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An annotated checklist of *Euxoa* Hübner, [1821] (Lepidoptera: Noctuidae: Noctuinae) species of Iran

Ehsan KAZEMI

Member of Young Researchers and Elites Club, Kerman Branch, Islamic Azad University, Kerman, Iran.
E-mail: ekazemi.kazemi86@gmail.com

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Abstract. A list of Iranian *Euxoa* Hübner, [1821] species is provided mainly based on the literatures since the begining of the twenteth century. Beside, some records were obtained from the study of material deposited in the Collection of Entomology, Shahid Bahonar University of Kerman, as well as the recent expeditions carried out on the fauna of Noctuidae family in Iran. This paper includes a checklist of 48 species and subspecies of *Euxoa* in Iran. Provincial distribution, citation of the original description, type locality and synonymy of each species and subspecies is presented.

Key words: checklist, *Euxoa*, Iran, Noctuidae, type locality.

Introduction

The subfamily Noctuinae has been studied by several authors (e.g. Fibiger 1990, Lafontaine 2004, Lafontaine & Fibiger 2004). The monophyly of Noctuinae is defined by 10 apomorphic character states although all are not presented within the same species (Fibiger 1997). This subfamily is now classified into 2 tribes, namely Agrotini Rambur and Noctuini Latreille, of these, the Agrotini has worldwide distribution and includes two subtribes Agrotina Rambur and Austrandesiina Angulo and Olivares (Lafontaine & Fibiger 2006). The members of Agrotini can be diagnosed by their frons which is either bulging or bears a central process, and by their foretibia which usually has rows of setae on both sides (Pogue 2006). Another synapomorphy for Agrotini is the presence of long, tubular vesica of male genitalia (Varga et al. 1990). The most species (belonging to 25 genera) of the subtribe Austrandesiina are restricted to South America and just *Peridroma saucia* (Hübner) representatives this subtribe worldwide (Fibiger & Lafontaine 2005) while the subtribe Agrotina is widespread throughout the world.

The subtribe Agrotina comprises 10 genera (sensu Fibiger & Lafontaine 2005), namely *Striacosta* Lafontaine, *Acetabia* Stephens, *Dichagyris* Lederer, *Eucoptocnemis* Grote, *Richia* Grote, *Copablepharon* Harvey, *Protogygia* McDunnough, *Euxoa* Hübner, *Feltia* Walker and *Agrotis* Ochsenheimer. Diagnostic features of the genuse *Euxoa* Hübner [1821], compared to its other congeners, are the presence of succular extension in the male valva and the presence of sclerotised plates in the wall of the ductus bursae in the female genitalia (Fibiger 1997).

As the members of this genus have a wide range of distribution all over the world, it is expected to be dispersed in different climatological regions in Iran, too. This paper contains a checklist of 48 species and subspecies of the genus *Euxoa* distributed in different provinces of Iran.

Materials and methods

During the recent expeditions, the moth specimens were collected using both portable and permanent light traps in different provinces of Iran, mainly in South and Southeast of the country. Data of collected material were obtained from a four years sampling program following 2008. The collected specimens were transferred to the laboratory and were spread on spreading boards. To identify the species properly, the genitalia of both male and female sexes (if present) were extracted and then mounted using Canadabalzam, Enthelan or Euparal mounting mediums. The specimens finally, were identified using both external and genital characteristics.

Checklist

Genus: *Euxoa* Hübner, [1821]
Euxoa Hübner [1821], *Verzeichniss bekannter Schmettling*: 209. Type Species: *Noctua decora* [Denis & Schiffermüller], 1775. L.t.: Austria, Vienna district.

[Synonymy: *Mimetes* Hübner, [1821]; *Metaxyja* Hübner, [1821]; *Telmia* Hübner, [1821]; *Carneades* Grote, 1883; *Paragrotis* Dyar, 1902]

***Euxoa lidia adumbrata* (Eversmann, 1842)**
Agrotis adumbrata Eversmann, 1842, *Bull. Soc. Imp. Nat. Moscow* 15: 543. L. t.: U.S.S.R. Kasan district.

[Synonymy: *norvegica* Staudinger, 1861; *polygonides* Staudinger, 1874; *obscura* Staudinger, 1874; *variegata* F.Wagner, 1913; *inexpectata pamiricola* Kozhantshikov, 1937]

Iranian record: Tehran (Ebert & Hacker 2002).

