

# A new genus and species of Psychidae from the Crimean Peninsula, Ukraine (Lepidoptera: Psychidae)

● EVGENIY V. RUTJAN & MICHAEL WEIDLICH

**Abstract.** A new Psychidae genus, *Mauropterix* gen. nov., and a new species *Mauropterix jailensis* sp. nov. are described from the Crimean Mountains (Crimean Peninsula, Ukraine), and belong to the Epichnopteryginae TUTT, 1900, Epichnopterygini TUTT, 1900. The adult male and female, pupa, larva, and cases are described. Data on ecology and biology are also given.

**Key words.** Lepidoptera, Psychidae, Epichnopterygidae, new genus, new species, Palearctic Region, Ukraine, Crimea.

**Zusammenfassung.** Eine neue Psychidae der Gattung *Mauropterix* gen. nov. und eine neue Art *Mauropterix jailensis* sp. nov. werden aus der Gebirgskrim (Halbinsel Krim, Ukraine) beschrieben, welche zu den Epichnopteryginae TUTT, 1900, Epichnopterygini TUTT, 1900 gehört. Die Männchen, Weibchen, Puppen, Larven und Säcke werden beschrieben und Einzelheiten zur Ökologie und Biologie mitgeteilt.

## Introduction

During a collecting trip in April 2006 to Ai-Petri Yaila (Crimean Mountains, Ukraine) many unknown bagworm cases with larvae and pupae were found on rocks and stones along a forest road (Fig. 1). These cases (Fig. 2) resembled those of *Proutia* sp. (Psychinae TUTT, 1900), but after a study of the adults of both sexes we recognized that the specimens belonged to the Epichnopteryginae TUTT, 1900 and that they differed from all known genera of this subfamily. We decided that these specimens should be described as a new genus and species. The taxonomic framework of the Psychidae is from SAUTER & HÄTTENSCHWILER (1991).

## *Mauropterix* gen. nov.

**Type species.** *Mauropterix jailensis* sp. nov.

**Etymology.** *Mauropterix* is derived from "mauropteros", a Greek combination of words referring to the dark wings of the male; only for the male gender.

**Description. Adults. Male.** Wingspan 9.5–12.5 mm. Head: eyes rounded ocelli absent, labial palps short, one-segmented, directed forward, clearly visible and covered with long black hairs. Antenna

bipectinate, segments covered with scales; pectination with setae, without scales, approximately three times as long as antennomeres length (near tenth or eleventh antennomere). Thorax not strong. Wings coated with dark, simple and bidentate, spindle-shaped scales: cloaking scales long and narrow, underlying scales short and broad. Fringe of both wings with two- to four-dentate cuneiform scales. Forewing with nine veins from discal cell; main radial and medial veins very close in their basal halves; radial accessory cell absent; medial accessory cell developed; anal veins: postcubitus (pcu) short and not reaching external margin; anal veins 2 and 3 completely merged.

Hindwing with five veins from discal cell reaching external margin, without accessory cell; anal veins normally developed. Legs covered with long hairs; foretibia with relatively long epiphysis (epiphysis index approximately 0.5–0.6), its base situated in middle of tibia; midtibia with one pair of spurs, and hindtibia with two pairs; space between spurs of hindtibia approximately one third length of hindtibia. Abdomen coated with hairs. Membrane between seventh and eighth segment without thorns.

**Male genitalia.** Phallus long, slightly crooked; saccus long and narrow; anellus with small thorns on external side.

**Female.** Vermiform, body slightly crooked and weakly sclerotized. Head covered with few long and thin hairs dorsally. Eyes oval and black, largest diameter approximately 2.5 times less than space between eyes. Antenna segmented, longer than vertical diameter of eye. Thorax covered with few long and thin hairs. Legs segmented; tarsi of all legs with two segments and two claws. Wings reduced, membranous (visible only under magnification). Abdominal tergites and sternites very lightly sclerotized. Afterwool with ring-shaped structure, not closed ventrally. Ovipositor short, lightly sclerotized. Both vaginal plates present. Ostium clearly visible. Papillae anales short and broad, covered with short setae. Apophyses thin and short.

