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## Five new Oriental species of the genus *Ichneumon* LINNAEUS (Hymenoptera, Ichneumonidae, Ichneumoninae)

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**A b s t r a c t :** In this study, new taxonomical and distributional informations of seven Oriental species of the genus *Ichneumon* LINNAEUS are presented. Five species are new to science: *Ichneumon brevitemporalis* nov.sp., *Ichneumon giganteus* nov.sp., *Ichneumon scopator* nov.sp., *Ichneumon sikkimensis* nov.sp., and *Ichneumon yunnanesis* nov.sp.

The new species are described and illustrated, and a key for the ♀♀ of Oriental *Ichneumon* species is presented.

**K e y w o r d s :** Ichneumonidae, Ichneumon, new species, Oriental.

### Introduction

The genus *Ichneumon* LINNAEUS is a very large genus of Ichneumonidae with more than 400 known species in the Palaearctic region (YU et al. 2016) but the genus is less diverse in the Oriental region. Not more than 20 species have been described from this area so far (YU et al. 2016, RIEDEL 2019).

During my recent studies of Oriental Ichneumoninae from the collections of several European museums and institutions, I found five additional species which are described here.

### Material and methods

For this publication, I had the opportunity to study the Oriental Ichneumoninae from the collections of the Biologiezentrum Linz/Austria (Linz), the Zoologische Staatssammlung München/Germany (ZSM), and the Senckenberg Deutsches Entomologisches Institut at Müncheberg/Germany (SDEI).

For the descriptions below, morphological terms follow BROAD et al. (2018). The distributional records were taken from the catalogue of YU et al. (2016) and my previous publication (RIEDEL 2019).

For the measurements the following relations were used: length of 1<sup>st</sup> flagellomere was measured in lateral view (length without annellus) and length and width of hind femur in lateral view. For the punctuation of body parts, the following definitions were used: sparse – distance 1.1-2× their diameter; rather dense – distance about as their diameter; dense – diameter of punctures larger than their distance.

Used abbreviations: OED – distance between lateral ocellus and compound eye; OOD – distance between lateral ocelli. HT – holotype, PT – paratype.

For the measurements an Olympus SZX 7 stereo microscope with dividing eyepiece was used. The figures were mainly taken with an Olympus SC 50 CCD-camera using the cellSens Imaging software and processed with the Helicon Pro software and Microsoft Office Picture Manager.

### List of species

#### *Ichneumon brevitemporalis* nov.sp. (Figs 1-4)

**Material examined:** Holotype: (♀) China: Yunnan, Tengchong, N 25.016° E 98.466°, 1900 m, 31.v.2009, leg. Blank, Liston, Taeger (SDEI).

**E t y m o l o g y :** The species name refers to the unusually short (latin: brevis) temples.

**Description:** Body length 6.5 mm. Flagellum with 31 flagellomeres, bristle-shaped; 1<sup>st</sup> flagellomere  $2.9 \times$  longer than wide; about 11<sup>th</sup> flagellomere square; widest flagellomeres square; preapical flagellomeres  $1.3 \times$  longer than wide. Temple rather short, moderately and linearly narrowed behind eye, dorsally  $0.5 \times$  as long as eye. OED  $1.2 \times$  and OOD  $1.1 \times$  ocellar diameter. Head densely rugose-punctate,  $\pm$  dull. Face densely rugose-punctate. Clypeus slightly convex, with rather dense punctures, shining; apical margin sharp, straight. Gena with striated punctures dorsally and sparse punctures ventrally. Mandible unmodified and with two teeth; ventral tooth smaller than dorsal tooth. Malar space  $0.9 \times$  as long as width of mandibular base.

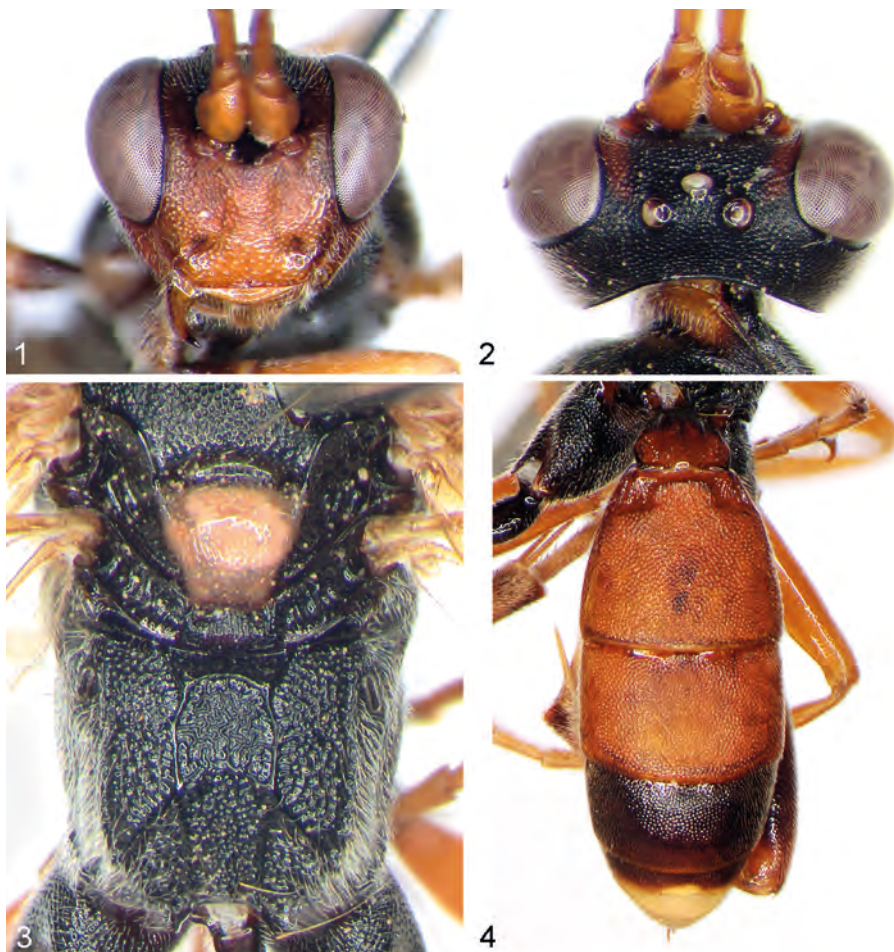
Notaulus indistinct. Mesoscutum densely rugose-punctate, dull. Mesopleuron including speculum and metapleuron rugose-punctate; juxtacoxal carina present. Scutellum slightly convex, about as long as wide, densely punctate, without lateral carina. Propodeum coarsely rugose-punctate. Area superomedia hexagonal, slightly longer than wide; anterior transverse carina (costula) absent. Hind coxa densely punctate, without scopa or other modifications. Hind femur densely punctate,  $3.9 \times$  longer than wide. Tarsi rather slender, 3<sup>rd</sup> mid tarsomere  $1.8 \times$  longer than wide. Claws simple. Areolet pentagonal, frontal distance between veins 2rs-m and 3rs-m  $3 \times$  their width; vein 1cu-a postfurcal by  $1 \times$  its width.

