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A REVISION OF THE PALAEARCTIC SPECIES OF THE EUGRAPHE HÜBNER, [1821] 1816 GENERIC COMPLEX. PART I. THE GENERA EUGRAPHE AND GONIOGRAPHA (LEPIDOPTERA, NOCTUIDAE)

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The Palaearctic species of the wide sense *Eugraphe* are revised, a new genus, *Goniographa* gen. n. and five new species, *G. discussa, G. shchetkini, G. metafunkei, G. naumanni* and *G. gyulaipeteri* spp. n. are described and the genus *Eugraphe* s. str. is redescribed. The *"Eugraphe" ornata* species complex is transferred into *Xestia* (s. l.), with the description of a new species of the group, *X.* (s. l.) *hypographa* sp. n. With 49 genitalia figures and 24 colour pictures.

Key words: Noctuidae, *Eugraphe* (s. l.), *Goniographa*, *Xestia* (s.l.), new genus, new species, new combinations, Eurasia

INTRODUCTION

The first detailed synopsis of the whole genus, together with those of certain other Xestiini genera (like, for instance, *Eugnorisma* BOURSIN, 1946) was published by BOURSIN in 1954. Later, this systematic survey was completed by him (BOURSIN 1963) with the treatment of the other eastern Palaearctic Xestiini, in particular the genus *Amathes* HÜBNER, 1821 (= *Xestia* HÜBNER, 1818). Subsequently, a number of species was additionally included into this genus by POOLE (1989). Some of them have already been studied in detail and removed from *Eugraphe*, e.g. the taxa of *Pseudohermonassa* VARGA, 1990, the members of the *Xestia senescens*-group, the European "*Eugraphe*" *jordani* (TURATI, 1912), see FIBIGER 1997, but the other Asiatic species of the wide sense *Eugraphe* have not been revised yet.

The recent studies on the *Eugnorisma* genus-group have been started still in the mid-eighties, and the results were published in a series of papers (VARGA & RONKAY 1987, VARGA *et al.* 1990, VARGA & RONKAY 1994, VARGA *et al.* 1995, HREBLAY & RONKAY 1998, RONKAY & VARGA, 1999, etc.). The taxa of the genus *Eugraphe* sensu BOURSIN had also been involved into the studies and it was surprisingly found already in the early phase of the investigations that the three

"well-known" species of the *Eugraphe marcida* (CHRISTOPH, 1893) species-group represent in fact three closely related, externally hardly separable twin species. On the other hand, these studies revealed the distinctness of the wide sense "*Eugraphe marcida* lineage" from *Eugraphe* s. str. and from the "*E. denticulata–E. xizangensis*" species pair.

Unfortunately, these new species have long been remained undescribed, due to the limited material available for the studies. It is worth to mention that the three formerly described species were rather poorly represented even in the largest museum collections and were insufficiently documented in the literature. Moreover, the majority of the specimens we had the opportunity to study originate from the collectings of Mrs E. VARTIAN and Prof. Dr C. NAUMANN in NE Afghanistan, although, the type localities of the three formerly described species lie in Central Asiatic part of the former Soviet Union (*E. marcida*: Turkmenistan, *E. decussa* and *E. funkei*: W Tien-Shan Mts). The last decade brought the breakthrough as we could put together the material of several Hungarian expeditions led to Turkmenistan and N Iran, and the large collection materials originating from Uzbekistan, Kazakhstan, Kirghisia and Tadjikistan (for instance, the SHCHETKIN collection, which is owned recently by Hungarian and German private collectors).

Thus, we could compare large series of most species and clarify the taxa of the three main lines of the *E. marcida* species-group. These three lines (the *decussa*-, the *funkei*- and the *marcida*-lines) are proved to represent a separate genus being distinct of *Eugraphe* s. str. The new genus, *Goniographa* contains altogether eight species; the description of the new genus and its five new species, as well as the detailed characterisation of the species groups and the three formerly described species, is given in the Systematic part of this paper. All known species are illustrated in colour, including the holotypes/lectotypes of all but one species (*G. marcida*).

Abbreviations: GYP – GYULAI PÉTER (in slide numbers); HNHM – Hungarian Natural History Museum, Budapest; RL – RONKAY LÁSZLÓ (in slide numbers); VZ – VARGA ZOLTÁN (in slide numbers); ZIN – Zoological Institute, Russian Academy of Sciences, St. Petersburg; ZMHU – Zoological Museum of the Humboldt University, Berlin; ZMUH – Zoological Museum, University of Helsinki; ZSM – Zoologische Staatssammlung, Munich.

SYSTEMATIC PART

THE SURVEY OF THE PALAEARCTIC SPECIES OF EUGRAPHE HÜBNER, [1821] 1816 (S. L.)

The genera *Eugraphe* and the newly described *Goniographa* **gen. n.** belong to the 2nd subgroup of the 8th genus-group sensu LAFONTAINE (1998: 171–172). He has outlined 9 larger, probably monophyletic "generic groups" of Noctuini (sensu LAFONTAINE), based on some imaginal and larval characters. The group (8), called "*Abagrotis* group" consists of 10 Nearctic/Holarctic genera: *Abagrotis*, *Adelphagrotis*, *Agnorisma*, *Parabagrotis*, *Prognorisma*, *Pronoctua*, *Protolampra*, *Pseudohermonassa*, *Setagrotis* and *Tesagrotis*. It is worth to mention, that the Palaearctic *Eugnorisma*, *Metagnorisma*, *Sinognorisma* and some new genera erected by RONKAY and VARGA (1999) belong to the same generic group. Two new genera, *Prognorisma* and *Agnorisma* have been erected and described by LAFONTAINE (1998), and this large and obviously heterogenous group has been subdivided. *Agnorisma*, *Eugnorisma*, *Prognorisma*, *Pseudohermonassa* and *Sinognorisma* have been characterized by having a field of spines at the apex of the aedeagus (i.e. carina) that does not extend onto the vesica (see: LAFONTAINE 1998, VARGA & RONKAY 1987, VARGA *et al.* 1990), and they have been separated from the group of genera consisting of *Adelphagrotis*, *Eugraphe*, *Graphiphora*, *Opigena*, *Parabagrotis* and *Setagrotis* in which a narrow spinulose bar extends from the apex of the aedeagus onto the basal part of the vesica. The very diverse genus *Xestia* probably belongs also to this group, but the spinulose bar mentioned above is often reduced or modified in different subgenera of *Xestia*. Some genera and species groups (tentatively ranked as subgenera) can be clearly characterised by some distinctive characters of the carina and the vesica penis (males) and the ostium bursae–ductus bursae complex, the modifications of the cervix bursae and the apical (posterior) part of the corpus bursae, the presence/absence of the signa etc. (females), respectively. It is found that these characters and, in addition, the ventral, lateral or dorsal projection of the vesica can be used for the characterisation of the different evolutionary lines within the genera/subgenera related to *Xestia* s. l., *Eugraphe*, etc. (*Abagrotis* group sensu LAFONTAINE).

The genus *Hypernaenia* HAMPSON, 1894, has been restituted for the species pair "*Eugraphe*" *denticulata* (WARREN, 1888) (type species of *Hypernaenia*, by monotypy; **stat. rev.**) and its sister species *H. xizangensis* (CHEN, 1982) (**comb. n.**).

The twin species "*E.*" *ornata* (STAUDINGER, 1892) and *X. hypographa* **sp. n.** have been transferred from *Eugraphe* to *Xestia*. The "*senescens*" species group could be recognised also as a well-defined species-group within *Xestia*.

"*Xestia*" *versuta* (PUNGELER, 1909) will be removed from *Xestia* and its taxonomic relegation will be discussed in a subsequent paper. This species is closely related to the taxa of the newly described *Goniographa* but differs from them by the lack of the generic autapomorphies of *Goniographa* (see in the diagnosis of the new genus).

Eugraphe HÜBNER, [1821] 1816
(Figs 18, 19, 44, 45, 50)

Type species: *Phalaena Noctua sigma* [DENIS et SCHIFFERMÜLLER], 1775.

Taxonomic remarks. A probably monotypic genus, its type species is Trans-Palaearctic. The genus is closely related to *Anagnorisma* RONKAY et VARGA, 1999, *Coenophila* STEPHENS, 1850 (Holarctic), *Eugnorisma* BOURSIN, 1946, and supposedly also to the Nearctic *Eueretagrotis*.

Diagnosis. The external appearance of the only known species of the genus (Fig. 50) is rather different from those of the closely related *Anagnorisma, Eugnorisma* and *Coenophila* (see also FIBIGER 1997), resembling mostly certain species of *Spaelotis* BOISDUVAL, 1840 and also *Graphiphora* OCHSENHEIMER, 1816.

The closest related genus of *Eugraphe*, owing to the genitalia features of both sexes, is *Anagnorisma*, one of the most ancient known groups of the *Eugnorisma–Eugraphe* phyletic line. Their male genitalia differ mainly by the size and structure of the subbasal cornutus which is much stronger, longer in *Anagnorisma* (see RONKAY & VARGA 1999, Figs 21, 22), the presence/absence of the long zone of fine sclerotised ribs in the inner curve of the vesica (present in *Eugraphe*, absent in *Anagnorisma*) and the shape and size of the pollex which is much more lobate in *Eugraphe* than in the *Anagnorisma* species.

The female genitalia of *Anagnorisma* show a less homogeneous picture where the typical features of *Eugraphe* (e.g. the well-developed postero-lateral appendages of the ostium bursae or the medially folded ductus bursae) may appear but in different combinations, and a part of the species still have signa in the corpus bursae.

The main differences between the male genitalia of *Eugraphe* and *Eugnorisma* lie in the aedeagus and the vesica: the aedeagus of *Eugraphe* has a ventral sclerotised bar of the carina extending towards basal part of vesica, terminated in a strong, dentate bulb; the carina of *Eugnorisma* has generally a dorsal (dentated, hooked, etc.) projection, if there is a stronger ventral sclerotisation (in the *E. chaldaica–E. spodia* group), it is always very strong and pyramidal. Another generic apomorphy of *Eugnorisma* is the presence of a distal, smaller or larger, field

of minute cornuti in the vesica, covering often the surface of a subterminal diverticulum; this cornuti field is completely missing in *Eugraphe*.

The most conspicuous differential feature of the female genitalia of *Eugraphe*, as compared with *Eugnorisma*, is the presence of large, heavily sclerotised, terminally rounded postero-lateral appendages of the ostium bursae. The ostium bursae of *Eugnorisma* is also strongly sclerotised, but its caudal margin is more or less straight, except in certain species of the *E. chaldaica* lineage, but is much weaker, therefore the caudal edge of the ostium bursae is only slightly U-shaped. It is worth mentioning that *Paradiarsia* and *Anagnorisma* have such appendages, although those of *Paradiarsia* are considerably smaller and weaker.

Eugraphe differs from *Coenophila*, besides the external dissimilarity, by the presence of the subbasal cornutus of the vesica (it is absent in *Coenophila*), the differently built apical part of the valva and the much longer, slenderer, curved harpe (see FIBIGER 1997, pp. 288–289, figs 193, 194) of the males, the different shape of the postero-lateral appendages of the ostium bursae (they are "bear-ear-shaped" in *Eugraphe*, "mouse-antler"-shaped in *Coenophila*) and the different proportion and shape of ductus bursae and corpus bursae (*Eugraphe* has short but strong, flattened ductus and large, spacious corpus bursae while the ductus bursae of *Coenophila* is long, narrowly tubular since the corpus bursae is rather small, elliptical) of the females.

Redescription. External features (Fig. 50): Medium-sized moths with dark brown ground colour of both wings, forewing costal area suffused with some reddish or ochreous brown scales; orbicular and reniform stigmata sharply marked, blackish, with some reddish-brownish definition, all other markings rather obsolescent; hindwing concolorous dark brown.

Male genitalia (Figs 18, 19): Uncus long and thin, slightly spatulate apically. Valva without cucullus and corona, pointed with a tiny "pseudopollex" laterally. Saccular extension weakly sclerotised. Harpe long, falcate. Juxta shield-shaped with two parallel sclerotised crests apically. Aedeagus long, slightly arcuate, carina weakly sclerotised, with modified, bulbous, dentate ribbon. Vesica saccate, recurved, projecting ventrally; with a small bulbed cornutus in subbasal position.

Female genitalia (Figs 44, 45): Ovipositor rather short, weak; papillae anales finely conical, setose; posterior gonapophyses slender, fine. Ostium bursae large, sclerotized, its ventral plate quadrangular, with large, flattened, somewhat "bear-ear-shaped" postero-lateral appendages. Ductus bursae medium long, flattened, proximally slightly dilated and curved, most parts strongly, granulously sclerotized. Distal part with strong, straight, oblique dorsal crest running from postero-lateral end towards middle of opposite edge. Anterior third with relatively strong wrinkles and ribs, extending deeply towards apical part of bursa copulatrix. Appendix bursae ample, semiglobular, finely wrinkled; corpus bursae long, sacculiform, weakly membranous; signa absent.

Goniographa gen. n.
(Figs 1–14, 24–40, 51–65)

Type species: *Agrotis decussa* STAUDINGER, 1897, *Dt. ent. Z. Iris* **9**: 367. Type locality: Alexander Mts.

Taxonomic remarks. BOURSIN (1954, 1963) noted that 3 species of *Eugraphe* are characterised by some shared genital characters: they have "a very strong pollex, making the distal part of the valva trifid (*marcida, decussa, funkei*)". More exactly: they can be characterised by the presence of an acute, subapical "pseudopollex", originating from the dorsal sclerotised margin of the valva and by the presence of a well-developed lateral pollex, situated close to the basis of the harpe. The apical "pseudopollex" can be evidently derived from the reduced cucullus, a homologous but less strong and acute lobe is present in the genera *Setagrotis*, *Eugraphe*, *Eugnorisma*, *Adelphagrotis*, etc. However, we should suppose that this character can be considered only as a homoplasy, because it may occur in both of the group of Xestiini genera having spinulose sclerotised plate of the carina and also in those genera which have a (variably) dentate bar at the base of the vesica.

The new genus comprises three species-groups (the *decussa-*, the *funkei-*, and the *marcida*-groups) consisting of closely related sister species. (The taxonomic placement of "*Eugraphe*" *versuta* (PÜNGELER, 1909) has remained uncertain, therefore it was not included into *Goniographa*). The external appearance of the species within these species groups are often confusingly similar but even certain species of the *decussa-* and *marcida* species-groups (for instance *G. discussa* and *G. gyulaipeteri*) can be surprisingly similar externally. The differences in the genitalia of both sexes, however, are easily recognisable not only between the three species-groups but also in the twin species of the given species-groups, too.

Synopsis of the species

Goniographa decussa (STAUDINGER, 1897) **comb. n.**
Goniographa discussa **sp. n.**
Goniographa shchetkini **sp. n.**
Goniographa funkei (PÜNGELER, 1901) **comb. n.**
Goniographa metafunkei **sp. n.**
Goniographa naumanni **sp. n.**
Goniographa marcida (CHRISTOPH, 1893) **comb. n.**
Goniographa gyulaipeteri **sp. n.**

Diagnosis. The new genus shows a unical combination of three main autapomorphies in the male genitalia which are as follows: 1) The dorsally projected vesica with dentate eversible ventral bar; 2) The complete lack of any spinulose or

specially modified surfaces on the vesica; 3) The characteristic tripartite appearance of the apical part of the valva, this unique character was already observed and commented by BOURSIN (1964), consisting of the pointed, cuneate valval apex, the also acute and usually strong pseudopollex and the well-developed, cuneate or thorn-like pollex.

The characteristic features of the female genitalia are the sclerotized, rather large, triangular, calyculate or infundibular ventral plate of ostium bursae, separated from the similarly sclerotised ductus bursae by a fine membranous collar; the sclerotized, flattened ductus bursae with stronger or weaker longitudinal suture at the ventral surface; the scobinate-wrinkled apical (posterior) third of the corpus bursae; the membranous, rather small main part of corpus bursae, having no signa.

