Two new species of Chalcosiinae from South East Asia (Lepidoptera: Zygaenidae)

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Abstract: Two new Chalcosiinae (Zygæniædae) are described from South East Asia, viz. *Eumorphiopais inouei* sp. n. from N Thailand (holotype male in Tiroler Landesmuseum Ferdinandeum, Innsbruck) and *Pseudarbudas efetovi* sp. n. from NE India (Khasia Hills) (holotype male in The Natural History Museum, London).

Zwei neue Chalcosiinae-Arten aus Südostasien (Lepidoptera: Zygaenidae)

Zusammenfassung: Zwei neue Chalcosiinae (Zygæniædae) aus Südostasien werden beschrieben, *Eumorphiopais inouei* sp. n. aus Nordthailand (Holotypus Männchen im Tiroler Landesmuseum Ferdinandeum, Innsbruck) und *Pseudarbudas efetovi* sp. n. aus Nordostindien (Khasia-Berge) (Holotypus männchen in The Natural History Museum, London).

Introduction

For more than ten years the author has been hesitating to describe two new Zygaenidae (Chalcosiinae) species from South East Asia, which he had found when working with material in the Natural History Museum in London. Only one single specimen of each was available.

Based on a revision of the former Arbudas-complex that initially included the genera *Arbudas* Moore, 1879, *Eumorphiopais* Hering, 1922, *Pseudarbudas* TARMANN, 1992, and *Heteropanula* TARMANN, 1992 (TARMANN 1992), there was no doubt that these two specimens were new for science as they could not be assigned to any taxon described so far. Nevertheless, there was still some hope to find more material somewhere.

Recently a series of ♂ specimens of one of the two species was collected by K. Černý (Innsbruck, Austria) in northern Thailand. This material was donated to the museum in Innsbruck. Moreover, this species is already figured in Endo & KISHIDA (1999: 71, fig. 21) but under the wrong name “Eumorphiopais leis”. To avoid further confusion both above-mentioned new species are now described.

All photos of paintings, specimens and genitalia are made with layer photography by S. Heim (Innsbruck, Austria).

Depositories of material and abbreviations

BMNH The Natural History Museum, London (formerly British Museum (Natural History)), U.K.

fw. forewing[s].

GP genitalia preparation/dissection/slide no.

HT holotype.

hw. hindwing[s].

PLT paralactotype.

PT paratype.

TLMF Tiroler Landesmuseen, Ferdinandeum, Naturwissenschaftliche Sammlungen, Innsbruck, Austria.

GMT Gerhard M. TARMANN.

uns. underside.

ups. upperside.

Descriptions

*Eumorphiopais inouei* sp. n.

(Figs. 1, 3–6)

Holotype ♂: Thailand, Lampang, Chiang Rai, 1090 m, road 1150, km 17 from Wiang Pa Pao, 27. v. 2011 (K. Černý) (TLMF) (Figs. 3–5).

Paratypes (in total 7 ♂♂): Thailand, 6 ♂♂, same data as HT (TLMF). 1 ♂ (Fig. 1), Province Chiang Mai, Chiang Mai W, Doi Suthep, 8.–10. vi. 1966 (H. Inoue) (BMNH) (Figs. 1, 6, 12–14).

Note: 1 ♂ from “N. Laos” is figured in Endo & KISHIDA (1999: 71, fig. 21) (as *Eumorphiopais leis*).

Derivatio nominis: This new species is named in honour of the late Hiroshi Inoue, Japan, who was one of the leading Asian scientists working on Zygaenidae and who discovered the first specimen of this new species. The specimen from Doi Suthep, Chiang Mai, had been separated in Inoue’s collection in the BMNH, obviously by himself. This indicates that Inoue may have already recognized it as an undescribed species but hesitated (like the present author) to base a description on one single and slightly worn specimen.

Description

♂ (n = 8).

Length of body: 11.2–12.0 mm; length of fw.: 14.9–16.0 mm; breadth of fw.: 7.3–9.0 mm; length of hw.: 11.9–13.0 mm; breadth of hw.: male 8.2–10.0 mm; length of antenna: 7.0–7.4 mm.

Head, thorax and ups. of abdomen thickly covered with dark olive green scales with a pronounced sheen; shiny bluish scales are scattered within the green scales, especially on head and collar and at the base of the abdomen, uns. of abdomen whitish.

Frons and v. of abdomen whitish.

The antennal character of the genus *Eumorphiopais* has already been described (like the present author) to base a description on one single and slightly worn specimen.