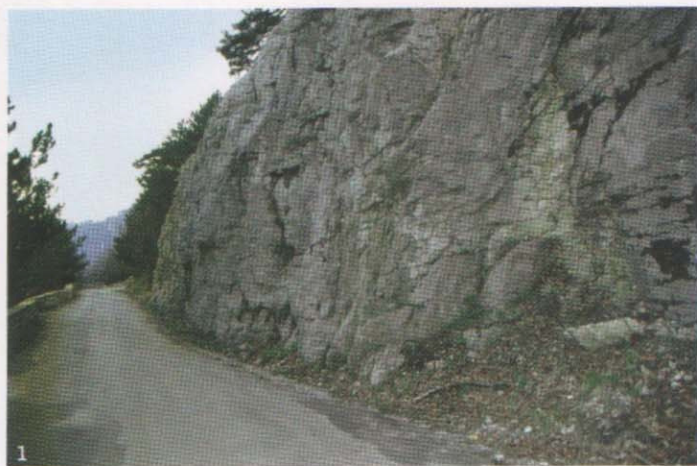
**Pupa. Male.** Head with four pairs of bristles, one close to neck. Labial palpi as long as head height (SAUTER & HÄTTENSCHWILER 1999). Abdominal segments four to eighth and intersegmental membranes 4–5, 5–6, 6–7, 7–8 dorsally with rows of thorns directed backward. Cremaster with two strong thorns on ventral side.

**Female.** Head plate with four pairs of bristles, one close to neck. Sheaths of antennae comparatively long. Wing sheaths clearly visible. Sheaths of legs developed and clearly visible. Abdominal segments four to seven and intersegmental membranes 4–5, 5–6, 6–7 dorsally with rows of thorns. Abdominal segment eight dorsally with swelling covered with thorns.

**Larva.** Head and thoracic segments with markings.

**Cases.** Spindle-shaped; consisting of plant fragments of different shape and size and small mineral pieces.





Figs 1-3. *Mauropterix* gen. nov. *jailensis* sp. nov. 1. Habitat in the Ai-Petri Yaila (photo: M. WEIDLICH). 2. Case on rocks (photo: E. V. RUTJAN). 3. Holotype, male (above), case (center), labels, recto & verso (below).

Fig. 13. *Mauropterix* gen. nov. *jailensis* sp. nov., female, ventral view (left), lateral view (right).



**Diagnosis.** *Mauropterix* gen. nov. is considered a member of the Epichnopteryginae because of the following shared characters: ovipositor short; female body slightly crooked and weakly sclerotized; male with most scales simple and spindle-shaped or hair-like on both wings; medial accessory cell of forewing developed; radial accessory cell of forewing absent; similar shape of body and wings of male.

In the Palaearctic region, the Epichnopteryginae are represented by twelve genera (see Tab. 1; DALLA TORRE & STRAND 1919; SAUTER & HÄTTENSCHWILER 1991, 1999). Within this subfamily *Mauropterix* gen. nov. is similar to *Bijugis* HEYLAERTS, 1881, *Reisseronia* SIEDER, 1956, *Heliopsychea* PINKER, 1956, and *Montanima* SIEDER, 1949 in the female habitus (comparatively long antennae, segmentation of legs). From *Bijugis* it differs in males by the differently-shaped saccus and narrower forewings, and in the type of larval case. From *Montanima* it differs in males by the longer pectinations of the antennae, the absence of thorns on the membrane between abdominal segments 7 and 8, and in the differently-shaped phallus. From *Reisseronia* and *Heliopsychea* the males differ in the longer epiphyses, the elongated and narrow saccus, phallus has other form; for females it differs by longer antennae.

### *Mauropterix jailensis* sp. nov.

**Holotype.** (Fig. 3) ♂ (with case and pupal skin) with labels: printed „Ukraina, Krym, Ms.[Montis] Aj-Petri, alt.[itudo] 1050–1100 m, 24.–25.iv.2006, E. Rutjan leg.“, „ex pupa 5.v.2006“; with red label on printed form „Holotypus“ (in italic) with handwritten insertion „*Mauropterix jailensis* Rutjan & Weidlich gen. & sp. n., ♂, Krym, Aj-Petri“ (recto) and „Coll. Schmalhausen Inst. Zool., Kiev“ (verso), coll. SCHMALHAUSEN Institute of Zoology Kiev.

**Paratypes** (adults with case and pupal skin). 125 ♂, 90 ♀, 226 cases; Ukraina, Krym, Ms. Aj-Petri, alt. 1050–1100 m, 24.–25.IV.2006, E. RUTJAN leg. ex pupa; 57 ♂, 28.IV., 1.–23.V.2006 and 42 ♀, 2.–21.V.2006, Crimea, Ai Petri Jaila, NW Jalta, 1050–1100 m, ex pupa; 68 ♂, 48 ♀, 2.–27.V.2006, all M. WEIDLICH leg.; 2 ♀, Crimea, Ms. Aj-Petri, alt. 1200 m, 25.IV.2006, ex larva, 21.V.2006, E. RUTJAN leg.; 96 cases, Crimea, Ms. Aj-Petri, alt. 1050–1100 m, 24.–25.IV.2006, E. RUTJAN leg.; 130 cases, Crimea, Ai Petri Jaila (Mountains), NW Jalta, 1050–1100 m, 24.–25.IV.2006, M. WEIDLICH leg. Paratypes are deposited at the Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine

(Kiev), Zoological Museum Humboldt-University (Berlin), Zoological Museum Taras Shevchenko National University (Kiev), Zoological Institute of Russian Academy of Sciences (St. Petersburg) and in our collections.

