

## Establishment of *Eichlinia* gen.n. for the Western hemisphere Melittiini (Lepidoptera: Sesiidae), with a catalogue of the genus

### Установление *Eichlinia* gen.n. в Melittiini (Lepidoptera: Sesiidae) Западного полушария с каталогом рода

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KEY WORDS: *Melittia*, *Eichlinia*, Nearctic Region, Neotropical Region, systematic, taxonomy, new combinations.

КЛЮЧЕВЫЕ СЛОВА: *Melittia*, *Eichlinia*, Неарктический регион, Неотропический регион, систематика, таксономия, новые комбинации.

**ABSTRACT.** A new genus from the tribe Melittiini (Lepidoptera, Sesiidae) is erected from the Western hemisphere: *Eichlinia* gen.n. The new genus differs from the all known genera of the tribe in the combination of the characters of both male and female genitalia. A key for determination of all genera of the tribe Melittiini is presented. All Nearctic and some Neotropical species of Melittiini are transferred from the genus *Melittia* to the new one. A preliminary catalogue species of the new genus, which contains updated taxonomic information including the references to the original descriptions, information on name-bearing types, mostly complete bibliographies, data on host plants and current known distribution is provided.

**РЕЗЮМЕ.** Установлен новый род *Eichlinia* gen.n. в трибе Melittiini (Lepidoptera, Sesiidae) Западного полушария. Новый род отличается от всех известных родов трибы сочетанием признаков мужских и женских гениталий. Представлен ключ для определения всех родов трибы Melittiini. Все неарктические и часть неотропических видов трибы Melittiini переносятся из рода *Melittia* в новый род. Предлагается предварительный каталог видов нового рода, который включает данные о первоначальных описаниях, информацию о номенклатурных типах, почти полную библиографию и современные знания о распространении.

#### Introduction

The genus *Melittia* Hübner, 1819 [“1816”] is the largest sesiid genus of the tribe Melittiini Le Cerf, 1917 [Arita, Gorbunov, 1996a, b; Gorbunov, Arita, 1996, 1997; Pühringer, Kallies, 2004, 2017; Gorbunov, 2014,

2015, 2017, 2020; Kallies, 2020]. It was originally erected by Hübner [1816–1826: 128] with the only species *Melittia anthedoniformis* Hübner, 1819 [“1816”], which was considered to be proposed as a replacement name for *Sphinx bombylifformis* Stoll, 1782 (= *Sphinx bombylifformis* Stoll, 1782) — a primary junior homonym of *Sphinx bombylifformis* Linnaeus, 1758 (Lepidoptera: Sphingidae) [Fletcher, Nye, 1982; Arita, Gorbunov, 1995; Gorbunov, 2017]. Further, *M. anthedoniformis* turned out to be the junior subjective synonym for *Sesia chalciformis* Fabricius, 1793 [Hampson, 1892]. Hence, *Melittia anthedoniformis* Hübner, 1819 [“1816”] (= *Sphinx bombylifformis* Stoll, 1782 [nec *Sphinx bombylifformis* Linnaeus, 1758]) = *Sesia chalciformis* Fabricius, 1793 is the type species and it was fixed by monotypy in accordance with Article 68.3 [ICZN, 1999]. The type locality of *Melittia bombylifformis* (Stoll, 1782) is “... op de Kust van Coromandel ... (sur la Côte de Coromandel ...)” [Stoll, 1782: 242] or east coast of the Hindustan Peninsula south of the Krishna River Delta to Cape Komorin. The type locality of *Sesia chalciformis* Fabricius, 1793 was cited in the original description as “Habitat Tranquebariae ...”, that is the town of Tharangambadi on the Coromandel Coast of India.

For a reason unclear to me, Hampson [1892: 202] indicates *Melittia satyriniformis* Hübner 1831 [“1825”] “from N. America” as the type species of the genus *Melittia*. His point of view was supported by Beutenmüller [1901: 231] and Bartel [1912: 379]. But already in his work on Sesiidae of the Oriental and Afrotropical regions, Hampson [1919: 84] corrected his mistake and rightly indicated the type species of the genus *Melittia*. Perhaps this fact for a long time prevented the elucidation

tion of the actual generic position of the Melittiini species of North America. Only in the mid-90s of the last century it was indicated that they all have clear differences in the structure of the male genitalia from *Melittia* from the Old World and all of them should be separated from it [Arita, Gorbunov, 1996b; Gorbunov, Arita, 1997].

In 1916–17 Le Cerf described three new genera of Melittiini from South America, namely *Premelittia* Le Cerf, 1916 (type species: *Premelittia rufescens* Le Cerf, 1916), *Neosphecia* Le Cerf, 1916 (type species: *Neosphecia combusta* Le Cerf, 1916), and *Melittina* Le Cerf, 1917 (type species *Melittina nigra* Le Cerf, 1917) [Le Cerf, 1916; 1917].

In their publication regarding a classification of Sesiidae of America north of Mexico, Duckworth and Eichlin [1977] absolutely without any argument synonymized these three taxa with the genus *Melittia* Hübner, 1819 [“1816”]. In 2017 I confirmed that the representatives of the Neotropical taxa of Melittiini “do not belong to *Melittia* and must be placed elsewhere” [Gorbunov, 2017: 128]. More recently, a review of the Neotropical genera of Melittiini described by Le Cerf was published, which restored all of them from synonyms of the genus *Melittia* [Moreira et al., 2019]. And now it is completely clear to me that all Melittiini species of North America as well as some of those from the Neotropical region belong to another genus that has not yet been described. Below I describe it as *Eichlinia* gen.n. In addition, I provide a preliminary catalogue of the genus *Eichlinia* gen.n., which contains updated taxonomic information including the references to the original descriptions, information on name-bearing types, mostly complete bibliographies, data on host plants and current known distribution. All synonymic names in the text are given in quotation marks, in the same way as they are presented in the original descriptions. The names of the host plants were verified with the Plant List [2010].