***Euxoa conspicua* (Hübner, 1827)**
Agrotis conspicua Hübner, 1827. *Sammlung exotische Schmetterlinge*, 9: 718.

[Synonymy: *agricola* Boisduval, 1829; *agricola* Geyer, [1835]; *lycarum* Herrich-Schaffer, 1846; *squalida* Eversmann, 1856; *abdita* de Joannis, 1891; *abscondita* Warren, 1909; *indistincta* Strand, 1915; *osthelderi* Corti, 1931; *complicate* Corti, 1932]

Iranian records: Fars (Hacker & Kautt 1999, Ebert & Hacker 2002), Mazandaran, Tehran, Azarbayjan-e-Gharbi, Azarbayjan-e-Sharghi, Kermanshah, Kordestan, Lorestan, Zanjan, Hamadan, Kerman, Khouzestan (Ebert & Hacker 2002).

***Euxoa ochrogaster rossica* (Staudinger, 1881)**
Agrotis islandica var. *rossica* Staudinger, 1881, *Stettin. Ent. Ztg* 42: 419. L. t.: Kirghizia, Saisan and Margelan.

Iranian records: North of Iran (Hacker 1990).

***Euxoa obelisca* ([Denis & Schiffermüller], 1775)**
Noctua obelisca [Denis & Schiffermüller], 1775, *Ankundung Eines Systematischen Werkes von den schmetterlinge der Wienergegend* 80: L. t.: Austria, Vienna district.

[Synonymy: *praticola* Hübner, 1827; *grisea* Tutt, 1902; *carbonis* Warren, 1909; *badia* Gillmer, 1910; *stephensii* Heydemann, 1933; *salioclitana* Boursin, 1934]

Iranian record: North of Iran (Hacker 1990).

***Euxoa tritici* (Linnaeus, 1761)**

Phalaena (*Noctua*) *tritici* Linnaeus, 1761, *Fauna Suecica* (Edn 2): 320. L. t.: Sweden.

[Synonymy: *eruta* Hübner, 1827; *fumosoides* Culot, 1909; *insulana* Corti, 1932; *epixanthea* Kovacs, 1952]

Iranian record: North of Iran (Hacker 1990).

***Euxoa segnilis cortii* Wagner, 1930**

Agrotis (*Euxoa*) *cortii* Wagner, 1930, *Int. Ent. Z.* 23: 549. L. t.: Turkey.

[Synonymy: *costaevittata* Wagner, 1930]

Iranian records: Mazandaran, Tehran (Ebert & Hacker 2002).

***Euxoa nigricans* (Linnaeus, 1761)**

Phalaena (*Noctua*) *nigricans* Linnaeus, 1761, *Fauna Suecica* (Edn 2): 322. L. t.: Sweden.

[Synonymy: *rubricans* Esper, 1786]

Iranian records: North of Iran (Hacker 1990).

***Euxoa basigramma hyrcana* Corti, 1932**

Euxoa basigramma hyrcana Corti, 1932, *Die Palaearkt. Eulenart. Nachtf. Suppl*: 37: L. t.: Iran.

Iranian records: Golestan (Ebert & Hacker 2002).

***Euxoa temera* (Hübner, [1808])**

Noctua temera Hübner, [1808], *Sammlung europaischer Schmetterlinge* 4: pl. 84, fig. 393. L.t.: Europe.

[Synonymy: f. *Ruris* Hübner, 1808; f. *fictilis* Hübner, 1827; f. *villiersi* Guenee, 1837; *declarans* Walker, 1857; *hemispherica* Hampson, 1903; *alphonsina* Fernandez, 1918; f. *huebneri* Boursin, 1926; *boursini* Schawerda, 1931; *perambulans* Corti, 1931; subsp. *Leucotera* Bytinski-Salz & Brandt, 1937]

Iranian records: Tehran, Guilan (Ebert & Hacker 2002).

***Euxoa distinguenda distinct* (Staudinger, 1892)**

Euxoa tritici var. *distinncta* Staudinger, 1892, *Dt. Ent. Z. Iris* 5: 358. L. t.: Turkey, Amasia.

[Synonymy: *uralensis* Corti, 1926; *rumelica* Boursin, 1935; *fotica* Kovacs, 1952]

Iranian records: Mazandaran (Ebert & Hacker 2002).

***Euxoa adjemi* Brandt, 1941**

Euxoa adjemi Brandt, 1941, *Mitt. Munch. Ent. Ges.* 31: 837. L. t.: Iran, Markazi, Soltanabad.

