SHILAP Revta. lepid., 36 (143), septiembre 2008: 301-339 CODEN: SRLPEF ISSN:0300-5267

The Plusiinae of Iran (Lepidoptera: Noctuidae)

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Abstract

Based on vast material from the collection of the Hayk Mirzayans Insect Museum (HMIM), the largest insect museum in the Middle East, which belongs to IRIPP, ITRD (Insect Taxonomy Research Department), some materials of Vartain Collection of Naturhistorisches Museum Wien, Austria; Staatliches Museum für Naturkunde Karlsruhe, Germany and Zoologische Staatssammlung München (ZSM), Germany; 29 species of subfamily Plusiinae, Noctuidae have been recorded. This information includes more than 1412 objects and 679 sites from objects. The materials of HMIM were collected on several expeditions by the Iranian entomologists of PPDRI from forty years ago till the present time. Some further taxonomic changes are proposed. Images of male genital organs and adult imagines, taxon information including citation of original description and the type materials, flight period, collected localities, elevational range, global distribution, distribution maps based on BIOOFFICE biodiversity software and some larval host-plants are presented for each species. Also in this study, 2 genera and 4 species marked by an asterisk are newly recorded from Iran.

KEY WORDS: Lepidoptera, Noctuidae, Plusiinae, Iran.

Los Plusiinae de Irán
(Lepidoptera: Noctuidae)

Resumen

Sobre la base de un extenso material de la colección del Hayk Mirzayans Insect Museum (HMIM), el museo de insectos más grande de Oriente Medio, que pertenece al IRIPP, ITRD (Insect Taxonomy Research Department), algunos materiales de la colección Vartain del Naturhistorisches Museum Wien, Austria; Staatliches Museum für Naturkunde Karlsruhe, Alemania y Zoologische Staatssammlung München (ZSM), Alemania, han sido registradas 29 especies de la subfamilia Plusiinae, Noctuidae. Esta información incluye más de 1.412 ejemplares y 679 localidades de estos ejemplares. Los materiales del HMIM fueron colectados de algunas expediciones de los entomólogos iraníes del PPDRI desde hace cuarenta años hasta la actualidad. Se proponen algunos futuros cambios taxonómicos. Para cada especie se representan sus genitalias, imágenes de los adultos, información del taxón incluyendo la de sui descripción original y el material tipo, periodos de vuelo, localidades donde se han recogido, altitud, distribución global, mapas de distribución basados sobre software de biodiversidad BIOOFFICE y algunas plantas nutricias de las larvas. También en este estudio, 2 géneros y 4 especies se han marcado con un asterisco como nuevas citas para Irán.

PALABRAS CLAVE: Lepidoptera, Noctuidae, Plusiinae, Irán.

Introduction

The noctuid subfamily Plusiinae is a moderately large, rather compact subfamily distributed worldwide, the supposed species number exceeds 400. This popular and easily recognizable noctuid

group is, as one might expect, monophyletic with numerous morphological, bionomical and biogeographical evidence for their monophyly. But the situation is so far not clear, despite the intense studies made on the Plusiinae in the last two centuries (GOATER *et al.* 2003).

The historical reviews of the higher classification of the Noctuidae and, within it, of the Plusiinae, are given with exhaustive accuracy by KITCHING (1984, 1987), LAFONTAINE & POOLE (1991) and KITCHING & RAWLINS (1998). The last revisional works tend to reject the former sister-group relationship of the Plusiinae with the Stictopterinae-Euteliinae phyletic trunk (GOATER *et al.* 2003). In the light of the new discoveries, the phylogeographic connections of the subfamily, are somewhat different from that of the hypothetic version proposed by KITCHING (1987: 178-179). The fact that the Neotropical *Abrostola* species show evident connections with the African tropical *Abrostola* groups but is remote from those of the Nearctic, together with the well-known distribution patterns of Argyrogramatini and Plusiini, suggests the much earlier evolution of the main phyletic lineages than is otherwise expected.

The subfamily is distributed worldwide except in the Antarctic. It is well represented in all continents of the Old World although from Australia and from central and south America, surprisingly, only few species are known.

The Plusiinae have been conventionally defined as the eye-lashed, quadrifine noctuids. The study of KITCHING (1987) demonstrated that this characterization is inadequate. Many of the outgroup taxa have lashed eyes, while one plusiine genus (*Mouralia*) has a distinctly trifine hindwing venation (KITCHING, 1987). Thus, the Plusiinae can be defined, on present evidence, as those noctuids with a convex occiput, few apical styloconic sensilla on the proboscis, which has strengthening bars that are semicircular on the most apical portion and anal papillae that bear differentiated, dorso-ventral rows of setae (KITCHING, 1987).

The History of the Plusiinae fauna investigation in Iran

Pfeiffer and Forster visited some high sites of Elburs mountains, 2500-2700 m in 1937 including Sardab Valley, Tackt-e-Soleiman of Mazandaran Province, in the vicinity of the Hasan-kif region. They discovered some new Plusiinae species to science of the genus *Euchalcia* which was described 25 years later by Dufay and called them *hyrcaniae* and *chalcophanes*. Dufay in 1967 also described another new *Euchalcia* from Elburs Mountains, Gachsar, which had been collected by Gharib in 1967. He called his new species *Euchalcia stilpna*. In 1991, Varga and Ronkay described another new Plusiinae species, *Desertoplusia colornata* from Turkey.

Investigations on the Plusiinae fauna of Iran by the Iranian entomologists were poorly published. Mirzayans, Borumand, Pazuki, Abai, Rajabi, Badii and Kalali had lots of expedition trips to different parts of Iran to collect the Lepidoptera fauna during the last decades of the twentieth century. Surely one of the first checklists of Iranian Lepidoptera belongs to BAROU (1967), who recorded 6 Plusiinae species from Iran, cited as: *Syngrapha circumflexa* L., *Phytometra festucae* L., *Phytometra ni* Hb., *Phytometra gamma* L., *Phytometra chalcites* Esp. and *Phytometra confusa* Steph.. In the second part of this work, MIRZAYANS & KALALI (1970) did not add any Plusiinae species to this list. Later, KALALI (1976) published a list of Lepidoptera of Khorassan and cited 5 Plusiinae species, namely, *Autographa gamma* L., *Trichoplusia ni* Hb., *Macdunnoughia confusa* Steph., *Syngrapha circumflexa* L. and *Plusia bella* Christ. The final list of the insect fauna of Iran was published by MODARRES AWAL (1994, 1997) who recorded 7 species for Iranian Plusiinae including *Autographa circumflexa* L., *Chrysodeixis* (= *Plusia*) *chalcites* Esp., *M. confusa* Steph., *Phytometra festucae* L., *Phytometra variabilis* Pill., *Plusia bella* Christ., and *T. ni* Hb.. HACKER & KAUTT (1999) published a list of the Noctuidae of Iran from some parts of Zagros Mountains which included 5 species as follows, *Euchalcia taurica* Ost., *Cornutiplusia circuflexa* L., *Trichoplusia exquisatella* Str., *T. ni* Hb. and *Desertoplusia colornata* Var. & Ron.. Four years later HACKER & MEINEKE (2001) published another checklist of the Noctuidae fauna of Iran which has been collected from Elburs Mountains and

Deh Bakri of the Kerman province. They listed 4 species of Plusiinae, *M. confusa* Steph., *C. circumflexa* L., *T. ni* Hb. and *T. exquisatella* Str.. An Austrian Zoology group included some of the famous Lepidopterists who visited the eastern parts of Elburs Mountains, Golestan forests in 2001 and who listed 4 Plusiinae species cited as, *A. gamma* L., *C. circumflexa* L., *T. ni* Hüb. and *Abrostola agnorista* Duf., of which the last one was described as a new species for science one year later by Hacker in EBERT & HACKER (2002). Some years ago, EBERT & HACKER (2002) published the most complete list of Iranian Plusiinae, which cited 19 species for the Iranian fauna. Lastly, the Paleotropical species, *Ctenoplusia vittata* W. was reported from southern parts of Iran (ZAHIRI, PLOESSL & TARMANN, 2007).

Family Noctuidae Latreille, 1809
Subfamily Plusiinae Boisduval, 1829

Tribe Abrostolini Eichlin & Cunningham, 1978

Genus *Abrostola* Ochsenheimer, 1816

A. tripartita (Hufnagel, 1766)*
(= *triplasia* auct. *nec* Linnaeus, 1758)
A. hyrcanica (Hacker, 2002)
A. clarissa (Staudinger, 1900)

Tribe Argyrogrammatini Eichlin & Cunningham, 1978

Genus *Trichoplusia* McDunnough, 1944

T. ni (Hübner, [1803])

Genus *Thysanoplusia* Ichnosé, 1973

Th. orichalcea (Fabricius, 1775)
Th. daubei (Boisduval, 1840)
Th. exquisatella (Strand, 1916)

Genus *Ctenoplusia* Dufay, 1970

Ct. vittata (Wallengren, 1856)

Genus *Chrysodeixis* Hübner, [1821]

Ch. chalcites (Esper, [1789])

Tribe Plusiini Boisduval, 1829

Subtribe Autoplusiina Kitching, 1987

Genus *Macdunnoughia* Kostrowicki, 1961

M. confusa (Stephens, 1850)

Subtribe Diachrysiina Beck, 1996

Genus *Diachrysia* Hübner, [1821]

D. chryson (Esper, [1789])
D. stenochrysis (Warren, 1913)*
(= *tutti* Kostrowicki, 1961)
D. generosa (Staudinger, 1900)

Subtribe Euchalciina Chou & Lu, 1979

Genus *Euchalcia* Hübner, [1821]

E. variabilis (Piller & Mitterpacher, 1783)
(= *cuprea* Esper, [1787])
E. emichi (Rogenhofer & Mann, 1873)
E. Taurica (Osthelder, 1933)
E. viridis (Staudinger, 1901)
E. hedeja Dufay, 1978
E. incredibilis Hacker & Ebert, 2002
E. chalcophanes Dufay, 1963
E. stilpna Dufay, 1969

Genus *Desertoplusia* Kljuchko, 1984

D. bella (Christoph, 1887)
D. colornata Varga & Ronkay, 1991

Genus *Panchrysia* Hübner, [1821]*

P. aurea (Hübner, [1803])*
(= *deaurata* Esper, [1787] *nec* Goeze, 1781)
(= *chryson* Borkhausen, 1792 *nec* Esper, [1789])

Genus *Plusidia* Butler, 1879*

P. cheiranthi (Tauscher, 1809)*

Subtribe Plusiina Boisduval, 1828

Genus *Autographa* Hübner, [1821]

A. gamma (Linnaeus, 1758)
(= *messmeri* Schadewald, 1992)
(= *voelkeri* Schadewald, 1992)
A. jota (Linnaeus, 1758)

Genus *Cornutiplusia* Kostrowicki, 1961

C. circumflexa (Linnaeus, 1767)

Genus *Plusia* Ochsenheimer, 1816

P. festucae (Linnaeus, 1758)

Tribe Abrostolini Eichlin & Cunningham, 1978
U. S. Dept. Agric. Tech. Bull., **1567**: 9
Type genus: *Abrostola* Ochsenheimer, 1816

The Abrostolini, the most primitive tribe in this investigation, is characterized in the adult form by having areas of raised scales on the forewings, tibiae without spines, male genitalia with a clavus in the form of a sclerotized, platelike projection from the costa margin of the sacculus, and ampulla uniquely spatulate (EICHLIN & CUNNINGHAM, 1978). As KITCHING (1987) mentioned, the tribes are best recognized by the form of the forewing stigmata, the fusion of the aedeagus to the juxta apex, the spatulate saccular lobe and desclerotized band and invaginated pocket laterally on T8 in the females. In addition, they are the only plusiines to possess raised scales in the forewing cell and to lack an eversible pouch between the anal papillae and A8 in the females. The larvae have prolegs on abdominal segments 4 and 5, though they are slightly reduced on the fourth, and a raduloid on the hypopharynx (EICHLIN & CUNNINGHAM, 1978).

This tribe is represented in the Iran fauna by one genus, *Abrostola,* with three species.

Abrostola Ochsenheimer, 1816
Abrostola Ochsenheimer, 1816, *Schmett. Eur*., **4**: 88.

Type-species: *Phalaena triplasia* Linnaeus, 1758, *Syst. Nat*. (Edn. 10) **1**: 517, designated by Duponchel, 1829, *in* Godart & Duponchel, *Hist. Nat. Lépid. Papillons Fr.*, **7**(2): 72.

Larval host-plants: Urticaceae and related families, one species on Asclepiadaceae.

Abrostola clarissa (Staudinger, 1900)
Plusia triplasia clarissa Staudinger, 1900. *Dt. ent. Z. Iris*, **12**: 381.
(Plate 1, Fig. 1 adult and Plate 5, Figs 30- 31 ♂ genitalia)

References: *Abrostola asclepiadis clarissa* (SCHWINGENSCHUSS, 1938); *Abrostola clarissa* (WILTSHIRE, 1971), *Abrostola clarissa* (HACKER, 1990); *Abrostola clarissa* (EBERT & HACKER, 2002).

Types: Syntypes. [Turkey]: Amasia, 2 ♂ ♂, 1 ♀; Mardin, 1 ♂; SE Taurus, Eibes, 1 ♀. [Israel]: Jerusalem, 2 ♂ ♂. [MNHU, Berlin].

Bionomics: Bivoltine, with a more or less continuous flight period: the adults are on the wing from the beginning of April to the end of August, the two generations are usually hardly separable from the collecting data. A xerothermophilous species, inhabiting most often dry, warm, usually rocky slopes with mosaics of grassland and patches of bushy forest; appearing sometimes above the timberline in rocky gorges and xeric subalpine meadows. The moths are active and good flyers, the first specimens appear at light early in the evening, sometimes still in the twilight and are active throughout the night (GOATER *et al.*, 2003).

Distribution: Ponto-Caspian. The species has a rather restricted range covering most parts of the Near East, Asia Minor, northern Iraq; it is present also in the northern edge of the Arabian Peninsula but is absent from the Caspian lowland, Turkmenistan and western Afghanistan (GOATER *et al.*, 2003).

Flight period: May to September.

Elevation range: 800-2600 m.

Distribution in Iran: Azerbaijan Gharbi, Azerbaijan Sharghi, Tehran, Semnan, Khorasan, Esfehan, Fars, Kohkiluyeh va Boyerahmad (Plate 13, Map 1).

Materials: Azerbaijan Gharbi: W. Baku, Ghezelbolagh, 1910 m., 27-VII-1976 (Pazuki & Borumand); Khoy, 30 km. Ghotur, 1480 m., 19-II-1976 (Pazuki & Borumand). Azerbaijan Sharghi:

Ahar, Harand, 1000 m., 3-VIII-1992 (Parchami & Badii); Kaleibar, Vinagh, 800 m., 7-8-VIII-1992 (Parchami & Badii). Tehran: Evin, Tehran, 20-VII-1971 (Light Trap); Evin, VII-1976 (Light Trap); Karaj, Arangeh, 1620 m., 10-IX-1983 (Hashemi). Semnan: N. Shahrud, Kashidar, 1250 m., 21-22-VIII-1982 (Hashemi). Khorasan: Akhlamad, Mashhad, 13-VII-1971 (Pazuki & Ayatolahi). Ghom (= Qom): 8 km S Fordu, Wesb, 2320 m., 26-28-VII-1983 (Pazuki & Hashemi). Esfehan: Natanz, Lakaj, 1550 m., 21-23-IX-1996 (Parchami & Badii). Fars: Schiraz, 10 km. N. Sivand, 1150 m., 15-V-1974 (Abai & Pazuki). Kohkiluyeh va Boyerahmad: Nogol, Padena, 2200 m., 15-IX-1998 (Manzari & Mofidi).

Abrostola tripartita (Hufnagel, 1766)*
Phalaena tripartita Hufnagel, 1766. *Berlin Mag*., **3**(4): 414.
(Plate 1, Fig. 2 adult and Plate 5, Figs. 32-33 ♂ genitalia)

References: *Abrostola tripartita* (GOATER *et al.,* 2003).

Synonymy: *urticae* Hübner, [1817]; *triplasia* auct.

Types: [Germany]: Berlin region.

Notes on systematics: An externally strongly variable species with numerous colour forms which do not deserve taxonomic rank, it is considered as taxonomically homogenous within its range.

Bionomics: Bivoltine with overlapping broods. The flight period is more or less continuous from April to September. The species generally inhabits arboreal, mesophilus or mesohygrophylous biotopes, absent or very rare in dry, exposed habitas. Larval host-plants are *Urticae* species (GOATER *et al.*, 2003).

Distribution: Euro-Siberian. Widely distributed in the western part of Eurasia, more sparsely in the Tien-Shan massif and the eastern Siberian Mountains but there are records also from the Pacific region.

Flight period: end April to end September.

Elevation range: 1230-2350 m.

Distribution in Iran: Azerbaijan Gharbi, Ardebil, Guilan, Mazandaran (Plate 13, Map 2).

Materials: Azerbaijan Gharbi: W Maku, Ghezelbolagh, 2220 m., 17-18-VII-1976 (Pazuki & Borumand); Ghoushchi, 1600 m., 26-VII-1976 (Pazuki & Borumand). Ardebil: Lac Neor, 2350 m., 17-VIII-1991 (Hashemi & Parchami). Guilan: Assalem, Pissasson, 1300 m., 15-16-VIII-1980 (Pazuki & Borumand). Mazandaran: Kelardasht, Chaman-Makarud, N36º 53' 21", E51º 09' 28", 1230 m., 30-IV-2006 (Zahiri); Sangdeh, Cheshmeh-Talar, Sarband, 1600 m., 23-IX-1992 (Badii & Ebrahimi); Chalkrud, Ekrasar, 1560 m., 11-IX-1990 (Ebrahimi & Badii); Ramsar, Javaherdeh, 1700 m., 8-IX-1990 (Ebrahimi & Badii).

Abrostola hyrcanica Hacker, 2002
Abrostola hyrcanica Hacker, 2002. *Esperiana*, **9**: 265, pl. 15, fig. 10.
(Plate 1, Fig 3 holotype (SMNK); Fig. 3(1) adult (HMIM) & Plate 5, Figs 34-35 ♂ genitalia).

References: *Abrostola hyrcanica* (EBERT & HACKER, 2002).

Types: Holotype. 1 ♂, [Nord-Iran, Elburs, 15 km. S Chalus, 15-18-V-1975 (W. Thomas)] (Fig. 9), Paratypes. 2 ♂ ♂, [Nord-Iran, 7 u. 10 km. S v. Chalus, 28-V-1969 u. 1-VI-1963 (E. Vartian)]; 3 ♂ ♂, 1 ♀, [Gorgantal, 50 km ostl. Minudasht, 450 m., 30-V-1971 (E. Vartian)].

Notes on systematics: The easternmost populations, hitherto known as *A. agnorista*, from Iran, and Azerbaijan, have been separated as an allopatric species, *A. hyrcanica* by EBERT & HACKER (2002) (GOATER *et al.,* 2003).

Distribution: Ponto-Caspian.

Flight period: May to September.

Elevation range: 0-2100 m.

Distribution in Iran: Azerbaijan Gharbi, Azerbaijan Sharghi, Ardebil, Guilan, Mazandaran, Golestan, Semnan and Qazvin (Plate 13, Map 3).