The images of moths were taken with a Sony® α450 DSLR camera equipped with a Minolta® 50 f/2.8 Macro lens. The genitalia were photographed using a Keyence® BZ-9000 Bioevo Fluorescence Microscope. The processing of all illustrations was finalized with Adobe® Photoshop® CC 2020 software.

All images of dry specimens are labeled with a number consisting of letters and digits: name of the family, two consecutive digits separated by n-dash and a year following m-dash (e.g. SESIIDAE Pictures №№ 0473-0474–2019). These letters and digit codes correspond to the numbering system of the figured specimens in the author’s archive.

Genitalia preparations are stored in microtubes with glycerol and pinned under the specimens. A label with the number of the genital preparation as a label (e.g. Genitalia preparation № OG–059–2018) is attached under each specimen and is listed in the author’s archive.

The material studied or mentioned herein is deposited in the following collections abbreviated in the text as follows:

AMNH — the American Museum of Natural History, New York, USA;

BMNH — the Natural History Museum, London, UK;

CIML — Instituto Miguel Lollo, Tucuman, Argentina;

COGM — A.N. Severtsov Institute of Ecology and Evolution of Russian Academy of Sciences, Moscow, Russia;

FMNH — Field Museum of Natural History, Chicago, Illinois, USA;

MACN — Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Buenos Aires, Argentina;

MNHP — Muséum national d’Histoire naturelle, Paris, France;

MCZC — Museum of Comparative Zoology, Cambridge, Massachusetts, USA;

NMNH — National Museum of Natural History, Smithsonian Institution, Washington DC, USA;

ZNHB — Museum für Naturkunde, Zentralinstitut der Humboldt-Universität zu Berlin, Germany.

## Taxonomic account

### *Eichlinia* O. Gorbunov, gen.n.

Figs 1–4, 9–15.

TYPE SPECIES: *Aegeria cucurbitae* Harris, 1828 (Figs 1–4). *Melittia auct., nec Melittia* Hübner, 1819 [“1816”]

DESCRIPTION. Colourful, rarely medium-sized, but mostly large-sized clearwing moths with alar expanse 24–62 mm. Superficially resembling genus *Melittia* (Figs 5–8).

Head with antenna slightly clavate with a poorly defined hook distally, ciliate and sometimes unipectinate in male; frons smooth-scaled with a projection of flat scales beneath antenna externally forming a characteristic shelf; labial palpus long, turhed-up, with a few hair-like scales ventrally; proboscis well-developed, long, functional; vertex covered with short hair-like scales. Thorax smooth-scaled, both metepimeron and metameron with long hair-like scales posteriorly. Hind leg with tibia and two basal tarsomeres tufted with long hair-like scales. Abdomen smooth-scaled, anal tuft undeveloped. Forewing completely opaque or posterior transparent area present but narrow and very short; veins  $R_1$ – $R_3$  parallel,  $R_4$  and  $R_5$  stalked for about half of their length; distance between bases of veins  $R_{4+5}$ ,  $M_1$ ,  $M_2$  and  $M_3$  nearly equal (Fig. 9). Hindwing transparent or opaque; vein  $M_3$  arises from vein  $CuA_1$  distinctly basal of cross-vein (Fig. 9).

**Male genitalia.** Tegumen-uncus complex broad; uncus broadened and bilobed distally with a large semi-circular plate of strong, short, pointed setae internally on each side; gnathos undeveloped (Fig. 10); valva (Fig. 11) elongate-oval, sometimes distinctly pointed ventro-apically, with a small group of short dense setae dorso-apically; saccular region with 1–3 projecting ridges devoid of setae; saccus broad and long, slightly club-shaped and rounded basally (Fig. 12); aedeagus (Fig. 13) narrow, somewhat longer than valva; vesica (Fig. 14) with numerous, small, pointed cornuti.

**Female genitalia.** 8<sup>th</sup> tergite narrow; lamella postvaginalis V-shaped, well sclerotized, lamella antevaginalis undeveloped; ostium bursae at level of 8<sup>th</sup> tergite, membranous, slightly funnel-shaped membranous; antrum membranous, thin and long, about as long as ostium bursae; corpus bursae ovoid without or with a small signum of minute spinules (Fig. 15).

DIFFERENTIAL DIAGNOSIS. Superficially, species of this new genus resemble certain species of genus *Melittia* with completely opaque forewings (*M. astarte* (Westwood,

1848) species-group and *M. aureosquamata* (Wallengren, 1863) species-group), and *Afromelittia caerulea* Bartsch, 2016. However, by the structure of the male genitalia *Eichlin-*



Figs 1–8. Melittiini spp: 1–4 — *Eichlinia cucurbitae* (Harris, 1828), **comb.n.**; 1–2 — male, USA, Montana, Columbus, 21.VI–01.VII.1994, native collector. Sesiidae picture № 0473-0474–2019. Alar expanse 25.2 mm (COGM); 3–4 — female, USA, Montana, Columbus, 21.VI–01.VII.1994, native collector. Sesiidae picture № 0469-0470–2019. Alar expanse 26.0 mm (COGM); 5–8 — *Melittia sangaica nipponica* Arita et Yata, 1987; 5–6 — male, Japan, Honshu, Aichi-ken, Toyota-shi, 07.I.2002, *ex l.*, O. Gorbunov & B. Tanaka leg. Sesiidae picture № 0061-0062–2014. Alar expanse 41.5 mm (COGM); 7–8 — female, Japan, Honshu, Aichi-ken, Kasugai-shi, Takagi, 18.I.2002, *ex l.*, O. Gorbunov & Y. Arita leg. Sesiidae picture № 0053-0054–2014. Alar expanse 42.0 mm (COGM).