Metasoma oxygygous, but hypopygium slightly elongate. Postpetiolus moderately widened; median field finely aciculate, lateral field finely rugose. Gastrocoelus distinctly impressed, with ridges. Thyridium transverse,  $0.9 \times$  as wide as interval between thyridia. 2<sup>nd</sup> tergite  $1.2 \times$  wider than long. 2<sup>nd</sup> and 3<sup>rd</sup> tergites densely rugose-punctate, 4<sup>th</sup> tergite with fine dense punctures. Ovipositor sheath slender, reaching behind metasomal apex by length of 3<sup>rd</sup> hind tarsomere.

Color: black. Palps, mandible except teeth, clypeus, gena, face and stripe of frontal orbit, scape, pedicel and basal four flagellomeres reddish. Flagellomeres 8-12 ivory dorsally. Collar, hind edge of pronotum and tegula red. Scutellum cream-yellow. Postpetiolus, 2<sup>nd</sup> and 3<sup>rd</sup> tergites red. Small apical spot of 5<sup>th</sup> tergite and 6<sup>th</sup> and 7<sup>th</sup> tergites mainly ivory. Coxae and trochanters black; legs otherwise mainly red; hind femur black, red basally and apically; hind tibia red, black in apical 0.2; hind tarsus except brown distal tarsomere red. Wings hyaline; pterostigma ochreous.

♂ unknown.

**D i s t r i b u t i o n :** Only known from Southern China.



**Figs 1-4:** *Ichneumon brevitemporalis* nov.sp. HT: (1) face, (2) head from dorsal, (3) propodeum, (4) metasoma.

***Ichneumon giganteus* nov.sp. (Figs 5-8)**

**Material examined:** Holotype: (♀) Laos, Hua Phan Prov., Phon Pan (Mt.), Ban Saleui (Village), 20°13'30"N 103°59'26"E, 1350-1900 m MSL, 03-05.06.2009, leg. C. Holzschuh, and many locals (Linz). Paratypes: (♂) Laos, Hua Phan Prov., Ban Saleui, Phon-Pan-Mt., 20°13'30"N 103°59'26"E, 1350-1900 m, 03.05.2011, leg. C. Holzschuh & natives (Linz); (♂) Laos, Hua Phan Prov., Ban Saleui, Phon-Pan-Mt., 20°13'30"N 103°59'26"E, 1350-1900 m, 07.05.2011, leg. C. Holzschuh & natives (Linz).

**Etymology:** The species name refers to the very large size.

**Description:** ♀. Body length 30 mm. Flagellum slender and slightly lanceolate, with 56 flagellomeres; 1<sup>st</sup> flagellomere 2.5 × longer than wide, about 15<sup>th</sup> flagellomere square, widest flagellomeres 1.2 × wider than long. Head punctate. Temple strongly and concavely narrowed behind eye. Occipital carina lamelliform. OED 1.2 × ocellar

diameter. Apical margin of clypeus almost straight. Malar space  $0.4 \times$  as long as width of mandibular base. Mandible unmodified and with two teeth; ventral tooth distinctly smaller than dorsal tooth. Genal carina reaching hypostomal carina far from mandibular base.

Mesosoma covered with whitish setae. Notaulus strongly impressed in frontal half of mesoscutum. Mesoscutum with fine superficial punctures and finely granulated, dull. Mesopleuron and metapleuron punctate, shining. Scutellum longer than wide, moderately elevated, without lateral carina. Area superomedia slightly elevated, hexagonal, slightly longer than wide, rugose; anterior transverse carina (costula) reaching its middle. Area externa of propodeum with fine oblique striation; area petiolaris with strong lateral carina and transverse striation. Hind coxa densely punctate, with very small reddish scopa. Hind femur slender, densely punctate,  $5.6 \times$  longer than wide. Tarsi slender; 3<sup>rd</sup> mid tarsomere  $2.0 \times$  longer than wide. Claws simple. Areolet longer than wide, frontal distance between veins 2rs-m and 3rs-m  $2 \times$  their width. Vein 1cu-a strongly postfurcal.