Most of the related genera have either a strongly sclerotised, plate-like and spinulose carina but without a bar-shaped dentate processus (*Eugnorisma*, *Metagnorisma, Paradiarsia, Anagnorisma* etc.) with ventrally or ventro-laterally projecting vesica. Other genera show some different, often modified forms of the bar-shaped dentate processus, but also combined with ventrally projecting vesica (*Eugraphe, Coenophila*, etc.). Those Xestiini genera which can be characterised with bulbed cornutus of the vesica (e.g. *Eugraphe*, "*Eugnorisma*" *miniago*, some *Lycophotia* spp., *Pseudohermonassa*, etc.) usually have ventrally projected vesica. The externally most similar *Anagnorisma* spp. do not have any dentate processus onto the basal part of vesica but have a thorn-like, not bulbed cornutus and their vesica is projected ventrally. Some species of the highly diverse genus *Xestia* (s. l.) may have dorsally projecting vesica, but in these cases the dentate processus of carina is also dorsal, and the vesica has no cornutus.

The structure of the female genitalia shows close relationships of *Goniographa* with certain species-groups of *Eugnorisma* and *Protognorisma* while it is rather distinct from those of *Eugraphe, Coenophila* or *Metagnorisma*. The female genitalia of *Eugnorisma* is generally more robust than those of *Goniographa*, the ostium is larger, broader but less elongate and less triangular, being more strongly fused with ductus bursae, the ductus bursae is regularly folded (sometimes very strongly, in different directions) and the posterior part of the corpus bursae and the cervix bursae are more ribbed-wrinkled and usually more spacious. The ostium-ductus complex of *Protognorisma* is rather similar to that of *Goniographa* at the first sight but the proportion of them is different, the ostium is smaller, shorter and the ductus is longer than those of *Goniographa*. In addition, *Goniographa* and *Eugnorisma* have no signa while *Protognorisma* (and *Metagnorisma*) have ribbon-like (*Protognorisma*) or patch-like (*Metagnorisma*) signa.

The female genitalia of *Eugraphe* differ from those of *Goniographa*, besides their larger size and more spacious corpus bursae, by the characteristic structure of

the ostium bursae with the long postero-lateral appendages (see above in the diagnosis of *Eugraphe*) and the medially strongly folded ductus bursae.

Description (Figs 51–65). Generally medium-sized species (wingspan 27–37 mm) with rather slender body, elongate, apically pointed forewings and relatively small, rounded hindwings. Head large, eyes large, globular; frons broad, smooth, finely convex, covered relatively sparsely with long hair-scales. Palpi slender, slightly upturned, second segment with longer or shorter scales laterally; third segment bar-shaped, longer (*funkei*-group), medium-long (*decussa*-group) or rather short (*marcida*-group). Proboscis well developed. Male antenna fasciculate with rather long cilia, female antenna shortly, sparsely ciliate. Collar and tegulae large, distinct, pro-and metathoracic tufts well developed. Abdomen long, slender, dorsal crest weak or reduced. Fore tibiae with a full row of longer spines, meso- and hind tibiae with two incomplete rows of spines. Tarsi with rather three than four rows of spines.

Male genitalia (Figs 1–14): Uncus strong, digitiform, often spatulate, pointed or obtuse apically; tegumen high, trigonal; valva elongate, apex bifid apically, pollex long, cuneate, spiniform or sligthly curved; harpe strong, may be short or elongate, curved; juxta shield-shaped. Aedeagus long, straight or slightly curved, carina strongly sclerotised with bar-shaped dentate processus which can be modified into some strongly sclerotised teeth; vesica saccate or tubular, projecting dorsally, partly or fully recurved, armed with broad and most often short, bulbed cornutus in subbasal or medial position.

Female genitalia (Figs 24–40): The female genitalia can be characterized by the weak, relatively short ovipositor; the sclerotized, rather large, more or less triangular ventral plate of the ostium bursae; the strong, often heavily sclerotized, flattened ductus bursae, often with fine longitudinal suture at ventral surface; the well-developed, ribbed-wrinkled, subconical or semiglobular appendix bursae; the scobinate-wrinkled apical (posterior) third of the corpus bursae; and the membranous, elliptical-ovoid main part of corpus bursae, having no signa.

The common species-group features of the three species-groups are described hereunder.

G. decussa-group

Male genitalia (Figs 1–4): Uncus digitiform, of medium length, obtuse terminally; valva with convex dorsal margin, lateral apical extension horn-shaped, longer than the dorsal one; harpe reduced to its basal plate; pollex long, pointed apically, oxbow-shaped. Juxta broad, shield-shaped, with short, bar-shaped sclerotisation apically. Aedeagus long, nearly straight, carina serrate, extended into a long, terminally curved serrate ribbon-shaped bar onto the basal part of the vesica. Vesica bilobate, with a moderately strong bulbed cornutus subterminally.

Female genitalia (Figs 24–29): Ostium bursae with ventral plate shorter or broader triangular or calyculate, having variably strong medio-caudal incision. Ductus bursae variably long, flattened, strongly, sometimes heavily sclerotized, tubular, usually finely tapering towards posterior end, sometimes with large, rounded lateral angle at middle; junction of ventral plate to corpus bursae may be weakly or strongly arched and/or crenellate, or having long and deep, sometimes sinuously folded large crest running into a rather globular, big ventral pouch.

G. funkei-group

Male genitalia (Figs 5–11): Uncus more or less spatulate, pointed terminally; valva very long with nearly straight dorsal margin, slender distally, lateral apical extension acute apically, slightly or essentially longer than dorsal one; harpe strong, curved; pollex strongly developed, pointed apically, with different shape in each species. Juxta relatively small, pentagonal. Aedeagus very long, straight with strongly dentate or finely serrulate carina; dentate bar more or less reduced. Vesica broadly tubular, unilobate, more or less recurved; position and size of bulbed cornutus different in each species.

Female genitalia (Figs 30–35): Ostium bursae with ventral plate triangular, trapezoidal or infundibular, caudal margin slightly convex, arcuate, with variably deep medial incision. Ductus bursae medium-long or long, broadly tubular or cask-shaped, proximal half of ductus bursae may have a long, strong lateral fold along left margin and a stronger lateral rib or a weak, short fold at anterior end. Appendix bursae relatively short, subconical-semiglobular; corpus bursae discoidal-globular.

G. marcida-group

Male genitalia (Figs 12–14): Uncus thin, elongate, pointed apically; tegumen broader, triangular. Valva elongate, narrow, with slightly convex dorsal margin; apical processes thorn-shaped, acute apically; harpe strong, pointed apically; pollex straight, cuneate, pointed apically. Juxta relatively small, shield-like. Aedeagus rather long, carina finely serrate, extended into a finely dentate ribbon-shaped bar onto basal part of the vesica. Vesica tubular, recurved, with short, bulbed cornutus.

Female genitalia (Figs 36–40): Ventral plate of ostium bursae broadly triangular-calyculate, with convex, evenly arcuate caudal margin, without incision. Ductus bursae, long, broad, flattened, anterior end with short but strong medio-lateral crest and a large, rounded, verrucose proximo-lateral plate. Appendix bursae large, subconical, with membranous apex and wrinkled-ribbed, scobinate basal two-thirds or with large, sclerotized, more or less rounded dorsal fold.

Goniographa decussa (STAUDINGER, 1897) **comb. n.**
(Figs 1–3, 24, 25, 51, 52)

Agrotis decussa STAUDINGER, 1897, *Dt. ent. Z. Iris* **9**: 367. Type locality: Alexander Mts.

Type material examined: a syntype male, a colour picture of which and the photo of its genitalia (slide 127 BOURSIN, mentioned as "holotype") are presented in Figs 1 and 51. This specimen is designated here as the lectotype of *Agrotis decussa* STAUDINGER (deposited in coll. STAUDINGER, ZMHU Berlin).

Additional material examined: Uzbekistan: 9 males, 5 females, W Tien Shan, Chimgan Mts, 800–2000 m, 69°58'E, 41°32'N, 18–25.VII.1990, leg. GYULAI & HREBLAY (coll. B. HERCZIG, P. GYULAI, G. RONKAY, Z. VARGA); 1 male, from the same Mts, 1600 m, 20.IX.1992, leg. L. MISKÓ; 1 male, Tien Shan Mts, Maidantal Mts, Pskem valley, 2100 m, 42°11'N, 70°50'E, 28–31.VII.1994; 1 male, W Tien Shan, Chatkal Mts, Besch-Aral, 2200 m, 71°27'E, 42°00'N, 27.VII.1993, leg. V. & A. LUKHTANOV; 1 male, Susamyr Mts, valley of Chickhan river, 1800 m, 29–30.VII.1994, leg. TOROPOV & SINIAEV (coll. P. GYULAI). Kirghisia: Issyk-Kul (coll. P. GYULAI); 1 male, Alai Mts, Uzhgen,

2300 m, 20–30.08.1999, leg. GURKO (coll. LEHMANN); 1 male, Alai Mts, 1800–2000 m, 10–20.VIII. 1999 (coll. BECHER); 1 male, Transili Alatau, 2500 m, Ak-tuz, 1–10.X.1997, leg. TOROPOV (coll. LEHMANN).

Slide Nos RL7545m, RL7546m, 7041VZ, 7156VZ (males), RL7531f (female).

Diagnosis. *G. decussa* resembles mostly the next, newly described species, *G. discussa*, the third species of the species-group, *G. shchetkini* is more similar externally to the small specimens of *G. gyulaipeteri* sp. n. having rounded forewing apex. The forewings of *G. decussa* are more triangular than those of *G. discussa*, apically more pointed, the orbicular, reniform and claviform stigmata are more regular, being defined finely by black scales and by fine ochreous contour-line; the dark intermacular patch in the cell, the basal dash and the subterminal chevron-spots are also more sharply marked. The hindwings are light brownish grey with darker suffusion along the veins.

The male genitalia of *G. decussa* can be distinguished from *G. discussa* by their more convex, "humped" dorsal margin of valva, the more reduced harpe, the broader juxta, the somewhat more slender, not spatulate uncus, the "broken" course of the ribbon-like extension of the carina and by the essentially shorter cornutus. The female genitalia of *G. decussa* have, comparing with those of *G.*

Fig. 1. *Goniographa decussa* (STAUDINGER), lectotype, MB127, male genital capsula

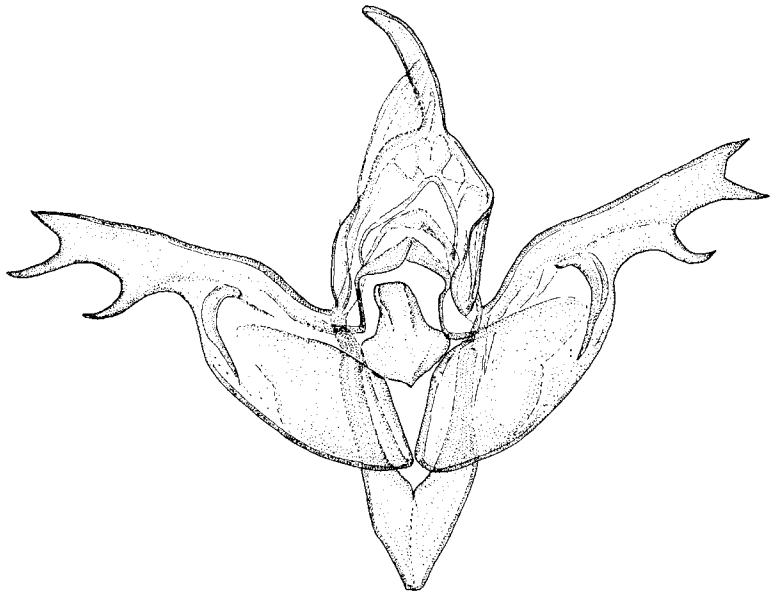


Fig. 2. *Goniographa decussa* (STAUDINGER), slide No. RL7546

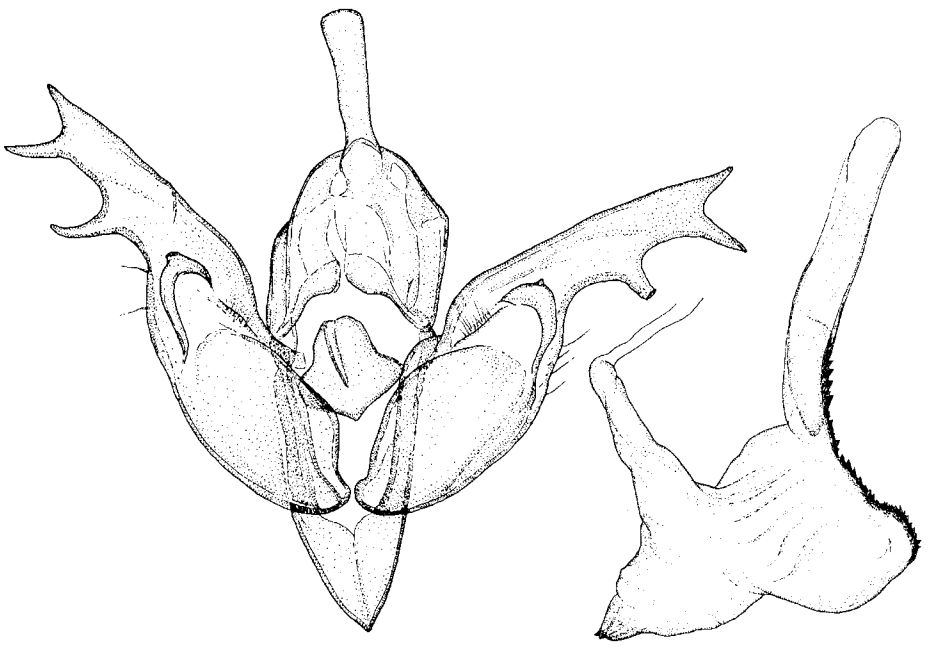


Fig. 3. *Goniographa decussa* (STAUDINGER), slide No. VZ7156

discussa and *G. shchetkini* (Figs 24–29), the largest ostium bursae with the strongest medio-caudal incision. The configuration of the ductus bursae is similar to that of *G. shchetkini* but it is considerably longer, proximally less dilated, without prominent lateral angle and the anterior arch of the ventral plate of ductus bursae is significantly deeper. The characteristic structure of the anterior third of ductus bursae of the third species of the lineage, *G. discussa*, differs conspicuously from those of *G. decussa* and *G. shchetkini* (see also in the diagnoses of the two other species of the lineage).

Description. Wingspan 27–37 mm. The external features are described in detail by STAUDINGER in the original description, two typical specimens are illustrated in colour in Figs 51 and 52.

Male genitalia (Figs 1–3): Uncus straight, obtuse; dorsal costa of valva humped. Distal, erect part of harpe reduced to a tiny protuberance; pollex moderately long, slighly curved; juxta very broad, with small, linguiform appendix apically. Aedeagus nearly straight, moderately long; dentate ribbon of ventral edge of carina "sickle"-shaped, broken medially; bulbed cornutus small, short, often bifid.

Female genitalia (Figs 24, 25): Ovipositor medium-long, rather weak; gonapophyses slender, fine. Ostium bursae sclerotized, its ventral plate broadly triangular, with broad, shallow medio-caudal incision. Ductus bursae strongly, rather smoothly sclerotized, long, broad, more or less flattened (its cross-section is flat triangular at proximal part), finely tapering towards posterior end. Ventral surface of ductus bursae with narrow longitudinal medial suture, junction of ventral plate to corpus bursae strongly arched and crenellate. Apical part of bursa copulatrix globular, wrinkled-ribbed, partly gelatinous and scobinate-verrucose. Appendix bursae relatively short, subconical, finely wrinkled; corpus bursae medium-long, elliptical-ovoid, weakly membranous, signa absent.

Bionomics and distribution. *Goniographa decussa* occurs in the Western Tien-Shan Mts, where it seems to be locally frequent in some lepidopterologically well-known localities, in medium elevations (between 800–2300 m!) of Kirghisia.

Goniographa discussa sp. n.
(Figs 4, 26, 27, 53, 54)

Holotype: male, Seravshan Mts, 45 km SEE Aini, 2000–2600 m, 68°03'E, 39°20'N, 17–18. VII.1994, leg. LUKHTANOV; slide No. RL7544m (coll. P. GYULAI, in HNHM Budapest).