Рис. 1–8. Melittiini spp: 1–4 — *Eichlinia cucurbitae* (Harris, 1828), **comb.n.**; 1–2 — самец, США, Монтана, Коламбас, 21.VI–01.VII.1994, местный коллектор. Sesiidae снимки № 0473-0474–2019. Размах крыльев 25,2 мм (COGM); 3–4 — самка, США, Монтана, Коламбас, 21.VI–01.VII.1994, местный коллектор. Sesiidae снимки № 0469-0470–2019. Размах крыльев 26,0 мм (COGM); 5–8 — *Melittia sangaica nipponica* Arita et Yata, 1987; 5–6 — самец, Япония, Хонсю, префектура Айчи, Тоёта, 07.I.2002, *ex l.*, О.Горбунов, Б. Танака leg. Sesiidae снимки № 0061-0062–2014. Размах крыльев 41,5 мм (COGM); 7–8 — самка, Япония, Хонсю, префектура Айчи, окрестности Касугайя, Такаги, 18.I.2002, *ex l.*, О.Горбунов, Ю. Арита leg. Sesiidae снимки № 0053-0054–2014. Размах крыльев 42,0 мм (COGM).

*ia* gen.n. seems to be the closest to *Afromelittia* Gorbunov et Arita, 1997 (type species: *Melittia occidentalis* Le Cerf, 1917), but they can be distinguished by both male and female genitalia (somewhat different shape of the tegumen-uncus complex and valva in the male, position of the ostium bursae, shape of the lamella postvaginalis, structure of the antrum and the shale of corpus bursae. Compare Figs 10–15 with figs 43 and 44 [in Gorbunov, Arita, 1997] or with figs 13a–g [in Eichlin, Duckworth, 1988]. From the genus *Melittia*, the species of the genus *Eichlinia* gen.n. clearly differ also by the structure of both male and female genitalia [compare Figs 10–15 and figs 13a–g in Eichlin, Duckworth, 1988 with numerous figs in Arita, Gorbunov, 1995, 1996a, b; Gorbunov, Arita, 1996, 1997; Špatenka et al., 1999; Gorbunov, 2014, 2015, 2017, 2020; Bartsch, 2016].

All genera of the tribe Melittiini can be determined by the following key compiled by the combinations of external features, morphology of both male and female genitalia and zoogeographical affiliation. I exclude from this key a completely unstudied monotypical genus *Desmopoda* Felder et Felder, 1874 (type species: *Desmopoda bombiformis* Felder et Felder, 1874), which is still known by a single holotype (♀) originated from the island of Ambon, Maluku, Indonesia. Highly likely, *Desmopoda* is a junior synonym of *Melittia* [Arita, Gorbunov, 1995; Gorbunov, 2020].

- 1 Proboscis undeveloped ..... 2
- Proboscis well-developed ..... 3
- 2 Vertex covered with hair-like scales; forewing with vein  $R_4$  and  $R_5$  separate basally; Neotropical ..... 2
- ..... *Neosphecia* Le Cerf, 1916
- Vertex smoothly scaled; forewing with veins  $R_4$  and  $R_5$  short stalked; Neotropical ... *Premelittia* Le Cerf, 1916

- 3 Head broad, distance between external margins of eyes larger than maximum width of protorax; anal lobe of hindwing transparent; Oriental ..... 4
- ..... *Cephalomelittia* Gorbunov et Arita, 1995
- Head normal, distance between external margins of eyes less than maximum width of protorax; anal lobe of the hindwing opaque or undeveloped ..... 4
- 4 Forewing with veins  $R_3$  and  $R_{4+5}$  short stalked ..... 5
- Forewing with veins  $R_3$  and  $R_{4+5}$  separate basally ..... 6
- 5 Forewing with transparent areas very small or completely undeveloped; male genitalia with uncus bilobed, broadened and rounded distally, with a large plate of short but strong setae on each side internally, valva rounded or pointed ventro-apically, with straight ventral margin [see figs 44a, 44d in Gorbunov, Arita, 1997 or figs 11–13 in Bartsch, 2016]; female genitalia with lamella postvaginalis well-developed, antrum slightly funnel-shaped, well-sclerotized medially [see fig. 43 in Gorbunov, Arita, 1997]; Afrotropical ..... *Afromelittia* Gorbunov et Arita, 1997
- Forewing with transparent areas we-developed; male genitalia with uncus bilobed and pointed apically, with a few teeth at tip internally, valva narrowed medially, with a small rounded appendix distally [see figs 30, 40, 41 in Gorbunov, Arita, 1997]; female genitalia with lamella postvaginalis undeveloped, antrum tube-shaped, well-sclerotized posteriorly [see fig. 42 in Gorbunov, Arita, 1997]; Afrotropical ..... *Agriamelissa* Meyrick, 1931
- 6 Male ..... 7
- Female ..... 9
- 7 Genitalia with uncus distally without a plate of strong, short, pointed setae internally on each side, valva narrowly elongated dorso-apically, sometimes with a finger-