Iranian records: Mazandaran (Ebert & Hacker 2002), Markazi (Brandt 1941).

***Euxoa sulcifera* (Christoph, 1893)**

Euxoa sulcifera Christoph, 1893, *Dt. Ent. Z. Iris* 6: 91. L. t.: Turkey.

Iranian records: Northwest of Iran (Hacker 1990).

***Euxoa christophi* (Staudinger, 1870)**

Agrotis christophi Staudinger, 1870, *Berl. Ent. Z.* 14: 110. L. t.: U.S.S.R., Sarepta.

[Synonymy: *lugens* Staudinger, 1870

Iranian record: Ardabil.

***Euxoa designata* Brandt, 1941**

Euxoa designate Brandt, 1941, *Mitt. Munch. Ent. Ges.* 31: 839. L. t.: Iran, Fars.

Iranian record: Fars (Brandt 1941, Ebert & Hacker 2002).

***Euxoa aneucta* Brandt, 1938**

Euxoa aneucta Brandt, 1938, *Ent. Rdsch.* 55: 499. L. t.: Iran, Fars.

Iranian records: Fars (Brandt 1938, Ebert & Hacker 2002), Mazandaran (Hacker & Meineke 2001).

***Euxoa dsheiron* Brandt, 1938**

Euxoa dsheiron Brandt, 1938, *Ent. Edsch.* 55: 499. L. t.: Iran, Tehran, Karaj.

Iranian record: Tehran (Brandt 1938).

***Euxoa aneucta binaloudica* Brandt, 1941**

Euxoa aneucta binaloudica Brandt, 1941, *Mitt. Munch. Ent. Ges.* 31: 838. L. t.: Iran, Khorasan.

Iranian record: Khorasan (Brandt 1941).

***Euxoa aquiline* ([Denis & Schiffermüller], 1775)**

Noctua aquilinea [Denis & Schiffermüller], 1775, *Ankundung Eines Systematischen Werkes von den schmetterlinge der Wienergegend* 80. L. t.: Austria, Vienna district.

[Synonymy: *fictilis* Hübner, 1813; *unicolor* Hübner, 1813; *sabuletorum* Boisduval, 1840; *distincta* Staudinger, 1892; *schwingenschussi* Corti, 1926; *actinea* Kozhanchikov, 1929; *quassa* Corti, 1931; *corporea* Corti, 1931; *rabiosa* Corti, 1931; *terrestris* Corti, 1931; *punctifera* Corti, 1931; *rangnowi* Corti, 1932; *schawerdae* Boursin, 1934; *pseudoobscurior* Heydemann, 1938; *uniformis* Rougemont, 1953; *petrina* Mayer, 1937]

Iranian records: Mazandaran, Azarbayjan-e-Gharbi, Tehran, Fars, Kordestan, Lorestan, Khouzestan (Ebert & Hacker 2002).

***Euxoa scurrilis* Draudt, 1937**

Euxoa scurrilis Draudt, 1937, *Die Palaearkt. Eulenart. Nachtf. Suppl*: 268. L. t.: Iran, Elburz Mountains.

Iranian records: Tehran, Lorestan, Fars (Ebert & Hacker 2002).

***Euxoa triaena* Kozhanchikov, 1929**

Euxoa saggita subsp. *triaena* Kozhanchikov, 1929, *Ezheg. Zool. Mus.* 30: 185. L. t.: U.S.S.R., Kazakstan.

[Synonymy:*sagitta* Hübner, 1813]

Iranian record: Tehran (Ebert & Hacker 2002).

***Euxoa abualisinai* Varga & Gyulai, 2002.**

Euxoa abualisinai Varga & Gyulai, 2002, *Esperiana* 9: 208. L. t.: Iran, Mazandaran.

Iranian record: Mazandaran (Varga et al. 2002).

***Euxoa abualisinai esfahanica* Varga & Gyulai, 2002.**

Euxoa abualisinai esfahanica Varga & Gyulai, 2002, *Esperiana* 9: 209. L. t.: Iran, Esfahan.

Iranian record: Esfahan (Varga et al. 2002).

***Euxoa cos* (Hübner, 1824)**

Noctua cos Hübner, 1824, *Sammlung Europaischer Schmetterlinge* 4: pl. 154, fig. 720. L. t.: Europe.

[Synonymy: *tephra* Boisduval, 1840; *vacillans* Herrich-Schaffer, 1854; *Nagyagensis* Freyer, 1845; *cycladum* Staudinger, 1870; *aphe* Mabille, 1885]

Iranian records: North of Iran (Hacker 1990).