Paratypes. Tadjikistan: 1 female, Pamir Mts, Artuch valley, 2–10.VIII.1988, coll. A.V. NEKRASOV (coll. HNHM Budapest); Pamir Mts, Shugnan, VI.1935, leg. WEIDINGER (coll. G. RONKAY); vic of Shuroabad, 35 km S Kuliabad, 2000 m, 12.VIII.1958, leg. SHCHETKIN; Peter 1st Mts, Chasor Thasma, 2100 m, 13.VII.1977, leg. SHCHETKIN; Peter 1st Mts, Muk, 2100 m, 27.VIII.1975, leg. SHCHETKIN; 1 male, 2 females Peter 1st Mts, Daran-Nazarak valley, Ganishou, 2110 m, 19–21.VIII. 1977, leg. SHCHETKIN; 18 specimens, from the same locality, VII-VIII.1994, leg. SHCHETKIN; 1 m, Peter 1st Mts, Ganishou, 1500–2500 m, 11.VII.2000, leg. RYBAK (coll. LEHMANN); 3 females, Daran-Nazarak valley, 1700 m, 15.VIII.1992, leg. SHCHETKIN; 1 male, 3 females, Karategin range, Sangikar gorge, 1700 m, 28.VIII.1969, leg. SHCHETKIN; 2 males, 2 females, Varzob valley, Maihur, 2000 m, 24.VII.–16.IX.1967, leg. SHCHETKIN; 1 female, Hissar Mts, Anzob pass, 3400 m, 50 km N

Dushanbe, 24–25.VII.1994, leg. LUKHTANOV; 2 males, from the same locality, 26.VIII.1967, leg. SHCHETKIN; 2 males, Hissar Mts, 25 km S Pendzhikent, 1800 m, 10.VII.1994, leg. LUKHTANOV; 1 female, Hissar Mts, Gushary, 1300 m, 18–25.IX.1985, leg. SHCHETKIN (coll. A. BECHER, J. STUMPF and P. GYULAI). Afghanistan: 1 male, Badakhshan, "Sarakanda" 4100 m, 01.18.1953. leg KLAPPERICH (ZSM).

Slide Nos RL7563m, RL7564m, RL7566m, VZ4673, VZ7022 (males), RL7481f, RL7570f, RL7575f (females).

Diagnosis. *G. discussa* has narrower and more rounded forewings comparing with that of *G. decussa*, with generally more obsolescent markings. The maculation of the new species is less conspicuous, with less sharply defined ochreous outlines of the reniform and orbicular stigmata; the claviform stigma is narrower, more obsolescent. The dark intermacular patch of the cell, the basal dash and the subterminal arrowheads are also less sharply marked; the darker suffusion of the hindwing is more diffuse.

Comparing the male genitalia of the two sister species, the uncus of *G. discussa* is slightly broader than in *G. decussa*, slightly spatulate terminally; the valvae have a less convex dorsal costa; the harpe is slightly more elongate; the dentate, ribbon-like extension of the carina is only slightly arcuate, recurved terminally; the bulbed cornutus is more acute and about twice as large as in *G. decussa*.

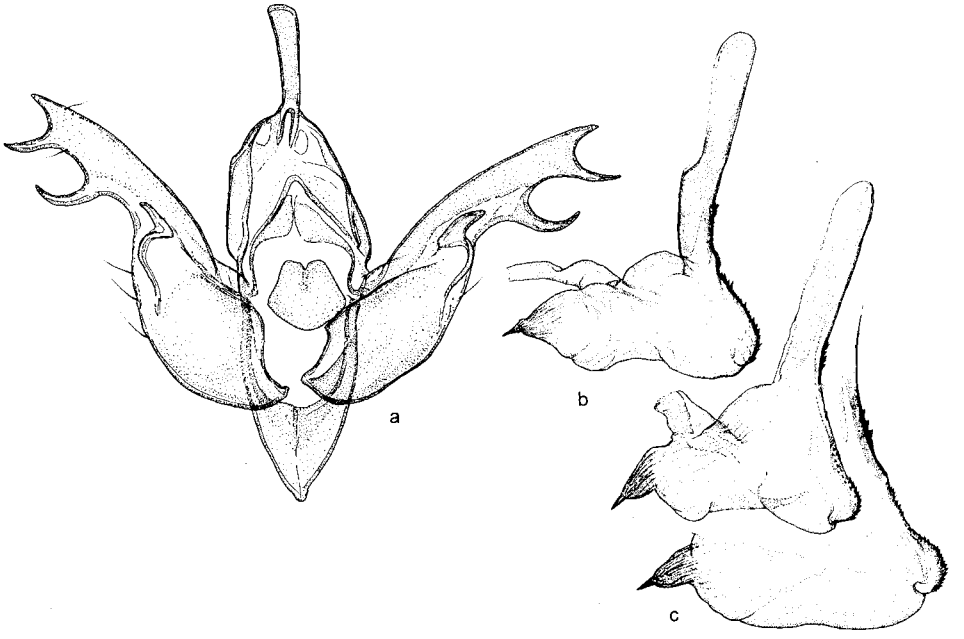


Fig. 4. *Goniographa discussa* sp. n., paratypes, slide Nos a–b = VZ4673, c = RL7566, d = RL7564

The female genitalia of *G. discussa* differ from those of *G. decussa* and *G. shchetkini* by their characteristic, long and deep, sometimes sinuously folded ventral crest of the anterior third of ductus bursae, terminated in a large, more or less globular ventral pouch, both related species have a deeper or shallower arch at anterior edge of ventral plate instead of this structure (see Figs 24–29). The ostium bursae is smaller than that of *G. decussa* but larger than in *G. shchetkini*, the medio-caudal incision is the smallest in *G. discussa*. The anterior third of the ductus bursae is less dilated, its lateral margins are almost parallel, this part is broader (*G. decussa*) or conspicuously broader (*G. shchetkini*) in the two related species.

Description. Wingspan 30–35 mm, length of forewing 13–15 mm. The main external features fit well with those of the *decussa*-group, the differential characteristics are given in the diagnosis. The holotype (male) and a typical female are illustrated in Figs 53 and 54.

Male genitalia (Fig. 4): Uncus slightly broader, slightly spatulate terminally; dorsal costa of valva only slightly convex; harpe small, more elongate; pollex long and curved; juxta shield-shaped with narrow and shallow incision apically; aedeagus straight, long and strong; dentate ribbon slightly arcuate, recurved terminally; bulbed cornutus large, acute.

Female genitalia (Figs 26, 27): Ovipositor medium-long, rather weak; gonapophyses slender, fine. Ostium bursae sclerotized, its ventral plate relatively short, broadly triangular, caudal edge almost straight, with minute medio-caudal incision only. Ductus bursae strongly, granulously sclerotized, more or less flattened, long, broad, with almost parallel lateral margins, only posterior third dilated slightly. Ventral surface of ductus bursae with fine longitudinal medio-lateral suture, anterior third with long and deep, sometimes sinuously folded large crest running into a rather globular, big ventral pouch. Apical part of bursa copulatrix small, flattened-conical, wrinkled, partly gelatinous and scobinate. Appendix bursae rather long, elliptical, finely wrinkled and gelatinous; corpus bursae elliptical-saccate; signa absent.

Bionomics and distribution. *G. discussa* is distributed from the Zeravshan and Hissar Mts through the western Pamir Mts to NE Afghanistan (Prov. Badakhshan), mostly at medium but exceptionally also at rather high elevations.

Etymology. The specific name refers to the less sharply defined markings of the new species.

Goniographa shchetkini sp. n.
(Figs 28, 29, 55)

Holotype: female, Tadjikistan, Pamir Mts, Vanch, Liangar glacier, 4000 m, 20.VIII.1962, ex pupa, leg. SHCHETKIN; slide No. RL7547f (coll. P. GYULAI, in HNHM Budapest).

Diagnosis. The unique type specimen of *G. shchetkini* resembles mostly a small *G. discussa* female but even more unicolorous, with only very weak paler brownish-ochreous irroration but with stronger violaceous hue, the filling of the

orbicular and reniform stigmata is also matching with the violaceous brown ground colour and the fine brownish suffusion of the hindwing is also more concolorous.

The female genitalia of *G. shchetkini* have the smallest ostium bursae and the shortest, proximally conspicuously dilated ductus bursae within the three closely allied species of the *decussa*-line.

Description. Wingspan 31 mm, length of forewing 14 mm. The main external features fit well with those of the *decussa*-group, the differential characteristics are given in the diagnosis. The holotype female is illustrated in Fig. 55.

Female genitalia (Figs 28, 29): Ovipositor medium-long, weak; gonapophyses slender, fine. Ostium bursae sclerotized, small, ventral plate triangular-calyculate, with fine, narrow medio-caudal incision. Ductus bursae heavily sclerotized, relatively short, proximal half considerably broader, with large, rounded lateral angle at middle of left side. Ventral surface of ductus bursae with fine, narrow longitudinal medial suture, junction of ventral plate to corpus bursae forming a rather flat arch. Apical part of bursa copulatrix semiglobular, small, wrinkled-ribbed; appendix bursae relatively long, elliptical, wrinkled. Corpus bursae medium-long, elliptical-ovoid; signa absent.

Bionomics and distribution. A poorly known species, its unique type was collected as a pupa at a high altitude place nearby the Liangar glacier.

Etymology. The new species is dedicated to the late Yuri SHCHETKIN (senior), the famous explorer of the Lepidoptera of the Pamir and the Hissar Mts in Tadjikistan.

Goniographa funkei (PÜNGELER, 1901) **comb. n.**
(Figs 5, 6, 30, 31, 56, 57)

Agrotis funkei PÜNGELER, 1901, *Dt. ent. Z. Iris* **14**: 181. Type locality: Zeravshan Mts.

Type material examined: A syntype male, illustrated in Fig. 56; the labels of the genitalia slide are as follows: "Holotype [printed]/ Agrotis funkei / Pglr. / Sarawschan (2500m) / 30.VI.1900 [handwritten] Boursin [printed]" (red label). This specimen is designated here as the lectotype of *Agrotis funkei* PÜNGELER (in coll. PÜNGELER, ZMHU Berlin).

Additional material examined. Tadjikistan: 4 males, 1 female, Seravshan Mts, 45 km SEE Aini, 2000–2600 m, 68°03'E, 39°20'N, 17–18.VII.1994, leg. LUKHTANOV (coll. P. GYULAI, Z. VARGA), 3 males, Seravshan Mts, Dasht, 2600 m, 68°03'E, 39°20'N, 18–19.VII.1994, leg. LUKHTANOV; 1 male, 2 females, Seravshan Mts, Iskander-kul, 2200 m, 23–25.VII.1968, leg. SHCHETKIN; 1 male, 1 female, Seravshan Mts, 2200 m, 22.VII.1968, leg. SHCHETKIN; 3 males, 3 females, Hissar Mts, Iskanderful, 1900–2300 m, 19–21.VII.1994, leg. LUKHTANOV (coll. P. GYULAI); 1 female, Hissar Mts, Takob, 1900 m, VII.1981, leg. V.V. DUBATOLOV (coll. G. RONKAY); 1 male, 3 females, Hissar Mts, 25 km S Pendzhikent, 1800 m, 10.VII.1994, leg. LUKHTANOV; Hissar Mts, Kvak valley, 1800 m, 21.VII.1960, leg. SHCHETKIN; 9 specimens, Hissar Mts, Takob, Varmonik, 1800 m, 20–21.VII.1961, 14–17.VII.1994, leg. SHCHETKIN; 5 specimens, Hissar Mts, Kondara valley, 1800 m, 21.VIII.1955, 20.VIII.–1.IX.1994, leg. SHCHETKIN; 1 male, Hissar Mts, Kabuty, 1950 m, 10.VII.1961, leg. SHCHETKIN; 1 male, Hissar Mts, Acrobat valley, 1600 m, 1–10.X.1997, leg. V. GURKO (coll. L. LEH-

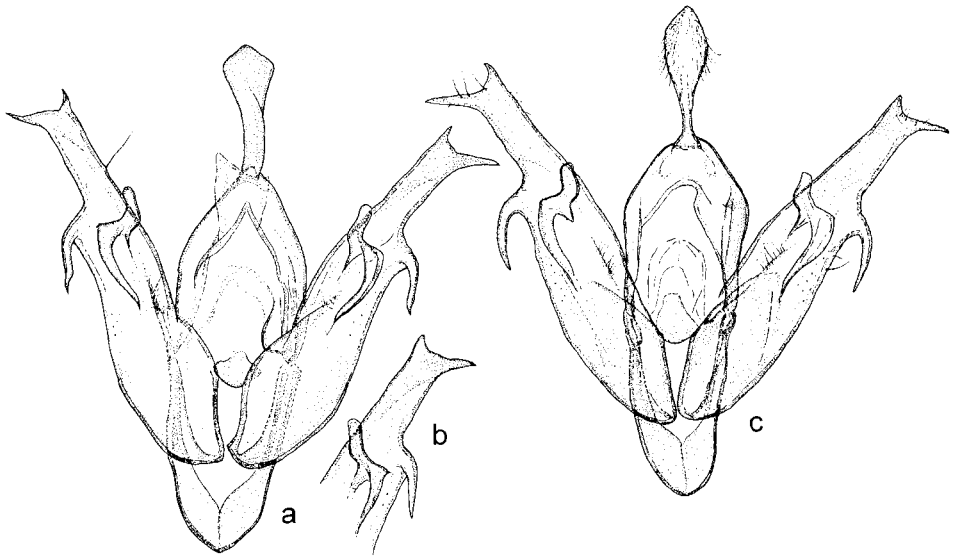


Fig. 5. *Goniographa funkei* (PÜNGELER), slide Nos a = VZ7151, b = VZ7152, c = VZ7043

MANN) 1 female, Varzob valley, 2000 m, 1.VIII.1967, leg. SHCHETKIN; 6 females, Varzob valley, Maihur, 2000 m, 12.VIII.–16.IX.1967, leg. SHCHETKIN (coll. P. GYULAI); 2 females, Pamir Mts, Artuch valley, 2–10.VIII.1988, coll. A.V. NEKRASOV (coll. HNHM Budapest and G. RONKAY); 3 females, Karategin range, Sangikar gorge, 1700 m, 28.VIII.1969, leg. SHCHETKIN; 1 male, from the same site, 1–4.IX.1994, leg. SHCHETKIN; 3 females, Peter 1st Mts, Daran-Nazarak valley, Ganishou, 1700 m, 5–13.VIII.1972, leg. SHCHETKIN; 1 male, from the same locality, 8–27.VIII.1974, 21–22.

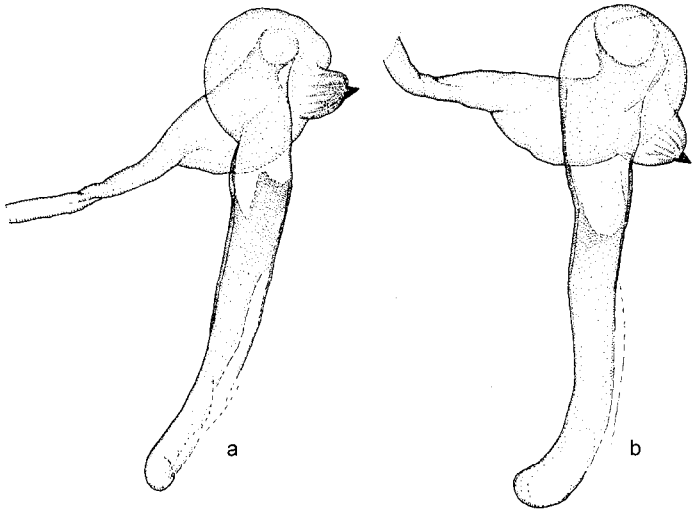


Fig. 6. *Goniographa funkei* (PÜNGELER), slide Nos a = VZ7151, b = VZ7152

VIII.1994, leg. SHCHETKIN; 1 male, 5 females, Peter 1st Mts, Daran-Nazarak valley, Ganishou, 2100 m, 8.VIII.1974, 17–18.VIII.1994, leg. SHCHETKIN; 2 females, Turkestan Mts, Shahristan pass, Kushikat, 3100 m, 26–28.VII.1994; 2000 m, 5–8.VI.1994, leg. LUKHTANOV (coll. P. GYULAI and J. STUMPF).