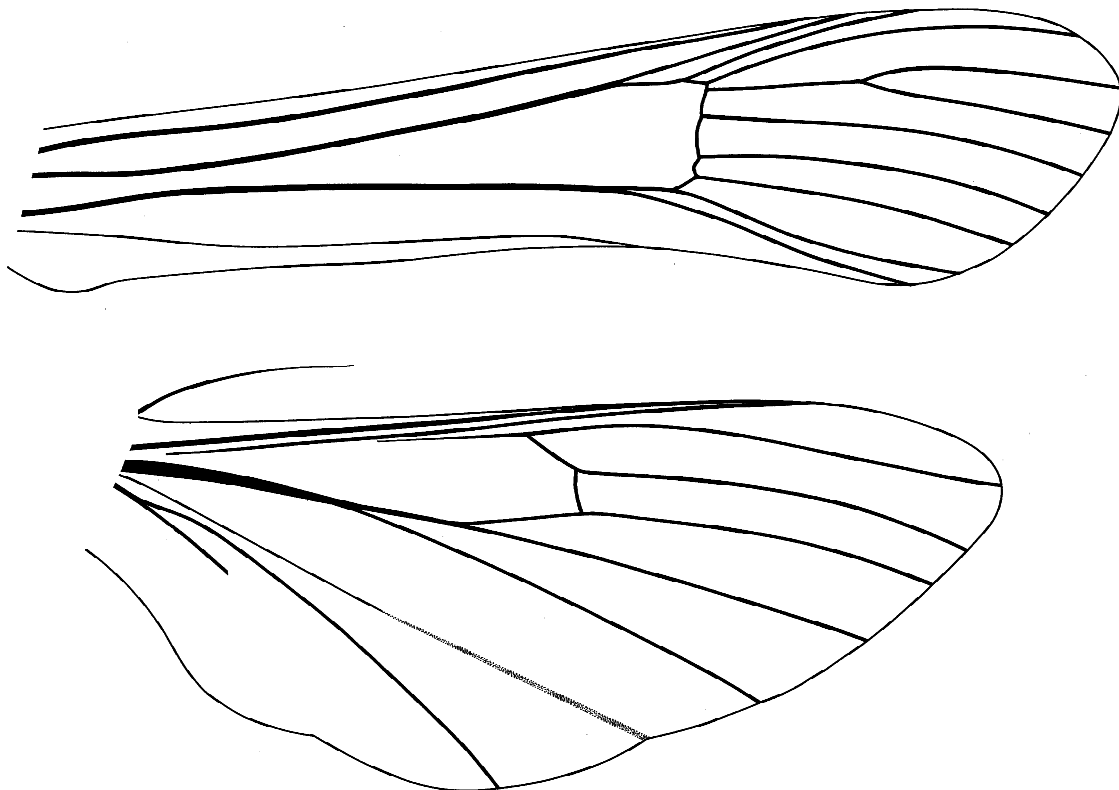
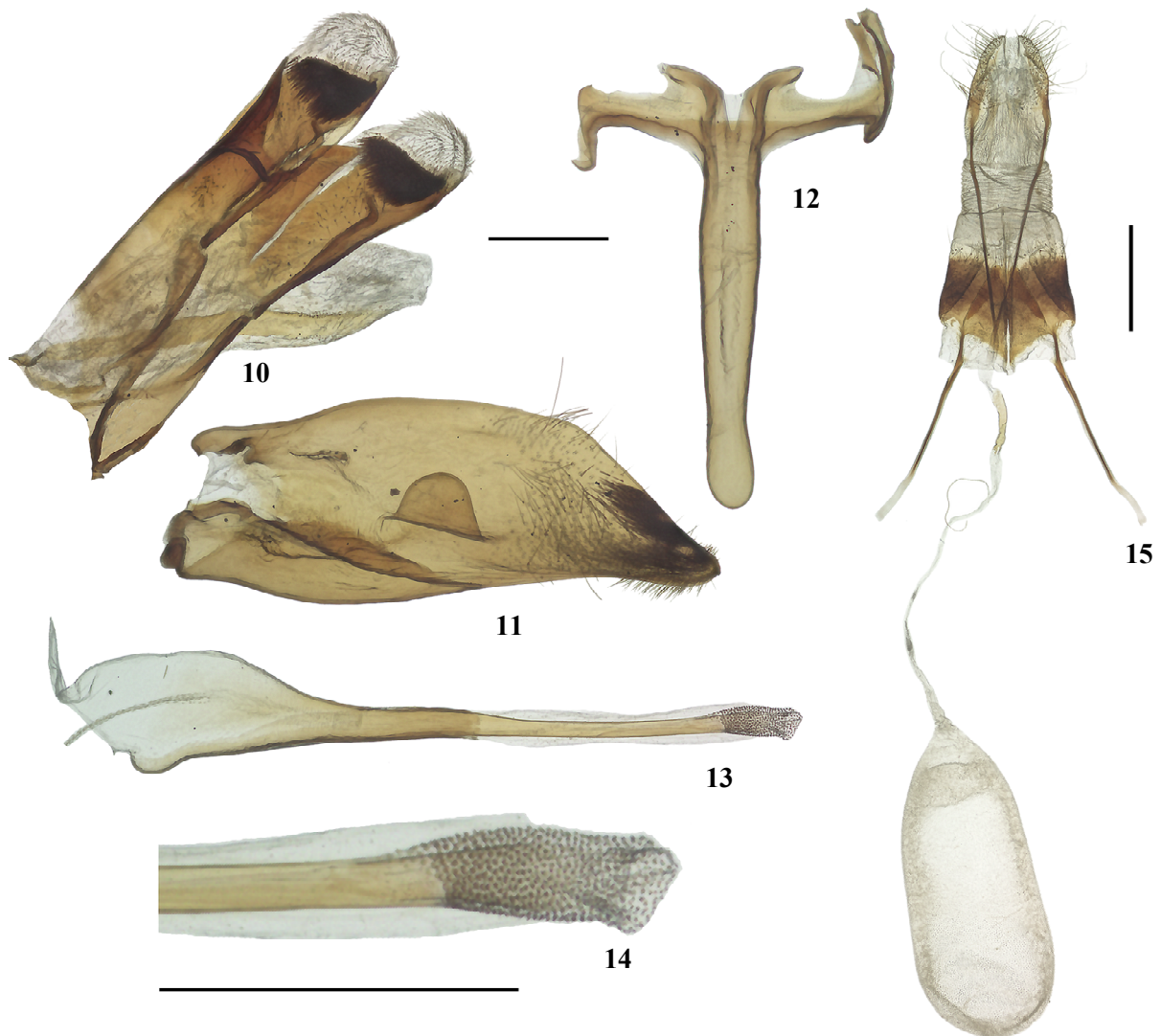


