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Description of *Aulacus schoenitzeri* spec.nov. (Hymenoptera, Evanioidea, Aulacidae) from China

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A b s t r a c t : *Aulacus schoenitzeri* spec.nov. from China (Shaanxi province) is described, figured and compared with the other Palaearctic species of *Aulacus* JURINE 1807. The new species is related to the common and widespread Palaearctic *Aulacus striatus* JURINE 1807, but it is easily recognized for the colour pattern of the body, with antennae extensively reddish-orange (A1-4 and A11-14 darker), tibiae and tarsi reddish-orange, and metasoma entirely black; the vertex dull, strongly striolate-punctate; the longer apical lobe of hind coxae (about 1/3 of the coxa length); hind surface of propodeum declivous. With this new species the number of *Aulacus* species known from Palaearctic region is raised to five, of which four are known only for the eastern part, and only one for the western part. The new species is the second of the genus *Aulacus* known for China, after the description of *A. erythrogaster* HE & CHEN 2002 for Zhejiang province (Oriental region).

K e y w o r d s : Aulacidae, *Aulacus schoenitzeri*, new species, China, Shaanxi province.

Introduction

The Aulacidae is a small family of parasitoid wasps which includes 169 living species in three genera: *Aulacus* JURINE 1807, *Pristaulacus* KIEFFER 1900 and *Panaulix* BENOIT 1984, and is found in all regions of the Earth except Antarctica (KIEFFER 1912; HEDICKE 1939; SMITH 2001; HE et al. 2002; JENNINGS et al. 2004a, b, c; TURRISI 2004, 2005). The genus *Aulacus* includes 58 species, of which only four known for the Palaearctic region (OEHLKE 1983, 1984; ALEKSEYEV 1986; 1993; KONISHI 1990).

The present knowledge of taxonomy, distribution and biology of Aulacidae must still considered unsatisfactory, due to the fact that Aulacidae are not easily found in their natural habitat, and are only rarely collected by most of the usual collecting methods. Consequently, most of Aulacidae are rare in collections and a relevant part of species is known from only one or a few specimens; the scarcity of available material is a serious limitation for studying the faunistics and the taxonomy of these wasps.

Aulacidae are parasitoids of wood-boring Hymenoptera and Coleoptera, with a koinobiont endophagous strategy (WHITFIELD 1998; JENNINGS & AUSTIN 2004). Hosts are not known for many species, but on the basis of the present knowledge they are represented by Coleoptera (mainly Buprestidae and Cerambycidae) and Hymenoptera (Xiphydriidae). The biology is better known for *Aulacus striatus* JURINE 1807, which is

associated with xylophagous larvae of *Xiphydria camelus* (LINNAEUS 1758) (SKINNER & THOMPSON 1960).

In the course of my extensive search for Palaearctic material of Aulacidae in the main European insect collections for some ongoing systematic revisions, I have examined a specimen of *Aulacus* which has proved to belong to a new species, here described.

Material and methods

This study is based on material obtained from some Museum collections for which the following acronyms are used in the text (curators in brackets):

OLML..... Biologiezentrum des Oberösterreichischen Landesmuseums, Linz, Austria (Mag. F. Gusenleitner).

MSNG..... Museo Civico di Storia Naturale "G. Doria", Genova, Italy (Dr. R. Poggi).

NIAES..... National Institute for Agro-Environmental Sciences, Insect Systematic Laboratory, Tsukuba (Ibaraki), Japan (Dr. K. Yasuda, Dr. K. Konishi).

ZSMC..... Zoologische Staatssammlung München, München, Germany (Prof. Dr. K. Schönitzer).

The morphological nomenclature follows that proposed by CROSSKEY (1951) and GAULD & BOLTON (1988). As for the most recent taxonomic studies on parasitic Hymenoptera, I used the term "mesosoma" rather than "thorax" and "metasoma" rather than "gaster" or "abdomen" (HUBER & SHARKEY 1993). Terminology for surface sculpturing follows HARRIS (1979). In the text the following abbreviations for some morphological structures are used: A, antennomere; T, tergite; S, sternite.

