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Revision of the genus *Jezarotes* Uchida (Hymenoptera: Ichneumonidae: Acaenitinae), with the description of a new species from Laos

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Abstract

Two Japanese species of *Jezarotes*, *J. tamanukii* Uchida, 1928, and *J. yamatonis* Uchida, 1928, are synonymized based on the results of a morphological examination and DNA sequence analysis of the mitochondrial COI gene. *Jezarotes tetragonis* Lee & Lee, 2009, from Korea is also synonymized with *J. tamanukii*. The key to the world's species of *Jezarotes* proposed by Lee & Lee (2009) is updated, including a new species *J. mitai* **sp. nov.** from Laos.

Key words: mtCOI, color variation, new species, parasitoid, taxonomy, Japan

Introduction

Jezarotes Uchida, 1928, is a small genus in the subfamily Acaenitinae (Hymenoptera, Ichneumonidae), containing seven species worldwide (Yu *et al*. 2012). Of these, two species are from Japan, two from Korea, two from China, and one from Taiwan. The only available bionomic information on *Jezarotes* is that a Japanese species, *J. tamanukii* Uchida, 1928, is a larval parasitoid of *Mesosa hirsuta* Bates (Coleoptera: Cerambycidae) (Kusigemati 1981).

Another Japanese species, *J. yamatonis* Uchida, 1928, had not been recorded since the original description of a male type specimen, which was separated from *J. tamanukii* only by the coloration of head, legs, and abdomen. However, we recently collected several specimens that are seemingly consistent with the species' original description. To determine whether it is distinct from *J. tamanukii*, we examined DNA sequences of the mitochondrial COI gene, and described its morphological characters in more detail. In addition, we describe a new species of *Jezarotes* from Laos, which occurs south of the currently accepted range of the genus.

Material and methods

Morphological examination. The specimens examined were from the following collections: Kanagawa Prefectural Museum of Natural History, Odawara (KPMNH); National Institute of Agro-Environmental Science, Tsukuba (NIAES); National Museum of Nature and Science, Tsukuba (NSMT); Osaka Museum of Natural History, Osaka (OMNH); and Systematic Entomology, Hokkaido University, Sapporo (SEHU). They were observed under a Nikon SMZ660 stereomicroscope. Photographs were taken with a Nikon D60 digital camera or a Keyence Digital Microscope VHX-600.

General morphological terminology follows Gauld (1991) and terminology for surface sculpture follows Eady (1968). Additionally, the anterior, raised section of the pronotum is referred to as a "collar". The following abbreviations are used in descriptions: basal mandibular width (BWM), length of malar space (MSL), ocello-ocular line (OOL), postocellar line (POL), lateral ocellar diameter (OD), metasomal tergite (T), and metasomal sternite (S). As well, Malaise trap is abbreviated as MT.

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Coloration. Yellow (Figs 20, 21). Antennal flagellum without a white band. Fore wing with two discrete dark markings, and apical dark mark of fore wing round shaped and not reaching vein *Cu1a*. Interocellar area, occiput, dorsal area of hind coxa, dorsal area of hind femur, and hind tarsus claws black. Hind tibia brown. Mesosoma with many black markings. Tegula, hind corner of pronotum, scutellum, postscutellum and propodeum light yellow. Tergites black each with an apical yellow band each segment.

Male. Unknown.

Distribution. Laos.

Bionomics. Host unknown.

Remarks. This new species most resembles *J. apicalis* from Taiwan, but is easily distinguished from it by the character states shown in the key below.

Key to the world's species of *Jezarotes* (modified from Lee & Lee, 2009)

1. Hind femur without a blunt ventral tooth (Fig. 24) 2
- Hind femur with a blunt ventral tooth (Figs. 3–5) 4
2. Fore wing without a brownish blot below stigma. China . . . . . *J. yanensis* Sheng & Sun
- Fore wing with a brownish blot below stigma 3
3. Antennal flagellum with a white band; ventral swelling of S1 only weakly projecting; apical dark mark of fore wing extended downward and reaching vein *Cu1a*; subgenital plate of female reaching far beyond abdominal apex. Taiwan . . . . . *J. apicalis* (Sonan)
- Antennal flagellum without a white band; ventral swelling of S1 strongly projecting (Fig. 25); apical dark mark of fore wing round shaped and not reaching vein *Cu1a*; subgenital plate of female reaching abdominal apex. Laos . . . . . *J. mitai* **sp. nov.**
4. Epicnemial carinae broadly interrupted in the middle; trochanter and trochantellus of hind leg brown. Korea . . . . . *J. dentatus* Lee & Lee
- Epicnemial carinae complete, not interrupted in the middle; trochanter and trochantellus of hind leg yellow 5
5. Vein *rs-m* distad of 2*m-cu* by 0.7 × its length; stigma brown; T1 1.8 × as long as width of its apex. China . . . . . *J. levis* Sheng
- Vein *rs-m* distad of 2*m-cu* by 1.2 × its length; stigma black; T1 1.9–2.8 × as long as width of its apex. Japan, Korea, Far East Russia . . . . . *J. tamanukii* Uchida

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References

Eady, R.D. (1968) Some illustrations of microsculpture in the Hymenoptera. *Proceedings of the Royal Entomological Society of London*, 43 (4–6), 66–72.
http://dx.doi.org/10.1111/j.1365-3032.1968.tb01029.x

Folmer, O., Black, M., Hoeh, W., Lutz, R. & Vrijenhoek, R. (1994) DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. *Molecular Marine Biology and Biotechnology*, 3, 294–297.

Ito, M. & Maeto, K. (2014) Revision of the genus *Yamatarotes* Uchida (Hymenoptera, Ichneumonidae, Acaenitinae) from Japan, based on morphological and molecular evidence. *Japanese Journal of Systematic Entomology*, 20, 107–113.

Ito, M., Watanabe, K. & Maeto, K. (2014) Revision of the genus *Arotes* Gravenhorst (Hymenoptera: Ichneumonidae: Acaenitinae) from Japan. *Zootaxa*, 3893 (2), 196–208.
http://dx.doi.org/10.11646/zootaxa.3893.2.2

Gauld, I.D. (1991) The Ichneumonidae of Costa Rica, 1. *Memoirs of American Entomological Institute*, 47, 1–589.

Kimura, M. (1980) A simple method for estimating evolutionary rate of base substitution through comparative studies of nucleotide sequence. *Journal of Molecular Evolution*, 16, 111–120.
http://dx.doi.org/10.1007/bf01731581

Kusigemati, K. (1981) New Host Records of Ichneumonidae from Japan (IV). *Memoirs of the Faculty of Agriculture, Kagoshima University*, 17, 135–138.

Lee, J.W. & Lee, S.M. (2009) Two new species in the genus *Jezarotes* (Hymenoptera: Ichneumonidae: Acaenitinae) from Korea. *Canadian Entomologist*, 141, 496–502.
http://dx.doi.org/10.4039/n09-025

Saitou, N. & Nei, M. (1987) The neighbor-joining method: a new method for reconstructing phylogenetic trees. *Molecular Biology and Evolution*, 4, 406–425.

Stigenberg, J., Vikberg, V. & Belokobylskij, S.A. (2011) *Meteorus acerbiavorus* sp. nov. (Hymenoptera, Braconidae), a gregarious parasitoid of *Acerbia alpine* (Quensel) (Lepidoptera, Arctiidae) in North Finland. *Journal of Natural History*, 45, 1275–1294.
http://dx.doi.org/10.1080/00222933.2011.552807

Tamura, K., Stecher, G., Peterson, D., Filipski, A. & Kumar, S. (2013) MEGA6: Molecular evolutionary genetics analysis version 6.0. *Molecular Biology and Evolution*, 30, 2725–2729.
http://dx.doi.org/10.1093/molbev/msr121

Townes, H., Momoi, S. & Townes, M. (1965) A catalogue and reclassification of the eastern Palearctic Ichneumonidae. *Memoirs of the American Entomological Institute*, 5, 1–661.
http://dx.doi.org/10.5479/si.03629236.216.1-2

Uchida, T. (1928) Dritter Beitrag zur Ichneumoniden-Fauna Japans. *Journal of the Faculty of Agriculture, Hokkaido Imperial University*, 25, 1–115.

Yu, D.S., van Achterberg, K. & Horstmann, K. (2012) World Ichneumonoidea 2011. Taxonomy, biology, morphology and distribution. [Flash drive]. Taxapad®, Vancouver, Canada.