

New taxa of *Euxoa decora* (Denis & Schiffermüller, 1775) and *Euxoa heringi* (Staudinger, 1877) (Noctuidae, Agrotina) species complex from Asia (Lepidoptera: Noctuidae)

Péter Gyulai

Abstract. The diagnosis and description of three new species and five new subspecies of *Euxoa* are provided. The main external and genitalia features of the new species and its closest relatives are characterised and discussed. The imagoes are illustrated on four tables with 32 colour figures, and the genitalia are presented on four monochromatic plates with figures of 16 males and 8 females. Furthermore, the lectotype of *Euxoa heringi marcens* (Christoph, 1893) has been designated.

Keywords. *Euxoa*, Asia, description, new species, new subspecies, taxonomy.

Citation. Gyulai P. 2026: New taxa of *Euxoa decora* (Denis & Schiffermüller, 1775) and *Euxoa heringi* (Staudinger, 1877) (Noctuidae, Agrotina) species complex from Asia (Lepidoptera: Noctuidae) . – *Lepidopterologica Hungarica* 22: 171–187.

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Introduction

The Palearctic *Euxoa decora* (Denis & Schiffermüller, 1775) and *Euxoa heringi* (Staudinger, 1877) (Noctuidae, Agrotina) species complex is fairly well known, but still has numerous zootaxonomic problems to be solved and some new taxa to be described. This publication attempts to, at least partially, resolve these by describing some new taxa and with the designation of a lectotype.

Taxonomic part

Euxoa decora (Denis & Schiffermüller, 1775) is a well-known Central and South European species (the nominotypical and further five subspecies are known), occurring in the rocky mountains. *Euxoa decora koruschensis* Boursin, 1940 from the Caucasus and *E. decora mimouna* (Le Cerf, 1933) from Morocco, are accepted as distinct species by the author of this publication. Although all the European subspecies described so far can be easily separated based on their external morphological features and distribution, due to the individual variability in the male and female genitalia (e.g. the length of the saccular extension in males and the varied shape of the corpus bursae and appendix bursae in females), separation at the species level has not been justified. The same applies to populations living on the eastern border of the species' distribution (Caucasus and Iran). The taxonomic rank of the somewhat whitish suffused, single "*Euxoa koruschensis* Brsn. *calceata* f. nov. M. Rjabov det." from the Caucasus (Dagestan, coll. ZIN) and the whitish specimens from Podkumok (Stavropol area, Russia) in the collection of ZIN are uncertain without genitalia dissection; the former one does not seem to be *E. koruschensis*, while the latter one must be an undescribed, new subspecies of *E. decora*.

Euxoa heringi (Staudinger, 1877) (= *Agrotis heringi* Christoph, 1877) was described from North Persia (Iran), Eastern Alborz, near Shahkuh. It occurs in Armenia, Turkey, Lebanon, Syria, Iraq, Iran. *Euxoa malickyi* Varga, 1990 (= *Euxoa (Euxoa) heringi malickyi* Varga, 1990; (TL: Greece, Grete) is a valid species, endemic in Crete. *Euxoa heringi maronitica* Wiltshire,

1939 (TL: Lebanon, Bsherre cedars) is a subspecies of *E. heringi* in the Levant. *Agrotis heringi* var. *signata* Staudinger, 1899 (TL: N. Persia) is preocc. *Agrotis signata* Boisduval, [1837]), The name *signata* survives as a synonym due to homonymy. The original type specimens are part of the Staudinger collection. Figures 32 and 48 in this publication show an Iranian specimen, which does not seem to be a *heringi* by its genitalia (almost evenly broad valve, long saccular extensions and harpe). A definitive solution to this problem would require the study and dissection of the type material in the Staudinger collection.

Since the holotype of *Euxoa heringi marcens* (Christoph, 1893) (= *Agrotis marcens* Christoph, 1893) (TL: Armenia, Kasikoparan, now in Turkey) has not been designated, the designation of the lectotype of this became necessary for the description of new taxa close to *E. heringi*. Mr. Alexey Matov was helpful enough to send me a picture of *E. marcens*, collected and described by Christoph, from the ZIN collection.

After this, I asked for the help of Prof. Zoltán Varga (Debrecen University, Hungary), who is an excellent expert on the Palearctic *Euxoa*, and he wrote the following:

"In the photo received from Matov in St. Petersburg, the small label has the exact date (18.7.83), in the collector's handwriting and the abbreviation of his name. The Chr. is written the same as on the larger name label, which is also Christoph's handwriting. The abbreviation "orig." corresponds to the current type in the terminology of the time (Staudinger also indicated it this way). The specimen, therefore, came into the possession of Grand Duke Nikolai Mikhailovich directly from the collector-descriptor Christoph. It does not have a type label, but it can be designated as a lectotype, or Matov can first be asked why it is not listed among the *Euxoa* types on the ZIN website. Of the specimens in the pictures received from Gábor Ronkay, the female was caught in the same place, in the same year, only a few days later (4.8.83, according to the label Korb!). The "marcens" on it is NOT Christoph's handwriting, but Staudinger's (I know him well!). Stgr. put the small circular "Orig." label on the specimens he considered to be types, but this one does not have one. The label indicating Stgr. 's ownership. is NOT a type label."

Mr Matov informed me that the reason why this taxon was not included in the ZIN type list was that he could not know which was the type between the two females, but he agrees with the above. Thus, the lectotype designation of *E. heringi marcens* is as follows:

Lectotype of *Euxoa heringi marcens* (Christoph, 1893): one four-cornered white label with a wide black border: "female, Kasikoparan"; small blue label: "orig"; big whitish label: "Kol. Vel. Kn. Nikolaja Mikhajlovicha" (in Russian); big blue label with the handwriting of Christoph "Marcens Chr."; small whitish label with the handwriting of Christoph "18. 7. 83. Chr. The lectotype is deposited in the collection of the Russian Academy of Sciences, Zoological Institute, Saint-Petersburg, Russia (= ZIN).

The separation of *E. decora* and *E. heringi* is not easy sometimes; the males of *E. decora* have significantly longer saccular extensions, and are generally less asymmetric, while the females of *E. decora* have a crista that is absent in the ovipositor of *E. heringi*. The presence or absence of the tiny apical diverticulum in the male vesica is not a reliable identification key, as it is either present or absent in the same *E. decora* or *E. heringi* population. Furthermore, the complete or incomplete inversion of the vesica, as well as the covering, also influences this.

The close relative *Euxoa clauda* Püngeler, 1906, differs well from both species, proven data are only available from Turkmenistan and NE Iran. Mr. Axel Hausmann and Ulf Buschbaum (ZSM) were helpful enough to send me the photo documentation of the single *E. clauda* from the Zagros range (W Iran, Prov. Fars, strasse Ardekan, Talochrosroe), however both by the external and genitalia features the male specimen seems to rather *Euxoa perierga dolomedes* Boursin, 1940.

Abbreviations for personal and institutional collections used herein include: PGM = collection of Péter Gyulai (Miskolc, Hungary); ZIN =collection of Russian Academy of Sciences, Zoo-

logical Institute, Saint-Petersburg, Russia; ZSM = collection of Zoologische Staatssammlung München, Germany; MMR = genitalia slide of Mohammad Mohdi Rabieh; GYP = genitalia slide of Péter Gyulai; m = male; f = female; HT = holotype; PT = paratype.

Description of the new taxa

Euxoa cornucaprea sp. n. (Figs 1, 2, 33, 34)

Type material. Holotype: male, Russia, North Caucasus, Dagestan, Dokuzparinsky Distr., 8 km S of Miskindzha vill., Shalbudztag Mts., 3000 m, 16–20 July 2022, leg. V. Zurilina GYP 6401, deposited in coll. P. Gyulai, Miskolc, Hungary.

Paratypes. Two males, with the same data as the holotype, slide no. GYP 5917 (PGM).

Diagnosis. *Euxoa cornucaprea* sp. n. is similar and related to the also caucasian *Euxoa kuruschensis* Boursin, 1940 (Figs 3–5, 35), however, the new species is smaller (30,0–34,0 mm and 37–40 mm, respectively), the forewings are lighter with reddish-brown suffusion, the antemedial and postmedial transversal lines are well defined and the hindwings unicolourous, without the broad dark suffusion in the marginal area, which is typical of *E. kuruschensis*.

Description (Figs 1, 2). Wingspan 30,0–34,0 mm. Antennae in males are finely bipectinate. Vesture of the head and thorax, the ground colour of the forewings and the fringe are almost concolourous reddish-brown. The orbicular and reniform macules are slightly discernible; the claviform absent. The antemedial and the postmedial transversal lines are dark brown, well defined; the antemedial zig-zag, the postmedial line slightly arcuate, finely laced. Hindwings are concolourous light brown, with slightly darker cellular macula and obscure medial line.

The male genitalia (Figs 33, 34) are characterised by the weak and long, apically pointed uncus; the subquadrangular, high juxta, dorsally–medially with a U-shaped depression with two lateral, triangular, symmetric extensions and with a slight triangular ventral extension. Valvae are almost evenly elongate, but the dorsal costa is slightly extended; the cucullus section dorsally strongly elongated, terminated in a row of strong setae. The harpe is evenly long and slightly outwards curved, apically rounded. The sacculus is tiny, triangle-shaped, apically acute, the two of the same size. Vinculum v-shaped. The aedeagus is strong, slightly ventrad curved. The everted tube of the endophallus slightly recurved dorsally; the subbasal diverticulum is large, elliptical, prominent; the medial one and the apical one are small.