Description of the new species and discussion

***Aulacus schoenitzeri* spec.nov. (Figs 1-4)**

Holotypus: ♀ labelled "China, 1000-1300 m, Shaanxi, Qinling mts., Xunyangba (6 km E), 23.V-13.VI.1998, I.H. Marshal leg/*Aulacus schoenitzeri* Turrisi sp.n. 2003 (red label)" (OLML).

Derivatio nominis: Named in honour of the friend Prof. Dr. Klaus Schönitzer, entomologist at Zoologische Staatssammlung München (Germany).

Female (holotypus)

Dimensions: Length, excluding ovipositor: 8.5 mm; fore wing length: 7.9 mm.

Colour: Mainly black; mandibles, apex of malar area, antennae, tibiae and tarsi reddish-orange, with A1-4 and A11-14, hind femorae and pretarsi of all legs darker; maxillo-labial complex light brown to brown; wings hyaline, with veins and stigma brown; hind wing with only vein 1-SC+R developed. Hairs whitish except a tuft on the dorsal sub-apical surface of each mandible, gold-reddish.

Head (Figs 1-2): 1.3 as wide as long (in dorsal view), dull; temples, from above, well developed, as long as eye-length (measured from above), sub-parallel and regularly rounded posteriorly; frons irregularly areolate-rugose; suprantennal transverse carina well developed; vertex, temples and malar area rugulose-punctate; occipital area

transverse-carinulate; POL:OOL= 0.65; ocellar area 2.0 times as wide as long; clypeus polished and shining, with coarse and moderately dense punctures, less dense in the middle; mandibles shining and polished, except the base and a medial area of dorsal surface, coarsely punctate; antenna about 0.8 as long as fore wing length; A3 4.5 as long as large; A4 6.4 as long as large and 1.8 as long as A3; A5 5.6 as long as large, and 1.7 as long as A3; following antennomeres progressively shorter, with the last one about 1.7 as long as large, cylindrical, with acute apex. Hairs sparse, short, erected on frons, vertex, most part of temples and clypeus, recumbent on malar area, part of temples, lateral margins of frons; hairs length of temples about 0.5 as a diameter of an ocellus, longer on frons and on clypeus; mandibles with basal half of dorsal surface covered with scattered and recumbent strong hairs and a tuft of similar hairs in the middle.

M e s o s o m a : Weakly sculptured; pronotum confused-rugose, its latero-inferior margin regularly rounded, without teeth (fig. 3); propleurae confused-rugulose to foveolate; prescutum not defined and not incised; mesoscutum transverse-carinate with axillae confused-rugulose to transverse-carinate; apex of mesoscutum, in lateral view, regularly rounded (fig. 3); notauli well defined, deep and narrow; scutellum transverse-carinate in the middle areolate-rugose on the margin; mesopleurae extensively areolate-rugose, with some confused transverse carinae on mesepimeri; metanotum shining, with weak longitudinal carinulae in the middle and oblique carinae on the sides; propodeum areolato-rugose, with base strongly transverse-grooved; hind surface of propodeum declivous; coxae dull, transverse-carinulate, with weak defined punctures among carinulae; hind coxae with a long apical lobe (fig. 4) about 1/3 as long as hind coxa length; trochanters moderately punctated; femorae moderately coarse and densely punctated, less densely on the ventral surface of anterior and median femorae; tibiae and tarsi finely sculptured; spurs of median and hind tibiae sub-equal in length; hind basitarsus sub-cylindrical, elongated, 9.8 as long as large and as long as tarsomeres 2-5; claws with only one small basal tooth on its inner margin; fore wing with vein 2-rs+m long. Hairs short, semi-erected or recumbent; propleurae with erected and dense hairs, about 0.5 as long as fore pretarsus length; coxae with moderately long and dense recumbent hairs; trochanters with moderately long and dense semi-erected hairs; femorae with short and moderately dense semi-erected or erected hairs; tibiae and tarsi with strong, dense and semi-erected hairs.

