The Nepalese species of the genus *Enicospilus* Stephens, 1835 (Hymenoptera, Ichneumonidae, Ophioninae): a preliminary revision and identification key to species

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Abstract

A total of 10 species of *Enicospilus* (Hymenoptera, Ichneumonidae, Ophioninae) have previously been reported from Nepal. Six new species are described here (*E. alleni* Shimizu sp. nov., *E. kakanicus* Shimizu sp. nov., *E. nepalensis* Shimizu sp. nov., *E. nikami Shimizu* sp. nov., *E. phulchokiensis* Shimizu sp. nov., and *E. tangi* Shimizu sp. nov.), and 10 are newly recorded (*E. ashbyi* Ashmead, 1904, *E. bifasciatus* (Uchida, 1928), *E. capensis* (Thunberg, 1824), *E. flavocephalus* (Kirby, 1900), *E. formosensis* (Uchida, 1928), *E. grammospilus* (Enderlein, 1921), *E. pudibundae* (Uchida, 1928), *E. purifenestratus* (Enderlein, 1921), *E. yonezawanus* (Uchida, 1928), and *E. zebrus* Gauld & Mitchell, 1981) from Nepal. A preliminary identification key to the Nepalese species of *Enicospilus* is provided. The elevational pattern of Nepalese *Enicospilus* is briefly discussed. *Enicospilus purifenestratus* is also recorded for the first time from Brunei.

Key Words

Biogeography, Darwin wasps, elevation, Nepal, new species, parasitoid wasps, systematics, taxonomy

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Introduction

Ophioninae Shuckard, 1840 (Hymenoptera, Ichneumoni-
da) is a moderately large monophyletic Darwin wasp
subfamily within the higher Ophioniformes, which main-
ly comprises solitary koinobiont endoparasitoids of Lep-
dioptera (Gauld 1985b; Quicke et al. 2009; Bennett et al.
2019; Klopfstein et al. 2019). The Ophioninae comprises
32 genera and over 1,100 species worldwide (e.g. Yu et al.
2016; Shimizu and Lima 2018; Shaw and Voogd 2019).
Many species of Ophioninae are considered to be crepus-
cular or nocturnal and usually have a testaceous body,
very large ocelli (posterior ocellus close to or touching
eye), and long antenna, with a few exceptions (e.g. all
species of Dictyonotus Kriechbaumer, 1894 are diurnal,
with a black body, small ocelli, and short antenna). These
characters are frequently shared with other nocturnal Ich-
neumonoidae (e.g. Netelia Gray, 1860 (Ichneumonidae,
Tryphoninae) and Xiphozelinae van Achterberg, 1979
(Braconidae)) (e.g. Shimizu 2017). Low latitudinal tropics
are considered to be the general centre of species diversity
in most groups of Ophioninae (e.g. Gauld and Mitchell
1981; Gauld 1985b, 1988), but a few genera are more di-
verse in mid-latitudinal temperate regions (e.g. Alopho-
phion Cushman, 1947 and Ophion Fabricius, 1798) (e.g.
Gauld 1985b; Alvarado 2014; Schwarzfeld et al. 2016).
Reliable and robust phylogenetic and biogeographic esti-
mates for ophionines have not been published yet.

Enicospilus Stephens, 1835 is the largest genus of
Ophioninae and predominantly tropical, with more than
700 species worldwide (e.g. Broad and Shaw 2016;
Enicospilus has been considered to be polyphyletic (Gauld
1985b), but there are no phylogenetic studies with
comprehensive taxon sampling.

Nepal is a landlocked country between India and
China’s Tibet Autonomous Region (26°22′N–30°27′N,
80°4′E–88°12′E) in the central part of the Himalaya,
about 800 km in latitudinal length and 140 km in lon-
gitudinal length (RAOnline 2019). Dramatic changes
of altitude (from less than 100 m to more than 8,000 m)
along the short longitudinal span in Nepal have created
a very diverse climatic and topographic environment as
well as a uniquely very rich species diversity of flora
and fauna (Savada 1991; MFSC 2014; RAOnline 2019).
Furthermore, Nepal is located between the Oriental and
Palaearctic regions and is a melting pot of species origin-
ating from both regions (MFSC 2014). Therefore, Nepal
is an interesting and important place to study biodiversity
and biogeography. However, no researchers have stud-
ied Ophioninae of Nepal, although Gauld and Mitchell’s
(1981) great regional revision for Indo-Papuan Ophion-
inae included a few specimens and species from Nepal.
Hence, only 10 species of Enicospilus have been recorded
in Nepal (Gauld and Mitchell 1981), whilst 107 species
have been reported from China and 73 from India (Yu et
al. 2016), indicating a high potential species diversity of
Enicospilus in Nepal.

This study aims to (1) review all previously recorded
species in Nepal, (2) describe new Nepalese species, (3)
newly record species from Nepal, (4) provide a prelimi-
nary identification key to the Nepalese species, and (5)
briefly discuss the biogeography of the Nepalese fauna
and species relationships with elevation.

Material and methods

A total of 707 specimens of Nepalese species of Enicospilus
were examined, 148 of which are from Nepal and 559 from
other countries (e.g. Brunei, China, India, Japan, Laos, and
Taiwan). Specimens were observed using a stereoscopic mi-
roscope (SMZ1500, Nikon, Tôkyô, Japan). Photographs
were taken using a single lens reflex camera (α7II, Sony,
Tôkyô, Japan) with a micro-lens (LAOWA 25 mm F2.8
2.5–5× ULTRA MACRO, Anhui Changgeng Optics Tech-
nology Co., Ltd, Hefei, China and A FE 50mm F2.8 Mac-
ro SEL50M28, Sony, Tôkyô, Japan) and 2× teleconverter
lens (SEL20TC, Sony, Tôkyô, Japan), captured in RAW
format, developed using Adobe Lightroom Creative Cloud,
and stacked using Zerene Stacker. All figures were edited in
Adobe Illustrator 2019 and Photoshop Creative Cloud.

Morphological terms follow those of Broad et al.
(2018). Legs and wings are described separately from the
mesosoma. The lower face is defined as the area between
the ventral margin of the clypeus and of the antennal sock-
ets. Terms for surface sculpture follow Eady (1968) and
the ventral margin of the clypeus and of the antennal sock-
ets. Terms for surface sculpture follow Eady (1968) and
those for characters of the discosomal marginal cell follow
Gauld and Mitchell (1981) (Fig. 1). ‘Sclerites’ refer to the sclerites of the fore wing
fenestra, which are differentiated as the proximal, central
and distal sclerites, all or none of which might be absent
in any one species. The indices follow Shimizu and Lima
(2018) and Shimizu et al. (2019) and are listed below.

Indices for head

GOI (geno-orbital index) = maximum breadth of eye in
profile / maximum breadth of gena in same line

dez.pensoft.net
**Figure 1.** Morphological terms for the fore wing of *Enicospilus* species used in the present study. Brown characters indicate acronyms. **C-1.** Subbasal cell; **C-2.** Discusubmarginal cell; **C-3.** Second discal cell; **C-4.** Marginal cell; **PS.** Proximal sclerite; **CS.** Central sclerite; **DS.** Distal sclerite.

**Indices for fore wing**

**AI** (alar index) = length of 1m-cu&M between 2m-cu and bulla / length of 2rs-m

**CI** (cubital index) = length of CU between 1m-cu&M and 2cu-a / length of 2cu-a

**DI** (discoidal index) = maximum vertical distance between CU (between 2cu-a and 2m-cu) and 1m-cu&M / length of CU between 2cu-a and 2m-cu

**ICI** (intercubital index) = length of 2rs-M / length of M between 2m-cu and 2rs-m

**SDI** (second discoidal index) = length of CU between 2cu-a and 2m-cu / length of CU between M&RS and 1m-cu&M

**SI** (sinuousness index) = maximum length between 1m-cu&M and a straight line connecting the intersection of M, 2m-cu, and 1m-cu&M and the intersection of 1m-cu&M and CU / distance between the intersection of M, 2m-cu, and 1m-cu&M and the intersection of 1m-cu&M and CU

**SRI** (second recurrent index) = length of 2m-cu / length of CU between 2cu-a and 2m-cu

**Indices for hind wing**

**NI** (nervellar index) = length of CU between M and cu-a / length of cu-a

**RI** (radial index) = length of RS between RA and rs-m / length of rs-m

**Indices for metasoma**

**DMI** (dorsal metasomal index) = length of dorsum of tergite 2 / length of dorsum of tergite 3

**PI** (petiolar index) = distance between base of tergite 1 and anterior margin of spiracle / distance between posterior margin of spiracle and apex of tergite 1

**THI** (thyridium index) = distance between anterior margin of tergite 2 and anterior margin of thyridium / maximum diameter of thyridium

Wing characters are especially important for identifying ophionine species, but wings are almost always folded, wrinkled, and/or crooked. For accurate measurements of wing characters, the left wings have been removed from the body, placed between microscope slides in 99.9% ethanol, and photographed. Then, wings have been enclosed in paraffin paper, and the whole thing pinned under the respective specimen. Measurements were taken from photos using the software, ImageMeasure ver. 1.14.

The degree of sexual dimorphism of Ophioninae is almost always very small, and most species can morphologically readily be distinguished without needing to dissect male genitalia (Gauld 1984). Therefore, the male genitalia is not dissected and new species are described based on holotype of both sexes in the present study, like previous ophionine studies (e.g. Gauld 1988; Broad and Shaw 2016; Shimizu 2017).
The non-morphological abbreviations below are used in the present study.

LT light traps
MsT Malaise traps

Abbreviations for repositories used in the present study are as follows.

ANIC Australian National Insect Collection, Canberra, Australia
NHMUK Natural History Museum, London, United Kingdom
CNC Canadian National Collection of Insects, Ottawa, Canada
DEI Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
EMUS Utah State University Insect Collection (= American Entomological Institute: AEI), Department of Biology, Utah State University, Logan, Utah, USA
EUM Ehime University Museum, Matsuyama, Japan
FZLU Fachbereich Zoologie, Martin-Luther-Universität, Halle, Germany
HMNH Hiwa Museum for Natural History, Shōbara, Japan
IZPAN Instytut Zoologiczny Polska Akademia Nauk, Warszawa, Poland
MCZ Museum of Comparative Zoology, Cambridge, USA
MNHA Museum of Nature and Human Activities, Sanda, Japan
MNHN Museum National d’Histoire Naturelle, Paris, France
MUC Marathwada University Collection, Aurangabad, India
NIAES Institute for Agro-Environmental Sciences, NARO (= National Institute for Agro-Environmental Sciences), Tsukuba, Japan
NM Naturhistorisches Museum, Vienna, Australia
NR Naturhistoriska Riksmuseet, Stockholm, Sweden
NSMT National Museum of Nature and Science, Tsukuba, Japan
OUMNH Oxford University Museum of Natural History (= the Hope Entomological Collection), Oxford, United Kingdom
SEHU The Laboratory of Systematic Entomology (= Entomological Institute: EIHU), Hokkaidó University, Sapporo, Japan
TARI Taiwan Agricultural Research Institute Council of Agriculture, Executive Yuan, Taichung, Taiwan
TM Termeszetdönteményi Múzeum, Budapest, Hungary
USNM Smithsonian National Museum of Natural History, Washington, DC, United States of America
ZIUU Zoological Institute, University of Uppsala, Sweden

ZSI Zoological Survey of India, Calcutta, India

Asterisks (*) are used for indicating a species newly recorded from Nepal.

**Results**

Over 31 morphospecies were recognised from 148 Nepalese specimens and Gauld and Mitchell’s (1981) previous records. Six of these species are new to science described below, 10 are newly recorded species from Nepal, 10 have been recorded previously from Nepal, and more than five are tentatively treated as species inquirendae, pending further taxonomic work. *Enicospilus purifenestratus* is also newly recorded from Brunei below.

**Taxonomy**

Class Hexapoda Blainville, 1816
Order Hymenoptera Latreille, 1802
Superfamily Ichneumonoidea Latreille, 1802
Family Ichneumonidae Latreille, 1802
Subfamily Ophioninae Shuckard, 1840

**Genus Enicospilus Stephens, 1835**

*Enicospilus* Stephens 1835: 126; type species, *Ophion merdarius Gravenhorst sensu Stephens (= *Ichneumon rami...* by monotypy (Stephens 1845).

*Henicospilus* Agassiz 1846: 138; unjustified emendation.


*Displis* Kriechbaumer 1894: 309; type species, *Ophion (Displis) natalensis* Kriechbaumer, 1894, by monotypy.

*Pleuroneuraphion* Ashmead 1900: 86; type species, *Pleuroneuraphion hawaiensis* Ashmead, 1900, by original designation.

*Banchogastra* Ashmead 1900: 87; type species, *Banchogastra niger Ashmead, 1900,* by original designation.

*Pycnophion* Ashmead 1900: 87; type species, *Pycnophion molokaiensis Ashmead, 1900,* by original designation.


*Pterospilus* Kriechbaumer 1901b: 156; type species, *Ophion (Enicospilus) dubius* Tosquinet, 1896, by subsequent designation (Viereck 1914: 126); junior homonym of *Pterospilus* Rondani, 1856.

*Trisplis* Kriechbaumer 1901b: 156; type species, *Ophion (Enicospilus) trimaculatus* Tosquinet, 1896, by monotypy.


*Ceratospius* Szépligeti 1905: 28; type species, *Ceratospius biroi Szépligeti, 1905,* by monotypy.

Ophiomorpha Szépligeti 1905: 34; type species, *Ophion curvinervis* Cameron, 1886 (= *Enicospilus cameronii* Dalla Torre, 1901), by subsequent designation (Hooker 1912); junior homonym of *Ophiomorpha* Nilsson, 1836.

Cryptocamptus Brèthes 1909: 230; unnecessary replacement name for *Allocamptus* Förster, 1869.

Amesospilus Enderlein 1914: 222; type species, *Ophion unicallosus* Vollenhoven, 1878, by original designation.


**Distribution.** Worldwide except Antarctica (Yu et al. 2016).

**Diagnosis.** Moderately to very large insects (fore wing length usually 9.0–30.0 mm).

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So Shimizu: The Nepalese species of the genus Enicospilus

Identification key to Enicospilus species of Nepal

This is a preliminary key to the Nepalese species of Enicospilus because there are potentially many more unrecorded or undescribed species in Nepal and its adjacent areas.

1. Fore wing hyaline with two or three strongly infuscate patches in the central part of the discosubmarginal cell (from distal end of M&R to base of 1m-cu&M) and the central part of the marginal cell (from antero-central margin to base of RS) (Figs 5F, 28F). Mesosoma either entirely black with pale yellow marks or pale yellow with black marks, never entirely testaceous or red-brown (Figs 5A, 28A, E)............................................................................................................................................. 2

- Fore wing entirely hyaline to weakly infuscate, without infuscate patches (e.g. Figs 4F, 7F, 10F). Mesosoma entirely testaceous or red-brown, without black marks (e.g. Figs 3A, E, 4A, E)............................................................................................................................................. 3

2 (1) Interocellar area black (Fig. 5D). Fore wing with fenestra moderately long, its anterodistal corner separated from proximal end of the vein RS by more than 1.0x of 2rs-m; |CI| = 0.2, SDI = 1.1–1.2; posterodistal corner of the second discal cell ca 65°; central sclerite drop-shaped, its major axis parallel to 2r&RS; vein 2rs-m bowed (Fig. 5F). Propodeum without posterior transverse carina (Fig. 5E).................................................E. bifasciatus (Uchida, 1928)*

- Interocellar area not infuscate (Fig. 28D). Fore wing with fenestra very long, its anterodistal corner almost reaching proximal end of the vein RS; |CI| = 0.4–0.5, SDI = 1.4–1.5; posterodistal corner of the second discal cell ca 95°; central sclerite almost oval, its major axis parallel to distal margin of the fenestra; vein 2rs-m straight (Fig. 28F). Propodeum with strong posterior transverse carinae laterally (Fig. 28E)...............E. zebrus Gauld & Mitchell, 1981*
3 (1) Fore wing without sclerites and quadra (Fig. 31). Outer mandibular surface always more or less flat without a diagonal structures .............................................................. E. erythrocerus species-group

– Fore wing with more or less sclerotised sclerites and sometimes with quadra (e.g. Figs 3F, 6F, 16F, 19F). Outer mandibular surface various, flat or with a diagonal groove or a line of punctures (e.g. Fig. 2A–D) .................................................. 4

4 (3) Fore wing fenestra without a proximal sclerite and only with a rather thick distal sclerite (Fig. 16F) .............................................................. E. lineolatus (Romon, 1913)

– Fore wing fenestra always with a proximal sclerite, and if fenestra with distal sclerite, it is more or less thin (e.g. Figs 6F, 8F, 9F) .............................................................. 5

5 (4) Fore wing fenestra without a central sclerite and quadra (e.g. Figs 6F, 12F, 13F, 19F) .............................................................. 6

– Fore wing fenestra with a central sclerite (e.g. Figs 3F, 4F, 9F, 11F) ................................................................................. 14

6 (5) Proximal sclerite more or less triangular; always strongly pigmented; its proximal margin more or less joining proximal margin of fenestra (Figs 13F, 24F, 25F, 27F) ........................................................................................................ 7

– Proximal sclerite not triangular, various (i.e. narrow and linear, or semicircular); usually weakly pigmented or not, except for that of E. javanus strongly pigmented; its proximal margin usually distinctly separated from proximal margin of fenestra by more than its own width (Figs 6F, 12F, 19F, 22F, 23F) .................. 10

7 (6) Outer mandibular surface flat without a diagonal setose deep groove .............. E. purifenesstratus (Enderlein, 1921)*

– Outer mandibular surface with a diagonal setose deep groove between its dorsoproximal corner and base of mandibular apical teeth (Fig. 2B, D) .......................................................................................... 8

8 (7) Lower face wider and 0.9× as wide as high (Fig. 25B). Upper mandibular tooth 2.1× as long as lower one (Fig. 2B).