**Type locality.** Crimean Peninsula, Crimean mountains, Ai-Petri Yaila.

**Etymology.** Jaila is a Latin transliteration of a Turkic word which means “summer pasture”. At the end of the 19th century, Crimean Tatars named the Crimean Mountains “Yaila”, which has been adopted in English (GOLOVINSKY 1895). In modern sense: Yaila – the top of the Main Ridge of the Crimean Mountains has the form of plateaux; it is treeless and covered with meadows or meadow-steppe vegetation (ENA & DIDUKH 1978).

**Description. Adults. Male** (Figs 4–12). Wingspan 9.5–12.5 mm (m = 11.4 mm, n = 30), forewing length 4.75–6.25 mm. Cuticle black. Head with black tuft of long, hair-like scales. Eye black, diameter approximately 1.65 times less than space between eyes. Labial palpus short and broad, proportion of length to width about 2 : 1 (Fig. 4), length approximately two times less than eye diameter. Antenna more than half length of forewing, consisting of 22–23 antennomeres (including scape and pedicel). Wings black-grey or dark grey. Cloaking scales (Fig. 5) of class 4–6 (SAUTER & HÄTTENSCHWILER 1999). Part of underlying and some of cloaking scales bidentate (class 1–2, according to SAUTER 1956). Fringe concolorous, with two to three-dentate cuneiform scales (rarely with four-dentate scales). Venation (Fig. 7) visible. External margin of medial accessory cell lightly developed. Usually with veins R3 and R4 on short pedicel. Epiphysis half as long as foretibia (Fig. 8). Mid- (Fig. 9) and hindlegs (Fig. 10) are typical for this genus. Abdomen and genital segments unicolourous, black, covered with long black hairs. Genitalia (Figs 11, 12). Length (without valvae) more than two times that of width in middle part. Phallus length (without vesica) approximately 0.65 times length of genitalia. Anellus with small thorns on external side. Saccus 2.5 times shorter than length of valva. Cucullus with numerous very short thorns on internal side. Top of sacculus with two thorns.

**Female.** Body length with protruded ovipositor approximately 5.0–6.5 mm. Body

colour yellow to brownish yellow (Figs 13a, 13b). Head (Figs 14a, 14b) thickly sclerotized, slightly covered with long white hair. Antenna with nine to ten antennomeres (including scape and pedicel); apical end nearly reaching middle of mesothorax. Thoracic segments dorsally more thickly sclerotized; slightly covered with long white hair. Segmentation of legs well developed. Tarsi of all legs with elongated two segments (their segmentation poorly visible). First abdominal segment dorsally more thickly sclerotized than others. Afterwool greyish white. For genitalia, see generic description and Figs 15a and 15b.