Distribution. The new species is local and rare, known only from the high Caucasus in Dagestan.

Etymology. The name of the new species originated from its tiny acute sacculus extensions, reminiscent of the small horns of a pygmy goat.

Euxoa subita sp. n. (Figs 6, 36)

Type material. Holotype: male, Iran, Mazandaran, Nur valley, 2300 m, 17–18. x. 2003, leg. P. Gyulai & A. Garai, slide no. GYP 1827 deposited in coll. P. Gyulai, Miskolc, Hungary.

Diagnosis. *Euxoa subita* sp. n. is similar in the external features to the caucasian *Euxoa kuruschensis* Boursin, 1940 (Figs 3–5, 35), the new species is smaller (32 mm and 37–40 mm, respectively), the forewings are lighter with greyish-brown suffusion, the antemedial and postmedial transversal lines are well defined, and the inner part of the hindwings is lighter than in *E. kuruschensis*.

Description (Figs 6, 36). Wingspan 32 mm. Antennae in males are finely bipectinate. Vesture of the head and thorax, the ground colour of the forewings and the fringe are almost concolourous greyish-brown. The orbicular and reniform macules are hardly discernible, the claviform stigma absent. The antemedial, postmedial, and subterminal lines are blackish; only the slightly arcuate, finely laced postmedial line is well defined. Hindwings are whitish with slight greyish-brown suffusion, with a slight cellular macula; the marginal area is broadly greyish-brown suffused, evenly darker outwardly.

The male genitalia (Fig. 36) are characterised by the strong and long, apically pointed uncus; the subquadrangular juxta, dorsally–medially with a V-shaped depression with two lateral, triangular, long, symmetric extensions and with a broadly triangular ventral extension.

Valvae are elongate, but the dorsal costa is slightly extended; the sacculus is very unique, basally triangular, since the basal edge is straight. The cucullus section is dorsally strongly elongated, terminated in a row of strong setae. The harpe is evenly long and slightly outwards curved, apically rounded. The saccular process is of medial length, apically acute, and of the same size. Vinculum v-shaped. The aedeagus is strong and straight. The everted tube of the endophallus is recurved dorsally; the subbasal diverticulum is large, globular, and prominent; the medial one is shortly finger-like, and the apical one is slight.

Distribution. The new species is local and rare, known only from the high Alborz in Iran. It is very unusual for *Euxoa* that a single fresh male was found in the middle of October.

Etymology. The name of the new species shows that this fresh one was a surprise at such a high elevation in the middle of October; additionally, it was a new species for science.

***Euxoa decora gubdeni* ssp. n.** (Figs 7, 8, 37, 38)

Type material. Holotype: male, Russia, Dagestan, Karabudakhkentky Distr., Gubden, N 42° 33', E 47°25', 27.viii. 2020, leg. V. Zurilina, slide no. GYP 6402, deposited in coll. P. Gyulai, Miskolc, Hungary.

Paratype. Male, with the same data, but with the date 27. viii. 2020, slide no.5712. (PGM)

Diagnosis and description. This new subspecies of *E. decora* was found in the lower mountains in the central Caucasus. Wingspan 29–31 mm. It differs from the other subspecies of *E. decora* with the concolourous light greyish-ash forewings and the underside of the hindwings, which are white with broad, brown medial stripe. Wing pattern discernible, but the noctuid maculation is obscure, with a slightly lighter shade of the ground colour; the reniform macule with a dark spot on the lower part. The transverse lines are fine, greyish, the medial stripe broad and diffuse, brownish-grey. The hindwings of the new subspecies are white or whitish, the marginal area narrow, diffuse, greyish-brownish, fringe clear white. The male genitalia of the new subspecies mostly reveals the typical *E. decora* characteristics; the juxta has a deep dorsal incision, valvae are straight, elongated and almost evenly broad, saccular extensions medium long, asymmetric, the left one is shorter. The female is unknown.

Distribution. The new subspecies is known only from the type locality in the eastern Caucasus, not too far from the Caspian Sea.

Etymology. The name refers to the type locality.

***Euxoa decora curiosa* ssp. n.** (Figs 9, 10, 39, 49)

Type material. Holotype: Female, Iran, prov. Mazandaran, C. Alborz Mts., Mazandaran, 5 km E of Minac, 2400 m, 23–24. viii. 2000, leg. P. Gyulai A. Garai, light trap, slide no. GYP 1886, deposited in coll. P. Gyulai, Miskolc, Hungary.

Paratype. Male, Iran, Mazandaran, Elburz Mts., 10 km E of Valiabad, 3200 m, 22–25. vii. 2000 m, leg. B. Benedek, GYP 1815 (PGM).

Diagnosis and description. The two known specimens found in the Alborz Mts. in northern Iran, outwardly, mostly resemble the specimens of the population of *Euxoa decora splendida* (Turati & Verity, 1911) (= *Euxoa decora* var. *albidecora* Sohn-Rethel, 1929) (Figs 11, 12, 40, 50) living in the Italian Apennines, but differ from them in the male and female genitalia. *Euxoa decora curiosa* ssp. n. is slightly larger than *E. decora splendida* (33–35 mm and 30–34 mm, respectively). In the females, the greyish-ash ground colour of the forewings and wing pattern is similar to the two taxa, but of the new subspecies is much darker with a broad and diffuse medial stripe. The hindwing of the new subspecies is also darker, particularly in the marginal area. The males of both taxa are much lighter colored; ground colour of all the wings of the new subspecies pale brown suffused, wing pattern obscure, the broad and diffuse medial stripe absent. In the female genitalia of the holotype of *E. decora curiosa* ssp. n. has much longer apophyses anteriores, a longer, more prominent appendix bursae and a less ample corpus bursae. In the male genitalia of the new subspecies, the juxta is much higher, the saccular extensions are shorter and more asymmetric in both sides, and the aedeagus is straight.

Distribution. The new subspecies is known only from the higher Central Alborz in Iran.

Etymology. The name “curiosa” means special, indicating that this new taxon from Iran is unique in that the two sexes appear with very different external features and that the female resembles a European subspecies of *E. decora*.

***Euxoa decora srnkai* ssp. n.** (Figs 13, 14, 41)

Type material. Holotype: male, Russia, Kabardino-Balkaria, C. Caucasus Mts., Bylym 10 km env., 1550 m, 26 viii. 2013., leg. L. Srnka, slide no. GYP 5733, deposited in coll. P. Gyulai, Miskolc, Hungary.

Paratypes. A series of males, with the same data, coll. Lubomir Srnka, Slovakia; two males coll. PGM. slide no. GYP 6400.

Diagnosis and description. The specimens found in the Central Caucasus display remarkable differences in the external features from all the known *E. decora* subspecies by the rather short, variegated forewings with greyish and brownish suffusion, densely scattered with greyish scales; the strictly defined and sinuous, crenellated antemedial and postmedial transverse lines (the latter one is strongly arched) with pale ghost, and the pale subterminal line, with a row of conspicuous dark brown triangle spots inside. This latter character is very unique to *E. decora* taxa. Wingspan 32–33 mm. The hindwings of the new subspecies are whitish with light greyish-brown suffusion; the marginal area broad, diffuse, darker greyish-brownish, fringe clear white. The male genitalia of the new subspecies reveal the typical *E. decora* characteristics; the saccular extensions are rather long, with the same length, and not as asymmetric as in *Euxoa decora gubdeni* ssp. n., the juxta is lower. No female was available.

Distribution. The new subspecies is known only from the type locality in the central Caucasus, at a moderate altitude.

Etymology. The new subspecies was named in honour of its collector, Mr Lubomir Srnka, of Slovakia.

***Euxoa rabiehae* sp. n.** (Figs 15, 42)

Type material. Holotype: male, Iran, prov. Khorasan Razavi, Ghuchan, N 37°13' 58, E 58° 28'39, 1598 m, 25. vii. 2011., leg. M. M. Rabieh, slide no. Rabieh 271 (coll. P. Gyulai).

Diagnosis and description. *Euxoa rabiehae* sp. n. is a rather small, unmistakable species, wingspan 27 mm. It was found in a remote place in NE Iran. In its external features, it differs well from all the known *E. decora* taxa, especially in the pale yellowish ground colour of the forewings, and it is rather reminiscent of *E. heringi zagroscola* ssp.n. (Figs 19, 20, 21, see below), but the male genital configuration is closer to that of *E. decora*. It differs from *E. heringi* particularly in the shape of the transverse lines and the whitish hindwings with broad brown marginal suffusion. The fine light brownish antemedial line is zigzag, and the postmedial line is less arcuate than in *E. heringi*. The other elements of the wing pattern (macules, etc.) absent. The male genitalia of the new subspecies reveal unique characters: the saccular extensions are completely symmetric and straight, of equal length and evenly diverging from the ampulla, forming a V-shape. The vesica tube is short, and the subbasal diverticulum is globular. No female was available.

Distribution. The new subspecies is known only from the type locality in NE Iran.