Metasoma strongly oxygyous. Lateral field of postpetiolus  $0.8 \times$  as wide as median field, median field strongly aciculate, with c. 20 fine longitudinal stripes. Thyridium  $1.2 \times$  wider than the interval between thyridia, the interval about as wide as median field of postpetiole. 2<sup>nd</sup> tergite  $1.1 \times$  wider than long. 2<sup>nd</sup> to 4<sup>th</sup> tergites finely punctate; 2<sup>nd</sup> tergite  $\pm$  aciculate medially; 5<sup>th</sup> tergite with very superficial punctures; 5<sup>th</sup> to 7<sup>th</sup> tergites shining. Ovipositor sheath slightly extending behind metasomal apex.

Color: black. Ivory are ventral stripes on flagellomeres 2-18, palps, mandibular base, side of clypeus, triangular spot on facial orbit, frontal and vertical orbits, gena and outer orbit in ventral half, scape and pedicel ventrally, propleuron, collar, upper margin and ventral spot on pronotum, spot on tegula, subtegular ridge, two longitudinal paramedian stripes on mesoscutum, smaller spot on mesopleuron frontal to epicnemial carina and larger spot on central mesopleuron, posteromedian spot on mesosternum, scutellum and postscutellum, upper division and spot on metapleuron, area dentipara, posterolateral marks on all tergites, spots on fore and mid coxae, all trochanters and trochantelli, apical 1/3 of all femora, tibiae and tarsi, dorsal and ventro-apical spots on hind coxa, apical 1/3 of hind tibia, fore and mid metatarsi apically and rings of other fore and mid tarsomeres, apical half of hind metatarsus, and 2<sup>nd</sup> to 5<sup>th</sup> hind tarsomeres mainly. Wings with brownish tinge; pterostigma blackish.

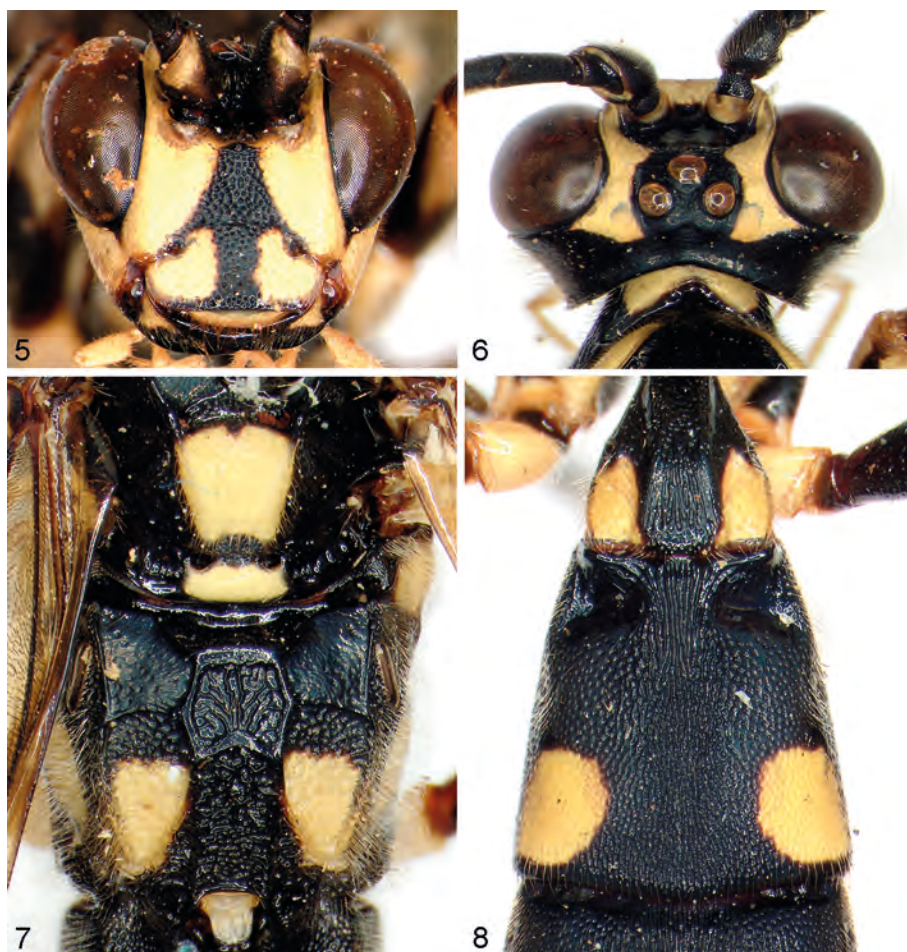
♂: Body length 23-29 mm. Flagellum slender and bristle-shaped, with 48-51 flagellomeres. Tyloids on flagellomeres 12-20, long-oval. Hind femur  $5.4 \times$  longer than wide. Fore metatarsus without apical tooth. 2<sup>nd</sup> tergite  $1.1 \times$  longer than wide. 2<sup>nd</sup> to 4<sup>th</sup> tergites finely punctate, aciculate medially,  $\pm$  dull; 5<sup>th</sup> tergite with aciculation in basal 1/3 only. 6<sup>th</sup> and 7<sup>th</sup> tergites shining, with superficial punctures.

Color: black. Tyloids black. Ivory are dorsal stripes on flagellomeres 1-21, clypeus and face entirely, frontal stripes on fore and mid femora, tibiae and tarsi, dorsal and ventro-apical spots on hind coxa, apical 1/4 of hind femur, apical 1/3 of hind tibia, apical half of hind metatarsus, and 2<sup>nd</sup> to 5<sup>th</sup> hind tarsomeres mainly. Wings hyaline, pterostigma blackish. Coloration otherwise as described for the ♀.

R e m a r k s : This new species represents one of the largest Ichneumonines from the Oriental region. It is related to *Ichneumon leucogigas* HEINRICH, 1965, but differs by two

longitudinal paramedian stripes on mesoscutum, posterolateral yellow marks of all tergites including the 7<sup>th</sup>, black prescutellar ridge and different coloration of the propodeum.