***Euxoa decora* ([Denis & Schiffermüller], 1775)**

Noctua decora [Denis & Schiffermüller], 1775, *Ankundung Eines Systematischen Werkes von den schmetterlinge der Wienergegend* 313. L. t.: Austria, Vienna district.

[Synonymy: *nebulosa* Hübner, 1808; *niven* Hübner, 1821; *nivalis* Vorbrodt, 1912; *decorate* Neuberger, 1904; *flavomaculata*

Schawerda, 1924]

Iranian records: Throughout Iran (Hacker 1990).

***Euxoa ebadhadiani* Gyulai & Varga, 2002**

Euxoa ebadhadiani Gyulai & Varga, 2002, *Esperiana* 9: 210. L. t.: Esfahan.

Iranian records: Esfahan, Kohkiluyeh va Boyer-Ahmad (Varga et al. 2002).

***Euxoa heringi* (Staudinger, 1877)**

Agrotis heringi Staudinger, 1877, *Stettin. Ent. Ztg*. 38: 181. L. t.: Iran, Shahkouh.

Iranian records: Tehran (Hacker & Meineke, 2001; Ebert & Hacker, 2002), Golestan, Lorestan, Hamadan, Kordestan, Kermanshah, Fars (Ebert & Hacker 2002).

***Euxoa emamrezai* Gyulai & Varga 2002**

Euxoa emamrezai Gyulai & Varga 2002, *Esperiana* 9: 210. L. t.: Iran, Esfahan.

Iranian records: Esfahan (Varga et al. 2002).

***Euxoa birivia* ([Denis & Schiffermüller], 1775)**

Noctua birivia [Denis & Schiffermüller], 1775, *Ankundung Eines Systematischen Werkes von den schmetterlinge der Wienergegend* 71. L. t.: Austria, Vienna district.

[Synonymy: *honoratina* Donzel, 1837; *sudeticola* Skala, 1929]

Iranian records: Throughout Iran (Hacker 1990).

***Euxoa anaemica* Draudt, 1936**

Euxoa anaemica Draudt, 1936, *Ent. Rdsch.* 53: 460. L. t.: Turkey, Vansee.

Iranian records: Southwest of Iran (Hacker 1990).

***Euxoa sigmata* Kozhantshikov, 1928**

Euxoa sigmata Kozhantshikov, 1928, *Revue. Russe Ent.* 22: 93. L.t.: Aschabad.

Iranian records: Khorasan (Ebert & Hacker 2002), Fars (Brandt 1941).

***Euxoa robiginosa* (Staudinger, 1895)**

Agrotis robiginosa Staudinger, 1895. *Dt. Ent. Z. Iris* 7: 271. L. t.: Jerusalem.

[Synonymy: *pseudoobelisca* Corti, 1932; *intensior* Draudt, 1936; *vinirufa* Draudt, 1936]

Iranian record: Lorestan (Ebert & Hacker 2002).

***Euxoa canariensis diamond* Boursin, 1940**

Euxoa canariensis diamondi Baursin, 1940, *Mitteilungen der Munchner Entomologischen Gesellschaft* 30: 474. L.t.: Iraq, Iran (Fars).

Iranian records: Khouzestan, Kordestan, Lorestan, Hormozgan, Boushehr, Fars, Sistan va Balouchestan (Ebert & Hacker 2002).

***Euxoa subdecora* Hampson, 1903**

Euxoa subdecora Hampson, 1903, *Cat. Lep. Phal. Br. Mus.* 4: 233. L. t.: Turkmenistan.

[Synonymy: *clauda* Pungeler, 1906; *clauda* Warren, 1909; *clauda* Corti, 1932]

Iranian records: Fars, Khorasan (Ebert & Hacker 2002).

***Euxoa perierga perierga* Brandt, 1938**

Euxoa perierga Brandt, 1938, *Entomologische Rundschau* 55: 499. L.t.: Iran, Fars, Sine-Sefid.

Iranian records: Fars (Brandt, 1938; Ebert & Hacker, 2002; Hacker & Kautt, 1999), Khorasan (Ebert & Hacker 2002).

***Euxoa perierga kendevani* Boursin, 1940**

Euxoa perierga kendevani Boursin, 1940, *Mitt. Munch. Ent. Ges.* 30: 477. L. t.: Iran, Elburz Mountain.

Iranian records: Semnan, Tehran (Ebert & Hacker 2002).

