

A new species of *Phradis* Förster (Hymenoptera: Ichneumonidae: Tersilochinae) from Japan

Новый вид *Phradis* Förster (Hymenoptera: Ichneumonidae: Tersilochinae) из Японии

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A new species, *Phradis hikosanus* sp. nov. from South Japan is described and illustrated. It differs from other species of the genus in its disproportionately small globose head and strongly compressed laterally mesosoma (lateral sides of mesosoma are almost flat). A key to three species of *Phradis* occurring in Japan is provided.

Новый вид *Phradis hikosanus* sp. nov. описан из Южной Японии. Он отличается от других видов рода своей непропорционально маленькой шаровидной головой и сильно сжатой с боков мезосомой (боковые стороны почти плоские). Дан определительный ключ трех видов рода *Phradis*, обитающих в Японии.

Key words: ichneumon flies, taxonomy, Japan, Hymenoptera, Ichneumonidae, Tersilochinae, *Phradis*, new species

Ключевые слова: наездники-ихневмониды, таксономия, Япония, Hymenoptera, Ichneumonidae, Tersilochinae, *Phradis*, новый вид

INTRODUCTION

Phradis Förster, 1869 is one of the most species-rich tersilochine genera, with a predominantly Holarctic distribution and 59 described species. Twenty four species of *Phradis* occur in Europe (Khalaim et al., 2009), and about 38 species in the entire Palearctic region (Khalaim, 2007b; Khalaim et al., 2009). Eighteen species were recently revised in the Nearctic fauna by Horstmann (2013). Beyond the Holarctic region, two species were described from South Africa (Khalaim, 2007a), one species was found in the mountainous part of Peruvian Amazonia (Khalaim & Bordera, 2012), and Gauld (1984) mentioned five undescribed species from Australia.

In Europe, some species of *Phradis* were reared from species of the genus *Meligethes* Stephens (Coleoptera: Nitidulidae) on rape

(Horstmann, 1971; Khalaim et al., 2009), but no host record is known from North America (Horstmann, 2013). Most species have a flight period in spring or early summer.

Only two species, *P. kyushuensis* Khalaim, 2007 and *P. nikishenae* Khalaim, 2007, were known from Japan hitherto (Khalaim, 2007b). Both these species were recently recorded from South Korea (Balueva et al., 2013). In this paper, a third rare Japanese species is described and illustrated, and an identification key to Japanese species of *Phradis* is provided.

MATERIAL AND METHODS

Wing venation and morphological terms predominantly follow Townes (1969, 1971) with changes according to Khalaim (2011). Photographs were taken at the Zoological Institute RAS (St Petersburg, Russia) with

a DFC 290 digital camera attached to a Leica MZ16 stereomicroscope; images were combined using Helicon Focus software. The holotype of the new species is deposited in the National Institute for Agro-Environmental Sciences, Tsukuba, Japan (NIAES).

RESULTS

Order HYMENOPTERA

Family ICHNEUMONIDAE

Genus *Phradis* Förster, 1869

Notes. The genus *Phradis*, as well as genera *Allophrys* Förster, 1869 and *Heterocola* Förster, 1869, belongs to the “*Phradis*” group of genera. Genera of this group can be distinguished by the combination of following features: first metasomal segment lacking glymmae, propodeum usually with basal area and fore wing with second recurrent vein usually interstitial or antefurcal. Within this group of genera, *Phradis* differs from *Heterocola* by its short maxillary and labial palpi (extremely long in *Heterocola*) and interstitial (rarely antefurcal) second recurrent vein (always strongly antefurcal in *Heterocola*), and from *Allophrys* by eyes of males not enlarged (strongly enlarged in males of *Allophrys*), usually lacking hypostomal carina (well developed in *Allophrys*), and fore wing with nervellus usually less reclivous.

Key to the species of *Phradis* occurring Japan

1. Basal area of propodeum very short, strongly transverse. Malar space 0.3 times as long as basal mandibular width. Head, in dorsal view, with temple almost half as long as eye width. Ovipositor sheath 2.4–2.7 times as long as first tergite. – Mongolia, Russia (Primorskiy reg.), South Korea, Japan (Kyushu I.) *P. nikishenae* Khalaim, 2007
- Basal area of propodeum distinctly elongate. Malar space 0.5–1.0 times as long as basal mandibular width. Head, in dorsal view, with temple 0.6–0.7 times as long as eye width. Ovipositor sheath 1.0–1.2 times as long as first tergite 2
2. Malar space as long as basal mandibular width. Head, in lateral view, with vertex flat. Mesosoma not especially compressed laterally, its lateral sides convex. – South Korea, Japan (Honshu I., Kyushu I.) *P. kyushuensis* Khalaim, 2007
- Malar space 0.5–0.6 times as long as basal mandibular width. Head, in lateral view, with vertex convex. Mesosoma strongly compressed laterally, its lateral sides flat. – Japan (Kyushu I) *P. hikosanus* sp. nov.

