

## New data on the species-group of *Argynnis paphia* in China, with description of a new taxon: *Argynnis westphali* sp. n. (Lepidoptera: Nymphalidae, Heliconiinae)

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**Abstract:** The still unknown female of *Argynnis gibeauxi* COENEN, 2015 is described, together with *Argynnis westphali* sp. n., third member of the nominotypical subgenus. The latter differs from the two sister species *A. paphia* (LINNAEUS, 1758) and *A. gibeauxi* only in slight details of the wing pattern but notably in the male genital morphology. The male holotype from Eastern Tibet, Nyingtri Prov., will be deposited in Museo Civico di Storia Naturale “Giacomo Doria” in Genoa, Italy.

**Neue Informationen über die Artengruppe von *Argynnis paphia* in China, mit Beschreibung einer neuen Art: *Argynnis westphali* sp. n. (Lepidoptera: Nymphalidae, Heliconiinae)**

**Zusammenfassung:** Das zuvor unbekannte Weibchen von *Argynnis gibeauxi* COENEN, 2015 wird beschrieben; weiterhin als weitere, dritte Art im nominotypischen Subgenus *Argynnis westphali* sp. n. Die neue Art unterscheidet sich von den anderen beiden ähnlichen Arten *A. paphia* (LINNAEUS, 1758) und *A. gibeauxi* in Details des Flügelmusters und besonders im männlichen Genitalapparat. Der männliche Holotypus aus Osttibet, Prov. Nyingtri, wird in das Museo Civico di Storia Naturale „Giacomo Doria“ in Genua, Italien, gelangen.

**Nuovi dati sulle *Argynnis* del gruppo *paphia* in Cina e descrizione della nuova specie *Argynnis westphali* sp. n. (Lepidoptera: Nymphalidae, Heliconiinae)**

**Riassunto:** Si descrivono la femmina ancora sconosciuta di *Argynnis gibeauxi* COENEN, 2015 unitamente ad *Argynnis westphali* sp. n., terza specie appartenente al sottogenere nominale. Quest'ultima differisce dalle due specie affini *A. paphia* ed *A. gibeauxi* per piccoli particolari del disegno alare ma se ne discosta notevolmente per la peculiare morfologia dell'apparato copulatore maschile. L'olotipo maschio proveniente dal Tibet orientale, Provincia di Nyingtri, verrà depositato presso il Museo Civico di Storia Naturale “Giacomo Doria” di Genova.

### Introduction

*Argynnis paphia* (LINNAEUS, 1758), type species of the genus *Argynnis* FABRICIUS, 1807, is widespread from N Africa to Japan across the entire Palaearctic Region. In a so vast area many subspecies have been described, the number of which considered valid by various authors ranging from five to more than ten.

Three of these are present in China (LANG 2012):

- ssp. *neopaphia* FRUHSTORFER, 1907, very close to the nominotypical *paphia*, lives in the Northeast and in the adjacent Russian Amur region;
- in Central China, from N Yunnan to Zhejiang, ssp. *megalegoria* FRUHSTORFER, 1907 is found, bigger on average than the nominotypical subspecies, with

much heavier black markings and more vivid colours on the underside;

- finally, ssp. *formosicola* MATSUMURA, 1927 occurs in Taiwan.

A further taxon, *argyrophontes* OBERTHÜR, 1923, erroneously ascribed in the past to ALPHÉRAKY (GAEDE 1930), has been wrongly considered Chinese (TUZOV et al. 2000, TUZOV 2003): this name has been in fact introduced by OBERTHÜR (1923) to designate an aberrant specimen of *Argynnis paphia* received from ALPHÉRAKY, “... provenant de la faune caucasique ...” [= “coming from the Caucasus”], figured by him merely in a work devoted to the genera *Argynnis* and *Melitaea*.

Until now *A. paphia* has been regarded as the only member in the subgenus *Argynnis*. Quite recently, however, a new Chinese species very close to *paphia* has been described under the name of *A. gibeauxi*, based on male specimens only collected in Sichuan by Vladimir MAJOR (COENEN 2015). It differs from the sympatric *A. paphia megalegoria* in some details of the wing pattern and more clearly in the structure of the male genitalia.

Based on the above, we have checked all the Chinese specimens of *A. paphia* in our collections. Out of a total of 39 specimens (23 ♂♂ and 16 ♀♀, of which 11 belong to the dark colour morph *valesinides* FRUHSTORFER, 1907), coming from various localities of Sichuan and Zhejiang, only one ♂ collected in Sichuan not far from Ya'an presented the external features indicated by COENEN to be diagnostic of the new species (Figs. 1, 2). Its genitalia showed, without any doubt, that it belongs to *A. gibeauxi* of which, however, the female remained unknown.