– Mandible very long, proximally tapered and distally side folded (Fig. 2B) .......... E. tangi Shimizu sp. nov.

– Lower face narrower and 0.7–0.8× as wide as high (Figs 13B, 27B). Upper mandibular tooth 1.2–1.5× as long as lower one (Fig. 2B). Mandible moderately long, more or less evenly tapered (Fig. 2D) .................................................................. 9

9 (8) Lateral longitudinal carinae of scutellum reaching anterior 0.6 of scutellum (Fig. 2F).

– Proximal and distal sclerites more or less confluent (Fig. 13F). Metapleuron entirely finely punctate, highly shiny, never with wrinkles or striae (Fig. 13E) ........................................................................... E. yonezawanus (Uchida, 1928)*

– Lateral longitudinal carinae of scutellum posterior to end of scutellum (Fig. 2H). Proximal and distal sclerites separated (Fig. 27F). Metapleuron moderately punctate to striate, moderately shiny, almost always with wrinkles or striae (Fig. 27E) .............................................................................. E. biharensis Townes, Townes & Gupta, 1961

10 (9) Hind tarsal claw uniformly pectinate (Fig. 2I). Fore wing vein 1m-cu&M evenly curved (Fig. 6F) ......................................................................................... E. flavocephalus (Kirby, 1900)*

– Fore wing vein 1m-cu&M moderately sinuous (Fig. 19F). 20 flagellomere 1.5× as long as wide ................................................................................. E. lineolatus sp. nov.

– Fore wing vein 1m-cu&M evenly curved (Fig. 23F). 20 flagellomere 2.0–2.2× as long as wide ................................................................................. E. lineolatus sp. nov.

11 (10) Fore wing with proximal sclerite confluent with distal one and its posterior end touching margin of fenestra; vein 1m-cu&M evenly curved; AI = 1.1–1.9, Cl = 0.2–0.5, SDI = 1.0–1.1 (Fig. 12F) .......... E. javanus (Szépligeti, 1910)

– Fore wing with proximal sclerite isolated and distal sclerite absent or vestigial; vein 1m-cu&M sinuous; AI = 0.7–0.9, Cl = 0.6–0.7, SDI = 1.3–1.4 (Fig. 22F) ................................................................................. E. pseudoconspersae (Sonan, 1927)

12 (11) Hind tarsal claw absent proximally (e.g. Fig. 2J). Fore wing vein 1m-cu&M evenly curved (Fig. 6F) .............. E. biharensis Townes, Townes & Gupta, 1961

– Fore wing vein 1m-cu&M moderately sinuous (Fig. 19F). 20 flagellomere 1.5× as long as wide ................................................................................. E. lineolatus sp. nov.

13 (12) Hind tarsal claw absent proximally (e.g. Fig. 2J). Fore wing vein 1m-cu&M evenly curved to sinuous (Figs 19F, 23F) .......................................................... E. lineolatus sp. nov.

14 (5) Fore wing vein 1m-cu&M strongly angled and broadened centrally (Fig. 9F) .......... E. flavocephalus (Kirby, 1900)*

– Fore wing vein 1m-cu&M evenly curved or sinuous, never strongly angled and broadened (e.g. Figs 3F, 7F, 8F) .................. 15

15 (14) Outer mandibular surface always with a diagonal setose deep groove between its dorsoproximal corner and base of mandibular apical teeth .................................................................. 16

– Outer mandibular surface almost flat, without a diagonal setose groove (e.g. 2A, C) .......................................................... 20

16 (15) Proximal sclerite not confluent with distal one (Figs 7F, 15F) ................................................................................. 17

– Proximal sclerite strongly confluent with distal one (Figs 17F, 20F, 29F) ................................................................................. 18

17 (16) Meso- and metapleureae entirely densely punctate, submatt to matt, punctures of metapleuron contiguous or separated by less than a puncture diameter, thus very weakly or not shiny (Fig. 7A, E) ................................................................................. E. capensis (Thunberg, 1824)*

– Meso- and metapleureae finely to moderately punctate to punctostriate, punctures never contiguous and separated by more than a puncture diameter, moderately to strongly shiny (Fig. 15A, E) .......... E. laqueatus (Enderlein, 1921)

18 (16) Central sclerite rather linear, positioned in rather anterodistal part of the fenestra (Fig. 29F). Proximal corner of proximal sclerite almost right angled (Fig. 29F) ................................................. Enicosipus sp. 1

– Central sclerite more or less oval, positioned in mediodistal part of the fenestra (Figs 17F, 20F). Proximal corner of proximal sclerite acutely angled (Figs 17F, 20F) .................................................................................
Enicospilus alleni Shimizu, sp. nov.

http://zoobank.org/BCA16349-534C-4CB2-9126-FFC9C451362B

Fig. 3

**Etymology.** The specific name is dedicated to the collector of the holotype, Mike Allen, who collected many specimens of Nepalese Hymenoptera that are now in NHMUK.

**Material examined.** 1 ♀: Nepal.

Type series: holotype ♀, Chautasa (6,000 ft), Nepal, 24.IX.1983, M.G. Allen leg. (NHMUK) (Fig. 3).

**Distribution.** Nepal.

**Description. Female** (Holotype) (Fig. 3). Body length ca 29.5 mm.

Head with GOI = 2.9 (Fig. 3C). Lower face 0.7× as wide as high, very finely coriaceous with fine punctures and setae (Fig. 3B). Clypeus 1.9× as wide as high, shiny and very finely coriaceous with fine punctures and setae, almost flat in profile, and its lower margin acute (Fig. 3B, C). Malar space 0.2× as long as basal mandibular width (Fig. 3B, C). Mandible weakly twisted by ca 25°, moderately long, evenly narrowed, its outer surface flat and smooth without a diagonal groove or a diagonal line of punctures (Fig. 3B, C). Upper mandibular tooth 1.4× as long as lower one (Fig. 3B). Frons, vertex and gena moderately shiny with fine setae (Fig. 3B–D). Posterior ocellus large and almost touching eye (Fig. 3B–D). Ventral end of occipital carina joining oral carina. Left antenna complete with 64 flagellomeres, and right antenna apically incomplete with 53 flagellomeres; first flagellomere 1.7× as long as second; 20th flagellomere 1.6× as long as wide.

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**Enicospilus phulchokiensis** Shimizu sp. nov.

E. phulchokiensis Shimizu sp. nov. (Holotype) (Fig. 3). Body length 19 (18) Posterior segments of metasoma infuscate (Fig. 17A). Scutellum smooth to punctate. Fore wing vein 1m-cu&M almost evenly curved (Fig. 17F).................................................. E. melanocarpus Cameron, 1905

- Metasoma entirely testaceous (Fig. 20A). Anterior 0.4 of scutellum transversely striate, anterior 0.4–0.5 punctate, and posterior 0.5 longitudinally strigose (Fig. 2G). Fore wing vein 1m-cu&M more or less sinuoux (Fig. 20F)..........

.......................................................................................................................... E. phulchokiensis Shimizu sp. nov.

20 (15) Proximal sclerite not triangular (Fig. 11F). Central sclerite positioned in almost central part of fenestra; linear and parallel to vein 2r&RS (Fig. 11F).................................................. E. grammospilus (Enderlein, 1921)*

- Proximal sclerite more or less triangular (e.g. Figs 3F, 8F, 14F). Central sclerite positioned in distal part of fenestra; variously shaped (e.g. Figs 4F, 10F, 26F)................................................... 21

21 (20) Outer mandibular surface with conspicuous very dense stout and long setae and its proximal concavity deep (Fig. 2C).................................................................................................................................. E. triparti tus Chiu, 1954

- Outer mandibular surface with scattered slender and short to moderately long setae and its proximal concavity shallow or absent (e.g. Fig. 2A)................................................... 22

22 (21) Central sclerite linear and parallel to distal margin of fenestra (Fig. 10F). Sides of scutellum rather weakly convergent posteriorly and sometimes subquadrate (Fig. 2E). Lower face wider and 0.8–0.9× as wide as high (Fig. 10B)..........

........................................................................................................................................ E. formosensis (Uchida, 1928)*

- Central sclerite oval to linear, if linear it is parallel to vein 2r&RS (e.g. Figs 4F, 8F, 18F, 21F). Sides of scutellum moderately to strongly convergent posteriorly. Lower face usually narrower and 0.6–0.8× as wide as high (e.g. Figs 3B, 8B, 18B).................................................. 23

23 (22) Proximal sclerite separated from distal sclerite (Figs 18F, 21F).......................................................................................................................... 24

- Proximal sclerite confluent with distal sclerite (Figs 3F, 4F, 8F, 14F, 30F).......................................................................................................................... 25

24 (23) Central sclerite weakly sclerotised and pigmented, ill-delineated, positioned in posterodistal part of fenestra (Fig. 18F). Posterior ocellus separated from eye by 0.3× its maximum diameter (Fig. 18B–D). Fore wing vein 1m-cu&M almost evenly curved (Fig. 18F).................................................. E. nepalensis Shimizu sp. nov.

- Central sclerite strongly sclerotised and pigmented, more or less well delineated, positioned in centroidal part of fenestra (Fig. 21F). Posterior ocellus separated from eye by less than 0.2× its maximum diameter (Fig. 21B–D). Fore wing vein 1m-cu&M moderately sinuous (Fig. 21F).................................................. E. pseudantennatus Gauld, 1977

25 (23) Outer margin of propodeal spiracle separated from pleural carina (e.g. Fig. 3E).................................................. 26

- Outer margin of propodeal spiracle joining pleural carina by a strong ridge (Figs 8E, 14E, 30E).................................................. 27

26 (25) Propodeum with distinct posterior transverse carina laterally (Fig. 3E). Proximal corner of proximal sclerite of fore wing fenestra sharply angled at ca 40° (Fig. 3F). Fore wing fenestra with two vestigial central sclerites (Fig. 3F)..........

........................................................................................................................................ E. alleni Shimizu sp. nov.

- Propodeum without posterior transverse carina (Fig. 4E). Proximal corner of proximal sclerite of fore wing fenestra blunt, angled at ca 65° (Fig. 4F). Fore wing fenestra with one vestigial to strong central sclerite (Fig. 4F)..........

........................................................................................................................................ E. ashbyi Ashmead, 1904*

27 (25) Central sclerite oval (Fig. 30F). Wings entirely very sparsely setose (Fig. 30F).................................................. Enicospilus sp. 2

- Central sclerite linear (Figs 8F, 14F). Wings entirely densely setose (Figs 8F, 14F).................................................. 28

28 (27) Central sclerite slender (Fig. 8F). Larger species with fore wing length more than 17.0 mm.................................................. 29

- Central sclerite stouter (Fig. 14F). Smaller species with fore wing length less than 15.0 mm.................................................. E. kashirensis (Uchida, 1928)
Figure 3. *Enicospilus allenii* Shimizu sp. nov., ♀, holotype. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.

*Mesosoma* entirely very weakly shiny or not (Fig. 3E). Pronotum entirely striate. Mesoscutum 1.5× as long as its maximum width, very closely coriaceous with dense setae, very weakly shiny, evenly rounded in profile, and its anterior margin almost truncate in dorsal view and rounded in profile (Fig. 3E). Notauli absent (Fig. 3E). Scutellum moderately convex, very closely coriaceous with setae, with lateral longitudinal carinae reaching posterior end (Fig. 3E). Epicnemium densely punctate with setae. Epicnemial carina weak, almost straight and inclined to anterior, its dorsal end not reaching anterior margin of mesopleuron (Fig. 3E). Mesopleuron entirely closely longitudinally strigose (Fig. 3E). Submetapleural carina very strongly broadened anteriorly and forming a lobe. Metapleuron densely punctate to reticulate with setae, moderately swollen (Fig. 3E). Propodeum very strong-
ly and abruptly declivous in profile; anterior transverse carina complete; pleural carina almost absent; anterior area longitudinally striate; spiracular area almost smooth with setae and strongly shiny; posterior area moderately subcentrally striate with a pair of strong posterior carinae laterally; propodeal spiracle elliptical, its outer margin not joining pleural carina by a ridge (Fig. 3E).

Wings. Fore wing length ca 19.5 mm with AI = 1.0, CI = 0.4, DI = 0.3, ICI = 0.6, SDI = 1.6, SI = 0.1, SRI = 0.2; vein 1m-cu&M almost evenly curved; vein 2r&RS very slightly sinuous and RS evenly curved; fenestra and sclerites of discosubmarginal cell as in Figure 3F; proximal sclerite triangular, confluent with distal sclerite, strongly pigmented; central sclerite entirely weakly sclerotised, very weakly pigmented partially, positioned in anterodistal part of fenestra; distal sclerite present proximally and absent distally; proximal corner of marginal cell uniformly setose; posterodistal corner of second discal cell ca 110°; posterodistal corner of subbasal cell ca 95°; vein 1cu-a antefurcal to M&RS by 0.3× 1cu-a length (Fig. 3F). Hind wing with NI = 2.8, RI = 2.2; vein RS straight; vein RA with 10 uniformly hamuli.

Legs. Outer surface of fore tibia with scattered short spines. Hind leg with coxa in profile 1.8× as long as deep; basitarsus 2.0× as long as second tarsomere; fourth tarsomere 0.6× as long as third tarsomere and 2.9× as long as wide; tarsal claw simply pectinate.

Metasoma with DMI = 1.4, PI = 2.7, THI = 3.5; dorsal margin of tergite 1 slightly sinuous in profile; thyridium elliptical (Fig. 3A).

Colour (Fig. 3). Entirely testaceous except for yellow eye orbit and vertex, apex of mandible black. Wings hyaline; fore wing sclerites and pterostigma testaceous; veins testaceous to brown.

Variation. Unknown, only known from the holotype.

Male. Unknown

Differential diagnosis. The affinities of *E. alleni* sp. nov. are unclear, but it may be related to the *E. flavicaput* group. However, *E. alleni* sp. nov. is a very distinctive species, readily distinguished by many characters, such as the elongate lower face (Fig. 3B), sculpture of the mesosoma (Fig. 3E), shape of propodeum (Fig. 3E), and two vestigial central sclerites of the fore wing fenestra (Fig. 3F).

*Enicospilus ashbyi* Ashmead, 1904*

Fig. 4

*Enicospilus ashbyi* Ashmead 1904: 17; holotype ♂, Philippines, USNM.


*Enicospilus concavus* Chiu 1954: 45; holotype ♂, Taiwan, TARI, examined; synonymised by Gauld and Mitchell (1981: 446).

Material examined. 11♀4♂; Nepal (1♂), India (11♀1♂), Taiwan (2♂). Type series: lectotype of *Henicospilus tainanensis* Uchida, 1928, ♂, Tainan, Taiwan, S. Takano leg. (SEHU); holotype of *Enicospilus concavus* Chiu, 1954, ♂, Taichou, Taiwan, 24.1.1932, J. Sonan leg. (TARI).

Non-type series: 1♀, Kathmandu (1,350 m), Nepal, VII.1983, M.G. Allen leg. (LT) (NHMUK) (Fig. 4); 9♀1♂, Patancheru, Andhra Pradesh, India, VII (7♀1♂) and VIII (2♀♂), 1980, Bhattacharaj leg. (LT) (NHMUK); 1♀, Jeypore, Orissa, India, IX.1958, P.S. Nathan leg. (EMUS); 1♀, Nilgiri Hills, India, V. 1953, P.S. Nathan leg. (CNC).


Diagnosis. Head (Fig. 4B–D): GOI = 2.1–2.4; lower face 0.7–0.8× as wide as high; clypeus flat to slightly convex in profile, its lower margin subacute; mandible rather weakly twisted by 25–30°, moderately long, evenly tapered, its outer surface without a diagonal structure; upper mandibular tooth 1.2–1.5× as long as lower one; posterior ocellus almost touching eye; antenna with 45–56 flagellomeres and 20th flagellomere 1.6–1.9× as long as wide.

Wings (Fig. 4F): fore wing with AI = 0.7–1.2, CI = 0.2–0.3, ICI = 0.5–0.7, SDI = 1.2–1.3; fore wing vein 1m-cu&M evenly curved, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 4F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite triangular, confluent with distal one, strongly pigmented; central sclerite usually partially strongly pigmented and sclerotised, strongly pigmented part linear and parallel to vein 2r&RS, positioned in anterodistal part of fenestra; distal sclerite present proximally and vestigial distally; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a antefurcal to subinterstitial to M&RS by less than 0.1× 1cu-a length.

Colour (Fig. 4): body including interocellar area entirely testaceous; wings hyaline.

Differential diagnosis. *Enicospilus ashbyi* is similar to *E. pallidus* (Taschenberg, 1875) and separated from it by a few characters of the central sclerite (pigmented part of central sclerite narrower in *E. ashbyi* and wider in *E. pallidus*). However, the sclerite characters (e.g. the shape and degree of sclerotisation of the central sclerite) exhibit a wide range of variation within both species, suggesting that there are cryptic species and that integrative taxonomy is needed to define species limits in this complex.

*Enicospilus bifasciatus* (Uchida, 1928)*

Fig. 5

*Henicospilus bifasciatus* Uchida 1928: 222; holotype ♂, Taiwan, SEHU, examined.
Material examined. 7♀3♂: Nepal (2♀♀), Taiwan (♀♂3♂♂).