Etymology. The new species is named in honour of its collector, Mr Mohammad Mahdi Rabieh, Iran, who is an excellent researcher not only of Iranian Noctuidae, but also of the local Orthoptera.

***Euxoa heringi zagroscola* ssp. n.** (Figs 19–21, 44, 45, 52)

Type material. Holotype: male, Iran, Fars, Kuh-e-Bul, 3700–4100 m, 13. vii. 2001, leg. S Nykl, slide no. GYP 5720, coll. P. Gyulai, Miskolc, Hungary.

Paratypes. five males, nine females, with the same data as the holotype (PGM); two males, one female, Iran, prov. Boyerahmad-va-Kohgiluyeh, SE-Zagros, 2900 m, Kuh-e-Dena, n. Bijan pass, 6 km N of Cisakht, 19–20. ix. 2001., leg. P. Gyulai & A. Garai (PGM); one male,

two females, Iran, Esfahan, Khansar, 14. vii. 2010, leg. Gyulai & Garai (PGM); two females, Iran, Esfahan, Khounsar, 2700–3200 m, 25. vi. 2001, leg. S. Nykl (PGM); two males, one female, Iran, Fars, Suriyan, 3100–3200 m, 10–11. vii. 2001, leg. S. Nykl (PGM); two males, Iran, Esfahan, Fereidun Shar, 3400 m, 30. vii.–1. viii. 2001, leg. S. Nykl (PGM); one female, Iran, prov. Boyerahmad, Kuh-e-Dena, 16 – 17.vii. 2001., leg. S. Nykl (PGM).

Slide nos.: GYP 1817, 1819, 3736, 5719, 5720, 5723 males; 5762, 6001 females.

Diagnosis and description. The new subspecies is distributed in the Central and South Zagros Mts., in Iran. Wingspan 28–30 mm. Compared to the nominotypical subspecies (16–18, 43, 51), *E. heringi zagroscola* **ssp. n.** can be easily separated by the lighter, yellow or pale yellowish ground colour of the forewings. The wing pattern is obscure; the transverse lines and the reniform macula are light brown, fine; the other wing patterns are absent. The hindwings of the new subspecies are white-whitish, with a slight diffuse marginal area. Compared to the nominotypical subspecies, the main differential characters in the male genitalia of the new subspecies are the regularly longer saccular extensions, while those are in the females, the somewhat shorter ovipositor; no further constant differences were found.

Distribution. The new subspecies is known from the Central and southern Zagros in Iran at higher altitudes.

Etymology. The name refers to the distribution of the new subspecies.

***Euxoa heringi zuvadica* ssp. n.** (Figs 27–31, 47, 54)

Type material. Holotype: male, Azerbaijan, Zuvand plateau, near Juhary-Amburdara, 2000–2400 m, 26. vii. – 9. viii. 1995., leg. ?, slide no. GYP 5724 (coll. P. Gyulai, Miskolc, Hungary).

Paratypes. Azerbaijan: one male, three females, with the same data as the holotype; one male, Talysh, Zuvand, Kalvaz vil. circ., 1800 m, 27. vii. 2008., leg. I. Pljutsh (PGM); one male, Talysh, Kalahan/Zuvand, 1600 m., 31. viii.–1. ix. 1992, leg. A. Schintlmeister (PGM); ten males, seven females, Talysh Mts., Gilidare, 1800 m., 2–3. ix. 1992., leg. V. Siniaev (PGM); 1 female, Talysh Mts., Kalahan, 1800 m., 31. viii.–1. ix., 1992., leg. V. Siniaev (PGM); 1 female, Kamerkei, 2480 m., 4–5. ix. 1992., leg. V. Siniaev (PGM); 3 males, Nakhichevan, Bichenek, 3. viii. 1970 leg. Tsvetaev (coll. ZIN); male, Talysh Mts., Gosmolyan vill., 1300 m, 29. viii. 1981 leg. Lisetsky (coll. ZIN); one male, Nakhichevan, Ordubad distr., Nusmus, 5. viii. 1935, leg. Rjabov (coll. ZIN); three males, two females, Nakhichevan, Ordubad distr., Nusmus, 4. viii. 1935, leg. Rjabov (coll. ZIN); one male, one female, Lerik distr., Tatomi, 5. viii. 1932, leg. Rjabov (coll. ZIN); three males, Lerik distr., Zuvant, Tatomi, 4. viii. 1932, leg. Rjabov (coll. ZIN). Slide nos. GYP 5713, 5717, 5732 (males), GYP 5718, 5729, 5761 (females). Further genitalia in ZIN: Nekrasov N 716, N 450 a, Rjabov 6569, 7633, 3327.

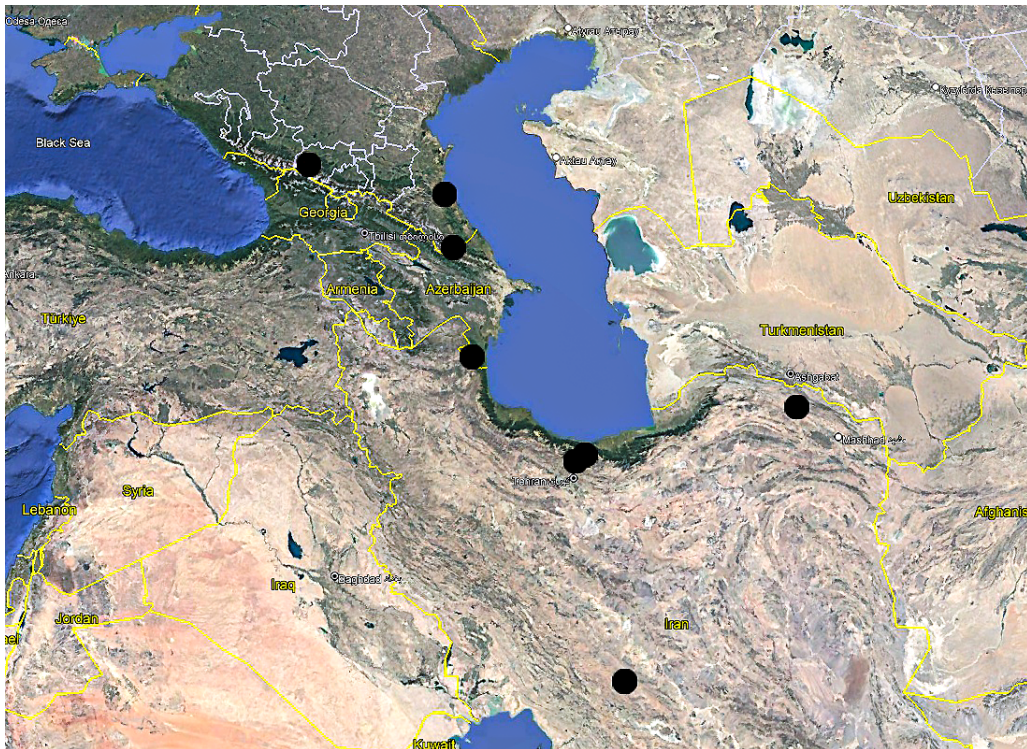
Diagnosis and description. *E. heringi zuvadica* **ssp. n.** is the eastern sibling taxon of the Armenian–Turkish *Euxoa heringi marcens* Christoph, 1893 (Figs 25, 26, 46, 53). Due to the high individual variability in both the males and females in both taxa, the separation is supported by the different distribution pattern; *E. heringi zuvadica* **ssp. n.** occurs only in Azerbaijan, while *E. heringi marcens* in Armenia, Turkey (very likely the somewhat smaller and mostly lighter Central Anatolian specimens also belong to this subspecies). Furthermore, in *E. heringi zuvadica* **ssp. n.** the forewings are more elongated, the hindwings slightly darker with a broader brown suffused marginal area than in *E. heringi marcens*. The fig 28. reveals a somewhat albinistic male of the new subspecies, but no significant difference was found in the male genitalia. The very old specimens are somewhat paler, more unicoloured, and yellowish suffused. The new subspecies has variegated brownish forewings with pale greyish forewings of the males and pale yellowish suffusion of the females, particularly on the transversal lines. Wingspan 29–36 mm. The noctuid maculation is finely, more or less incompletely encircled by pale yellowish; the claviform macula is absent. The hindwings of the new subspecies are whitish in males, light brownish in females, with a broad, diffuse, brownish. In the male genitalia of the new subspecies, the saccular extensions are shorter and more asymmetric, the basal diverticulum and the basal section of the vesica tube are larger than in *E. heringi marcens* (Figs 1, 23, 24). In the female genitalia, *E. heringi zuvadica* **ssp. n.** has somewhat longer apophyses posteriores and corpus bursae.

Distribution. The new subspecies is widely distributed in the mountains of eastern Azerbaijan.