Materials: Azerbaijan Gharbi: Rezaiyeh, Ghasemlu, 1440 m., 24-VII-1976 (Pazuki & Borumand). Azerbaijan Sharghi: Khodafarin, Arasbaran Forests, Gandomnan (N38º 59' 12" E48º 52' 12"), 1280 m., 15-VII-2005 (Zahiri & Khiaban N.); Kaleybar, Vayeghan, 1440 m., 5-6-VIII-1992 (Parchami &

Badii). Ardebil: Lac Neor, 2350 m., 17-VIII-1991 (Hashemi & Parchami); Heyran, Haji Amir Pain, N38º 25' 15.2" E48º 36' 03.4", 950 m., 19-VI-2006 (Zahiri R. & Falsafi H.). Guilan: Eshkevar, Gilanchakan, 1820 m., 27-VI-1997 (Barari & Mofidi); Assalem, 250 m., 14-VIII-1992 (Parchami & Badii); Assalem, Abish-Gharah, 1250 m., 30-VII-1976 (Pazuki & Borumand); Assalem, Lakudeh, 250 m., 8-9-VII-2000 (Barari, Mofidi, Ebrahimi & Deuve); Assalem, Kharjagil, 180 m., 24-25-VIII-1994 (Sarafrazi & Ebrahimi), Assalem, Schondol, 950 m., 9-VIII-1974 (Mirzayans & F.B.); Rasht, 0 m., 22-VI-2001 (Ghayourfar); Assalem, Parehsar, 750 m., 13-VIII-1974 (Mirzayans & Ilkhani); Assalem, Parehsar, 950 m., 14-VIII-1974 (Mirzayans & Abai); Pahlavi, Pounel, 250 m., 30 km. S of Assalem, 12-VIII-1974 (Mirzayans & Ilkhani); Bandar Pahlavi, Summer 1976 (Mussavi); Rasht, Masuleh, 1400 m., 12-VIII-1991 (Hashemi & Parchami); Hashtpat, Rek, 15 km Hashtpar, 570 m., 31-VIII-1975 (Mirzayans); Astara, Phandoghposhteh, 726 m., 18-VI-2001 (Ghayourfar); Shalma, Masal, 3-VIII-2005 (Hesami); Siahkal, Balarud, 350 m., 6-7-VII-2000 (Ebrahimi, Mofodi, Barari & Deuve; Lahijan, Siahkal, Balarud, 270 m., 12-VIII-1980 (Pazuki & Borumand); Astara, 5 km Ardebil Rd., 100 m., 26-V-1997 (Sarafrazi, Badii & Nazari V.). Mazandaran: Amol, Galikesh, N36º 28' 35", E52º 27' 50", 40 m., 3-5-V-2006 (Zahiri); Ramsar, Dalikhani, 950 m., 1-IX-1975 (Mirzayans); 15 km Tchalus, 220 m., 2-IX-1975 (Mirzayans); Tonekabon, Sehezar, Ash-Mahaleh, 760 m., 7-IX-1990 (Ebrahimi, Badii); Ramsar, Javaherdeh, 1700 m., 8-IX-1990 (Ebrahimi & Badii); Amol, 30 km, Segharkhi, 500 m., 23-X-1974 (Borumand & Pazuki); Shahsavar Lab., 10-11-VIII-1980 (Pazuki & Borumand); Kelardasht, 12 km N., S Abbasabad, 700 m., 18-IX-1981 (Pazuki); Chalkrud, Ekrasar, 1560 m., 11-IX-1990 (Ebrahimi & Badii); Kelardasht, Vandarbon, 2100 m., 27-VI-1998 (Mofidi); Chalus, Talaju, 200 m., 25-VIII-1994 (Sarafrazi & Ebrahimi); Tonekabon, 30-IX-1981 (Pazuki). Golestan: Gorgan, Aliabad, Shirinabad, 22-V-2005 (Falsafi & Nematian); Jangale Golestan, Mazarli, 530 m., 19-20-VI-1975 (Pazuki & Abai); Park-e-Melli-Golestan, Dashte Shad, 1390 m., 25-26-VII-1996 (Ebrahimi & Nazari V.); Park-e-Melii-Golestan, Tangeh-Gol, 5-V-1999 (Moghaddam, Barari & Manzari); Golestan, Tange Gol, 620 m., 23-25-V-1986 (Pazuki); Gorgan, 12-IX-1975 (Maschayekhi); Galikesh, 28-IX-2000 (Ghayourfar & Gilasian). Semnan: N Shahrud, Kashidar, 21-22-VIII-1982 (Hashemi). Qazvin: Ziaran, 1461 m., N36º 06'10" E50º 30'16", Biotop: river with mixed trees, bushes & herbaceous plants (Zahiri).

Tribe Argyrogrammatini Eichlin & Cunningham, 1978
U. S. Dept. Agric. Tech. Bull., **1567**: 12
Type genus: *Argyrogramma* Hübner, 1823

This primarily tropical tribe of plusiines is quite well characterised by three synapomorphies. All argyrogramatines have secondary hair brushes arising on St8, basally directed setose scales apically on the valve, and a differentially sclerotized band on the vesica (KITCHING, 1987). GOATER *et al.* (2003) mentioned that this tribe is well characterized by the following synapomorphies. In adults, males usually have additional abdominal tufts in the intersegmental members of segments 4-7, but their development is highly variable, 8th tergites possess a specialized structure, additional satellite sclerites present on posterior apophyses.

Trichoplusia McDunnough, 1944
Trichoplusia McDunnough, 1944. *Mem. sth. Calif. Acad. Sci*., **2**: 204.
Type-species: *Plusia brassicae* Riley, 1870. *Rep. noxious beneficial & other Insects, Missouri*, **2**: 110, fig. 81, by original designation.

Trichoplusia ni (Hübner, [1803])
Noctua ni Hübner, [1803]. *Samml. eur. Schmett*. **4**: pl. 58, fig. 284.
(Plate 1, Fig. 4 adult (Cotype, ZSM), and Plate 5, Figs 36-37 ♂ genitalia)

References: *Plusia ni* (BIENERT, 1870); *Plusia ni* (CHRISTOPH, 1873); *Plusia ni* (CHRISTOPH, 1877); *Phytometra ni* (SCHWINGENSCHUSS, 1938); *Trichoplusia ni* (REISSER, 1958); *Phytometra ni* (BAROU, 1967); *Trichoplusia ni* (HACKER, 1990); *Trichoplusia ni* (HACKER

& KAUTT, 1999); *Trichoplusia ni* (HACKER & MEINEKE, 2001); *Trichoplusia ni* (EBERT & HACKER, 2002); *Trichoplusia ni* (GOATER *et al.,* 2003).

Types: Europa.

Notes on systematics: The Old World populations are very homogeneous in both external and genital features, and are sometimes conspicuously different externally from those of the New World, in the paler forewing ground colour and often more variegated wing pattern (GOATER *et al.*, 2003).

Bionomics: *T. ni* is a strongly migratory tropical species, which appears with more or less regularity in the temperate areas of the northern hemisphere. It is continuously brooded throughout the year where the climate is appropriate, where it is usually common or even abundant, and is often a serius pest (GOATER *et al.,* 2003). They are active during the day and at night, and are often found flying over scented flowers in the daytime and in twilight.

Distribution: Cosmopolitan. Probably the most widespread of all Plusiinae, accruing in all continents except Antarctica (GOATER *et al.*, 2003).

Flight period: early February to end December

Elevation range: 0-2930 m

Distribution in Iran: In all of Iran's territory (Plate 13, Map 4).

Materials: -20 m to 2930 m, February to December.

Thysanoplusia Ichnosé, 1973

Thysanoplusia Ichnosé, 1973. *Kontyû*, **41**: 137.

Type-species: *Phytometra intermixta* Warren, 1913, *in* Seitz, *Gross-Schmettl. Erde*, **3**: 357, pl. 64, row g., by original designation.

Thysanoplusia (*Thysanoplusia*) *orichalcea* (Fabricius, 1775)

Noctua orichalcea Fabricius, 1775. *Syst. Ent*.: 607.

(Plate 1, Fig. 5 adult and Plate 6, Figs 38- 39 ♂ genitalia)

References*: Plusia orichalcea* (LEDERER, 1872); *Thysanoplusia orichalcea* (HACKER, 1990); *Thysanoplusia orichalcea* (GOATER *et al.,* 2003).

Types: Lectotype: India.

Notes on systematics: The taxonomy of this group is discussed in detail by RONKAY & BEHOUNEK (1996) and BEHOUNEK & RONKAY (1999).

Bionomics: *T. orichalcea* is a tropical and subtropical species, which is fairly common throughout tropical Africa and in certain parts of the southern Mediterranean, but is much rarer in Europe northwards from the Mediterranean coast (GOATER *et al.*, 2003). The adults are on the wing throughout the year but most often from March to December, active both by day and at night. They are very active, visiting flowers or flying very rapidly around light sources. They occasionally come to sugar bait (GOATER *et al.,* 2003).

Distribution: Palaeotropical.

Flight period: mid March to end October.

Elevation range: 400-1900 m.

Distribution in Iran: Guilan, Mazandaran, Golestan, Tehran, Khorasan, Fras & Hormozgan (Plate 13, Map 5).

Materials: Guilan: Daylaman, 12 km N, Siahkal, 1300 m., 13-VIII-1980 (Pazuki & Borumand). Mazandaran: Kelardasht, 12 km N, S Abbasabad, 700 m., 28-IX-1981 (Pazuki); Zirab, 3 km W Kolarjan, 950 m., 2-3-X-1981 (Pazuki); Rudbar, Amol, 1600 m., 20-VIII-1981 (Hashemi); Kamarbon, Baladeh, Nur, 14-15-IX-1994 (Ardeh, Badii & Hashemi); Yakhab, 23 S Sangdeh, 1500 m., 30-IX-1994 (Mirzayans, Ebrahimi & Badii); Segharchi, 30 km S Amol, 500 m., 23-X-1974 (Borumand & Pazuki); Dohezar, Tonekabon, 425 m., 11-X-1995 (Rezvani, Badii & Ebrahimi); Segharchi, Amol, 500 m., 23-X-1974 (Borumand & Pazuki). Golestan: Astrabad (= Gorgan); 8-IX-1993 (Ghelich & Abai); Jahan Nama, Radkan, Kordkuy, 1600 m., 24-IX-1992 (Ebrahimi & Badii). Tehran: Damavand, 1900 m., 21.X.1974 (Boruamnd & Pazuki); Evin, Tehran, 1600 m., 19-V-1995 (Mirzayans H.); 10-X-1974

(Light Trap); 19-V-1995 (Mirzayans). Khorasan: Torogh, Mashhad, 27-IV-1975 (Light Trap). Fars: Haft Khan (Anonymous leg.). Hormozgan: Bandar-e-Jask, 12-III-1991 (Mirzayans & Badii); Siahu, Bandar-e-Abbas, 600 m., 10-11-III-1995 (Sarafrazi & Badii).

Thysanoplusia (*Daubeplusia*) *daubei* (Boisduval, 1840)
Plusia daubei Boisduval, 1840. *Gen. Index Meth. Eur. Lep*.: 159.
(Plate 1, Fig. 6 and Plate 6, Figs 40-41 ♂ genitalia)

References*: Trichoplusia daubei* (HACKER, 1990); *Trichoplusia daubei* (EBERT & HACKER, 2002); *Trichoplusia daubei* (GOATER, RONKAY & FIBIGER, 2003).

Types: Lectotype: [France]: "Gall. Mer"; [Spain]: "Hispan".

Notes on systematics: The taxonomy of this group has been discussed in detail by RONKAY & BEHOUNEK (1996) and BEHOUNEK & RONKAY (1999).

Bionomics: *T. (D.) daubei* is bivoltine in the European Mediterranean, probably multivoltine in the southern Himalayas and Indochina (GOATER, RONKAY & FIBIGER, 2003). The flight period is from May to December. In Asia the species is often more common along the foothills of the eastern high mountains.

Distribution: Palaeotropical. *T*. (*D*.) *daubei* is distributed from the Atlas Mts. and the Mediterranean throughout eastern Africa, Arabia, southern Iran and Central Asia towards the Himalayan region, India, Indochina and the Pacific territories, China, Japan and Taiwan (GOATER *et al.*, 2003).

Flight period: March to November.

Elevation range: 50-1750 m.

Distribution in Iran: Kermanshah, Khuzestan, Fars, Bushehr, Hormozgan, Kerman & Sistan va Balouchestan (Plate 13, Map 6).

Materials: Kermanshah: Kermanshah (Bakhtaran), 28-I-1975 (Nuri); Hamib, 14 km S Ahvaz, 30-IV-1976 (Pazuki & Abai); Nahre Salim, Arvand Rud, 16-XI-1995 (Mirzayans & Badii); Jazireh Minu, 50 m., 11-V-1972 (Pazuki & Borumand); 14-IV-2002 (Ghayourfar); 15-XI-1995 (Mirzayans & Badii); Haft Tappeh, Dezful, 70 m., 13-V-1975 (Pazuki & Borumand); Safiabad, Dezful, 80 m., 23-IV-1995 (Parchami, Ardeh & Badii); Ahvaz, 140 m., 20-X-1977 (Mortazaviha & Hashemi). Fars: Mamasani (Nurabad); 8-IX-1971 (Borumand); Neyriz, 40 km E, 5-V-1975 (Thomas W.); Radan, 38 km S Abadeh, 270 m., 29-IV-1986 (Mirzayans & Hashemi). Bushehr: Kangan, Jam, 500 m., 7-8-I-1996 (Ardeh, Badii & Nazari V.); Jam, 620 m., 19-I-1997 (Barari, Mofidi & Nazari V.). Hormozgan: Minab, 23-IV-1971 (Safavi & Zairi); Minab, 10 km N, 60 m., 4-III-1973 (Ebert); Konardon, 36 km E Gawkoshak, 210 m., 23-IV-1977 (Pazuki & Hashemi); Bashagerd, Senderk, 220 m., 12-V-1977 (Safavi & Pazuki); Issin, Periplocaaphylla steppe, 240 m., 5-IV-1973 (Abai); Kuh-e-Geno, Bagh Tang, 410 m., 7-8-V-1977 (Pazuki); Strae nach Sirjan, km 107, Bandar-e-Abbas, 850 m., 7-III-1973 (Ebert). Kerman: Mohamadabad, Jiroft, 3-4-V-1973 (Borumand); Kahnuj, Ab-Barik, 500 m., 22-IV-1994 (Ebrahimi & Parchami); Jiroft, 16 km SW, 820 m., 19-20-V-1977 (Safavi & Pazuki); Gowe Niskan, Kahnuj Marz, Jiroft, 880-1000 m., 12-III-1978 (Pazuki); Esfandagheh Sargaz, Jiroft, 1650 m., 20-V-1977 (Safavi & Pazuki); Baft, Dareh Pahn, 1750 m., 21-V-1977 (Safavi, Pazuki & Abai). Sistan va Balouchestan: Bampour, 530-570 m., 16-IV-1968 (Pazuki & Ayatollahi).

Thysanoplusia exquisatella (Strand, 1916)
Phytometra exquisite ab. *exquisitella* Strand, 1916. *Arch. Naturgesch*., **1916** (A 2): 49-50.
(Plate 1, Fig. 7)

References*: Trichoplusia exquisatella* (HACKER, 1990); *Trichoplusia exquisatella* (HACKER & KAUTT, 1999)*; Trichoplusia exquisatella* (HACKER & MEINEKE, 2001)*; Trichoplusia exquisatella* (EBERT & HACKER, 2002); *Thysanoplusia exquisatella* (GOATER *et al.*, 2003).

Types: [Belutschistan].

Flight period: May to September.

Elevation range: 1800-3300 m.

Distribution in Iran: Yazd, Esfahan, Fras, Kerman (Plate 13, Map 7).

Materials: Yazd: Shir Kuh, 3300 m., 3-VII-1981 (Hashemi). Esfahan: Ghohrud, Kashan, 1800 m., 12-VIII-1986 (Hashemi); Miameh, Delijan, 2000 m., 18-VI-1984 (Pazuki & Hashemi); Miameh, 35 km N, 2050 m., 6-VIII-1978 (Pazuki & Borumand); Ghonudieh, Nain, 2100 m., 1-VII-1981 (Hashemi); Abyaneh, Natanz, 2200-2300 m., 14-16-VI-1984 (Pazuki & Hashemi); 29-VI-1981 (Hashemi). Fars: Miyanjangal, 12-IX-1971 (Borumand); Didegan, 3 km S Abadeh, 1900 m., 20-VI-1972 (Ebert & Falkner); N Didegan, 100 km S Abadeh, 2000 m., 9-VI-1969 (Ebert); Didegan, 100 km südl, Abadeh, nördl, 2000 m., 20-V-1974 (Abai & Pazuki). Kerman: Ghanat-e-Marvan, Baft, 2800 m., 23-V-1977 (Safavi, Pazuki & Abai).

Ctenoplusia Dufay, 1970
Ctenoplusia Dufay, 1970. *Faune Madagascar*, **31**: 91.
Type-species: *Plusia limbirena* Guenée, 1852, *in* Boisduval & Guenée, *Hist. nat. Insectes* (Lépid.), **6**: 350, by original designation.

Larval host-plants: *Ctenoplusia albostriata* and putative allies feeding on Asteraceae.

Ctenoplusia vittata (Wallengren, 1856)
Plusia vittata Wallengren, 1856. *Ant. Zool*.: 63.
(Plate 2, Fig. 8)

References*: Ctenoplusia vittata* (ZAHIRI, PLÖSSL & TARMANN, 2007).

Types: Lectotype: [South Africa]: Kaffern.

Bionomics: A tri- or multivoltine species, which is found in a wide range of habitats, from the rather dry, open savanna to the median-high and higher montane rain forests and the *Erica-Lobelia* zone on the giant African volcanoes. The adults are attracted strongly to artificial light.

Distribution: Paleotropical.

Flight period: end April.

Elevation range: 1330 m.

Distribution in Iran: Hormozgan (Plate 13, Map 8).

Materials: Iran, Hormozgan, Kuh-e-Bakhun N, Deh Tidar, 1330 m., N27º 58' 26.8", E56º 15' 31.3", 25-IV-2006 (Plössl & Tarmann).

Biotop: Artemisia steppe and plantation of orange trees and other trees.

Chrysodeixis Hübner, [1821]
Chrysodeixis Hübner, [1821]. *Verz. bekannter Schmett*.: 252.
Type-species: *Phalaena* (*Noctua*) *chalcites* Esper, 1789. *Die Schmett*., **4**(2) Abschnitt **1**: 447, pl. 141, fig. 3, by subsequent designation by Dyar, 1902, *Jl. N. Y. ent. Soc*., **10**: 81.

Chrysodeixis chalcites (Esper, [1789])
Phalaena (*Noctua*) *chalcites* Esper, 1789. *Die Schmett*., **4**(2) Abschnitt **1**: 447, pl. 141, fig. 3).
(Plate 2, Fig. 9 and Plate 6, Figs 42-43 ♂ genitalia)

References*: Phytometra chalcites* (BAROU, 1967); *Chrysodeixis chalcites* (HACKER, 1990); *Chrysodeixis chalcites* (EBERT & HACKER, 2002); *Chrysodeixis chalcites* (GOATER *et al.,* 2003).

Types: Lectotype: [Italy].

Notes on systematics: The *chalcites*-line comprises a small group of often confusingly similar species, both externally and in their genitalia. The only African-western Palaearctic species is *C. chalcites* (GOATER *et al.,* 2003).

Flight period: May to September.

Elevation range: 0-2400 m.

Distribution in Iran: Mazandaran, Kordestan, Qazvin, Tehran, Semnan, Lorestan, Kohkiluyeh va Boyer ahmad, Khuzestan & Sistan va Balouchestan (Plate 14, Map 9).

