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ON THE TAXONOMY OF THE GENERA *SESAPA* AND *NIPPONASURA* (LEPIDOPTERA, EREBIDAE, ARCTIINAE)

A. V. Volynkin

Altai State University, Lenina st., 61, Barnaul, RF-656049 Russia
Tomsk State University, Institute of Biology, Ecology, Soil Science, Agriculture and Forestry,
Lenina Avenue, 36, Tomsk, RF-634050 Russia
E-mail: volynkin_a@mail.ru

On the Taxonomy of the Genera *Sesapa* and *Nipponasura* (Lepidoptera, Erebidae, Arctiinae).
Volynkin, A. V. — Statuses of the lithosiinae genera *Sesapa* Walker, 1854 and *Nipponasura* Inoue, 1965 are revised, *Sesapa* is treated as a valid distinct genus and *Nipponasura* is downgraded here as a subgenus of *Sesapa*. Male and female genitalia of *Sesapa* and male vesica of *Nipponasura* are described and illustrated for the first time. A new combination is established: *Sesapa* (*Sesapa*) *sanguinea* (Moore, 1877), **comb. n.** *Sesapa* (*Nipponasura*) *inouei* Volynkin, **nom. n.** is introduced as replacement name for *Nipponasura sanguinea* Inoue, 1965.

Key words: Lithosiini, Nudariina, Asia, Japan, China, revised status, replacement name, new combination.

Introduction

The *Asura* / *Miltochrista* generic complex is one of the largest and taxonomically most difficult Lithosiini groups including several hundreds of species distributed in Afrotropical, Oriental, Palearctic and Australian Regions. Systematics of the Oriental and partly Palearctic members of the generic complex was reviewed by Holloway (2001), and those of the Afrotropical members by Durante (2008; 2009; 2012).

The genus *Sesapa* was erected by Walker (1854) for a single species *Sesapa inscripta* Walker, 1854. Hampson (1900) synonymized it with *Miltochrista*, and at present several other taxa originally described as *Sesapa* by different authors (Butler, 1877; Moore, 1877) are placed to the genera *Miltochrista* and *Barsine* (Holloway, 2001; Kirti, Singh, 2015). Meanwhile, Holloway (2001) suggested distinct generic status of *Sesapa*, but genitalia of the type species of *Sesapa* were still unknown and status of the genus *Sesapa* was unclear.

Examination of *S. inscripta* genitalia confirmed that it is not congeneric with *Miltochrista miniata* (Forster, 1771), the type species of *Miltochrista*, and that *Sesapa* is a distinct genus. On the other hand, *Nipponasura* Inoue, 1965 also having unclear status (Volynkin, 2016 a) show no significant differences in genitalic structures from *Sesapa* except reduction of the medial costal process and presence of merged transtilla with well-developed transtillar processes in *Nipponasura*. Therefore I consider *Nipponasura* as a **new synonym** of in the genus *Sesapa* and as a subgenus in it. In addition, during examination of genitalia of other members of the *Asura* / *Miltochrista* generic complex an additional species of *Sesapa*, *S. sanguinea* (Moore, 1877), **comb. n.**, so at present the type species of *Nipponasura*, *S. (N.) sanguinea* (Inoue, 1965) is a junior secondary homonym of *S. sanguinea* (Moore, 1877), therefore I introduce here the name *Sesapa* (*Nipponasura*) *inouei* Volynkin, **nom. n.** as replacement name for *sanguinea* (Inoue).

In the present paper, diagnoses for both *Sesapa* and *Nipponasura* are given and species belonging to the genus *Sesapa* are also reviewed.

Material and methods

The paper is based on the materials of the collections of Natural History Museum, London (NHM) (United Kingdom), Museum Witt / Zoologische Staatssammlung, München (MWM/ZSM) (Germany), and Zoologisches Forschungsmuseum Alexander Koenig (ZFMK) (Bonn, Germany).

The genitalia were dissected and mounted in euparal on glass slides. Photos of imago were taken using the camera Nikon D3100/AF-S Nikkor, 18–55 mm. Photos of the genitalia were taken by the same camera attached to a microscope with an LM-scope adapter, and further processed by Adobe Photoshop CS4® software.

Genus *Sesapa* Walker, 1854

Sesapa Walker, 1854: 547.

Type species: *Sesapa inscripta* Walker, 1854 (by monotypy).

