

# A new species of the genus *Homolobus* Foerster from Ecuador (Hymenoptera: Braconidae: Homolobinae)

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A new high elevation altitude species of the genus *Homolobus* Foerster (Hymenoptera: Braconidae: Homolobinae), *H. fuscinervis* spec. nov. from Ecuador (Napo province, 2163 m elevation) is described and illustrated.

## Introduction

The genus *Homolobus* Foerster, 1862 (family Braconidae Nees, 1812; subfamily Homolobinae van Achterberg, 1979) has been revised by van Achterberg (1979), but still new species are found especially in the Neotropical region. Recently, the second author found a distinctive and common high altitude species in Napo Province (Ecuador). It belongs to the subgenus *Oulophus* van Achterberg, 1979, of which six Neotropical species were previously known (van Achterberg 1979). The comparatively high number of species of the subgenus *Oulophus* seems to be typical for the Neotropical region. The biology of the new species is unknown, but other members of the genus are koinobiont endoparasitoids (with a final ectoparasitoid phase) of the Lepidoptera larvae, mainly in Geometridae and Noctuidae (van Achterberg 1979; Shaw, 2006).

Specimens for this study were collected during the Caterpillars and Parasitoids of the Eastern Andes of Ecuador project (NSF-BSI-03-46729; NSF-BSI-07-17458; Dyer et al., 2008). Specimens were sampled by Malaise trap during consecutive months ranging from December 2006 to June 2008, and by yellow pans during July 2008 and June 2009. All specimens were sampled in the Yanayacu Biological Station and Center for Creative Studies (elevation 2163 m; 00°35'9"S, 77°53'4"W), which is situated on the northeastern slope of the Andes in Napo Province, Ecuador. The reserve comprises both primary and secondary growth montane forests (Greeney, 2008). The Holdridge life zone is tropical montane moist forest (Holdridge, 1967).

For the recognition of the subfamily Homolobinae, see van Achterberg (1979, 1990, 1993, 1997) or Shaw (1995, 2006), and for the terminology used in this paper, see van Achterberg (1988). The holotype of *H. fuscinervis* is deposited in the Nationaal Natuurhistorisch Museum, Leiden (RMNH). Paratypes are deposited at the RMNH, University of Wyoming Insect Museum (UWIM), the Museum of Comparative Zoology, Harvard University (MCZ), and the Museo Ecuatoriano de Ciencias Naturales (MECN).

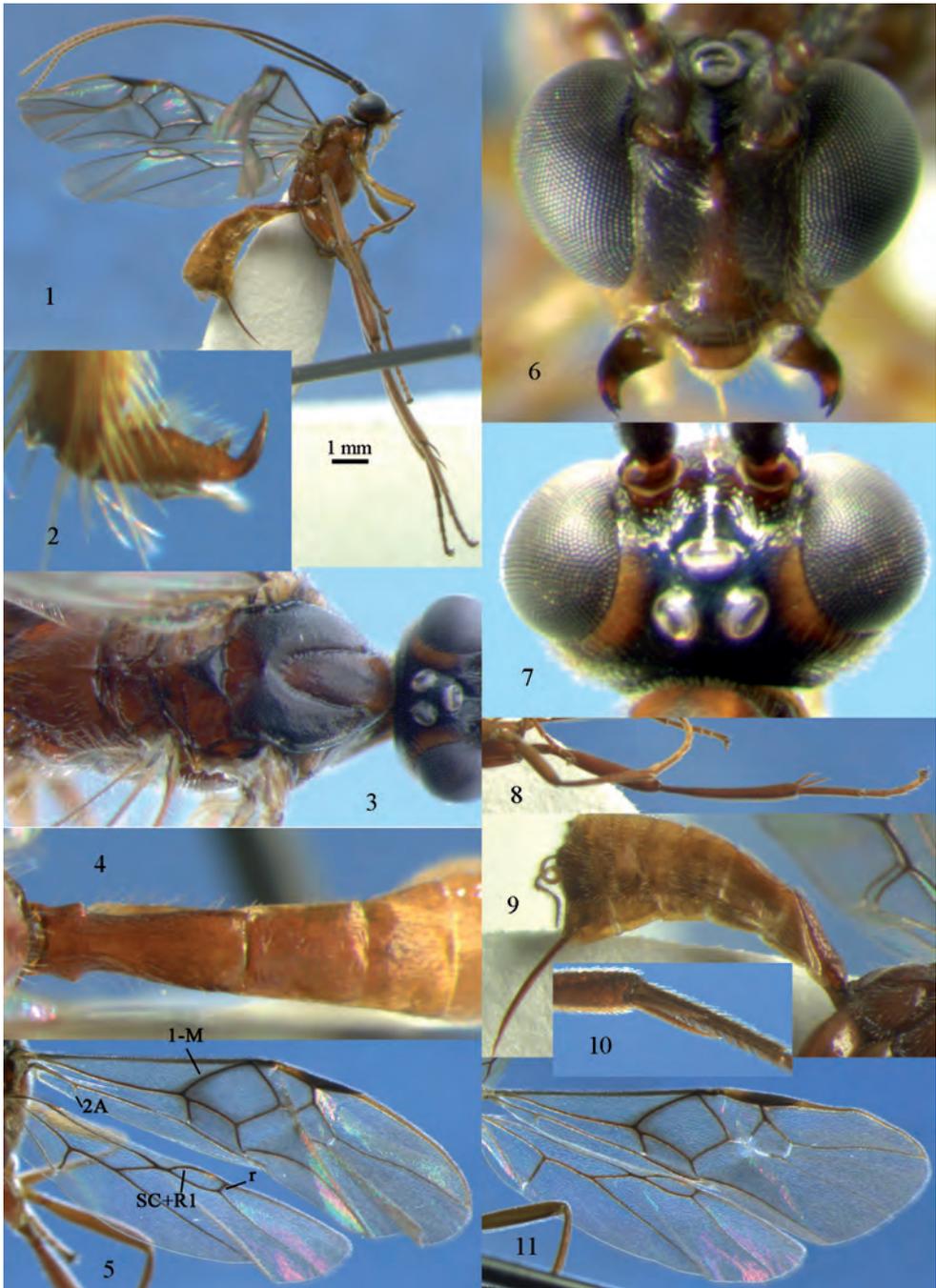
### Key to Neotropical species of the *Homolobus* subgenus *Oulophus* van Achterberg