Materials: Mazandaran: Abbasabad, Tonekabon, 18-VII-1980 (Hashemi & Zairi); Akapol,

Rudbarak, Kelardasht, 1800 m., 1-IX-1980 (Ebrahimi & Badii); Amol, 7-VIII-1984 (Abai); Amol, 12 km N, 250 m., 28-X-1970 (Ebert); Amol, Tader-Sa, 950 m., 20-21-IX-1981 (Pazuki); Ash-Mahaleh, Sehezar, Tonekabon, 760 m., 7-IX-1990 (Ebrahimi & Badii); Behshahr, Pasand Research Station, 5-VII-1981 (anonymous leg.); Chalandar, Nur, Hashemi, 12-IX-1983 (Hashemi); Dohezar, Tonekabon, 425 m., 11-X-1995 (Rezvani, Badii & Ebrahimi); Galikesh, Amol, N36º 28' 35", E52º 27' 50", 40 m., 3-5-V-2006 (Zahiri R.); Harijan, 2000 m., 28-VIII-1990 (Ebrahimi & Badii); Javaher Deh, Ramsar, 1700 m., 8-IX-1990 (Ebrahimi & Badii); Kelardasht, 18-X-1971 (Naim); 26-VIII-1976 (Zairi); Kelardasht, 12 km N, S Abbasabad, 700 m., 28-IX-1981 (Pazuki); 28-IX-1990 (Pazuki); Marzan Abad, Kelardasht, 400 m., 17-VII-1976 (Zairi); 26-VIII-1976 (Zairi); 26-VIII-1976 (Zairi); Mazid, Baladeh, 1800 m., 10-IX-1983 (Hashemi); Nayrank, Nowshahr, 0 m., 10-X-1995 (Rezvani, Badii & Ebrahimi); Nowshahr, 7-VII-1977 (Abai); Panjab, Nur, 1250-1940 m., 8-IX-1983 (Hashemi); 11-X-1995 (Rezvani, Badii & Ebrahimi); Polemoun, Amol, 1640 m., 21-X-1974 (Borumand & Pazuki); Rostam Rud, 6 km, Nur, 8-VIII-1980 (Pazuki & Borumand); Segharchi, 30 km Amol, 500 m., 23-X-1974 (Borumand & Pazuki); Shirud, 3 km W, Tonekabon, 26-IX-1981 (Pazuki); Tonekabon, 30-IX-1981 (Pazuki); 16-25-IV-1971 (Rudsari); Tonekabon Laboratory, 1-30-V-1983 (Rudsari); 10-11-VIII-1980 (Pazuki & Borumand); Zirab, 3 km Kolarjan, 950 m., 2-X-1981 (Pazuki). Kordestan: Marivan, 36 km NE, Strae nach Baneh, 1550 m., 8-9-VII-1975 (Pazuki). Qazvin: Dezak Sur, Alamut, Rudbar, 25-28-IX-1982 (Hashemi). Tehran: Chelcheshmeh, 30 km SW Firuzkuh, 1900 m., 29-VIII-1983 (Borumand & Pazuki); Damavand Mts., Northern sloppe, 2370 m., 26-VIII-1992 (Ebrahimi & Badii); Gudak, 20 km N Firuzkuh, 2270 m., 4-X-1981 (Pazuki); Hessarbon, Firuzkuh, 1600 m., 5-6-X-1981 (Pazuki); Karaj, 1400 m., 15-X-1997 (Mofidi); Karimabad, Pishva, Varamin, 900 m., 19-XI-1991 (Ebrahimi & Badii); S-Rand Tehran-Evin, Elburs Mts., 1400 m., 27-IX-1972 (Ebert). Semnan: Kashidar, N Shahrud, 1250 m., 21-22-VIII-1982 (Hashemi). Lorestan: Kogah, Oshtorankuh, 2350 m., 29-30-VIII-1975 (Pazuki). Kohkiluyeh va Boyerahmad: Sisakht, Yasuj, 2250 m., 13-VI-1972 (Ebert & Pazuki); Yasuj, 15 km SE, 2050 m., 15-VI-1972 (Ebert & Pazuki). Khuzestan: Behbahan, 350 m., 3-V-1995 (Parchami, Ardeh & Badii); Bidroyeh, 36 km N Andimeshk, 430 m., 11-IV-1977 (Pazuki & Hashemi); Khoramshahr, 6-VI-1974 (Zairi); Kutehshahnuf, Abadan, 5 m., 11-V-1994 (Sarafrazi & Hashemi); Lali, Cheshmeh-Tarkhan, 350 m., 8-V-1994 (Sarafrazi & Hashemi); Mollasani, Ahvaz, 20-100 m., 16-V-1975 (Pazuki & Borumand); Safiabad, Dezful, 80 m., 12-XI-1995 (Mirzayans & Badii); Shahiyun, Dezful, Salenkuh, 1250 m., 8-V-2001 (Mofidi, Gilasian & Hajesmailian). Sistan va Balouchestan: Kabud, Rig, Iranshahr, 18 km W, 500 m., 15-V-1972 (Abai & Ebert).

Tribe Plusiini Boisduval, 1828
Europ. Lep. Index Meth.: 91
Type genus: *Plusia* Ochsenheimer, 1816

Subtribe Autoplusiina Kitching, 1987
Bull. Br. Mus. Nat. Hist., Ent., **54**: 196
Type genus: *Autoplusia* McDunnough, 1944

Macdunnoughia Kostrowicki, 1961
Macdunnoughia Kostrowicki, 1961. *Acta zool. cracov.*, **6**: 402.
Type-species: *Plusia confusa* Stephens, 1850, *List Specimens Br. Anim. Colln Br. Mus.*, **5**: 291, by original designation.

Macdunnoughia confusa (Stephens, 1850)
Plusia confusa Stephens, 1850, *List Specimens Br. Anim. Colln Br. Mus.*, **5**: 291.
(Plate 2, Fig. 10 and Plate 6, Figs 44-45 ♂ genitalia)

References: *Plusia gutta* (CHRISTOPH, 1873); *Plusia gutta* (CHRISTOPH, 1877); *Macdonnoughia confusa* (HACKER & MEINEKE, 2001); *Phytometra confuse* (MODARRES AWAL,

2001); *Macdonnoughia confusa* (EBERT & HACKER, 2002); *Macdonnoughia confusa* (GOATER *et al.,* 2003).

Types: Lectotype: [Europe], France.

Notes on systematics: The species shows extensive external variation in the forewing ground colour and the shape and size of stigma, and therefore numerous forms have been described which have no taxonomic importance (GOATER *et al.,* 2003).

Bionomics: A widespread migrant species, the imagines of which show no rigid habitat preference although the larvae have usually been found in lightly wooded and open grassy habitats, also including anthropogenic areas (GOATER *et al.,* 2003). Bi- or trivoltine, depending on the climate of the region. Adults are on the wing more or less continuously from April to November. The moths often fly by day, especially on migration, and visit flowers or rest for short periods on the stems and foliage of herbaceous plants (GOATER *et al.,* 2003).

Distribution: Trans-Palaearctic.

Flight period: mid April to end October.

Elevation range: -20-2200 m.

Distribution in Iran: Azerbaijan Gharbi, Azerbaijan Sharghi, Ardebil, Guilan, Mazandaran, Golestan, Khorasan, Tehran, Qazvin, Zanjan, Esfahan and Khuzestan (Plate 14, Map 10).

Materials: Azerbaijan Gharbi: Bashkand, Avajigh, Maku, 1400 m., 16-VI-1976 (Pazuki & Borumand); Cheshmeh Soraya, Maku, 900 m., 22-VIII-1994 (Ebrahimi & Sarafrazi). Azerbaijan Sharghi: Khoda Afarin, 350 m., 9-VIII-1992 (Parchami & Badii); Kiamaki, Jolfa, Kuh-e-Miab, 2000 m., 5-VIII-1998 (Nazari V.); Khalatpushan, Tabriz, 26-VIII-1974 (Mashayekhi). Ardebil: Moghan, 12-X-1967; 27-VII-1967; 29-VIII-1962 (Abai); Heyran, Haji Amir Pain, N38º 25' 15.2" E48º 36' 03.4", 950 m., 19-VI-2006 (Zahiri R. & Falsafi H). Guilan: Lakudeh, Assalem, 250 m., 8-9-VII-2000 (Barari, Mofidi, Ebrahimi & Deuve); Amarlu, E Rudbar, 1000 m., 27-IX-1970 (Ebert); Assalem, 250 m., 14-VIII-1992 (Parchami & Badii); Astara, 5 km Ardebil Road, 100 m., 25-V-1997 (Sarafrazi, Badii & Nazari V.); Bandar-e-Anzali (= Pahlavi), -20 m., 2-VIII-1968 (Abai & Modj.); 28-IX-1970 (Ebert); 8-VIII-1974 (Mirzayans & F. B.); 13-VIII-1969 (Mirzayans); Damash, Amarlu (= Jirandeh), E49º 48' 16", N36º 45' 44", 13-15-VI-2006 (Zahiri R. & Falsafi H.); Gissum, Assalem, 160 m., 18-VIII-1980 (Pazuki & Borumand); Siahkal, Bala Rud, Lahijan, 270 m., 6-7-VII-2000 (Ebrahimi, Mofidi, Barari & Deuve); Rasht, College of Agriculture, 0 m., 15-VII-2001 (Zahiri R.); Sheikhmahal, Assalem, 160 m., 28-30-VI-1977 (Pazuki & Mortazaviha). Mazandaran: Chalandar, Nur, 12-IX-1983 (Hashemi); Div Cheshmeh, Nowshahr, 1050 m., 8-X-1995 (Rezvani, Ebrahimi & Badii); Dormod, Javaherdeh, Ramsar, 4-5-VII-2000 (Barari, Mofidi, Ebrahimi & Deuve); Ekrasar, Chalakrud, 1560 m., 11-IX-1990 (Ebrahimi & Badii); Kelardasht, 15-VIII-1976 (Zairi); Marzan Abad, Kelardasht, 400 m., 17-VII-1976 (Zairi); 17-VIII-1956 (Zeydi); Mazid, Baladeh, 1800 m., 10-IX-1983 (Hashemi); Nowshahr, 7-VII-1977 (Abai); Rostamrud, 6 km, Nur, 8-VIII-1980 (Pazuki & Borumand); Sari, 0 m., 23-VI-1995 (Mirzayans, Safavi & Badii); Shahsavar (= Tonekabon), 6-VI-1973; 27-IX-1972; 24-VI-1973 (Ebert); 10-25-IX-1971 (Mostofipor); 11-VII-1974 (Abai); Segharchi, 30 km Amol, 500 m., 23-X-1974 (Borumand & Pazuki); Sehezar, Tonekabon, 980 m., 27-VI-1998 (Mofidi); Shirud, 3 km W, Tonekabon, 26-IX-1981 (Pazuki); Tonekabon, 30-IX-1981 (Pazuki); 17-VIII-1980 (Hashemi & Zairi); Tonekabon Hght., 250 m., 27-VII-1980 (Hashemi & Zairi); Tonekabon Laboratory, 10-11-VIII-1980 (Pazuki & Borumand); Zirab, Palang Darreh, 540 m., 24-25-VI-1977 (Pazuki & Mortazaviha). Golestan: Gavandar, Maraveh Tapeh, 250 m., 30-IX-1992 (Ebrahimi & Badii); Gorgan, 10-VIII-1967 (Abai); Mazarli, Park-e-Melli Golestan, 530 m., 19-10-VI-1977 (Pazuki & Abai); Park-e-Melli Golestan, 700 m., 6-V-1993 (Pazuki & Badii); Shahpasand, Ramian, 420 m., 4-VI-1982 (Hashemi); Sulgerd, Park-e-Melli Golestan, 1150 m., 16-18-VII-1985 (Pazuki). Khorasan: Cheshmeh Gilas, Mashhad, 1000 m., 9-IX-1980 (Hashemi & Zairi). Tehran: Anjom Abad, Shahriar, 900 m., 19-10-X-1991 (Ebrahimi & Badii); Eshtehard, Karaj, 980 m., 20-21-X-1991 (Ebrahimi & Badii); Evin, Tehran, 1600 m., 4-8-VIII-1971; 26-28-VII-1971; 8-IX-1973; 9-VIII-1971; 26-V-1976; 10-VII-1971 (Light Trap); Karaj, 1400 m., 20-IV-1972; Malard, Karaj, 26-IX-1971 (Sabzevari); 15-VIII-1971; 20-IV-1974 (Sazevari); Shahdasht, Karaj, 5-V-1976; 14-IV-1976; 17-IV-1976; 29-IV-1976; 13-IV-1976 (Radjabi);

Sir Ab, Elburs Mts., Tehran, 650 m., 17-VI-1961; 17-VII-1961 (Klapperich J.). Qazvin: Abgarm, 1500 m., 11-VIII-1997 (Barari & Mofidi); Taleghan, 2200 m., 26-31-VII-1976 (Kavian); Ziaran, E50º 30' 16", N36º 06' 10", 1560 m., 22-VII-2005 (Zahiri R.). Zanjan: Asadabad, Soltanieh, 1750 m., 14-VIII-1993 (Ebrahimi & Sarafrazi). Esfahan: Abyaneh, Natanz, 2150 m., 14-16-VI-1984 (Pazuki & Hashemi); Mashhad Ardehar, Kashan, 1600 m., 25-VII-1981 (Hashemi); Sericheh, Niasar, Kashan, 1650 m., 8-VIII-1988 (Hashemi). Khuzestan: Jazireh Minu, 50 m., 29-IV-1976 (Pazuki & Abai).

Subtribe Diachrysiina Beck, 1996
Neue Ent. Nachr., **36**: 42
Type genus: *Diachrysia* Hübner, [1821]

Diachrysia Hübner, [1821]
Diachrysia Hübner, [1821]. *Verz. bekannter Schmett*.: 252.
Type-species: *Diachrysia orichalcea* Fabricius sensu Hübner, [1821], *Verz. bekannter Schmett*.: 252 (= *Phalaena chryson* Esper, 1789, *Die Schmett*., **4**(2) Abschnitt **1**: 446, pl. 141, fig. 2, by subsequent designation by Dyar, 1902, *Jl. N. Y. ent. Soc*., **10**: 81).

Diachrysia chryson (Esper, [1789])
Phalaena (*Noctua*) *chryson* Esper, [1789]. *Die Schmett*., **4**(2) Abschnitt **1**: 446, pl. 141, fig. 2.
(Plate 2, Fig. 11 and Plate 7, Figs. 46-47 ♂ genitalia)

References: *Diachrysia chryson chryson* (HACKER, 1990); *Diachrysia chryson* (EBERT & HACKER, 2002); *Diachrysia chryson* (GOATER *et al.*, 2003).

Types: Lectotype: Central Italy [Italy].

Bionomics: Univoltine in most parts of its range and in some parts it is bivoltine.

Distribution: Euro-Siberian. *D. chryson* has a wide but rather scattered Trans-Palearctic distribution from the British Isles to Japan (GOATER *et al.,* 2003).

Flight period: mid May to end September.

Elevation range: 0-700 m.

Distribution in Iran: Guilan and Mazandaran (Plate 14, Map 11).

Materials: Guilan: Sheikhmahal, Assalem, 160 m., 28-30-VI-1977; Siahkal, Balarud, Lahijan, 270 m., 12-VIII-1980 (Pazuki & Borumand). Mazandaran: Amol, 7-VIII-1974 (Abai); Shahsavar, 17-VII-1980 (Hashemi & Zairi); Chalandar, Nur, 12-IX-1983 (Hashemi); Tonekabon (= Shahsavar), 30-IX-1981 (Pazuki); Nowshahr, 7-VII-1977 (Abai); 16-V-1973 (Khial); Nur, 1974; Tonekabon Laboratory, 11-VII-1974; 19-VIII-1973 (Abai); Shahsavar, 20-V-1973 (Ebert); Tonekabon Hight, 250 m., 18-VII-1980 (Hashemi & Zairi); Kelardasht, 12 km N, S Abassabad, 700 m., 28-IX-1981 (Pazuki).

Diachrysia generosa (Staudinger, 1900)
Plusia generosa Staudinger, 1900. *Dt. ent. Z. Iris*, **12**: 380.
(Plate 2, Fig. 12 adult, Plate 7, Figs 48-49 ♂ genitalia)

References*: Plusia chrysitis* (BIENERT, 1870); *Plusia chrysitis* (CHRISTOPH, 1873); *Phytometra chrysitis* (WILTSHIRE, 1945); *Diachrysia chrysitis generosa* (EBERT & HACKER, 2002); *Diachrysia generosa* (GOATER *et al.,* 2003).

Types: Turkey, Zeitun.

Notes on systematics: *D. generosa* is probably derived from *D. chrysitis*, and is the xeromontane type of the *D. chrysitis* generic complex (GOATER *et al.,* 2003).

Bionomics: Bivoltine, univoltine only in the higher ranges of the Caucasus massif. The univoltine brood flies in July-August, while the adults of the bivoltine populations can be found more or less continuously from May to September.

Distribution: Ponto-Mediterranean-Iranian. *D. generosa* is recorded from Turkey, including the European part, the Caucasus region, Armenia, Georgia and Azerbaijan, Iran and Afghanistan.

Flight period: end May to early October.

Elevation range: 0-2800 m.

Distribution in Iran: Azerbaijan Gharbi, Azerbaijan Sharghi, Ardebil, Guilan, Mazandaran, Golestan, Qazvin and Tehran (Plate 14, Map 12).

Materials: Azerbaijan Gharbi: Rajan, 30 km SW Rezaiyeh, 1650 m., 24-VII-1976 (Pazuki & Borumand). Azerbaijan Sharghi: N Sahand Mountains, 2400 m., 2-3-VIII-1992 (Parchami & Badii); Kaleybar, Ghale Babak, 1500 m., 5-VII-1997 (Mofidi & Barari); Miyaneh, Bozghush Mountains, Torkmanchay, Kalhor, N37º 42' 27", E47º 22' 25", 2150 m. (Zahiri). Ardebil: Haji Amir-e- Paeen, Gardaneh-e-Heyran, N38º 25'15", E48º 36' 03", 950 m., 19-VI-2006 (Zahiri R. & Falsafi H.); Lac Neor, 2350 m., 17-VIII-1991 (Hashemi & Parchami). Guilan: Rudbar, Amarlu (Jirandeh), Damash, N36º 45' 44.6" E49º 48' 16.8", 1750 m., 13-15-VI-2006 (Zahiri R. & Falsafi H.); Asalem- Khalkhal Rd., Asalem Forests, N37º 40' 33.7" E48º 47' 53.6", 550 m., 15-VI-2006 (Zahiri R. & Falsafi H.); Eshkevar, Gilanchakan, 1820 m., 27-VI-1997 (Barari & Mofidi); Assalem, Schondol, 950 m., 9-VIII-1974 (Mirzayans & F. B.); Assalem, Sheikh Mahal, 160 m., 28-30-VI-1977 (Pazuki & Mortazaviha); Assalem, Pissason, 1300 m., 15-16-VIII-1980 (Pazuki & Borumand); Assalem, Abish Gharah, 1250 m., 30-VII-1976 (Pazuki & Borumand); Assalem, Parehsar, 750 m., 13-VIII-1974 (Mirzayans & Ilkhani); Assalem, 29-IX-1970 (Ebert & Abai); Assalem, Lakudeh, 250 m., 8-9-VII-2000 (Barari, Mofidi, Ebrahimi & Deuve); Bandar-e-Pahlavi, Assalem, Kom, 150 m., 4-VIII-1975 (Mirzayans); Pahlavi, Assalem, Pissason, 1150 m., 7-VIII-1975 (Mirzayans); Siahkal, 12 km N Daylaman, 1300 m., 13-VIII-1980 (Pazuki & Borumand); Siahkal, Khasekhani, 1200 m., 11-VII-2000 (Ebrahimi, Mofidi, Barari & Deuve); Rasht, Amarlu, 1000 m., 27-VII-1970 (Ebert & Abai); Rasht, 7-13-V-1973 (Shenasi); Astara, km 5 Ardebil Rd., 100 m., 26-V-1997 (Sarafrazi, Badii & Nazari V.); Hashtpar, Assalem, 1250 m., 6-IX-1972 (Borumand & Zairi); Hashtpar, Rek, 15 km Hashtpar, 570 m., 31-VIII-1975 (Mirzayans). Mazandaran: Tonekabon, 30-IX-1981 (Pazuki); 17-VIII-1980 (Hashemi & Zairi); Ramsar, Dalikani, 950 m., 1-IX-1975 (Mirzayans); Zirab, 3 km W Kolarjan, 2-3-X-1981, 950 m. (Pazuki); Zirab, Palangdareh, 540 m., 24-25-VI-1977 (Pazuki & Mortazaviha); Nur, Panjab, 1250 m., 18-VIII-1981 (Hashemi); Amol, Sangechal, 1200 m., 18-VI-1995 (Mirzayans, Sarafrazi & Badii); Baladeh, Mazid, 1800 m., 10-IX-1983 (Hashemi); Baladeh, Yush, 1920 m., 13-IX-1996 (Badii, Ardeh & Hashemi); Kelardasht Mountains, 24-VII-1980 (Hashemi & Zairi); Chalkrud, Ekrasar, 1560 m., 11-IX-1990 (Ebrahimi & Badii); Polur, Nava Mountains, 13-VII-1976 (Zairi & Lavali); N Kandovan, Khakak, 2560 m., 9-VII-1977 (Pazuki & Mortazaviha); 12 km N Kelardasht, S Abbasabad, 28-IX-1981, 700 m. (Pazuki); Baladeh, Yush, 1920 m., 13-IX-1994 (Badii, Ardeh & Hashemi). Golestan: Jangale Golestan, Mazarli, 530 m., 19-20-VI-1977 (Pazuki & Abai); Ramian, Jamehshuran, 1250 m., 22-VI-1995 (Mirzayans, Badii & Sarafrazi); Kalaleh, Gharehsar, 380 m., 1-X-1992 (Ebrahimi & Barari). Tehran: Damavand, Polur, 2200 m., 22-IX-1970 (Abai); Polur, Nava Mountains, 13-VII-1976 (Zairi & Lavali); Evin, Tehran, 28-VIII-1971 (Light Trap); 30-VII-1974 (Light Trap); Dizin, Velayatrud, 2250 m., 28-VII-1994 (Ebrahimi); Rudbar Ghasran, Garmabdar, 2370 m., 28-29-V-1991 (Ebrahimi & Badii); Karaj, Kandovan, Sarchal, 2800 m., 4-8-VII-1977 (Pazuki & Mortazaviha); Karaj, Kalha, 2000 m., 25-26-VIII-1996 (Barari, Badii & Sarafrazi); Karaj, Azadbar, 2400 m., 7-9-V-1995 (Sarafrazi, Badii & Linnavori); Karaj, Kondor, 1850 m., 14-VI-1992 (Ebrahimi & Badii); Tehran, Taleghan, 8 km W Zidasht, 10-13-VI-1977 (Pazuki & Mortazaviha); Shemshak, 2700 m., 11-12-VIII-1981 (Hashemi); Karaj, Arangeh, 1620 m., 10-IX-1983 (Hashemi). Qazvin: Taleghan, Sabzan, 1550 m., 30-VIII / 1-IX-1996 (Badii, Barari & Sarafrazi).

