopodal legs without tarsal papillae. Claws of pregonopodal legs broken off. Postgonopodal legs (including leg pairs 10 and 11) without tarsal papillae. Claw of leg pairs 10 and 11 at base with one small additional claw dorsally and a long setoid filament ventrally. Claw of midbody legs at base with one small additional claw dorsally and a long setoid filament ventrally.

Legs 10 and 11 with coxal glands. Coxa 10 with an unciform process curved anteriad, this process carrying rather long setae at curvature (Fig. 1). Trochanter 10 with a small, low, ventral outgrowth setose apically. Coxa 11 without modifications. Trochanter 11 with a very low ventral prominence supporting 1-2

setae.

Gonopods. Anterior gonopod telopodite somewhat flattened, 1-segmented (under the microscope, the anterior gonopod telopodite can look 2-segmented, because its base is attached to the adjacent mesal portion of the posterior gonopod, so that the attachment place looks like a border between segments), flagelliform, its distal half being beset with minute cuticular spinules and positioned inside a sheath (Fig. 2).

Posterior gonopod colpocoxites fused medially, curved posteriad distally. Mesal sheath processes of posterior gonopod colpocoxites fused medially into a single cup-shaped structure (ms). Lateral sheath process (lp) a plate placed horizontally and curved caudad. As a result, ms and two processes lp combined forming another cup-shaped structure which is larger than ms. Postrior gonopod angiocoxite with a globule, but without process in posterior view.

Posterior gonopod coxal part with a long, lateral, flat branch (lb) subcircular coiled forward. Basal part of this branch fused to both colpocoxite and anterior angicoxite.

Angicoxite depressed centrally in anterior view (Fig. 3), supplied with a long flat process (ap); distal portion of this process being hidden under an anteromesal fold of colpocoxite. Posterior gonopod telopodite 2-segmented, femur normal.

Female unknown.

Name. The specific epithet refers to the nearly circular lateral coxal branch of the posterior gonopod.

Remarks. The new species is also high-montane, being obviously confined to the central, high-mountainous part of the island. This fully agrees with the distribution pattern demonstrated by the remaining Diplomaragnidae known from Taiwan (Mikhaljova *et al.*, 2010). This family is basically Palaearctic, ranging from slightly west of the Urals in the west, throughout Siberia and northern Mongolia, to the Pacific coast of Russia, to the Sakhalin and Kurile islands, to peninsular Korea, as well as to the main islands of Japan and to Taiwan in the east and southeast (Mikhaljova, 2004). Such a strikingly diverse fauna of *Tokyosoma* of Taiwan, coupled with the mid- to high-montane habits and prevailing allopatry of its constituent species, only emphasizes the importance of Palaearctic elements in the millipede fauna of the island.

Key to the *Tokyosoma* species occurring in Taiwan

1(2) Posterior gonopod colpocoxite with a lateral horn-shaped process ..... *T. distinctum*

2(1) Posterior gonopod colpocoxite without lateral horn-shaped process 3

3(6) Lateral coxal branch of posterior gonopod with neither any processes nor blades 4

4(5) Lateral coxal branch of posterior gonopod coiled subcircular ..... *T. tortum* sp. nov.

5(4) Lateral coxal branch of posterior gonopod straight, lying parallel to colpocoxite and sharply curved only in apical part ..... *T. australe*

6(3) Lateral coxal branch of posterior gonopod with some processes and blades 7

8(15) Posterior gonopod colpocoxite with a distal outgrowth ... 9

9(10) Distal outgrowth of posterior gonopod colpocoxite short ..... *T. breviprocessum*

10(9) Distal outgrowth of posterior gonopod colpocoxite long 11

11(12) Lateral coxal branch of posterior gonopod bifurcated into long and slender branches ..... *T. bifurcatum*

12(11) Lateral coxal branch of posterior gonopod not bifurcated into long and slender branches 13

13(14) Lateral coxal branch of posterior gonopod with a dentiform process subapically and with an unciform process laterally ..... *T. fanfan*

14(13) Lateral coxal branch of posterior gonopod without any processes subapically, but with a pointed, spiniform process near midway ..... *T. spinifer*

15(8) Posterior gonopod colpocoxite without distal outgrowth 16

16(17) Lateral coxal branch of posterior gonopod with a spiraled distal portion carrying a lateral serrate blade .. *T. serratum*

17(16) Lateral coxal branch of posterior gonopod divided into three processes distally ..... *T. cornutum*

18(19) Middle portion of posterior gonopod lateral coxal branch microtuberculate laterally, distal portion of the branch blade-shaped ..... *T. lobatum*

19(18) Middle portion of posterior gonopod lateral coxal branch with a lateral, thin, serrate blade, distal portion of the branch beak-shaped ..... *T. taroko*

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