1. Vein r of hind wing present (figs 5, 11), at least partly as a brownish pigmented stripe ..... 2
  - Vein r of hind wing completely absent ..... 5
2. Area near vein 1-M of fore wing distinctly infusate (figs 5, 11); head largely or completely black (figs 6, 7); pterostigma (except basally) dark brown or largely so (figs 5, 11); Ecuador ..... *H. fuscinerivis* spec. nov.
  - Area near vein 1-M of fore wing subhyaline; head largely or completely yellowish-brown; colour of pterostigma variable ..... 3
3. Pterostigma bicoloured, basally and apically more or less yellowish and remainder dark brown; vertex very finely coriaceous laterally; [hind femur and tibia brownish-yellow] ..... 4
  - Pterostigma unicoloured, yellowish-brown; vertex smooth laterally or nearly so; Panama, Mexico, U.S.A. (Arizona) ..... *H. acares* van Achterberg, 1979
4. Length of ovipositor sheath about 0.4 times fore wing; second submarginal cell of fore wing subquadrate; antenna blackish; Bolivia .....
  - ..... *H. occidentalis* van Achterberg, 1979
  - Length of ovipositor sheath about 0.1 times fore wing; second submarginal cell of fore wing distinctly longer than high; antenna yellowish-brown; Mexico .....
    - ..... *H. bicolor* van Achterberg, 1979
5. Vein SC+R1 of hind wing weakly curved; area basally of vein 2A of fore wing sparsely setose; precoxal suture extensively punctate; [antenna dark brown]; Brazil ..... *H. obscurus* van Achterberg, 1979
  - Vein SC+R1 of hind wing straight (cf. fig. 5); area basally of vein 2A of fore wing glabrous; precoxal suture largely or completely smooth ..... 6
6. Hind tarsus ivory; length of fore wing of ♀ 1.2-1.3 times body (of ♂ about 1.1 times); inner aspect of 3<sup>rd</sup>-8<sup>th</sup> antennal segments of ♀ with a rather weakly developed ridge; subapical tooth of tarsal claws somewhat larger; length of ovipositor sheath about 0.07 times fore wing; Colombia ..... *H. macropterus* van Achterberg, 1979
  - Hind tarsus brownish-yellow; length of fore wing of ♀ 1.0-1.1 times body (of ♂ about equal); inner aspect of 3<sup>rd</sup>-8<sup>th</sup> antennal segments of ♀ without ridge; subapical tooth of tarsal claws minute; length of ovipositor sheath 0.13-0.14 times fore wing; Chile, Argentina ..... *H. rectinervis* van Achterberg, 1979

### Description

*Homolobus fuscinerivis* spec. nov.  
(figs 1-11)