Type series: holotype of Henicospius bifasciatus Uchida, 1928, ♀, Baibara, Taiwan, Uchida leg. (SEHU).

Non-type series: 2♀♀, Godaveri (1,550–1,700 m), Nepal, 1.VI.1984, M.G. Allen leg. (LT) (NHMUK) (Fig. 5); 1♂, Bukai, Taiwan, 13.VI.1934, L. Gressitt leg. (NHMUK); 1♂, Horisha, Taiwan, V. 1927, Sonan leg. (TARI); 1♀, Musha, Taiwan, IV.1938, Sonan leg. (TARI); 1♂, Shinten, Taiwan, IV.1921, Sonan leg. (TARI); 2♀♀, Taihoku, Taiwan, I. 1924, Sonan leg. (TARI); 1♀, Taipei, Taiwan, V.1950, Chiu leg. (TARI).


Diagnosis. Head (Fig. 5B–D): GOI = 3.1–3.4; lower face 0.6–0.7× as wide as high; clypeus moderately convex in profile, its lower margin acute; mandible rather strongly twisted by 55–65°, moderately long,
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**Figure 5.** *Enicospilus bifasciatus* (Uchida, 1928), ♀. **A.** Habitus; **B.** Head, frontal view; **C.** Head, lateral view; **D.** Head, dorsal view; **E.** Mesosoma, lateral view; **F.** Central part of fore wing.

Evenly tapered, its outer surface without a diagonal structure; upper mandibular tooth 1.2–1.3× as long as lower one; posterior ocellus close to eye; antenna with 54–56 flagellomeres and 20th flagellomere 3.1–3.3× as long as wide.

**Mesosoma** (Fig. 5E): mesopleuron rather coarsely longitudinally punctostriate to striate; scutellum with lateral longitudinal carinae reaching posterior end and convergent posteriorly; metapleuron rather coarsely striate; propodeum evenly weakly rounded, its posterior area

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moderately reticulate, outer margin of propodeal spiracle joining pleural carina by a ridge.

Wings (Fig. 5F): fore wing with AI = 0.7–1.0, CI = 0.4–0.5, ICI = 0.2, SDI = 1.1–1.2; fore wing vein 1m-cu&M evenly curved, 2r&RS almost straight, centrally broadened; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 5F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite triangular, confluent with distal one, strongly pigmented; central sclerite rather weakly pigmented and sclerotised, drop-shaped and its major axis parallel to vein 2r&RS, positioned in mediodistal part of fenestra; distal sclerite present proximally and vestigial distally; proximal corner of marginal cell of fore wing very sparsely setose, almost glabrous; vein 1cu-a-subterstitial to antefurcal to M&RS by less than 0.2× 1cu-a length.

Colour (Fig. 5): body entirely pale yellow with black marks on mesosoma, interocellar area, and posterior segments of metasoma; wings hyaline with two strongly infumate patches in the central part of the discosubmarginal cell (from anterior end of M&RS to base of 1m-cu&M) and the central part of the marginal cell (from anterocentral margin to base of RS).

Differential diagnosis. *Enicospilus bifasciatus* is a very distinctive species and no closely related species are currently known. Hence, it is easily distinguished from all *Enicospilus* by many characters listed in the above diagnosis as well as identification key, such as two pairs of vein 2r&RS almost straight; mesosoma declivous, its posterior area moderately reticulate; metapleuron densely punctate; propodeum declivous, its posterior area moderately reticulate, outer margin of propodeal spiracle not joining pleural carina by a ridge.

Wings (Fig. 6F): fore wing with AI = 0.6–0.7, CI = 0.3–0.5, ICI = 0.7–0.8, SDI = 1.2–1.4; fore wing vein 1m-cu&M evenly curved, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 6F; fenestra of fore wing not long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite linear, separated from or vestigially confluent with distal one, weakly pigmented; central sclerite absent; distal sclerite present proximally, vestigial to moderately strong distally; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a antefurcal to M&RS by 0.2–0.3× 1cu-a length.

Colour (Fig. 6): body including interocellar area entirely testaceous; wings hyaline to slightly infuscate.

Differential diagnosis. *Enicospilus bifasciatus* is similar to *E. marryamum*, *E. nikami* sp. nov., *E. pudibundae*, and *E. transversus*, but can be distinguished from *E. marryamum*, *E. nikami* sp. nov., and *E. transversus* by the proximally complete pectination of the hind tarsal claw (Fig. 2I) (proximally incomplete in *E. nikami* sp. nov. and *E. pudibundae*).

*Enicospilus capensis* (Thunberg, 1824)*

Fig. 7

*Ichneumon capensis* Thunberg 1824: 262; holotype ♀, South Africa, ZIUU.

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*Enicospilus biharensis* Townes, Townes & Gupta, 1961

Figs 2I, 6

*Henicospilus horsfieldi* var *glabratus* Morley 1913: 395; holotype ♀, India, NHMUK, examined; junior secondary homonym of *Enicospilus glabratus* (Say, 1835).


Material examined. 11♀♀1♂: Nepal (10♀♀1♂), India (1♀).

Type series: holotype of *Henicospilus horsfieldi* var *glabratus* Morley, 1913 (= *Enicospilus biharensis* Townes, Townes & Gupta, 1961), ♀, Bihar, Chapra, India (NHMUK, Type 3b.1266).

Non-type series: 1♀, Dotoulouse (900 m), Nepal, VII.1983, M.G. Allen leg. (Figs 2I, 6); 2♀♀, Kathmandu (4,300′), Nepal, VIII.1981, M.G. Allen leg.; 1♀, Kathmandu (1,300 m), Nepal, X.1982, M.G. Allen leg. (LT); 1♀, Kathmandu (1,350 m), Nepal, VII.1983, M.G. Allen leg. (LT); 1♀, Kathmandu (1,400 m), Nepal, IX.1983, M.G. Allen leg. (LT); 1♀, Kathmandu (1,500 m), Nepal, III.1983, M.G. Allen leg. (LT); 2♀♀, Dolalghat (900 m), Nepal, VII.1983, M.G. Allen leg.; 1♀, Chautara (6,000′), Nepal, 24.ix.1983, M.G. Allen leg. (all NHMUK).


Diagnosis. Head (Fig. 6B–D): GOI = 2.5–3.2; lower face 0.6–0.8× as wide as high; clypeus almost flat in profile, its lower margin acute; mandible moderately twisted by 30–40°, moderately long, evenly strongly tapered, its outer surface without a diagonal structure; upper mandibular tooth 1.2–1.3× as long as lower one; posterior ocellus almost touching eye; antenna with 53–64 flagellomeres and 20th flagellomere 1.7–2.1× as long as wide.

Mesosoma (Fig. 6E): mesopleuron densely punctate to closely longitudinally punctostriate; scutellum with lateral longitudinal carinae reaching posterior end and convergent posteriorly; metapleuron densely punctate; propodeum declivous, its posterior area moderately reticulate, outer margin of propodeal spiracle not joining pleural carina by a ridge.

Wings (Fig. 6F): fore wing with AI = 0.6–0.7, CI = 0.3–0.5, ICI = 0.7–0.8, SDI = 1.2–1.4; fore wing vein 1m-cu&M evenly curved, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 6F; fenestra of fore wing not long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite linear, separated from or vestigially confluent with distal one, weakly pigmented; central sclerite absent; distal sclerite present proximally, vestigial to moderately strong distally; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a antefurcal to M&RS by 0.2–0.3× 1cu-a length.

Colour (Fig. 6): body including interocellar area entirely testaceous; wings hyaline to slightly infuscate.

Differential diagnosis. *Enicospilus biharensis* is similar to *E. marryamum*, *E. nikami* sp. nov., *E. pudibundae*, and *E. transversus*, but can be distinguished from *E. marryamum*, *E. nikami* sp. nov., and *E. transversus* by the evenly curved fore wing vein 1m-cu&M (Fig. 6F) (more or less sinuous in *E. marryamum*, *E. nikami* sp. nov., and *E. transversus*, e.g. as in Figure 19F), and from *E. nikami* sp. nov. and *E. pudibundae* by the proximally complete pectination of the hind tarsal claw (Fig. 2I) (proximally incomplete in *E. nikami* sp. nov. and *E. pudibundae*).
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**Figure 6.** *Enicospilus biharensis* Townes, Townes & Gupta, 1961, ♀. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.


*Ophion antankarus* Saussure 1892: 15; type ♂, Madagascar, MNHN; synonymised by Townes and Townes (1973: 174).


*Henicospilus praedator* Enderlein 1921: 28; holotype ♀, Madagascar, IZPAN; synonymised by Townes and Townes (1973: 175).

*Henicospilus incarinatus* Enderlein 1921: 30; holotype ♂, Madagascar, IZPAN; synonymised by Townes and Townes (1973: 175).


*Enicospilus obniciosus* Seyrig 1935: 75; lectotype ♂, Kenya, MNHN, designated by Townes and Townes (1973: 18); synonymised by Gauld and Mitchell (1978: 143).


Material examined. 66♀ 43♂ and 3 unsexed: Nepal (1♀), India (57♀ 41♂), Japan (1♂), Kenya (2♀ 1♂ and 1 unsexed), Madagascar (1♀ and 1 unsexed), Malaysia (1♀), Saudi Arabia (1 unsexed), South Africa (1♀), Uganda (2♀), Zimbabwe (1♀).

Type series: holotype of Henicospi
idula indica So
nen, 1940,♀, Kitadaïto-jima, Okinawa Pref., Ryûkyûs, Japan, 18.III.1939, M. Yanagihara leg. (TARI); holotype of Henicospi
dula fossatus Chiu, 1954,♀, Jahore, Malaysia, 1.X.1916, J. Sonan leg. (TARI); holotype of Henicospi

Non-type series: 1♀, Chitwan (200 m), Terai, Nepal, 12–13.III.1983. M.G. Allen leg. (Fig. 7); 1♀ 5♂, Comi


Diagnosis. Head (Fig. 7B–D): GOI = 1.5–2.0; lower face 0.8–1.0× as wide as high; clypeus rather strongly convex in profile, its lower margin impressed; mandible weakly twisted by 10–20°, long, proximally tapered and distally parallel sided, its outer surface with a diagonal setose groove between its dorso
coprolophal and ventral surfaces; upper mandibular tooth 2.5–3.0× as long as lower one; posterior ocellus separated from eye by 0.1–0.2× its own maximum diameter; antenna with 44–66 flagellomeres and 20th flagellomere 1.6–2.0× as long as wide.

Mesosoma (Fig. 7E): mesopleuron densely punctate, submatt to matt; scutellum with lateral longitudinal car

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Wings (Fig. 7F): fore wing with AI = 0.4–0.8, CI = 0.3–0.6, ICI = 0.4–0.6, SDI = 1.3–1.5; fore wing vein 1m-cu&M slightly sinuous, 2r&RS almost straight; fen

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Colour (Fig. 7): body including interocellar area entirely yellow- to red-brown; wings hyaline.

Differential diagnosis. Enicospus capensis is most similar to E. insularis and distinguished from it by the not clearly delineated central sclerite (Fig. 7F) (well delineated in E. insularis), but diagnostic characters for these species are not strongly supported and need more study. Enicospus capensis also more or less resembles E. ra
diludus, but distinguished from it by the densely punctate and submatt to matt meso- and metapleurce (Fig. 7E) (meso- and metapleurce moderately punctate and never submatt to matt in E. ramidulus).

Enicospus flavicaput (Morley, 1912) Fig. 8

Enicospus xanthocephalus Cameron 1907: 178; holotype ♀, Myanmar, NHMUK, examined; junior primary homonym of Enicospus xanthocephalus Cameron, 1905.

Enicospus flavicaput Morley 1912: 45; replacement name for Enico

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Material examined. 5♀ and 1 unsexed: Brunei (3♀), Indonesia (1♀), Myanmar (1♀), Sri Lanka (1 unsexed); no Nepalese specimens were examined.

Type series: holotype of Enicospus xanthocephalus Cameron, 1907 (= Enicospus flavicaput Morley, 1912),♀, Haundraw Valley, Tenasserim, Myanmar, VIII.1894, C.T. Bingham leg. (NHMUK, Type 3b.1233).

Non-type series: 1♀, U. Temburong (1,500 m), Bukit Retak, Brunei, IV.1981, I.D. Gaull leg. (Fig. 8); 1♀, Montane forest (1,618 m), Bukit Retak, Brunei, V.1979, I.D. Gaull leg.; 1♀, Pagon Ridge, Pagon, Brunei, II.1982, G. Allen leg.; 1♀, Periawatte (1,200–1,500 m), Mt Gede, West Java, Indonesia, I.1938; 1 unsexed, near Mahiyangana, Badulla Dist., Sri Lanka, 24.V.1974, Gans & Prasanna leg. (all NHMUK).


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**Figure 7.** *Enicospilus capensis* (Thunberg, 1822), ♀.  
A. Habitus;  
B. Head, frontal view;  
C. Head, lateral view;  
D. Head, dorsal view;  
E. Mesosoma, lateral view;  
F. Central part of fore wing.

**Diagnosis.** *Head* (Fig. 8B–D): GOI = 2.9–3.1; lower face 0.6–0.7× as wide as high; clypeus weakly convex in profile, its lower margin subacute; mandible moderately twisted by 30–40°, moderately long, evenly tapered, its outer surface without a diagonal structure; upper mandibular tooth 1.3–1.6× as long as lower one; posterior ocellus...
Figure 8. *Enicospilus flavicaput* (Morley, 1912), ♀. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.

close to eye; antenna with 71–76 flagellomeres and 20th flagellomere 2.3–2.5× as long as wide.

Mesosoma (Fig. 8E): mesopleuron rather coarsely longitudinally striate; scutellum with lateral longitudinal carinae reaching anterior 0.8–1.0 and convergent posteriorly; metapleuron rather coarsely striate to strigose; propodeum evenly rounded to slightly declivous, its posterior area coarsely reticulate, outer margin of propodeal spiracle joining pleural carina by a strong ridge.

Wings (Fig. 8F): fore wing with AI = 0.3–0.4, CI = 0.2–0.4, ICI = 0.6–0.7, SDI = 1.2–1.4; fore wing vein 1m-cu&M weakly sinuous, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 8F; fenestra of fore wing not long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite triangular, confluent with distal one, strongly pigmented; central sclerite strongly pigmented and sclerotised, linear and parallel to vein 2r&RS, positioned in anterodistal part of fenestra; distal sclerite
present proximally and vestigial to absent distally; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a antefurcal to M&RS by 0.1–0.2× 1cu-a length.

**Colour** (Fig. 8): body including interocellar area entirely testaceous; wings hyaline to weakly infuscate.

**Differential diagnosis.** *Enicospilus flavicaput* is most similar to *E. kanshirensis* but can be distinguished from it by the slender central sclerite (Fig. 8F) (central sclerite stouter in *E. kanshirensis*, as in Figure 14F), and larger body size (i.e. fore wing length more than 17.0 mm in *E. flavicaput* but less than 15.0 mm in *E. kanshirensis*).

***Enicospilus flavocephalus* (Kirby, 1900)*

**Material examined.** 13♀♀ 1♂ and 1 unsexed: Nepal (2♀♀1♂), Australia (5♀♀5♂ and 1 unsexed), Brunei (2♀♀1♂), Japan (1♂), Singapore (1♂), Taiwan (3♀♀6♂♂).

Type series: lectotype of *Ophion flavocephalus* Kirby, 1900, ♀, Flying Fish Cove, Christmas Island, Australia, C.W. Andrews leg. (NHMUK, Type 3b.1273); holotype of *Henicospilus albicaput* Morley, 1912, ♂, Mackay, Queensland, Australia (NHMUK, Type 3b.1254); holotype of *Henicospilus similis* Matsumura and Uchida, 1926; holotype, Ryûkyû Island, SEHU, examined; synonymised by Uchida (1928: 221).

**Diagnosis.** *Henicospilus similis* is very distinctive species, but its body size, colour pattern, and profile are very similar to *E. xanthocephalus*. *Enicospilus flavocephalus* is easily distinguished from *E. xanthocephalus* by many characters, such as the pale yellow interocellar area (Fig. 9B, D) (black in *E. xanthocephalus*) and centrally abruptly angled and broadened fore wing vein 1m-cu&M of *E. flavocephalus* (Fig. 9F) (evenly curved in *E. xanthocephalus*).

***Enicospilus formosensis* (Uchida, 1928)*

**Material examined.** 2♀♀ 2♂♂ and 1 unsexed: Nepal (1♂), Brunei (1♂), India (1 unsexed), Japan (1♀), Taiwan (1♀).

Type series: holotype of *Henicospilus formosensis* Uchida, 1928, ♀, Baibara, Taiwan, 15.VI.1926, Y. Saito & Kikuchi leg. (SEHU); holotype of *Enicospilus saepis* Chiu, 1954, ♀, Nara, Honshû, Japan, 17.VIII.1918, J. So Shimizu: The Nepalese species of the genus *Enicospilus*
Figure 9. *Enicospilus flavocephalus* (Kirby, 1900), ♀. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.
Allen leg.; 1 unsexed, NW Himalaya, Dalhousie, India, 8.VII.1965, Tikar leg. (all NHMUK).