Slide Nos GYP1564m, RL7549m, RL7551m, RL7576m, RL7577m, RL7582m, 7043VZ, 7151VZ, 7152VZ, 7154VZ (males), RL7480f, RL7553f, RL7554f, RL7556f, RL7557f, RL7558f, RL7579f, RL7580f, RL7585f, RL7586f, RL7589f, RL7590f (females).

Diagnosis. The forewing pattern of *G. funkei* is the most distinct within the *funkei*-group, even in case of the darkened specimens (see Figs 56–61), the forewing of *G. funkei* is somewhat broader than that of *G. metafunkei*. No further key features can be found for the three closely related species of the group, the satisfactory identification requires the study of the genitalia.

The male genitalia of *G. funkei* differ from those of *G. metafunkei* by the shape of the pollex bending characteristically down (proximo-ventrally) (see Figs 5–8), the narrower distal part of the valva with longer "pseudopollex" and the much shorter cornutus of the vesica sitting usually on a somewhat broader bulb. The differences between *G. funkei* and *G. naumanni* are much more prominent as *G. funkei* has much shorter harpe, downwardly bent pollex (it is curved upwards in *G. naumanni*) and smooth carina (which is armed with large, heavily sclerotised teeth in *G. naumanni*).

The female genitalia of *G. funkei* differ from its sibling species, *G. metafunkei*, by their shorter ostium bursae, significantly shorter but somewhat broader ductus bursae having only weak lateral fold and short, less sclerotized proximo-lateral rib(s) and shorter, apically more rounded appendix bursae (see Figs 30–33). The female genitalia of the third species of the *G. funkei* group, *G. naumanni*, is conspicuously different from those of the two closely allied taxa by their heavily sclerotized, much broader and entirely flattened, rather cask-shaped ductus bursae, fused firmly with the relatively short but broad, trapezoidal ostium bursae (Figs 34, 35).

Description. Wingspan 32–36 mm, length of forewing 15–17 mm. The main external features are fairly characterised by PÜNGELER in the original description, the slight differential characteristics are given in the diagnosis. The lectotype (male) and a typical female are illustrated in Figs 56 and 57.

Male genitalia (Figs 5, 6): The typical features of the species group are given in the diagnosis of the genus. Distal part of valva narrow, with more or less parallel margins; valval apex fine, acute, "pseudopollex" long, straight. Harpe rather short; pollex long, thin, bent downwards. Aedeagus long and thin, slightly arcuate; carina smooth. Vesica relatively small, short, recurved, with a short but broadly bulbed cornutus.

Female genitalia (Figs 30, 31): Ostium bursae sclerotized, ventral plate triangular, caudal margin slightly convex, arcuate, with rather deep medial incision. Ductus bursae medium-long, broadly tubular, flattened, granulously sclerotized, finely tapering towards ostium bursae. Proximal half of ductus bursae slightly curved laterad, often with lateral rib or a weak, short fold at anterior end; junction to corpus bursae with short, ribbed lamina at inner curve. Apical part of bursa copulatrix wrin-

kled-ribbed, partly gelatinous and scobinate-verrucose. Appendix bursae relatively short, subconical-semiglobular; corpus bursae discoidal-globular, weakly membranous; signa absent.

Bionomics and distribution. *Goniographa funkei* has the largest distribution in this species group. The type locality is the Zeravshan range, the area of the species covers the western Tien-Shan Mts (Turkestan Mts, Karategin range, Peter I. Mts, etc.), the Hissar Mts and also the western parts of the Pamir massif, where it occurs sympatrically with *G. naumanni*.

Goniographa metafunkei sp. n.
(Figs 7, 8, 32, 33, 58, 59)

Holotype: female, Kirghisia, Susamyr Mts, valley of Chickhan river, 1800 m, 29–30.VII.1994, leg. TOROPOV & SINIAEV; slide No. RL7528f (coll. P. GYULAI, in HNHM Budapest).

Paratypes. Kirghisia: 4 males, 2 females, Susamyr Mts, valley of Chickhan river, 1800 m, 29–30.VII.1994, leg. TOROPOV & SINIAEV; 2 males, 1 female, Alai Mts, Tengizbai, 27.VII.1994, leg. TOROPOV & SINIAEV; 2 males, 1 female, Talassky Alatau Mts, Kara-Bura pass, 1800 m, 42°18'N, 71°35'E, 29.VII.1993, leg. V. & A. LUKHTANOV (coll. P. GYULAI and G. RONKAY); 2 males, 1 female, Kirghiz Mts, Kara Baitta valley, Sosnovka, 1600 m, 6.VIII.1999, leg. PLYUSHCH (coll. A. BECHER, L. LEHMANN & J. STUMPF).

Slide Nos GYP687m, RL7548m, RL7578m, RL7587m (males), RL7581f, RL7588f (females).

Diagnosis. *Goniographa metafunkei* differs from the two closely allied species by its slightly (but in larger material clearly recognisable) smaller size and narrower forewing and the rather strong and blurred dark irroration. The male genitalia of *G. metafunkei* differ from those of *G. funkei* by their broader distal part of the valva, the straight, oblique, thorn-like pollex and the significantly larger cornutus of the vesica; from *G. naumanni* by its shorter harpe, broader distal part of the valva, the straight, distally not upcurved pollex and the smooth carina.

The female genitalia of *G. metafunkei* can be characterized by its long, narrowly tubular ductus bursae with relatively strong, long proximo-lateral fold and the presence of a long, curved, sclerotized ribbon connecting the anterior end of ductus bursae with the inner curve of appendix bursae. The ductus bursae of the new species is the longest within the *G. funkei* group, the ostium bursae is longer, more infundibular, medio-caudally less incised than in *G. funkei* and the appendix bursae is longer, more conical, apically less rounded (see Figs 30–33).

Description. Wingspan 30–35 mm, length of forewing 13–15 mm. The main external features fit well with those of the *funkei*-group, the differential characteristics are given in the diagnosis. The holotype (female) and a typical male are illustrated in Figs 58 and 59.

Male genitalia (Figs 7, 8). The specific features of *G. metafunkei* are as follows: Distal part of valva rather broad, apical process and "pseudopollex" relatively broad, triangular. Harpe rather short;

Fig. 7. *Goniographa metafunkei* sp. n., paratype, slide No. GyP687

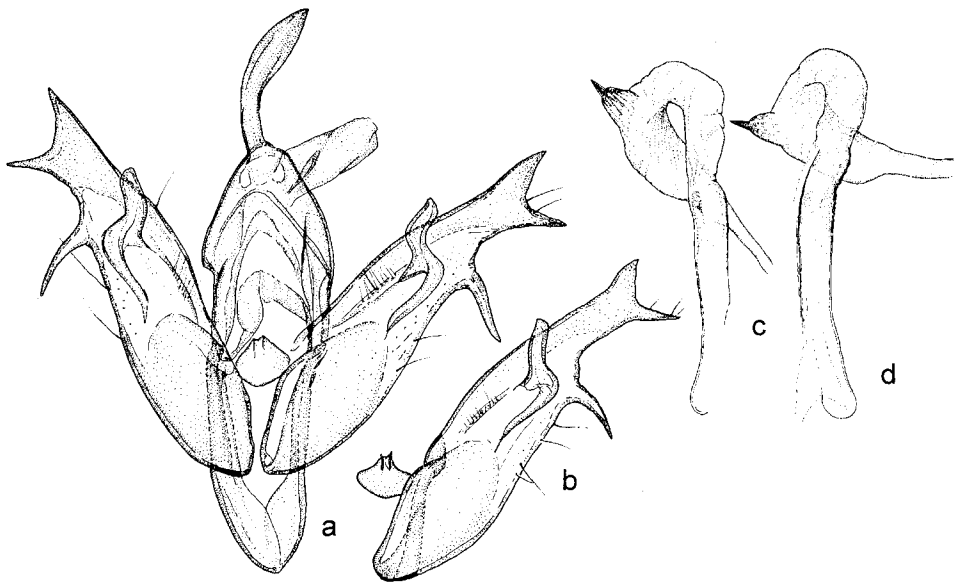


Fig. 8. *Goniographa metafunkei* sp. n., paratypes, slide Nos a–b = RL7548, c–d = RL7578

pollex long, straight, oblique. Aedeagus long and thin, slightly arcuate; carina smooth. Vesica relatively small, short, recurved, with long, strong, bulbed cornutus.

Female genitalia (Figs 32, 33): Ovipositor short, weak; posterior gonapophyses medium-long, slender, fine, anterior apophyses short. Ostium bursae sclerotized, its ventral plate elongate, triangular-infundibuliform, caudal margin slightly convex, arcuate, with shallow medial incision. Ductus bursae long, tubular, flattened, granulously sclerotized, finely tapering towards ostium bursae. Proximal half of ductus bursae with long, strong lateral fold along left margin; junction to corpus bursae with long, cristate-ribbed lamina at inner curve. Apical part of bursa copulatrix wrinkled-ribbed, partly gelatinous and scobinate-verrucose. Appendix bursae medium-long, elliptical-subconical, finely wrinkled; corpus bursae discoidal-globular, weakly membranous, signa absent.

Bionomics and distribution. The new species has a very strictly limited distribution in the western part of the Tien-Shan massif and the Alai Mts.

Etymology. The new species follows *G. funkei* in the system.

Goniographa naumanni sp. n.
(Figs 9–11, 34, 35, 60, 61)

Holotype: male, "Afghanistan, Badakhshan, Darrah-e-Kuf, 2480 m, 16.07.1972., leg. BRADE & NAUMANN"; slide No. VZ4634 (coll. Z. VARGA).

Paratypes. Afghanistan: 1 male, 1 female, Prov. Kadaghan, Salang-Paß N-Seite, 2400 m, 11–12. VII.1971. leg. VARTIAN; 1 male, Khurd-Kabul, 5.VII.1963. leg. KASY & VARTIAN, 1 male, Dasht-i-Nawar, Hokak, 2850 m, 7–9.IX.1963. leg. VARTIAN (coll. Z. VARGA); 1 male, Badakhshan, Darwaz, Shewa plateau, Darrah-e-Gulistan, 2800 m, 21.VIII.1973, 1 male, Badakhshan, Darwaz, Shewa valley, Basindj, 1900–2000 m, 27.VIII.1973., leg. Naumann & Nauruz. (coll. NAUMANN). Tadjikistan: 1 male, Pamir Mts, Shugnan, VII.1935, leg. WEIDINGER (coll. G. RONKAY); 9 males, 12 females, Pamir Mts, Chorog, July–August 1963–65, leg. SHCHETKIN; 1 female, from the same locality, 11.VIII.1992, leg. SHCHETKIN; 1 female, from the same site, 29–31.VII.1999, leg. SHCHETKIN; 1 female, Pamir Mts, Shod, 2300 m, 20.X.1987, leg. NEKRASOV (coll. P. GYULAI and J. STUMPF).

Slide Nos RL7552m, RL7555m, VZ3634; VZ3635, VZ3685, VZ4640, VZ7032, VZ7153 (males), RL7583f, RL7584f (females).

Diagnosis: The new species is almost equal in size with *G. funkei*, although the forewings are slightly narrower triangular with less pointed apex. Forewing colouration and pattern of the two species are highly similar, ground colour of *G. naumanni* is somewhat more ochreous grey, the postmedian line is less evenly curved and crenulate, the claviform stigma is slightly shorter and more obsolescent and the hindwing is a bit more suffused marginally. The satisfactory separation of the two species requires the study of the genitalia. This process is much easier in the females, as no dissection is needed to recognise the differences of the ostial plate.

The male genitalia of *G. naumanni* differ conspicuously from those of the two twin species by its considerably longer harpe, distally upcurved ("oxbow"-

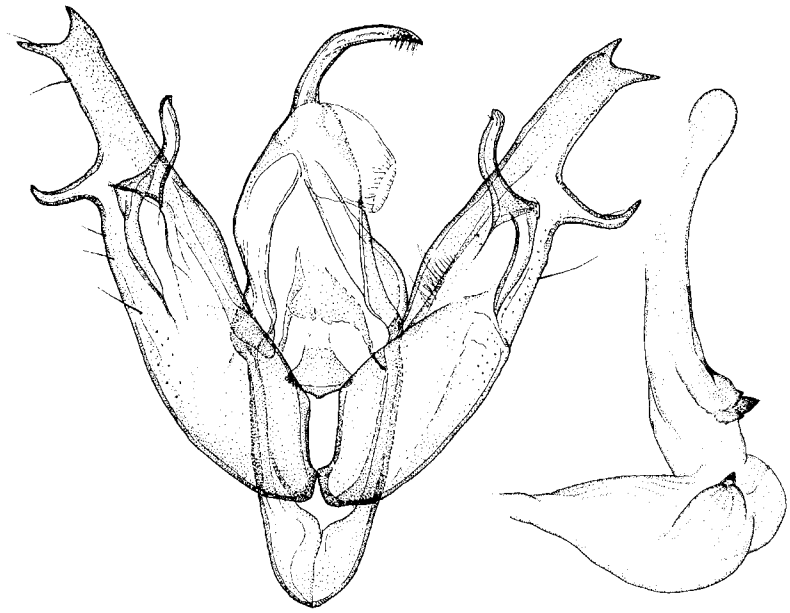


Fig. 9. *Goniographa naumanni* sp. n., holotype, slide No. VZ4634

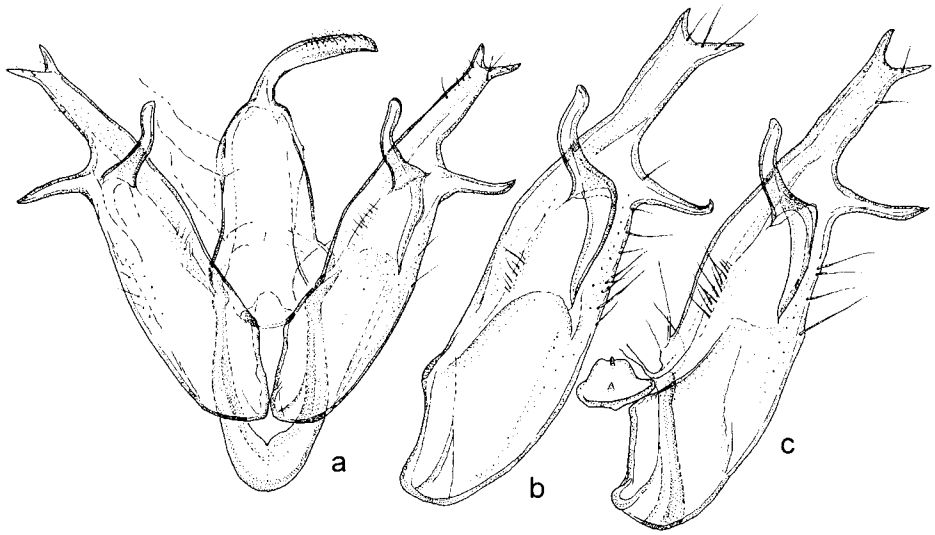


Fig. 10. *Goniographa naumanni* sp. n., paratypes, slide Nos a = VZ3634, b = VZ4640, c = VZ3635

shaped) pollex, the much stronger sclerotised carina bearing 2–3 large, acute teeth and the presence of a huge subbasal diverticulum of the not fully recurved vesica.

Comparing the female genitalia of *G. naumanni* with those of its two sister species, *G. naumanni* has conspicuously broader but shorter, trapezoidal, not triangular-infundibular ostium bursae and much stronger, heavily sclerotized, very broad, not tubulat but more or less cask-shaped ductus bursae.

Description. Wingspan 32–37 mm, length of forewing 14–17 mm. The main external features fit well with those of *G. funkei*, with only a bit more diffuse dark forewing markings. The holotype (male) and a typical female are illustrated in Figs 60 and 61.