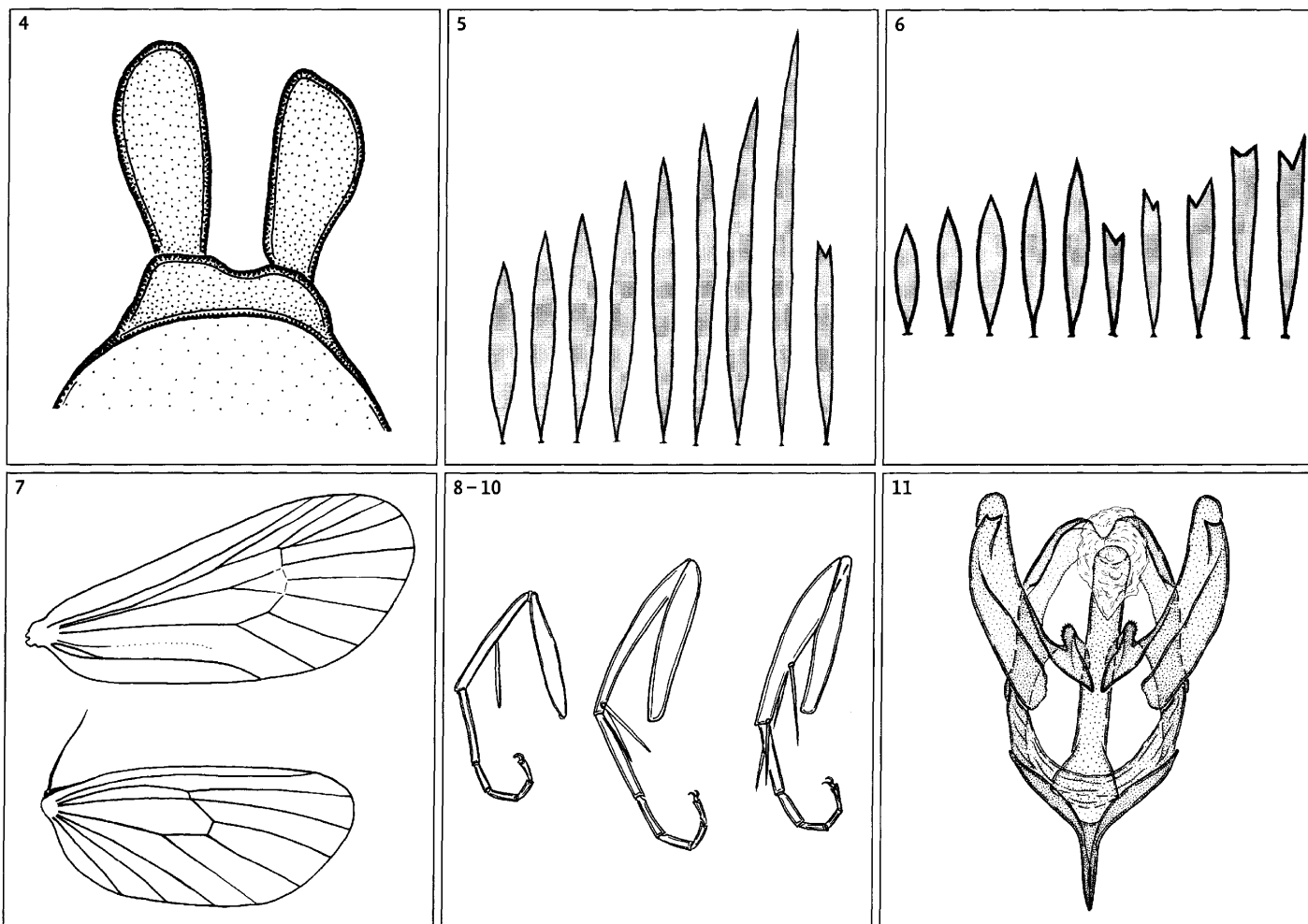
**Pupa. Male** (Figs 16, 17a, 17b, 18). Head-plate width (without antennae) about twice length of labial palpi (Fig. 16). Tergite of segment four with row of 20–25 thorns, segments five and six each with row of 30–33 thorns, segment seven with row of 24–27 thorns, segment eight with row of 12–15 thorns, all directed backward (Fig. 17b). Genital segments dorsally with five pairs of setae (Fig. 18).

**Female** (Figs 19, 20a, 20b, 21). Head plate typical of genus (Fig. 19). Length of labial palpi 2.5 times less than head height. Tergite of segment four with row of 18–20 thorns, segment five with row of app. 32–34 thorns, segment six with row of 38–40 thorns, and segment seven with row of 28–31 thorns, all directed backward (Fig. 20a, 20b). Segment 8 dorsally with swelling covered with small thorns (Fig. 21).

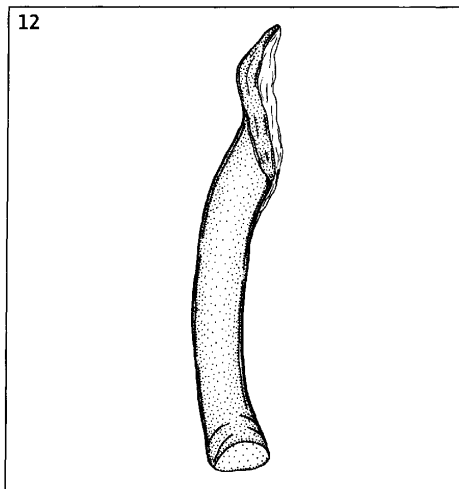
**Larva** (Figs 22, 23, 24a, 24b). Body colour brownish rose. Head and thorax segments with markings (Figs 22, 23). Labrum: external side with six pairs of setae (Fig. 24a); internal side with three pairs of strong thorns (Fig. 24b).

**Cases** (Fig. 2). Length 7.0–9.5 mm, diameter 2.5–3.5 mm. Consisting of plant fragments of different lengths and mineral parts. Ventrally covered with mineral pieces. Female cases broader and longer than those of males. Externally similar to those of European *Proutia* species.