**Distribution:** Only known from Laos.



**Figs 5-8:** *Ichneumon giganteus* nov.sp.: (5) face of HT, (6) head of PT, (7) propodeum of PT, (8) basal tergites of PT.

***Ichneumon leucogigas* var. *australis* HEINRICH, 1965, new ♂**

**Material examined:** Laos, Hua Phan Prov., Phon-Pan, Umg. Ort Ban Saleui, N 20°13'30'' E 103°59'26'', 1350-1900 m, 1♀ 21-22.iv.2010, 1♀ 28.iv.2010, 1♂ 7-8.v.2010, 1♀ 14-15.v.2010, 1♂ 6.v.2011, 3♂♂ 25-26.iv.2012, 2♂♂ 2-3.v.2012, leg. C. Holzschuh & natives (Linz and coll. RIEDEL).

**Remarks:** ♂: Flagellum with 40 flagellomeres. Tyloids on flagellomeres 9-17. Hind femur slender, 4.5 × longer than wide, with very scattered punctures in basal 1/3

and ventral 1/2. Postpetiolus with some transverse rugae basally and fine longitudinal aciculation apically.

The available ♂♂ differ from *Ichneumon leucogigas* s.str. by: 2<sup>nd</sup> to 4<sup>th</sup> tergites with posterolateral ivory spots, 5<sup>th</sup> to 7<sup>th</sup> tergites completely black. Coloration otherwise as described for *I. leucogigas* (HEINRICH 1965: 82-83).

**Distribution:** Known from Myanmar, new record for Laos.

### ***Ichneumon rhododendron* HEINRICH, 1965**

**Material examined:** Laos, Hua Phan Prov., Phon-Pan, Umg. Ort Ban Saleui, N 20°13'30'' E 103°59'26'', 1350-1900 m, 1♀ 6-11.iv.2014, leg. C. Holzschuh & natives (Linz); China, Yunnan prov., Heishui, 35 km N Lijiang, 27.13°N 100.19°E, 1♀ 1-19.vii.1992, 1♀ 18.vi.-4.vii.1993, leg. S. Beyer (Linz).

**Remarks:** ♀: Body length 12 mm. Flagellum with 41 flagellomeres; flagellomeres 9-15 with ivory stripes. Mesoscutum reddish, with three dark brown longitudinal stripes. Hind femur with sparse punctures in ventral 1/3, 3.7 × longer than wide. Collar and subtegular ridge yellowish, upper margin of pronotum pale reddish. Margins of mesopleuron and metapleuron partly dark reddish. Structure and coloration otherwise as described by HEINRICH (1965: 84-85).

**Distribution:** Known from Myanmar and Nepal, new records for Southern China and Laos.

### ***Ichneumon scopator* nov.sp. (Figs 9-11)**

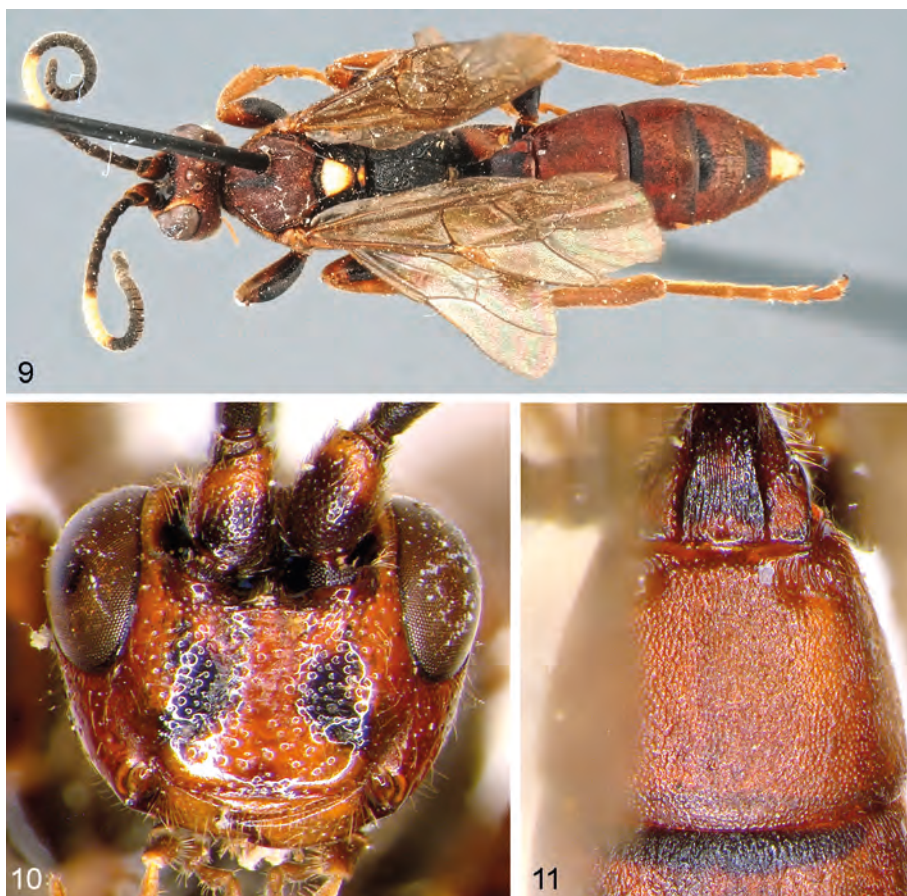
**Material examined:** Holotype: (♀) China, Yunnan, Dequen, 3900 m, 10.vii.-19.vii.1996, E. Kucera lg. (Linz).