Nipponasura Inoue, 1965: 241; **syn. n.**

Type species: *Nipponasura sanguinea* Inoue, 1965 (by original designation).

Diagnosis. Small moths; male antenna ciliate, female antenna filiform. Sexual dimorphism is poorly expressed: females are slightly larger and have paler hindwings than males. The male genitalia have the following autapomorphies: 1) the costa is broad and short, interrupted perpendicular to the valva axis, its length is only two-thirds or three quarters of valva length (whereas in other genera the costa is longer and distally narrowed or rounded); 2) the distal membranous lobe of valva is long, broad and well separated from the distal saccular process (whereas in other genera the distal membranous lobe of valva is smaller and the distal saccular process is usually situated close to it). In addition, the vesica of *Sesapa* has two or three clusters of numerous thin spines (whereas in the majority of genera of the *Asura* / *Mitochondrista* generic complex vesica has short or very large cornuti or robust spines, only genera *Asura* and *Xanthetis* have clusters of numerous thin spines). The female genitalia are similar to those of other genera of the *Asura* / *Mitochondrista* generic complex, but the antevaginal plate has deep and narrow medial concavity and irregularly dentate margins.

Distribution. South and East China.

Subgenus *Sesapa* Walker, 1854

Diagnosis. The nominative subgenus differs from *Nipponasura* by the larger size of moths, non-merged transtillae without transtillar processes, presence of very small trigonal medial costal process directed ventrally in the male genitalia, flat antevaginal plate, much shorter and narrower ductus bursae and elongated, pear-like corpus bursae in the female genitalia.

***Sesapa (Sesapa) inscripta* (Walker, 1854) (figs 1, 1–3; 2, 1; 3, 1)**

Sesapa inscripta Walker, 1854: 547 (type locality: “North China”).

= *Sesapa erubescens* Butler, 1877: 345 (type locality: “North China”).

Type material examined. **Holotype** ♂ *Sesapa erubescens*: without abdomen, handwritten label “*Sesapa erubescens* Butler Type” / handwritten label “China, Shanghai (Fortune) 54–8” / round printed label with a green circle “Type” / printed label “1. *Sesapa inscripta*” (Coll. NHM).

Other material examined. **China:** Hoeng-Shan (900 m), Provinz Hunan, 18.08.1933, 4 ♀ (Höne) (ZFMK); same locality and collector, 3.08.1933, 4 ♀ (Höne) (MWM / ZSM).

Diagnosis. Externally, the species differs from its closest relative, *S. sanguinea* by presence of crosslines on forewings and darker hindwings of both sexes. In the male genitalia, *S. inscripta* differs from *S. sanguinea* by the narrower uncus, the slightly smaller medial costal process, the shorter apical membranous lobe of valva, the shorter, C-like curved distal saccular process, the larger aedeagus (in comparison with the genital capsule), and presence of only two clusters of spines in the vesica (whereas in *S. sanguinea* there is one more small bunch-like cluster). In the female genitalia, *S. inscripta* differs from *S. sanguinea* by the shorter apophyses anteriores, the narrower antevaginal plate, the narrower ductus bursae, the narrower appendix bursae, and the weaker spines in the posterior section of corpus bursae.

Distribution. China (Shanghai, Jiangxi, Hunan, Fujian) (Daniel, 1951; Fang, 2000).

***Sesapa (Sesapa) sanguinea* (Moore, 1877), **comb. n.** (figs 1, 4–6; 2, 2; 3, 2)**

Setinochroa sanguinea Moore, 1877: 87 (Type locality: “Shanghai”).

Type material examined. **Holotype**: ♂: without abdomen, handwritten label “*Setinochroa sanguinea* Moore, Shanghai, type” / printed round label with a red circle “Type” “Moore Coll. 94–106” (printed label), printed label with QR-code “NHMUK010604771” (printed label) (HNM).