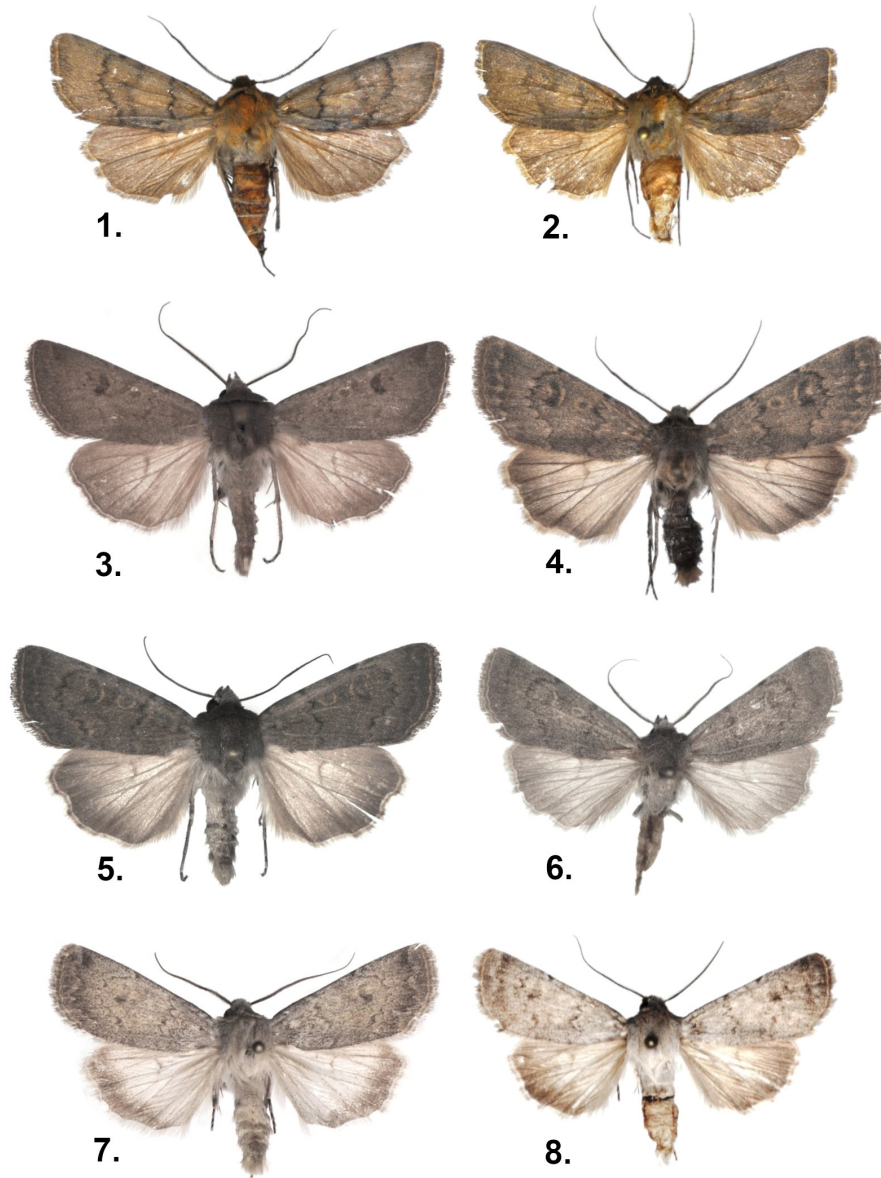
Etymology. The name refers to the type locality of the holotype.

Acknowledgements

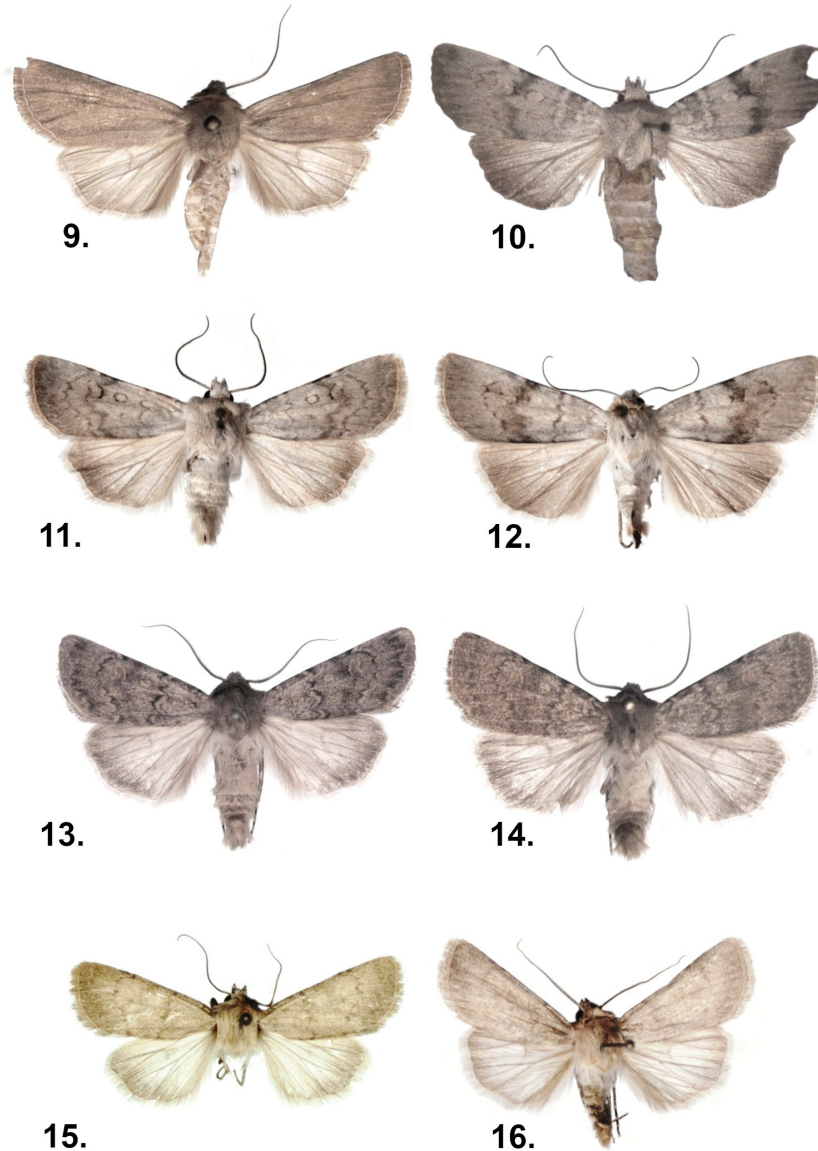
The author is grateful to Prof. Zoltán Varga (University of Debrecen, Hungary) for the help in clarifying the problems concerning the lectotype of *Euxoa heringi marcens* (Christoph, 1893) and for consultation; to Alexey Yu. Matov (Russian Academy of Sciences, Zoological Institute, Saint-Petersburg, Russia) for consultation, for the review and for a lot of photo documentation from the collection of the ZIN; to Mohammad Mohdi Rabieh (University of Birjand, Iran) for the holotype of *Euxoa rabiehae* sp. n.; to Lubomir Srnka (Lehota pod Vtácnikom, Slovakia) for the holotype of *Euxoa decora srnkai* ssp. n.; to Axel Hausmann and Ulf Buschbaum (ZSM) for *Euxoa* type documentation; to Balázs Benedek (Mohács, Hungary) for specimens; to his wife Adrienne Gyulai-Garai (Miskolc, Hungary) for computer and microscopic assistance and for her help and tolerance during seven Iranian expeditions; and to Imre Fazekas (Pécs, Hungary) for checking, editing, and publishing the manuscript.



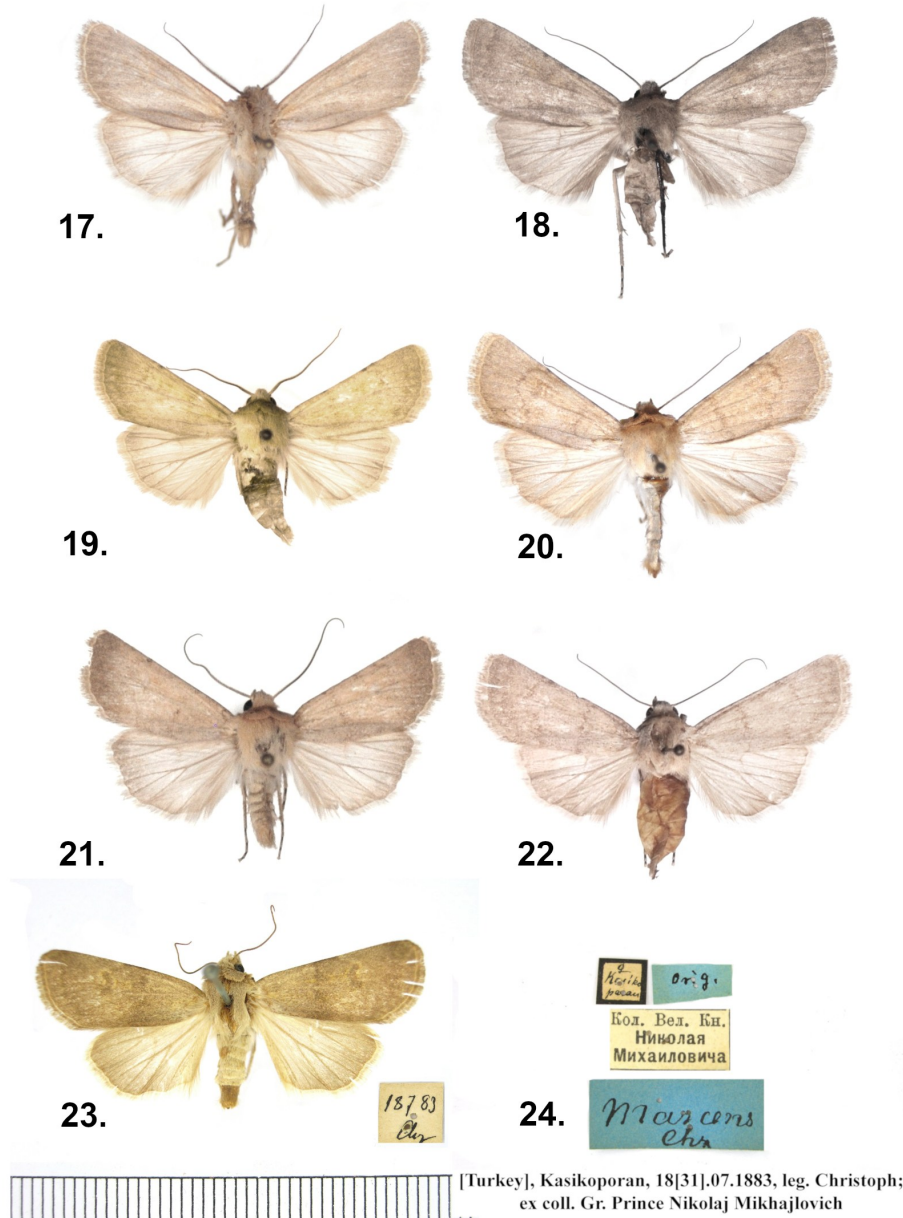
Text Fig. 1. A schematic map showing the locations of the new *Euxoa* taxa. Details are provided in the text. Graphics: © I. Fazekas, 2026.