**Etymology:** The species name refers to the small but distinct scopa of hind coxa.

**Description:** Body length 11 mm. Flagellum filiform, with 33 flagellomeres; 1<sup>st</sup> flagellomere 1.5 × longer than wide; about 5<sup>th</sup> flagellomere square; widest flagellomere 1.3 × wider than long; preapical flagellomere 0.6 × as long as wide. Temple moderately and roundly narrowed behind eye. OED 1.3 × and OOD 1.3 × ocellar diameter. Frons coarsely rugose-punctate, dull. Face with rather dense punctures, shining. Clypeus with sparse punctures, strongly shining. Gena seen laterally 1.3 × as wide as eye, with sparse punctures ventrally. Malar space long, 1.4 × as long as width of the mandibular base and 1.3 × as long as 1<sup>st</sup> flagellomere. Genal carina reaching hypostomal carina far from mandibular base; both carinae low.

Mesosoma covered with grey hairs. Notaulus shortly impressed at frontal margin of mesoscutum. Mesoscutum densely rugose-punctate, dull. Mesopleuron densely punctate, with striated rugae dorsally. Metapleuron coarsely rugose-punctate; juxtacoxal carina present. Scutellum almost flat, about as long as wide, with sparse punctures, without lateral carina. Propodeum rugulose-punctate. Area superomedia rectangular, slightly longer than wide. Anterior transverse carina (costula) absent. Mid coxa almost smooth ventrally. Hind coxa densely punctate, with small distinct scopa apico-ventrally (0.2 × as long as hind coxa). Hind femur 3.5 × longer than wide, with sparse punctures in ventral third and at base. Tarsi moderately widened; 3<sup>rd</sup> mid tarsomere 1.3 × longer than wide. Hind tibia with c. 5 denticular spurs externally. Areolet pentagonal; frontal distance between veins 2rs-m and 3rs-m 2 × their width. Vein 1cu-a postfurcal by 2 × its width.





**Figs 9-11:** *Ichneumon scopator* nov.sp. HT: (9) habitus, (10) face, (11) basal tergites.

Metasoma oxypygous. Postpetiole distinctly widened, with distinct dorsal carina, lateral field  $0.5 \times$  as wide as median field; median field with c. 10 regular striae. Gastrocoelus strongly impressed, with longitudinal ridges. Thyridium transverse,  $0.8 \times$  as wide as the interval between thyridia. 2<sup>nd</sup> and 3<sup>rd</sup> tergites finely and densely rugose-punctate, dull. Ovipositor sheath slightly extending behind metasomal apex.

Color: black. Flagellomeres 7-13 ivory dorsally. Palps, mandible, clypeus, face except two paramedian black spots, orbits, vertex and scape red. Frontal orbit with narrow yellowish stripe. Frontal and upper margins of pronotum, mesoscutum and tegula red. Scutellum and postscutellum yellow. Side of postpetiolus and all tergites red. 2<sup>nd</sup> to 4<sup>th</sup> tergites with transverse black basal stripes; 6<sup>th</sup> and 7<sup>th</sup> tergites with median ivory spots. Coxae and trochanters black; fore and mid coxae apically, hind coxa dorsally and all trochantelli red. Femora black,  $\pm$  reddish apically. Tibiae and tarsi red. Wings with yellowish infuscation. Pterostigma yellowish.

♂ unknown.

**D i s t r i b u t i o n :** Southern China (Yunnan).

***Ichneumon sikkimensis* nov.sp. (Figs 12-16)**

**Material examined:** Holotype: (♀) [India] Sikkim, Yoksam, 4.xi.1978, leg. E. Albertshofer (ZSM).

**E t y m o l o g y:** The species name refers to the collection site, the Indian province Sikkim.

**D e s c r i p t i o n:** Body length 9 mm. Flagellum filiform, with 35 flagellomeres; 1<sup>st</sup> flagellomere  $1.5 \times$  longer than wide; 8<sup>th</sup> flagellomere square; preapical flagellomere  $0.6 \times$  as long as wide. Temple slightly narrowed behind eye, dorsally about as wide as eye. OED  $1.6 \times$  and OOD  $1.0 \times$  ocellar diameter. Frons and vertex coarsely rugose-punctate, dull. Face punctate, sparsely punctate centrally, with some transverse rugae paramedially. Clypeus with sparse punctures, shining. Gena with very sparse punctures ventrally. Mandible unmodified and with two teeth; ventral tooth smaller than dorsal tooth. Malar space very long,  $1.7 \times$  longer than width of mandibular base.

Mesosoma covered with pale hairs. Notaulus not distinctly impressed. Mesoscutum with dense confluent punctures, dull. Mesopleuron punctate, striate in caudal half. Metapleuron completely striate. Juxtacoxal carina absent. Scutellum flat, as long as wide, without lateral carina and with very sparse punctures. Propodeum coarsely rugulose-punctate. Area superomedia rectangular,  $1.1 \times$  longer than wide; anterior transverse carina (costula) absent. Hind coxa without scopa, with very sparse punctures in apical half. Hind femur basally and in ventral half with sparse and superficial punctures, finely granulate,  $3.7 \times$  longer than wide. Tarsi rather slender, 3<sup>rd</sup> mid tarsomere  $1.7 \times$  longer than wide. Claws simple. Areolet pentagonal, frontal distance between veins 2rs-m and 3rs-m  $3 \times$  their width. Vein 1cu-a strongly postfurcal.

Postpetiolus moderately widened apically, without distinct dorsal carina; median field with superficial fine aciculation. Gastrocoelus almost triangular, slightly impressed and with some fine oblique striae. Thyridium small, oblique,  $0.3 \times$  as wide as the interval between thyridia. 2<sup>nd</sup> and 3<sup>rd</sup> tergites with fine dense punctures; 2<sup>nd</sup> tergite  $\pm$  striate between thyridia; following tergites almost smooth and shining.