Diachrysia stenochrysis (Warren, 1913)*

Phytometra stenochrysis Warren, 1913, *in* Seitz, *Gross- Schmetterl. Erde*, **3**: 348, pl. 64, row f.

(Plate 2, Fig. 13 adult and Plate 7, Figs 50-51 ♂ genitalia)

References*: Diachrysia stenochrysis* (GOATER *et al.,* 2003).

Types: Lectotype: [Japan], Yesso, Ichikishiri.

Synonymy: *juncta* Tutt, 1892; *tutti* Kostrowicki, 1961.

Notes on systematics: The taxonomic interpretation of the *Diachrysia chrysitis* species complex is one of the evergreen problems in Noctuidae taxonomy since Kostrowicki separated the complex into

two distinct species (GOATER *et al.,* 2003). Kostrowicki in1961 erected the taxon *Plusia tutti* as a species different from the well-known *D. chrysitis*, based on certain external and male genital features (GOATER *et al.*, 2003). At the International Noctuidae Symposium in Innsbruck (1989) a taxonomically wider overview of the problem was presented by Michael Fibiger. He provided his own results based on examination of the male genitalia, including features of the everted vesica, of the two species, and included a third species, *D. generosa* which, until then, had been regarded as a subspecies of *D. chrysitis* (GOATER *et al.*, 2003). There is a forgotten fourth species of the complex, the Pasific *D. stenochrysis*, which has never been involved in these studies although it lives right in the supposed 'centre of speciation' and 'centre of dispersion' of the genus. It can be easily demonstrated that the typical external and genital features of tutti are strongly expressed in *D. stenochrysis* and that the parallelism of the two species also appears in Far Eastern areas (see RONKAY, 1982). Morever, the only striking "character displacement" between the two species exists in this region, where the forewing pattern and the male and female genitalia show easily recognizable and non-overlapping specific features (GOATER *et al.,* 2003).

Bionomics: Bivoltine, sometimes trivoltine populations. A rather hygrophious species, preferring more humid biotopes than *D. chrysitis*, although specimens can be found practically everywhere from the seashore to the subalpine zone.

Distribution: Euro-Siberian. The typical populations are distributed in the pacific part of Asia, similar ones along the Amur valley, the south Siberian mountains and Mongolia (GOATER *et al.,* 2003).

Flight period: mid May to end September.

Elevation range: -20- 750 m.

Distribution in Iran: Guilan and Mazandaran (Plate 14, Map 13).

Materials: Guilan: Bandar-e-Pahlavi (= Anzali), -20 m. (Musavi); Parehsar, Assalem, 750 m., 14-V-1977 (Abai); Rasht, 0 m., 21-VII-1973 (Shenasi); Sheikhmahal, Assalem, 160 m., 28-30-VI-1977 (Pazuki & Mortazaviha). Mazandaran: Shahsavar (= Tonekabon); 8-VIII-1971 (Ghazioff); 30-IX-1981 (Pazuki); 10-11-VIII-1980 (Pazuki & Borumand); Zirab, Palang Darreh, 540 m., 24-25-VI-1977 (Pazuki & Mortazaviha).

Subtribe Euchalciina Chou & Lu, 1979
Entomotaxonomia, **1**: 77
Type genus: *Euchalcia* Hübner, [1821]

Larval host-plants: (most) Ranunculaceae; Euchalcia (part) Boraginaceae, Urticaceae and related families, one species on Asclepiadaceae.

Euchalcia Hübner, [1821]
Euchalcia Hübner, [1821]. *Verz. bekannter Schmett.*: 250.
Type-species: *Noctua illustris* Fabricius, 1787, *Mantissa Insect.*, **2**: 164, by subsequent designation by Dyar, 1902, *Jl. N. Y. ent. Soc.*, **10**: 81.

N. illustris is a junior subjective synonym of *Noctua variabilis* Piller & Mitterpacher, 1783, *Iter per Poseganam Scjavoniae Provinciam*: 70, pl. 6, fig. 4.
Plusia Ochsenheimer, 1816, partim, *Schmett. Eur.*, **4**: 89.
Phytometra Hampson, 1913 (nec Haworth, 1809), partim, *Cat. Lepid. Phalaenae Br. Mus.*, **13**: 452.
Adeva McDunnough, 1944, *Mem. sth. Calif. Acad. Sc.*, **2**: 213.

Euchalcia is one of the few genera of Euchalciina with a relatively short, laterally less compressed palpus and without a conspicuously long third segment. The strongest, universally present synapomorphy of this genus, and of *Desertoplusia* (s. l.), is the characteristically large, rounded, somewhat conical basal plate of the terminal cornutus. No other apomorphic feature is consistent within this large genus, appearing only in one or a few species-groups (GOATER *et al.,* 2003).

Euchalcia stilpna Dufay, 1969
Euchalcia stilpna Dufay, 1969. *Opusc. zool*., **110**: 1, figs. 1, 2.
(Plate 2, Fig.14 holotype (ZSM), Fig. 14(1) adult, Plate 7, Figs 52-53 ♂ genitalia)

References: *Euchalcia stilpna* (POOLE, 1989), *Euchalcia stilpna* (HACKER, 1990), *Euchalcia stilpna* (EBERT & HACKER, 2002).

Types: Gatchsar, Province de Teheran, Gatshsar, Iran. Holotype deposit in Coll. Zool. Samml.

Notes on systematics: *Euchalcia stilpna* Dufay, 1969 was described by a single female. Figured by EBERT & HACKER (2002, pl. 15, fig. 12).

Distribution: Ponto-Caspian.

Flight period: May to July.

Elevation range: 400-2800 m.

Distribution in Iran: Mazandaran and Tehran (Plate 14, Map 14).

Materials: Tehran: Karaj, Kandovan Sarchal, 2800 m., 3-4-VII-1977 (Pazuki & Mortazaviha); Karaj, Azadbar, 2400 m., 7-9-V-1995 (Sarafrazi, Badii & Linnavori); Evin, Tehran, 1600 m., 26-VI-1971 (Light Trap); Gachsar, Karaj (Anonymous leg.); Sarchal, Kandovan, Karaj, 2800 m., 4-8-VII-1977 (Pazuki & Mortazaviha); Shimshak, Elburs-Geb. Südseite, 2300 m., 1-22-VII-1970 (E. Vartian) (NHMW). Mazandaran: Marzanabad, 400 m., 6-VII-1995 (Badii, Sarafrazi & Linnavori).

Euchalcia emichi (Rogenhofer, 1873)
Plusia emichi Rogenhofer, 1873. *Verh. zool.-bot. Ges. Wien*, **23**: 569.
(Plate 3, Fig. 15, Plate 8, Figs 54-55 ♂ genitalia)

References: *Euchalcia emichi* (DUFAY, 1963), *Euchalcia emichi* (HACKER, 1990), *Euchalcia emichi* (EBERT & HACKER, 2002).

Types: Turkey, Giaur Dagh [Amanus].

Distribution: Ponto-Caspian.

Flight period: end March to early August.

Elevation range: 1000-2250 m.

Larval host-plants: The larvae of taxon were recorded on a yellow flowered *Nonea* sp. (Boraginaceae) in Central Anatolia (Turkey).

Distribution in Iran: Azerbaijan Gharbi, Azerbaijan Sharghi & Ardebil (Plate 14, Map 15).

Materials: Azerbaijan Gharbi: Rajan, 30 km. SW Rezaiyeh, 1650 m., 24-VII-1976 (Pazuki & Borumand); Ghoushchi, 1600 m., 26-VII-1976 (Pazuki & Borumand); Rezaieh, Ghoushchi, 9-VI-1975 (Abai); W Maku, Ghezel-Bolagh, 1910 m., 27-VII-1976 (Pazuki & Borumand); Khoy, 1000 m., 7-VI-1975 (Abai); Rezaiyeh, 7 km Sivana, Kuhe, 1660 m., 22-VII-1976 (Pazuki & Borumand); Rezaiyeh, 8 km Band (Mirza Abad), 1450 m., 21-VII-1976 (Pazuki & Borumand); Rezaiyeh Lake, Sahi lsl., 1-VI-1975 (Abai); Rezaiyeh, Kahriz, 30-VI-1956 (Anonymous leg.); Siahchaman, 1600 m., 15-VII-1976 (Pazuki & Borumand). Azerbaijan Sharghi: Tabriz, Khalatpushan, 13-VI-1975 (Anonymous leg); same locality, 13-19-VII-1974 (Mashayekhi); Tabriz, Gharah-Chaman, 1100 m., 23-VI-1985 (Mirzayans & Pazuki); Mianeh, Bozghush, 2250 m., 29-30-VII-1992 (Parchami & Badii); Miyaneh, Bozghush Mountains, Torkmanmchay, Kalhor, 2150 m., N37º 42’ 27”, E47º 22’ 25”(Zahiri); Basmendj, 17-VI-1974 (Damanabi); Sahand, Chini-Bolagh, 2300 m., 25-VI-1985 (Mirzayans & Pazuki). Ardebil: Meshkin-Shahr, Ilandu, 1800 m., 3-VII-1997 (Barari & Mofidi).

Euchalcia taurica (Osthelder, 1933)
Phytometra consona subsp. *taurica* Osthelder, 1933. *Mitt. münch. ent. Ges*., **23**: 97.
(Plate 3, Fig. 16 adult, Plate 8, Figs. 56-57 ♂ genitalia)

References: *Euchalcia taurica* (POOLE, 1989), *Euchalcia taurica* (HACKER, 1990), *Euchalcia taurica* (HACKER & KAUTT, 1999); *Euchalcia taurica* (EBERT & HACKER, 2002).

Types: Holotype: 1 ♀, Marasch, Achyr Dagh septentrional, Bertiz Jaila, 1800 m., 9-13-VI-1929 (E. Pfeiffer leg.), [ZSM, Munich], Paratypes: 1 ♂, Marasch, Achyr Dagh septentrional, Bertiz Jaila, 1800 m., 9-13-VI-1929 (E. Pfeiffer leg.), 1 ♂, Marasch, 600-900 m., Taurus central, 30-IV (Einh. Slr. leg.).

Notes on systematics: The only close relative of this taxon is an allopatric sibling species named *E. consana*, which occurred in Europe. The non-European *E. taurica* differs in the more sinous post-median line and in the subterminal line, which does not extend beyond the tornal mark, as well as in the genitalia.

Distribution: Ponto-Caspian. In the near East, Asia Minor and Iran, *E. consana* is replaced by its twin species, *E. taurica*.

Flight period: end April to mid July.

Elevation range: 1600-2800 m.

Distribution in Iran: Azerbaijan Gharbi, Azerbaijan Sharghi, Ardebil, Mazandaran, Tehran, Qazvin, Zanjan, Qom & Fars (Plate 14, Map 16).

Materials: Azerbaijan Gharbi: Siahchaman, 1600 m., 15-VII-1976 (Pazuki & Borumand); Bazargan (Anonymous leg.). Azerbaijan Sharghi: Miyaneh, Bozghush Mountains, Torkmanmchay, Kalhor, 2150 m., N37º 42' 27", E47º 22' 25" (Zahiri). Ardebil: Meshkin-Shahr, Ilandu, 1800 m., 3-VII-1997 (Barari, Mofidi). Mazandaran: N Kandovan, Khakak, 2560 m., 9-VII-1977 (Pazuki & Mortazaviha). Tehran: Karaj, Kandovan, Sarchal, 2800 m., 4-8-VII-1977 (Pazuki & Mortazaviha); Assara, 1850 m., 40 km. N Karaj, 27-VI-1970 (S. B. K. GH.). Qazvin: Rudbar-e-Shahrestan, Daryabak, 2150 m., 12-VI-1995 (Parchami, Ebrahimi & Ardeh). Zanjan: Zanjan-Bijar, 50 km. SW Zanjan, 1700 m., 28-VI-1975 (Pazuki). Qom: 8 km S Fordu, Wesb, 7-8-VI-1984 (Pazuki & Hashemi). Fars: 50 km. NW Ardekan, Tangeh Sorkh, 2250 m., 16-VI-1972 (Ebert & Pazuki); Mamasani, Chahchenar, 3-19-V-1976 (Abai); Mamasani, Chahtut, 1-8-VI-1976 (Abai); same locality, 20-29-V-1976 (Abai); Kazerun, Gavkoshak, 21-26-X-1975 (Abai).

Euchalcia chalcophanes Dufay, 1963

Euchalcia chalcophanes Dufay, 1963. *Bull. mens. Soc. linn. Lyon*, **1963**: 70.

(Plate 3, Figs. 17 Paratype (ZSM) and 18 adult, Plate 8, Figs. 58-59 ♂ genitalia)

References: *Euchalcia chalcophanes* (DUFAY, 1868), *Euchalcia chalcophanes* (EBERT & HACKER, 2002), *Euchalcia chalcophanes* (HACKER, 1990).

Types: Holotype: 1 ♂, Tacht I Suleiman, Vallee du Sardab, Monts Elbours, 2500-2700 m., 14-18-VII-1937 (E. Pfeiffer et W. Forster leg.). Allotype: 1 ♀, Tacht I Suleiman, Vallee du Sardab, Monts Elbours, 2500-2700 m., 14-18-VII-1937 (E. Pfeiffer et W. Forster leg.). Holotype preserved in [Germany], ZSM and Paratypes preserved in coll. Museum National, Paris and coll. C. Dufay.

Notes on systematics: *E. siderifera*, *E. italica* and the non-European and taxonomically rather remote *E. chalcophanes* are all very similar. *E. chalcophanes* is closest to *E. italica*; it is less orange-tinted than *E. siderifera* and less Olive-green than *E. siderifera* subsp. *achaiae*.

Bionomics: see GOATER *et al.*, 2003.

Distribution: Ponto-Caspian.

Flight period: mid June to August

Elevation range: 1950-2900 m

Distribution in Iran: Tehran, Mazandaran, Qazvin, Kordestan & Kohkiluyeh va Boyerahmad (Plate 15, Map 17).

Materials: Tehran: 23 specimens**,** Kandovan, Sarchal, 2800 m., 4-8-VII-1977 (Pazuki & Mortazaviha), 2 ♀ ♀, Shahrestanak, Cheshmeh Kil-Kola, 2400 m., 20-VII-1988 (Mirzayans & Badii). Mazandaran: 4 ♂ ♂, 4 ♀ ♀, N Kandovan, Khakak, 2560 m., 9-VII-1977 (Pazuki & Mortazaviha). Qazvin: 1 ♂, Rudbar-e-Shahrestan, Daryabak, 2150 m., 12-VI-1995 (Parchami, Ebrahimi & Ardeh). Kordestan: 4 ♂ ♂, 6 ♀ ♀, Saghez (Saqez) 45 km SW, Saghez-Baneh, 2000 m., 30-VI-1975 (Pazuki). Kohkiluyeh va Boyerahmad: Sisakht, Tange-Sorkh, 12-15-VI-1975 (Ebert & Falkner).

Euchalcia hyrcaniae Dufay, 1963

Euchalcia hyrcaniae Dufay, 1963. *Bull. mens. Soc. linn. Lyon*, **1963**: 69.

(Plate 3 Figs. 18 Holotype (ZSM))

References: *Euchalcia hyrcaniae* (Dufay, 1968).

Types: Holotype: [Iran], Tacht I Suleiman, vallee du Sardab, Monts Elburs, 2500-2700 m, 14-18-

VII-1937 (E. Pfeiffer et W. Forster leg.), preserved in Coll. Zoologische Staatssammlung des Bayerischen Staates, Munich, 4 paratypes in coll. C. Dufay (St-Genis-Laval).

Distribution: Ponto-Caspian.

Flight period: July.

Elevation range: 2500-2700 m.

Distribution in Iran: Tehran, Elburs Mountains (Plate 15, Map 18).

Materials: Tehran: 1 ♂, Holotype, Elburs Mts., Sardab Valley, Takht-e-Soleiman, 2500-2700 m., 14-18-VII-1937 (E. Pfeiffer et W. Forster); 1 ♀, Allotype, Elburs Mts., Sardab Valley, Takht-e-Soleiman, 2500-2700 m., 14-18-VII-1937 (E. Pfeiffer et W. Forster); 4 Paratypes, Elburs Mts., Sardab Valley, Takht-e-Soleiman, 2500-2700 m., 14-18-VII-1937 (E. Pfeiffer et W. Forster).

Euchalcia hedeja Dufay, 1978

Euchalcia hedeja Dufay, 1978. *Bull. mens. Soc. linn. Lyon*, **47**: 71.

(Plate 3, Fig. 19 Holotype (SMNK))

References: *Euchalcia hedeja* (Hacker 1990).

Types: [Osttürkei], Vansee.

Flight period: July.

Elevation range: 1650 m

Distribution in Iran: Azerbaijan Gharbi (Plate 15, Map 19).

Materials: Azerbaijan Gharbi: Sardasht, 2 km W, 1650 m., 3-VII-1975 (Ebert & Falkner).

Euchalcia viridis (Staudinger, 1901)

Plusia modesta var. *viridis* Staudinger, 1901, *in* Staudinger & Rebel, *Cat. Lep. Palaearct. Faunengeb*., **1**: 236.

(Plate 3, Fig. 20 adult (SMNK))

References: *Euchalcia viridis* (HACKER, 1990).

Types: Lectotype: [Türkei]: Anatolia, Taurus, Hadjin preserved in collection Staudinger, Zoologisches Museum der Humboldt-Universität, Berlin.

Flight period: June to July

Elevation range: 1700-2800 m

Distribution in Iran: Tehran & Zanjan (Plate 15, Map 20).

Materials: Tehran: Gachsar, 15 km E, 2800 m., 1-11-VII-1975 (Ebert). Zanjan: Zanjan, 53 km S, Strae Zanjan-Bijar, 1700 m., 28-29-VI-1975 (Ebert & Falkner).

Euchalcia incredibilis Hacker & Ebert, 2002

Euchalcia incredibilis Hacker & Ebert, 2002. *Esperiana*, **9**: 265, pl. 15, fig. 13.

(Plate 3, Fig. 21 Holotype, Plate 8, Figs. 60-61 ♂ genitalia)

References: *Euchalcia incredibilis* (Hacker & Ebert, 2002); figured by EBERT & HACKER (2002, pl. 15, fig. 13 and Male genitalia fig. 92).

Types: [Iran]: 30 km s Rezaiyeh, 1400m (Plate 15, Map 21).

Distribution: Ponto-Caspian.

Flight period: May to June.

Elevation range: 1300-1400 m.

Distribution in Iran: Azerbaijan Gharbi and Azerbaijan Sharghi (Fig. 68).

Materials: Azerbaijan Gharbi: 1 ♂, 15 km Rezaiyeh, 10-VI-1975 (Abai); 1 ♂, Rezaiyeh, 1350 m., 7-VI-1975 (Abai, L. T.). Azerbaijan Sharghi: Tabriz, Gharah-Chaman, 1100 m., 23-VI-1985 (Mirzayans & Pazuki).

Desertoplusia Kljuchko, 1984

Desertoplusia Kljuchko, 1984. *Vest. Zool*., **1984**(3): 73.

Type-species: *Plusia bella* Christoph, 1887, *Stett. ent. Ztg*., **48**: 164, by original designation.

Desertoplusia bella (Christoph, 1887)
Plusia bella Christoph, 1887. *Stett. ent. Ztg*., **48**: 164.
(Plate 3, Fig. 22 adult and Plate 9, Figs 62-63 ♂ genitalia)

References*: Plusia bella* (POOLE, 1989); *Desertoplusia bella* (HACKER, 1990); *Plusia bella* (MODARRES AWAL, 2001).

Types: [Turkmenistan]: Aschabad.

Distribution: Turkmenistan and Iran (just Kopeh Dagh Mountains).

Flight period: April to August.

Elevation range: 1500- 2950 m.

Distribution in Iran: North Khorassan including Kopeh Dagh Mountains, E parts of National Golestan Park and Binaloud Mountains and eastern parts of Eburs Mountains of Semnan province (Plate 15, Map 22).

