SEVERAL SPECIES OF GENUS EUGOA WALKER, 1858 (ARCTIINAE, LITHOSIINI) FROM INDONESIA AND INDIA

Karol BUCSEK

Slovak Academy of Sciences, Institute of Zoology, Dúbravská cesta 9, 845 06 Bratislava, Slovak republic; e-mail: monosyntaxis@gmail.com


Abstract: The work deals with the description of eight new species of the genus Eugoa Walker, 1858 occurring in Indonesia: Eugoa regalis Bucsek n. sp., Eugoa silvia Bucsek n. sp., Eugoa protessellata Bucsek n. sp., Eugoa zitnani Bucsek n. sp., Eugoa similis Bucsek n. sp., Eugoa kareli Bucsek n. sp., Eugoa tanimbara Bucsek n. sp. and Eugoa floresicola Bucsek n. sp.

Further, in this work is for the first time published a display of the holotype of Eugoa eeckei Strand, 1922, deposited in Naturalis Biodiversity Center, Leiden and the first finding of Eugoa bipunctalis van Eecke, 1926 for the island of Flores.

There is also published the species Eugoa ?euryphaea Hampson, 1914 from India, which problematical issue will need to be further examined.

Key words: Erebidae, new species, South-East Asia, taxonomy

INTRODUCTION

The genus Eugoa Walker, 1858 belongs to the Eugoa-group (together with other 5 genera – HOLLOWAY 2001), tribe Lithosiini Billberg of the subfamily Arctiinae Leach and family Erebidae.

Totally 114 species are listed and also two subspecies of this genus, whose status is clear (BUCSEK 2016; DUBATOLOV & BUCSEK 2016; SINGH & KIRTI 2016). Most of them occur in Asia (from India through Nepal and China to Japan, the entire South-East Asia) and seven species are known from Africa (BUCSEK 2016).

Important contributions to the knowledge of Eugoa Walker, 1858 in addition to those cited in the following text, include BETHUNE-BAKER (1904), BUCSEK (2008, 2012), BUTLER (1877), CERNY & PINRATANA (2009), ČERNÝ & BUCSEK (2014), VAN EECKE (1930), HAMPSON (1891, 1898, 1900), HOLLOWAY (2001), MOORE (1884–7), ROTHSCCHILD (1915), SEITZ (1914), STRAND (1922) and WALKER (1858, 1862).
MATERIAL AND METHODS

The photos of adults were made with NIKON COOLPIX L610. Genitalia were mounted in microscopic slides using Canada balsam, morphological observations were made using Leica M205FA and photos by CANON EOS 60D, subsequently were genitalia demounted and applies on label under adults (preserved in glycerine in test tubes). Post-shooting image processing was done using the software Adobe® Photoshop CS5. Holotypes are stored in the Slovak National Museum, Bratislava, paratypes in the collections of Karel Černý and Karol Bucsek.

Abbreviations

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<thead>
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<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>NBC</td>
<td>Naturalis Biodiversity Center, Leiden</td>
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<td>SNM</td>
<td>Slovak National Museum, Bratislava</td>
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<tr>
<td>CKC</td>
<td>in coll. Karel Černý, Innsbruck</td>
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<td>CKB</td>
<td>in coll. Karol Bucsek, Bratislava</td>
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<tr>
<td>HT</td>
<td>holotype</td>
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<td>PT</td>
<td>paratype</td>
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SYSTEMATIC SECTION

Genus Eugoa Walker, 1858
Type species: Eugoa aequalis Walker, 1858 (Borneo).


Eugoa regalis Bucsek n. sp.
(Figs. 1a, 1b, 15, 16)

Holotype: ♂, Gunung Makaroewa, 800 m, Bantimurung NP, Sulawesi, INDONESIA, Date: April 9, 2010, leg. Akihiko Miyano, SNM with a museum serial number SZ 10 888.
Paratypes: 1 ♀, Gunung Makaroewa, 800 m, Bantimurung NP, Sulawesi, INDONESIA, Date: April 8, 2010, leg. Kenichiro Nakao, 1 ♂, 3 ♀♀, Indonesia, S. Sulawesi, Palopo, Puncak, 850 m, 23.–31.XII.1993, leg. Karel Cerny, CKC, 1 ♂, 1 ♀, Indonesia, S. Sulawesi, Palopo, Puncak, 850 m, 23.–31.XII.1993, leg. Karel Cerny, 1 ♂, Puncak Palopo, 1100 m, 28 km from Palopo, Sulawesi, INDONESIA, Date: April 7, 2010, leg. Akihiko Miyano, 1 ♀, Gunung Makaroewa, 800 m, Bantimurung NP, Sulawesi, INDONESIA, Date: April 8, 2010, leg. Kenichiro Nakao, 2 ♀♀, Puncak Palopo, 1100 m, 28 km from Palopo, Sulawesi, INDONESIA, Date: April 7, 2010, leg. Akihiko Miyano, CKB.
Wingspan. Male 22–23 mm, female 23–24 mm.