Figures 1–8. *Euxoa* spp. and *Euxoa* ssp. adults. **1.** *E. cornucaprea* sp. n., HT, m, Russia, N. Caucasus, Dagestan, Dokuzparinsky Distr., 8 km S of Miskindzha vill., Shalbuzdag Mts., 3000 m, 16–20 July 2022, leg. V. Zurilina, GYP 6401 (PGM); **2.** *E. cornucaprea* sp. n., PT, m, with the same data as the holotype, GYP 5917 (PGM); **3.** *E. koruschensis* Boursin, 1940, m, Russia, Chechnia–Ingousetia, NE Caucasus, Torgim, 1000 m, 19. ix. 1990., leg. B. Herczig & L. Ronkay, GYP 5735 (PGM); **4.** *E. koruschensis* Boursin, 1940, m, Russia, Terskol, C. Caucasus, 27–29. viii. 2013., leg. L. Srnka (PGM); **5.** *E. koruschensis* Boursin, 1940, m, Russia, North Caucasus, Dagestan, Dokuzparinsky Distr., 8 km S of Miskindzha vill., Shalbuzdag Mts., 3000 m, 16–20 July 2022, leg. V. Zurilina (PGM); **6.** *E. subita* sp. n. HT, m, Iran, Mazandaran, Nur valley, 2300 m, 17–18. X. 2003, leg. P. Gyulai & A. Garai, GYP 1827 (PGM); **7.** *E. decora gubdeni* ssp. n., HT, m, Russia, Dagestan, Karabudakhkentsky Distr., Gubden, N 42°33', E 47°25', 27.viii. 2020, leg. V. Zurilina, slide no. GYP 6402 (PGM); **8.** *E. gubdeni* ssp. n., PT, m, with the same data as the holotype, GYP 5712 (PGM).

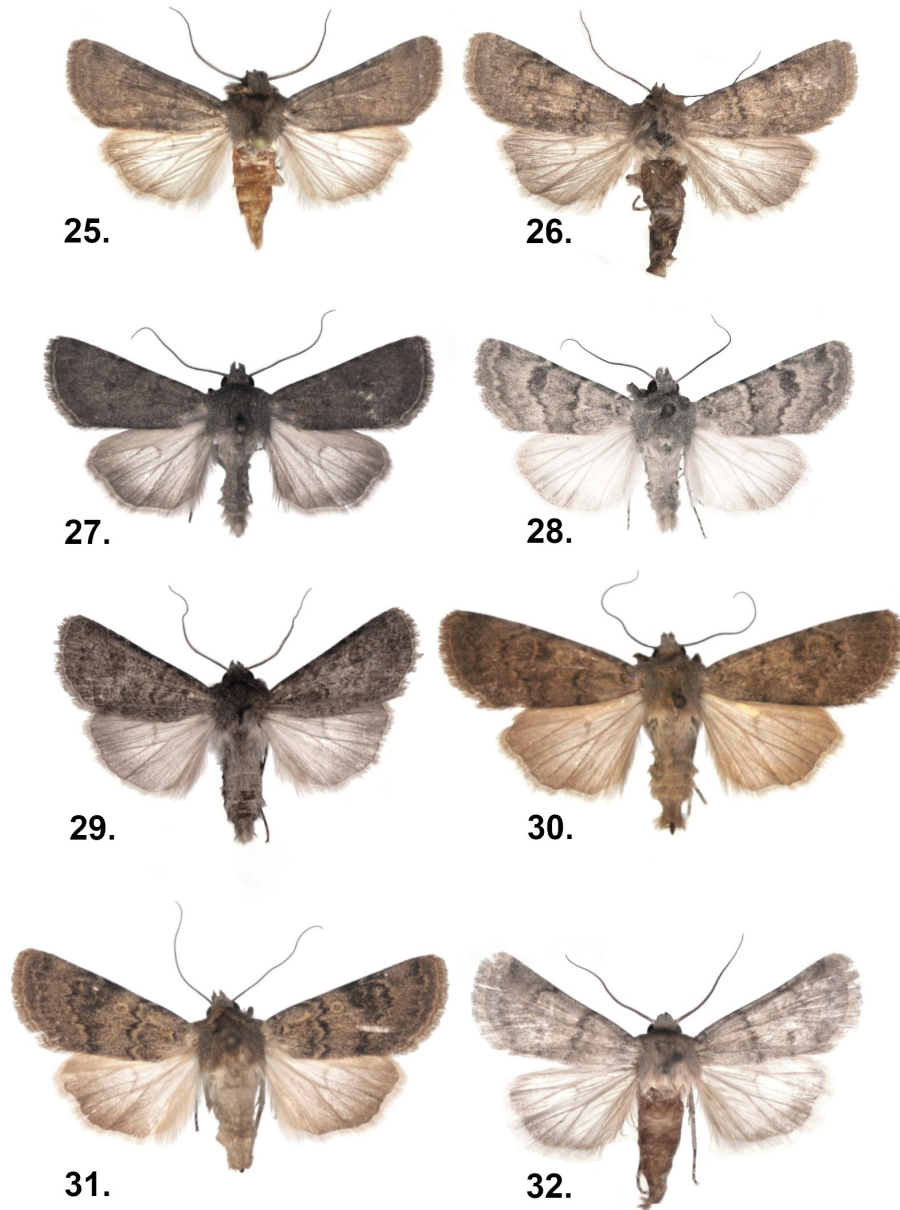


Figures 9–16. *Euxoa* spp. and *Euxoa* ssp. adults. **9.** *E. decora curiosa* ssp. n., PT, m, Iran, Mazandaran, Elburz Mts., 10 km E of Valiabad, 3200 m, 22–25. vii. 2000 m, leg. B. Benedek, GYP 1815 (PGM); **10.** *E. decora curiosa* ssp. n., HT, f, Iran, prov. Mazandaran, C. Alborz Mts., Mazandaran, 5 km E of Minac, 2400 m, 23–24. viii. 2000, leg. P. Gyulai A. Garai, light trap, GYP 1886 (PGM); **11.** *E. decora splendida* (Turati & Verity, 1911), m, Italy, Apennin centr., Mts. Terminillo, GYP 6000 (PGM); **12.** *E. decora splendida* (Turati & Verity, 1911), f., Italy, prov. Rieti, Apennin centr. Mts. Terminillo, GYP 5999 (PGM); **13.** *E. decora srnkai* ssp. n., HT, m, Russia, Kabardino–Balkaria, C. Caucasus Mts., Bylym 10 km env., 1550 m, 26 viii. 2013., leg. L. Srnka, slide no. GYP 5733(PGM); **14.** *E. decora srnkai* ssp. n., PT, m, Russia, Kabardino, with the same data as the holotype, GYP 6400 (PGM); **15.** *E. rabiehae* sp. n., HT, m, Iran, prov. Khorasan Razavi, Ghuchan, N 37°13' 58, E 58°28'39, 1598 m, 25. vii. 2011., leg. M. M. Rabieh, slide no. Rabieh 271 (PGM); **16.** *E. heringi* (Staudinger, 1877), m, Iran, prov. Tehran, C. Alborz, n. pass, Mazandaran v., 3100 m, 13–14. ix. 2001, leg. P. Gyulai A. Garai (PGM);