Material. — Holotype, ♀ (RMNH), "Ecuador: Napo Province, Yanayacu Biological Station, S 00°35.9' W 77°53.4', 2163 m, 1-10.ii.2008, J. Simbaña Macucoloma trail, Malaise trap, NSF-BSI-07-17458, S.R. Shaw". Paratypes: 16 ♀♀ + 284 ♂♂ (RMNH, UWIM, MCZ, MECN), same label data, but collected 1-8.xii.2006 (7 ♂♂), 1-8.i.2007 (15 ♂♂), 1-8.ii.2007 (1 ♀, 3 ♂♂), 1-8.iii.2007 (6 ♂♂), 1-8.iv.2007 (13 ♂♂), 1-8.v.2007 (6 ♂♂), 1-8.vi.2007 (3 ♂♂), 1-8.vii.2007 (10 ♂♂), 1-8.viii.2007 (7 ♂♂), 1-8.ix.2007 (12 ♂), 1-8.x.2007 (4 ♂♂), 5-12.xi.2007 (26 ♂♂), 3-10.xii.2007 (12 ♂♂), 1-10.ii.2008 (18 ♂♂), 1-8.iii.2008 (1 ♀, 9 ♂♂), 2-9.iv.2008 (3 ♂♂), 1-10.v.2008 (5 ♂♂), 1-10.vi.2008 (6 ♂♂), 1-10.ix.2008 (14 ♂♂), 1-10.x.2008 (2 ♀♀, 21 ♂♂), 1-10.



Figs 1-11, *Homolobus fuscineris* spec. nov., ♀, holotype, but 10 and 11 of ♂, paratype. 1, Habitus, lateral aspect; 2, inner hind claw, lateral aspect; 3, mesosoma, dorsal aspect; 4, first-third metasomal tergites, dorsal aspect; 5, 11, wings; 6, head, anterior aspect; 7, head, dorsal aspect; 8, hind leg; 9, metasoma, lateral aspect; 10, hind tibial spurs.

xi.2008 (9 ♂♂), 1-10.xii.2008 (1 ♀, 9 ♂♂), 1-10.i.2009 (2 ♀, 7 ♂♂), 2-12.ii.2009 (3 ♀♀, 8 ♂♂), 2-12.iii.2009 (4 ♀♀, 16 ♂♂), 1-10.iv.2009 (7 ♂♂), 1-10.v.2009 (10 ♂♂), 3-13.vi.2009 (1 ♀, 10 ♂♂) and 1-10.vii.2008, yellow pans (1 ♀, 6 ♂♂), 3-13.vi.2009 (1 ♂).

Holotype, ♀, length of body 6.4 mm, of fore wing 7.5 mm.

Head.— Antennal segments 40, bristly setose, third antennal segment without crest and 1.3 times fourth segment, length of third, fourth and penultimate segments 5.0, 3.8 and 2.5 times their width, respectively, apical segment with distinct apical spine and subapical segments with erect setae, about as long as width of segments; fourth segment of labial palp 5.5 times as long as third segment; length of maxillary palp 1.5 times as long as height of head (fig. 1); length of eye in dorsal view 2.5 times temple; temple directly narrowed behind eyes (fig. 7); OOL:diameter of ocellus:POL = 7:5:4; frons shiny, depressed in front of anterior ocellus; remainder nearly flat and with some striae, shiny but narrow lateral part rather dull, setose and granulate; vertex flat, very finely granulate, dull; face rather flat, superficially transversely rugulose, with distinct medio-dorsal tubercle; clypeus convex, with few punctures, its apical margin thin, nearly straight medially and separated; length of malar space 0.7 times basal width of mandible and mandibular condyli below lower level of eyes (fig. 6).

Mesosoma.— Length of mesosoma 1.4 times its height; side of pronotum antero-medially distinctly crenulate, finely crenulate posteriorly and remainder smooth, convex subapically; precoxal suture absent; mesopleuron punctulate and setose, largely smooth; mesosternal sulcus narrow and nearly smooth posteriorly; metapleural flange medium-sized, apically obtuse; metapleuron smooth except for some rugae postero-ventrally; notauli complete, very finely crenulate and anteriorly largely smooth, narrow (fig. 3); mesoscutal lobes densely superficially punctulate and densely setose; scutellum triangular (fig. 3); surface of propodeum largely smooth and partly glabrous, posteriorly with a pair of fine carinae and in between superficially rugose; posterior part of propodeum not separated from antero-dorsal part.