Other material examined. **China:** Hubei: Chang-Yang, 06.1888, 5 ♂, 5 ♀ (A. E. Pratt) (HNM); [Shanghai] “Chine, env. de Changhai”, 1895, 1 ♀ (Baumert) (HNM); [Hubei, Yichang] Ichang, 07.1888, 1 ♀ (Mrs. Pratt coll.) (HNM); “Walker coll. Shanghai”, 1 ♀ (HNM); Shanghai, 1 ♂ (W. B. Pryer) (HNM); Jiangsu: “Lungtan, b. Nanking”, 11, 13, 15, 17, 18, 21, 23, 25.06, 19.07.1933, 6 ♂, 5 ♀ (Höne) (ZFMK); Shanghai, 10, 26, 28.06.1932, 2 ♂, 1 ♀ (Höne) (ZFMK); Shanghai, 23.06, 26.08.1940, 2 ♀ (Höne) (ZFMK); same data, 6.06, 8.06.1932, 1 ♂, 1 ♀, slide AV1926f Volynkin (ZFMK); Zhejiang: “Ost Tien-mu-shan” [East Tianmu Mountain], 31.05, 9.06.1932, 2 ♂ (Höne) (ZFMK); “Mokanshan” [Mogan Mountain], 16.06.1930, 1 ♂ (Höne) (ZFMK); “Shanghai, China” slide AV1918m Volynkin, 1 ♂ (ZFMK).