Soon after, checking the collection of our friend Alessandro BISI of Genoa, we found two Chinese specimens of *Argynnis*, ♂ and ♀, purchased by him in 2012, exactly labelled as those of the type series of *A. gibeauxi*: China, Sichuan, Maipu, Jiulong, 10.–28. VII. 2008, Vladimir MAJOR coll. In the wing pattern of these two specimens the external diagnostic characters of *gibeauxi* were so evident that their identification was possible with no doubts. The female is therefore hereunder described and figured for the first time (Figs. 3, 4).

### *Argynnis gibeauxi* COENEN, 2015

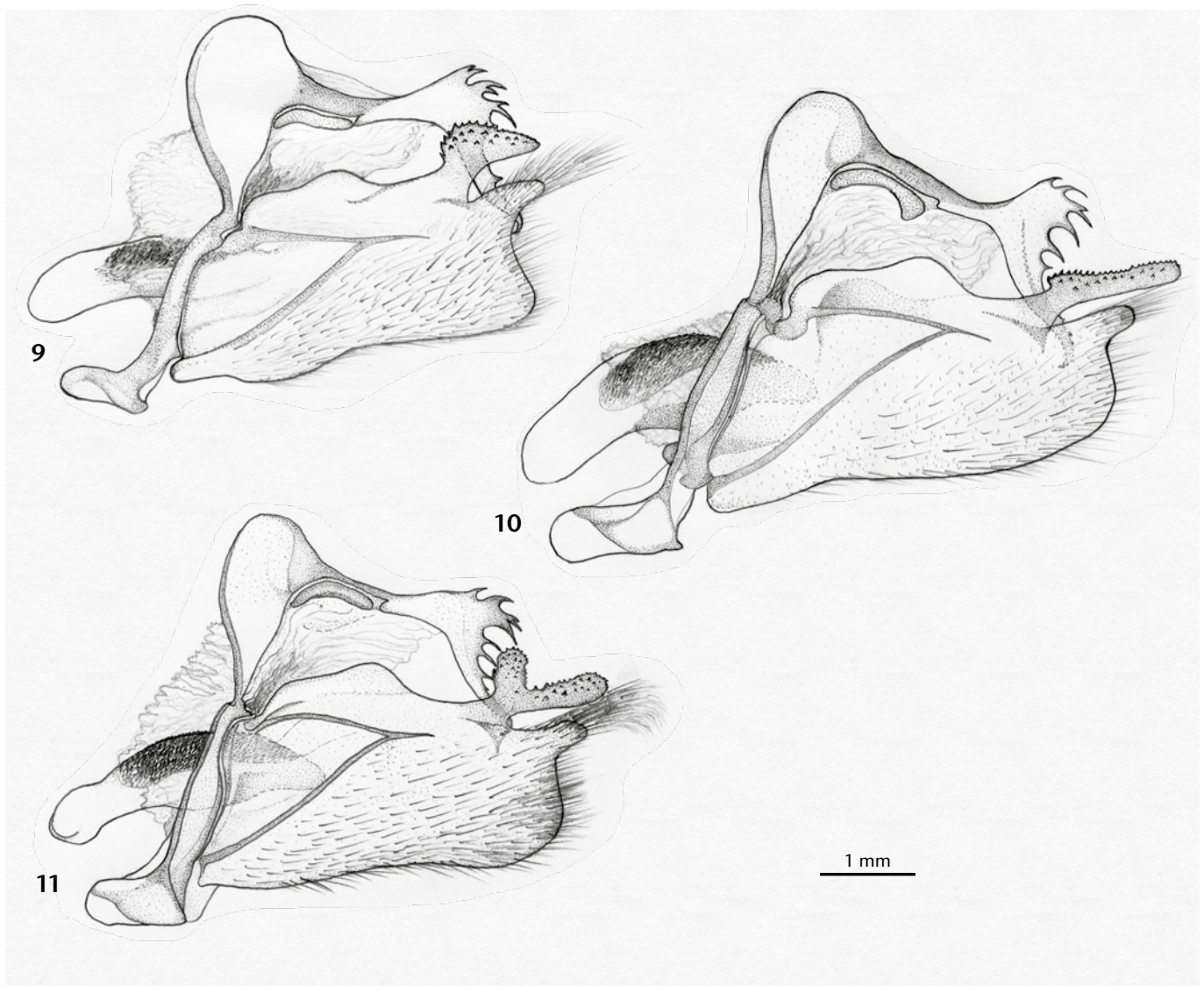
#### Description of the female

Length of the forewing (from base to apex): 51 mm.