Male genitalia (Figs 9–11). The specific features of the male genitalia are the long, slender harpe, the long, distally arched ("oxbow"-shaped) pollex, the nearly straight aedeagus with two or three large, pyramidal teeth on the ventral edge of the carina, the dorsally upturned but not fully recurved vesica with elliptical subbasal diverticulum and with short and strong submedial bulbed cornutus.

Female genitalia (Figs 34, 35): Ovipositor short, weak; posterior gonapophyses medium-long, slender, fine, anterior apophyses short. Ostium bursae relatively short but broad, trapezoidal, with strongly convex, medially slightly incised caudal margin. Sclerotizations of ostium bursae and ductus bursae almost completely fused with each others. Ductus bursae heavily sclerotized, medium-long, broad, rather cask-shaped, with strongly tapering proximal third. Apical part of bursa copulatrix finely scobinate, partly wrinkled-ribbed, partly gelatinous. Appendix bursae subconical, finely wrinkled and verrucose; corpus bursae elliptical-ovoid, signa absent.

Bionomics and distribution. The new species seems to be confined to the Hissar Mts, the western Pamir Mts (Shugnan range, Chorog) and the north-eastern territories of Afghanistan (Prov. Badakhshan, Kadaghan and Darwaz Mts). In the north-west, there is a narrow overlap between the

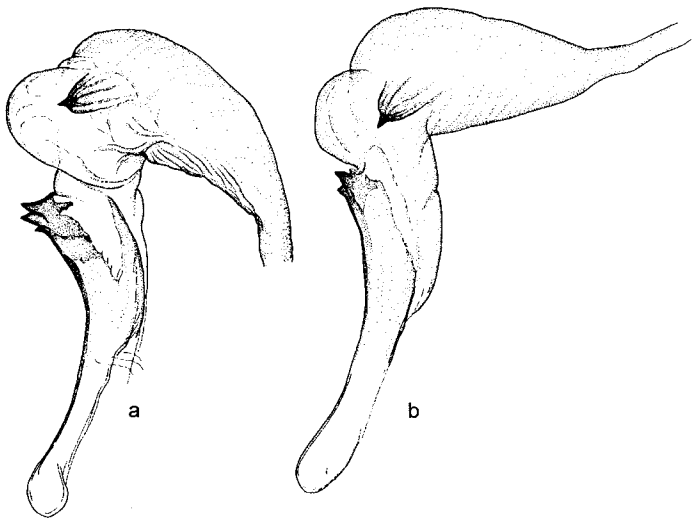


Fig. 11. *Goniographa naumanni* sp. n., paratypes, slide Nos a = VZ3634, b = VZ3635

areas of *G. funkei* and *G. naumanni*; the south-eastern boundary of the distribution of the new species is the Paghman Mts near Kabul (Khurd-Kabul).

Etymology. The new species is dedicated to one of its collectors, the prominent entomologist, Prof. Dr. Clas M. NAUMANN, who has made several important entomological discoveries in Afghanistan.

Goniographa marcida (CHRISTOPH, 1893) **comb. n.**
(Figs 12, 36, 37, 62, 63)

Agrotis marcida CHRISTOPH, 1893, *Dt. ent. Z. Iris* **6**: 90. Type locality: Askhabad (Turkmenistan: Ashgabat).

Type material examined: 1 male, 1 female syntypes, Turkmenistan, Askhabad (ZIN St. Petersburg).

Additional material examined: Turkmenistan: 2 males, 2 females, Kopet-Dagh Mts, Firyuza, 400–600 m, 25.IX.1991, No. L27, leg. A. PODLUSSÁNY, L. RONKAY & Z. VARGA; 4 males, 12 females, Kopet-Dagh Mts, Karayalchi, 1600 m, 5.X.1991, No. L36, leg. A. PODLUSSÁNY, L. RONKAY & Z. VARGA (coll. HNHM Budapest, B. HERCZIG, P. GYULAI, G. RONKAY and Z. VARGA). Iran: 1 male, 1 female, Prov. Khorassan, Kopet-Dagh Mts, 2300 m, 10 km N Jevenly, 27.VIII.2000, leg. A. GARAI & P. GYULAI; 5 males, 5 females, Prov. Khorassan, Kopet-Dagh Mts, Jozak NP, 2 km W Jozak, 1350 m, 28.VIII.2000, leg. A. GARAI & P. GYULAI (coll. P. GYULAI).

Slide Nos RL7476m, 7030VZ (males), RL7477f, RL7569f, RL7574f (females).

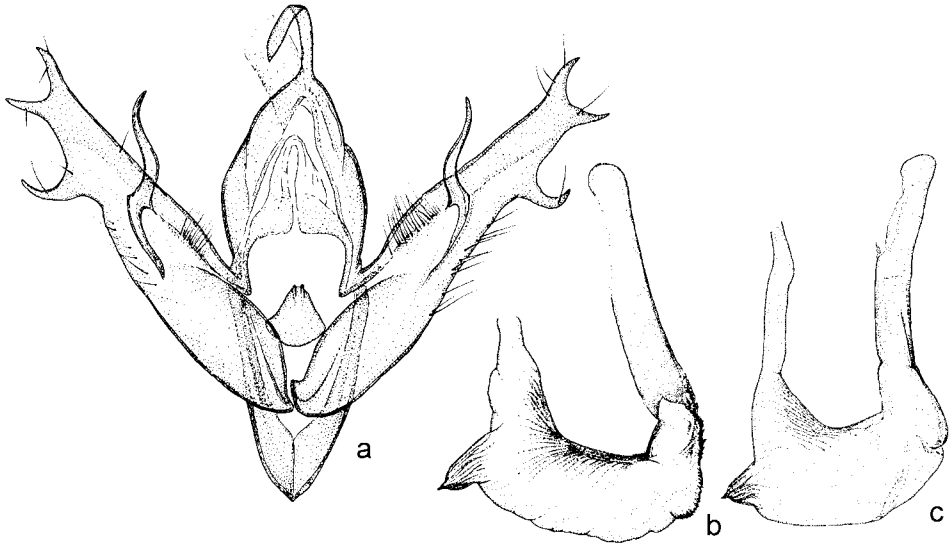


Fig. 12. *Goniographa marcida* (CHRISTOPH), slide Nos a-b = RL7476, c = VZ7030

Diagnosis: *Goniographa marcida* differs from its sister species, *G. gyulaipeteri* by its generally more unicolorous brownish forewings with less intense paler irroration in the median area and by the rather concolorous brown hindwings of both sexes (the inner area of the hindwing is much paler, often prominently whitish in *G. gyulaipeteri*).

Comparing the male genitalia of *G. marcida* and *G. gyulaipeteri*, the distal part of valva of *G. marcida* has longer processus, with more arcuate pollex originating rather far from "pseudopollex", these processi are shorter in *G. gyulaipeteri* and the "pseudopollex" is situated almost at the "halfway between valval apex and pollex. The harpe of *G. marcida* is somewhat longer, S-shaped, the juxta is narrower than in its sister species. The configuration of the vesica also shows easily recognisable differences as the vesica of *G. marcida* is upturned dorsally but not recurved as in *G. gyulaipeteri* (see Figs 12–14), and the cornutus is longer, narrower with smaller basal bulb.

The female genitalia of the two closely related species, *G. marcida* and *G. gyulaipeteri*, differ conspicuously by their appendix bursae (Figs 36–40) which is membranous-scobinate in *G. marcida* while *G. gyulaipeteri* has a large, strongly sclerotized dorso-medial fold. The ostium bursae of *G. marcida* is broader, shorter, without caudal incision, the proximal part of the ductus bursae is finely curved laterad, having short but strong medio-lateral crest and rounded, verrucose ventral plate while the ductus bursae of *G. gyulaipeteri* is straight, having more or less parallel margins, without proximo-lateral crest and verrucose plate.

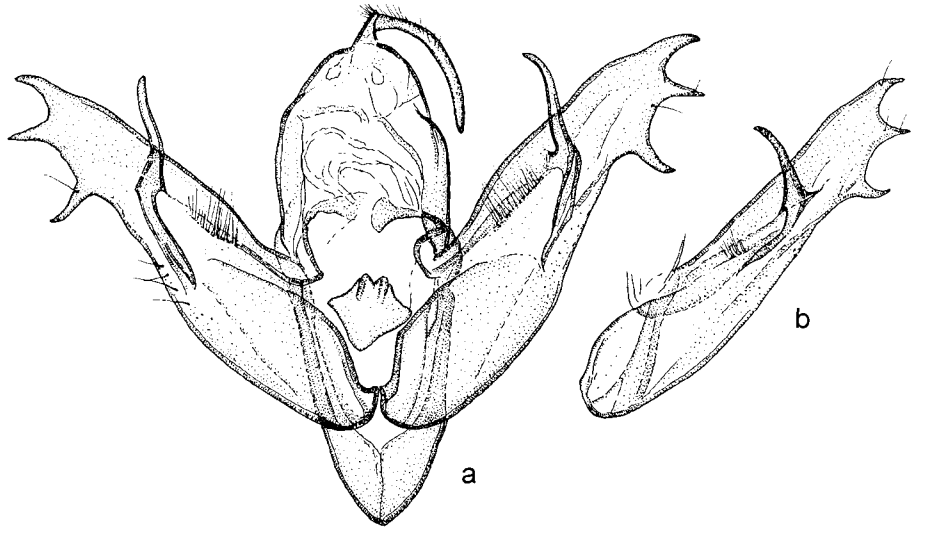


Fig. 13. *Goniographa gyulaipeteri* sp. n., paratypes, slide Nos a = RL7479, b = VZ4643

Description. Wingspan 27–35 mm, length of forewing 12–16 mm. The characterisation of the external features is rather laconic in the original (Latin) description and the measures are somewhat larger ("length of forewing 14–17 mm). The colour pictures of a typical male (from Iran, Khorassan) and a typical female (from the Kopet-Dagh, Turkmenistan) are given in Figs 62 and 63.

Male genitalia (Fig. 12): Uncus strong, pointed; valva straight, elongate with nearly parallel margins; harpe arcuate and pointed; pollex spine-shaped, slightly curved; juxta shield-shaped, narrower apically; aedeagus strong, dentate ribbon with fine teeth, recurved terminally, vesica broad, saccate, only moderately recurved, with a short, acute bulbed cornutus in submedial position.

Female genitalia (Figs 36, 37): Ovipositor rather short, weak; gonapophyses slender, fine. Ostium bursae sclerotized, its ventral plate broadly triangular-calyculate, caudal margin convex, evenly arcuate, without incision. Ductus bursae, long, broad, flattened, strongly, granulously sclerotized, anterior end with short but strong medio-lateral crest and a large, rounded, verrucose proximo-lateral plate. Ventral surface of ductus bursae with narrow longitudinal medial suture. Apical part of bursa copulatrix membranous, wrinkled-ribbed; appendix bursae large, subconical, with membranous apex and wrinkled-ribbed, scobinate basal two-thirds. Corpus bursae small, elliptical-ovoid, weakly membranous; signa absent.

Bionomics and distribution. *Goniographa marcida* seems to be confined to the Kopet-Dagh mountain system, both in Turkmenistan and Iran (Khorassan region).

Goniographa gyulaipeteri sp. n.
(Figs 13, 14, 38–40, 64, 65)

Holotype: female, Tadjikistan, cca 25 km from Kirovabad, at the road to Parkhar, 800 m, 12.X.1960, leg. Y.L. SHCHETKIN, slide No. RL7568f (coll. P. GYULAI, in coll. HNHM Budapest).

Paratypes. Tadjikistan: 3 males, 8 females, Hissar Mts, Kondara valley, 1900 m, 24.IX.1979, coll. A. V. NEKRASOV (coll. HNHM Budapest, B. HERCZIG and G. RONKAY); 2 males, 8 females, from the same valley, August–September 1954–56, leg. SHCHETKIN; 1 female, Hissar Mts, Kondara valley, 1800 m, 20.VIII.–1.IX.1994, leg. Y. SHCHETKIN; 8 specimens, Hissar Mts, Kondara valley, 1100 m, 2–9.IX.1994, leg. Y. SHCHETKIN; 1 female, from the same valley, 1100 m, 20.IX.1979, leg. PLYUSHCH; 9 specimens, Hissar Mts, Gushary, 1300 m, 22–31.VIII.1965, 17–25.IX.1985, 18.VIII. 1992, leg. SHCHETKIN; 1 female, Hissar Mts, Ramit, 18.IX.1950, leg. SHCHETKIN; 1 female, Hissar Mts, Kvak valley, 1800 m, 9.IX.1954, leg. SHCHETKIN; 1 male, 2 females, cca 25 km from Kirovabad, 800 m, 30.VIII.1958, 12–13.X.1960, leg. Y.L. SHCHETKIN; 3 males, 5 females, Obichingou river, n. Tawildara, 1850 m, 2–4.IX.1970, leg. SHCHETKIN; 1 male, Peter 1st Mts, Darai-Nazarak valley, 1700 m, 26.VII.–3.VIII.1992, leg. SHCHETKIN; 1 female, Peter 1st Mts, 2180 m, 16.VIII.1977, leg. SHCHETKIN (coll. A. BECHER, P. GYULAI & J. STUMPF); 2 females, vic. Dushanbe, 750 m, 3.IX.1970, leg. SHCHETKIN; Pamir Mts, Shugnan Mt., Sangan-dara, 3650 m, 23.VII.2000, leg. Y. SHCHETKIN (coll. G. RONKAY). Uzbekistan: Kara-tyube, S of Samarkand, 10–18.VIII.1896, leg. VERIGIN (coll. Z. VARGA); 2 females, Alai Mts, Dugobo, 2600 m, 16.VIII.1985, leg. DANILEVSKY (coll. HNHM Budapest); 1 male, 2 females, W Tien Shan Mts, Chatkal, 1600 m, 30.VIII.–1.IX.1997; 4 females, Seravshan Mts, Kitab, 1400–1600 m, 10–20.X.1997 (coll. A. BECHER & J. STUMPF). Afghanistan: Badakhshan, Darwaz, Shewa valley, Basindj, 1900–2000 m, 27.VIII.1973, Nr. 1421, leg. C. NAUMANN (coll. NAUMANN).

Slide Nos RL7479m, RL7572m, 3686VZ, 4643VZ, 7155VZ (males), RL7478f, RL7501f, RL7502f, RL7567f, RL7571f, RL7573f (females).

Diagnosis. The detailed comparison of the two species are given in the diagnosis of *G. marcida*. A short summary of the specific features of *G. gyulaipeteri* are as follows: the median area of the forewing has stronger pale ochreous(-brownish) irroration, the filling of the stigmata is also paler; the inner area of the hindwing is whitish in both sexes, in certain male specimens the whole wing is whitish with weak darker marginal suffusion only (these specimens resemble also *G. decussa* and *G. discussa*, but their crosslines are less prominent, the wing is less variegated, and the genitalia of the two species-groups show easily recognisable differences).

The male genitalia of *G. gyulaipeteri* are characterised by the rather uniform tripartite distal part of valva with relatively short processi, the shorter, more arcuate harpe, the subdeltoidal, rather broad juxta, the fully recurved vesica with short cornutus sitting on a broad, semiglobular basal bulb (see Figs 13, 14).

The female genitalia of *G. gyulaipeteri* differs from its twin species by its longer, narrower ostium bursae, having shallow medio-caudal incision, longer ductus bursae without anterior crest and ventral verrucose plate and by the presence of a large, strongly sclerotized dorso-medial fold on the appendix bursae which is completely missing in *G. marcida*.

Description. Wingspan 27–35 mm, length of forewing 12–15 mm. The main external features of the species and the diagnostic external characteristics are given in the diagnoses of *G. marcida* and *G. gyulaipeteri*. The holotype (female) and a typical male are illustrated in Figs 64 and 65.