Fig. 9. Wing venation of *Eichlinia cucurbitae* (Harris, 1828), **comb.n.**

Рис. 9. Жилкование крыльев *Eichlinia cucurbitae* (Harris, 1828), **comb.n.**

- shaped appendix medio-ventrally, covered with sparse setae at dorsal margin [see figs 7a, 7b in Gorbunov, Arita, 1995 or fig. 10 in Kallies et al., 2016]; East Palaearctic, Oriental ..... *Macroscelesia* Hampson, 1919
- Genitalia with uncus distally with a plate of strong, short, pointed setae internally, valva, oval, elongate-oval or rectangular with 1–3 groups of dense setae distally ..... 8
- 8 Antenna with well-defined hook distally; uncus narrowed distally, gnathos present, valva oval, elongate-oval or rectangular with 3 groups of dense setae; Afrotropical, East Palaearctic, Oriental, Australasian ..... *Melittia* Hübner, 1819 [“1816”]
- Antenna with poorly defined hook distally; uncus broadened distally, gnathos undeveloped, valva oval or elongate-oval with a group of dense setae; Nearctical, Neotropical ..... *Eichlinia* O. Gorbunov, **gen.n.**
- 9 Legs with hind tibia and tarsus with slightly elongated scales, not forming a well defined hindleg tuft; hindwing with anal lobe undeveloped; Neotropical ..... *Melittina* Le Cerf, 1917
- Legs with hind tibia and tarsus with elongated scales, forming a well defined hindleg tuft; hindwing with anal lobe present ..... 10
- 10 Ostium bursae at level of 8<sup>th</sup> tergite (Fig. 15); Nearctical, Neotropical ..... *Eichlinia* O. Gorbunov, **gen.n.**
- Ostium bursae at 7<sup>th</sup> sternite ..... 11
- 11 Ostium bursae opening at posterior half of 7<sup>th</sup> sternite, funnel-shaped, slightly sclerotized; corpus bursae ovoid or pear-shaped with a more or less developed signum, forming from rows of minute spinules [see figs 312–315 in Špatenka et al., 1999]; Afrotropical, East Palaearctic, Oriental, Australasia ..... *Melittia* Hübner, 1819 [“1816”]



Figs 10–15. Genitalia of *Eichlinia cucurbitae* (Harris, 1828), **comb.n.**: 10–14 — male, USA, Montana, Columbus, 21.VI–1.VII.1994, local collector (COGM). Genital preparation № OG–059-2018; 10 — tegumen-uncus complex; 11 — valva; 12 — saccus; 13 — aedeagus; 14 — vesica; 15 — female, USA, Montana, Columbus, 21.VI–1.VII.1994, local collector (COGM). Genital preparation № OG–060-2018; Scale bar 0.5 mm, 1.0 mm for 15.

Рис. 10–15. Гениталии *Eichlinia cucurbitae* (Harris, 1828), **comb.n.**: 10–14 — самец, США, Монтана, Коламбас, 21.VI–1.VII.1994, местный сборщик (COGM). Препарат гениталий № OG–059-2018; 10 — тегумен-ункус комплекс; 11 — вальва; 12 — саккус; 13 — эдеагус; 14 — везика; 15 — самка, США, Монтана, Коламбас, 21.VI–1.VII.1994, местный сборщик (COGM). Препарат гениталий № OG–060-2018; масштаб: 0,5 мм, 1,0 мм для 15.

— Ostium bursae opening at anterior margin of 7<sup>th</sup> sternite, cup-shaped, well-sclerotized; corpus bursae globose without signa [see figs 11, 12 in Kallies et al., 2016]; East Palaearctic, Oriental ..... *Macroscelesia* Hampson, 1919

**LIFE HISTORY.** Due to the fact that some species of *Eichlinia* **gen.n.** are serious pests of pumpkins (Cucurbitaceae), the features of their biology are well known and described in detail. In accordance of the Western hemisphere investigations [Engelhardt, 1946; Eichlin, 1975; Eichlin, Duckworth, 1988; Canhilal et al., 2006] the larval host plants are species of the family Cucurbitaceae, including cultivars. Larvae are stem borers. They live in the lower part of vine where sometimes form a gall-like broadenings. The fully grown larva burrows into the topsoil, where it makes a cocoon. The larva overwinters in this earthen cocoon and pupates in early summer of the following year. There are one or two generations, depending on the natural conditions.

**COMPOSITION.** I am currently including 11 species in this new genus. The most important information about all these types is presented in the catalog below.

**RANGE.** Nearctic and Neotropical regions from NE Canada (Ontario) in the north to Argentina (Buenos Aires) in the south.

**ETYMOLOGY.** The new genus is dedicated to the late Dr. Thomas D. Eichlin (21.09.1938–19.09.2013), a major authority on the family Sesiidae of the Western Hemisphere. The gender is feminine.

### Preliminary catalogue of the genus *Eichlinia* O. Gorbunov, **gen.n.**

#### *Eichlinia calabaza* (Duckworth et Eichlin, 1973), **comb.n.**

“*Melittia calabaza* n. sp.” — Duckworth, Eichlin, 1973b: 151, figs 3a, 6; map. 1. Type locality: “Mexico: Mex., Teotihuacan, ...”. Holotype ♂ (USNM).