Color: reddish. Blackish are distal flagellum from 19<sup>th</sup> flagellomere on, frons above antennae, propleuron, side of pronotum medially, frontal spot of mesoscutum, entire mesosternum, frontal margin of propodeum, area superomedia and area petiolaris, basal band of 2<sup>nd</sup> tergite, basal and apical bands of 3<sup>rd</sup> tergite, bases of coxae and spots of all trochanters. Yellowish are upper pronotal margin, prescutellar carina, scutellum and postscutellum, side of propodeum, hind margin of postpetiolus, posterolateral spots on 2<sup>nd</sup> to 4<sup>th</sup> tergites, apico-median spots of tergites 5-7 and subbasal rings of all tibiae. Wings hyaline, pterostigma yellowish.

♂ unknown.

**R e m a r k s:** This new taxon is closely related to *I. americanicolor* HEINRICH, 1965 and *I. tricoloratus* RIEDEL, 2019, but differs by its smaller size and subbasal yellow tibial rings.

**D i s t r i b u t i o n:** Northern India.





**Figs 12-16:** *Ichneumon sikkimensis* nov.sp. HT: (12) habitus, (13) face, (14) head from dorsal, (15) propodeum, (16) basal tergites.

***Ichneumon yunnanensis* nov.sp. (Figs 17-19)**

**Material examined:** Holotype: (♀) China-Yunnan prov., 10 km E of Yunlong vill. 17.-18.viii.1998, O. Safránek et M. Trýzna lgt. (ZSM).

**E t y m o l o g y :** The species name refers to the collection site, the Chinese province Yunnan.

**Description:** Body length 15 mm. Flagellum filiform, with 41 flagellomeres; 1<sup>st</sup> flagellomere  $1.7 \times$  longer than wide; about 8<sup>th</sup> flagellomere square; preapical flagellomere  $0.7 \times$  as long as wide. Temple slightly and roundly narrowed behind eye, dorsally  $0.9 \times$  as long as eye. OED  $1.7 \times$  ocellar diameter. Frons and vertex with coarse and rugose punctures, dull. Face densely punctate, partly rugose. Clypeus with sparse punctures, shining. Gena with sparse punctures ventrally. Malar space  $1.1 \times$  longer than width of mandibular base. Genal carina reaching hypostomal carina far from mandibular base; hypostomal carina slightly elevated.

Mesosoma with pale hairs. Side of pronotum with fine dense punctures. Notaulus impressed at frontal margin of mesoscutum. Mesoscutum with dense punctures, shining. Mesopleuron densely punctate, shining. Metapleuron punctate, partly rugose; juxtacoxal carina absent. Scutellum flat, slightly wider than long, punctate, without lateral carina. Propodeum coarsely rugulose-punctate. Area superomedia rectangular, slightly longer than wide; anterior transverse carina (costula) absent. Hind coxa densely punctate, with a very finely granulated area ventrally but without scopa. Base and ventral third of hind femur with coarse but sparse punctures, hind femur  $3.7 \times$  longer than wide. Claws simple. Areolet pentagonal, frontal distance between veins 2rs-m and 3rs-m  $4 \times$  their width. Vein 1cu-a postfurcal.

Metasoma oxygygous. Postpetiolus strongly widened apically, without distinct dorsal carina; median field with fine dense aciculation. Gastrocoelus slightly impressed and with some fine striae. Thyridium small, oblique,  $0.7 \times$  as wide as the interval between thyridia. 2<sup>nd</sup> tergite  $1.3 \times$  wider than long. 2<sup>nd</sup> and 3<sup>rd</sup> tergites with fine dense punctures and fine granulation, moderately shining; 2<sup>nd</sup> tergite with fine longitudinal rows of punctures between thyridia, but without distinct aciculation; 4<sup>th</sup> tergite superficially punctate; following tergites almost smooth and strongly shining.

**Color:** black. Reddish are occiput and part of frons, side of clypeus, tegula and mesoscutum (except diffuse longitudinal blackish median and lateral stripes). Ivory are flagellomeres 8-15 dorsally, wide facial and narrow frontal orbits up to vertex, frontal and upper margins of pronotum, subtegular ridge, scutellum, large spot on dentiparal area, wide apical band of postpetiolus (narrowed medially), large almost rectangular posterolateral spots on 2<sup>nd</sup> to 4<sup>th</sup> tergites, large apical spots on 5<sup>th</sup> to 7<sup>th</sup> tergites (widest on 5<sup>th</sup> tergite) and dorsal spots on all coxae. Legs black; tarsi with diffuse dark reddish-brown suffusion. Wings slightly yellowish, pterostigma brownish.

♂ unknown.

**D i s t r i b u t i o n :** Southern China (Yunnan).



Figs 17-19: *Ichneumon yunnanensis* nov.sp. HT: (17) habitus, (18) face, (19) head.

### Key to the ♀♀ of *Ichneumon* LINNAEUS from the Oriental region

(except *I. latimodjonis* HEINRICH and *I. silvicola* HEINRICH from Sulawesi):

- 1 Body including legs black; only scutellum, narrow median stripes on 7<sup>th</sup> or 6<sup>th</sup> to 7<sup>th</sup> tergites and upper margin of pronotum ivory. Flagellum short, filiform. Body length 15 mm. Myanmar..... *I. chasmiops* HEINRICH, 1965
- Body with extended ivory color pattern or metasoma ± red.....2
- 2 Large species, body length >20 mm. Black; mesosoma, metasoma and legs with extended ivory coloration. Metasoma without red tergites. ....3
- Smaller species, body length at most 16 mm. Metasoma often with red tergites. ....4
- 3 Very large, body length 30 mm. Mesoscutum with two paramedian ivory stripes. All tergites with posterolateral ivory spots. Prescutellar carina black. Laos. ....*I. giganteus* nov.sp.