M e t a s o m a : Not compressed, ovoidal in shape, polished and shining; petiolus short and stocky, a little longer than large, with strong and mainly longitudinal carinae on the base of its dorsal surface; T1 and T2 fused; T3-5 with only some scattered, fine and superficial punctures and some scattered hairs; T6-7 with very fine, superficial and moderately dense punctures and covered with moderately long and dense hairs; S7 shining with moderately dense punctures and hairs; T8 dull, irregularly rugulose, with some hairs; ovipositor 0.9 as long as fore wing length; valvulae 3 covered with short, semi-erected and moderately dense hairs, with apex obliquely truncated, knife-shaped.

M a l e : Unknown.

D i s t r i b u t i o n : Popular Republic of China, Shaanxi Province.

B i o l o g y : Unknown.

D i s c u s s i o n : Until now only four species of the genus *Aulacus* were described for the Palaearctic region: *A. striatus* JURINE 1807, *A. flavigenis* ALEKSEYEV 1986, *A.*

japonicus KONISHI 1990 and *A. jeoffreyi* ALEKSEYEV 1993 (OEHLKE 1983; ALEKSEYEV 1986; 1993; KONISHI 1990). Among these species *A. schoenitzeri* Turrisi spec. nov. is most similar to the common and widespread Palaearctic *A. striatus*, of which I have examined abundant material from MSNG, OLML and ZSMC. Due to the colour of the metasoma, entirely black, the new species resembles *A. japonicus* KONISHI, described for Japan, of which I have examined the holotypus, deposited in NIAES. The comparison of these specimens revealed several diagnostic features of *A. schoenitzeri* spec. nov., reported in the following comparative table:

***A. schoenitzeri* spec.nov. ♀**	***A. striatus* JURINE ♀**	***A. japonicus* KONISHI ♀**
Vertex dull, strongly striolate-punctate.	Vertex shining, irregularly, coarsely and deeply punctured, sometimes with very fine carinulae.	Vertex shining with fine, superficial and moderately dense punctures.
Antennae extensively reddish-orange with A1-4 and A11-14 darker.	Antennae entirely blackish-brown.	Antennae entirely blackish-brown.
Propodeum declivous.	Propodeum weakly declivous.	Propodeum very weakly declivous.
Apical lobe of hind coxae long, about 1/3 of the coxa length.	Apical lobe of hind coxae shorter, about 1/5 of the coxa length.	Apical lobe of hind coxae very short, about 1/13 of the coxa length.
Legs blackish, except tibiae and tarsi, reddish-orange.	Femorae, tibiae and tarsi extensively reddish-orange.	Legs blackish-brown, except articular regions and extensively fore tibiae and tarsi, yellowish brown.
Metasoma entirely black.	Metasoma extensively reddish-orange.	Metasoma entirely black with sternites extensively brown.
Ovipositor 0.9 as long as fore wing length.	Ovipositor 0.7-0.8 as long as fore wing length.	Ovipositor 0.4 as long as fore wing length.

The new species is the second of the genus *Aulacus* known for China, after the description of *A. erythrogaster* HE & CHEN 2002 from Zhejiang province (Oriental region, holotypus not examined). The latter species could be distinguished for the sculpture of frons (obscurely punctate on upper half, transversely carinate on lower half), the colour of head (with frons, clypeus and temples yellowish brown), and of the legs (fore and median femorae black, apically yellow, hind tibiae yellow at base, remaining part blackish brown), the shape of the propodeum (weakly declivous), the very short distal lobe on hind coxae, and the extensively red-orange metasoma (HE et al. 2002). The remaining two Palaearctic species of *Aulacus*, *A. flavigenis* and *A. jeoffreyi*, both known for the eastern part and not available to me for study, are easily distinguished from *A. schoenitzeri* spec.nov. for the colour pattern and some morphological features (ALEKSEYEV 1986; 1993): *A. flavigenis* has the head shining, extensively yellow, with sparse punctures and the frons, over antennal joints, weakly transverse-rugose, the proximal half of the metasoma reddish, the fore and median legs yellow-brown, the hind

femorae and tibiae dark brown; *A. jeoffreyi* is a small species with a body length of only 4.4 mm (excluding ovipositor) having the head smooth and shining with sparse punctures, the frons, over antennal joints, weakly transverse-rugose, A3 3.0 as long as large, A4 5.5 as long as large, the metasoma dark brown, antennae and the legs brown, with tibiae (especially fore and median ones) pale-brown.