*Melittia calabaza* — Duckworth, Eichlin, 1977: 52; Duckworth, Eichlin, 1978a: 7; Duckworth, Eichlin, 1978b: 5, 21, figs 4, 20, pls 2, 8; Solomon, Dix, 1979: 16; Heppner, Duckworth, 1981: 26; Sondak, 1981, figs 1–7; Becker, Eichlin, 1984: 13, 14; Friedlander, 1986: 282, 283; Eichlin, Duckworth, 1988: 52, 54, text-figs 13a, 13c, 13g, pl. 2, fig. 2; Eichlin, 1995: 48; Pühringer, Kallies, 2004: 17; Pohl et al., 2016: 206; Moreira et al., 2019: 42, 43; San Martín-Romero et al., 2019.

**HOST PLANT.** *C. argyrosperma* K. Koch, *Cucurbita maxima* Duchesne, *C. moschata* Duchesne, *C. pepo* L. (Cucurbitaceae).

**DISTRIBUTION.** USA: Arizona, New Mexico, Texas; Mexico: Zacatecas, Hidalgo, Mexico, Morelos, Veracruz.

#### *Eichlinia cucurbitae* (Harris, 1828), **comb.n.**

“*Aegeria Cucurbitae*.” — Harris, 1828: 33. Type locality: not stated [USA]. Holotype ♀ (MCZC).

= “*Melittia Satyriniformis*.” — Hübner, 1831 [“1825”]: 17, figs 453, 454. Type locality: “... das Vaterland ... Georgien ist.” [= USA: Georgia]. Type material: lost.

= “*Trochilium ceto*. Westw.” — Westwood, 1848: 62, pl. 30, fig. 6. Type locality: “North America”. Holotype ♀ (BMNH).

= “*Melittia Amoena*. n. sp.” — Edwards, 1882: 53. Type locality: “Douglas Co., Kansas, 900 feet, ...” [= USA: Kansas, Douglas County]. Type material: lost.

*Aegeria cucurbitae* — Engelhardt, 1946: 182; Duckworth, Eichlin, 1973a: 9.

*Melittia amoena* — Beutenmüller, 1896: 113; Duckworth, Eichlin, 1973a: 3.

*Melittia cucurbitae* — Beutenmüller, 1896: 113; Dalla Torre, Strand, 1925: 140; Zukowsky, 1936: 1248, pl. 179, row b; McDunnough, 1939: 86; Engelhardt, 1946: 182, 183, 216, pl. 3, fig. 23; pl. 12, fig. 54, 54a; pl. 16, fig. 84; Howe, 1950: 480, 483; Howe, Rhodes,

1973: 266; Heppner, Duckworth, 1981: 26; Eichlin, Duckworth, 1988: 52, text-figs 12a, 12b, 12c, 12d, 13b, pl. 2, fig. 4; Klun et al., 1990: 64; Brown, Mizel, 1993: 6, 8, 16, pl. 2, figs 12a–b; Becker, Eichlin, 1984: 13, 14; Friedlander, 1986: 283; Eichlin, 1995: 48; Pühringer, Kallies, 2004: 17; Jackson et al., 2005: 27; Canhilal et al., 2006: 1; Capinera, 2008: 3533; Krinski, 2015: 1; Pohl et al., 2016: 206; Middleton, 2018: 1; Moreira et al., 2019: 42, 43.

*Melittia satyriniformis* — Druce, 1883: 32; Druce, 1896: 324; Beutenmüller, 1899: 149; Beutenmüller, 1901: 228, 229, 232, fig. 8, pl. 29, fig. 1; Dyar, 1902: 364; Walsingham, 1913: 192; Dalla Torre, Strand, 1925: 148; Zukowsky, 1936: 1249, pl. 179, row b; McDunnough, 1939: 86; Duckworth, Eichlin, 1977: 52; Solomon, Dix, 1979: 16; Becker, Eichlin, 1984: 13, 14.

*Melittia ceto* — Walker, 1856: 66; Druce, 1883: 32; Engelhardt, 1946: 182.

*Trochilium ceto* — Engelhardt, 1946: 182; Duckworth, Eichlin, 1973a: 7.

**HOST PLANT.** *Cucurbita andreana* Naudin, *C. argyrosperma* K. Koch, *C. ecuadorensis* Cutler et Whitaker, *C. ficifolia* Bouché, *C. maxima* Dochesne, *C. moschata* Dochesne, *C. okeechobeensis* (Small) L.H. Bailey, *C. pepo* L., *Echinocystis lobata* (Michx.) Torr. et A. Gray (Cucurbitaceae).

**DISTRIBUTION.** Canada: Ontario; USA: Montana, Minnesota, Wisconsin, Michigan, New York, Vermont, Maine, South Dakota, Nebraska, Iowa, Illinois, Indiana, Ohio, Pennsylvania, New Jersey, Connecticut, Kansas, Missouri, Kentucky, West Virginia, Virginia, Oklahoma, Arkansas, Tennessee, North Carolina, Texas, Louisiana, Mississippi, Alabama, Georgia, South Carolina, Florida; Mexico: Coahuila, Durango, Jalisco, Mexico, Veracruz, Guerrero, Yucatan; Guatemala: Baja Verapaz; Panama: Chiriqui; Colombia; Venezuela; Peru; Brazil: Amazonas, Pará, São Paulo; Argentina: Buenos Aires.

#### *Eichlinia eichlini* (Friedlander, 1986), **comb.n.**

“*Melittia eichlini* new species Friedlander” — Friedlander, 1986: 278, figs 1, 2, 4, 7, 8, 11–16. Type locality: “...Jalisco, 5 km w. Atenquiqui, ...” [= Mexico: Jalisco, Atenquiqui]. Holotype ♂ (NMNH).

*Melittia eichlini* — Eichlin, 1995: 48; Pühringer, Kallies, 2004: 15.

**HOST PLANT.** *Cucurbita argyrosperma* K. Koch (Friedlander [1986: 281, 283] cited as *C. sororia* Bailey) (Cucurbitaceae).