Wings.— Fore wing: r:3-SR:SR1 = 5:14:57; SR1 rather sinuate; cu-a long and oblique (figs 1, 5); 1-CU1:2-CU1 = 1:8; 2-SR:3-SR:r-m = 27:28:13; 2A shortly developed only pigmented; area basally of 2A glabrous. Hind wing: r present just after basal quarter of cell; 2-SC+R longitudinal; SC+R1 nearly straight (fig. 5); basal quarter of SR slightly curved, strongly pigmented but unsclerotised; M+CU:1-M = 20:13.

Legs.— Hind coxa largely smooth, densely setose and punctulate; tarsal claws with small ventral tooth and basally yellowish pectinate (fig. 2); length of femur, tibia and basitarsus 5.2, 9.9 and 9.4 times their width, respectively; length of hind tibial spurs 0.6 and 0.5 times as long as hind basitarsus, outer spur distinctly sinuate in lateral view.

Metasoma.— Length of first tergite 2.4 times its apical width, its surface smooth with some rugulosity (fig. 4), its dorsal carinae absent except for weak carinae near spiracles; second tergite smooth, but somewhat pimply because of setae (fig. 4); length of ovipositor times 0.11 times as long as fore wing.

Colour.— Yellowish-brown; head dark brown or blackish-brown, but temple, medial triangle and tubercle of face, vertex laterally, malar space and more or less yellowish-brown or brown; mesosoma brown, but scutellum, mesoscutum (except anteriorly and narrowly medio-posteriorly), tegula (but humeral plate pale yellow-

ish), pronotum anteriorly and propleuron dark brown; basal 0.4 of antenna blackish to dark brown and remainder brownish-yellow; palpi pale yellowish; fore and middle coxae and trochanters brownish-yellow; basal third and vein 1-R1 of fore wing yellow; remainder of pterostigma and of veins dark brown; wing membrane near veins 1-M and 1-CU1 dark brown, distal part of fore wing largely somewhat infusate (fig. 5).

Variation. — Length of fore wing 6.2-7.5 mm and of body 6.3-7.0 mm; antennal segments of ♀ 40 (n = 4), and of ♂ 39 (n = 18) or 40 (n = 12); length of first tergite 2.2-2.5 times its apical width, its surface large smooth and shiny to rugulose; length of ovipositor times 0.11-0.12 times as long as fore wing; ovipositor length approximately equal to hind coxa length, or just slightly longer than hind coxa; face completely dark brown or with dark chestnut brown medial triangle (fig. 6); basal 0.3-0.4 of pterostigma yellow; propleuron dark brown to yellowish-brown; mesoscutum partly or completely dark brown or black. Hind tibial spurs of male acute apically and straight (fig. 10).

Etymology. — The species name is derived from the Latin *fuscus*, meaning dusky or dark, and Latin *nervus*, for nerve. The name refers to the dark brown pigmentation along fore wing veins 1-M and 1-CU1, which is diagnostic for this species.

Discussion. — It is interesting to note that while the project so far has reared more than 30,000 individual caterpillars, including numerous examples of Geometridae and Noctuidae (known hosts for other *Homolobus* species), that *H. fuscinervis* has not yet been reared from a host caterpillar. On the other hand, for a presumed solitary parasitoid, sampling by Malaise trap has shown *H. fuscinervis* to be a locally common species that is active as flying adults during every month of the year. The species has also been collected using yellow pans, but not yet collected at black lights. This gap between sampling methods shows the importance of using diverse sampling methods for assessing biodiversity of Braconidae in an area, and also suggests some things about the possible hosts. Since the common and apparent caterpillars of the low vegetation at Yanayacu have now been well-sampled, the absence of *H. fuscinervis* reared from these hosts suggests that the species may selectively parasitize either very cryptic caterpillars, nocturnal caterpillars, or caterpillars that feed high in the forest canopy. Another interesting aspect is the strong sampling bias towards males over females (43/1) in the Malaise and yellow pan samples (172 total males sampled as compared with only 4 females total in the same samples). The persistence of this pattern over many months of sampling suggests some real phenomenon where males are common near the forest floor (where traps are placed), while females are comparatively rare at the same places. One possible explanation is if preferred host caterpillars are located high in the canopy, females may spend most of their time flying high in the canopy, thereby avoiding traps at ground level. *Homolobus* larvae, when they mature, normally emerge from the host caterpillar to spin their own cocoon. If the emerging *Homolobus* larvae drop to the forest floor to pupate, or if they pupate on old leaves that fall to the forest floor, the emerging virgin adult female wasps might be best located by males at low levels in the forest. This could account for a behaviour where males spend much time flying low in the forest, searching for mates, placing them at a level more easily sampled by Malaise traps. Hopefully, in the future we may be able to test this hypothesis by sampling caterpillars that feed high in the canopy.

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