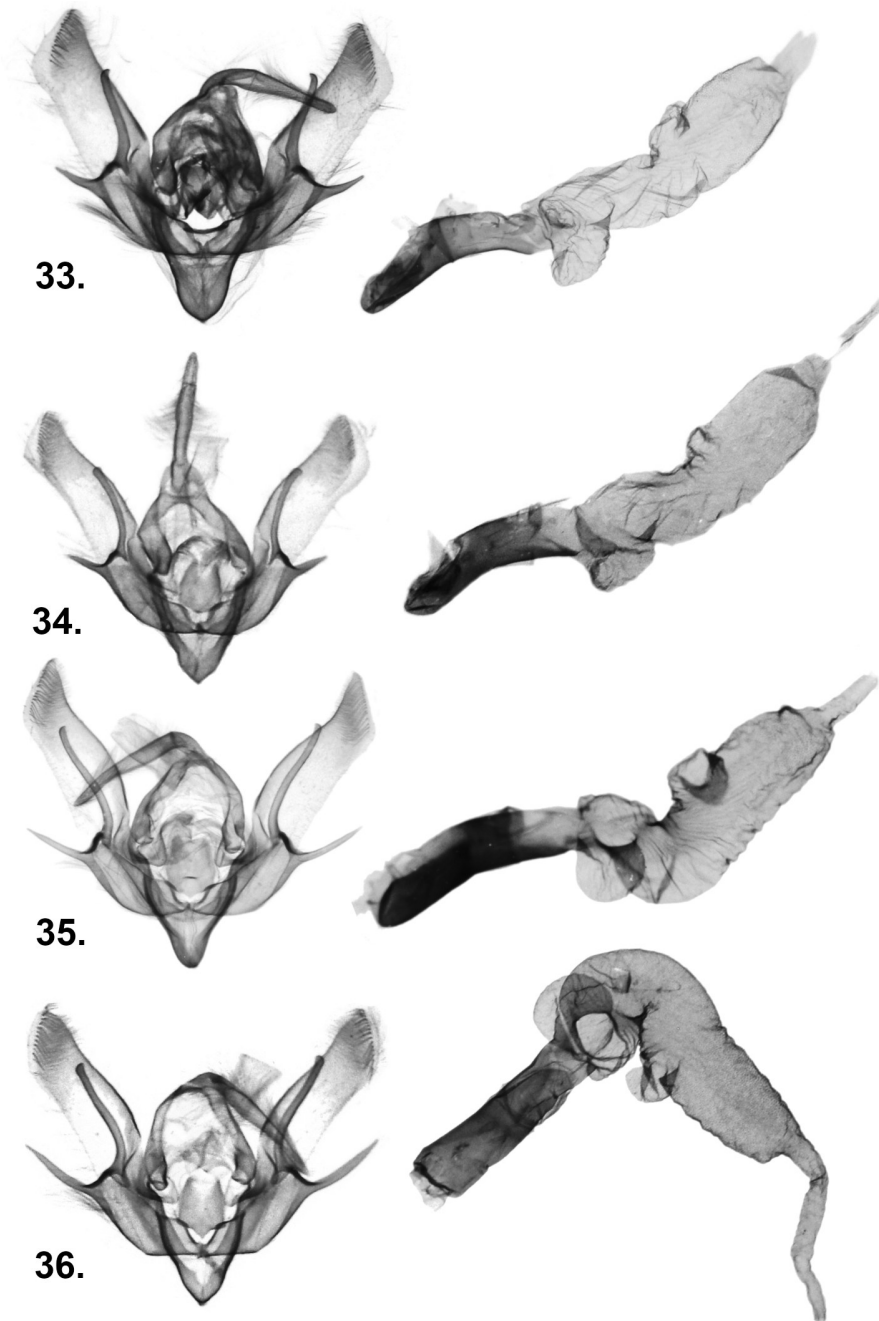


[Turkey], Kasikoporan, 18[31].07.1883, leg. Christoph;
ex coll. Gr. Prince Nikolaj Mikhajlovich

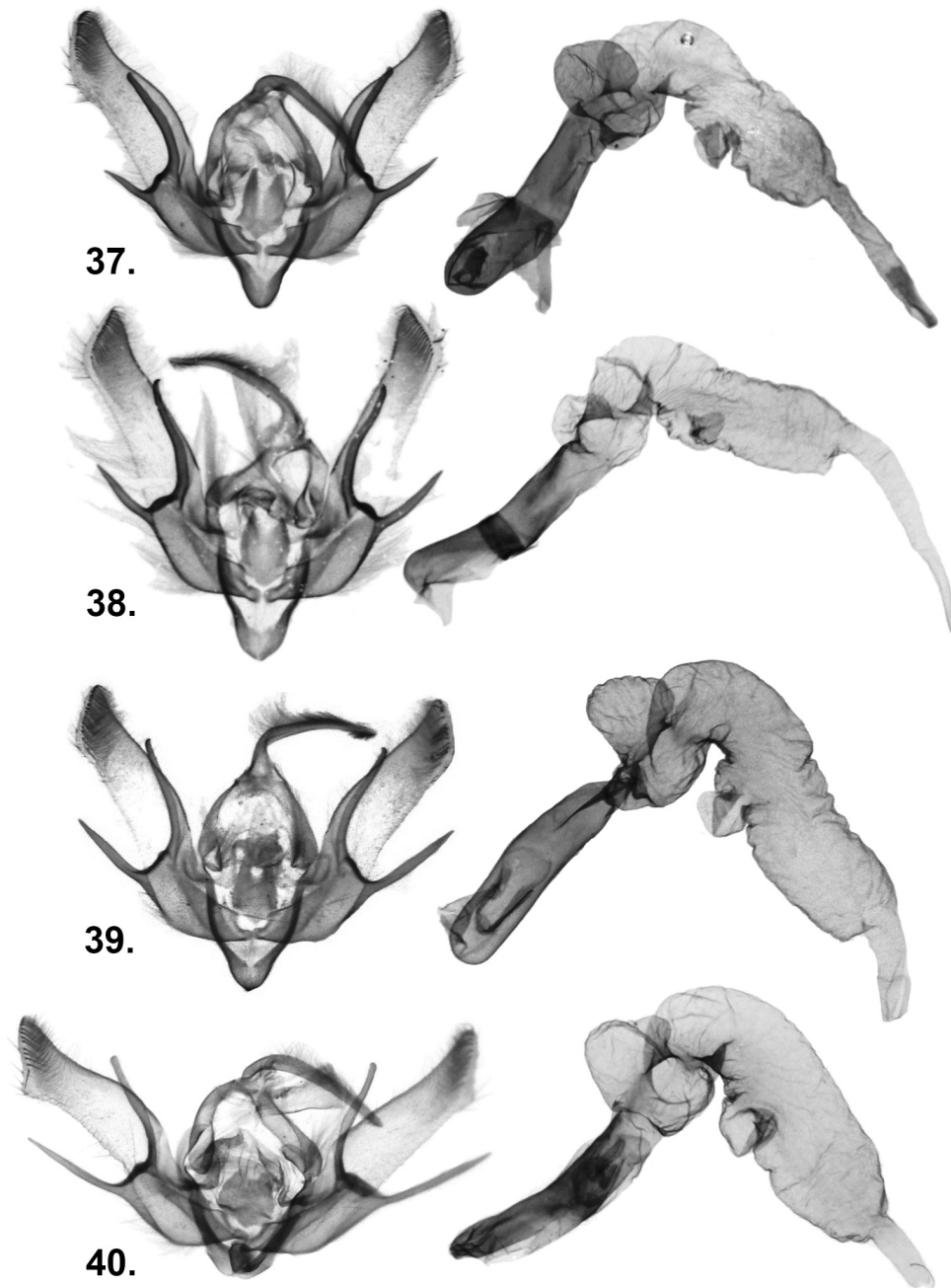
Figures 17–24. *Euxoa* spp. and *Euxoa* ssp. adults. **17.** *E. heringi* (Staudinger, 1877), m, Iran, prov. Tehran, Alborz, Demavend, n. Lardam, 2700m, 15–16. ix. 2001, leg. P. Gyulai & A. Garai (PGM); **18.** *E. heringi* (Staudinger, 1877), f, Iran, prov. Tehran, Alborz, Demavend, n. Lardam, 2700 m, 15–16. ix. 2001, leg. P. Gyulai & A. Garai, GYP 5737 (PGM); **19.** *E. heringi zagroscola* ssp. n., HT, m, Iran, Fars, Kuh–e–Bul, 3700–4100 m, 13. vii. 2001, leg. S Nykl, GYP 5720 (PGM); **20.** *E. heringi zagroscola* ssp. n., PT, f, Iran, prov. Boyerahmad–va–Kohgiluyeh, SE–Zagros, 2900 m, Kuh–e–Dena, n. Bijan pass, 6 km N of Cisakht; 19–20. ix. 2001., leg. P. Gyulai & A. Garai (PGM); **21.** *E. heringi zagroscola* ssp. n., PT, m., Iran, Esfahan, Khansar, 14. vii. 2010, leg. Gyulai & Garai, GYP 5723 (PGM); **22.** *E. heringi zagroscola* ssp. n., PT, f, Iran, Fars, Suriyan, 3100–3200 m, 10–11. vii. 2001, leg. S. Nykl, GYP 5762 (PGM); **23.** *E. heringi marcens* Christoph, 1893, Lectotype, Armenia, Kasikoporan (ZIN); **24.** labells of fig. 23. (ZIN).