Materials: Khorasan: Allahakbar Mts., Kopetdagh Mts., 2950 m., 16-VI-1974 Radjabi & Pazuki); Almeh, Park-e-Melli Golestan, 1600 m., 17-25-V-1988 (Pazuki); 26-29-V-1986 (Pazuki); Eizman, Bojnourd, 17-V-2005 (Falsafi & Nematian); Gifan-e-Oliya, 20-V-2005 (Falsafi & Nematian); Yakhtikalan, Park-e-Melli Golestan, 2-VI-1986 (Pazuki); Zoshk, Mashhad, Binalud Mts., 2000 m., 19-VI-1974 (Radjabi & Pazuki); Zoshk, Mashhad, 1500-1700 m., 8-VI-1973 (Ayatollahi). Semnan: Moalleman, 1070 m., 17-V-2005 (Falsafi & Nematian); Cheshmeh Ali, 20 km N Damghan, 1560 m., 23-24-V-2005 (Falsafi & Nematian); Ahuvan, 1900 m., 29-V-1982 (Hashemi); Schahkoub, Schahrud, 2150 m., 15-VI-1974 (Rajabi & Pazuki); Kamare Cheheldokhtar, Shahrud, 1700 m., 3-VIII-1982 (Hashemi).

Desertoplusia colornata Varga & Ronkay, 1991
Desertoplusia colornata Varga & Ronkay, 1991. *Acta zool. hung*., **37**: 263-312.
(Plate 4, Fig. 23 adult and Plate 9, Figs 64-65 ♂ genitalia)

References*: Desertoplusia colornata* (HACKER & KAUTT, 1999); *Desertoplusia colornata* (EBERT & HACKER, 2002).

Types: [Holot. m: Türkei, Agri, coll. G. Ronkay, Budapest]

Flight period: May to July.

Elevation range: 140-2600 m.

Distribution in Iran: Azerbaijan Gharbi, Guilan, Tehran, Semnan, Qom, Esfehan, Fars, Kohkiluyeh va Boyerahmad, Khuzestan, Kerman and Hormozgan (Plate 15, Map 23).

Materials: Azerbaijan Gharbi: Ghezel Bolagh, W Maku, 1910 m., 17-18-VII-1976 (Pazuki & Borumand); Rezaiyeh, 30 km S, 1400 m., 10-VI-1975 (Amsel); Insel im Rezaiyeh-see, 1350 m., 1-VI-1975 (Amsel). Guilan: Bivarzin, Lowshan, 900 m., 27-28-V-1997 (Badii, Nazari V. & Sarafrazi).Tehran: Arangeh, 25 km N Karaj, 1550 m., 1-6-VI-1972 (Ebert & Falkner); Polur, Damavand, Elburs Mts., 2500 m., 21-VI-1969 (Amsel); Tehran, 30 km N, Elburs Geb., S-side, 1800 m., 27-V-1971 (Eva Vartian); Keredj (Karaj); 14 km nördl, Elburs Gebridge, N Iran, 1600 m., 12-VI-1969 (Vartian E.); Zidasht, 8 km W, 2200 m., 10-13-VI-1977 (Pazuki & Mortazaviha). Qom: Wesb, 2450 m., 24-IV-1981 (Hashemi); Wesb, Fordu, 2320 m., 7-8-VI-1984 (Pazuki & Hashemi). Esfehan: Abyaneh, Natanz, 2150-2300 m., 6-VI-1988 (Hashemi & Badii); 29-VI-1981 (Hashemi); Ghohrud, Kashan-Meimeh, 2450 m., 11-13-V-2005 (Trusch, Petsch. & Muller); Jahagh, 4 km S, Kashan, 2000 m., 14-15-VI-1984 (Pazuki & Hashemi); Khansar, Golestan Kuh, 2700 m., 5-6-VII-1982 (Borumand & Pazuki); 3-4-VII-1983 (Mirzayans & Borumand); Park-e-Ghamishlu, 2000 m., 16-17-VI-1993 (Mirzayans & Badii). Fars: Fort Miyan-Kotal, Kazerun, 1900 m., 11-VI-1969 (Ebert & Falkner); Strae Ardekan-Talochosroe, Comee, 2600 m., 15-VII-1937 (Branst); Kotal-e-Piresan, Dasht-e-Arjan, 2000 m., 11-VI-1969 (Ebert & Falkner); Fort Miyan-Kotal, Strae Shiraz-Kazerun, 2200 m., 20-V-1937 (Brandt F.); Fasa, 40 km W, 3-V-1975 (Thomas W.); Jahrom, 1120 m., 11-V-1974 (Abai & Pazuki); Muk, Firuzabad, 1800 m., 8-9-V-1985 (Mirzayans & Hashemi). Kohkiluyeh va Boyerahmad: Sisakht, Yassuj, 2050 m., 15-V-1972 (Ebert & Falkner); Yasuj, 15 km SE, 2050 m., 15-VI-1972 (Ebert & Pazuki). Khuzestan: Ahvaz, 140 m., 29-V-1982 (Hashemi). Kerman: Ghanat-e-Marvan, Baft, 23-V-1977 (Safavi, Pazuki & Abai). Hormozgan: Hajiabad, 1140 m., 25-IV-1996 (Ardeh, Badii & Nazari).

Panchrysia Hübner, [1821]*
Panchrysia Hübner, [1821]. *Verz. bekannter Schmett*.: 252.
Type-species: *Noctua aurea* Hübner, [1803], *Samml. eur. Schmett*., **4**: pl. 59, fig. 288, by monotypy.

Panchrysia (*Panchrysia*) *deaurata* (Esper, 1787)*
Bombyx deaurata Esper, 1787. *Die Schmett*., **4**(2) Abschnitt **1**: pl. 110, fig. 6.
(Plate 4, Fig. 24 adult (ZSM))

References: *Panchrysia* (*Panchrysia*) *deaurata* (GOATER *et al*., 2003), *Panchrysia deaurata* (HACKER, 1990).

Types: [Europe].

Bionomics: Univoltine or bivoltine, depending on habitat. The flight period is May-June and July-September where the species is double-brooded, or in a protracted single generation. A xerophilous species which occurs in steppes, forest steppes, hot, strongly isolated, dry rocky slopes, especially on limestone, preferring those habitats where *Thalictrum* grows in masses. (GOATER *et al.,* 2003).

Distribution: Holo-Mediterranean-Turkestanian.

Flight period: end May to August.

Elevation range: 1000-1800 m.

Distribution in Iran: Azerbaijan Sharghi & Tehran (Plate 15, Map 24).

Materials: Azerbaijan Sharghi. 1 ♂, Basmendj, 28-VI-1974 (Damanabi); 1 ♂, Basmendj, 18-VIII-1974 (Damanabi). Tehran: Ask, Demavand, Elburs Geb., Nordseite, 1800 m., 29-V-1971 (Vartian E.).

Plusidia Butler, 1879*
Plusidia Butler, 1879. *Illust. typical Specimens Lepid. Heterocera Colln Br. Mus.,* **3**: 27.
Type-species: *Plusidia abrostoloides* Butler, 1879, *Illust. typical Specimens Lepid. Heterocera Colln Br. Mus.,* **3**: 28, pl. 47, fig. 5, by original designation.

Plusidia cheiranthi (Tauscher, 1809)*
Noctua cheiranthi Tauscher, 1809. *Mem. Soc. Nat. Moscou*, **2:** 322, pl. 20, fig. 6.
(Plate 4, Fig. 25 adult)

References: *Plusidia cheiranthi* (POOLE, 1989); *Plusidia cheiranthi* (GOATER *et al.,* 2003).

Types: [USSR]: Waskuntschatskoi.

Bionomics: Normally univoltine. The adults are on the wing between June and August. A Xerothermophilous steppe species which occurs in dry open habitats, steppes, forest steppes, dry slopes, rocky gorges and deep rocky valleys of xeromontane high mountains. Larvae feed on *Thalictrum* as host-plants (INOUE *et al.*, 1982).

Distribution: Siberian.

Flight period: June.

Elevation range: 1400-1500 m.

Distribution in Iran: Azerbaijan Gharbi (Plate 16, Map 25).

Materials: Azerbaijan Gharbi: 1 ♂, 1 ♀**,** Rezaiyeh, Ghasemlu, 10-VI-1975 (Abai).

Subtribe Plusiina Boisduval, 1828
Europ. Lep. Index Meth.: 91
Type genus: *Plusia* Ochsenheimer, 1816

Autographini Eichlin & Cunningham, 1978
U. S. Dept. Agric. Tech. Bull., **1567**: 17
Type genus: *Autographa* Hübner, [1821]

Autographa Hübner, [1821]
Autographa Hübner, [1821], *Verz. bekannter Schmett*.: 251.
Type-species: *Phalaena gamma* Linnaeus, 1758, *Syst. Nat*. (Edn. 10), **1**: 513, by subsequent designation by Grote, 1896, *Entomologist's Rec. J. Var*., **8**: 303.

Autographa gamma (LINNAEUS, 1758)
Phalaena gamma Linnaeus, 1758. *Syst. Nat*. (Edn. 10), **1**: 513.
(Plate 4, Fig. 26 adult and Plate 9, Figs 66-67 ♂ genitalia)

References: *Autographa gamma* (BAROU, 1967); *Autographa gamma* (POOLE, 1989); *Autographa gamma* (HACKER, 1990); *Autographa gamma* (EBERT & HACKER, 2002); *Autographa gamma* (GOATER *et al.,* 2003: 223; pl. 15, figs 16-23; gen. figs 244, 311).

Types: [LS, London]: Europe.

Notes on systematics: The type species of the genus represents one of the most autapomorphic, if not the most autapomorphgic, lineages within the large and diverse genus.

Bionomics: *A. gamma* is practically continuously brooded in the southern Mediterranean, while in most parts of Europe it usually has three generations in a year. This species is one of the mpst common migratory moths in the Palearctic, a pest of field crops and of several garden and orchard plants. BECK (1960) recorded Lamium, Stachys, Galeopsis, Menta, Prunus, Rubus, Sambucus as Larval host-plants.

Distribution: Trans-Palearctic.

Flight period: February to December.

Elevation range: 20-2930 m

Distribution in Iran: Azerbaijan Gharbi. Azerbaijan Sharghi, Ardebil, Guilan, Mazandaran, Golestan, Khorassan, Tehran, Semnan, Qom, Qazvin, Zanjan, Kordestan, Kermanshah, Lorestan, Khuzestan, Kohkiluyeh va Boyerahmad, Chaharmahal va Bakhtiari, Esfahan, Fars, Bushehr, Kerman, Sistan va Balouchestan (Plate 16, Map 26).

Materials: -20 m to 2930 m, February to December.

Autographa jota (Linnaeus, 1758)
Phalaena jota Linnaeus, 1758. *Syst. Nat*. (Edn. 10), **1:** 513.
(Plate 4, Fig. 27 adult and Plate 9, Figs 68-69 ♂ genitalia)

References: *Autographa jota* (GOATER *et al.,* 2003: 227; pl. 15, figs 37-40; gen. figs 253, 318); *Autographa jota* (POOLE, 1989); *Autographa jota* (HACKER, 1990); *Autographa gamma* (BAROU, 1967).

Types: Lectotype: [Germany].

Notes on systematics: The type species of the genus represents one of the most autapomorphic, if not the most autapomorphgic, lineages within the large and diverse genus.

Bionomics: *A. jota* occurs in two conspicuously differently colour forms. In the southern Balkans and south-west Asia, Turkey, the Caucasus range and north-west Iran, populations are remarkably, and usually homogenously, paler pinkish, the median of the forewing not darkened strongly bellow cell, all elements of pattern less distinct, and the hindwing also paler than in specimens from the rest of the range (GOATER *et al.,* 2003).

Distribution: Western Palearctic.

Flight period: May to September.

Elevation range: 1250-2600 m.

Distribution in Iran: Azerbaijan Sharghi, Ardebil, Guilan, Mazandran, Golestan, Tehran and Fars (Plate 16, Map 27).

Materials: Azerbaijan Sharghi: Ghaleh Babak, Kaleybar, 1500 m., 5-VII-1997 (Mofidi & Barari). Ardebil: Khalkhal, Kuh-e-Almas, 1900 m., 30-VI-1997 (Barari & Mofidi); N Sahand Mts., 2440 m., 2-3-VIII-1992 (Parchami & Badii). Guilan: Rudbar, Amarlu (Jirandeh), Damash, N36º 45' 44.6", E49º 48' 16.8", 1750 m., 13-15-VI-2006 (Zahiri R. & Falsafi H.); Abish Gharah, Assalem, 1250 m., 30-VII-1976 (Pazuki & Borumand). Mazandran: Mazuchal, Hasan Kif, 1800 m., 13-VII-2000 (Ebrahimi,

Barari, Mofidi & Deuve); 2-3-VII-2000 (Barari, Mofidi & Deuve); Akapol, Rudbarak, Kelardasht, 1800 m., 1-IX-1990 (Ebrahimi & Badii); Dormod, Javaher Deh, Ramsar, 10-VII-2000 (Barari & Ebrahimi); Golestan: Sangdeh, Cheshmeh Bula, 1650 m., 25-VI-1998 (Mofidi). Tehran: Gachsar, 15 km E, 2600 m., 1-11-VII-1975 (Ebert); Polur, Nava Mountains, 1600 m., 13-VII-1976 (Zairi). Fars: Chahchenar, Mamasani, 3-19-V-1976 (Abai).

Cornutiplusia Kostrowicki, 1961
Cornutiplusia Kostrowicki, 1961. *Acta zool. cracov*., **6**: 432.
Type-spacies: *Phalaena circumflexa* Linnaeus, 1767, *Syst. Nat*. (Edn. 12), **1**: 844, by original designation.

Cornutiplusia circumflexa (Linnaeus, 1767)
Phalaena circumflexa Linnaeus, 1758. *Syst. Nat.* (Edn 12), **1:** 844.
(Plate 4, Fig. 28 adult and Plate 10, Figs 70-71 ♂ genitalia)

References: *Plusia circumflexa* (BIENERT, 1870); *Plusia circumflexa* (CHRISTOPH, 1873); *Syngrapha circumflexa* (REISSER, 1958); *Syngrapha circumflexa* (BAROU, 1967); *Cornitiplusia circumflexa* (HACKER & KAUTT, 1999); *Cornitiplusia circumflexa* (HACKER & MEINEKE, 2001); *Cornitiplusia circumflexa* (EBERT & HACKER, 2002).

Types: [Europe].

Notes on systematics: The type species of the genus represents one of the most autapomorphic, if not the most autapomorphgic, lineages within the large and diverse genus.

Bionomics: *Cornitiplusia circumflexa* is multivoltine in tropical and subtropical areas, migrating specimens have been found in the more temperate areas between February and November. The taxon is a xerothermophilous species, inhabiting dry steppes, semi deserts and deserts (GOATER *et al.,* 2003).

Distribution: Palaeotropical.

Flight period: February to December.

Elevation range: 0-3300 m.

Distribution in Iran: Azerbaijan Gharbi. Azerbaijan Sharghi, Ardebil, Guilan, Mazandaran, Golestan, Khorassan, Yazd, Tehran, Semnan, Qom, Markazi, Qazvin, Zanjan, Hamedan, Kordestan, Kermanshah, Lorestan, Ilam, Khuzestan, Kohkiluyeh va Boyerahmad, Chaharmahal va Bakhtiari, Esfahan, Fars, Bushehr, Kerman, Hormozgan & Sistan va Balouchestan (Plate 16, Map 28).

Materials: 0 m to 3300 m, February to December

Plusia Ochsenheimer, 1816
Plusia Ochsenheimer, 1816. *Schmett. Eur*., **4**: 89.
Type-species: *Phalaena festucae* Linnaeus, 1758, *Syst. Nat*. (Edn. 10), **1**: 513, by subsequent designation by Duponchel, 1826, *in* Godart & Duponchel, *Hist. nat. Lépid. Papillons Fr.*, **6**: [(3)].

Plusia festucae (Linnaeus, 1758)
Phalaena jota Linnaeus, 1758. *Syst. Nat*. (Edn 10), **1:** 513.
(Plate 4, Fig. 29 adult and Plate 10, Figs 72-73 ♂ genitalia)

References: *Plusia festucae* (EBERT & HACKER, 2002); *Plusia festucae* (GOATER *et al.,* 2003: 227; pl. 15, figs 37-40; gen. figs 253, 318); (POOLE, 1989); (HACKER, 1990); *Plusia festucae* (BAROU, 1967).

Types: [Europe]

Notes on systematics: taxon is a polytypic species, although in the western Palearctic variation occurs within populations rather than showing any remarkable geographic variation.

Importance: The species is often common along the pacific Coast (Russian Far East, Korea, Japan, and eastern China) where it may cause damage in paddy fields.

Bionomics: Bivoltine. A hygrophilous species, favouring cool and moist marshy and swampy

habitats, stream valleys and lake shores in both lowland and hilly areas (GOATER *et al.*, 2003). Larval host-plants are Poaceae (Graminae).

Distribution: Euro-Siberian.

Flight period: May to November.

Elevation range: -20-2900 m

Distribution in Iran: Azerbaijan Gharbi, Ardebil, Guilan, Mazandaran, Tehran, Khorasan, Esfahan, Charmahal va Bakhtiari and Fars (Plate 16, Map 29).

Materials: Azerbaijan Gharbi: Bashkand, Avajigh, Maku, 1400 m., 16-VI-1976 (Pazuki & Borumand); Bazargan, 1450 m., 6-VI-1975 (Abai); Habash-e-Sofla, Khoy, 1825, 19-20-VIII-1994 (Sarafrazi & Ebrahimi). Ardebil: Namin, 10 km N, 1450 m., 15-VIII-1991 (Hashemi & Parchami). Guilan: Abish-Gharah, Assalem, 1250 m., 30-VII-1976 (Pazuki & Borumand); Assalem, Talysch, 1300 m., 29-IX-1970 (Ebert); Assalem, 1800 m., 18-VII-1972 (Abai); Astara, 5-IX-1972 (Borumand & Zairi); Bandar-e-Anzali, 5 km E, 8-VIII-1974 (Mirzayans); 10-VII-1966 (Mirzayans); -20 m., 28-IX-1970 (Ebert); 14-VIII-1969 (Mirzayans); 2-VIII-1968 (Abai & Modj.); Daylaman, 12 km N, Siahkal, 1300 m., 13-VIII-1980 (Pazuki & Borumand); Gissum, Assalem, 160 m., 18-VIII-1980 (Pazuki & Borumand); Hashtpar, Assalem, 1250 m., 6-IX-1972 (Borumand & Zairi); Pissason, 15 km Assalem, 220 m., 30-VIII-1975 (Mirzayans); Pounel, 250 m., 12-VIII-1974 (Mirzayans & Ilkhani); Rasht, 0 m., 21-VII-1973; 22-XI-1972; 7-13-V-1973; 15-VII-1971; 8-X-1973 (Shenasi); 17-VI-2001 (Ghayourfar); Rasht, College of Agriculture, 0 m., 15-VII-2001 (Zahiri R.); Schondal, Assalem, 950 m., 9-VIII-1974 (Mirzayans); Sheykhmahal, Assalem, 160 m., 28-30-VI-1977 (Pazuki & Mortazaviha); Talesh, 100 m., 13-14-VIII-1991 (Hashemi & Parchami). Mazandaran: Amol, 7-VIII-1974 (Abai); Behshahr, Jangal-e-Duk, 840 m., 23-VI-1977 (Pazuki & Mortazaviha); Kelardasht, 24-VII-1976 (Zairi); Nowshahr, 29-X-1971 (Naim); Rostamrud, 6 km, Nur, 8-VIII-1980 (Pazuki & Borumand); Shahsavar envir. 0 m., 4-25-VI-1973 (Ebert); 7-VIII-1971 (Ghazioff); Tonekabon Laboratory, 1-V / 30-VII-1983 (Rudsari); 10-11-VIII-1980 (Pazuki & Borumand); Zirab, Palang Darreh, 540 m., 24-25-VI-1977 (Pazuki & Mortazaviha). Tehran: Ask, Damavand, Elburs Geb., Nordseite, 1800 m., 22-VII-1971 (Vartian E.); Evin, Tehran, 1600 m., 2-VIII-1971 (Light Trap); 27-IX-1972 (Ebert); Gatschsar, 15 km E, S-Seite, 2900 m., 10-12-VIII-1975 (Ebert & Falkner); Polur, Damavand (Elburs Mts.); 2500 m., 7-10-VII-1972 (Ebert & Falkner); Sir Ab, Elburs Mts., Tehran, 650 m., 17-VII-1961 (Anonymous leg.). Khorasan: Aladagh, Khosravieh, 1600 m., 16-VI-1974 (Radjabi & Pazuki). Esfahan: Sericheh, Niasar, Kashan, 1650 m., 29-31-VII-1983 (Pazuki & Hashemi). Charmahal va Bakhtiari: Ardal, 1720 m., 5-IX-1991 (Ebrahimi & Badii). Fars: Kanezenian, Shiraz, 2000 m., 18-V-1974 (Abai & Pazuki).