It is interesting to note that of the five Palaearctic species of *Aulacus*, only one occurs in the western part, while all of these species occur in the eastern part, four of these being exclusive of the extreme eastern territories. The discovery of two species during the last two years, shows our poor knowledge of the eastern Palaearctic Aulacidae and suggests that more species may exist.

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Zusammenfassung

Aulacus schoenitzeri spec.nov. aus China (Provinz Shaanxi) wird beschrieben und in wesentlichen Merkmalen abgebildet sowie mit den übrigen paläarktischen *Aulacus*-Arten verglichen. Die neue Art ist mit der häufigen und weit verbreiteten paläarktischen Art *Aulacus striatus* JURINE 1807 verwandt, lässt sich jedoch leicht an der Farbzeichnung des Körpers, der rötlichorangen Antennen (A1-4 und A11-14 dunkler), den rötlichorangen Tibien und Tarsen und dem gänzlich schwarzen Metasoma unterscheiden. Der Scheitel ist matt, stark kleinstreifig punktiert, der längere Lobus der hinteren Coxe nimmt etwa das Ausmaß eines Drittels der Coxenlänge ein. Die hintere Fläche des Propodeums ist abschüssig. Mit dieser neuen Art sind nunmehr aus der Paläarktis 5 *Aulacus*-Spezies bekannt, wobei vier davon nur im östlichen Teil vorkommen. Die neue Art ist die zweite Art der Gattung, die aus China bekannt wurde, nach der Beschreibung von *A. erythrogaster* HE & CHEN 2002 aus der Provinz Zhejiang (Orientalische Region).

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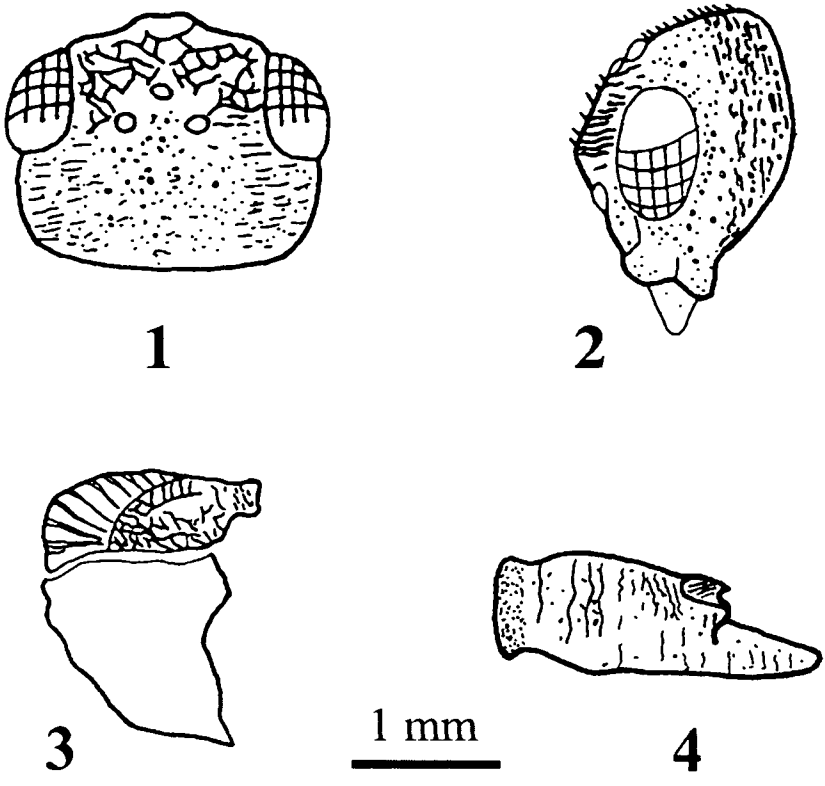

Figs 1-4: *Aulacus schoenitzeri* TURRISI spec.nov., holotypus ♀. (**1**) Head in dorsal view; (**2**) Head in lateral view; (**3**) Pronotum and mesoscutum in lateral view; (**4**) Hind coxa in lateral view.