**Distribution.** Eastern Palaearctic and Oriental regions (Yu et al. 2016). Newly recorded from Nepal.

**Diagnosis.** *Head* (Fig. 10B–D): GOI = 2.2–2.4; lower face 0.8–0.9× as wide as high; clypeus moderately convex in profile, its lower margin subacute to blunt; mandible weakly twisted by 10–20°, moderately long, evenly tapered, its outer surface without a diagonal structure; upper mandibular tooth 1.2–1.4× as long as lower one; posterior ocellus close to eye; antenna with 66–69 flagellomeres and 20th flagellomere 2.1–2.2× as long as wide.

*Mesosoma* (Fig. 10E): mesopleuron moderately punctate; scutellum with lateral longitudinal carinae reaching anterior 0.8 or more and weakly convergent posteriorly so that subquadrate (Fig. 2E); metapleuron punctate with isolated striae; propodeum declivous in profile, its posterior area coarsely irregularly wrinkled, sometimes with posterior transverse carina laterally,

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**Figure 10.** *Enicospilus formosensis* (Uchida, 1928), ♂. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.
outer margin of propodeal spiracle joining pleural carina by a ridge or not.

Wings (Fig. 10F): fore wing with $AI = 0.2–0.6$, $CI = 0.2–0.9$, $ICI = 0.5–0.6$, $SDI = 1.1–1.3$; fore wing vein 1m-cu&M weakly sinuous, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 10F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite triangular, confluent with distal one, strongly pigmented; central sclerite moderately to strongly pigmented and sclerotised, linear and parallel to distal margin of fenestra, positioned in distal part of fenestra; distal sclerite present proximally and vestigial to absent distally; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a a subinterstitial to antefurcal to M&RS by less than $0.2 \times 1cu-a$ length.

Colour (Fig. 10): body including interocellar area testaceous; wings weakly infumate. /n

**Differential diagnosis.** *Enicospilus formosensis* is a distinctive species and can easily be distinguished by many characters, such as the wide face (Fig. 10B), shape of the central sclerite (Fig. 10F), more or less subquadrate scutellum (Fig. 2E), as listed in the diagnosis.

**Enicospilus grammospilus** (Enderlein, 1921)*

*Fig. 11*

*Dicamptus grammospilus* Enderlein 1921: 17; holotype ♂, Sumatra, IZPAN, photos examined.

**Material examined.** 1♀3♂: Nepal (1♀), Indonesia (1♂), Brunei (13♀2♂). Type series: holotype of *Dicamptus grammospilus* Enderlein, 1921, ♂, Soekaranda, Sumatra, Indonesia, (500 m). Non-type series: 1♀, Pokhara (950 m), Nepal, VII–VIII.1983, M.G. Allen leg. (LT) (Fig. 11); 2♀1♂1♂, Montane Forest (1,618 m), Bukit Retak, Brunei, IX.1979, I.D. Gauld leg.; 8♀2♂1♂, Bukit Retak (1,500 m), U. Temburong, Brunei, IV.1981, I.D. Gauld leg.; 1♀, Pagon Ridge, Pagon, Brunei, II.1982, M.G. Allen leg. (all NHMUK).**

**Distribution.** Oriental region (Yu et al. 2016). Newly recorded from Nepal.

**Diagnosis.** Head (Fig. 11B–D): GOI = 2.5–2.7; lower face 0.7–0.8× as wide as high; clypeus almost flat in profile, its lower margin acute; mandible moderately twisted to antefurcal to M&RS by less than $0.2 \times 1cu-a$ length. Mesosoma (Fig. 11E): mesopleuron punctate dorsally and rather closely longitudinally punctostriate to striate ventrally; scutellum with lateral longitudinal carinae reaching anterior 0.8 or more and convergent posteriorly; metapleuron rather closely striate; propodeum declivous in profile, its posterior area concentrically striate, outer margin of propodeal spiracle not joining pleural carina by a ridge.

Wings (Fig. 11F): fore wing with $AI = 0.8–1.4$, $CI = 0.5–0.6$, $ICI = 0.4–0.5$, $SDI = 1.4–1.5$; fore wing vein 1m-cu&M almost evenly curved, 2r&RS weakly bowed centrally; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 11F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite not triangular, confluent with distal one, weakly to strongly pigmented; central sclerite weakly to strongly pigmented and sclerotised, linear and parallel to vein 2r&RS, positioned in central part of fenestra; distal sclerite weak; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a a subinterstitial to antefurcal to M&RS by less than $0.1 \times 1cu-a$ length.

Colour (Fig. 11): body including interocellar area entirely testaceous; wings hyaline. **Differential diagnosis.** *Enicospilus grammospilus* is a very distinctive species on account of its characteristic shape of fore wing vein 2r&RS and sclerites as in Figure 11F. No similar species are recognised and is very easily distinguished from all other *Enicospilus* species by the characters summarised in the above diagnosis, such as concentrically striate posterior area of propodeum and characteristic shape of sclerites of discosubmarginal cell of fore wing (cf. Fig. 11F).

**Enicospilus javanus** (Szépligeti, 1910)*

*Fig. 12*


**Material examined.** 4♀4♂: Nepal (5♀2♂), Brunei (30♀2♂), India (2♀), Papua New Guinea (4♀), Singapore (1♀), Sri Lanka (2♀). Non-type series: 2♀1♂1♂, Kakani (2,000 m), Nepal, VIII.1982, M.G. Allen leg. (LT); 3♀, Kathmandu (1,350 m), Nepal, VII.1983, M.G. Allen leg. (LT) (Fig. 12); 1♂, Pokhara, Nepal, VIII.1982, M.G. Allen leg. (LT); 2♀1♂, Gn. Pagon (1,700 m), U. Temburong, Brunei, IV.1981, I.D. Gauld leg.; 2♀, Pagon Ridge, Pagon, Brunei, II.1982, I.D. Gauld leg.; 2♀, Montane forest (1,618 m), Bukit Retak, Brunei, I.X.1979, I.D. Gauld leg.; 2♀, Pagon Ridge, Brunei, II.1982, I.D. Gauld leg.; 2♀, 1st forest (500 m), U. Temburong, Brunei, IV.1981, I.D. Gauld leg.; 1♀, Thekkadi, Periyar Dam, Travancore, India, 6–10.V.1937; 1♀, Andhra Pradesh, Patancheru, India, XII.1980, Bhatnagar leg. (LT); 1♀, Wau (1,200 m),
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Figure 11. *Enicospilus grammospilus* (Enderlein, 1921), ♂. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.


Figure 12. *Enicospilus javanus* (Szépligeti, 1910), ♀. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.
**Diagnosis.** *Head* (Fig. 12B–D): GOI = 2.7–3.2; lower face 0.7–0.8× as wide as high; clypeus moderately convex in profile, its lower margin blunt; mandible moderately twisted by 15–30°, moderately long, evenly tapered, its outer surface without a diagonal structure; upper mandibular tooth 1.2–1.5× as long as lower one; posterior ocellus almost touching eye; antenna with 55–62 flagellomeres and 20th flagellomere 2.0–2.5× as long as wide.

*Mesosoma* entirely moderately to strongly shiny with setae (Fig. 13B–D). Posterior ocellus close to eye (Fig. 13B–D). Ventral end of occipital carina joining oral carina. Antenna with 73 flagellomeres; first flagellomere 1.7× as long as second; 20th flagellomere 2.8× as long as wide.

**Types.** 
Holotype ♂, Kakani (2,000 m), Nepal, VIII.1982, M.G. Allen leg. (LT) (NHMUK) (Figs 2F, 13).

**Distribution.** Nepal.

**Material examined.** 1♂: Nepal.

**Description. Male** (Holotype) (Fig. 13). Body length ca 24.0 mm.

*Head* with GOI = 2.8 (Fig. 13C). Lower face 0.7× as wide as high, moderately punctate with setae, strongly shiny (Fig. 13B). Clypeus 1.5× as wide as high, moderately punctate with setae, moderately convex in profile, and its lower margin impressed (Fig. 13B, C). Malar space 0.4× as long as basal mandibular width (Fig. 13B, C). Mandible moderately twisted by ca 30°, moderately long, more or less evenly tapered, its outer surface with a diagonal setose groove between its dorsoproximal corner to base of mandibular apical teeth (Fig. 13B, C). Upper mandibular tooth 2.0× as long as lower one (Fig. 13B).

*Wings* (Fig. 12F): fore wing with AI = 1.1–1.8, CI = 0.2–0.5, ICI = 0.4–0.6, SDI = 1.0–1.1; fore wing vein 1m-cu&M evenly curved, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 12F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite not triangular, confluent with distal one, at least anteriorly very strongly pigmented; central sclerite absent; distal sclerite more or less strong and rather thick; proximal corner of marginal cell of fore wing more or less uniformly setose; vein 1cu-a subinterstitial to antefurcal to M&RS by less than 0.1× 1cu-a length.

*Colour* (Fig. 12): body including interocellar area entirely testaceous; wings hyaline to slightly infumate.

**Differential diagnosis.** *Enicospilus javanus* is distinctive and one of the most easily distinguishable species on account of the proximally extended fore wing fenestra and the shape of the sclerites (cf. Fig. 12F).

*Enicospilus kakanicus* Shimizu, sp. nov.

http://zoobank.org/CF0F0E094-738D-4491-8EBA-3C673E97C238

Figs 2F, 13

**Etymology.** The specific name is derived from the type locality, Kakani, Nepal.

**Material examined.** 1♂: Nepal.

Type series: holotype ♂, Kakani (2,000 m), Nepal, VIII.1982, M.G. Allen leg. (LT) (NHMUK) (Figs 2F, 13).

**Distribution.** Nepal.

**Description. Male** (Holotype) (Fig. 13). Body length ca 24.0 mm.

*Head* with GOI = 2.8 (Fig. 13C). Lower face 0.7× as wide as high, moderately punctate with setae, strongly shiny (Fig. 13B). Clypeus 1.5× as wide as high, moderately punctate with setae, moderately convex in profile, and its lower margin impressed (Fig. 13B, C). Malar space 0.4× as long as basal mandibular width (Fig. 13B, C). Mandible moderately twisted by ca 30°, moderately long, more or less evenly tapered, its outer surface with a diagonal setose groove between its dorsoproximal corner to base of mandibular apical teeth (Fig. 13B, C). Upper mandibular tooth 2.0× as long as lower one (Fig. 13B). Frons and gena strongly shiny with fine setae (Fig. 13B–D). Posterior ocellus close to eye (Fig. 13B–D). Ventral end of occipital carina joining oral carina. Antenna with 73 flagellomeres; first flagellomere 1.7× as long as second; 20th flagellomere 2.8× as long as wide.

**Metasoma** entirely moderately to strongly shiny with setae (Fig. 13E). Pronotum punctate with wrinkled centrally. Mesoscutum 1.4× as long as its maximum width, finely punctate with setae, and evenly rounded in lateral profile (Fig. 13E). Notauli absent (Fig. 13E). Scutellum moderately convex, finely punctate with setae, with lateral longitudinal carinae reaching anterior 0.6 (Fig. 2F). Epinotium densely punctate. Epicnemial carina strongly present, evenly and moderately curved to anterior, its dorsal end reaching anterior margin of mesopleuron (Fig. 13E). Mesopleuron entirely punctate with longitudinal wrinkles or striae (Fig. 13E). Submetapleurial carina almost parallel sided (Fig. 13E). Metapleuron entirely finely punctate with setae (Fig. 13E). Propodeum weakly evenly rounded in profile; anterior transverse carina complete; anterior area longitudinally striate; spiracular area finely punctate with setae; posterior area moderately longitudinally striate centrally and irregularly wrinkled to reticulate laterally; propodeal spiracle elliptical, its outer margin not joining pleural carina by a ridge (Fig. 13E).

*Wings* (Fig. 13). Fore wing length ca 17.0 mm with AI = 0.4, CI = 0.4, DI = 0.3, ICI = 0.5, SDI = 1.4, SI = 0.1, SRI = 0.3; vein 1m-cu&M almost evenly curved; vein 2r&RS straight and RS evenly curved; fenestra and sclerites of discosubmarginal cell as in Figure 13F; proximal sclerite triangular, confluent with distal sclerite, strongly pigmented; central sclerite absent; distal sclerite more or less entirely present from base to apex, weakly to moderately pigmented; proximal corner of marginal cell evenly setose; posterodistal corner of second discal cell ca 95°; posterodistal corner of subbasal cell ca 95°; vein 1cu-a antefurcal to M&RS by 0.2× 1cu-a length (Fig. 13F). Hind wing with NI = 1.8, RI = 1.8; vein RS straight; vein RA with six uniform hamuli.

**Legs.** Outer surface of fore tibia with scattered spines. Hind leg with coxa in profile 1.9× as long as deep; basitarsus 2.0× as long as second tarsomere; fourth tarsomere 0.6× as long as third tarsomere and 4.2× as long as wide; tarsal claw simply pectinate.

*Metasoma with PI = 3.8, DMI = 1.2, THI = 3.6; dorsal margin of tergite 1 not sinuous; thyroidum elongate (Fig. 13A).*

*Colour* (Fig. 13). Entirely testaceous except for apex of mandible black. Wings hyaline; sclerites of gena and veins testaceous.

*Variation. Unknown.*

**Female.** Unknown.

**Differential diagnosis.** *Enicospilus kakanicus* sp. nov. is similar to and can be confused with *E. longitarssis* Tang, 1990, *E. tangi* sp. nov., and *E. yonezawanus* (Uchida, 1928). These species all belong to the *E. raimidius* complex and share the following characters: outer surface of mandible with a diagonal setose deep groove.
between its dorsoproximal corner and base of mandibular apical teeth (e.g. Fig. 2B, D), fore wing fenestra without central sclerite (e.g. Figs 13F, 25F, 27F), and proximal sclerite triangular (e.g. Figs 13F, 25F, 27F). *Enicospilus kakanicus* sp. nov. is distinguished from the above species by the rather short lateral longitudinal carinae of the scutellum, i.e. reaching the anterior 0.6 of the scutellum in *E. kakanicus* sp. nov., as in Figure 2F, but almost always reaching the posterior end of the scutellum in *E. longitarsis* Tang, 1990, *E. tangi* sp. nov., and *E. yonezawanus*, as in, e.g., Figure 2H, and also by the characters used in the above key, such as width of lower face, mandibular shape and length, and surface sculptures of metapleuron.

Figure 13. *Enicospilus kakanicus* Shimizu sp. nov., ♂. **A.** Habitus; **B.** Head, frontal view; **C.** Head, lateral view; **D.** Head, dorsal view; **E.** Mesosoma, lateral view; **F.** Central part of fore wing.
Enicospilus kanshirensis (Uchida, 1928)

Fig. 14

Henicospilus kanshirensis Uchida 1928: 226; holotype ♂, Taiwan, SEHU, examined.


Material examined. 3♀3♂: Nepal (1♂), India (1♀), Indonesia (1♂1♀), Taiwan (1♂1♀).

Type series: holotype of Henicospilus kanshirensis Uchida, 1928, ♂, Kanshirei [= Gauziling], Tainan, Taiwan, 15.IV.1908, S. Matsumura leg. (SEHU).

Non-type series: 1♀, Dharan Sal & 2° forest (330m), Terai, Nepal, 14–15.XI.1983, M.G. Allen leg. (Fig. 14); 1♀, Anamalai Hills (3,500'), Cinchona, India, V.1957, P.S. Nathan leg.; 1♀, Tijgaacha, Mt Djampang, West Java, Indonesia, I.1938, K.M. Walsh leg.; 1♀, Tengah, Mt Tjieng, Djampang Mts, West Java, Indonesia, I.1938, K.M. Walsh leg.; 1♀, Sunmoon Lake, Taiwan, 22–29.IX.1970, Shui-Chen Chiu leg. (all NHMUK).


Diagnosis. Head (Fig. 14B–D): GOI = 2.8–3.1; lower face 0.7× as wide as high; Clypeus moderately convex in profile, its lower margin subacute to blunt; mandible moderately twisted by 20–30°, moderately long, evenly tapered, its outer surface without a diagonal structure; upper mandibular tooth 1.4–1.6× as long as lower one; posterior ocellus close to eye; antenna with 63–66 flagellomeres and 20° flagellomere 2.1–2.3× as long as wide.

Mesosoma (Fig. 14E): mesopleuron entirely closely to rather coarsely longitudinally striate; scutellum with lateral longitudinal carinae reaching anterior 0.8 or more and convergent posteriorly; metapleuron rather coarsely striate to strigose; propodeum weakly declivous, its posterior area coarsely reticulate to longitudinally punctostriate; scutellum with lateral longitudinal carinae reaching anterior 0.8 or more and convergent posteriorly; mesopleuron closely to longitudinally striate; posterior ocellus close to eye; antenna with 63–66 flagellomeres and 20° flagellomere 2.1–2.3× as long as wide.

Wings (Fig. 14F): fore wing with AI = 0.4–0.5, CI = 0.2–0.3, ICI = 0.5–0.7, SDI = 1.1–1.3; fore wing vein 1m-cu&M moderately sinuate, 2r&RS almost straight; venation and sclerites of discosubmarginal cell of fore wing as in Figure 14F; fenestra of fore wing not very well defined; vein 1cu-a microturbinate, its anterodistal corner and base of mandibular apical teeth; upper mandibular tooth 1.3–1.4× as long as lower one; posterior ocellus almost touching eye; antenna with 56–62 flagellomeres and 20° flagellomere 2.1–3× as long as wide.

Mesosoma (Fig. 14E): mesopleuron entirely to rather coarsely longitudinally striate; scutellum with lateral longitudinal carinae reaching anterior 0.8 or more and convergent posteriorly; metapleuron rather coarsely striate to strigose; propodeum weakly declivous, its posterior area coarsely reticulate to longitudinally striate, outer margin of propodeal spiracle joining pleural carina by a ridge.