- Large, body length 22-24 mm. Mesoscutum with central ivory spot. 2<sup>nd</sup> to 5<sup>th</sup> tergites with posterolateral ivory spots, 5<sup>th</sup> to 7<sup>th</sup> tergites with median ivory spots. Prescutellar carina ivory. Myanmar. .... *I. leucogigas* HEINRICH, 1965
- 4 Hypostomal carina lamelliform widened. 1<sup>st</sup> to 3<sup>rd</sup> tergites with yellow apical bands. 1<sup>st</sup> and 5<sup>th</sup> to 7<sup>th</sup> tergites red, apical tergites without ivory median spots. Legs entirely red. Body length 11 mm. Nepal. .... *I. cavigena* RIEDEL, 2019
- Hypostomal carina not distinctly wider than genal carina. Coloration of metasoma different, usually apical tergites with distinct yellow or ivory median spots. .... 5
- 5 Postpetiolus and 2<sup>nd</sup> to 4<sup>th</sup> tergites black, with posterolateral ivory spots. Body length 15-16 mm. .... 6
- Metasoma ± red. Coxae often without ivory spots. Body usually smaller. .... 7
- 6 Mesoscutum entirely red. 5<sup>th</sup> to 7<sup>th</sup> tergites with median ivory spots. Tibae black, without subbasal ivory rings. Hind coxa densely punctate, with a very finely granulated area ventrally but without scopa. Body length 15 mm. Southern China. .... *I. yunnanensis* nov.sp.
- Mesoscutum black, with two paramedian ivory stripes. 5<sup>th</sup> to 7<sup>th</sup> tergites with lateral ivory spots. All tibiae with ivory subbasal rings. Hind coxa with very fine dense punctures ventrally, but without scopa. Body length 16 mm. India: Himalaya ..... *I. heinrichi* GUPTA, 1987 (syn. *I. himalaynus* HEINRICH, 1974 praecoc.)
- 7 All tergites red, 2<sup>nd</sup> to 4<sup>th</sup> tergites with black basal bands. Flagellum filiform. Scutellum ivory or yellow. .... 8
- All tergites or at least 2<sup>nd</sup> and 3<sup>rd</sup> tergites red, 2<sup>nd</sup> tergite without black basal band. .... 13
- 8 2<sup>nd</sup> and 3<sup>rd</sup> tergites with diffuse yellow posterolateral spots, 6<sup>th</sup> and 7<sup>th</sup> tergites with yellow median spots. Flagellum red basally, black distally, without ivory ring (yellowish centrally in *I. tricoloratus*). Hind coxa with sparse punctures ventrally. .... 9
- 2<sup>nd</sup> and 3<sup>rd</sup> tergites without yellow posterolateral spots. Flagellum with distinct ivory ring. .... 11
- 9 Larger, body length 11 mm. Flagellum with 38 flagellomeres. Postpetiolus and 4<sup>th</sup> tergite without yellow bands or spots. Postscutellum and frontal orbit reddish. Hind coxa with weak scopa. Flagellum two-coloured. Himalayan region of India. .... *I. americanicolor* HEINRICH, 1965
- Smaller, body length 9 mm. Flagellum with 35 flagellomeres. Postscutellum, apical band on postpetiolus and posterolateral spots on 2<sup>nd</sup> to 4<sup>th</sup> tergites yellow. Hind coxa without scopa ..... 10
- 10 All tibiae with subbasal yellow rings. Petiolus entirely red. Frontal orbit black. Flagellum two-coloured. Northern India. .... *I. sikkimensis* nov.sp.
- Tibiae without subbasal yellow rings. Petiolus black basally. Frontal orbits with yellow stripe. Flagellum tricoloured: red basally, yellowish medially and black distally. Nepal. .... *I. tricoloratus* RIEDEL, 2019
- 11 Dorsal mandibular tooth long and thick, ventral tooth only indicated by a small rim at lower side of dorsal tooth. Yellow median spots on apical tergites weak. Flagellum tricoloured: basal flagellomeres red, central flagellomeres with ivory rings, distal flagellomeres black. Hind coxa ventrally with dense punctures. Mesoscutum completely red. Body length 10-12 mm. Widespread in the Oriental region. .... *I. rhododendron* HEINRICH, 1965
- Mandible unmodified, dorsal tooth pointed, ventral tooth smaller but distinct. 6<sup>th</sup> and 7<sup>th</sup> tergites with distinct ivory spots medially. Flagellum black, with central ivory ring. ... 12
- 12 Hind coxa mainly smooth ventrally, with few very sparse punctures. Malar space about as long as width of mandibular base. Median field of mesoscutum black. Body length 11 mm. Myanmar. .... *I. malaisei* HEINRICH, 1965
- Hind coxa densely punctate ventrally and with small but distinct scopa. Malar space 1.4 × as long as width of mandibular base. Mesoscutum red. Body length 11 mm. Southern China. .... *I. scopator* nov.sp.