Phradis hikosanus sp. nov.

(Figs 1–8)

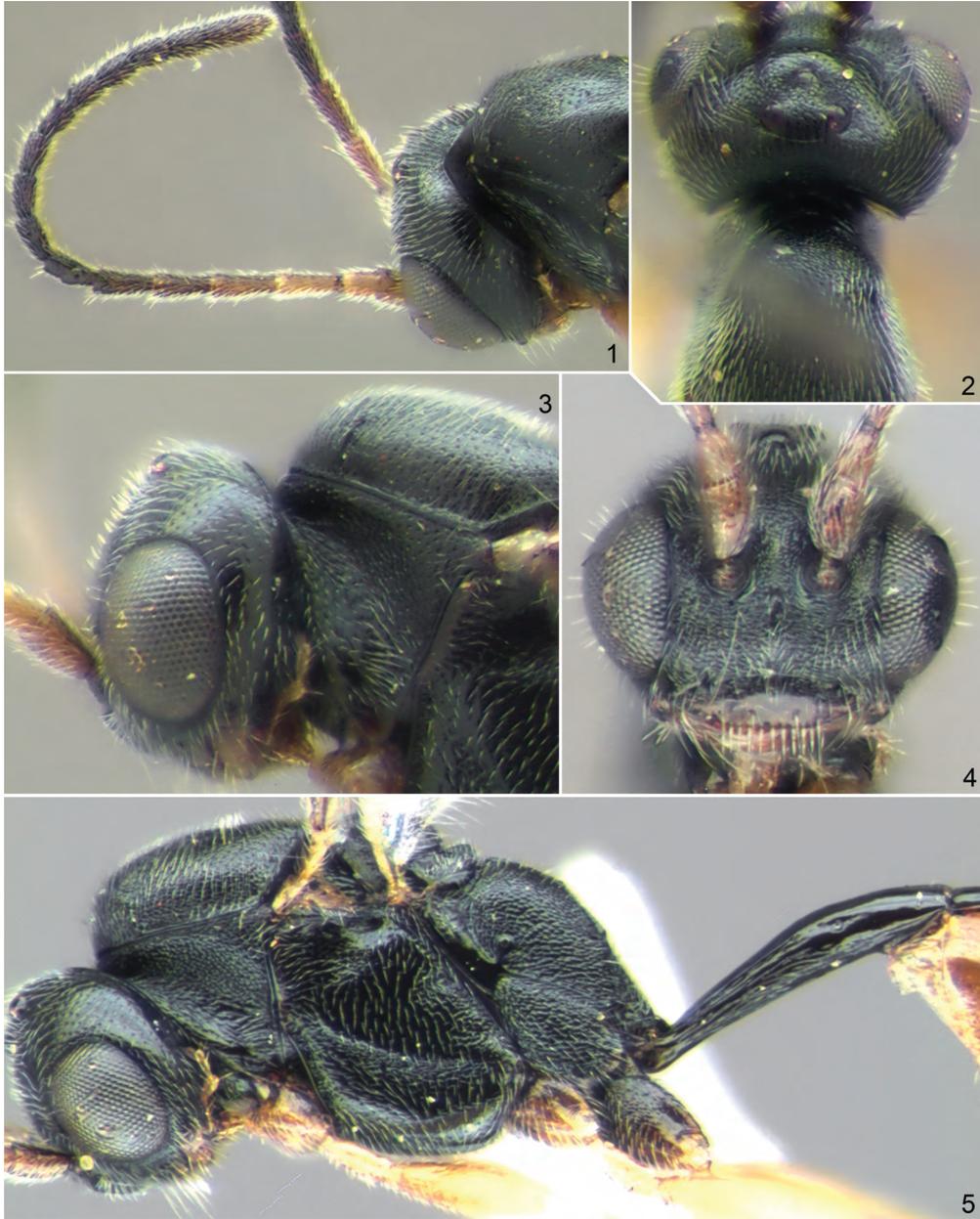
Holotype. Female; **Japan**, Kyushu I., Fukuoka Pref., Mt Hikosan, 29 April 1973, coll. H. Maki-hara (NIAES).

Etymology. From the type locality, Mountain Hikosan.

Comparative diagnosis. Differs from other species of the genus by its disproportionately small, globose head (Fig. 3) and strongly, laterally compressed mesosoma (lateral sides of mesosoma are almost flat, similar to the Costa Rican species *Allophrys compressor* Khalaim & Broad). The new species is also characterized by the long and linear foveate groove of the mesopleuron (Fig. 5), long and narrow basal and apical areas of the propodeum (Fig. 6), antefurcal second recurrent vein, short first abscissa of radius, and very slender first and second metasomal tergites (Fig. 8).

