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Two closely related *Homidia* species (Entomobryidae, Collembola) revealed by morphological and molecular evidence

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Abstract

Two closely related *Homidia* species, *H. fascia* Wang & Chen, 2001 and *H. pseudofascia* **sp. nov.**, are recognized by both morphological and molecular approaches. Both species have minor morphological differences except distinct colour patterns on thorax. Genetic distances (18%) of COI barcodes between them greatly exceed commonly employed threshold (3%), also indicating two independent species. The use of colour pattern in taxonomy of *Homidia* is also discussed.

Key words: colour pattern, new taxon, DNA barcoding, chaetotaxy

Introduction

Homidia, the dominant entomobryid genus in China (based on our collection), was established by Börner (1906) as a subgenus of *Entomobrya* Rondani, 1861 based on type species *Homidia cingula* Börner, 1906, and was raised to generic level by Denis (1929). It is characterized by the absence of body scales, 8+8 eyes, the presences of dental spines and "eyebrow" macrocheatae on anterior Abd. IV in adults, bilobed apical bulb of Ant. IV, and subapical tooth larger than apical one on mucro (Börner 1906; Szeptycki 1973). So far, 61 species of this genus have been described, approximately half of them recorded from China (Pan *et al*. 2011a; Yuan & Pan 2013; Bellinger *et al*. 1996–2014).

The most frequently used and effective characters for species diagnosis in Homidia are labial chaetae, chaetotaxy of Abd. IV, number of dental spines, and colour pattern (Shi *et al.* 2010; Pan *et al.* 2011b; Yuan & Pan 2013). However, labial chaetae and tergal chaetotaxy are relatively conservative in *Homidia* compared to the other Entomobryini genera (e.g. *Entomobrya*, *Sinella*, *Coecobrya*); the homology of tergal chaetae is often difficult to determine (Szeptycki 1979; Zhang *et al.* 2011). The number of the dental spines is variable during development and between individuals. Colour pattern as a brief tool has been criticized for its intraspecific variations by some authors (Jordana & Baquero 1999, 2005). DNA barcoding (Hebert *et al.* 2003), as the present-day popular tool for species identification, has been applied in Collembola and usually works well in most cases (Porco *et al.* 2010, 2012a, b, 2014; Schneider & D'Haese 2013; Stevens *et al.* 2006). Here, two closely related species of *Homidia* were revealed based on DNA barcoding and morphological evidence.

Material and methods

Taxon sampling. Specimens were collected using a mouth aspirator and then stored in 99% ethanol at -20°C. Two

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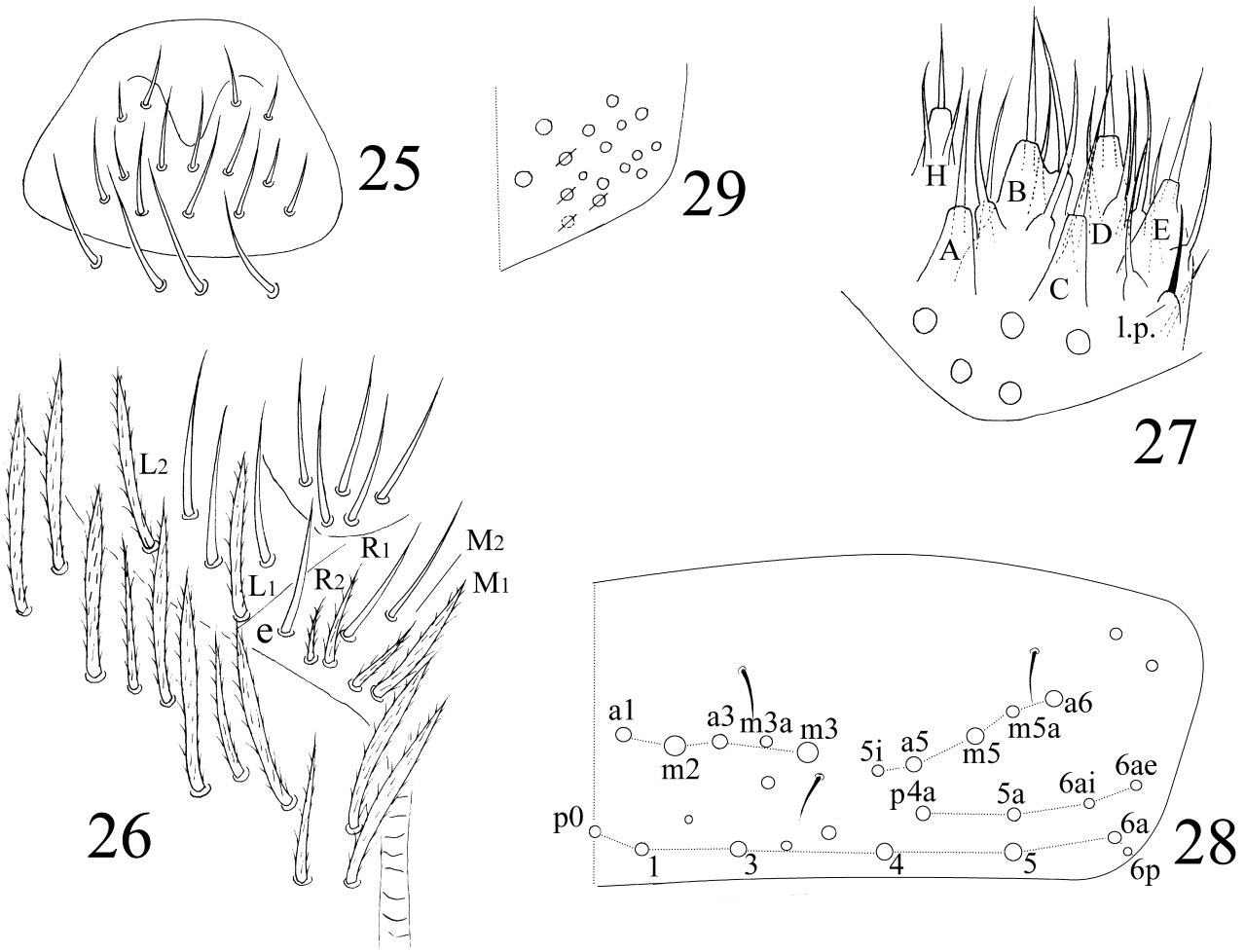

FIGURES 25–29. *H. fascia*: 25, prelabral and labral chaetae; 26, labial chaetae; 27, labial palp; 28, chaetotaxy of Abd. V; 29, manubrial plaque.

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