Discussion

This paper comprises the full information about the subfamily in Iran avaible for the authors. However, through future examinations and field works we do expect the list of Iranean Plusiinae could be expanded by several species, both such which occur in the bordering contries to Iran as well as new species, undescribed.

Acknowledgements

The authors extend their sincere thanks to Dr. Laszlo Ronkay, Hungarian Natural History Museum, Budapest; Dr. Ebrahim Ebrahimi, curator of HMIM and head of the ITRD, IRIPP (former PPDRI); Dr. Martin Lödl, Naturhistorisches Museum Wien, Austria; Dr. Ian J. Kitching, British Musem Natural History, London; Mr. Hermann H. Hacker, Staffelstein, Germany; Dr. Gunter Ebert, Staatliches Museum für Naturkunde Karlsruhe (SMNK); Dr. Robert Trusch, Staatliches Museum für Naturkunde Karlsruhe (SMNK); Dr. Axel Hausmann, Zoologische Staatssammlung München (ZSM); Mr. Filippe Fastre, Belgium; Dr. Wolfgang Speidel, Zoologisches Museum Witt, München (ZMWM); Mr. Bernard Plössl, Innsbruck, Austria and Mr. Gottfried Behounek, Munich, Germany for the loan of the specimens discussed herein, collaboration, and for discussions and suggestions. The authors are grateful to Eng.

Ali Pazuki; Eng. H. Borumand; Eng. H. Mirzayans; Prof. Dr. M. Abai; Prof. Dr. Rajabi and another colleagues of Insect Taxonomy Research Department (ITRD) who collectiong the materials for Hayk Mirzayans Insect Museum (HMIM) during the past 40 years. The authors also sincerely thank Prof. Dr. Gerhard Tarmann, Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria, who supplied the BIOOFFICE software permits and Mrs Mariann Fibiger for correcting the manuscript into English.

BIBLIOGRAPHY

BAROU, P. J., 1967.– Contribution a la connaissance la faune des Lépidoptères de l'Iran.– *Entomologie Phytopath. appl.,* **26**: 41-58, 1–122.

DUFAY, C., 1963.– Descriptions de trois nouvelles espèces d'*Euchalcia* Hb. d'Asie antérieure (Lep. Noctuidae Plusiinae).– *Bull. mens. Soc. linn. Lyon*, **32**: 68-72.

DUFAY, C., 1968.– Révision des Plusiinae Palearctiques I. Monographie du Genre *Euchalcia* Hübner.– *Veröff. zool. StSamml. Münch.*, **12**: 21-154.

DUFAY, C., 1969.– Description d'*Euchalcia stilpna* n. sp., de I'Iran (Lep. Noctuidae, Plusiinae). *Opusc. zool.*, **110**: 1-4.

DUFAY, C., 1972.– Descriptions de nouveaux africains (Lep. Noctuidae).–*Bull. mens. Soc. linn. Lyon*, **41**: 65-72, 93-111.

DUFAY, C., 1974.– Descriptions de nouveaux Plusiinae Indo-Australiens et Neotropicaux (Lep. Noctuidae).– *Bull. mens. Soc. linn. Lyon*, **43**: 102-111.

DUFAY, C., 1978.– Descriptions de nouveaux Plusiinae (Lepidoptera, Noctuidae).– *Bull. mens. Soc. linn. Lyon*, **47**: 71-76.

EBERT, G. & HACKER, H. H., 2002.– Beitrag zur Fauna der Noctuidae des Iran: Verzeichnis der Bestände im Staatlichen Museum für Naturkunde Karlsruhe, taxonomische Bemerkungen und Beschreibung neuer Taxa (Noctuidae, Lepidoptera).– *Esperiana*, **9**: 237-409.

EICHLIN, T. D. & CUNNINGHAM, H. B., 1978.– The Plusiinae (Lepidoptera: Noctuidae) of America north of Mexico, emphasizing genitalic and larval morphology.– *U. S. Dept. Agric. Thech. Bull.*, **1567**: 1-222.

FIBIGER, M. & LAFONTAINE, J. D., 2005.– A review of the higher classification of the Noctuoidea (Lepidoptera) with special reference to the Holarctic fauna.– *Esperiana*, **11**: 7-82.

FIBIGER, M. & HACKER, H. H., 2005.– Systematic List of the Noctuoidea of Europe (Notodontidae, Nolidae, Arctiidae, Lymantriidae, Erebidae, Micronoctuidae and Noctuidae).– *Esperiana*, **11**: 83-175.

GOATER, B., RONKAY, L. & FIBIGER, M., 2003.– *Noctuidae Europaeae, Catocalinae and Plusiinae*, **10**: 452 pp. Entomological press, Sorø.

GUTLEB, B. & WIESSER, C., 2001.– Nordiran, Ergebnisse einer zoologischen Exkursion.– *Carinthina* II, **2001**: 33-140.

HACKER, H. H., 1990.– Die Noctuidae Vorderasiens (Lepidoptera), Systematische Liste mit einer Übersicht über die Verbreitung unter besonderer Berücksichtigung der Fauna der Türkei (einschlielich der Nachbargebiete Balkan, Südruland, Westtukestan, Arabische Halbinsel, Ägypten).– *Neue Ent. Nachr.*, **27**: 1-707.

HACKER, H. H. & KAUTT, P., 1999.– Noctuoidea aus dem Iran, gesammelt 1997 von A. Hofmann und P. Kautt (Insecta, Lepidoptera).– *Esperiana*, **7**: 473-484.

HACKER, H. H. & MEINEKE, J-U., 2001.– Beitrag zur Fauna der Noctuidae des Iran: Ergebnisse von Forschungen der Jahre 1998 bis 2000 (Lepidoptera).– *Esperiana*, **8**: 791-810.

HAMPSON, G. F., 1913.– *Catalogue of the Lepidoptera Phalaenae in the British Museum*, **13**: xiv+ 609 pp., plates 222-239. Taylor & Francis, London.

HEPPNER, J. B., 1991.– Classification of Lepidoptera.– *Holarctic Lepid.*, **5**(1) supplement **1**: 1-148.

HOLLOWAY, J. D., 1985.– The moths of Borneo: family Noctuidae: subfamilies Euteliinae, Stictopterinae, Plusiinae, Pantheinae.– *Malayan Nat. J.,* **38:** 157-317.

KALALI, G. H., 1976.– A list of Lepidoptera from Province of Khorasan (Iran). – *J. ent. Soc. Iran,* **3** (fi): 131-135.

KITCHING, I. J., 1984.– An historical review of the higher classification of the Noctuidae (Lepidoptera).– *Bull. Br. Mus. nat. Hist*., **49**: 153-234.

KITCHING, I. J., 1987.– Spectacles and Sinlver Ys: a synthesis of the systematics, cladistics and biology of the Plusiinae (Lepidoptera: Noctuidae).– *Bull. Br. Mus. nat. Hist*., **54** (2): 261 p.

KITCHING, I. J. & RAWLINS, J. E., 1999.– The Noctuoidea. pp. 355–401. *In* N. P. KRISTENSEN (Ed.).

Lepidoptera: Moths and Butterflies. Volume 1: Evolution, Systematics and Biogeography.– *Handbook of Zoology / Handbuch der Zoologie*, **4**(35): X + 1-491. Walter de Gruyter, Berlin - New York.

LAFONTAINE, J. D. & FIBIGER, M., 2006.– Revised Higher Classification of the Noctuoidea (Lepidoptera).– *Bull. ent. Soc. Can.,* **138**: 610–635.

MIRZAYANS, H. & KALALI, G. H., 1970.– Contribution a la connaissance la faune des Lépidoptères de l'Iran (2).– *Entomologie et Phytopath. appl.,* **29**: 15-23.

MITCHELL, A., MITTER, C. & REGIER, J. C., 2005.– Systematics and evolution of the cutworm moths Lepidoptera: Noctuidae): evidence from two protein-coding nuclear genes.– *Syst. Ent*.: 10.1111/j.1365-3113.2005.1-26.

MODARRES AWAL, M., 1994.– *List of Agricultural Pests and Their Natural Enemies in Iran*: 364 pp. Ferdowsi University Press, Mashhad.

MODARRES AWAL, M., 1997.– *List of Agricultural Pests and Their Natural Enemies in Iran* (2nd Edition): 429 pp. Ferdowsi University Press, Mashhad.

MODARRES AWAL, M., 1999.– A List of noctuid moths (Lep.: Noctuidae) of northern Khorassan.– *Scient. Jl. agric.,* **21** (1-2): 37-50.

POOLE, R. W., 1989.– Noctuidae, 1-3, *in* J. HEPPNER (ed.).– *Lepidopterorum Catalogus* (New Series), Fasc., **118**: 1314 pp. E. J. Brill / Flora & Fauna Publications, Leiden-New York-Kobenhavn-Köln.

RONKAY, L., 1982.– Plusiinae (Lepidoptera, Noctuidae) from Korea.– *Folia ent. hung.,* **43**: 137-145.

SCHWINGENSCHUSS, L., 1937.– Weitere Neuheiten aus Nord-Persien.– *Z. öst. EntVer*., **22**: 57-60.

SCHWINGENSCHUSS, L., 1939a.– Beitrag zur Lepidopterenfauna von Iran (Persien) insbesondere im Nordiran.– *Ent. Z., Frankf. a .M.*, **53**: 13-14, 36-38, 62-64, 86-88, 95-96, 125-128, 135-136, 149-152, 166-168.

SCHWINGENSCHUSS, L., 1939b.– Beitrag zur Lepidopterenfauna von Iran (Persien) insbesondere im Nordiran.– *Ent. Rdsch*., **53**: 200-210.

SPEIDEL , W., FÄNGER, H. & NAUMANN, C. M., 1996.– The phylogeny of the Noctuidae (Lepidoptera).– *Syst. Ent*., **21**: 219–251.

VARGA, Z. & RONKAY, L., 1991.– Taxonomic studies on the palaearctic Noctuidae (Lepidoptera). 1. New taxa from Asia.– *Acta zool. hung*., **37**(3-4): 263-312.

WILTSHIRE, E. P., 1945.– 70 new records of Lepidoptera from Iran and a few notes on Persian Rhopalocera.– *Entomologist's Rec. J. Var*., **57**: 77-85.

WILTSHIRE, E. P., 1971.– Österreichische Expeditionen nach Persien und Afghanistan. Beiträge zur Lepidopterfauna, Teil 15 Noctuidae-Quadrifinae.– *Annln. naturh. Mus. Wien*, **75**: 627-649.

ZAHIRI, R., PLÖSSL, B. & TARMANN, G., 2007.– *Ctenoplusia vittata* (Wallengren, 1856) (Lepidoptera: Noctuidae): a new genus and species record for Iran.– *Zoology in the Middle East*, **40**: 115.

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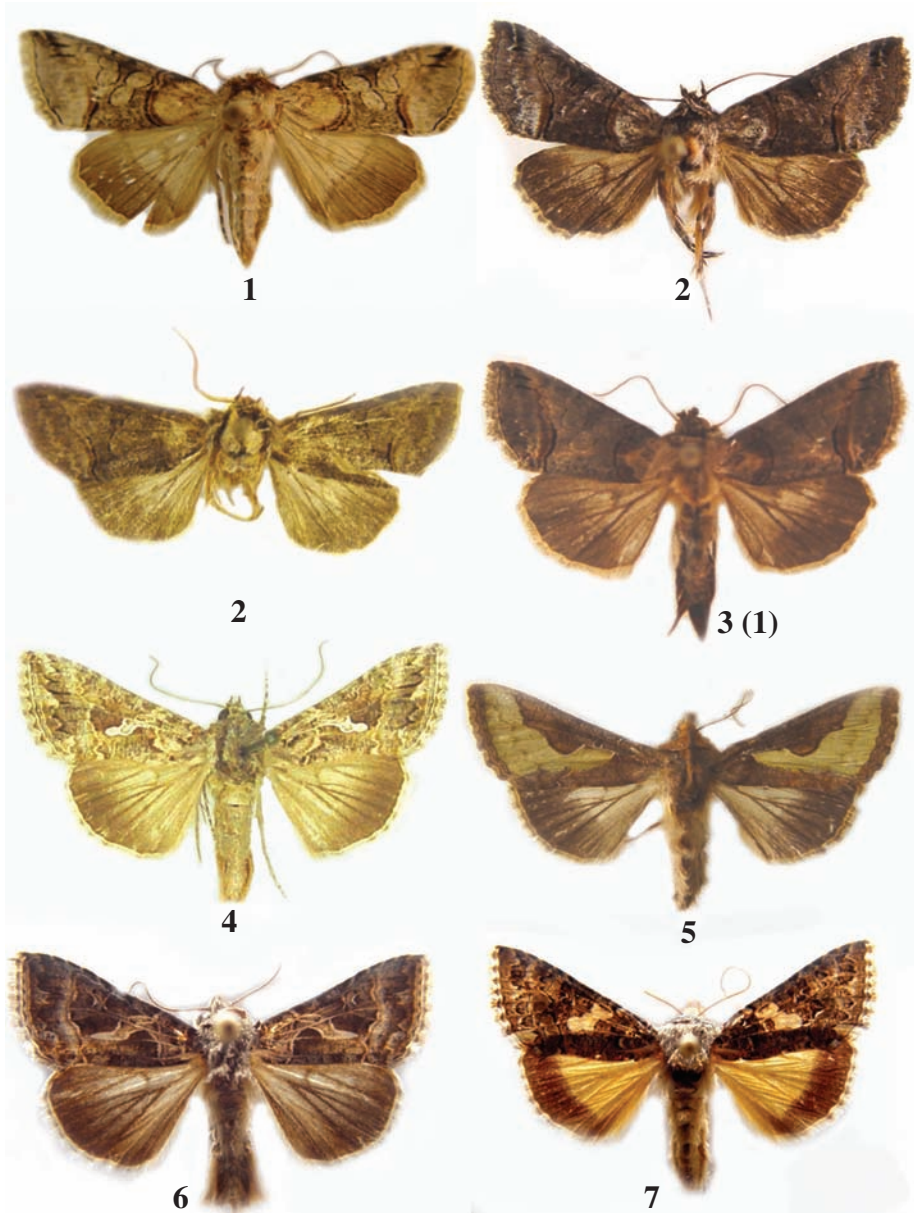
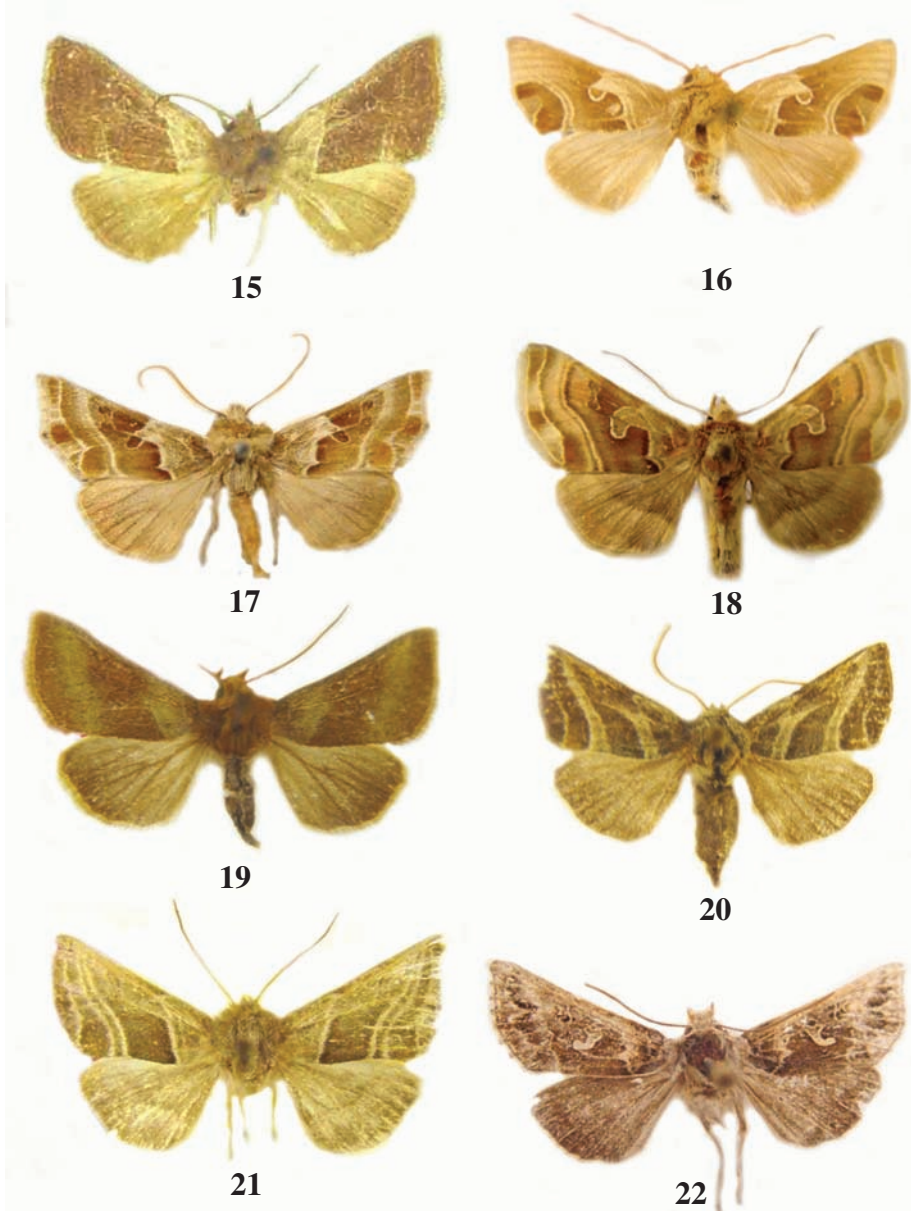
(Recibido para publicación / *Received for publication* 14-II-2008)
(Revisado y aceptado / *Revised and accepted* 16-III-2008)

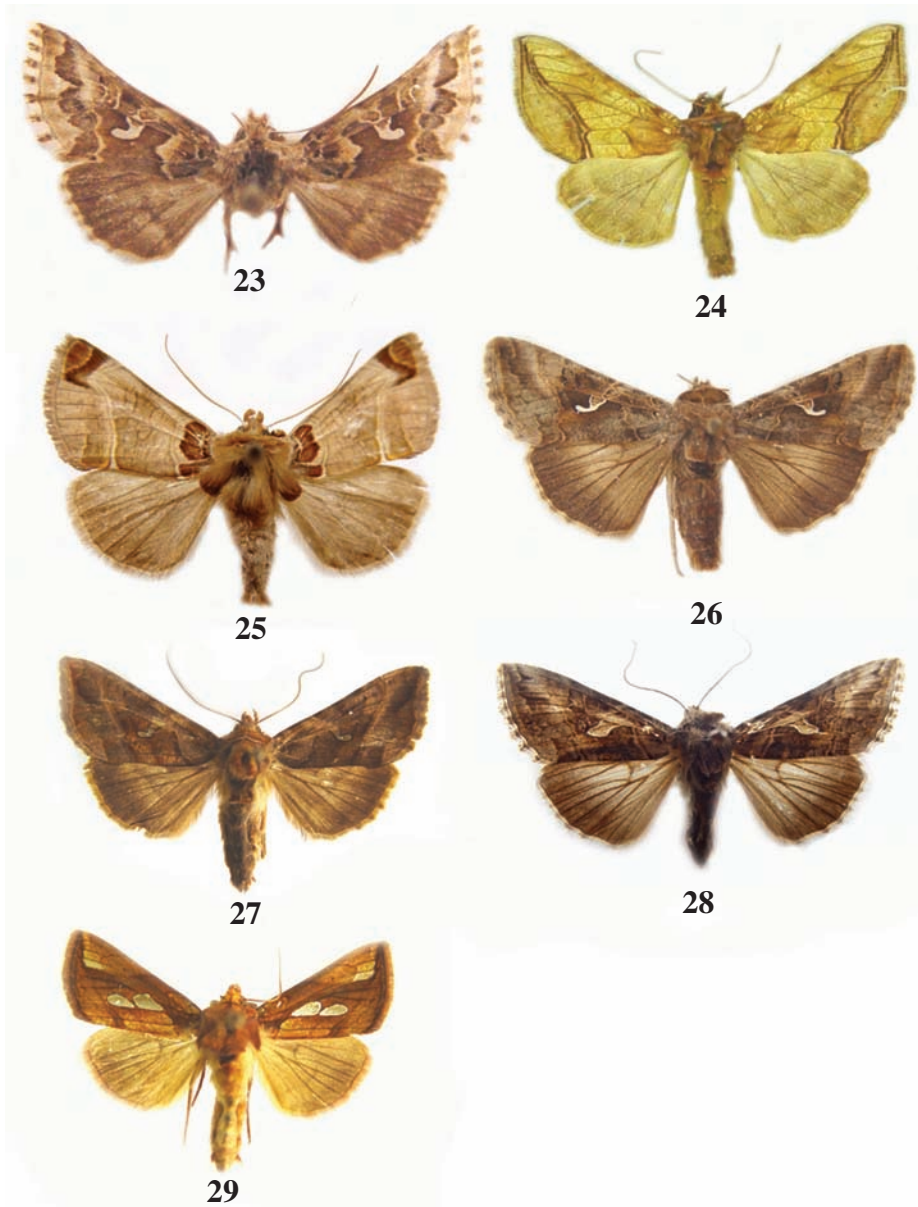


Figs. 1-7.–1. *Abrostola clarissa* (Staudinger, 1900), (HMIM). **2.** *Abrostola tripartita* (Hufnagel, 1766), (HMIM). **3-3(1).** *Abrostola hyrcanica* Hacker, 2002; **3.** holotype (SMNK); **3(1).** adult male, (HMIM). **4.** *Trichoplusia ni* (Hübner, [1803]), cotype, Italia Central, Mti Sabini, coll. F. Dannehl, (ZSM). **5.** *Thysanoplusia (Thysanoplusia) orichalcea* (Fabricius, 1775), (HMIM). **6.** *Thysanoplusia (Daubeplusia) daubei* (Boisduval, 1840), (HMIM). **7.** *Thysanoplusia exquisatella* (Strand, 1916), (HMIM).