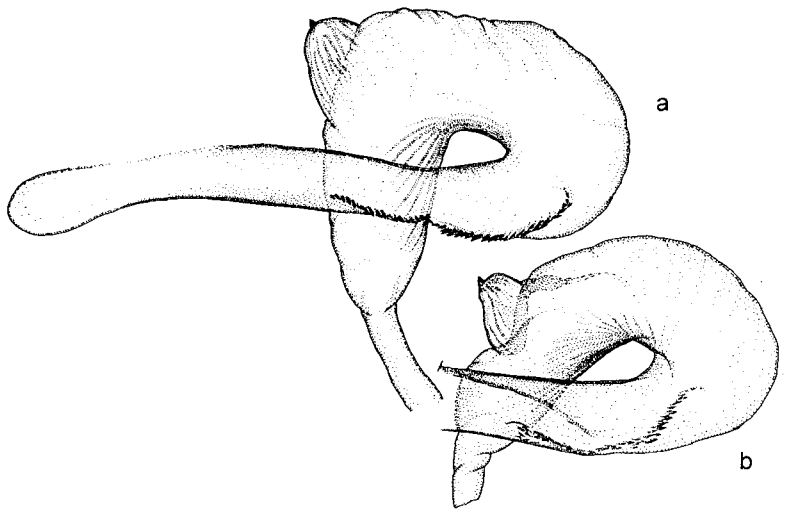


Fig. 14. *Goniographa gyulaipeteri* sp. n., paratypes, slide Nos a = RL7479, b = VZ4643

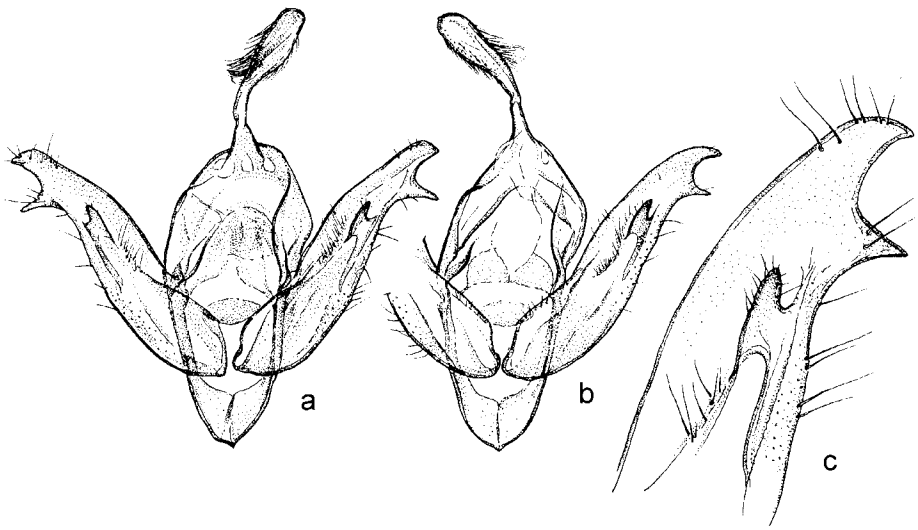


Fig. 15. *Xestia (s.l.) ornata* (STAUDINGER), slide Nos a = VZ7047, b = VZ7065, c = RL7483

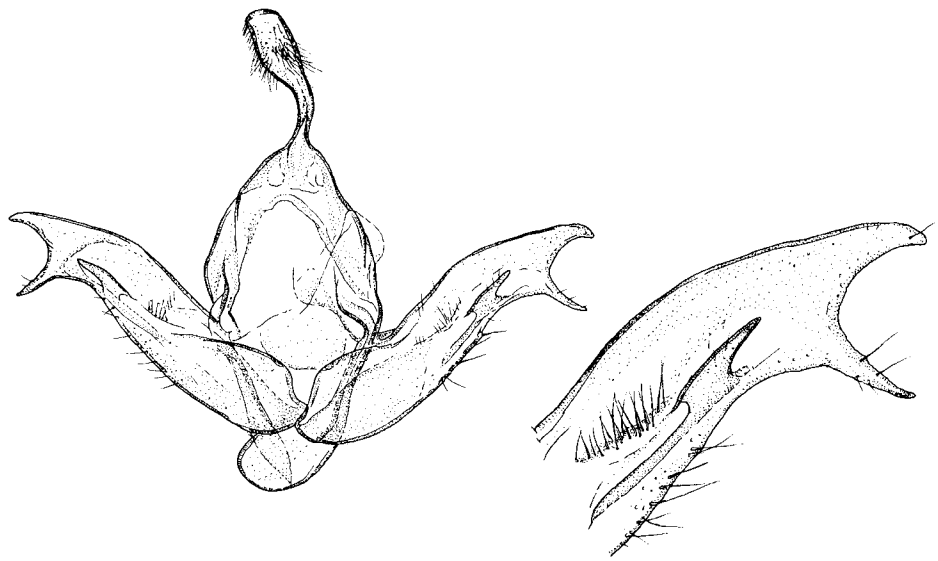


Fig. 16. *Xestia (s.l.) hypographa* sp. n., paratype, slide No. VZ7045

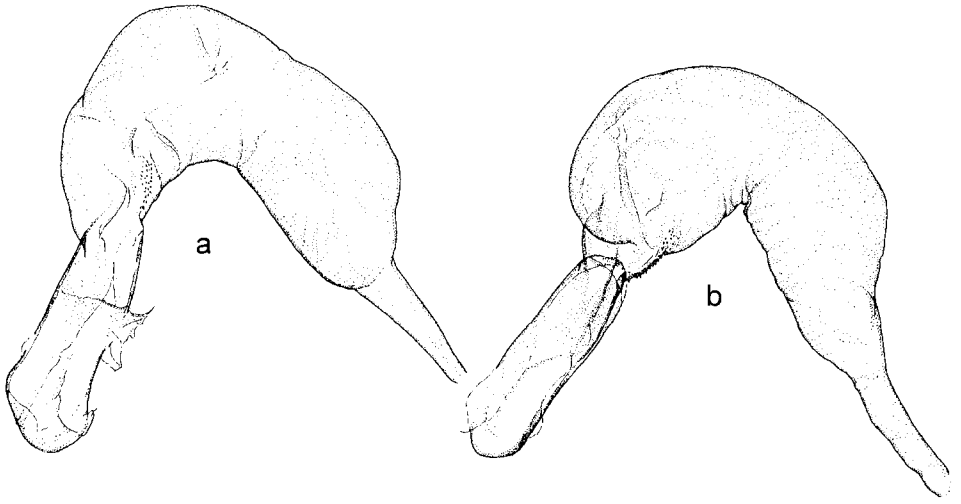


Fig. 17. 17a = *Xestia* (s.l.) *ornata* (STAUDINGER), slide No. VZ7047, 17b = *X.* (s.l.) *hypographa* sp. n., paratype, slide No. VZ7045

Male genitalia (Figs 13, 14): Uncus strong, pointed; valva straight, elongate with nearly parallel margins; harpe straight and acute apically; pollex spine-shaped, shorter; juxta shield-shaped, broader; aedeagus strong, longer; dentate ribbon with fine teeth, nearly evenly arcuate, vesica broad, less saccate, fully recurved with a tiny, acute bulbed cornutus in submedial position.

Female genitalia (Figs 38–40): Ostium bursae with triangular, rather broad and long ventral plate with slight medial incision on caudal margin. Ductus bursae long, broad, flattened, sclerotized, ventral plate with fine, narrow, longitudinal suture at middle. Apical part of bursa copulatrix membranous, wrinkled-ribbed; appendix bursae large, apex membranous, dorsal side with large, sclerotized, more or less rounded fold. Corpus bursae elliptical-ovoid, membranous; signa absent.

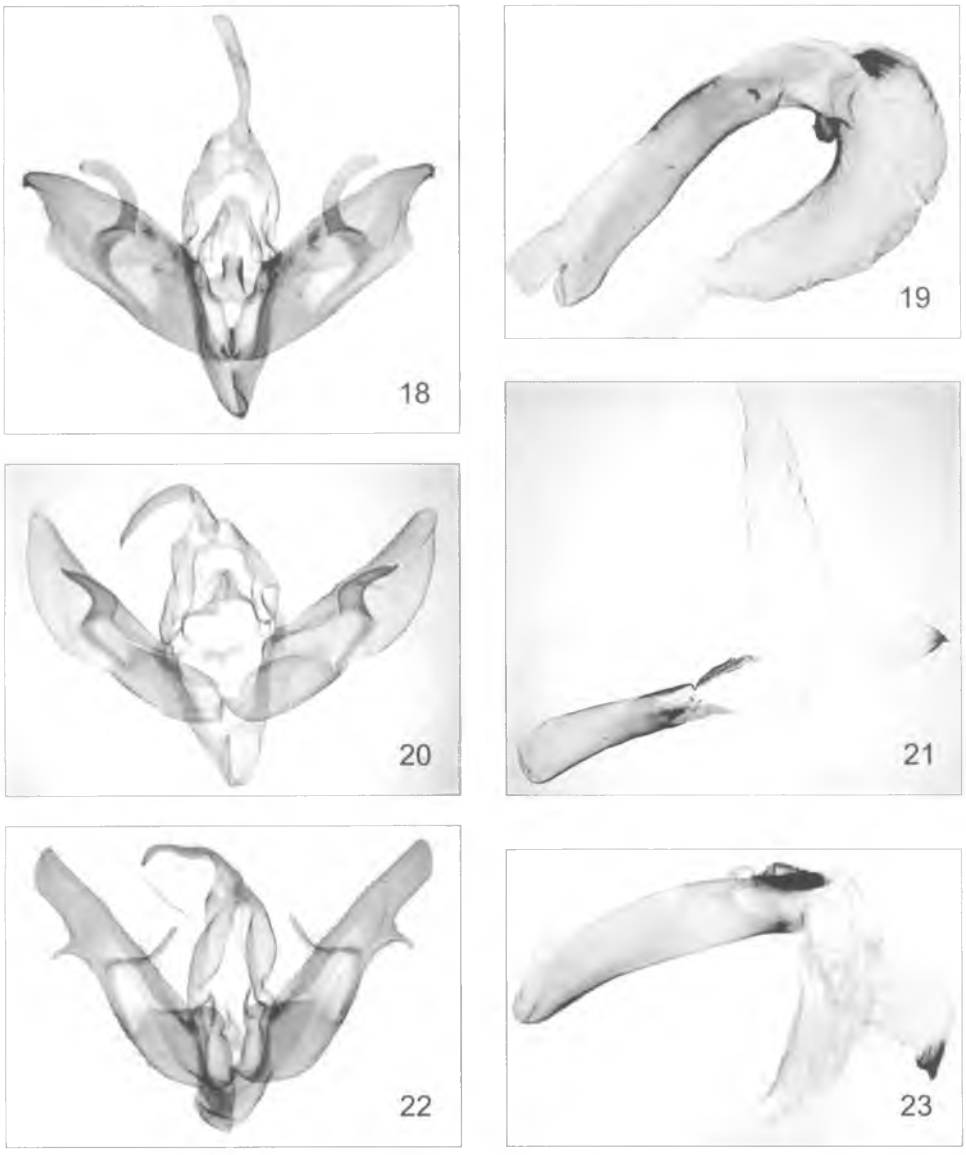
Bionomics and distribution. The new species is widely distributed in the western Tien-Shan Mts, in the Hissar and Alai Mts, in the western Pamirs (Shugnan range) and also in NE. Afghanistan (Badakhshan).

Etymology. The new species is dedicated to our friend and excellent lepidopterist, Dr. PÉTER GYULAI, who has discovered several interesting new taxa of Noctuidae in Asia.

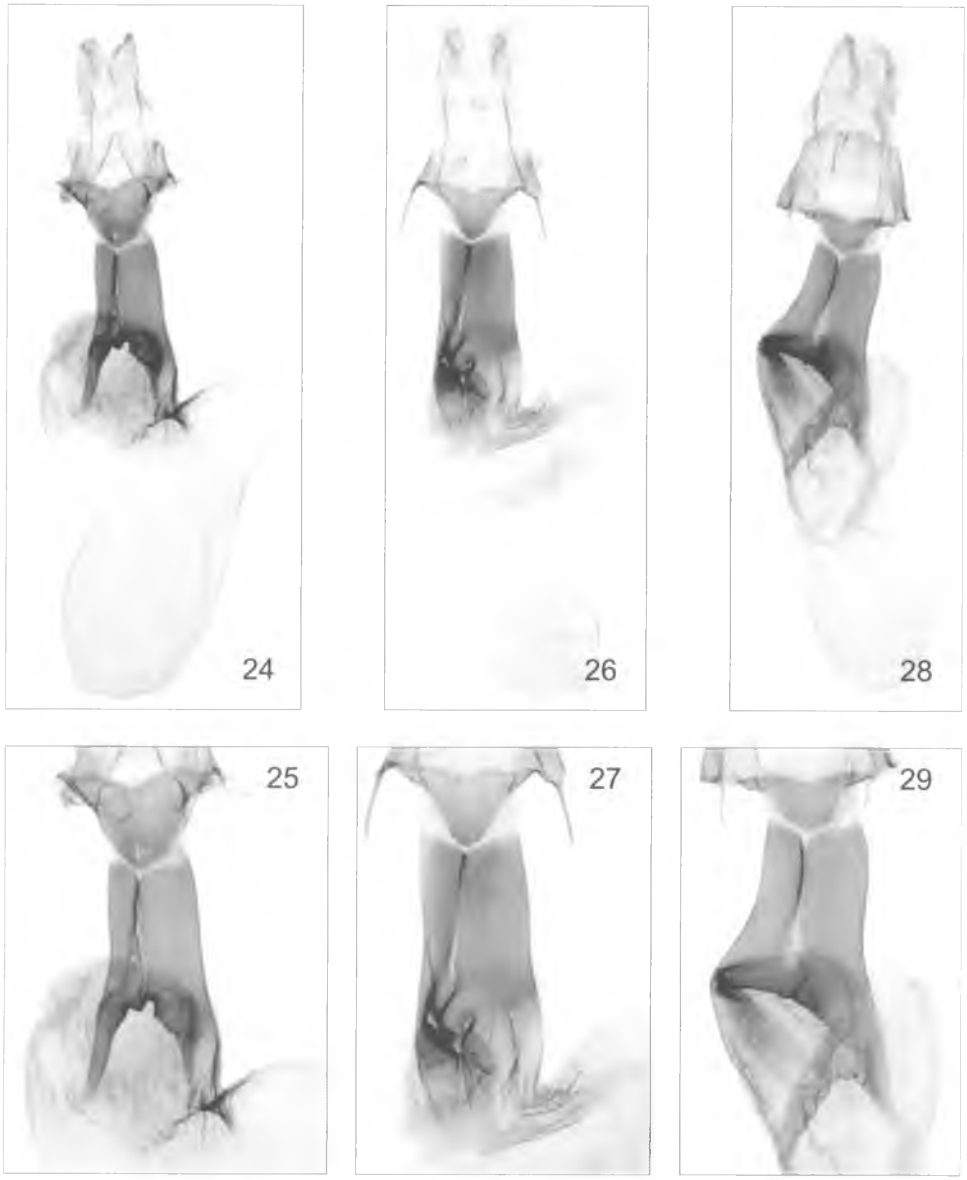
THE GENERIC PLACEMENT OF "EUGRAPHE" ORNATA AND ITS SISTER SPECIES

The curious Noctuinae species "*Eugraphe*" *ornata* was originally described as "*Hydrilla*" *ornata* STAUDINGER, 1892 (type locality: Margelan – probably the Alai Mts). HAMPSON (1903) described the same species as *Lycophotia macrina*