- 13 Postpetiolus with ivory apical band, 2<sup>nd</sup> and 3<sup>rd</sup> tergites with posterolateral ivory spots. Propodeum with ivory lateral spot. Mesosoma dark reddish-brown, apical tergites with median ivory spots. ....14
- Postpetiolus, 2<sup>nd</sup> and 3<sup>rd</sup> tergites without ivory spots. Mesosoma partly or completely black. Metasoma often tri-coloured, 5<sup>th</sup> to 7<sup>th</sup> tergites with median ivory spots. ....15
- 14 Legs reddish-brown. Mesoscutum with two paramedian longitudinal ivory stripes. 5<sup>th</sup> to 7<sup>th</sup> tergites with median ivory spots. Metasoma semi-amblypygous: hypopygium moderately elongate. Body length 13 mm. Myanmar..... *I. obtusicauda* HEINRICH, 1965
- All tibiae with subbasal yellowish or ivory rings. Mesoscutum without paramedian ivory stripes. 6<sup>th</sup> and 7<sup>th</sup> tergites with ivory median spots, 5<sup>th</sup> tergite black. Metasoma oxygygous: hypopygium short. Body length 12 mm. Myanmar and Himalayan region. .... *I. annaelisae* HEINRICH, 1965
- 15 Legs including coxae and trochanters reddish. Postpetiolus with wide yellow apical band, 2<sup>nd</sup> tergite red; 3<sup>rd</sup> tergite black in apical half, reddish-yellow apically. Apical tergites yellowish. Mesosoma black. Body length 13 mm. Southern India. .... *I. ardates* CAMERON, 1897
- At least coxae  $\pm$  black. Basal tergites of different coloration. ....16
- 16 All tergites red, 6<sup>th</sup> and 7<sup>th</sup> tergites with ivory or yellow median spots. Mesoscutum and head mainly red. ....17
- Only 2<sup>nd</sup> and 3<sup>rd</sup> tergites red; apical tergites black, with or without ivory spots. ....18
- 17 2<sup>nd</sup> and 3<sup>rd</sup> tergites smooth and shining, with exceptionally sparse and fine punctures. Body length 12.5 mm. Nepal..... *I. politoventris* RIEDEL, 2019
- 2<sup>nd</sup> and 3<sup>rd</sup> tergites densely and coarsely rugose-punctate,  $\pm$  dull. Body length 14-15 mm. Nepal..... *I. ruficephalus* RIEDEL, 2019
- 18 Flagellum slender and bristle-shaped; 1<sup>st</sup> flagellomere more than 4  $\times$  longer than wide. Black; face, clypeus and gena red. Postpetiolus  $\pm$  red. Small, body length 8 mm. Myanmar. .... *I. graciliformis* HEINRICH, 1965
- Flagellum stouter, 1<sup>st</sup> flagellomere 2-3  $\times$  longer than wide. Larger, body length 12-16 mm. 2<sup>nd</sup> and 3<sup>rd</sup> tergites red, 1<sup>st</sup> tergite black. ....19
- 19 6<sup>th</sup> and 7<sup>th</sup> tergites without ivory spots, at most 7<sup>th</sup> tergite with median reddish spot. ....20
- 6<sup>th</sup> and 7<sup>th</sup> tergites with distinct ivory median spots. ....21
- 20 Malar space 1.6  $\times$  as long as width of mandibular base. Juxtacoxal carina absent. Scape, pedicel and flagellomeres 1-8 red. 2<sup>nd</sup> and 3<sup>rd</sup> tergites completely red. 7<sup>th</sup> tergite with weak reddish median spot. Hind tibia apically and hind tarsus completely black. Body length 12 mm. Nepal..... *I. longigenalis* RIEDEL, 2019
- Malar space 1.2  $\times$  longer than width of mandibular base. Juxtacoxal carina present. Basal flagellomeres black. 2<sup>nd</sup> tergite completely and 3<sup>rd</sup> tergite laterally red. 7<sup>th</sup> tergite black. Hind tibia and tarsus red. Body length 12.5 mm. Nepal. .... *I. creutzburgi* RIEDEL, 2019
- 21 Head black, only frons and vertical orbit, gena apically and lateral part of face reddish. Flagellum bristle-shaped, with 42 flagellomeres. Area superomedia almost square. 2<sup>nd</sup> and 3<sup>rd</sup> tergites completely red. Mesoscutum completely black. Body length 16 mm. Myanmar. .... *I. indosessor* HEINRICH, 1965
- Head red; only stemmaticum, median frons and antennal grooves black. Flagellum usually filiform, with at most 37 flagellomeres. Area superomedia longer than wide.....22
- 22 Very small, body length 6.5 mm. Flagellum with 31 flagellomeres. Head coarsely rugose-punctate. Hind coxa densely punctate, without scopa. Area superomedia slightly longer than wide. Southern China. .... *I. brevitemporalis* nov.sp.
- Larger, body length 12-13 mm. Flagellum with 36-37 flagellomeres. Area superomedia distinctly longer than wide. ....23
- 23 3<sup>rd</sup> tergite red with black basal band, 5<sup>th</sup> to 7<sup>th</sup> tergites with ivory spots. Hind coxa without scopa. Body length 12 mm. Myanmar..... *I. ruficaput* HEINRICH, 1965
- 2<sup>nd</sup> and 3<sup>rd</sup> tergites completely red, only 6<sup>th</sup> and 7<sup>th</sup> tergites with ivory spots. Hind coxa with strong scopa. Body length 12.5 mm. Nepal..... *I. nepalensis* RIEDEL, 2019

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## Zusammenfassung

In dieser Studie werden neue Informationen zur Taxonomie und Verbreitung von sieben Arten der Gattung *Ichneumon* LINNAEUS aus der orientalischen Region gegeben. Fünf dieser Arten sind neu für die Wissenschaft: *Ichneumon brevitemporalis* nov.sp., *Ichneumon giganteus* nov.sp., *Ichneumon scopator* nov.sp., *Ichneumon sikkimensis* nov.sp. und *Ichneumon yunnanesis* nov.sp.

Die neuen Arten werden beschrieben und illustriert. Außerdem wird ein Bestimmungsschlüssel für die Weibchen der bekannten orientalischen *Ichneumon*-Arten präsentiert.

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