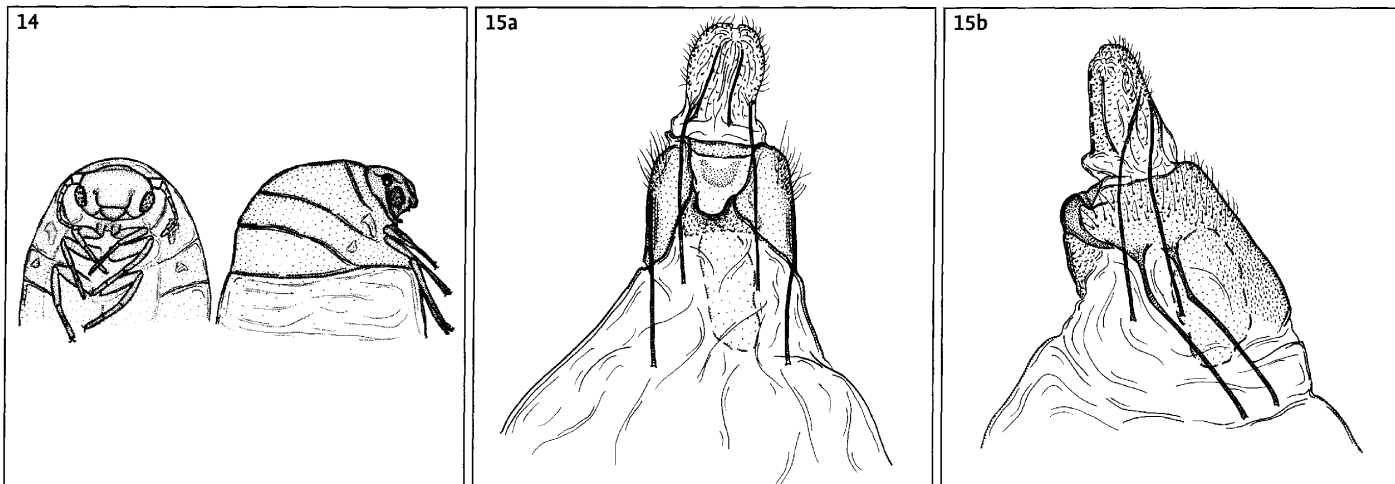
**Diagnosis.** *Mauropterix jailensis* sp. nov. is compared here with the species of Epichnopteryginae occurring on the Crimean Peninsula: *Bijugis bombycella* ([DENIS & SCHIFFERMÜLLER], 1775), *Reisseronia tschetverikovi* SOLYANIKOV, 1990, *Psychidea alba* SOLYANIKOV, 1990, *Rebelia noc-*

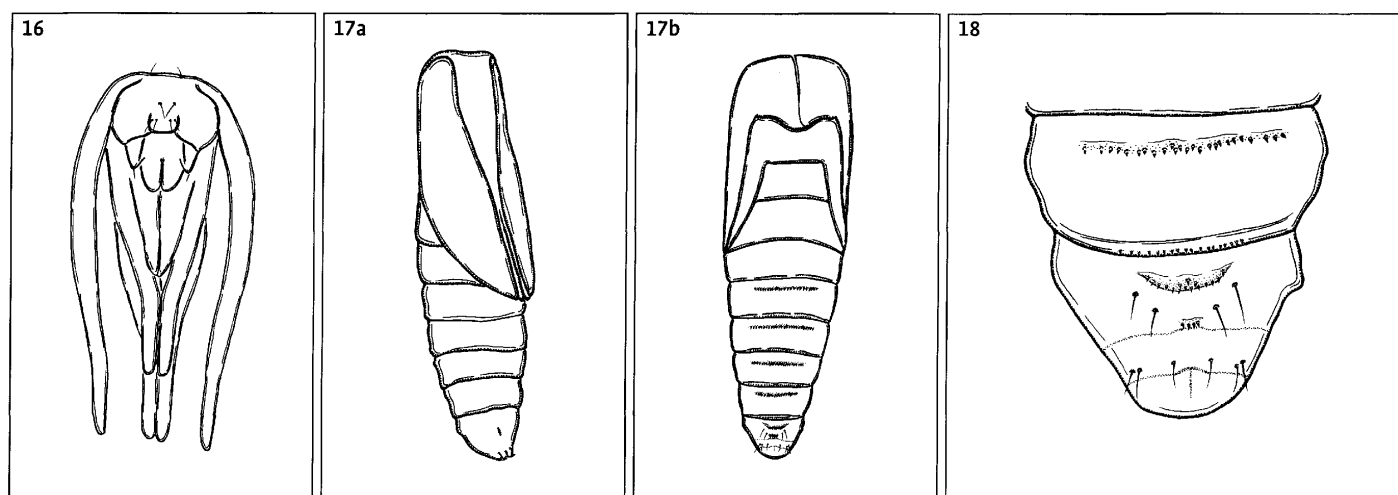


**Figs 4–12.** *Mauropterix* gen. nov. *jailensis* sp. nov., male. 4. Labial palpi. 5. Cloaking scales of forewing. 6. Underlying scales of forewing. 7. Wing venation. 8. Foreleg. 9. Midleg. 10. Hindleg. 11. Genitalia, ventral view. 12. Phallus, lateral view.