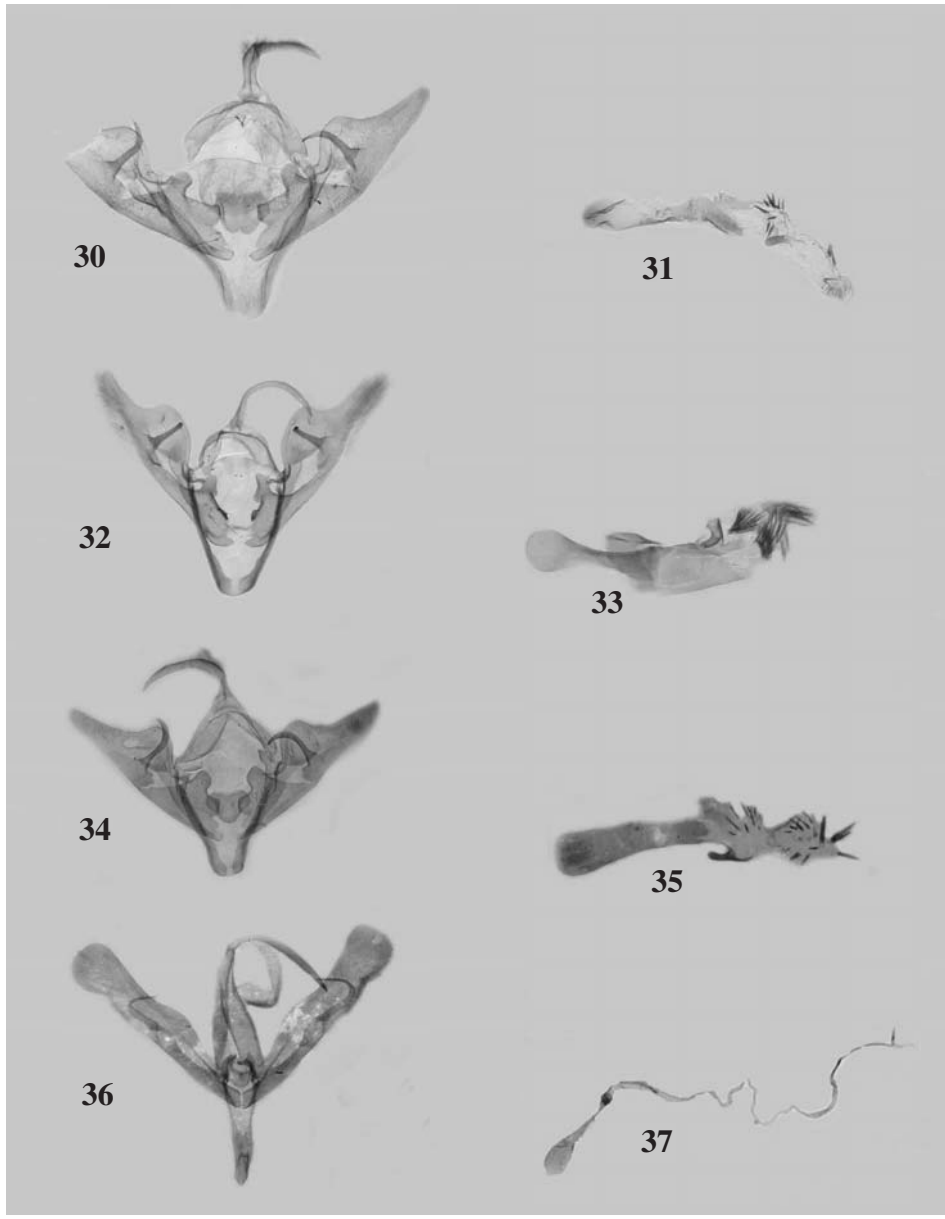
Figs. 8-14.– 8. *Ctenoplusia vittata* (Wallengren, 1856), Malaysia, Staatliches Museum für Naturkunde Stuttgart. **9.** *Chrysodeixis chalcites* (Esper, [1789]), (HMIM). **10.** *Macdunnoughia confusa* (Stephens, 1850), (HMIM). **11.** *Diachrysia chryson* (Esper, [1789]), (HMIM). **12.** *Diachrysia generosa* (Staudinger, 1900), (HMIM). **13.** *Diachrysia stenochrysis* (Warren, 1913), (HMIM). **14-14(1).** *Euchalcia stilpna* Dufay, 1969; **14.** holotype (ZSM); **14(1)** adult male, (HMIM).



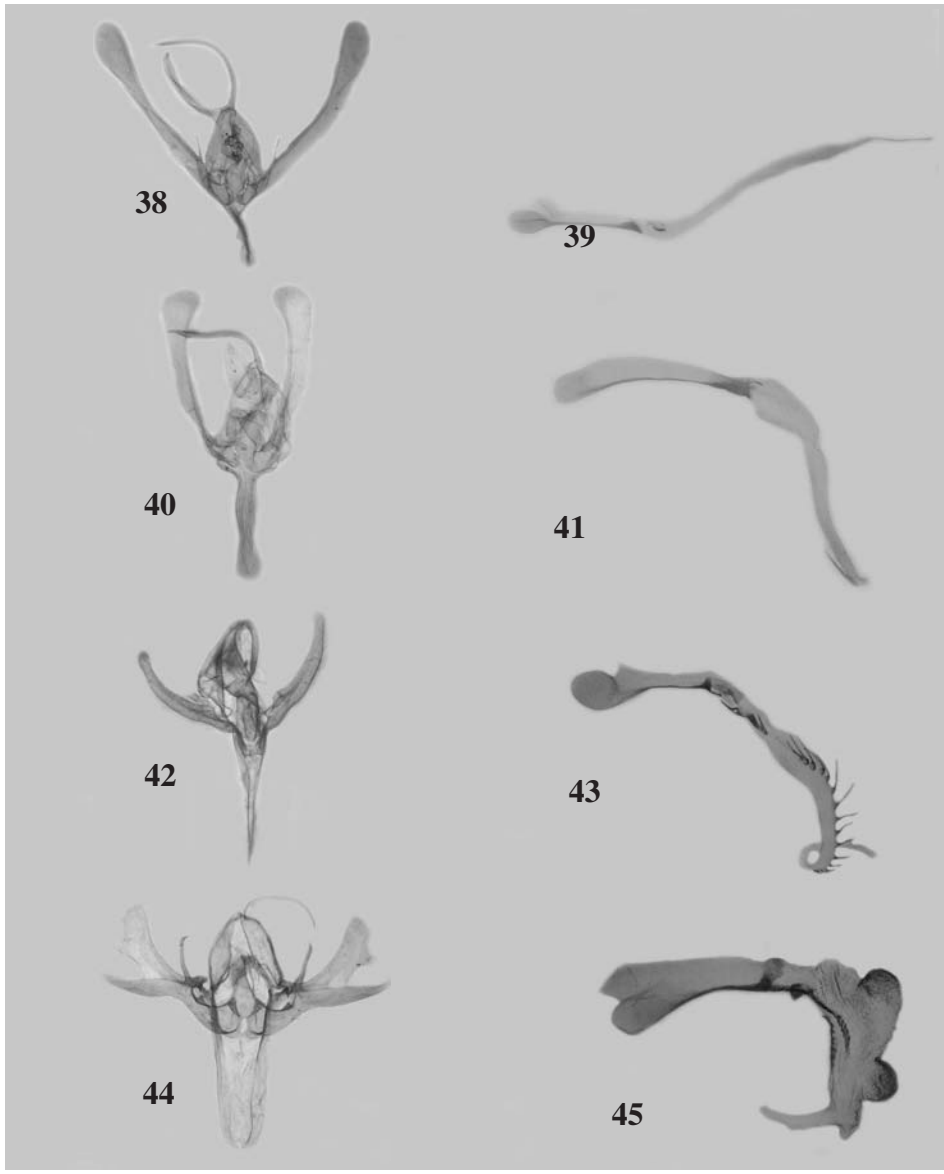
Figs. 15-22.–15. *Euchalcia emichi* (Rogenhofer, 1873), (HMIM). **16.** *Euchalcia taurica* (Osthelder, 1933), (HMIM). **17.** *Euchalcia chalcophanes* Dufay, 1963, paratype (ZSM). **18**. *Euchalcia hyrcaniae* Dufay, 1963, holotype (ZSM). **19.** *Euchalcia hedeja* Dufay, 1978, holotype (SMNK). **20.** *Euchalcia viridis* (Staudinger, 1901) (SMNK). **21.** *Euchalcia incredibilis* Hacker & Ebert, 2002, holotype (SMNK). **22.** *Desertoplusia bella* (Christoph, 1887), (HMIM).



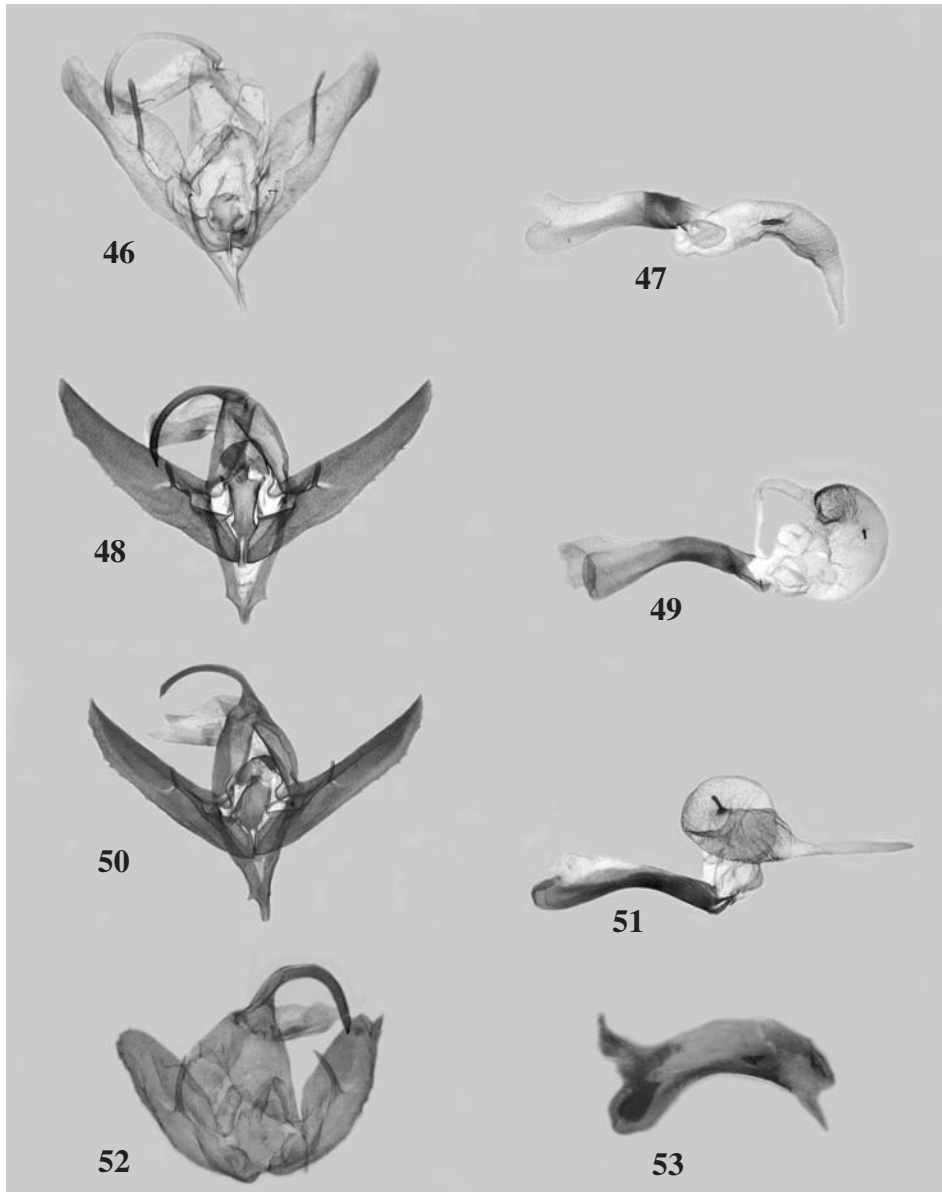
Figs. 23-29.– 23. *Desertoplusia colornata* Varga & Ronkay, 1991, (HMIM). **24.** *Panchrysia (Panchrysia) deaurata* (Esper, 1787), (ZSM). **25.** *Plusidia cheiranthi* (Tauscher, 1809), (HMIM). **26.** *Autographa gamma* (Linnaeus, 1758), (HMIM). **27.** *Autographa jota* (Linnaeus, 1758), (HMIM). **28.** *Cornutiplusia circumflexa* (Linnaeus, 1767), (HMIM). **29.** *Plusia festucae* (Linnaeus, 1758), (HMIM).



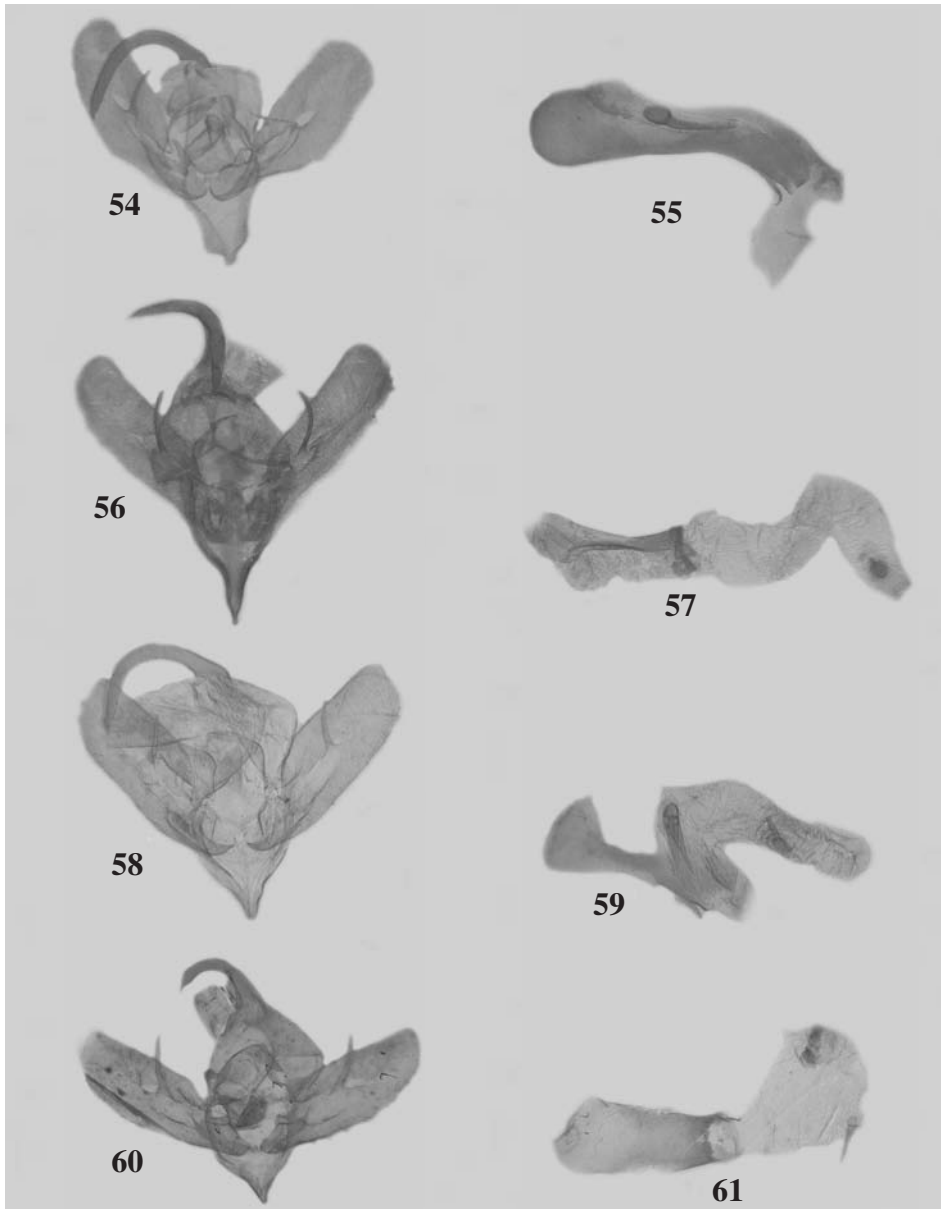
Figs. 30-37.– 30-31. *Abrostola clarissa* (Staudinger, 1900)*,* male genitalia; **30.** valva; **31.** aedeagus (HMIM). **32-33.** *Abrostola tripartita* (Hufnagel, 1766)*,* male genitalia; **32.** valva; **33.** aedeagus (HMIM). **34-35.** *Abrostola hyrcanica* Hacker, 2002*,* male genitalia; **34.** valva; **35.** aedeagus (HMIM). **36-37.** *Trichoplusia ni* (Hübner, [1803])*,* male genitalia; **36.** valva (HMIM); **37.** aedeagus (USA, borrowing from GOATER *et al*., 2003, MF permission)



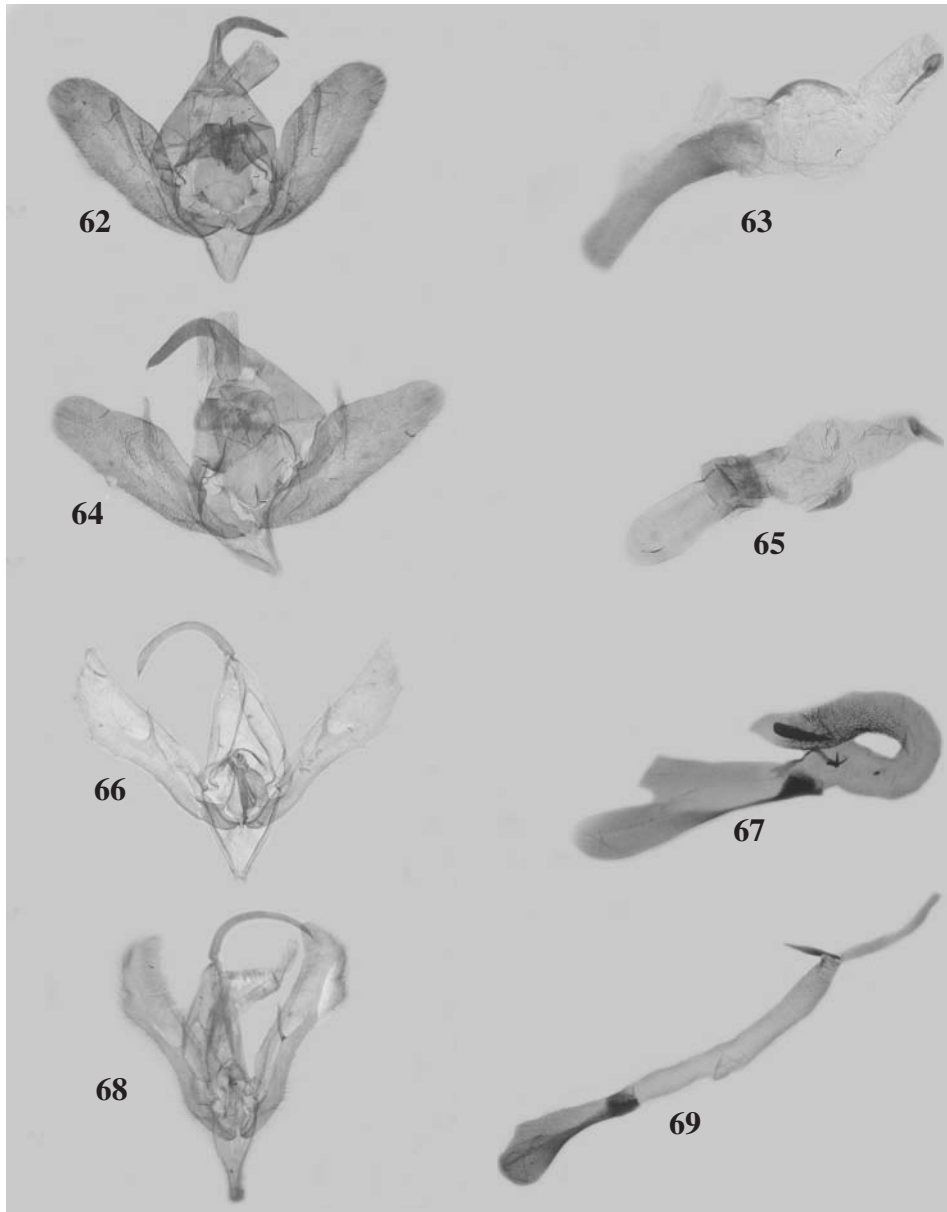
Figs. 38-45.– 38-39. *Thysanoplusia* (*Thysanoplusia*) *orichalcea* (Fabricius, 1775), male genitalia; **38.** valva (HMIM); **39.** aedeagus (Nepal, borrowing from Goater *et al*. 2003, MF permission). 40-41. *Thysanoplusia* (*Daubeplusia*) *daubei* (Boisduval, 1840), male genitalia; **40.** valva (HMIM); **41.** aedeagus (Spain, borrowing from GOATER *et al*., 2003, MF permission). **42-43.** *Chrysodeixis chalcites* (Esper, [1789]), male genitalia; **42.** valva (HMIM); **43.** aedeagus (Malta, borrowing from GOATER *et al*., 2003, MF permission). **44-45.** *Macdunnoughia confusa* (Stephens, 1850), male genitalia; **44.** valva (HMIM); **45.** aedeagus (Bulgaria, borrowing from Goater *et al*. 2003, MF permission)



