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Trichadenotecnum species from Peninsular Malaysia and Singapore (Insecta: Psocodea: 'Psocoptera': Psocidae)

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Abstract

Species of the bark louse genus *Trichadenotecnum* Enderlein (Insecta: Psocodea) from Peninsular Malaysia and Singapore are revised with illustrations and identification keys. Twenty species are here recognised, with four new species and ten recorded for the first time from this region, together with an unnamed species represented by a single female. The previously described species *T. marginatum* New & Thornton is not included because its generic assignment is questionable. Females of *T. cinnamonum* Endang & New, *T. imrum* New & Thornton and *T. sibolangitense* Endang, Thornton & New, and the male of *T. kerinciense* Endang & New are described for the first time. A new species group is defined for *T. krucilense* Endang, Thornton & New.

Key words: *Trichadenotecnum*, Psocidae, new species, Malaysia, Singapore

Introduction

The free living Psocodea or "Psocoptera" is now recognized as a paraphyletic assemblage (Yoshizawa & Johnson 2003, 2006, 2010), within which *Trichadenotecnum* Enderlein is one of the most species-rich genera (Lienhard & Smithers 2002; Lienhard 2011). Previous studies on the Oriental fauna have revealed enormous species diversity within this genus (Hong Kong—Thornton 1961, Yoshizawa & Lienhard 2004; Indonesia—Endang & Thornton 1992, Endang *et al.* 2002, Endang & New 2005; Japan—Yoshizawa 2001, 2003; China—Li 2002; Nepal—Yoshizawa *et al.* 2007). Peninsular Malaysia is designated as one of the biodiversity hotspots in the world (e.g., Ceballos & Ehrlich 2006). However, the *Trichadenotecnum* fauna of Peninsular Malaysia has been considered in only a few scattered papers, with only five species (excluding the questionable *T. marginatum*) recorded from the region to date (New 1975; New & Thornton 1976; New & Lee 1992). Even including the species from Singapore, the total number of *Trichadenotecnum* known from this region is only six (New & Lienhard 2007), in contrast to the 20 species known from the neighboring island, Sumatra (Endang & New 2005).

Within *Trichadenotecnum*, several species groups have been proposed based mainly on male and female genitalia. However, considerable morphological gaps among the species groups, or even among some species within a group, render morphology-based phylogenetic estimation and estimation of morphological transformation series difficult. High diversity of *Trichadenotecnum* in the Oriental Region, and lack of extensive investigation of some areas within the region, suggest that undiscovered species may help to fill such morphological gaps. Faunal surveys of this region may also help in understanding the phylogeny and morphological evolution within this genus.

The samples examined here were mostly collected through the Development of Insect Inventory Project in Tropical Asia led by Prof. Osamu Yata (Kyushu University). Methods and terminology follow Yoshizawa (2001, 2003), but the more widely adopted term spermapore plate (e.g., Endang *et al.* 2002) is used instead of internal plate (Betz 1983; Yoshizawa 2001, 2003). Depository abbreviations are: MHNG: Muséum d'histoire naturelle,

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APPENDIX. New species group assignments proposed for some species not treated in the main text.

The *spiniserrulum* group
Trichadenotecnum paradika Endang & New, 2005 (from Indonesia)
The *majus* group
Trichadenotecnum arciforme Thornton, 1961 (from Hong Kong)
Trichadenotecnum laticornutum Endang, Thornton & New, 2002 (from Indonesia)
Trichadenotecnum quadrispinosum Endang, Thornton & New, 2002 (from Indonesia)
Trichadenotecnum waykananense Endang & New, 2005 (from Indonesia)