This single specimen is notably similar to the form *valesinides* of *A. paphia megalegoria*, but the black markings on the upperside are even much heavier; in particular:







**Figs. 1–4:** *Argynnis gibeauxi* COENEN, 2015. **Figs. 1–2:** ♂, China, W Sichuan, Pass between Ya’an and Yingjing, 1300 m, 6. vii. 1996, leg. E. GALLO; 1: upperside, 2: underside. **Figs. 3–4:** ♀, China, Sichuan, Maipu, Jiulong, 10.–28. vii. 2008, leg. V. MAJOR; 3: upperside, 4: underside. — **Figs. 5–8:** *Argynnis westphali* sp. n. **Figs. 5–6:** Holotype ♂, Eastern Tibet, Nyingtri Prov., 2500–3000 m, Tongmai, 1. vii. 1998, leg. R. WESTPHAL; 5: upperside, 6: underside. **Figs. 7–8:** Paratype ♂, same data as holotype; 7: upperside, 8: underside.

**Figs. 9–11:** ♂ genitalia. **Fig. 9:** *Argynnis paphia megalegoria* FRUHSTORFER, 1907, China, W Sichuan, Siping vic., 1600–1900 m, 4.–5. vii. 1996, leg. E. GALLO, prep. gen. GAL 894. — **Fig. 10:** *Argynnis gibeauxi*, same specimen as Figs. 1/2, prep. gen. GAL 889. — **Fig. 11:** *Argynnis westphali* sp. n., holotype (same specimen as Figs. 5/6), prep. gen. GAL 893.

- the spots of the median series are very large, elongated and confluent in the spaces 4 to 6 (a);
- the postdiscal ones are fused together, from space 5 to the wing’s costal margin, to form a single conspicuous patch (b);
- on the underside of the hindwing the silvery bands are very broad and, as in the male, the basal one extends in space 2 towards the tornus nearly to touch the median band (c).

Three more male specimens present in our collections, collected by R. WESTPHAL in Eastern Tibet, were very similar but not identical to *A. paphia megalegoria*. The dissection of two of them caused a great surprise, revealing the presence of a new species, undoubtedly very close in wing pattern to *paphia* and *gibeauxi* but notably different at male genital level, which is hereunder described.

### *Argynnis westphali* sp. n.

**Holotype** ♂: Eastern Tibet, Nyingtri Prov., 2500–3000 m, Tongmai, 1. vii. 1998, leg. WESTPHAL.

**Paratypes** (in total 2 ♂♂): 1 ♂, same data as holotype, in coll. GALLO; 1 ♂, same data as holotype, in coll. DELLA BRUNA (Figs. 7, 8).

The holotype, at present in coll. GALLO, will be deposited in the Museo Civico di Storia Naturale “Giacomo Doria” in Genoa, Italy.

**Derivatio nominis:** This new taxon is named after the German lepidopterist Robert WESTPHAL, who collected the three specimens subject of this study.

### Description of the male

Length of the forewing (base to apex): 34–39 mm.

The apex of the forewing, compared to that of the two sisterspecies, is distinctly less elongated, consequently the outer margin is almost vertical rather than oblique.

Otherwise the ground colour and the black markings on the upperside (Fig. 5) are very similar to those of *A. gibeauxi*:

- as in this taxon the black subapical spot in space 6, generally absent in *A. paphia*, is present (d),
- and the androconial brands are very prominent. On the contrary the underside of the hindwing (Fig. 6) is more similar to that of *A. paphia*, because the silvery basal band does not extend towards the anal angle, however the green ground colour is more vivid and the central silvery area in space 8 is better outlined with black (e).

But the greatest differences are found in the genitalia, particularly in the peculiar shape of the spiny costal terminal process of the valva: this, rather than consisting of a single arm, more or less long, as in the two other species (Figs. 9, 10), consists of two arms of different length, the shorter of which, the basal one, directed vertically almost at right angle (Fig. 11).

The female is at present unknown.

## Conclusion

Therefore there are now three *Argynnis* species which must be considered within the nominotypical subgenus: *A. paphia* LINNAEUS, 1758, *A. gibeauxi* COENEN, 2015 and *A. westphali* sp. n. Their external features are very much alike and the male genitalia are similar as well, having the same kind of uncus shaped as a cock's crest ("fin-like crest" sensu WARREN 1944). However their valvae are distinctly different, showing constant and sharp characters useful to identify each of the three taxa with absolute certainty.

The discovery of *A. westphali* once more exemplifies the case of a cryptic taxon, hidden under a widespread species, which only casually has been identified with scrutiny. Obviously in these cases the greatest surprises must be expected from the peripheral, often isolated, populations.

The last interesting problem to be solved concerns the possible sympatry between *A. westphali* and *A. paphia*

*megalegoria*: it will be necessary to ascertain whether the records of the latter from Tibet (LANG 2012) are correct or if, on the contrary, they must be referred to the former.

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