Wings (Fig. 14F): fore wing with AI = 0.4–0.5, CI = 0.2–0.3, ICI = 0.5–0.7, SDI = 1.1–1.3; fore wing vein 1m-cu&M moderately sinuate, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 14F; fenestra of fore wing not very well defined; posterior ocellus almost touching eye; antenna with 56–62 flagellomeres and 20° flagellomere 2.1–3× as long as wide.

Differential diagnosis. Enicospilus kanshirensis is most similar to E. flavicaput but can be distinguished from it by the stouter central sclerite (Fig. 14F) (central sclerite slender in E. flavicaput as in Figure 8F), and smaller body size (i.e. fore wing length less than 15.0 mm in E. kanshirensis but more than 17.0 mm in E. flavicaput).

Enicospilus laqueatus (Enderlein, 1921)

Fig. 15

Henicospilus laqueatus Enderlein 1921: 26; holotype ♀, Taiwan, IZPAN.

Enicospilus leetoni Chiu 1954: 38; holotype ♀, Taiwan, TARI, examined; synonymised by Gauld and Mitchell (1981: 396).

Material examined. 29♀7♂ and 2 unsexed: Nepal (3♀9♂), India (2♀1♂), Taiwan (23♀2♂ and 2 unsexed), Zambia (1♀).

Type series: holotype of Enicospilus leetoni Chiu, 1954, ♀, Taihoku, Taiwan, 1.IX.1925, J. Sonan leg. (TARI).


Diagnosis. Head (Fig. 15B–D): GOI = 2.9–3.1; lower face 0.7–0.8× as wide as high; Clypeus moderately convex in profile, its lower margin acute; mandible weakly twisted by 10–25°, moderately long, evenly tapered, its outer surface with a diagonal setose groove between its dorsoproximal corner and base of mandibular apical teeth; upper mandibular tooth 1.3–1.4× as long as lower one; posterior ocellus almost touching eye; antenna with 56–62 flagellomeres and 20° flagellomere 2.1–3× as long as wide.

Mesosoma (Fig. 15E): mesopleuron punctate to longitudinally punctostriate; scutellum with lateral longitudinal carinae reaching posterior end and convergent posteriorly; metapleuron punctostriate; propodeum weakly declivous in profile, its posterior area moderately reticulate, outer margin of propodeal spiracle joining pleural carina by a ridge.

Wings (Fig. 15F): fore wing with AI = 0.4–0.6, CI = 0.4, ICI = 0.4–0.6, SDI = 1.2–1.4; fore wing vein 1m-cu&M almost evenly curved or very slightly sinuous, 2r&RS al-
most straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 15F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite triangular, separated from distal one, strongly pigmented; central sclerite strongly pigmented, sclerotised, well-delined D-shaped to semi-circular, positioned in almost mediodistal part of fenestra; distal sclerite absent proximal and more or less strong distally; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a antefurcal to M&RS by 0.1–0.3 × 1cu-a length.

**Colour** (Fig. 15): body including interocellar area entirely testaceous; wings hyaline.

**Differential diagnosis.** *Enicospilus laqueatus*, *E. pseudoantennatus*, *E. vestigator*, and *E. tripartitus* share similar fenestra, sclerites, and fore wing venation (e.g.

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**Figure 14.** *Enicospilus kanshirensis* (Uchida, 1928), ♂. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.
So Shimizu: The Nepalese species of the genus *Enicospilus*

Figure 15. *Enicospilus laqueatus* (Enderlein, 1921), ♂. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.

Figs 15F, 21F, 26F). However, *E. laqueatus* can be readily separated from *E. pseudoantennatus*, *E. vestigator*, and *E. tripartitus* by a diagonal setose deep groove of the outer surface of the mandible between its dorsoproximal corner and base of mandibular apical teeth (outer mandibular surface without a distinct diagonal setose deep groove in
E. pseudoantennatus, E. vestigator, and E. tripartitus, as in e.g. Figure 2C).

Enicospilus lineolatus (Roman, 1913)

Fig. 16

Enicospilus striatus Cameron 1899: 103; holotype ♀, India, OUMNH; junior secondary homonym of Enicospilus striatus (Brullé); synonymised by Gaul and Mitchell (1981: 304).

Enicospilus lineolatus Roman 1913: 30; holotype ♂, Philippines, NR.

Enicospilus uniformis Chiu 1954: 25; holotype ♂, Taiwan, TARI, examined; synonymised by Gaul and Mitchell (1981: 304).

Enicospilus flavus Chiu 1954: 28; holotype ♂, Taiwan, TARI, examined; synonymised by Gaul and Mitchell (1981: 304).


Material examined. 88♀♂15♂♂ and 3 unsexed: Nepal (10♀♀4♂♂), Australia (1♀♂), Brunei (2♀♂), India (34♀♀4♂♂ and 1 unsexed), Japan (17♀♂), Papua New Guinea (2♀♂), Sri Lanka (1♀♂), Taiwan (21♀♀4♂♂ and 2 unsexed).


Non-type series: 1♀♂, Kathmandu (4,300′), Nepal, VIII.1981, M.G. Allen leg. (Fig. 16A–E); 1♀♂, Kathmandu (4,300′), Nepal, VIII.1982, M.G. Allen leg.; 1♀♂2♀♂, Phulchoki (2,000 m), Nepal, VIII.1982, M.G. Allen leg. (LT) (Fig. 16F by ♀♂); 2♀♂, Godavari (6,000′), Kathmandu, Nepal, 1–2 (1♀♂), 3 (1♀♂). VIII.1967 (MsT); 1♀♂, Godavari (5,000′), Kathmandu, Nepal, 10.VIII.1967 (MsT); ♀♂, near Simra (180 m), Adhbabhar, Nepal, 23–28.VIII.1967 (MsT); 1♀♂, Kakani (2,070 m), Nepal, VII.1983, M.G. Allen leg. (LT); 2♀♂, Kakani (2,000 m), Nepal, VIII.1982, M.G. Allen leg. (LT); 1♀♂1♂♂, Kathmandu (1,350 m), Nepal, VII.1983, M.G. Allen leg. (LT); ♀♂, Victoria, Toolangi, Australia, I–II.1983, Farrugia & Gauld leg.; 2♀♂, U. Temburong (1,500 m), Bukit Retak, Brunei, IV.1881, L.D. Gauld leg.; 34♀♀6♂♂ and 1 unsexed, Andhra Pradesh, Patancheru, India, VI (1♀♂), VII (1♀♂), VIII (4♀♂), IX (27♀♂5♂♂ and 1 unsexed), X (1♀♂).1980 (1♀♂), Bhatnagar leg. (LT) (all NHMUK); 17♀♂, Hitujigaoka (43°00′N, 141°24′E), Sapporo, Hokkaidō, Japan, 16–23.VIII (1♀♂), 30.VIII–6.IX (1♀♂)007, 28.VII–4.VIII (1♀♂), 4–11 (6♀♂), 11–18 (4♀♂). VIII.1–8.IX (4♀♂).2008, K. Komishi leg. (MsT) (EUM); 1♀♂, Kokoda (365 m), Papua New Guinea, VI.1933, L.E. Cheesman leg.; 1♀♂, Wau (1,200 m), Morobe District, Papua New Guinea, 24–26.II.1963, J. Sedlacek leg. (MsT); 1♀♂, Peak View Motel (550 m), Kandy, Sri Lanka, 15–24.I.1970, Davis & Rowe leg. (all NHMUK); 3♀♂3♂♂ and 2 unsexed, Karen, Thailand, 6–14.V (1♀♂ and 1 unsexed), 26.VIII–4.XI.1972, 16–22.IV.1973 (1♀♂ and 1 unsexed) (MsT); 16♀♂1♂♂, Wafeng Hill, Taichung, Taiwan, I (2♀♂1♂♂), II (1♀♂), IV (10♀♂), V (3♀♂).1984, K.S. Lin & K.C. Chou leg. (MsT) (all TARI).


Diagnosis. Head (Fig. 16B–D): GOI = 2.2–2.7; lower face 0.7–0.8× as wide as high; clypeus almost flat in profile, its lower margin acute to subacute; mandible rather weakly twisted by 10–20°, moderately long, proximally tapered and distally more or less parallel sided, its outer surface without a diagonal structure; upper mandibular tooth 1.3–1.5× as long as lower one; posterior ocellus almost touching eye; antenna with 51–61 flagellomeres and 20th flagellomere 1.9–2.2× as long as wide.

Mesosoma (Fig. 16E): mesopleuron punctate; scutellum with lateral longitudinal carinae reaching at least anterior 0.8 and convergent posteriorly; metapleuron punctate to punctostrigose; propodeum weakly declivous, its posterior area moderately reticulate, outer margin of propodeal spiracle not joining pleural carina by a ridge.

Wings (Fig. 16F): fore wing with AI = 0.5–0.9, CI = 0.5–0.9, ICI = 0.7–1.0, SDI = 1.3–1.5; fore wing vein 1-cu-a moderately sinuous, 2rc&M almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 16F; fenestra of fore wing not long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal and central sclerites absent; distal sclerite strong and more or less centrally broadened; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a interstitial to antefurcal to M&R by less than 0.3× 1cu-a length.

Colour (Fig. 16): body including interocellar area entirely testaceous; wings hyaline.

Differential diagnosis. Some species of Oriental Enicospilus (e.g. E. fusiformis and E. unicolor) have a centrally broadened distal sclerite and lack proximal and central sclerites, as in Figure 16F. Among them, E. lineolatus is most similar to E. unicolor, but distinguished by the narrower distal sclerite than that of E. unicolor and testaceous fore wing pterostigma and sclerite (brown in E. unicolor).

Enicospilus melanocarpus Cameron, 1905

Fig. 17

Enicospilus reticulatus Cameron 1902: 52; holotype ♂, Maldives, NHMUK, examined; synonymised by Gauld and Mitchell (1981: 377); junior primary homonym of Enicospilus reticulatus Cameron, 1899.
Eniscospilus (sic) melanocarpus Cameron 1905: 122; holotype ♀, Sri Lanka, NHMUK, examined.

Henicospilus nigrinervis Szépligeti 1906: 142; holotype ♂, New Guinea, TM; synonymised by Gauld and Mitchell (1981: 377); junior secondary homonym of Enicospilus nigrinervis Cameron, 1901.

Ophion (Henicospilus) nocturnus Kohl 1908: 315; holotype ♀, Samoa, NM; synonymised by Gauld and Mitchell (1981: 378).

Henicospilus turneri Morley 1912: 51; lectotype ♂, Australia, NHMUK, examined, designated by Townes et al. (1961: 291); synonymised by Gauld and Mitchell (1981: 378).


Henicospilus crassivena Enderlein 1921: 24; holotype ♂, Sumatra, IZPAN; synonymised by Townes et al. (1961: 281).


Material examined. 105♀♀21♂♂ and 6 unsexed: Nepal (5♀♀2♂♂), Australia (1♀), China (1♂), Maldives (1♂), India (26♀♀), Indonesia (4♀♀2♂♂ and 1 unsexed), Japan (2♀♀), Malaysia (1♀), Papua New Guinea (7♀♀1♂), Philippines (7♀♀), Singapore (1 unsexed), Sri Lanka (8♀♀8♂♂, Taiwan (43♀♀15♂♂ and 4 unsexed).

Type series: holotype of Enicospilus reticulatus Cameron, 1902, ♂, Hulule, Maldives Islands, 20.VI.1900 (NHMUK, Type 3b.1268); holotype of Enicospilus (sic) melanocarpus Cameron, 1905, ♂, Sri Lanka (NHMUK, Type 3b.1234); lectotype of Henicospilus turneri Morley, 1912, ♂, Mackay, Queensland, Australia, 1899, Turner leg. (NHMUK, Type 3b.1261); holotype of Henicospilus atricornis var. zeylanicus Morley, 1913, ♂, Kandy, Sri Lanka, 11.VII.1910, Green leg. (NHMUK, Type 3b.2098); holotype of Enicospilus quintuplex Chiu, 1954, ♂, Shaowu, Fukien, China, 8.X.1945, S.H. Chao leg. (TARI).


Diagnosis. Head (Fig. 17B–D): GOI = 2.5–3.1; lower face 0.7–0.8× as wide as high; clypeus slightly to strongly convex in profile, its lower margin acute; mandible weakly twisted by 10–20°, moderately long, evenly tapered, its outer surface without a diagonal structure; upper mandibular tooth 1.2–1.5× as long as lower one; posterior ocellus almost evenly rounded, its posterior area moderately reticulate, outer margin of propodeal spiracle not joining pleural carina by a ridge.

Mesosoma (Fig. 17E): mesopleuron punctate to longitudinally punctostriate; scutellum with lateral longitudinal carinae reaching posterior end and convergent posteriory; metapleural punctate to punctostriate; propodeum almost evenly rounded, its posterior area moderately reticulate, outer margin of propodeal spiracle not joining pleural carina by a ridge.

Wings (Fig. 17F): fore wing with AI = 0.4–1.1, CI = 0.3–0.5, ICI = 0.4–0.5, SDI = 1.1–1.4; fore wing vein 1m-cu&M more or less evenly curved, 2r&S almost straight; fenestra and selerites of discosubmarginal cell of fore wing as in Figure 17F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal selerite triangular, strongly confluent with distal one, strongly pigmented; central selerite moderately to strongly pigmented and sclerotised, usually well-delineated oval, positioned in antero- to medio-distal part of fenestra; distal selerite more or less evenly strong from proximal to distal; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a subterminal to antefurcal to M&S by less than 0.3×1cu-a length.

Colour (Fig. 17): body including interocellar area entirely testaceous with black posterior segments of metasoma; wings hyaline.
Differential diagnosis. *Enicospilus melanocarpus* is very similar to *E. sauteri*, but distinguished by the uniformly setose marginal cell of the fore wing (Fig. 17F) (marginal cell of fore wing proximally glabrous in *E. sauteri*) and the oval central sclerite (Fig. 17F) (central sclerite linear in *E. sauteri*). Many species were synony-
mixed with *E. melanocarpus* under Gauld’s conservative species criteria, but their wide distribution and considerable range of morphological variation indicate this name includes many species. Therefore, further researches are needed to reveal the true species diversity under the name ‘*melanocarpus*’.

**Enicospilus nepalensis** Shimizu, sp. nov.

http://zoobank.org/7C19F1EE-EC88-4090-A25B-0089401B750A

Figs 2A, 18

**Etymology.** The specific name is derived from the type locality.

**Material examined.** 2♀♀; Nepal.

Type series: holotype ♀, Pokhara (950 m), Nepal, VII–VIII.1983, M.G. Allen leg. (LT) (NHMUK) (Figs 2A, 18); paratype ♀, same label and repository as holotype.

**Distribution.** Nepal.

**Description. Female** (Holotype) (Fig. 18). Body length ca 16.5 mm.

*Head* with GOI = 2.5 (Fig. 18C). Lower face 0.8× as wide as high, finely punctate with setae, strongly shiny (Fig. 18B). Clypeus 1.6× as wide as high, finely punctate, moderately convex in profile, its lower margin impressed (Fig. 18B, C). Malar space 0.4× as long as basal mandibular width (Fig. 18B, C). Mandible weakly twisted by ca 15°, moderately long, its proximal half evenly narrowed and distal half subparallel sided, its outer surface entirely almost flat with long and rather stout setae (Figs 2A, 18B, C). Upper mandibular tooth 1.7× as long as lower one, very slender and cylindrical (Figs 2A, 18B). Frons, vertex and gena strongly shiny with fine setae (Fig. 18B–D). Posterior ocellus rather small and separated from eye by 0.3× its own maximum diameter (Fig. 18B–D). Ventral end of occipital carina joining oral carina. Antenna with 49 flagellomeres; first flagellomere 1.6× as long as second; 20th flagellomere 2.3× as long as wide.

**Mesosoma** entirely strongly shiny with setae (Fig. 18E). Pronotum punctostriate dorsally and finely coriaceous ventrally (Fig. 18E). Mesoscutum 1.5× as long as its maximum width, almost smooth with very fine punctures with setae, and evenly rounded in profile (Fig. 18E). Notauli absent (Fig. 18E). Scutellum moderately convex, almost smooth with very fine and sparse punctures with setae, with lateral longitudinal carinae reaching posterior end (Fig. 18E). Epicnemium from densely striogose dorsally to densely punctate ventrally with setae. Epicnemial carina present, evenly curved to anterior, its dorsal end not reaching anterior margin of mesopleuron (Fig. 18E). Mesopleuron finely punctate dorsally and longitudinally punctostriate to striogose ventrally (Fig. 18E). Metapleural carina almost parallel sided centrally and weakly broadened anteriorly (Fig. 18E). Metapleuron moderately punctate with setae (Fig. 18E). Propodeum evenly rounded in profile; anterior or transverse carina complete centrally, its lateral end almost joining pleural carina; anterior area longitudinally striate; spiracular area almost smooth with very fine and sparse punctures and setae; posterior area rather finely subconcentrically striate; propodeal spiracle elliptical, its outer margin not joining pleural carina by a ridge (Fig. 18E).