***Euxoa mustelina* (Christoph, 1876)**

Agrotis mustelina Christoph, 1876, *Horae Soc. Ent. Ross.* 12: 249. L. t.: Iran, Elburz Mountains, Schahkuh.

Iranian records: Tehran, Khorasan (Ebert & Hacker 2002).

***Euxoa shahabbasi* Gyulai & Varga, 2002**

Euxoa shahabbasi Gyulai & Varga, 2002, *Esperiana* 9: 207. L. t.: Iran, Khorasan.

Iranian record: Khorasan (Varga et al. 2002).

***Euxoa cespitis* (Swinhoe, 1885)**

Agrotis cespitis Swinhoe, 1885, *Trans. Ent. Soc. London* 1885: 349. L. t.: Balouchestan.

[Synonymy: *praestigiosa* Brandt, 1941]

Iranian records: Lorestan, Sistan va Balouchestan (Ebert & Hacker 2002).

***Euxoa deserta hamadanensis* Varga, 1979**

Euxoa deserta hamadanensis Varga, 1979, *Z. Arb. Gem. Oster. Ent.* 31: 3. L. t.: Iran, Hamadan.

Iranian record: Hamadan (Ebert & Hacker 2002).

***Euxoa conifer* (Christoph, 1877)**

Agrotis conifera Christoph, 1877, *Horae Soc. Ent. Ross.* 12: 249. L. t.: Caucasus.

Iranian records: North of Iran (Hacker 1990).

***Euxoa fallax* (Eversmann, 1854)**

Agrotis fallax Eversmann, 1854, *Bull. Soc. imp. Nat. Mosc.* 27 (3): 185. L.t.: U.S.S.R., Kirghizia, Southern steppes and banks of the Syr-Darja.

Iranian record: Sistan va Balouchestan (Brandt 1941).

***Euxoa zernyi* Boursin, 1944**

Euxoa zernyi Boursin, 1944, *Revue fr. Ent.* 10: 159. L.t.: U.S.S.R., Orenburg.

Iranian record: Kerman.

***Euxoa eremopersa* Gyulai & Varga, 2006**

Euxoa eremopersa Gyulai & Varga, 2006, *Esperiana* 12: 272. L.t.: Iran, Esfahan.

Iranian records: Esfahan (Gyulai & Varga 2006).

***Euxoa homicida lugubris* (Brandt, 1941)**

Euxoa lugubris Brandt, 1941, *Mitteilungen der Munchner Entomologischen Gesellschaft* 31:839. L.t.: Iran, Taftan.

Iranian records: Kordestan, Lorestan, Zanjan, Hormozgan, Kerman, Khorasan (Ebert & Hacker, 2002) Sistan va Balouchestan (Brandt 1941).

***Euxoa homicida schahkuhensis* (Bartel, 1907)**

Agrotis homicida schahkuhensis Bartel, 1907, *Dt. Ent. Z. Iris* 19: 205. L. t.: Iran, Golestan, Shahkouh.

Iranian records: Tehran, Hamadan, Golestan (Ebert & Hacker 2002), Kerman (Hacker & kautt 1999).

***Euxoa hilaris* (Freyer, 1838)**

Agrotis hilaris Freyer, 1838, *Neuere Beitrage Zur Schmetterlingskunde* 3: 89. L. t.: Turkey, Istanbul district.

Iranian records: Northwest of Iran (Hacker 1990).

***Euxoa foeda* (Lederer, 1855)**

Agrotis foeda Lederer, 1855, *Verh. (Abh.) Zool-bot. Ver. Wien* 5:

107. L. t.: U.S.S.R., Altai Mountains.

[Synonymy: *enitens* Corti, 1926; *vanensis* Draudt, 1937]

Iranian records: Tehran, Fars, Lorestan, Kordestan, Markazi, Khorasan (Ebert & Hacker 2002) Kerman.

***Euxoa difficillima* Draudt, 1937**

Euxoa difficillima Draudt, 1937, *Die Palaearkt. Eulenart. Nachtf. Suppl.* 243. L. t.: Iran, Elburz Mountains.

Iranian records: Tehran, Lorestan, Khorasan, Fars (Ebert & Hacker 2002).

***Euxoa rjabovi* Kozhantshikov, 1929**

Euxoa rjabovi Kozhantshikov, 1929, *Dt. Ent. Z. Iris* 43: 180. L. t.: Caucasus.

Iranian records: Tehran, Fars (Ebert & Hacker 2002).

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