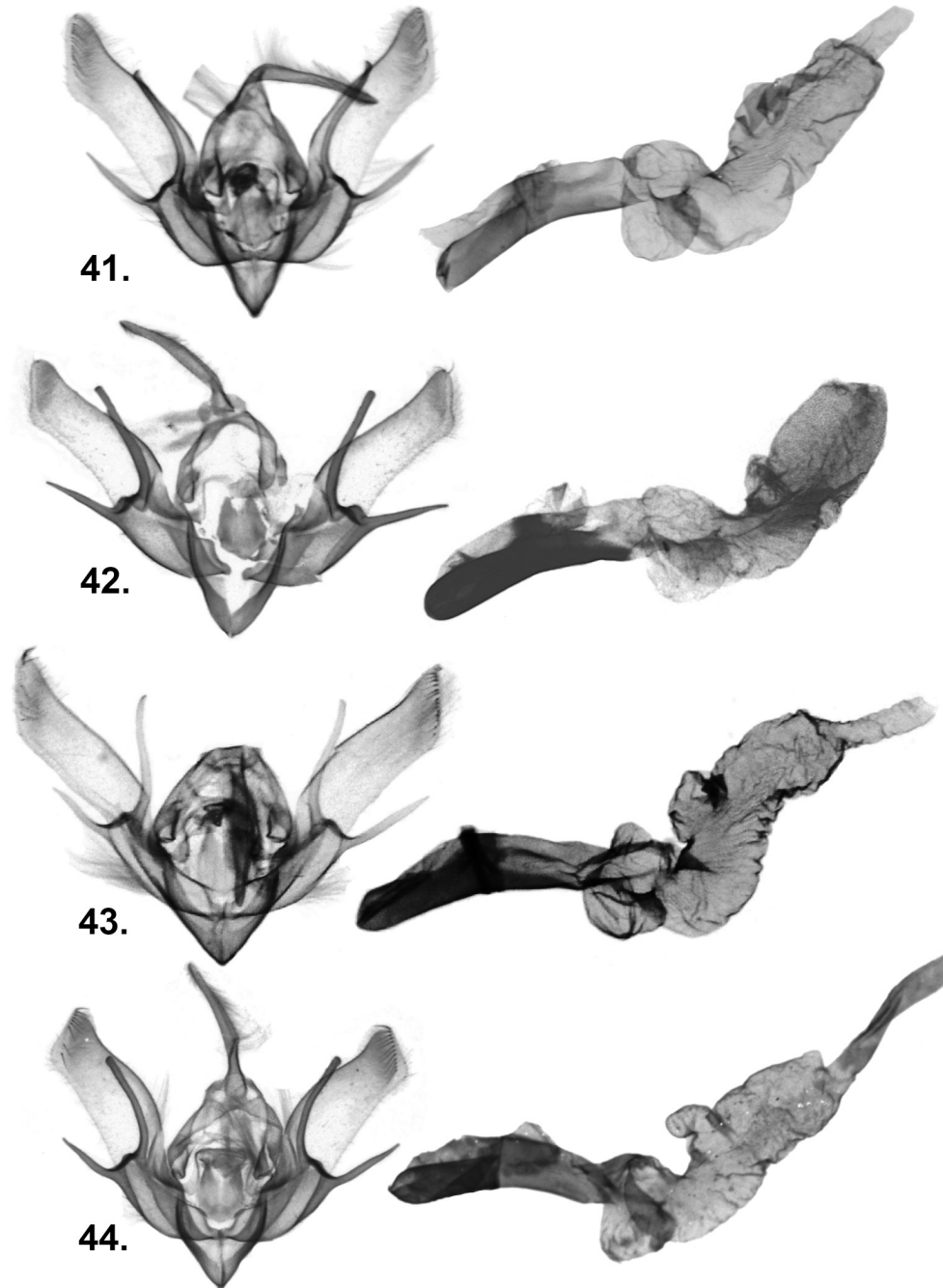
Figures 25–32. *Euxoa* spp. and *Euxoa* ssp. adults. **25.** *E. heringi marcens* Christoph, 1893, m. E. Turkey, prov Agri, 5 km E. of Sarican, 1800 m, 17–18. vii. 1989., leg. P. Gyulai & M. Hreblay, GYP 5757 (PGM); **26.** *E. heringi marcens* Christoph, 1893, f. E. Turkey, prov Agri, 5 km E. of Sarican, 1800 m, 17–18. vii. 1989. leg. P. Gyulai & M. Hreblay, GYP 5760. (PGM); **27.** *E. heringi zuvandica* ssp. n., HT, m, Azerbaijan, Zuvand plateau, near Juhary–Amburdara, 2000–2400 m, 26. vii.–9. viii. 1995., leg. ?, slide no. GYP 5724 (PGM); **28.** *E. h. zuvandica* ssp. n., Azerbaijan, Zuvand plateau, near Juhary–Amburdara, 2000–2400 m, 26. vii.–9. viii. 1995., leg. ?, GYP 5717 (PGM); **29.** *E. h. zuvandica* ssp. n., m, Azerbaijan, Talysh, Gilidare, 1800 m., 2–3. ix. 1992., leg. V. Siniaev, GYP 5732 (PGM); **30.** *E. h. zuvandica* ssp. n., Azerbaijan, Zuvand plateau, near Juhary–Amburdara, 2000–2400 m, 26. vii.–9. viii. 1995., leg.?, GYP 5718 (PGM); **31.** *E. h. zuvandica* ssp. n., Azerbaijan, Zuvand plateau, near Juhary–Amburdara, 2000–2400 m, 26. vii.–9. viii. 1995., leg. ? (PGM); **32.** *E. ? heringi*, Iran, prov. Mazandaran, Elburz Mts., 10 km S. of Balade, 1500 m, 19. vii. 2000, leg. B. Benedek, GYP 1816 (PGM).



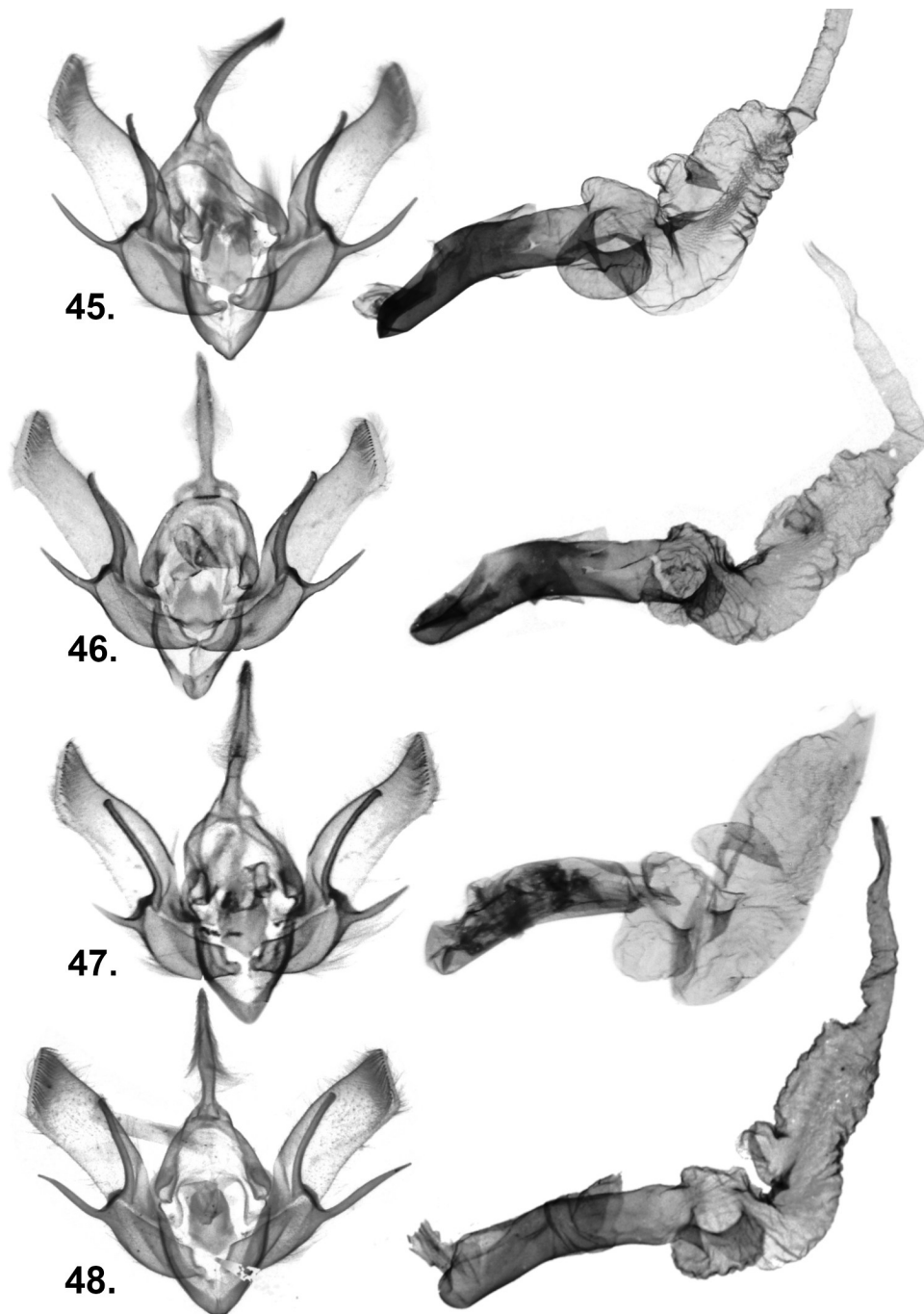
Figures 33–36. Male genitalia of *Euxoa* spp. and *Euxoa* ssp. **33.** *E. cornucaprea* sp. n., HT, Russia, N. Caucasus, Dagestan, Dokuzparinsky Distr., 8 km S of Miskindzha vill., Shalbuzdag Mts., 3000 m, 16–20 July 2022, leg. V. Zurilina, GYP 6401 (PGM); **34.** *E. cornucaprea* sp. n., PT, m, with the same data as the holotype, GYP 5917 (PGM); **35.** *E. kuruschensis* Boursin, 1940, Russia, Chechnia–Ingousetia, NE Caucasus, Torgim, 1000 m, 19. ix. 1990., leg. B. Herczig & L. Ronkay, GYP 5735 (PGM); **36.** *E. subita* sp. n. HT, Iran, Mazandaran, Nur valley, 2300 m, 17–18. x. 2003, leg. P. Gyulai & A. Garai, GYP 1827 (PGM).