**Wings.** Fore wing length ca 11.0 mm with Al = 0.4, CI = 0.3, DI = 0.4, ICI = 0.4, SDI = 1.2, SI = 0.2, SRI = 0.3; vein 1m-cu&M almost evenly curved; vein 2r&RS slightly sinuous and RS evenly curved; fenestra and sclerites of discosubmarginal cell as in Figure 18F; proximal sclerite triangular, not confluent with distal sclerite, very strongly pigmented; central sclerite small and its major diameter subequal to thickness of vein 2r&RS, suboval, weakly sclerotised and pigmented, positioned in posterdiscal part of fenestra; distal sclerite moderately pigmented; proximal corner of marginal cell evenly setose; posterodiscal corner of second discal cell ca 95°; posterodiscal corner of subsabral cell ca 95°; vein 1cu-a slightly antefurcal to M&RS by 0.1× 1cu-a length (Fig. 18F). Hind wing with Ni = 1.2, RI = 1.7; vein RS straight; vein RA with 6 uniform hamuli.

**Legs.** Outer surface of fore tibia without dense and long spines. Hind leg with coxa in profile 1.7× as long as deep; basitarsus 2.0× as long as second tarsomere; fourth tarsomere 0.6× as long as third tarsomere and 3.5× as long as wide; tarsal claw simply pectinate.

**Metasoma** with PI = 2.8, DMI = 1.3, THI = 2.5; dorsal margin of tergite 1 more or less sinuous; thrytidium elongate (Fig. 18A). 

**Colour.** (Fig. 18). Entirely testaceous except for apex of mandible, posterior part of T5, and T6–8 black. Wings hyaline; proximal sclerite brown; central and distal sclerites amber; veins brown.

**Variations** (n = 2): body length 15.5–16.5 mm; head with GOI = 2.4–2.5; clypeus 1.6–1.7× as wide as high; malar space 0.3–0.4× as long as basal mandibular width; mandible twisted by 15–25°; upper mandibular tooth 1.6–2.1× as long as lower one; antenna with first flagellomere 1.6–1.7× as long as second; pronotum punctostriate dorsally and finely coriaceous ventrally or entirely almost smooth to weakly coriaceous with very sparse and fine punctures; metapleuron sparsely to moderately punctate; fore wing length 10.0–11.0 mm; hind coxa in profile 1.6–1.7× as long as deep; fourth tarsomere 3.5–3.7× as long as wide; metasoma with PI = 2.7–2.8; THI = 2.5–2.8; mandible proximally testaceous and apically black or entirely dark brown to black.

**Male.** Unknown.

**Differential diagnosis.** *Enicospilus nepalensis* sp. nov. is probably closely related to or belongs to the *E.ramidulus* complex. Among the complex, *E. nepalensis* sp. nov. is most closely related to *E. tricorniatus* Rao & Nikam, 1970 based on the rather small ocelli relative to other *Enicospilus* (posterior ocellus separated from eye by more than 0.3× its own maximum diameter) (e.g. Fig. 18B–D), highly shiny body (e.g. Fig. 18A–E), shape.
Figure 18. *Enicospilus nepalensis* Shimizu sp. nov., ♀, holotype. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.
of body (e.g. Fig. 18A), shape and position of the fore wing veins and sclerites (e.g. Fig. 18F), distribution, etc. However, *E. nepalensis* sp. nov. is readily distinguishable from *E. tricorniatus* by the following characters: lower face more or less elongate and 0.8× as wide as high (Fig. 18B) (lower face subquadrate to transverse and 1.0–1.1× as wide as high in *E. tricorniatus*), the central sclerite weakly sclerotised and pigmented (Fig. 18F) (moderately to strongly sclerotised and pigmented in *E. tricorniatus*), moderate-sized, fore wing length 10.0–11.0 mm (small, fore wing length less than 8.5 mm in *E. tricorniatus*), posterior ocellus separated from eye by 0.3× its own maximum diameter (Fig. 18B–D) (posterior ocellus separated from eye by almost its own maximum diameter in *E. tricorniatus*).

**Enicospilus nikami** Shimizu, sp. nov.

http://zoobank.org26026EC4-711F-49F7-AFA8-C4772D6E0F99

Figs 2J, 19

**Etymology.** The specific name is dedicated to Dr P.K. Nikam who studied Ophioninae as well as other groups of Hymenoptera mainly of India.

**Material examined.** 1♀: Nepal.

Type series: holotype ♀, Kathmandu (1,300 m), Nepal, XI.1982, M.G. Allen leg. (LT) (NHMUK) (Figs 2J, 19).

**Distribution.** Nepal.

**Description.** **Female** (Holotype) (Fig. 19). Body length ca 23.0 mm.

_Head_ with GOI = 2.9 (Fig. 19C). Lower face 0.6× as wide as high, shiny, rather finely punctate with setae (Fig. 19B). Clypeus 1.6× as wide as high, sparsely and finely punctate with setae, almost flat in profile, and its lower margin acute (Fig. 19B, C). Mandible weakly twisted by ca 25° long, proximally strongly narrowed, centrally to apically subparallel sided, its outer surface flat and smooth without a diagonal groove and line of punctures (Fig. 19B, C). Upper mandibular tooth 1.3× as long as lower one (Fig. 19B). Frons, vertex and gena moderately shiny with fine setae (Fig. 19B–D). Posterior ocellus almost touching eye (Fig. 19B–D). Ventral end of occipital carina joining oral carina. Antenna with 59 flagellomeres; first flagellomere 1.9× as long as second; 20th flagellomere 1.5× as long as wide.

_Mesosoma_ entirely moderately shiny with setae (Fig. 19E). Pronotum finely coriaceous with punctures to closely strigose (Fig. 19E). Mesoscutum 1.5× as long as its maximum width, finely punctate with setae, strongly shiny, and evenly rounded in profile (Fig. 19E). Notauli absent (Fig. 19E). Scutellum moderately convex, with lateral longitudinal carinae almost reaching posterior end, and moderately punctate with setae (Fig. 19E). Epinuncium densely punctate with setae. Epinuncial carina present, evenly weakly curved to anterior, its dorsal end not reaching anterior margin of mesopleuron (Fig. 19E). Mesopleuron entirely moderately punctate, and ventral margin longitudinally finely strigose (Fig. 19E). Submetapleural carina broadened anteriorly (Fig. 19E). Metapleuron diagonally closely strigose (Fig. 19E). Propodeum declivous in profile; anterior transverse carina complete centrally, its lateral end not joining pleural carina; pleural carina absent posteriorly; anterior area longitudinally striate medially and smooth laterally; spiracular area finely coriaceous; anterior area concentrically striate; propodeal spiracle elliptical, its outer margin not joining pleural carina by a ridge (Fig. 19E).

_Wings._ Fore wing length ca 15.0 mm with AI = 0.5, CI = 0.6, DI = 0.3, ICI = 0.8, SDI = 1.5, SI = 0.1, SRI = 0.3; vein 1m-cu&M moderately sinuous; vein 2r&RS very slightly bowed but almost straight, and RS evenly curved; fenestra and sclerites of discosubmarginal cell as in Figure 19F; proximal sclerite linear, weakly pigmented and virtually un sclerotised so that vestigial, separated from distal sclerite; central sclerite absent; distal sclerite almost absent but anterodistal part slightly pigmented; proximal corner of marginal cell uniformly setose; posterodistal corner of second discal cell ca 90°; posterodistal corner of subbasal cell ca 65°; vein 1cu-a antefurcal to M&RS by 0.2× 1cu-a length (Fig. 19F). Hind wing with NI = 2.6, RI = 1.7; vein RS straight; vein RA with 11 uniform hamuli.

_Legs._ Outer surface of fore tibia with very few spines. Hind leg with coxa in profile 1.7× as long as deep; basitar sus 2.2× as long as second tarsomere; fourth tarsomere 0.4× as long as third tarsomere and 2.6× as long as wide; tarsal claw simply pectinate except lacking pecten proximally.

_Metasoma_ with PI = 3.2, DMI = 1.3, THI = 2.5; dorsal margin of tergite 1 not sinuous; thyroidium elongate (Fig. 19A).

_Colour_ (Fig. 19). Entirely testaceous except for apex of mandible black. Wings hyaline; sclerites of fore wing fenestra very slightly pigmented, testaceous; veins black to testaceous.

_Variation._ Unknown

**Male.** Unknown

**Differential diagnosis.** *Enicospilus nikami* sp. nov. is similar to *E. biharensis*, *E. maruyamanus*, *E. pudibundae*, and *E. transversus* and these species are rather difficult to separate from each other. However, *E. nikami* sp. nov. can be distinguished from *E. biharensis*, *E. maruyamanus* and *E. transversus* by the proximally incomplete pectinae of hind tarsal claw (Fig. 2J) (hind tarsal claw completely pectinate from its base to apex in *E. biharensis*, *E. maruyamanus* and *E. transversus*, as in e.g. Figure 2I), from *E. biharensis* and *E. pudibundae* by the sinuous fore wing vein 1m-cu&M (Fig. 19F) (1m-cu&M evenly curved in *E. biharensis* and *E. pudibundae* as in Figures 6F, 23F), from *E. maruyamanus* by
the entirely moderately punctate mesopleuron (Fig. 19E) (mesopleuron entirely longitudinally punctostriate in *E. maruyamanus*) and the angle of posterodistal corner of second discal cell (i.e. ca 90° in *E. nikami* sp. nov. as in Figure 19F, but ca 115° in *E. maruyamanus*), and from *E. transversus* by the entirely moderately punctate mesopleuron (Fig. 19E) (mesopleuron entirely longitudinally striate in *E. transversus*).
Enicospilus phulchokiensis Shimizu, sp. nov.
http://zoobank.org23580571-7C71-49F7-B2BE-5EDC87CAC2C3
Figs 2G, 20

Etymology. The specific name is derived from the type locality.

Material examined. 1♀: Nepal.

Type series: holotype ♀, Phulchoki, M.G. Allen leg. (NHMUK) (Figs 2G, 20).


Description. Female (Holotype) (Fig. 20). Body length ca 21.5 mm.

Head with GOI = 2.9 (Fig. 20C). Lower face 0.7× as wide as high, rather finely punctate with setae, strongly shiny (Fig. 20B). Clypeus 1.3× as wide at high, finely punctate with setae, moderately convex in profile, and its lower margin impressed (Fig. 20B, C). Malar space 0.4× as long as basal mandibular width (Fig. 20B, C). Mandible weakly twisted by ca 20°, moderately long, evenly narrowed, its outer surface with a diagonal setose deep groove between its dorsoproximal corner to base of mandibular apical teeth (Fig. 20B, C). Upper mandibular tooth 1.6× as long as lower one, slender and cylindrical (Fig. 20B). Frons, vertex and gena strongly shiny with fine setae (Fig. 20B–D). Posterior ocellus almost touching eye (Fig. 20B–D). Ventral end of occipital carina joining oral carina. Antenna with 64 flagellomeres; first flagellomere 2.2× as long as second; 20th flagellomere 2.2× as long as wide.

Mesosoma entirely strongly shiny with setae (Fig. 20E). Pronotum finely punctate dorsally and striogose to rugose ventrally (Fig. 20E). Mesoscutum 1.5× as long as its maximum width, almost smooth with very fine punctures with setae, and evenly rounded in profile (Fig. 20E). Notauli absent (Fig. 20E). Scutellum moderately convex, anterior 0.4 transversely striate, anterior 0.4–0.5 punctate, and posterior 0.5 longitudinally striogose, with lateral longitudinal carinae reaching posterior end (Figs 2G, 20E). Epinemi- dumus densely punctate with setae. Epinemial carina present, evenly curved to anterior, its dorsal end close to anterior margin of mesopleuron (Fig. 20E). Mesopleuron entirely finely punctate, longitudinally striogose ventrally (Fig. 20E). Submetapleural carina weakly evenly broadened anteriorly (Fig. 20E). Metapleuron entirely finely punctate with setae (Fig. 20E). Propodeum almost evenly rounded in profile; anterior transverse carinae carinate; anterior area longitudinally striate; spiracular area almost smooth with very fine and sparse punctures with setae; posterior area rather finely irregularly rugose; propodeal spiracle elliptical, its outer margin not joining pleural carina by a ridge.

Wings. Fore wing length ca 13.5 mm with AI = 0.4, CI = 0.4, DI = 0.4, IC = 0.5, SDI = 1.2, SI = 0.1, SRI = 0.3; vein 1m-cu&M weakly sinuous; vein 2r&RS almost straight and RS evenly curved; fenestra and sclerites of discosubmarginal cell as in Figure 20F; proximal sclerite triangular, confluent with distal sclerite, moderately pigmented; central sclerite rather small and its minor diameter smaller than thickness of vein 2r&RS, elliptical, moderately sclerotised and pigmented, positioned in mediodistal part of fenestra; distal sclerite moderately pigmented; proximal corner of marginal cell evenly setose; postero-distal corner of second discal cell ca 105°; postero-distal corner of subbasal cell ca 85°; vein 1cu-a subinterstitial to M&RS (Fig. 20F). Hind wing with NI = 1.3, RI = 1.7; vein RS straight; vein RA with 7 uniform hamuli.

Legs. Outer surface of fore tibia with sparse spines. Hind leg with coxa in profile 2.0× as long as deep; basitarus 2.0× as long as second tarsomere; fourth tarsomere 0.6× as long as third tarsomere and 4.6× as long as wide; tarsal claw simply pectinate.

Metasoma with PI = 2.9, DMI = 1.4, THI = 2.9; dorsal margin of tergite 1 weakly sinuous; thyridium elongate (Fig. 20A).

Colour (Fig. 20). Entirely testaceous except for apex of mandible black. Wings hyaline; sclerites amber; veins brown.

Variation. Unknown

Male. Unknown

Differential diagnosis. Mandibular structure and mesosoma sculpture of E. phulchokiensis sp. nov. indicate that it belongs to the E. ramidulus complex. Enicospilus phulchokiensis sp. nov. runs to couplet 230 (including E. melanocarpus and E. xavius) of Gauld and Mitchell’s (1981: 143) key, and to couplet 61 (including E. melanocarpus and E. sauteri) of Tang’s (1990: 34, 181) key. However, E. phulchokiensis sp. nov. is distinguishable from E. melanocarpus, E. sauteri and E. xavius by the strongly sculptured scutellum (Fig. 2G), sinuous fore wing vein 1m-cu&M (Fig. 20F), and entirely testaceous metasoma without black posterior segments (Fig. 20A). Moreover, E. phulchokiensis sp. nov. is possibly related to E. puncticulatus of Tang, 1990 and its related species-group, but distinguished from E. puncticulatus by the confluent proximal and distal sclerites (Fig. 20F) (separated in E. puncticulatus).

Enicospilus pseudantennatus Gauld, 1977
Fig. 21

Enicospilus pseudantennatus Gauld 1977: 92; holotype ♀, Australia, ANIC.

Material examined. 6♀6♂: Australia (5♀6♂), Indonesia (1♀). No Nepalese specimens were examined.

Type series: paratypes of Enicospilus pseudantennatus Gauld, 1977, 1♀, Paramatta, NSW, Australia, 16.1.1921 (EMUS); 5♂, Tambourine Mts, SE Queensland, Australia, 1–9.V.1935, R.E. Turner leg.; 1♂, Cabramatta, NSW, Australia, 6.IV.1963, M. Nikitin leg.; 1♂, Merrylands, NSW, Australia, 25.XI.1964, M. Nikitin leg. (all NHMUK).

Non-type series: 1♀, D.PI Research Stn, Gatton, SE Queensland, Australia, 13–21.IV.1981 (MsT) (Fig. 21); 1♀, Mt Tambourine, Queensland, Australia, 12–18.X.1978, I.D. Galloway leg.; 1♀, Canberra, ACT, Australia, IX.1981, I.D. Gauld leg. (all NHMUK); 1♀, Ambon, Indonesia, 29.IX.1960, A.M.R. Wegner leg. (EMUS).

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**Diagnosis.** **Head** (Fig. 21B–D): GOI = 2.2–2.8; lower face 0.7–0.8× as wide as high; clypeus moderately convex in profile, its lower margin impressed; mandible rather weakly twisted by 10–20°, moderately long, evenly tapered, its outer surface without a diagonal structure; upper mandibular tooth 1.3–1.6× as long as lower one; posterior ocellus close to eye; antenna with 56–63 flagellomeres and 20th flagellomere 2.2–2.4× as long as wide.

**Mesosoma** (Fig. 21E): mesopleuron entirely punctate; scutellum with lateral longitudinal carinae reaching posterior end and convergent posteriorly; metapleuron punctate; propodeum evenly weakly rounded, its posterior area moderately reticulate, outer margin of propodeal spiracle not joining pleural carina by a ridge.
Figure 21. *Enicospilus pseudantennatus* Gauld, 1977, ♀. **A.** Habitus; **B.** Head, frontal view; **C.** Head, lateral view; **D.** Head, dorsal view; **E.** Mesosoma, lateral view; **F.** Central part of fore wing.

*Wings* (Fig. 21F): fore wing with AI = 0.3–0.6, CI = 0.3–0.4, ICI = 0.5–0.7, SDI = 1.2–1.4; fore wing vein 1m-cu&M moderately sinuous, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 21F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite triangular, separated from distal one, strongly pigmented; central sclerite...
Enicospilus pseudoconspersae (Sonan, 1927)

Fig. 22

Henicospilus pseudoconspersae Sonan 1927: 48; holotype ♂, Taiwan, TARI, examined.

Henicospilus mushanus Uchida 1928: 216; holotype ♂, Taiwan, SEHU, examined; synonymised by Gauld and Mitchell (1981: 344).

Enicospilus tenuinubeculus Chiu 1954: 34; holotype ♂, China, TARI, examined; synonymised by Gauld and Mitchell (1981: 345).

Material examined. 7♀♀7♂♂: Nepal (5♀♀4♂♂), China (1♀♀1♂♂), Japan (1♀♀1♂♂).