**DISTRIBUTION.** Mexico: Jalisco, Colima, Michoacan.

#### *Eichlinia faulkneri* (Eichlin, 1992), **comb.n.**

“*Melittia faulkneri*, new sp.” — Eichlin, 1992: 141, figs 11, 29. Type locality: “Mexico.—Baja California: 49 mi. S Cataviña, ...” [= Mexico: Baja California, Ensenada, 78.9 km S Cataviña]. Holotype ♀ (USNM).

*Melittia faulkneri* — Eichlin, 1995: 48; Brown, 2004: 102; Pühringer, Kallies, 2004: 15.

**HOST PLANT.** *Cucurbita palmata* S. Watson (Cucurbitaceae).

**DISTRIBUTION.** Mexico: Baja California.

#### *Eichlinia gilberti* (Eichlin, 1992), **comb.n.**

= “*Melittia gilberti*, new sp.” — Eichlin, 1992: 140, figs 9, 10, 25. Type locality: “Mexico. — Baja California: 49 mi. S Cataviña, ...” [= Mexico: Baja California, Ensenada, 78.9 km S Cataviña]. Holotype ♂ (USNM).

*Melittia gilberti* — Eichlin, 1995: 48; Brown, 2004: 102; Pühringer, Kallies, 2004: 15.

**HOST PLANT.** *Cucurbita palmata* S. Watson (Cucurbitaceae).

**DISTRIBUTION.** Mexico: Baja California.

#### *Eichlinia gloriosa* (Hy Edwards, 1880), **comb.n.**

“*Melittia gloriosa*, n. sp.” — Edwards, 1880: 71. Type locality: “... in San Leonardo, Cal., ...” [= USA: California, Alameda County, San Leonardo]. Holotype ♀ (AMNH).

= "*Melittia superba* n. sp." — Barnes, Lindsey, 1922: 122. Type locality: "... Seward Co., Kansas." [= USA: Kansas, Seward County]. Holotype ♂ (USNM). It is a junior primary homonym of *Melittia superba* Rothschild, 1909.

= "*Melittia lindseyi*, new name." — Barnes, Benjamin, 1925: 14. Replacement name for *Melittia superba* Barnes et Lindsey, 1922.

= "[*Melittia*] *Barnesi* Dalla Torre nom. nov." — Dalla Torre in Dalla Torre, Strand, 1925: 138. Replacement name for *Melittia superba* Barnes et Lindsey, 1922.

*Melittia barnesi* — Duckworth, Eichlin, 1973a: 5.

*Melittia gloriosa* — Beutenmüller, 1892: 171; Beutenmüller, 1896: 113; Beutenmüller, 1899: 149, 150; Beutenmüller, 1901: 235, pl. 29, fig. 3; Dyar, 1902: 364; Snow, 1905: 160; Engelhardt, 1924: 125; Dalla Torre, Strand, 1925: 144; Thompson, 1929: 121; Zukowsky, 1936: 1249, pl. 179, row c; McDunnough, 1939: 87; Engelhardt, 1946: 182, 188, pl. 31, figs 178, 179; Duckworth, Eichlin, 1973a: 13; Duckworth, Eichlin, 1977: 52; Duckworth, Eichlin, 1978b: 5, 23, figs 5–7, 21, pl. 2; Solomon, Dix, 1979: 16; Heppner, Duckworth, 1981: 26; Friedlander, 1986: 282; Eichlin, Duckworth, 1988: 52, 57, text-fig. 13d, pl. 2, figs 1, 3, 5; Eichlin, 1995: 48; Brown, 2004: 102; Powell, 2005: 367; Pühringer, Kallies, 2004: 17; Taft, Schaper, 2014: 58, 60; Pohl et al., 2016: 206; Moreira et al., 2019: 42, 43.

*Melittia lindseyi* — Zukowsky, 1936: 1249; McDunnough, 1939: 87; Stallings, Turner, 1944: 30, 31; Duckworth, Eichlin, 1973a: 15, 28.

*Melittia superba* — Duckworth, Eichlin, 1973a: 5, 15, 28.

HOST PLANT. *Cucurbita foetidissima* Kunth, *C. palmata* S. Watson, *Marah fabaceus* (Naudin) Greene (Cucurbitaceae).

DISTRIBUTION. USA: Oregon, California, Kansas, Arizona, New Mexico, Texas, Colorado, Oklahoma. Mexico: Sonora, Baja California.

#### *Eichlinia grandis* (Strecker, 1881), **comb.n.**

"*Trochilium Grande*, n. sp." — Strecker 1881: 156. Type locality: "Hab. Texas." [= USA: Texas]. Holotype ♀ (FMNH).

= "*Melittia Beckeri*, sp. n." — Druce, 1892: 276. Type locality: "Hab. Mexico, near Durango city ..." [= Mexico: Durango, Durango]. Holotype ♂ (BMNH).

= "*Melittia grandis hermosa*, new variety" — Engelhardt, 1946: 186, pl. 31, fig. 177. Type locality: "Arizona." [= USA: Arizona]. Holotype ♀ (NMNH).

*Melittia beckeri* — Druce, 1896: 325; Druce, 1897: pl. 69, fig. 18; Duckworth, Eichlin 1978a: 5.

*Melittia grandis* — Beutenmüller, 1896: 113; Beutenmüller, 1899: 149, 151; Beutenmüller, 1901: 235, pl. 29, fig. 4; Dyar, 1902: 364; Walsingham, 1913: 193; Dalla Torre, Strand, 1925: 144; Zukowsky, 1936: 1249, pl. 179, row c; McDunnough, 1939: 87; Engelhardt, 1946: 182, 184; Duckworth, Eichlin, 1977: 52; Duckworth, Eichlin, 1978b: 5, 26, fig. 22, pl. 2; Solomon, Dix, 1979: 16; Heppner, Duckworth, 1981: 26; Friedlander, 1986: 278, 279, 281–284; Eichlin, Duckworth, 1988: 52, 56, text-fig. 13e, pl. 2, figs 6, 8, 10, pl. A, fig. 9; Pühringer, Kallies, 2004: 17; Taft, Schaper, 2014: 58, 60; Pohl et al., 2016: 206; Moreira et al., 2019: 42, 43.