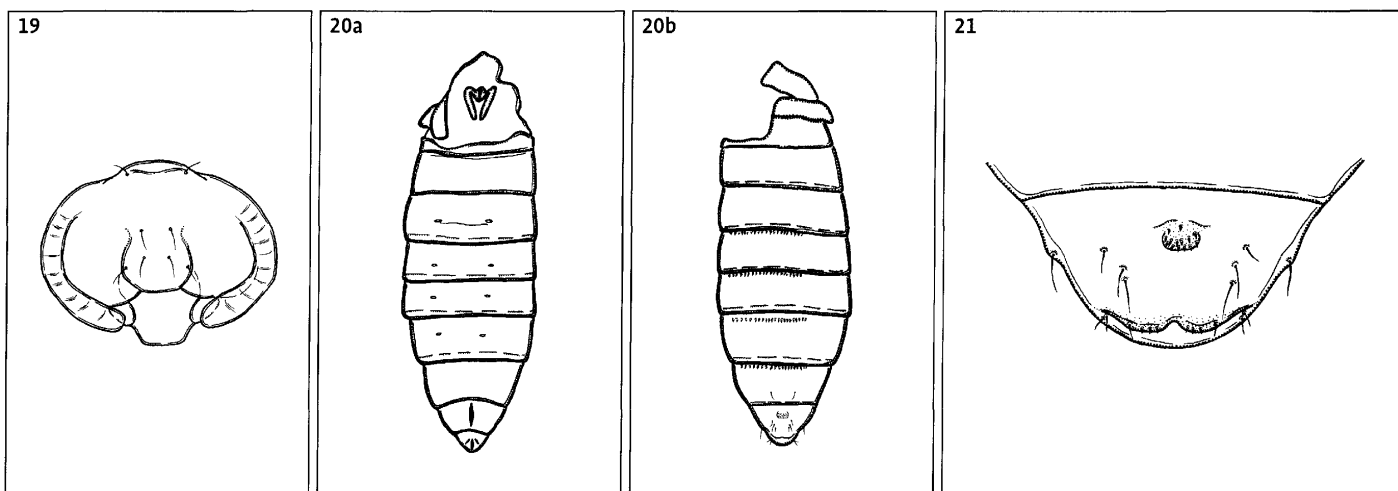


**Figs 14–15.** *Mauropterix* gen. nov. *jailensis* sp. nov., female. 14. Head and thoracic segments, ventral view (left), lateral view (right), 15. Genitalia. a. ventral view, b. lateral view.

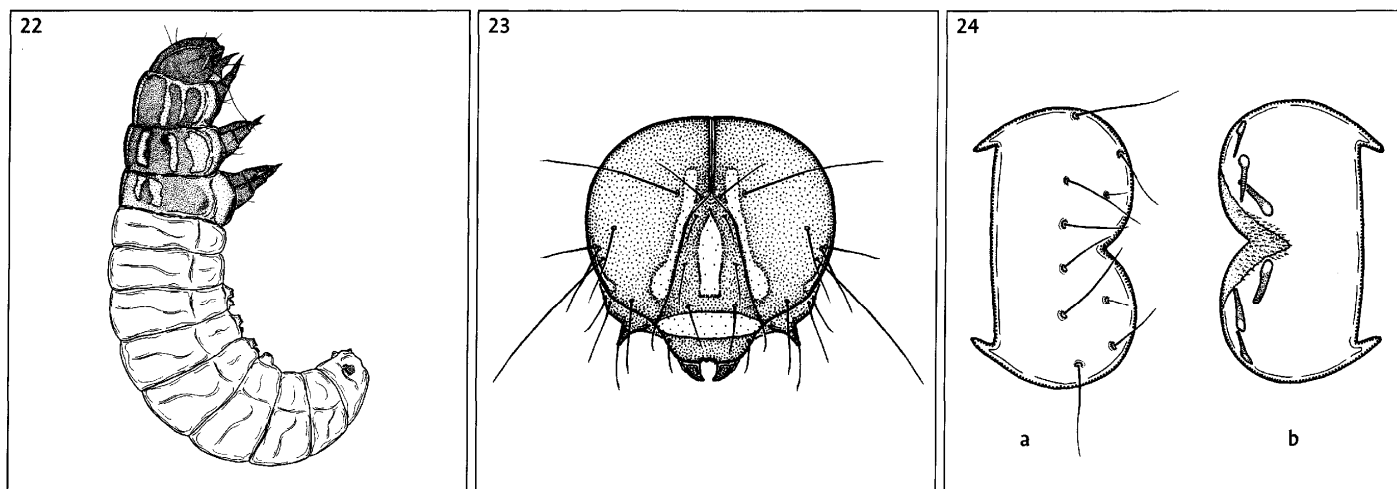




Figs 16–18. *Mauropterix* gen. nov. *jailensis* sp. nov., male pupa. 16. Head plate. 17. Exuvium, a. ventral, b. dorsal. 18. Cremaster, dorsal view.