Non-type series: 1♀♀, Kakani (2,070 m), Nepal, VII.1983, M.G. Allen leg. (LT) (Fig. 22); 1♀♀, Kathmandu (1,300 m), Nepal, XI.1982, M.G. Allen leg. (LT); 1♀♀, Godavari (1,550–1,700 m), Nepal, V.1983, M.G. Allen leg. (LT); 1♀♀, Godavari (5,000′), Nepal, V.1983, M.G. Allen leg. (LT); 1♀♀, Kathmandu (4300′), Nepal, VIII.1982; 1♀♀, Phulchoki (2,000 m), Nepal, VIII.1982, M.G. Allen leg. (LT); 1♀♀, Kathmandu (4300′), Nepal, VIII.1982; 1♀♀, Sal & 2y forest (330 m), Dharan, Terai, Nepal, 14–15.XI.1983, M.G. Allen leg.; 1♀♀, Godavari, Kathmandu, Nepal, V.1983; 1♀♀, Kathmandu, Nepal, 15–16.XI.1983, M.G. Allen leg.; 1♀♀, Godavari, Kathmandu, Nepal, V.1983; 1♀♀, S of Ulleri (5,000′), Nepal, 16.V.1954, J. Oinlan leg.; 1♀♀, China (all NHMUK); 1♀♀, Hiji agricultural road (85 m, 26°43′16.8″N, 128°10′43.4″E), Hiji, Kunigami Village, Kunigami County, Okinawa-ken, Okinawa Pref., Japan, 3–4.VII.2016, S. Shimizu et al. leg. (LT) (NIAES).


Diagnosis. Head (Fig. 22B–D): GOI = 2.8–3.1; lower face 0.6–0.7× as wide as high; clypeus almost flat in profile, its lower margin acute to subacute; mandible rather weakly twisted by 15–25°, moderately long, proximally tapered and distally approximately parallel sided, its outer surface without a diagonal structure; upper mandibular tooth 1.2–1.4× as long as lower one; posterior ocellus almost touching eye; antenna with 52–65 flagellomeres and 20th flagellomere 1.7–2.3× as long as wide.

Mesosoma (Fig. 22E): mesopleuron punctate to longitudinally punctostriate; scutellum with lateral longitudinal carinae reaching posterior end and convergent posteriorly, metapleuron punctostriate; propodeum evenly rounded, its posterior area moderately reticulate, outer margin of propodeal spiracle not joining pleural carina by a ridge.

Wings (Fig. 22F): fore wing with AI = 0.7–0.9, CI = 0.6–0.7, IC1 = 0.4–0.6, SDI = 1.3–1.4; fore wing vein 1m-cu&M moderately sinuous, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 22F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite semicircular, isolated and not touching margin of fenestra, almost always (very) weakly pigmented; central sclerite absent; distal sclerite absent or vestigial; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a antefurcal to M&RS by 0.2–0.3× 1cu-a length.

Colour (Fig. 22): body including interocellar area entirely red-brown; wings hyaline.

Differential diagnosis. Enicospilus pseudoconspersae is one of the most distinctive and easily distinguishable species among the Oriental species of Enicospilus on account of the characteristic isolated and weakly pigmented semicircular proximal sclerite (Fig. 22F). There are no known morphologically similar species.

Enicospilus pudibundae (Uchida, 1928)*

Fig. 23

Henicospilus pudibundae Uchida 1928: 219; lectotype ♂, Japan, SEHU, designated by Townes et al. (1965: 330), examined.

Material examined. 18♀♀2♂♂: Nepal (2♀♀1♂♂), Brunei (3♀♀), India (1♀♀), Japan (12♀♀1♂♂).

Type series: Lectotype of Henicospilus pudibundae Uchida, 1928, ♂, Sapporo, Hokkaido, Japan, 4.VI.1925, Tama-nuki leg. (emerged from Dasychira pudibunda L.) (SEHU).

Non-type series: 2♀♀, Kakani, Nepal, 1–30.V.1984, M.G. Allen leg. (Fig. 23); 1♀♀, Sal & 2y forest (330 m), Dharan, Terai, Nepal, 14–15.XI.1983, M.G. Allen leg.; 1♀♀, Godavari, Kathmandu, Nepal, 5.VIII.1967; 1♀♀, China (all NHMUK); 1♀♀, Hiji agricultural road (85 m, 26°43′16.8″N, 128°10′43.4″E), Hiji, Kunigami Village, Kunigami County, Okinawa-ken, Okinawa Pref., Japan, 3–4.VII.2016, S. Shimizu et al. leg. (LT) (NIAES).
Figure 22. Enicospilus pseudoconspersae (Sonan, 1927), ♂. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.

tagawa City, Hokkaidô, Japan, 5–19.VIII.2007, H. Hara
leg. (MsT) (NSMT); 1 ♀, Yoshigahira, Niigata Pref., Ja
paign; 25.VI.1954, K. Baba leg. (MNHA); 1 ♀, Kurokawa,
Niigata Pref., Japan, 22.VI.1954, K. Baba leg. (MNHA); 1 ♀, Oyamada, Machida City, Tôkyô, Japan, IX.2008,
S. Ohsato leg. (NHMUK); 1 ♀, Dokan-Shinmichi, Im
VIII.2010 (MsT) (NSMT); 1 ♀, Mt Futatabi-san, Kôbe
(MNHA); 6 ♀♂, Mori, Tôjyô Town, Shôbara City, Hiroshi
ma Pref., Japan, 21.VII.2015 (1 ♀), 6 (2 ♀♂), 8 (1 ♀).
(LT) (HMNH).

**Distribution.** Eastern Palaearctic and Oriental regions
(Yu et al. 2016). Newly recorded from Nepal.

**Diagnosis.** Head (Fig. 23B–D): GOI = 2.6–2.8;
lower face 0.7× as wide as high; clypeus almost flat
in profile, its lower margin acute to subacute; man
ible weakly twisted by 10–20°, moderately long, evenly
tapered, its outer surface without a diagonal structure;
upper mandibular tooth 1.2–1.5× as long as lower one;
posterior ocellus (almost) touching eye; antenna with
Figure 23. *Enicospilus pudibundae* (Uchida, 1928), ♀. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.

54–59 flagellomeres and 20th flagellomere 2.0–2.1× as long as wide.

*Mesosoma* (Fig. 23E): mesopleuron entirely punctate; scutellum with lateral longitudinal carinae reaching posterior end and convergent posteriorly; metapleuron punctate; propodeum weakly declivous, its posterior area irregularly wrinkled, outer margin of propodeal spiracle not joining pleural carina by a ridge.

*Wings* (Fig. 23F): fore wing with \( A_1 = 0.5–1.0, C_1 = 0.5–0.7, I_1 = 0.5–0.7, S_1 = 1.4–1.5 \); fore wing vein 1m-cu&M evenly curved, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 23F;
fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite more or less linear, very weakly confluent with distal one or not, very weakly to strongly pigmented; central sclerite absent; distal sclerite more or less weak to absent; proximal corner of marginal cell of fore wing sparsely to uniformly setose; vein 1cu-a subinterstitial to anteocular to M&RS by less than 0.2× 1cu-a length.

Colour (Fig. 23): body including interocular area entirely testaceous, sometimes posterior segments of metasoma weakly infuscate; wings hyaline to very slightly infuscate.

Differential diagnosis. Enicospilus pudibundae resembles E. biharensis, E. maruyamanus, E. nikami sp. nov., and E. transversus, but can be distinguished from E. biharensis, E. maruyamanus, and E. transversus by the proximally incomplete pectination of the hind tarsal claw (pectination of hind tarsal claw complete from base to apex of the claw in E. biharensis, E. maruyamanus, and E. transversus, as in e.g. Figure 2d) and also from E. maruyamanus, E. nikami sp. nov., and E. transversus by the evenly curved fore wing vein 1m-cu&M (Fig. 23f) (1m-cu&M more or less sinuous in E. maruyamanus, E. nikami sp. nov. and E. transversus, as in e.g. Figure 19f). The Nepalese and some other Oriental specimens exhibit a rather wider proximal sclerite and serrarosity in the proximal corner of the fore wing fenestra than the holotype and Eastern Palaearctic specimens, suggesting that the Oriental specimens are potentially cryptic species. However, at present, I have not enough evidence to describe them as a new species and tentatively follow Gauld and Mitchell’s (1981) species criteria.

Enicospilus purifenestratus (Enderlein, 1921)*
Fig. 24

Amesospilus purifenestratus Enderlein 1921: 17; holotype ♀, Sumatra, IZPAN.

Material examined. 4♀ 4♂: Nepal (1♀ 4♂), Brunei (2♀), Singapore (1♀).

Non-type series: 1♀, Kathmandu (1,350 m), Nepal, VII.1983, M.G. Allen leg. (LT); 4♀, Phulchoki (2,000 m), Nepal, VIII.1982, M.G. Allen leg. (LT) (Fig. 24); 2♀, Seria, Brunei, XII.1979, Allen leg.; 1♀, Singapore, 1905, H.N. Ridley leg. (all NHMUK).


Diagnosis. Head (Fig. 24B-D): GOI = 2.7–3.0; lower face 0.6–0.7× as wide as high; clypeus slightly convex in profile, its lower margin subacute to blunt; mandible weakly twisted by 10–20°, moderately long, proximally tapered and distally more or less parallel sided, its outer surface without a diagonal structure; upper mandibular tooth 1.3–1.5× as long as lower one; posterior ocellus almost touching eye; antenna with 56–59 flagellomeres and 20th flagellomere 1.6–1.9× as long as wide.

Enicospilus tangi Shimizu, sp. nov.
http://zoobank.org/3CFC30CE-94A9-4D5E-A3D7-F40D221C6127
Figs 2B, H, 25

Etymology. The specific name is dedicated to Dr Yuqing Tang who described E. longitarsis, which is morphologically the most similar species to the one that is hereby described, and has contributed to the taxonomy of Ophioninae in Asia, represented by the monograph of Chinese Enicospilus (Tang 1990).

Material examined. 1♂: Nepal.


Description. Male (Holotype) (Figs 2B, H, 25). Body length ca 24.5 mm.

Head with GOI = 2.5 (Fig. 25C). Lower face 0.9× as wide as high, moderately punctate with setae and shiny (Fig. 25B). Clypeus 1.7× as wide as high, moderately punctate with setae, moderately convex in profile, lower margin impressed (Fig. 25B, C). Malar space 0.4× as long as basal mandibular width (Fig. 25B, C). Mandible weakly twisted by ca 25°, very long, proximally strongly narrowed, centrally to apically subparallel sided, its outer surface with a diagonal setose deep groove between dorsoproximal corner to base of mandibular apical teeth (Figs 2B, 25B, C). Upper mandibular tooth 2.1× as long as lower one, stouter than lower one (Figs 2B, 25B). Frons, vertex and gena moderately shiny with fine setae.
Figure 24. *Enicospilus purifenestratus* (Enderlein, 1921), ♂. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.
(Fig. 25B–D). Posterior ocellus close to eye, separated from eye by less than 0.1× its own maximum diameter (Fig. 25B–D). Ventral end of ocular carina joining oral carina. Antenna incomplete apically, right antenna with 64 flagellomeres and left antenna with 65 flagellomeres; first flagellomere 1.9× as long as second; 20th flagellomere 2.2× as long as wide.

Metasoma entirely moderately shiny with setae (Fig. 25E). Pronotum punctate dorsally and punctostriate centrally to ventrally (Fig. 25E). Mesoscutum 1.5× as long as its maximum width, densely and finely punctate with setae, rather weakly twisted, and evenly rounded in profile (Fig. 25E). Notauli absent (Fig. 25E). Scutellum moderately convex, moderately punctate with setae, with lateral longitudinal carinae almost reaching posterior end (Figs 2H, 25E). Epicnemium densely punctate with setae. Epicnemial carina carinate, evenly moderately long, proximally tapered and distally parallel sided, its outer surface flat but with conspicuous dense setae and a proximal deep concavity; upper mandibular margin of tergite 1 slightly sinuous; thyridium elongate (Fig. 25F).

Legs. Ventral 0.7 of outer surface of fore tibia with rather dense spines. Hind leg concha in profile 1.8× as long as deep; basitarsus 2.0× as long as second tarsomere; fourth tarsomere 0.7× as long as third tarsomere and 5.0× as long as wide; tarsal claw simply pectinate.

Metasoma with PI = 2.8, DMI = 1.3, THI = 2.1; dorsal margin of tergite 1 slightly sinuous; thyridium elongate (Fig. 25A).

Colour (Fig. 25). Entirely testaceous except for apex of mandible black. Wings hyaline; proximal sclerite testaceous, distal sclerite very weakly pigmented; veins brown.

Variation. Unknown.

Female. Unknown.

Differential diagnosis. Enicospilus tangi sp. nov. can be confused with E. kakanicus sp. nov., E. longitarsis, and E. yonezawanus, all of which belong to the E. ramidulus complex. Among these species, E. tangi sp. nov. is most closely related to E. longitarsis, and these species are distinguished from the other Oriental species of Enicospilus by the triangular proximal sclerite (e.g. Fig. 25F), the absence of the central sclerite (e.g. Fig. 25F), moderately large value of SDI (over 1.3) (e.g. Fig. 25F), a diagonal setose deep groove of the mandibular outer surface (e.g. Fig. 2B), moderately large fore wing fenestra (e.g. Fig. 25F), rather dense spines on the outer surface of the fore tibia, etc. Enicospilus tangi sp. nov. is distinguished from E. longitarsis by the following character states: scutellum narrowed posteriorly (Fig. 2H) (subquadrate in E. longitarsis); fore wing vein 1m-cu&M evenly curved (Fig. 25F) (slightly sinuous in E. longitarsis); lower face 0.9× as wide as high (Fig. 25B) (0.8 in E. longitarsis); GOI = 2.5 (Fig. 25C) (1.8 in E. longitarsis).

Enicospilus tripartitus Chiu, 1954

Figs 2C, 26

Enicospilus tripartitus Chiu 1954: 36; holotype ♀, Taiwan, TARI, examined.

Material examined. 27♀10♂ and 2 unsexed: Nepal (24♀8♂ and 1 unsexed), China (1♀), India (1♂), Japan (1 unsexed), Taiwan (2♀), unknown (1♂).

Type series: holotype of Enicospilus tripartitus Chiu, 1954, ♀, Taihoku, Taiwan, 27.VIII.1937, J. Sonan leg. (TARI); paratype of same species, 1♂, no data (NHMUK).

Non-type series: 24♀8♂, Kakani (2,000 m), Nepal, VIII.1982 (2♀), VI (4♀1♂), VII (4♀3♂), 1–23 (2♀2♂). VIII (3♀1♂), IX (4♀), X (2♀). 1983, 1–30.V (1♀1♂), 1–14.VII (2♀). 1984, M.G. Allen leg. (Figs 2C, 26); 1 unsexed, Sangu (ca 6,200′), Taplejung district, Nepal, 16–29.X.1961; 1♀, ShinKaiSi (1,340 m), Mt Omei, Szechuen, China; 1♂, Kangra Valley (1,370 m), India, X.1899, Dudgeon leg. (all NHMUK); 1 unsexed, Genka-yama, Okinawa-hontô, Okinawa Pref., Japan, 4.V.1964, T. Takara & T. Kakinohana leg. (MNHA); 1♀, Kuanhsi, Taiwan, 29.VIII.1968 (MsT) (TARI); paratype of same species, 1♂, no data (NHMUK).


Diagnosis. Head (Figs 2C, 26B–D): GOI = 2.2–2.9; lower face 0.7–0.8× as wide as high; clypeus moderately to strongly convex in profile, its lower margin more or less blunt; mandible rather weakly twisted by 10–20°, moderately long, proximally tapered and distally parallel sided, its outer surface flat but with conspicuous dense setae and a proximal deep concavity; upper mandibular
Figure 25. Enicospilus tangi Shimizu sp. nov., ♂, holotype. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.

Tooth 1.2–1.6× as long as lower one; posterior ocellus close to eye; antenna with 55–66 flagellomeres and 20th flagellomere 2.2–2.4× as long as wide.

Mesosoma (Fig. 26E): mesopleuron entirely more or less densely punctate and submatt; scutellum with lateral longitudinal carinae reaching posterior end and conve-
Figure 26. *Enicospilus tripartitus* Chiu, 1954. ♀.  
A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view;  
E. Mesosoma, lateral view; F. Central part of fore wing.
gent posteriorly; metapleuron densely punctate as mesopleuron; propodeum weakly declivous, its posterior area moderately reticulate, outer margin of propodeal spiracle not joining pleural carina by a ridge.

Wings (Fig. 26F): fore wing with $AI = 0.3–0.6$, $CI = 0.3–0.4, IC = 0.5–0.7, SDI = 1.2–1.6$; fore wing vein 1m-cu&M almost evenly curved to slightly sinusous, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 26F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite triangular, separated from distal one, strongly pigmented; central sclerite strongly pigmented and sclerotised, well-delineated oval and its major axis parallel to distal margin of fenestra, positioned in mediodistal part of fenestra; distal sclerite absent to weak; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a subintertristal to antefurcal to M&RS by less than 0.2× 1cu-a length.

Colour (Fig. 26): body including intercellar area entirely reddish brown; wings hyaline.