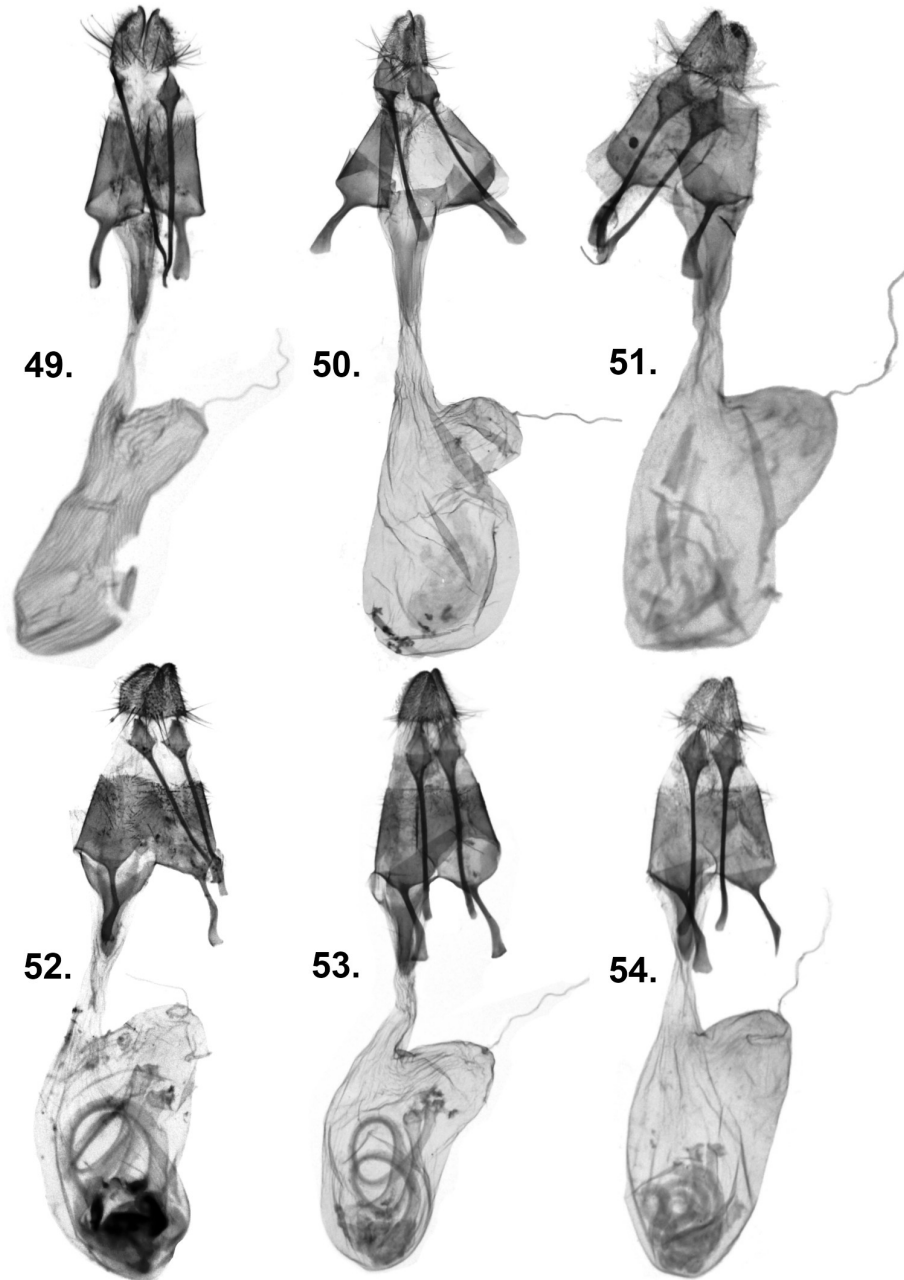
Figures 37–40. Male genitalia of *Euxoa* spp. and *Euxoa* ssp. **37.** *E. decora gubdeni* **ssp. n.**, HT, Russia, Dagestan, Karabudakhkentky Distr., Gubden, N 42°33', E 47°25', 27.viii. 2020, leg. V. Zurilina, GYP 6402 (PGM); **38.** *E. decora gubdeni* **ssp. n.**, PT, with the same data as the holotype, GYP 5712 (PGM); **39.** *E. decora curiosa* **ssp. n.**, PT, Iran, Mazandaran, Elburz Mts., 10 km E of Valiabad, 3200 m, 22–25. vii. 2000, leg. B. Benedek, GYP 1815 (PGM); **40.** *E. decora splendida* (Turati & Verity, 1911), Italy, Apennin centr., Mts. Terminillo, GYP 6000 (PGM).



Figures 41–44. Male genitalia of *Euxoa* spp. and *Euxoa* spp. **41.** *E. decora srnkai* ssp. n., HT, Russia, Kabardino–Balkaria, C. Caucasus Mts., Bylym 10 km env., 1550 m, 26 viii. 2013., leg. L. Srnka, slide no. GYP 5733 (PGM); **42.** *E. rabiehae* sp. n., HT, Iran, prov. Khorasan Razavi, Ghuchan, N 37°13' 58, E 58°28'39, 1598 m, 25. vii. 2011., leg. M. M. Rabieh, slide no. Rabieh 271 (PGM); **43.** *E. heringi* (Staudinger, 1877), Iran, Mazandaran, Elburz Mts., 10 km E of Valiabad, 3200 m, 22–25. vii. 2000, leg. B. Benedek, GYP 5730 (PGM); **44.** *E. heringi zagroscola* ssp. n., HT, m, Iran, Fars, Kuh–e–Bul, 3700–4100 m, 13. vii. 2001, leg. S Nykl, GYP 5720 (PGM).



Figures 45–48. Male genitalia of *Euxoa* spp. and *Euxoa* ssp. **45.** *E. heringi zagroscola* **ssp. n.**, PT, Iran, Esfahan, Khounsar, 2700–3200 m, 25. vi. 2001, leg. S. Nykl, GYP 1819 (PGM); **46.** *E. heringi marcens* Christoph, 1893, E. Turkey, prov Agri, 5 km E. of Sarican, 1800 m, 17–18. vii. 1989., leg. P. Gyulai & M. Hreblay, GYP 5757 (PGM); **47.** *E. heringi zuvandica* **ssp. n.**, HT, Azerbaijan, Zuvand plateau, near Juhary–Amburdara, 2000–2400 m, 26. vii.–9. viii. 1995., leg. ?, slide no. GYP 5724 (PGM); **48.** *E. ? heringi*, Iran, prov. Mazandaran, Elburz Mts., 10 km S. of Balade, 1500 m, 19. vii. 2000, leg. B. Benedek, GYP1816 (PGM).



Figures 49–54. Female genitalia of *Euxoa* spp. and *Euxoa* ssp. **49.** *E. decora curiosa* **ssp. n.**, HT, Iran, prov. Mazandaran, C. Alborz Mts., Mazandaran, 5 km E of Minac, 2400 m, 23–24. viii. 2000, leg. P. Gyulai A. Garai, light trap, GYP 1886 (PGM); **50.** *E. decora splendida* (Turati & Verity, 1911), Italy, prov. Rieti, Apennin centr. Mts. Terminillo, GYP 5999 (PGM); **51.** *E. heringi* (Staudinger, 1877), Iran, prov. Tehran, Alborz, Demavend, n. Lardam, 2700 m, 15–16. ix. 2001, leg. P. Gyulai & A. Garai, GYP 5737 (PGM); **52.** *E. heringi zagroscola* **ssp. n.**, PT, Iran, Fars, Suriyan, 3100–3200 m, 10–11. vii. 2001, leg. S. Nykl, GYP 5762 (PGM); **53.** *E. heringi marcens* Christoph, 1893, E. Turkey, prov Agri, 5 km E. of Sarican, 1800 m, 17–18. vii. 1989. leg. P. Gyulai & M. Hreblay, GYP 5760. (PGM); **54.** *E. heringi zuvandica* **ssp. n.**, Azerbaijan, Zuvand plateau, near Juhary–Amburdara, 2000–2400 m, 26. vii.–9. viii. 1995., leg. ?, GYP 5718 (PGM).

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