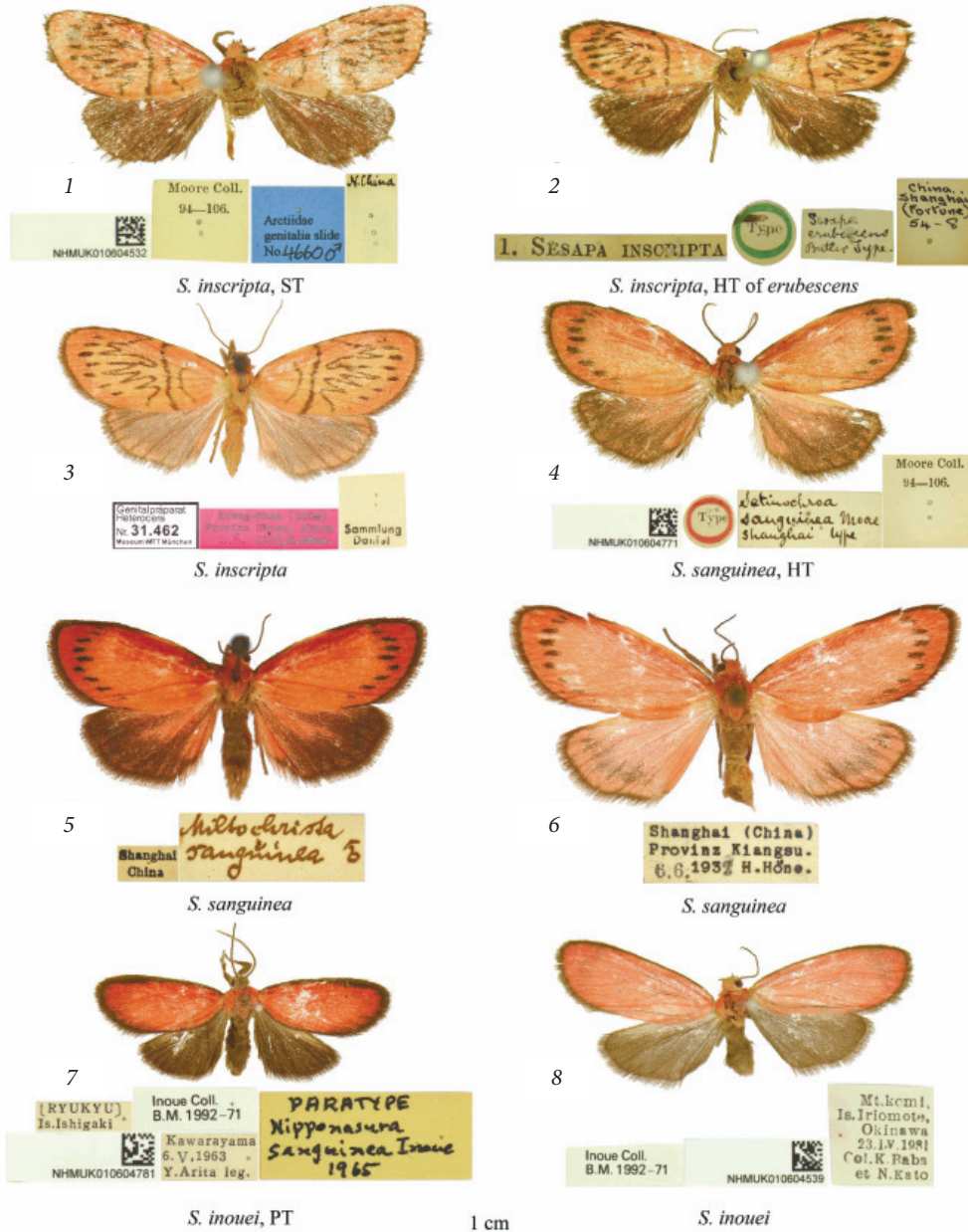


Fig. 1. *Sesapa* spp., adults, dorsal view: 1 — *S. inscripta*, ♂, N China (©NHM); 2 — *S. inscripta*, holotype ♂ of *S. erubescens*, China, Shanghai (©NHM); 3 — *S. inscripta*, ♀, China, Hunan prov. (ZFMK); 4 — *S. sanguinea*, holotype ♂, China (©NHM); 5 — *S. sanguinea*, ♂, China, Shanghai (ZFMK); 6 — *S. sanguinea*, ♀, China, Shanghai (ZFMK); 7 — *S. inouei*, paratype ♂, Japan, Ishigaki Isl. (©NHM); 8 — *S. inouei*, ♀, Japan, Iriomote Isl. (©NHM).

Diagnosis. Externally, the species differs from its closest relative, *S. inscripta*, by the absence of crosslines on forewing and paler hindwing. The male genitalia of *S. sanguinea* differ from those of *S. inscripta* by the medially broader uncus, slightly larger medial costal process, longer apical membranous lobe of valva, longer and s-like curved distal saccular process, smaller aedeagus (in comparison with the genital capsule), and presence of three clusters of spines in the vesica (whereas in *S. inscripta* there are only two clusters). The female genitalia of *S. sanguinea* differ from those of *S. inscripta* by the longer apophyses anteriores, broader antevaginal plate, broader ductus bursae, broader appendix bursae, and stronger spines in the posterior section of corpus bursae.

Distribution. China (Shanghai, Zhejiang, Yunnan).