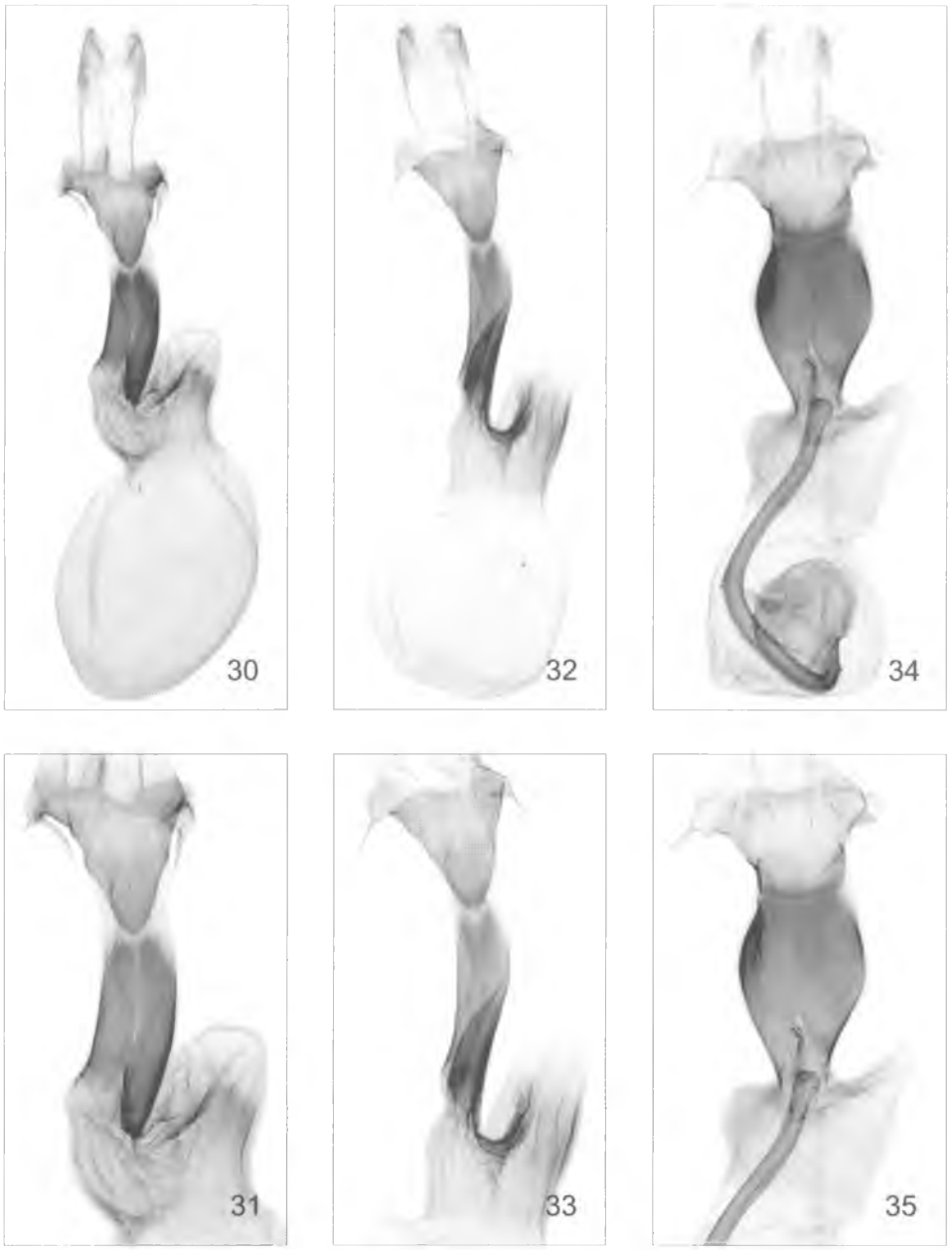
from the coll. PÜNGELER (type locality: Alexander Mts). WARREN (in SEITZ, 1910) synonymised *L. macrina* with *H. ornata* and placed it to the genus *Rhyacia*. He also provided the records of two pairs of specimens which were collected in



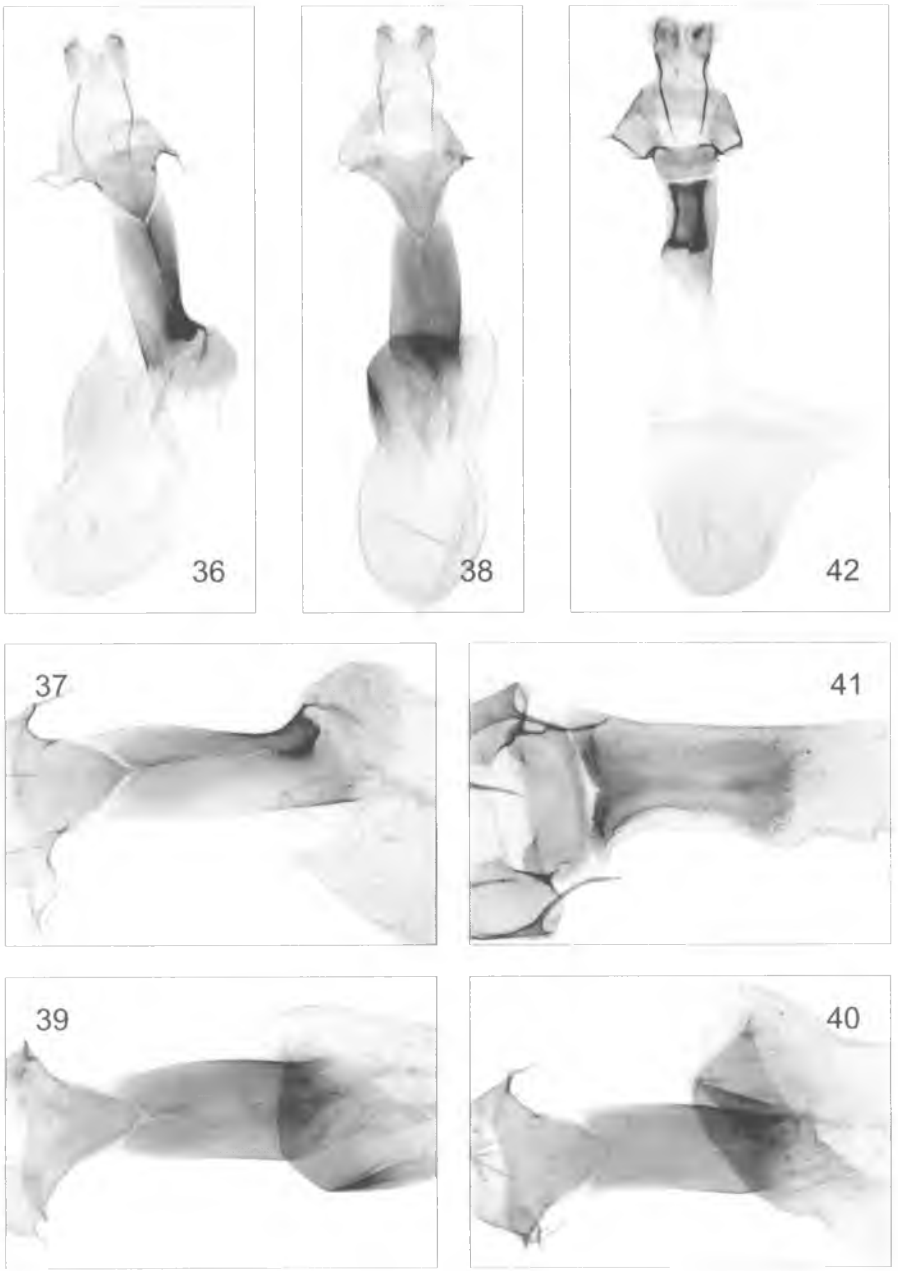
Figs 18–23. 18–19 = *Eugraphe sigma* (DENIS et SCHIFFERMÜLLER), slide no. RL7595: 18 = genital capsula, 19 = aedeagus with vesica everted; 20–21 = *Hypernaenia denticulata* (WARREN, 1888), slide no. RL7559: 20 = genital capsula, 21 = aedeagus with vesica everted; 22–23 = *"Eugraphe" versuta* (PÜNGELER), slide no. RL7503: genital capsula, 23 = aedeagus with vesica everted



Figs 24–29. 24–25 = *Goniographa decussa* (STAUDINGER), slide No. RL7531: 24 = female genitalia, 25 = posterior part in larger magnification; 26–27 = *G. discussa* sp. n., paratype, slide No. RL7481: 26 = female genitalia; 27 = posterior part in larger magnification; 28–29 = *G. shchetkini* sp. n., holotype, slide No. RL7547: 28 = female genitalia; 29 = posterior part in larger magnification



Figs 30–35. 30–31 = *Goniographa funkei* (PÜNGELER), slide No. RL7554: 30 = female genitalia, 31 = posterior part in larger magnification; 32–33 = *G. metafunkei* sp. n., holotype, slide No. RL7528: 32 = female genitalia, 33 = posterior part in larger magnification; 34–35 = *G. naumanni* sp. n., paratype, slide No. RL7584: 34 = female genitalia, 35 = posterior part in larger magnification



Figs 36–42. 36–37 = *Goniographa marcida* (CHRISTOPH), slide No. RL7477: 36 = female genitalia, 37 = posterior part in larger magnification; 38–40 = *G. gyulaipeteri* sp. n., paratypes: 38 = female genitalia, slide No. RL7501, 39–40 = posterior part in larger magnification (slide Nos RL7501, RL7502); 41 = *Xestia* (s. l.) *ornata* (STAUDINGER), slide No. RL7482, posterior part in larger magnification, 42 = *X.* (s. l.) *hypographa* sp. n., paratype, slide No. RL7542, female genitalia

Prov. Kuliab (Afghanistan), in these specimens the marginal field is not ochreous as in the type specimen but more greyish.

The study of the external and genital characters of this rather peculiar species (and its allopatric sibling) and the comparison of them with those of the taxa of *Eugraphe* inevitably showed their distinctness. Owing to the genitalia features of both sexes of *X. ornata* and *X. hypographa* sp. n. they should be placed into the genus *Xestia* (s. l.).

Xestia (s. l.) *ornata* (STAUDINGER, 1892) **comb. n.**
(Figs 15, 17, 41, 66, 67)

Hydrilla ornata STAUDINGER, 1892, *Dt. ent. Z. Iris* **4**: 296. Type locality: Margelan (?Alai Mts).

Type material examined: A syntype male from Margelan, a colour picture of which is illustrated in Fig. 66. This specimen is designated here as the lectotype of *Hydrilla ornata* STAUDINGER (coll. STAUDINGER, ZMHU Berlin).

Material examined. Kirghisia: 2 males, 5 females, Alai Mts, Tengizbai, 7.VII.1994, leg. TOROPOV & SINIAEV (coll. P. GYULAI, L. LEHMANN, Z. VARGA); 1 male, Ala-Archa valley, 20.VII.1986, leg. M. KOPP; 1 female, Alai Mts, Dugobo, 1800–2000 m, 25–26.VII.1992, leg. M. KOPP; 1 female, Alai Mts, Dugobo, 2300 m, 15.VII.1995, leg. MURZIN (coll. P. GYULAI). Tadjikistan: 1 male, 2 females, Pamir Mts, Artuch valley, 2–10.VIII.1988, coll. A.V. NEKRASOV (coll. HNHM Budapest and G. RONKAY); 1 male, Vantch, Gushon, 25.07.1988, leg. JÜRIVETE (coll. ZMUH); 4 males, 7 females, Varzob valley, Maihur, 2000 m, 12.VIII.1967, leg. SHCHETKIN; 1 male, 1 female, from the same locality, 6.VII.1967, leg. SHCHETKIN; 3 males, 5 females, Varzob valley, VIII.1967, leg. SHCHETKIN; 2 females, Karategin range, Sangikar gorge, 1700 m, 28.VIII.1969, leg. SHCHETKIN; 1 female, Peter 1st Mts, Muk, 2100 m, 27.VIII.1975, leg. SHCHETKIN; 5 males, 8 females, Peter 1st Mts, Ganishou, 2070 m, 14–18.VIII.1974, leg. SHCHETKIN; 1 male, 1 female, Hissar Mts, Kvak valley, 1800 m, 28.VII.1960, leg. SHCHETKIN; 3 males, 2 females, Hissar Mts, Gushary, 1400 m, 19.IX.1965, leg. SHCHETKIN; 4 females, Hissar Mts, Kondara valley, 1800 m, 20.VIII.–1.IX.1994, leg. SHCHETKIN; 1 male, Hissar Mts, Iskanderful, 1900–2300 m, 19–21.VII.1994, leg. LUKHTANOV; 2 females, Obichingou river, n. Tawildara, 1850 m, 2.IX.1970, leg. SHCHETKIN; 1 female, Seravshan Mts, Iskander-kul, 2200 m, 23–25.VII.1968, leg. SHCHETKIN; 1 female, Seravshan Mts, 17.VII.1988 (coll. A. BECHER, P. GYULAI & J. STUMPF). Afghanistan: 1 male, Badakhshan, Darwaz, Shewa valley, Basindj, 1900–2000 m, 27.VIII.1973., leg. Naumann & Nauruz (coll. VARGA), 2 females, prov. Kadaghan, Salang-pass N-side, 69°w, 35°40'l, 2400 m, 11–12.VII.1972. leg. Vartian (coll. VARTIAN, NHMW).

Slide Nos RL2492m, RL7483m, RL7550m, VZ7047, VZ7065 (males), RL7482f, RL7543f (females).

Diagnosis: Moths of smaller size with conspicuously slender body, showing some external similarity to the species of the *Caradrina* genus-group (see the taxonomic misplacement of the species by STAUDINGER). It is quite dissimilar to all related Noctuinae spp., but rather similar to the newly described species, *X. hypographa* sp. n. The most important differential characters are the very large, sharply defined orbicular and reniform stigmata with light ochreous filling, the sharply

marked, light ochreous ante- and postmedian lines, the light ochreous cilia and also several characters in the genitalia of both sexes, see below in the diagnosis of *X. hypographa*.

Description. Wingspan 28–36 mm, length of forewing 13–16 mm. Head and conspicuously long, slender abdomen light ochreous grey, thorax slighly darker and more greyish. Antenna filiform, with short and dense ciliation (male) or thin, filiform without ciliation (female). Forewing narrow triangular, acute apically. Ground colour ochreous grey, often with some greenish colouration; sharply marked, reniform stigma large, broad with light ochreous filling and sharply defined with black scales; orbicular spot broad, elliptical, light ochreous, sharply defined with black scales. Ante- and postmedial lines double, crenulate with ochreous filling; the outer side of antemedial and the inner side of postmedial is sharply defined with black scales. Subterminal line fine, broken, often with 2–3 arrowheads at the inner side. Hindwing light ochreous grey, shiny. Cilia light ochreous. Sexes similar, females slightly darker, with somewhat more elongate forewings.

Male genitalia (Figs 15, 17a): Uncus obtuse but less spatulate than in case of the new species; cucullus and corona fully reduced. Valva pointed apically, pollex short or moderately elongate, harpe tiny, shorter but broader than in the new species, finely rounded apically. Sacculus simple, clavus reduced, juxta broad, rounded trapezoidal, weakly sclerotised. Aedeagus simple with dentate ribbon on the carina, dentate ribbon of aedeagus more sclerotised, more and unevenly dentate than in the new species; vesica saccate without cornuti and sclerotised elements.

Female genitalia (Fig. 41): Ostium bursae sclerotized, quadrangular, broad and short, caudal margin with two small, ear-like postero-lateral appendages. Ductus bursae medium-long, broad, flattened, granulously sclerotized, ventral surface with stronger medial plate. Sclerotization of anterior part asymmetrical, considerably longer on left side. Appendix bursae large, subconical, weakly membranous, finely wrinkled, projected proximo-laterad. Corpus bursae elliptical, membranous, with four short, weak signum-stripes at fundus bursae.

Bionomics and distribution: The species is distributed from the northern Tien-Shan Mts. through the Pamirs and Hissar-Darwaz system to eastern Afghanistan (Nuristan).

Etymology: The name refers to the conspicuously rich and colourful markings of the species.