TLMF

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character is lacking in worn specimens, see Fig. 1); fw. uns. dark grey, with a large oval yellow patch close to apex (similar as in hw. but not reaching the fringe) and with shiny bluish scales proximally. Hw. ups. dark grey in fresh specimens, brownish in worn specimens, with a triangular yellow patch at apex, fringe concolorous with the exception of a few white scales distad of cell which are absent in worn specimens; hw. uns. like ups. but with many more shiny blue scales that cover almost the whole proximal and anal part of the wing; fringe dark grey with a few white scales posterior of apex. Legs dark brown, covered with shiny bluish scales, tibia without epiphysis, mid and hind tibia with two very short spurs. The androconial organ (sensu TARMANN 1992, YEN 2003, YEN et al. 2005) is short but well visible.

Genitalia ♂ (Figs. 12–17). Uncus broad, helmet-shaped, strongly sclerotised, double-lobed, with strong distal emargination, setae-bearing humps (a generic character of Eumorphiopais TARMANN, 1992) close to each other. Aedeagus straight or slightly curved, with a peculiar, pocket-shaped insertion of the ductus seminalis at proximal end, with one short straight cornutus.
Differential diagnosis

_Eumorphiopais inouei_ sp. n. is similar to _Eumorphiopais leis_ (Swinhoe, 1894) in colour and wing pattern but the yellow parts have a significantly different shape (see Figs. 1, 3, 7). Moreover, _E. inouei_ sp. n. has a more intensive shiny bluish uns. and the shiny scales are arranged at the proximal part of the wing and not at the distal parts as in _E. leis_ (see Figs. 4, 8, 10). In the male genitalia the uncus is more slender in _E. inouei_ sp. n. and the distal end is emarginated and not almost straight, the setae-bearings
humps are closer together in *E. inouei* sp. n. than in *E. leisi*. Aedeagus with one cornutus in *E. inouei* sp. n. but with a bundle of cornuti in *Eumorphiopais leisi* (see Figs. 14, 17, 20, 23).

**Biology**

Unknown. The 7 ♂♂ from Chiang Rai were obtained at light.

**Distribution**

So far only known from northern Thailand and northern Laos.

**Pseudarbudas efetovi** sp. n.

(Figs. 2, 25–27)

_Holotype ♂_ (Fig. 2), India, Khasia Hills (native collector) (BMNH). — No paratypes.

_Derivatio nominis_: This species is named in honour of my dear friend Prof. Dr. Konstantin A. Efetov (Simferopol, Ukraine), who is one of the leading scientists working on *Zygaenidae*.

**Description**

♂.

Length of body: 9.0 mm; length of fw.: 14.0 mm, breadth of fw.: 7.4 mm; length of hw.: 11.5 mm, breadth of hw.: 7.4 mm; length of antenna: 5.8 mm.

Head dark brown antero-dorsally, yellow ventrally, compound eyes black, chaetosema yellow; antenna bipectinate, blackish brown, yellow at tips of pectinations, with 37 segments. Thorax and abdomen yellowish brown on ups., yellow on uns., legs yellow, partly brown laterally; fw. ups. uniform ochreous, covered with scattered white scales at the proximal two-thirds of wing, fringe short, brown, uns. of fw. yellow, fringe brown, hw. upper- and uns. yellow, fringe yellow.

Genitalia ♂ (Figs. 25–27). Uncus single, translucent, with a pair of lateral setae-fields basally where the uncus is fused with the broad, round and also not strongly sclerotised tegumen; vinculum rounded, without a distinct saccus; valva short, stout, triangular dorsally,
almost pointed distally, translucent and strongly folded, less folded and shorter ventrally, without a stronger sclerotised marginal part, at the inner dorsal margin of the ventral part of the valve there is a prominent, finger-like, upwards pointing process developed, the ventral part of the valve covered with short, triangular spines distally, with longer setae or spines proximally; aedeagus straight, short and stout, more strongly sclerotised distally, the everted vesica approximately of the same length as the aedeagus, with one prominent cornutus of characteristic shape distally. Eighth tergite of abdomen translucent, with stronger sclerotised caudal margin.

Differential diagnosis
Externally extremely similar but slightly larger than *Pseudarbudas ochrea* (Elwes, 1890) (Fig. 11). The valva is longer, more slender and rounded in *P. ochrea*, the dorsal process on the ventral part of the valva is placed differently, is much shorter, stronger sclerotised and strongly curved inwardly, the spines at the ventral part of the valve are concentrated proximally (Figs. 25, 28). The aedeagus is similar in shape in both species (Figs. 26, 29) but the cornuti are different. In *P. ochrea* the cornutus is shark-tooth shaped but consists of many small cornuti whereas *P. efetovi* sp. n. has a band-like and slightly curved cornutus with distal dentations (Figs. 27, 30).

Biology
Unknown.

Distribution
So far only the holotype is known.

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References