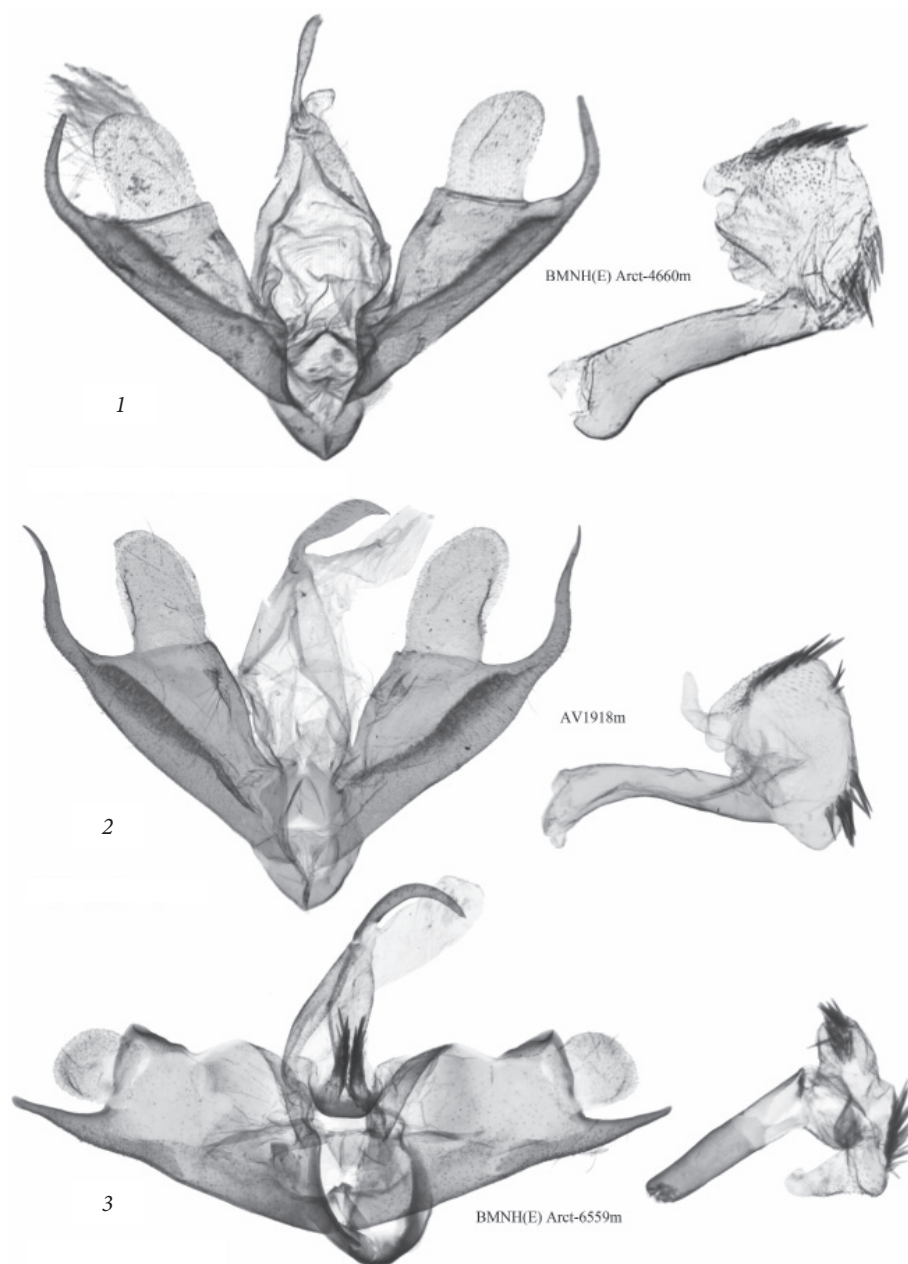


Fig. 2. *Sesapa* male genitalia, ventral view: 1 — *S. inscripta* (holotype of *S. erubescens*), China, Shanghai, slide BMNH(E) Arct-4660 m Holloway (©NHM); 2 — *S. sanguinea*, China, Shanghai, slide AV1918m Volynkin; 3 — *S. inouei*, Japan, Iriomote Isl., slide BMNH(E) Arct-6559 m Volynkin (©NHM).

Subgenus *Nipponasura* Inoue, 1965, stat. n.

Nipponasura Inoue, 1965: 241 (as genus).

Type species: *Nipponasura sanguinea* Inoue, 1965 (by original designation).

Diagnosis. The single known member of the subgenus is significantly smaller than both species of the subgenus *Sesapa*. The male genitalia are similar to those of *Sesapa*, but differ by the horseshoe-like merged transtillae with long and narrow transtillar processes covered with spinules, absence of medial costal processes and the narrower vesica (in *Sesapa* the vesica is broad, globular). The female genitalia differ from those of *Sesapa* by the rugose antevaginal plate, the longer and broader ductus bursae and the more or less globular corpus bursae.

Distribution. Japan: Ryukyu Islands.

***Sesapa* (*Nipponasura*) *inouei* Volynkin, nom. n. (figs 1, 7–8; 2, 3; 3, 3)**

Nipponasura sanguinea Inoue, 1965: 242; non *Sesapa sanguinea* (Moore, 1877) (= *Setinochroa sanguinea* Moore, 1877).

Type material examined. **Holotype:** ♂, “Ka-arayama, Ishigaki Is., Ryukyu, 12.06.1963, H. Inoue” (handwritten & printed label), “Holotype *Nipponasura sanguinea* Inoue, 1965” (handwritten red label), “Holotype” (round printed label with a red circle), “Inoue coll. B.M. 1992–71” (printed label), “Type status verified K. Buckmaster 1992” (printed label), “Type photographed in colour” (printed label), “No. 995”, (handwritten label), “NHMUK010605746” (printed label with QR-code) (NHM). **Paratype:** ♂, “Ryukyu, Is. Ishigaki, Kawarayama, 6.05.1963, Y. Arita leg.” (NHM).

Other material examined. **Japan:** Shirahama, Iriomote I., Ryukyu, 14.11.1963, 1 ♂, slide BMNH(E) Arct.-6559 m Volynkin (NHM); Mt. Komi, Is. Iriomote, Okinawa [pref.], 23.04.1981, 1 ♀ (Col. K. Baba et N. Kato) (NHM).

Diagnosis. See the diagnosis of the subgenus.

Distribution. Endemic to Japanese Ryukyu Islands (Ishigaki Is., Iriomote Is., Yonakuni Is.) (Inoue, 1965).