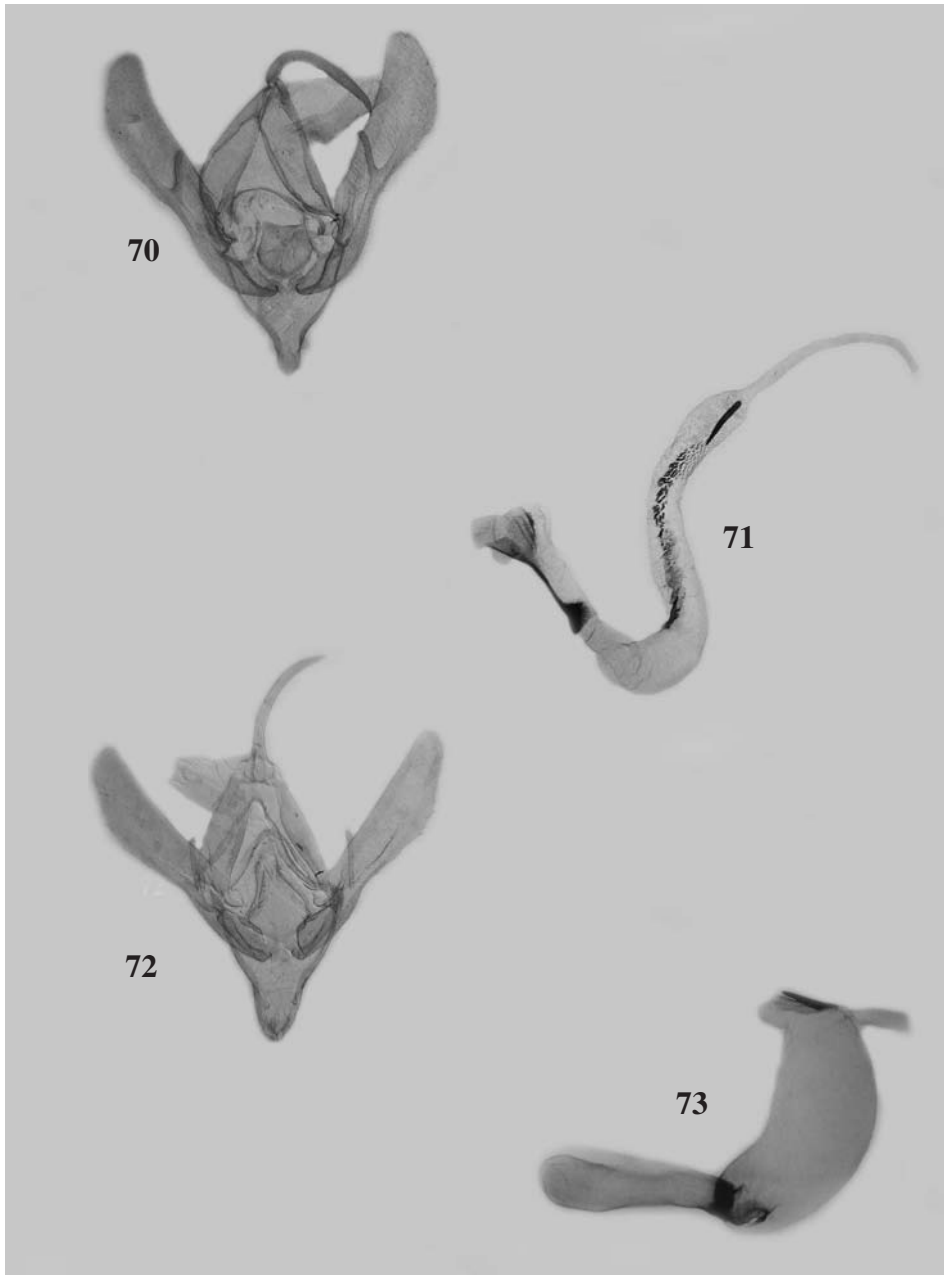
Figs. 46-53.– 46-47. *Diachrysia chryson* (Esper, [1789]), male genitalia; **46.** valva (HMIM); **47.** aedeagus (Hungary, borrowing from GOATER *et al*., 2003, MF permission). **48-49.** *Diachrysia generosa* (Staudinger, 1900), male genitalia; **48.** valva; **49.** aedeagus (Armenia, borrowing from GOATER *et al*., 2003, MF permission). **50-51.** *Diachrysia stenochrysis* (Warren, 1913), male genitalia; **50.** valva; **51.** aedeagus (Mongolia, borrowing from Goater *et al*. 2003, MF permission). **52-53.** *Euchalcia stilpna* Dufay, 1969, male genitalia; **52.** valva; **53.** aedeagus (HMIM).



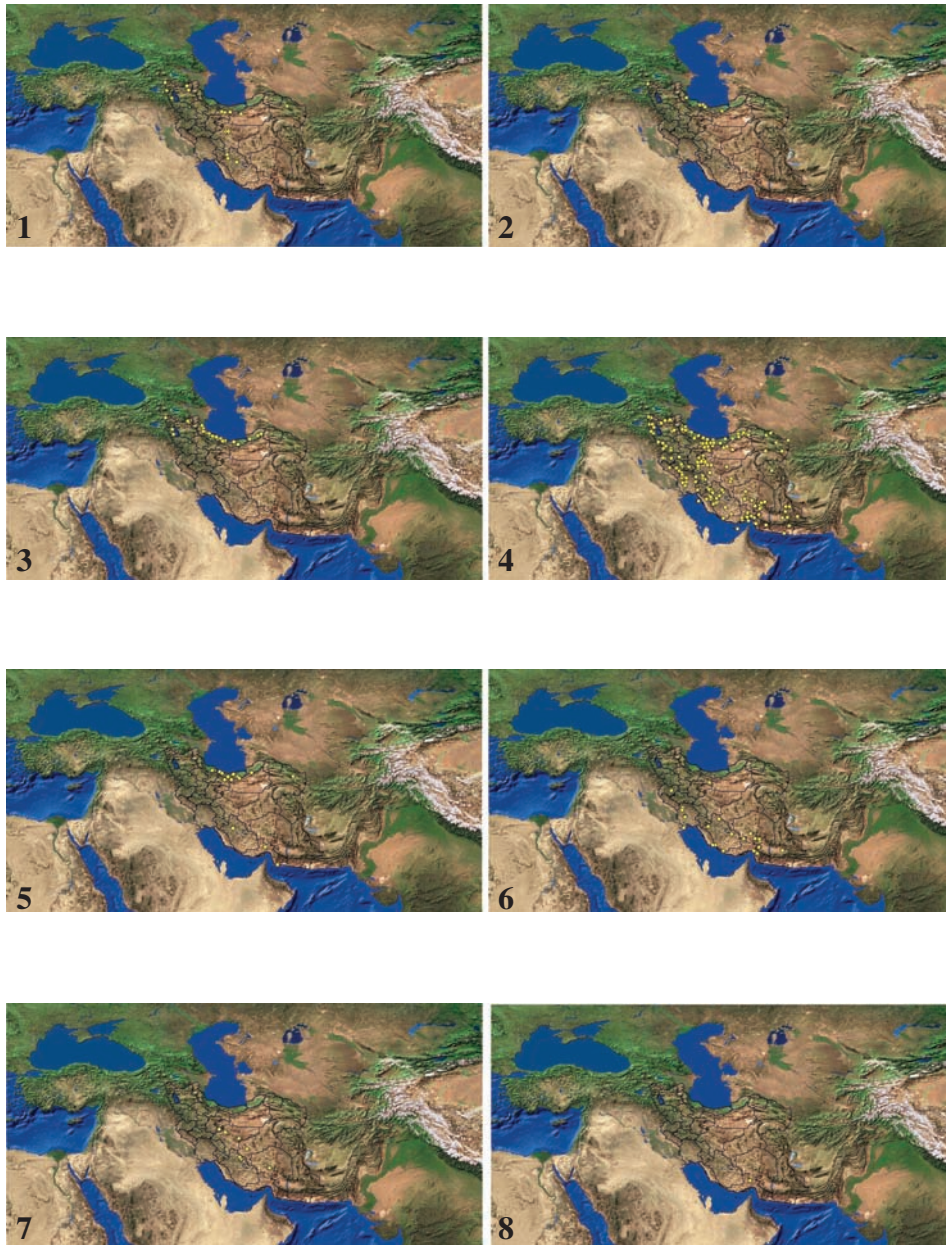
Figs. 54-61.– 54-55. *Euchalcia emichi* (Rogenhofer, 1873), male genitalia; **54.** valva; **55.** aedeagus (HMIM). **56-57.** *Euchalcia taurica* (Osthelder, 1933), male genitalia; **56.** valva; **57.** aedeagus (HMIM). **58-59.** *Euchalcia chalcophanes* Dufay, 1963, male genitalia; **58.** valva; **59.** aedeagus (HMIM). **60-61.** *Euchalcia incredibilis* Hacker & Ebert, 2002, male genitalia; **60.** valva; **61.** aedeagus (Paratype, Hacker Coll., borrowing from EBERT & HACKER 2002).



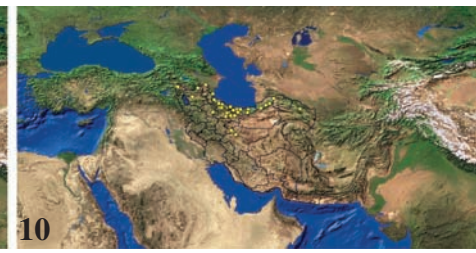
Figs. 62-69.– 62-63. *Desertoplusia bella* (Christoph, 1887), male genitalia; **62.** valva; **63.** aedeagus (HMIM). **64-65.** *Desertoplusia colornata* Varga & Ronkay, 1991, male genitalia; **64.** valva; **65.** aedeagus (HMIM). **66-67.** *Autographa gamma* (Linnaeus, 1758), male genitalia; **66.** valva; **67.** aedeagus (Bulgaria, borrowing from GOATER *et al*., 2003, MF permission). **68-69.** *Autographa jota* (Linnaeus, 1758), male genitalia; **68.** valva; **69.** aedeagus (Finland, borrowing from GOATER *et al*., 2003, MF permission).

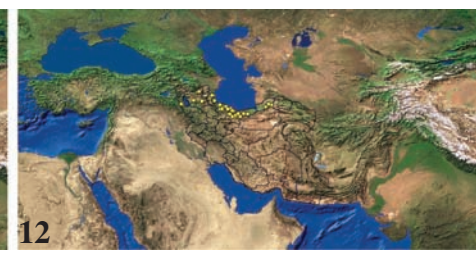


Figs. 70-73.–70-71. *Cornutiplusia circumflexa* (Linnaeus, 1767), male genitalia; **70.** valva; **71.** aedeagus (Turkmenia, borrowing from Goater *et al*., 2003, MF permission). **72-73.** *Plusia festucae* (Linnaeus, 1758), male genitalia; **72.** valva; **73.** aedeagus (Denmark, borrowing from GOATER *et al*., 2003, MF permission).

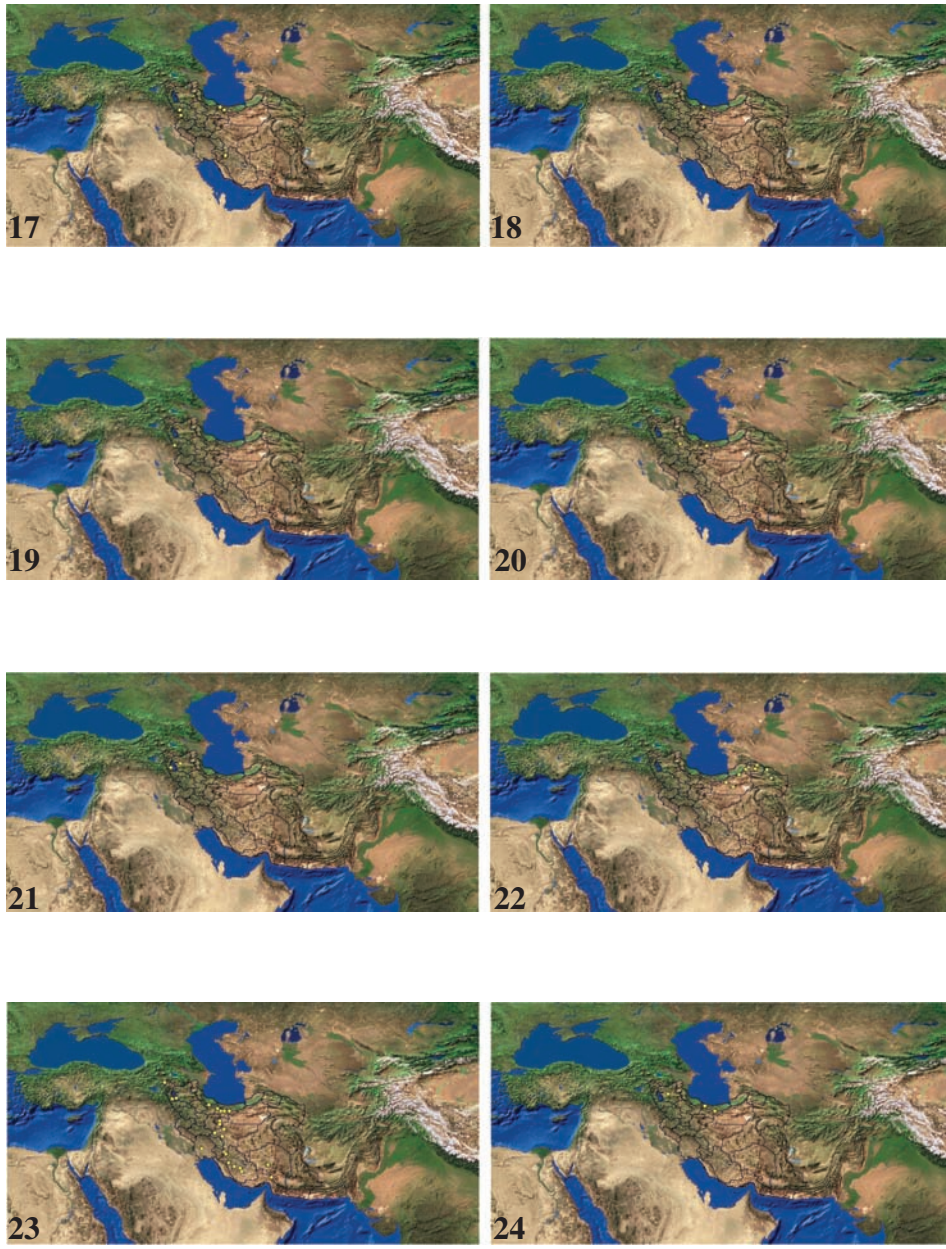


Maps 1-8.– Distribution in Iran, **1.** *Abrostola clarissa* (Staudinger, 1900). **2.** *Abrostola tripartita* (Hufnagel, 1766). **3.** *Abrostola hyrcanica* Hacker, 2002. **4.** *Trichoplusia ni* (Hübner, [1803]). **5.** *Thysanoplusia orichalcea* (Fabricius, 1775). **6.** *Thysanoplusia* (*Daubeplusia*) *daubei* (Boisduval, 1840). **7.** *Thysanoplusia exqusatella* (Strand, 1916). **8.** *Ctenoplusia vittata* (Wallengren, 1856).

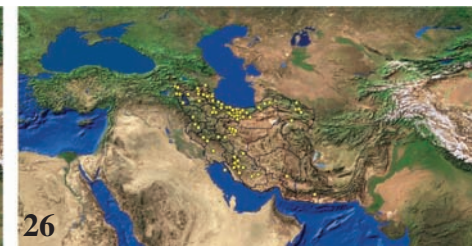


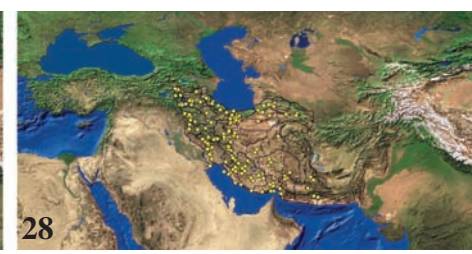


Maps 9-16.– Distribution in Iran, **9.** *Chrysodeixis chalcites* (Esper, [1789]). **10**. *Macdunnoughia* (*Macdunnoughia*) *confusa* (Stephens, 1850). **11.** *Diachrysia chryson* (Esper, [1789]). **12.** *Diachrysia generosa* (Staudinger, 1900). **13.** *Diachrysia stenochrysis* (Warren, 1913). **14.** *Euchalcia stilpna* Dufay, 1969. **15.** *Euchalcia emichi* (Rogenhofer, 1873). **16.** *Euchalcia taurica* (Osthelder, 1933).



Maps 17-24.– Distribution in Iran, **17.** *Euchalcia chalcophanes* Dufay, 1963. **18.** *Euchalcia hyrcaniae* Dufay, 1963. **19.** *Euchalcia hedeja* Dufay, 1978. **20.** *Euchalcia viridis* (Staudinger, 1901). **21.** *Euchalcia incredibilis* Hacker & Ebert, 2002. **22.** *Desertoplusia bella* (Christoph, 1887). **23.** *Desertoplusia colornata* Varga & Ronkay, 1991. **24.** *Panchrysia deaurata* (Esper, [1787]).





Maps 25-30.– Distribution in Iran, **25.** *Plusidia cheiranthi* (Tauscher, 1809). **26.** *Autographa gamma* (Linnaeus, 1758). **27.** *Autographa jota* (Linnaeus, 1758). 28. *Cornutiplusia circumflexa* (Linnaeus, 1758). 29. *Plusia festucae* (Linnaeus, 1758). **30.** Provinces of Iran. 1- West Azerbaijan, 2- East Azerbaijan, 3- Ardebil, 4- Guilan, 5- Mazandaran, 6- Golestan, 7- Khorassan [Khorassan has recently divided into 3 provinces: 7(1): North Knorassan; 7(2): Razavi Khorassan; 7(3): South Khorassan], 8- Semnan, 9- Tehran, 10- Qazvin, 11- Zanjan, 12- Kordestan, 13- Kermanshah, 14- Hamedan, 15- Markazi, 16- Qom, 17- Esfehan, 18- Yazd, 19- Lorestan, 20- Ilam, 21- Khuzestan, 22- Chahar Mahal va Bakhtiari, 23- Kohkiluye va Boyer-Ahmad, 24- Fars, 25- Bushehr, 26- Kerman, 27- Hormozgan & 28- Sistan va Balouchestan