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The genus *Leucophenga* (Diptera, Drosophilidae), part V: the *mutabilis* species group from East Asia, with morphological and molecular evidence

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Abstract

A total of seven known species of the *Leucophenga mutabilis* species group are resurveyed from the East Asia: *L. angusta* Okada, 1956; *L. bellula* Bergroth, 1894; *L. magnipalpis* Duda, 1924; *L. nigripalpis* Duda, 1924; *L. orientalis* Lin & Wheeler, 1972; *L. striatipennis* Okada, 1989 and *L. taiwanensis* Lin & Wheeler, 1972. The diagnosis of the *mutabilis* group is revised, and a key to the seven species of this group is provided. DNA sequences of the mitochondrial *COI* (cytochrome *c* oxidase subunit I) gene with BOLD process ID and GenBank accession numbers are provided for these species. The pairwise intra- and interspecific Kimura two-parameter *COI* distances among the aforementioned seven known species are summarized; and the utility of DNA barcoding in the genus *Leucophenga* is discussed.

Key words: China, new species, *Leucophenga mutabilis* group, Drosophilidae

Introduction

Leucophenga mutabilis species group has been established by Bächli (1971). Up to the present, a total of about 33 species have been designated into this group (Bächli 2015): 17 spp. from the Afrotropical region, 10 spp. from the Australasian region, 12 spp. from the Oriental region, and 4 spp. from the Palearctic region (Brake & Bächli 2008). The descriptions on the Oriental species are largely hoary and simple. Species of the *mutabilis* group differs from the remaining *Leucophenga* species in having sexually dimorphic palpus: it is large and nearly bare in female, but slender and setigerous in male (Okada 1989; Fartyal *et al.* 2005). However, some additional characters can be used as diagnoses, e.g. proclinate orbital seta (Orb₁) close to ocellar triangle (Figs 2A, 2B, 5A); cercus with ca. 10 long setae near posterior margin (Figs 5B, 6–11A).

Recently, a series of surveys on the genus *Leucophenga* from East Asia were promoted with DNA barcoding (Su *et al.* 2013; Huang *et al.* 2013a, b, 2014), with two new species groups, *abbreviata* and *interrupta* groups been established by Su *et al.* (2013) and Huang *et al.* (2013a), further uncovering the *Leucophenga* fauna in East Asia. In this study, seven known species of the *mutabilis* group from the East Asia (China and Japan) are examined; a total of 77 DNA barcodes of the mitochondrial *COI* gene (cytochrome *c* oxidase subunit I gene) for these species are provided with BOLD process ID and GenBank accession numbers.

Material and methods

Materials and morphological terminology. The specimens were collected by sweeping on tussocks and tree trunks along streams in forest, then immediately immersed in 75% ethanol. All specimens are deposited in Department of Entomology, South China Agricultural University, China (SCAU). For morphological examinations of the specimens we follow the methods in Huang *et al.* (2013a, b). For definitions of measurements, indices and abbreviations are followed Zhang & Toda (1992) and Chen & Toda (2001).

Morphological and molecular identification. Based on the morphological characters, 77 field-caught