*Holotype.* Male, 23 mm antennae pectinated, head and patagium white, thorax light-brown, in mesothorax white, regular, significant spot, abdomen straw-yellow. Forewings white with dark-brown bands, at the bottom of basal field, in the middle part a dark-brown stain, in discal field wide band, on the postbasal side straight, postdiscal band is more or less equally wide, on both ends bent to marginal. On termen narrow band which does not extend both to the apex and tornus. On costa ochre colouring, cilia ochre. Hindwings pale-yellow, termen and cilia ochre. In apical grey dusting.

*Male genitalia.* Uncus of conic shape, slightly curved, at the tip gently extending outward, valvae wide, in the middle section narrowed, in the top third with distinctive pubescence, ampulla large, at the base very broad, terminated with outwardly extending blunt spike, saccus pointed - symmetrically rising out from valvae. Aedeagus with two large cornuti.

*Female.* Antennae filiform, female habitualy the same as male.

*Female genitalia.* Sclerotized part very strong with significant spikes, ductus bursae broad, corpus bursae with sparsely placed cornuti, which are irregularly arranged.

*Similar species.* *Eugoa dissozona* (Meyrick, 1889) from Papua New Guinea, the main difference is: *Eugoa dissozona* (Meyrick, 1889) has a basal spot extending from costa to inner margin and the tape on termen is larger and of arcuate shape.

*Deriavatio nominis.* Royal = regalis.

**Eugoa silvia** Bucsek n. sp.
(Figs. 2a, 2b, 17)

*Holotype:* ♂, MOLUKKEN, Halmahera, Mt. Talagaranu, 600 m, 15 km SE Baru (Primär wald), 22.–31.1.1996, 1°12'N, 127°32'E, leg. Sinjaev & Tarasov, SNM with a museum serial number SZ 10 889.

*Paratype:* 1 ♀, INDONESIA, N. Moluccas, Halmahera Isl., Mt. Talagaranu, 15 km SE Baru, prim. forest, 600 m, 22.–31.1.1996, 1°12'N, 127°32'E, leg. V. Sinjaev & E. Tarasov, CKB.

Wingspan. Male 25 mm, female 27 mm.

*Holotype.* Male, antennae gently pectinated, head and patagium creamy-white, tegula cream with dark-brown spot, thorax cream, abdomen straw-yellow. Forewings cream-white with dark-brown bands in basal at the base in the middle a dark-brown stain, on costa rounded dark-brown band, in discal field broad irregular band, on costa wider, postdiscal tape is very wide, irregular, both bands are in the discal field associated with oblique dark brown tape. On termen wide tape, in submarginal with three blunt peaks, in marginal lighter. Cilia ochre-brown. Hindwings pale-yellow, in apical grey dusting.
Female. Antennae filiform, female habitually the same as male.

Male genitalia. Uncus thick, on the top with a thin apex, valva more or less equally wide, strongly pilous, on the top with two spikes, on costal margin with a sharp point, on saccular margin rounded. Saccus rounded – symmetrically rising from valvae. Aedeagus with very significant cornutus, which is with the spikes on top.

Derivatio nominis. The species is named after the first name of my girlfriend Silvia.

**Eugoa bipunctalis** van Eecke, 1926
(Figs. 3a, 3b, 18, 19)

*Eugoa bipunctalis* van Eecke: Holloway, 2001, Moths of Borneo 7: 417, pl. 7, fig. 363.

Wingspan. Male 25–26 mm, female 26–28 mm.

Type locality. Sumatra.

Note. For the island of Flores it is the first published finding, for the comparison is displayed the specimen from Sumatra.

**Eugoa protessellata** