



УДК 595.792.13

TERSILOCHINAE (HYMENOPTERA: ICHNEUMONIDAE) OF VIETNAM, PART 2: GENUS *BARYCNEMIS* FÖRSTER, 1869

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ABSTRACT

The genus *Barycnemis* Förster, 1869 (Hymenoptera: Ichneumonidae: Tersilochinae) is most abundant and species rich in the Holarctic region where about 35 species are known, i.e. 15 species in the Nearctic region and 26 in the Palaearctic region. Beyond the Holarctic region, one species occurs in Central America, two in the Oriental region and one in Australia. Only two species of *Barycnemis* were recorded from the Oriental region till now: *B. dissimilis* (Gravenhorst, 1829) from Nepal and *B. sanctijohanni* (Rao et Kurian, 1951) from North India. Nothing was known about the occurrence of the genus *Barycnemis* in Vietnam until present day. In this paper, two species of *Barycnemis*, *B. dissimilis* and *B. liliputana* sp. nov., are found to occur in Vietnam. *Barycnemis liliputana* sp. nov., with body length 1.6 mm and fore wing length 1.4 mm, is the smallest known tersilochine species. The new species may easily be recognized by its extremely small size, very slender antennal flagellum with only 14–16 flagellomeres and highly polished head and mesosoma. It resembles *B. gracillima* (Thomson, 1889) occurring in Europe, Caucasus and Kazakhstan as both have a similar head and slightly depressed ovipositor, but *B. liliputana* differs from this species, in addition to the characters listed above, by its slender first metasomal segment with small glymma (similar to those in *B. dissimilis* and *B. tobiasi* Khalaim, 2004) and slender legs. *Barycnemis dissimilis* is also recorded from Taiwan and North India. The genus *Barycnemis* is recorded from Vietnam and Taiwan for the first time. An identification key to the two *Barycnemis* species occurring in Vietnam is provided.

Key words: Asia, key, new species, Oriental region, parasitoids, taxonomy

ТЕРЗИЛОХИНЫ (HYMENOPTERA: ICHNEUMONIDAE: TERSILOCHINAE) ВЬЕТНАМА, ЧАСТЬ 2: РОД *BARYCNEMIS* FÖRSTER, 1869

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РЕЗЮМЕ

Род *Barycnemis* Förster, 1869 (Hymenoptera: Ichneumonidae: Tersilochinae) наиболее обычен и разнообразен в Голарктике, будучи представлен 35 видами, в том числе 15 видами в Неарктике и 26 видами – в Палеарктике. За пределами Голарктической области один вид рода *Barycnemis* обитает в Центральной Америке, два – в Ориентальной области и один – в Австралии. До настоящего времени лишь два вида рода *Barycnemis* были известны из Ориентальной области: *B. dissimilis* (Gravenhorst, 1829) из Непала и *B. sanctijohanni* (Rao et Kurian, 1951) из Северной Индии. Ничего не было известно о распространении рода во Вьетнаме до сегодняшнего дня. В этой работе два вида рода *Barycnemis*, *B. liliputana* sp. nov. и *B. dissimilis*, указаны для Вьетнама. *Barycnemis liliputana* sp. nov. имеет длину тела 1.6 мм и длину переднего крыла 1.4 мм, являясь самым мелким известным видом терзилохин. Новый вид может быть легко распознан благодаря своим чрезвычайно мелким размерам тела, очень стройному жгутику антенны с 14–16 флагелломерами и полированным голове и

мезосоме. Формой головы и слабо сжатым дорсо-вентрально яйцекладом *B. liliputana* напоминает обитающий в Европе, Казахстане и на Кавказе вид *B. gracillima* (Thomson, 1889), но отличается от последнего (в дополнение к перечисленным выше признакам) стройным первым сегментом метасомы с маленькой глиммой (этот сегмент похож на таковой у *B. dissimilis* и *B. tobiasi* Khalaim, 2004) и стройными ногами. *Barycnemis dissimilis* также отмечен для Тайваня и Северной Индии. Род *Barycnemis* впервые отмечен для Вьетнама и Тайваня. Дан определительный ключ для двух видов *Barycnemis*, обитающих во Вьетнаме.

Ключевые слова: Азия, определительный ключ, новый вид, Ориентальная область, паразитоиды, таксономия

INTRODUCTION

Vietnamese fauna of the subfamily Tersilochinae is very poorly known being represented in this country by only four genera with ten species: *Allophrys occipitata* Khalaim, 2011, *Diaparsis convexa* Khalaim, 2005, *D. dediticia* Khalaim, 2011, *D. hilaris* Khalaim, 2011, *D. minuta* Khalaim, 2011, *D. viela* Khalaim, 2011, *D. vietnamica* Khalaim, 2011, *D. zispina* Khalaim, 2011, *Probles vietnamica* Khalaim, 2011, and *Sathropterus secundus* Khalaim, 2011 (Khalaim 2011). Species of the genera *Allophrys* Förster, 1869 and *Aneuclis* Förster, 1869 will be reviewed in my first paper on Vietnamese Tersilochinae (Khalaim, unpublished), and the present article continues the study of Vietnamese fauna of the genus *Barycnemis* Förster, 1869.

The genus *Barycnemis* is most abundant and species rich in the Holarctic region where about 35 species are known, i.e. 15 species in the Nearctic region (Khalaim 2002; Horstmann 2010) and 26 in the Palaearctic region (Horstmann 1981; Khalaim 2004, 2007, 2015a, 2015b, 2016; Balueva et al. 2013; Khalaim and Sheng 2015). Beyond the Holarctic region, one species occurs in Central America (Khalaim and Broad 2012), two in the Oriental region (Khalaim 2011) and one in Australia (Khalaim 2015c).

Only two species of *Barycnemis* were recorded from the Oriental region till now: *B. dissimilis* (Gravenhorst, 1829) from Nepal and *B. sanctijohanni* (Rao et Kurian, 1951) from North India (Khalaim 2011). Nothing is known about the occurrence of the genus *Barycnemis* in Vietnam.

Very little is known about host range of the genus. In Europe, two species have been recorded as parasitoids of the coleopteran genera *Byrrhus* Linnaeus, 1767 (Byrrhidae) and *Bledius* Leach, 1819 (Staphylinidae) (Horstmann 1981; Wyatt and Foster 1989), and in the Nearctic region one species was reared from a *Pissodes* sp. (Curculionidae) (Horstmann 2010).

The aim of this work is to review Vietnamese fauna of the genus *Barycnemis*, describe one new species and provide an identification key to two species occurring in this country.

MATERIAL AND METHODS

Material for this study was obtained from the following institutions: the Naturalis, Leiden, the Netherlands (RMNH); the Oberösterreichisches Landesmuseum, Linz, Austria (OLML); and the Texas A&M University, College Station, Texas, USA (TAMU). One specimen of *B. dissimilis* is deposited in the Zoological Institute RAS, Saint Petersburg, Russia (ZIN).

Morphological terminology follows that of Townes (1971) with changes according to Khalaim (2011). Photographs were taken in ZIN, with a Canon EOS 70D digital camera attached to an Olympus SZX10 stereomicroscope, and partially focused images were combined using Helicon Focus Pro software.

SYSTEMATICS

Family Ichneumonidae Latreille, 1802

Subfamily Tersilochinae Schmiedeknecht, 1910

Genus *Barycnemis* Förster, 1869

Type species: *Porizon claviventris* Gravenhorst, 1829, included by Brischke (1880: 192), designated by Viereck (1914: 19).

Two species of the genus *Barycnemis* have been discovered from Vietnam: the widely distributed in the Holarctic region *B. dissimilis*, and one undescribed species. *Barycnemis dissimilis* is also recorded for the first time from Taiwan and India. *Barycnemis liliputana* sp. nov. possesses body length 1.6–1.9 mm and fore wing length 1.4–1.8 mm, and is the smallest known tersilochine species (most tersilochines have body and fore wing length 3.0 to 6.0 mm).

Key to species of *Barycnemis* occurring in Vietnam

1. Flagellum with 18–22 flagellomeres (Fig. 1). Malar space 0.5–0.8 times as long as basal mandibular width (Fig. 1). Face, frons, mesoscutum and dorsolateral area of propodeum granulate, dull. Basal part of propodeum about 1.5 times as long as apical area. Ovipositor compressed (Fig. 2). Body length about 3.8 mm, fore wing length 3.2 mm *B. dissimilis* (Grav.)
- Flagellum with 14–16 flagellomeres (Fig. 3). Malar space very short, 0.2 times as long as basal mandibular width (Fig. 5). Face, frons, mesoscutum and dorsolateral area of propodeum polished. Basal part of propodeum twice as long as apical area. Ovipositor slightly depressed. Body length 1.6–1.9 mm, fore wing length 1.4–1.8 mm *B. liliputana* sp. nov.

***Barycnemis dissimilis* (Gravenhorst, 1829)**

(Figs. 1, 2)

Material. VIETNAM: 4 females (3 in RMNH, 1 in ZIN), Tonkin, Lai Châu Prov., Hoang Lien National Park [Nature Reserve since 2006], 15 km W of Sa Pa, 1900 m, Malaise traps, 15–21 October 1999, coll. C. v. Achterberg. TAIWAN: 1 female (TAMU), Nantou Hsien, Meifeng, 22 May 1982, coll. R. Wharton. INDIA: 2 females (TAMU), Uttar Pradesh, Gobind Djam village, N 30°42.1', E 79°35.6', 3150–3300 m, 20–23 May 1999, coll. Yu.M. Marusik.

Remarks. Vietnamese specimens of this species morphologically well correspond with the Palaearctic material but have legs strongly darkened, e.g. hind coxa is more or less entirely black, hind femur brown to brownish black, hind tibia extensively brown to dark brown and remaining parts of legs with variable amount of brown markings. This is the first record of *B. dissimilis* from Vietnam, Taiwan and India.

Distribution. Holarctic and Oriental species: North America, Europe, Caucasus, Russian Siberia and Far East, Mongolia, Nepal, Japan, South Korea, East China (Henan), Taiwan, Vietnam (northwest), India (Uttar Pradesh).

***Barycnemis liliputana* sp. nov.**

(Figs. 3–7)

Holotype. Female – VIETNAM, Vinh Phúc Prov., “Thanh Son Biodivers. St.”, 50 km N of Hanoi, 300 m, Malaise trap, 4 April – 12 May 2000, coll. Mai Phu Quy, RMNH'00 (RMNH).

Paratype. VIETNAM: 1 female (OLML), “Thahn” [Thanh] Hoa Prov., Hoan – Hoa, garden, 1 January – 16 February 2013, “MTI”.

Etymology. The name refers to small size of the species and pertains to lilliputs (liliputs in some languages), tiny inhabitants of the fabulous island. The name was coined by Jonathan Swift in his novel “Gulliver’s Travels” (1726).

Comparison. The new species may easily be recognized by its extremely small size, very slender antennal flagellum with only 14–16 flagellomeres and highly polished head and mesosoma. It resembles *B. gracillima* (Thomson, 1889) occurring in Europe, Caucasus and Kazakhstan as both have similar head and slightly depressed ovipositor, but *B. liliputana* differs from this species, in addition to characters listed above, by its slender first metasomal segment with small glymma (similar to those in *B. dissimilis* and *B. tobiasi* Khalaim, 2004) and slender legs.

Description. Female. Body length 1.6 mm. Fore wing length 1.4 mm.

Head strongly narrowed and rounded behind eyes in dorsal view; temple 0.8 times as long as eye width. Clypeus lenticular, 2.8 times as broad as long (Fig. 4), convex in lateral view. Mandible slender, with upper tooth much longer than the lower. Malar space very short, about 0.2 times as long as basal mandibular width (Fig. 5). Antennal flagellum filiform, very slender, with 14 flagellomeres in holotype and 16 in paratype (Fig. 3); flagellomeres 2 and 3 twice and subapical flagellomeres about 1.5 times as long as broad. Face with weak median prominence in upper part. Head, in profile, with eyes and antennae somewhat displaced downwards (Fig. 3). Clypeus, face, frons and vertex polished, impunctate. Occipital carina complete.

Mesosoma almost entirely polished, impunctate. Scutellum in profile almost flat, with lateral longitudinal carinae only at extreme base. Notaulus distinctly impressed anterolaterally. Foveate groove in centre of mesopleuron, almost straight, thin and sharp, with transverse wrinkles (Fig. 7). Propodeum mediodorsally with shallow furrow; transverse carina distinct. Basal part of propodeum about twice as long as apical area. Propodeal spiracle small, separated from pleural carina by 1.5–2.0 times diameter of spiracle. Apical area broad, flat, with uneven surface; apical longitudinal carinae strong posteriorly and weak anteriorly, reaching transverse carina anteriorly in paratype and not reaching in holotype.



Figs. 1–7. *Barycnemis dissimilis*, female (1, 2) and *B. liliputana* sp. nov., holotype female (3–7). 1 – head with antennae, front view; 2 – apex of metasoma with ovipositor, lateral view; 3 – habitus, lateral view; 4 – head, front view; 5 – head and anterior part of mesosoma, ventro-lateral view; 6 – hind leg (without coxa), lateral view; 7 – mesopleuron, antero-ventro-lateral view.

Fore wing with second recurrent vein (*2m-cu*) strongly postfurcal, very weakly pigmented and hardly discernible. Intercubitus (*2rs-m*) thick and very short, much shorter than abscissa of cubitus between intercubitus and second recurrent vein (abscissa of *M* between *2rs-m* and *2m-cu*). First abscissa of radius (*Rs+2r*) slightly longer than width of pterostigma. First and second sections of radius (*Rs+2r* and *Rs*) meeting at slightly obtuse angle (about 95–100°). Metacarpus (*R1*) short, not reaching apex of the wing. Postnervulus intercepted distinctly below its middle. Hind wing with nervellus (*cu1&cu-a*) recalcitrant, slanted about 45°.

Legs moderately slender (Fig. 6). Hind femur 3.3 times as long as broad and almost 1.2 times as long as tibia. Hind basitarsus as long as tibia. Spurs of hind tibia distinctly curved apically. Tarsal claws not pectinate.

First tergite slender, entirely smooth; in lateral view with a strong angulation in basal 0.3–0.4 (Fig. 3). Glymma small, situated in apical 0.65 of tergite, joining by fine furrow to ventral part of postpetiole. Second tergite much longer than broad. Thyridial depression more than 3.0 times as long as broad, shallow in holotype and sharply delimited in paratype. Ovipositor slender, weakly and evenly upcurved, slightly depressed; sheath almost as long as first tergite.

Head, mesosoma and first metasomal segment reddish brown. Palpi, mandible (teeth reddish), lower 0.7 of clypeus and tegula yellow. Antenna entirely brown. Pterostigma pale brown. Fore and mid legs yellow with extensive brown markings. Hind leg with coxa, femur and tibia brown (tibia pale basally), trochanters and tarsus yellow. Metasoma behind first tergite brown.

Male. Unknown.

Variation. The paratype is somewhat larger and darker than the holotype: body length 1.9 mm, fore wing 1.8 mm, head and mesosoma predominantly black, antenna with scape and pedicel brownish and flagellum black, metasoma behind first tergite dark brown.

Distribution. Oriental species: North Vietnam.

ACKNOWLEDGEMENTS

I am thankful to Frederique Bakker (RMNH), Martin Schwarz (OLML), John D. Oswald and Karen Wright (TAMU) for the loan of valuable material, and to

Andrei Humala (Petrozavodsk, Karelia, Russia) for his important comments and corrections. The study was performed in the frames of the state research project AAAA-A17-117030310210-3 and supported by the Russian Foundation for Basic Research (grant no. 16-04-00197).

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Submitted August 11, 2017; accepted October 19, 2017.