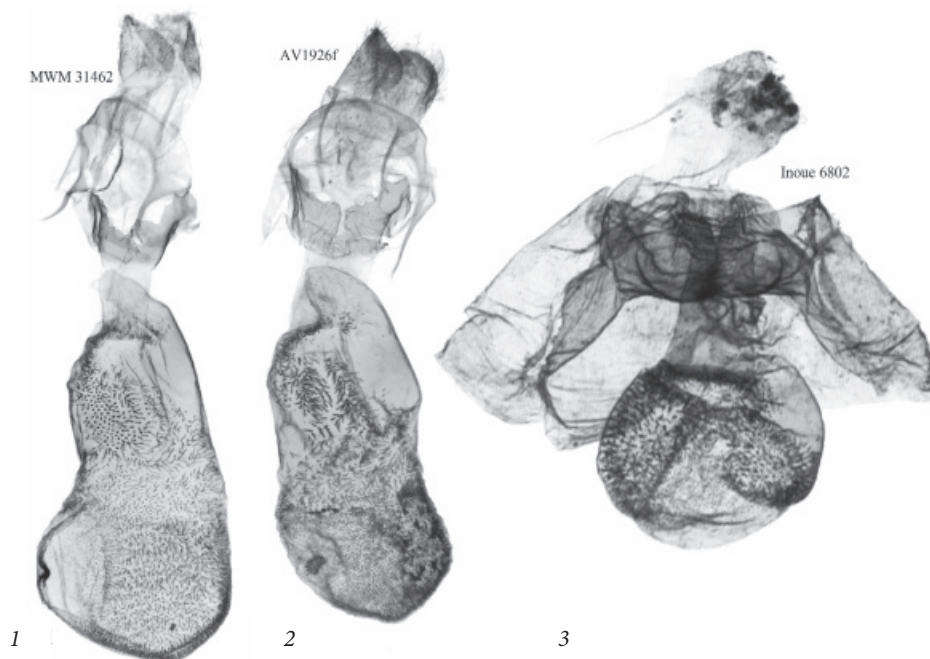


Fig. 3. *Sesapa* spp., female genitalia, ventral view: 1 — *S. inscripta*, China, Hunan Prov., slide MWM 31462 Volynkin; 2 — *S. sanguinea*, China, Shanghai, slide AB1926f Volynkin; 3 — *S. inouei*, Japan, Ryukyu Isl., slide Inoue 6802 (©NHM).

Discussion

At present the *Asura* / *Miltochrista* generic complex includes 30 valid nominal genera: *Asuridia* Hampson, 1900, *Barsine* Walker, 1854 (= *Ammatho* Walker, 1855, *Castabala* Walker, 1864, *Mahavira* Moore, 1878, *Korawa* Moore, 1878), *Melanaema* Butler, 1877, *Cyme* Felder, 1861, *Eutane* Walker, 1854, *Nepita* Moore, [1860], *Disasuridia* Fang, 1991, *Indiania* Kirti, Gill & Joshi, 2014, *Quadratura* Holloway, 2001, *Barsochrista* Singh & Kirti, 2016, *Pseudobarsine* Singh & Kirti, 2016, *Sesapa* Walker, 1854 **stat. rev.** (with subgenus *Nipponasura* Inoue, 1965, **syn. & stat. n.**), *Ovipennis* Hampson, 1900, *Idopterum* Hampson, 1894, *Gurna* Swinhoe, 1892, *Miltochrista* Hübner, [1819] (= *Lyclene* Moore, [1860]), *Symmetrodes* Meyrick, 1886 (= *Habrochroma* Turner, 1940), *Asuridoides* Daniel, 1951, *Cabarda* Walker, 1863, *Adites* Moore, [1882], *Pseudoadites* Singh & Kirti, 2016, *Afrasura* Durante, 2009, *Tumicla* Wallengren, 1863, *Chryasura* Hampson, 1914, *Arctelene* Kirti & Gill, 2008, *Gymnasura* Hampson, 1900, *Asura* Walker, 1854, *Graptasura* Hampson, 1900, *Xanthetis* Hampson, 1900, and *Parafrasura* Durante, 2012 (Holloway, 2001; Kirti, Singh, 2016; Volynkin, 2016 a; 2016 b). The taxonomic status of the genera *Allochrista* Roepke, 1946, *Asuropsis* Matsumura, 1927 and *Neasuroides* Matsumura, 1927 is still unclear. In addition, the huge genera *Barsine* and *Miltochrista* are clearly heterogenous and their generic/subgeneric structure needs revision (Volynkin et al., in prep.).

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