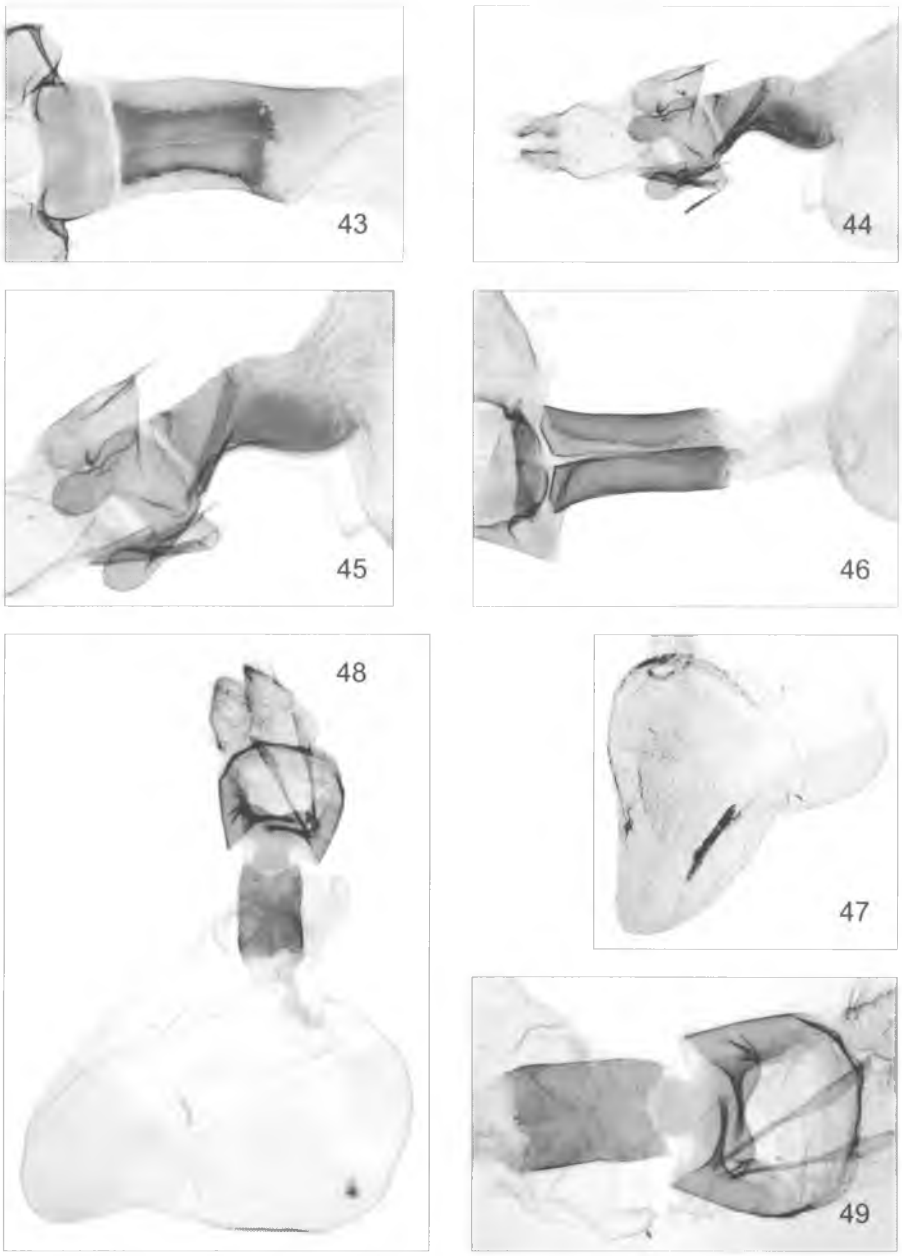
Xestia (s. l.) hypographa sp. n.
(Figs 16, 17, 42, 43, 68, 69)

Holotype: male, Talassky Alatau Mts, Kara-Bura pass, 1800 m, 42°18'N, 71°35'E, 29.VII. 1993, leg. V. & A. LUKHTANOV; slide No. RL7565m (coll. P. GYULAI).

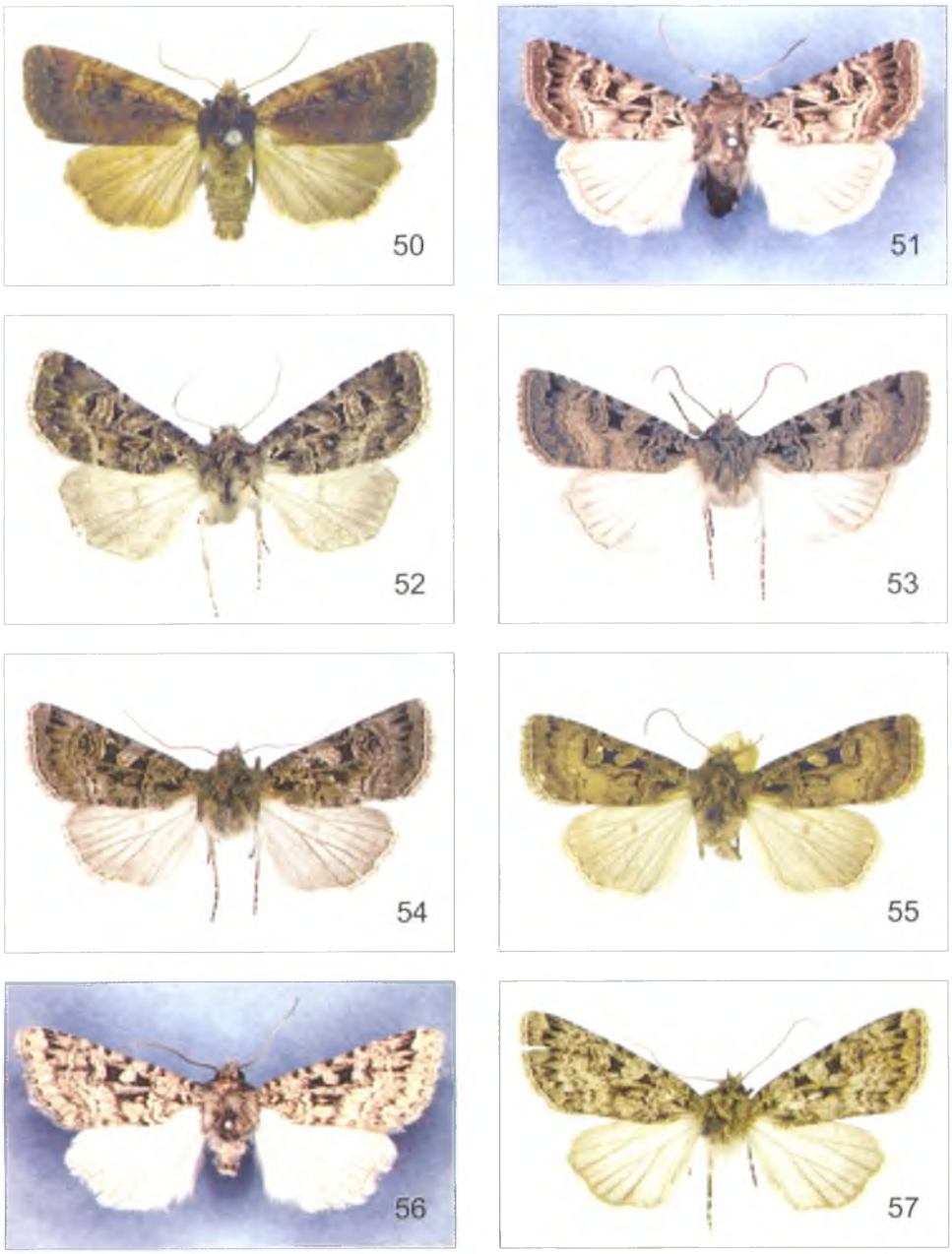
Paratypes. Kirghisia: 4 females, Susamyr Mts, valley of Chickhan river, 1800 m, 29–30.VII. 1994, leg. TOROPOV & SINIAEV; 1 female, Kirghiz Mts, Kara Baitta valley, Sosnovka, 3–4.VIII.1999, leg. PLYUSHCH (coll. P. GYULAI and G. RONKAY). Uzbekistan: 1 male, W. Tien-Shan, Chimgan Mts, 1300 m, 23.09.1991. leg. JÜRIVETE (coll. ZMUH).

Slide Nos VZ7045 (male), RL7529f, RL7530f, RL7542f (females).

Diagnosis: Forewing is somewhat broader, apex less elongate, than in *X. ornata*; ground colour is more greyish-greenish, the ochreous colouration is sup-

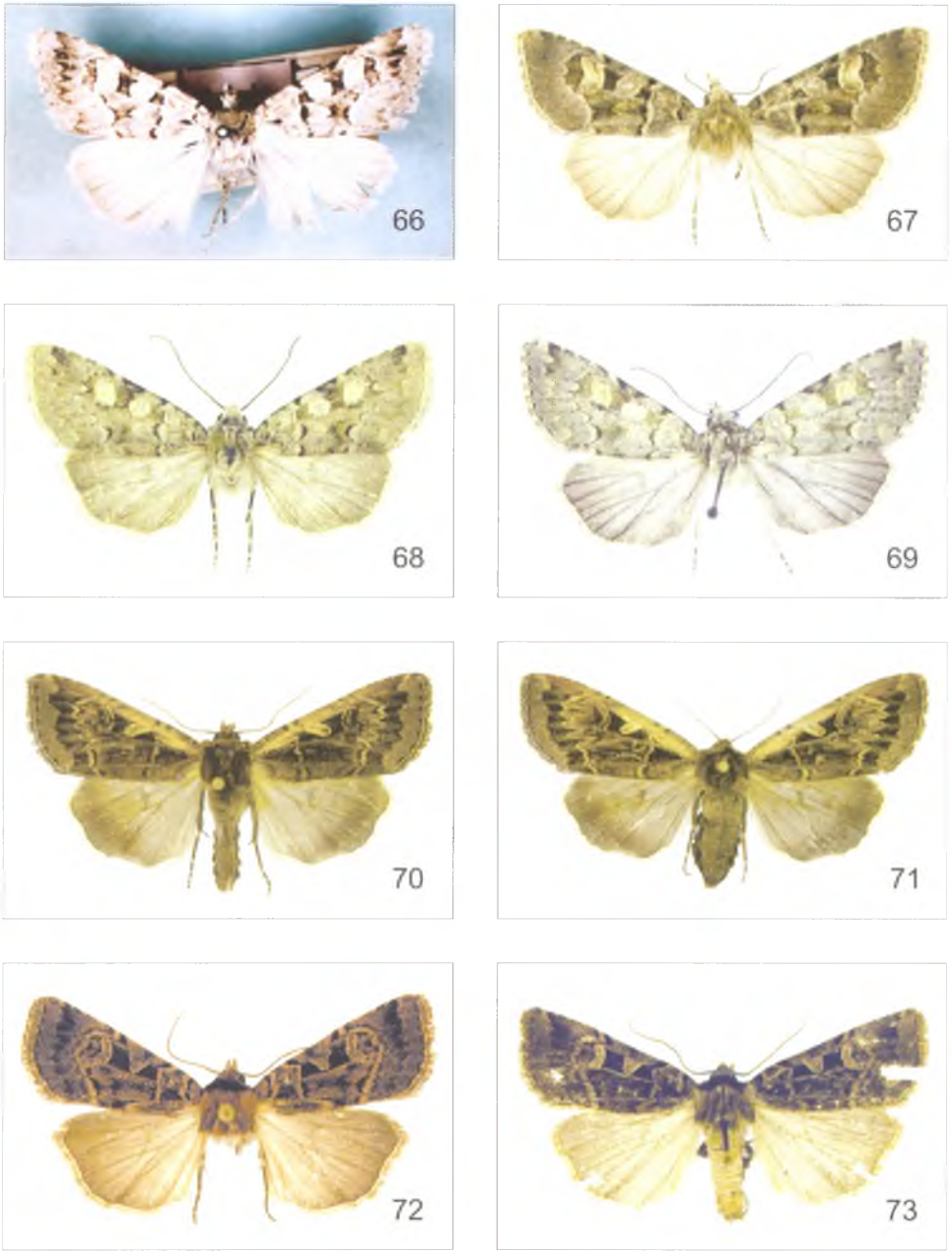


Figs 43–49. 43 = *Xestia (s. l.) hypographa* sp. n., paratype, slide No. RL7542, posterior part in larger magnification; 44–45 = *Eugraphe sigma* (DENIS et SCHIFFERMÜLLER), slide No. RL7596: 44 = female genitalia, 45 = posterior part in larger magnification; 46–47 = *Hypernaenia denticulata* (WARREN), female genitalia, slide No. RL7560: 46 = posterior part, 47 = anterior part; 48–49 = *"Eugraphe" versuta* (PUNGELER), slide No. RL7504: 48 = female genitalia, 49 = posterior part in larger magnification



Figs 50–57. 50 = *Eugraphe sigma* (DENIS & SCHIFFERMÜLLER) male,; 51–52 = *Goniographa decussa* (STAUDINGER): 51 = lectotype, 52 = female, Uzbekistan; 53–54 = *G. discussa* sp. n.: 53 = holotype, 54 = paratype female, Tadjikistan; 55 = *G. shchetkini* sp. n., holotype; 56–57 = *Goniographa funkei* (PÜNGELER): 56 = lectotype, 57 = female, Tadjikistan

Figs 58–65. 58–59 = *Goniographa metafunkei* sp. n.: 58 = holotype, 59 = paratype male, Kirghisia; 60–61 = *G. naumanni* sp. n.: 60 = holotype, 61 = paratype female, Afghanistan; 62–63 = *G. marcida* (CHRISTOPH): 62 = male, Turkmenistan, 63 = female, NE Iran; 64–65 = *G. gyulaipeteri* sp. n.: 64 = holotype, 65 = paratype male, Tadjikistan



Figs 66–73. 66–67 = *Xestia (s. l.) ornata* (STAUDINGER): 66 = lectotype, 67 = female, Tadjikistan; 68–69 = *X.* (s. l.) *hypographa* sp. n.: 68 = holotype, 69 = paratype, female, Kirghisia; 70–71 = *Hypernaenia denticulata* (WARREN): 70 = male, 71 = female (both from NW Pakistan); 72–73 = *"Eugraphe" versuta* (PÜNGELER): 72 = male, 73 = female (both from Mongolia)

pressed by the densely dispersed darker scales; the wing pattern is less sharply marked, reniform and orbicular stigmata are narrower, more greyish.

The male genitalia of the two sister species differ in the following features (see Figs 15–17): the uncus of the new species is more spatulate and obtuse than that of *X. ornata*, the pollex is longer, almost straight and more pointed; the harpe is significantly thinner, longer, apically acute; the dentate ribbon of the carina is thinner, evenly serrulate, the vesica is more saccate, especially in the basal half.

The ground plan of the female copulatory organ is the same in the two sibling species (Figs 41–43), but the ostium bursae of the new species is significantly longer, narrower and the appendix bursae is projected laterally while that of *X.* (s. l.) *ornata* is situated closer to fundus bursae and projected proximo-laterally.

Description: Relatively small moths with slender body, wingspan 32–34 mm, length of forewing 14–15 mm. Sexes similar, females somewhat larger, more broad-winged. Head and abdomen light ochreous grey, slightly darker than in ther former species, thorax slightly darker ochreous grey. Antenna filiform, in male ciliate. Forewing triangular with rounded apex and outer margin; ground colour darker greenish-ochreous grey. Orbicular and reniform stigmata regular, lighter than the ground colour, not sharply defined. Claviform spot obsolescent. Ante- and postmedial lines double, not sharply defined. Subterminal line obsolescent. Hindwing ochreous grey. Cilia ochreous grey.

Male genitalia (Figs 16, 17b): Uncus spatulate, obtuse apically. Cucullus and corona reduced. Valva pointed apically, pollex pointed, straight, longer than in *X. ornata*; harpe tiny, acute apically, clavus reduced, juxta broad, weakly sclerotised. Aedeagus simple, carina with thin, evenly serrulate-dentate ribbon; vesica saccate without cornuti or other sclerotised elements.

Female genitalia (Figs 42, 43): Ovipositor short, weak; gonapophyses slender, fine. Ostium bursae sclerotized, quadrangular, relatively long and narrow, caudal margin evenly convex, with two small, ear-like postero-lateral appendages. Ductus bursae medium-long, flattened, broadly tubular, both surfaces granulously sclerotized, ventral plate with stronger medial plate. Sclerotization of anterior part asymmetrical, considerably longer on left side. Apical part of corpus bursae membranous, finely wrinkled-ribbed; appendix bursae large, subconical, weakly membranous, finely wrinkled, projected laterad. Corpus bursae elliptical-saccate, membranous, with four short, narrow signum-stripes close to fundus.

Bionomics and distribution: The new species is known only from the north-western part of the Tien-Shan Mts.

Etymology: The name refers to the main external differential feature of the species: the less distinct forewing markings.

*

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