Figs 19–21. *Mauropterix* gen. nov. *jailensis* sp. nov., female pupa. 19. Head plate. 20. Exuvium, a. ventral, b. dorsal. 21. Cremaster, dorsal view.



Figs 22–24. *Mauropterix* gen. nov. *jailensis* sp. nov., larva. 22. Total, lateral view. 23. Head. 24. Labrum, a. external side, b. internal side (all drawings: E. V. RUTJAN).

*turnella* (ALPHERAKY, 1876), *Epichnopterix crimaeanae* KOZHANTSHIKOV, 1956 and *Stichobasis helicinoides minimus* RUTJAN, 1998.

The following details differs the species from *M. jailensis* sp. nov. (see also Tab. 1):

*Bijugis bombycella*, male: wingspan 16.0–20.0 mm, wings yellow or brownish yellow, forewing broader and with pattern, saccus broad; larval cases exceptionally with grass parts.

*Reisseronia tschetverikovi*, male: wingspan 6.5–8.5 mm ( $m = 7.4$  mm,  $n = 16$ ), vena-

tion poorly visible, forewing with 8 veins from discal cell and reaching external margin, saccus extremely short, phallus short, hindtibia with only one pair of spurs, antenna with 17 segments; female: antenna short, tarsi on all legs absent; larval cases small and exceptionally with plant fragments.

Tab. 1. Diagnostic characters of genera of Epichnopheryginae.

	male					male			female		case	larva		
	discoidal cell veins	antenna (including scape and pedicel)	proportion length pectinate to segment (in middle part of antenna)	scales of forewing: cloaking / fringe (on apical part)	epiphysis & its position on tibia	hindtibia	proximal contraction of vinculum	saccus	phallus length / form	thorns on membrane 7./8. segment	antenna	legs / claws on tarsi	material and shape	markings on head and thorax segments
<b>Bijlugs HEYLAERTS, 1881</b>	9	21-25	2-3 : 1	1-3-dentate, spindle-shaped or cuneiform/more-dentate, lance-like	long/medial	2 pair spurs	present	long & width	long/slightly crooked	absent	short to long, segmented	good developed & segmented/present	fragments plants, spindle-shaped	present
<b>Reisseronia SIEDER, 1956</b>	8	15-25 (usually 16-18)	2-2.5 : 1	2-dentate, cuneiform or spindle-shaped/one-dentate, hair-shaped or more-dentate, lance-like	absent or long/medial or proximal	1 pair spurs	absent	absent or very short & narrow	short/straight	absent	short or very short, segmented or unsegmented	different developed & segmented/present	fragments plants, spindle-shaped	absent
<b>Heliopteryx PINKER, 1956</b>	9	20-21	3-4 : 1	one-dentate, spindle-shaped/one-dentate hair-like	short/distal	2 pair spurs (close)	present (light developed)	short & narrow	long/clear crooked	present	short, segmented	developed & segmented/present	fragments plants, spindle-shaped	present (Pinker (1956))
<b>Mauropertix gen. n.</b>	9	22-23	3 : 1	1-2-dentated, spindle-shaped or hair-like/2-4-dentate (usually 2-3-dentate), cuneiform	long/medial	2 pair spurs	absent	long & narrow	long/slightly crooked	absent	long, segmented	good developed & segmented/present	fragments plants and mineral parts, spindle-shaped	present
<b>Montanina SIEDER, 1949</b>	9	18-22	2 : 1	one-dentate, spindle-shaped/more-dentate, lance-like	long/medial	2 pair spurs (is not very close)	absent	long & narrow	long/clear crooked	present	short, segmented	short, segmented/present	fragments plants, spindle-shaped	present
<b>Rebelia HEYLAERTS, 1900</b>	9	19-29 (usually 20-22)	3-4 : 1	one-dentate, spindle-shaped or hair-like/more-dentate, lance-like	short/medial	2 pair spurs	absent	different length & narrow	long/clear crooked	present	absent or very short & unsegmented	very short & unsegmented/absent	mineral parts, tubularform and slightly crooked	absent
<b>Psychidopsis KOZHANTCHIKOV, 1956</b>	8	21-24	1.5 : 1	1-3-dentate, spindle-shaped or cuneiform/more-dentate, cuneiform	long/proximal	2 pair spurs (close)	present (light developed)	short & narrow	long/clear crooked	present	undescribed	undescribed	fragments plants and mineral parts, spindle-shaped	unknown
<b>Psychocentra MEIER, 1963</b>	6	16-18	2-2.5 : 1	one-dentate, hair-like/one-dentate, hair-like	long/proximal	2 pair spurs (close)	present	very short & narrow	long/crooked	absent	unknown	unknown	unknown	unknown
<b>Psychidea RAMBUR, 1866</b>	9	20-24	2-2.5 : 1	one-dentate, hair-like or spindle-shaped/more-dentate, lance-like	absent	2 pair spurs (close)	absent	short & narrow	long/clear crooked	absent	short or very short, segmented	short or very short, unsegmented/absent	mineral parts, tubularform and slightly crooked	absent
<b>Acentra BURROWS, 1932</b>	9	19-24	1.2-2 : 1	one-dentate, hair-like/more-dentate, cuneiform	absent	2 pair spurs (close)	absent	short or very short & narrow	short or comparatively short/straight or slightly crooked	absent	very short, unsegmented	very short, unsegmented/absent	mineral parts, tubularform and slightly crooked	absent
<b>Epichnophertix HÜBNER, 1825</b>	8	16-26 (usually 16-18)	3-4 : 1	1-3-dentate, hair-like or spindle-shape/one-dentate, hair-like	absent	2 pair spurs	present	long & width	long/slightly crooked	absent	absent or very short & unsegmented	absent or very short & unsegmented/absent	fragments plants, spindle-shaped	present
<b>Whitella TUTT, 1900</b>	8	16-20	3-4 : 1	one-dentate, hair-like/one-dentate, hair-like	absent	2 pair spurs	present	long & width	long/slightly crooked	absent	absent or very short & unsegmented	absent or very short & unsegmented/absent	fragments plants, spindle-shaped	present
<b>Stichobasis KIRBY, 1892</b>	8	17-21	2.5-3 : 1	one-dentate, spindle-shaped or hair-like/1-2-dentate, spindle-shaped or hair-like	absent	1 pair spurs	absent	absent or short & width	long/slightly crooked in S. helcinoides & short/straight in ssp. minna	absent	absent	very reduced & unsegmented/with one claw	fragments plants and mineral parts, spindle-shaped	present