*Melittia grandis* var. *hermosa* — Duckworth, Eichlin, 1973a: 13.

*Trochilium Grande* — Duckworth, Eichlin, 1973a: 3.

HOST PLANT. *Cucurbita foetidissima* Kunth (Cucurbitaceae).

DISTRIBUTION. USA: Kansas, California, Arizona, New Mexico, Texas, Oklahoma; Mexico: Durango.

#### *Eichlinia khmer* (Le Cerf, 1917), **comb.n.**

"*Melittia Khmer* n. sp." — Le Cerf, 1917: 161, pl. 475, fig. 3916. Type locality: "Cambodge, Angkor, ...". Obviously, this type locality is wrong due to mislabeling. It must be located somewhere in North or Central America [Arita, Gorbunov, 1996 b]. Holotype ♂ (MNHP).

*Melittia khmer* — Dalla Torre, Strand, 1925: 145; Gaede, 1933: 791, pl. 95, row f; Heppner, Duckworth, 1981: 27; Arita, Gorbunov, 1996b: 184, figs 39, 40, 58a–d; Pühringer, Kallies, 2004: 17.

*Melittia chmer* — Hampson, 1919: 93.

HOST PLANT. Unknown.

DISTRIBUTION. North America (?).

#### *Eichlinia magnifica* (Beutenmüller, 1899), **comb.n.**

"*Melittia magnifica*, sp. nov." — Beutenmüller, 1899: 151. Type locality: "Austin, Texas." [= USA: Texas, Austin]. Holotype ♀ (AMNH).

*Melittia magnifica* — Beutenmüller, 1901: 236, pl. 29, fig. 5; Dyar, 1902: 364; Dalla Torre, Strand, 1925: 146; Zukowsky, 1936: 1250, pl. 179, row c; McDunnough, 1939: 87; Engelhardt, 1946: 182, 191; Duckworth, Eichlin, 1973a: 16; Duckworth, Eichlin, 1977: 52; Solomon, Dix, 1979: 16; Heppner, Duckworth, 1981: 27; Eichlin, Duckworth, 1988: 52, 58, pl. 2, fig. 12; Brown, 2004: 102; Pühringer, Kallies, 2004: 17; Pohl et al., 2016: 206.

HOST PLANT. *Cucurbita argyrosperma* Huber (Cucurbitaceae).

DISTRIBUTION. USA: Texas; Mexico: Baja California.

#### *Eichlinia pulchripes* (Walker, 1856), **comb.n.**

"*Melittia pulchripes*." — Walker, 1856: 67. Type locality: "Venezuela." Lectotype ♀ (BMNH), designated by Duckworth, Eichlin 1978: 21.

= "*Melittia riograndensis* Brèthes, n. sp." — Brèthes, 1920: 284. Type locality: "... Pelotas" [= Brazil: Rio Grande do Sul, Pelotas]. Lectotype ♂ (MACN), designated by Becker, Eichlin, 1984: 14.

= *Melittia pulchripes dangeloi* — Köhler, 1941: 10. Type locality: "Corrientes, ..." [= Argentina: Corrientes]. Lectotype ♂ (IML), designated by Duckworth, Eichlin 1978a: 21.

= *Melittia satyriniformis* auct., nec *Melittia satyriniformis* Hübner, 1831 ["1825"].

*Melittia pulchripes* — Walker, 1856: 67; Dalla Torre, Strand, 1925: 147; Zukowsky, 1936: 1249, pl. 179, row b; Duckworth, Eichlin, 1978a: 21; Heppner, Duckworth, 1981: 27; Becker, Eichlin, 1984: 14; Pühringer, Kallies, 2004: 15.

*Melittia pulchripes d'angeloi* — Duckworth, Eichlin, 1978a: 21.

*Melittia riograndensis* — Zukowsky, 1936: 1253; Becker, Eichlin, 1984: 13, 14.

HOST PLANT. Unknown.

DISTRIBUTION. Guatemala; Honduras; Venezuela; Colombia; Brazil: Pará.

#### *Eichlinia snowii* (Hy Edwards, 1882), **comb.n.**

"*Melittia Snowii*, n. s." — Edwards, 1882: 53. Type locality: "Kansas, ..." [= USA: Kansas]. Lectotype ♂ (AMNH), designated by Duckworth, Eichlin, 1973a: 27.

*Melittia snowii* — Beutenmüller, 1892: 171; Beutenmüller, 1896: 113; Beutenmüller, 1899: 149, 150; Beutenmüller, 1901: 234, pl. 29, fig. 2; Dalla Torre, Strand, 1925: 148; Zukowsky, 1936: 1249, pl. 179, row b; Engelhardt, 1946: 182, 186; Duckworth, Eichlin, 1973a: 27; Duckworth, Eichlin, 1977: 52; Solomon, Dix, 1979: 16; Heppner, Duckworth, 1981: 27; Friedlander, 1986: 279, 281–283; Eichlin, Duckworth, 1988: 52, 54, text-fig. 13f, pl. 2, fig. 7; Eichlin, 1995: 48; Pühringer, Kallies, 2004: 17; Taft, Schaper, 2014: 60; Pohl et al., 2016: 206; Moreira et al., 2019: 42, 43.

*Melittia snowi* — McDunnough, 1939: 87; Stallings, Turner, 1944: 31.

HOST PLANT. *Cucurbita foetidissima* Kunth (Cucurbitaceae).

DISTRIBUTION. USA: Colorado, Nebraska, Kansas, Arizona, New Mexico, Oklahoma, Texas.

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