Differential diagnosis. Four Oriental Enicospilus species, $E. laqueatus$, $E. pseudantennatus$, $E. vestigator$, and $E. tripartitus$, have similar fenestra, sclerites, and fore wing veins (e.g. Figs 15F, 21F, 26F), as mentioned under $E. tripartitus$ and $E. pseudantennatus$. Among them, $E. tripartitus$ is readily distinguishable from other species by the outer mandibular surface: outer surface of mandible with very dense setae and sharp and rather deep proximal concavity in $E. tripartitus$ (Figs 2C, 26B, C), but more or less flat proximally with scattered setae in $E. laqueatus$ (Fig. 15B, C) $E. pseudantennatus$ (Fig. 21B, C) and $E. vestigator$.

**Enicospilus yonezawanus** (Uchida, 1928)*

Figs 2D, 27

Henicospilus yonezawanus Uchida 1928: 218; lectotype $\varphi$, Japan, SEHU, designated by Townes et al. (1965: 337), examined. 

Enicospilus microstriatellus Uchida 1956: 95; holotype $\varphi$, Ryûkyû Island, SEHU, examined; synonymised by Gauld and Mitchell (1981: 337).

Material examined. 27$\varphi\varphi8\sigma\sigma$: Nepal (1$\varphi$), India (10$\varphi\varphi$), Indonesia (1$\varphi$), Japan (2$\varphi\varphi7\sigma\sigma$), Laos (8$\varphi\varphi$), Malaysia (4$\varphi\varphi$), Papua New Guinea (1$\varphi$), Taiwan (1$\varphi\varphi$).

Type series: lectotype of **Henicospilus yonezawanus** Uchida, 1928, $\varphi$, Yonezawa, Yamagata Pref., Honshû, Japan, 23.VII.1919, S. Matsumura leg. (SEHU); holotype of **E. microstriatellus** Uchida, 1956, $\varphi$, Simurra, Ama-mi-ôshima, Kagoshima Pref., Ryûkyû, Japan, 7.IV.1954, T. Kumata leg. (SEHU).

Non-type series: 1$\varphi$, Godaveri (1,550–1,700 m), Nepal, IX.1983, M.G. Allen leg. (LT) (Figs 2D, 27); 10$\varphi\varphi$, Andhra Pradesh, Patancheru, India, IX.1980, Ratnagar leg. (LT); 1$\varphi$, Medan, L. Fulmek, Sumatra, Indonesia (all NHMUK); 1$\sigma$, Isa (32°8′29.3″N, 130°33′13.7″E), Kagoshima Pref., Kyûshû, Japan, 7.IX.2012, Y. Matsubara & K. Fukuda leg. (MsT) (NSMT); 5$\varphi\varphi$, Isa (32°3′64.1″N, 130°31′38.4″E), Kagoshima Pref., Kyûshû, Japan, 7.IX.2012, Y. Matsubara & K. Fukuda leg. (MsT) (CNC); 1$\varphi$, Hiji agricultural road (85 m, 26°43′16.8″N, 128°10′43.4″E), Hiji, Kumigi Vil., Kumigi County, Okinawa-hontô, Okinawa Pref., Ryûkyû, Japan, 2–3. VII.2016, S. Shimizu et al. leg. (LT) (MNHA); 4$\varphi\varphi$, Phou Khouen (19.250697 N, 102.254204 E), Luang Phabang, Laos, 21–22.IV.2018, H. Yoshitomi leg. (EUIM); 4$\varphi\varphi$, Sala Phou Khouen (19°25′7.57″N, 102°25′41.6″E), Luang Phabang, Laos, 21.IV.2018, K. Yasuda leg. (LT) (EUIM); 1$\varphi$, Serdang, Malaysia, IX.1979, Khashiyah leg.; 1$\varphi$, Carambola Farm, Serdang, Selangor, Malaysia, XI.1979; 2$\varphi\varphi$, Serdang, Selangor, Malaysia, X (1$\varphi$) and XI (1$\varphi$), 1979, I.D. Gauld leg.; 1$\varphi$, Morobe (1,000 m), Wau, Papua New Guinea, X.1979, I.D. Gauld leg. (all NHMUK); 1$\varphi$, Chihpen, Taichung, Taiwan, 17–18. II.1982, L.Y. Chou & K.C. Chou leg. (TARI).

**Distribution.** Australasian, Eastern Palaearctic, and Oriental regions (Yu et al. 2016). Newly recorded from Nepal.

**Diagnosis.** Head (Figs 2D, 27B–D): GOI = 2.9–3.2; lower face 0.7–0.8× as wide as high; clypeus moderately convex in profile, its lower margin impressed; mandible weakly twisted by 10–20°, moderately long, evenly tapered, its outer surface with a diagonal setose groove between its dorsoproximal corner and base of mandibular apical teeth; upper mandibular tooth 1.2–1.5× as long as lower one; posterior ocellus almost touching eye; antenna with 63–70 flagellomeres and 20th flagellomere 2.0–2.2× as long as wide.

**Mesosoma** (Fig. 27E): metapleuron punctate to rather closely longitudinally striate; scutellum with lateral longitudinal carinae reaching posterior end and convergent posteriorly; metapleuron punctate to striate; propodeum almost evenly rounded, its posterior area moderately reticulate, outer margin of propodeal spiracle joining pleural carina by a ridge.

Wings (Fig. 27F): fore wing with $AI = 0.3–0.7$, $CI = 0.2–0.4$, IC = 0.4–0.6, $SDI = 1.2–1.3$; fore wing vein 1m-cu&M almost evenly curved to very slightly sinusous, 2r&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 27F; fenestra of fore wing not very long and its anterodistal corner distinctly separated from proximal end of vein RS; proximal sclerite triangular, separated from distal one, strongly pigmented; central sclerite absent; distal sclerite absent proximally and weak distally; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a antefurcal to M&RS by 0.1–0.3× 1cu-a length.

Colour (Fig. 27): body including intercellar area entirely testaceous; wings hyaline.

**Differential diagnosis.** Enicospilus yonezawanus is one of the most common in the Eastern Palaearctic and Oriental regions and more or less distinctive species based on some characters, such as mandibular and
Figure 27. *Enicospilus yonezawanus* (Uchida, 1928), ♀. **A.** Habitus; **B.** Head, frontal view; **C.** Head, lateral view; **D.** Head, dorsal view; **E.** Mesosoma, lateral view; **F.** Central part of fore wing.
clypeal structure, shape of fore wing sclerites, and surface sculpture of mesopleuron, but can be confused with *E. kakanicus* sp. nov., *E. longitarsis*, and *E. tangi* sp. nov. However, *E. yonezawanus* is distinguishable from *E. kakanicus* sp. nov. by the complete lateral longitudinal carinae of the scutellum (lateral longitudinal carinae of the scutellum posteriorly absent in *E. kakanicus* sp. nov., as in Figure 2F), from *E. longitarsis* and *E. tangi* sp. nov. by the scattered spines on the outer fore tibial surface (spines rather dense in *E. longitarsis* and *E. tangi* sp. nov.) and the separated proximal and distal sclerites (Fig. 27F) (proximal and distal sclerites confluent in *E. longitarsis* and *E. tangi* sp. nov. as in e.g. Figure 25F).

**Enicospilus zebrus** Gauld & Mitchell, 1981*

*Fig. 28*

*Enicospilus zebrus* Gauld and Mitchell 1981: 406; holotype ♂, Myanmar, EMUS, examined.

**Material examined.** 8♀3♂: Nepal (3♀2♂), China (2♀1♂), Myanmar (3♀♂). Type series: holotype of *Enicospilus zebrus* Gauld & Mitchell, 1981, ♀, Mt Victoria (2,800 m), Myanmar, V.1938, G. Heinrich leg. (EMUS); paratypes of *E. zebrus*, 2♀♂, same data as holotype except for 2,400 m (NHMUK and EMUS).

Non-type series: 1♂, Choche Lekh (3,500 m), Chautara Dist., Nepal, 17.VI.1983, G. Robinson leg.; 1♂, Phulchoki peak (2,700 m), Nepal, X.1983, M.G. Allen leg. (LT); 1♂, Phulchoki (2,500 m), Nepal, IX.1982, M.G. Allen leg. (LT) (Fig. 28); 1♀, montane & oak forest (2,760 m), Phulchoki, Nepal, VIII.1983, M.G. Allen leg. (LT); 1♀, Nauling Lekh (9,000′), Gobre, Nepal, VI.1983, M.G. Allen leg. (LT); 2♀♂, Yu Lung Mountain (3,200 m), Likiang, Yunnan, P.R. China, 15–21.VI.2009, A.C. Galsworthy leg. (LT) (all NHMUK).

**Distribution.** Oriental region (Yu et al. 2016). Newly recorded from Nepal.

**Diagnosis.** Head (Fig. 28B–D): GOI = 3.0–3.2; lower face 0.6–0.7× as wide as high; clypeus slightly convex in profile, its lower margin acute; mandible weakly twisted by 10–20°, moderately long, proximally tapered and distally more or less parallel sided, its outer surface without a diagonal structure; upper mandibular tooth 1.2–1.3× as long as lower one; posterior ocellus almost touching eye; antenna with 58–61 flagellomeres and 20th flagellomere 2.6–2.7× as long as wide.

**Mesosoma** (Fig. 28E): mesopleuron punctate to rather coarsely longitudinally striate; scutellum with lateral longitudinal carinae reaching posterior end and convergent posteriorly; metapleuron rather coarsely striate; propodeum evenly weakly rounded, its posterior area more or less coarsely irregularly wrinkled with strong posterior transverse carina laterally, outer margin of propodeal spiracle joining pleural carina by a ridge.

**Wings** (Fig. 28F): fore wing with AI = 0.5, CI = 0.3–0.4, ICI = 0.4–0.5, SDI = 1.4–1.5; fore wing vein 1m-cu&M very slightly sinuous, 2&RS almost straight; fenestra and sclerites of discosubmarginal cell of fore wing as in Figure 28F; fenestra of fore wing very long and its anterodistal corner very close to proximal end of vein RS; proximal sclerite triangular, confluent with distal one, strongly pigmented; central sclerite moderately pigmented, ill-delineated semicircular to oval, its major axis parallel to distal margin of fenestra, positioned in very distal and slightly anterior part of fenestra; distal sclerite entirely moderately pigmented; proximal corner of marginal cell of fore wing uniformly setose; vein 1cu-a antefurcal to M&RS by 0.1× 1cu-a length.

**Colour** (Fig. 28): body entirely black with pale yellow patterns, intercellar area not infuscate; wings hyaline but fore wing with three strongly infumate areas around anterocentral part of discosubmarginal cell, proximal part of second discal cell, and central part of marginal cell.

**Differential diagnosis.** Gauld and Mitchell (1981) suggested that *E. zebrus* is related to the *E. signativentris* species-group and very close to *E. biumbratus* (Morley, 1912) on body and wing color pattern as well as other characters, but *E. zebrus* is distinguished from *E. biumbratus* by many characters, such as the longer fore wing fenestra (Fig. 28F), smaller and semicircular to oval central sclerite (Fig. 28F), etc.

**Species inquirendae and pending taxonomic acts**

Some morphospecies and species-groups listed here are tentatively treated as species inquirendae pending taxonomic acts. Two morphospecies (*Enicospilus* sp. 1 (Fig. 29) and *Enicospilus* sp. 2 (Fig. 30)) are likely to be undescribed species, but the only available specimens are in poor condition, so they are not be described here. Also, the *E. erythrocerus* species-group is currently taxonomically challenging. Type specimens must be re-examined and integrative taxonomic methods should be included to delimit and redefine species. Three morphospecies are included in Nepalese specimens of the *E. erythrocerus* group (Fig. 31), and at least one of these is potentially an undescribed species.

**Enicospilus sp. 1**

*Fig. 29*

**Material examined.** 1 unsexed: Nepal. 1 unsexed, Phulchoki (2,000 m), Nepal, VIII.1982, M.G. Allen leg. (LT) (NHMUK) (Fig. 29).

**Comments.** The mandibular structure of this species indicates it is associated with the *E. ramidulus* complex. *Enicospilus* sp. 1 does not key out to any species in Gauld and Mitchell’s (1981) and Tang’s (1990) keys and is possibly an undescribed species. It may potentially be found to be closely related to *E. choui* Tang, 1990 or *E. sinicus* Tang, 1990. However, only one broken specimen is known, so I tentatively treat this species as a species inquirenda.
Enicospilus sp. 2

Fig. 30

Material examined. 1♂: Nepal.

1♂, Terai (200 m), Chitwan, Nepal, 12–13.III.1983, M.G. Allen leg. (NHMUK) (Fig. 30).

Comments. The material examined is not in bad condition except for incomplete antennae. However, antennal characters are often useful and important for distinguishing Enicospilus species, as previous studies suggested (e.g. Broad and Shaw 2016). Therefore, antennae should be complete to describe a new species.

The affinities of this species are not clear, but, as with Enicospilus sp. 1, it also does not key out to any species in Gauld and Mitchell’s (1981) or Tang’s (1990) keys, indicating that it is potentially an undescribed species.

Figure 28. Enicospilus zebrus Gauld & Mitchell, 1981, ♀. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.
Enicospilus erythrocerus species-group

Fig. 31

Material examined. 8♀19♂: Nepal.
1♀1♂, Godaveri (1,550–1,700 m), Nepal, VI (1♂), IX (1♀).1983, M.G. Allen leg. (LT); 1♂, Chautasa (6,000′), Nepal, 24.IX.1983, M.G. Allen leg. (Fig. 31A, B); 1♀, Kakani (2,070 m), Nepal, VII.1983, M.G. Allen leg. (LT); 1♀, secondary vegetation (1,500 m), Kathmandu, Nepal, 10.I.1984, M.G. Allen leg. (LT); 1♂, Godaveri (1,550–1,700 m), Nepal, 5.VIII.1984, M.G. Allen leg. (LT) (Fig. 31C, D); 1♀, Kakani

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Figure 30. Enicospilus sp. 2, ♂. A. Habitus; B. Head, frontal view; C. Head, lateral view; D. Head, dorsal view; E. Mesosoma, lateral view; F. Central part of fore wing.
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Figure 31. Nepalese specimens of the *Enicospilus erythrocerus* species-group spp. A-B. ♂ from Chautasa: A. habitus, B. central part of fore wing; C-D. ♂ from Godaveri: C. habitus, D. central part of fore wing; E-F. ♀ from Kathmandu: E. habitus, F. central part of fore wing.

(2,070 m), Nepal, VII.1983, M.G. Allen leg. (LT); 3♀15♂, Kathmandu (1,300 m), Nepal, X (3♂♀), XI (3♀12♂), 1♀, Kakani (2,070 m), Nepal, VII.1983, M.G. Allen leg. (LT); 1♀, Pokhara (950 m), Nepal, M.G. Allen leg. (LT) (all NHMUK).

**Comments.** The *E. erythrocerus* species-group is moderately large and one of the most taxonomically confusing groups within *Enicospilus*. It consists of rather large wasps with the fore wing fenestra lacking any trace of sclerites, SDI more than 1.2, lateral longitudinal carinae of the scutellum almost always reaching the posterior end, moderately sized fore wing fenestra, etc. In this study, I examined 27 Nepalese specimens of this species-group and recognised at least three morphospecies (Fig. 31). However, further research is needed to identify or describe them. Therefore, I tentatively treat all specimens of the *E. erythrocerus* species-group as species inquirenda.

**Discussion**

Many species of Nepalese *Enicospilus* were recognised from middle elevations, and the median value of elevation for 83% of Nepalese *Enicospilus* fauna is between 950–2,070 m (Fig. 32). These species are generally widely distributed in the mountainous areas of the (sub)tropical Oriental region and, in some species, such as *E. lineolatus* and *E. yonezawanus*, also in the Eastern Palaearctic region. On the other hand, three species (i.e. *E. capensis*, *E. kanshirensis*, and *E. pudibundae*) have been collected only at lower elevations, from 200–330 m (Fig. 32). These species are also widely distributed in the Oriental region, as with the middle-elevation species, and in particular *E. capensis* is a very widespread Old World species known from the Afrotropical, Australasian, Oceanic, and Oriental regions (Gauld and Mitchell 1981). However, *E. zebrus* has been collected only at higher elevations (Fig. 32), above 2,500 m, suggesting that this species is restricted
to the northern high-elevational margin of the continental Oriental region and endemic to the southern slope and eastern highlands of the Himalayas. This is a preliminary study of the Nepalese fauna of *Enicospilus*, as well as of Ophioninae; the sample size is small and the sampling bias of the materials used in the present study is not known, but trends of elevational distribution patterns are indicated. These elevational and distribution patterns of Nepalese *Enicospilus* species are fairly consistent with those proposed by Gauld and Mitchell (1981) and Gauld (1985a).

The Nepalese fauna of *Enicospilus* has trebled through this study, even though it is a preliminary work. Based on species represented by more than two specimens, no endemcity of the Nepalese fauna is recognised, with most species common to other Oriental countries. Moreover, several common Oriental *Enicospilus* species, such as *E. abdominalis* (Szépligeti, 1906), *E. aciculatus* (Taschenberg, 1875), *E. concentralis* Cushman, 1937, *E. dasychitrae* Cameron, 1905, *E. dolosus* (Tosquinet, 1896), *E. exaggeratus* Chiu, 1954, *E. nigropectus* Cameron, 1905, *E. riukiuensis* (Matsumura & Uchida, 1926), *E. shinkanus* (Uchida, 1928) and *E. signativentris* (Tosquinet, 1903), have not been found in Nepal yet, but they may be present in the country. Considering the *Enicospilus* fauna of adjacent areas of Nepal and that of the Old World, at least 60 species are potentially found in Nepal. Therefore, additional studies and greater sampling efforts are needed to reveal the true *Enicospilus* diversity in Nepal.

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