Description. Female. Body length 3.4 mm. Fore wing length 2.3 mm.

Head globose, in dorsal view, 1.5 times as broad as long, rounded posterior to eyes (Fig. 2); temple almost 0.7 times as long as eye width (Fig. 2). Eyes and bases of antennae conspicuously displaced ventrally (Fig. 3). Clypeus lenticular in anterior view, 3.5 times as broad as long (Fig. 4), convex in lateral view, smooth, with fine punctures in upper 0.3. Mandible with upper tooth longer than lower tooth. Malar space 0.5–0.6 times as long as basal mandibular width. Antennal flagellum (Fig. 1) basally very slender, with 14 flagellomeres; second flagellomere about 2.5 times and subapical flagel-



Figs 1–5. *Phradis hikosanus* sp. nov., female (holotype). **1**, antenna, lateral view; **2**, head and anterior part of mesosoma, dorsal view; **3** – head and anterior part of mesosoma, lateral view; **4** – head, front view; **5** – head, mesosoma and first metasomal segment, lateral view.

lomeres 1.2–1.3 times as long as broad. Face short (Fig. 4), 2.7 times as broad (shortest distance between inner eye margins) as long (measured from level of lower margin of antennal socket to upper clypeal margin), with

median tubercle in upper part, rather strongly prominent in lateral view (Fig. 3). Face granulate, dull, impunctate. Frons granulate and dull in lower part to smooth and shining in upper part, finely punctate. Vertex finely



Figs 6–8. *Phradis hikosanus* sp. nov., female (holotype). **6**, propodeum, dorsolateral view; **7**, mesosoma with ovipositor and legs, lateral view; **8** – base of metasoma, dorsal view.

granulate, dull, impunctate. Temple finely granulate and dull peripherally, smooth and shining with very fine punctures centrally. Occipital carina complete.

Mesosoma very strongly laterally compressed (Fig. 2), 3.2 times as long (measured from anterior margin of mesoscutum to hind end of propodeum) as broad (width of mesoscutum at level of tegulae), its lateral sides almost flat. Mesoscutum granulate, dull, with very fine (mostly indistinct) punctures. Notaulus as strong wrinkle (Fig. 3). Scutellum with lateral longitudinal carinae only at extreme base. Foveate groove (Fig. 5) long and relatively thin, weakly upcurved anteriorly, situated rather high on mesopleuron and extending almost entire length of mesopleuron. Mesopleuron above foveate groove more or less smooth, weakly shining, with fine but sharp punctures; below foveate groove strongly granulate; peripherally predominantly granulate and dull. Propodeal spiracle small, separated from pleural carina by almost 4.0 times diameter of spiracle (Fig. 5). Propodeum strongly and evenly granulate, dull, impunctate (Figs 5, 6); basal area indistinct, narrow and long, triangular (widened anteriorly and pointed posteriorly), 0.6 times as long as apical area (Fig. 6). Apical area long and narrow, pointed ante-

riorly (Fig. 6); apical longitudinal carinae weak but complete, reaching transverse carina anteriorly.

Fore wing with second recurrent vein distinctly antefurcal. Intercubitus short. First abscissa of radius somewhat shorter than width of pterostigma. First and second abscissae of radius meeting at angle of 95–100°. Metacarpus not reaching apex of fore wing. Postnervulus intercepted distinctly below its middle. Hind wing with nervellus distinctly reclivous.

Legs moderately slender (Fig. 7). Hind femur 3.9 times as long as broad and 0.85 times as long as tibia. Hind basitarsus 0.45 times as long as tibia. Tarsal claws not pectinate.

First tergite very slender, 5.8 times as long as posteriorly broad (Fig. 8), striate dorsally in basal 0.3 and laterally in basal 0.7; petiole round in cross-section centrally, not separated from postpetiole in dorsal view (Fig. 8). Glymma absent. Second tergite 3.3 times as long as anteriorly broad (Fig. 8). Thyridial depression almost 3.0 times as long as broad. Ovipositor short and slender, weakly upcurved, with weak and moderately long dorsal subapical notch; sheath about 1.2 times as long as first tergite.

Head, mesosoma and first metasomal segment black. Palpi, mandible (teeth

dark red), lower 0.8 of clypeus and tegula yellow-brown to reddish brown. Antenna brown basally to black apically. Pterostigma pale brown. Legs brownish yellow, fore coxa slightly brownish, mid coxa brown and hind coxa dark brown. Metasoma posterior to first tergite yellowish brown ventrally to brown laterally and dorsally. Ovipositor sheath dark brown.

Male. Unknown.

Distribution. South Japan (Kyushu I.).

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