*Psychidea alba*, male: wingspan 11.4–14.0 mm, wings hyaline, whitish in basal part and light grey along external margin, epiphysis absent; female: legs reduced, not segmented; larva: head and thoracic segments without pattern; larval cases differently shaped and consisting only of mineral parts.

*Rebelia nocturnella*, male: wingspan 14.0–18.0 mm (m=15.5 mm, n=8), wings grey or light grey, epiphysis shorter (approximately 0.3 foretibia length), membrane between segments 7–8 with thorns; female: legs reduced, not segmented; larva: head and thoracic segments without pattern; larval cases differently shaped and consisting only of mineral parts.

*Epichnopterix crimaeanae*, male: wingspan 9.0–10.0 mm, antenna with 17 antennomeres, forewings with eight veins from discal cell to external margin, genitalia with long and broad saccus; female: antenna reduced or very short, legs short, not segmented; pupa: head plate with very short labial palpi and antennal sheaths; larval cases exceptionally with grass parts.

*Stichobasis helicoides minimus*, male: wingspan 8.0–9.5 mm (m=8.6 mm, n=20), labial palpus very long and ventrally directed, antenna with 17–18 antennomeres, forewings with eight veins from discal cell to external margin, hindtibia with only one pair of spurs; female: antenna only with scapus, legs short, very strong reduced, all with one claw; pupa: head plate with very short

labial palpi and antennal sheaths; larval cases are smaller in length.

**Distribution and habitat.** The species is known only from the southern Crimean Mountains, especially from the southern slopes of Ai-Petri Yaila at altitudes of 1050–1200 m above sea level, in the coniferous forest belt (Fig. 1). In this area, the rocks consist of limestone and sandstone and the vegetation consists of *Pinus pallasiana*, *Pinus sylvestris* var. *hamata* (= *Pinus sosnovskyi*), *Carpinus orientalis*, *Juniperus oxycedrus*, *Sorbus torminalis* etc. The herbaceous stratum is very poor: *Carex humilis*, *Brachipodium rupestre*, *Poa sterilis*, *Teucrium chamaedrys*, and *Galium mollugo*. The rock surfaces are covered with lichens, algae, and mosses. On the northern slopes of Ai-Petri Yaila this species was not found.

**Life history.** Univoltine. The larva hibernates on the last or penultimate stage. The adults can be found from the end of April to the end of May or perhaps to early June. In laboratory conditions males emerged approximately between 16:00 and 18:00 and females, approximately between 17:00 and 19:00. In the same habitats the psychids *Reisseronia tschetverikovi* SOLYANIKOV, 1990 and *Apterona helicoidella* (VALLOT, 1827) (parthenogenetic form), and the tineid *Eudarcia* sp. also occur.

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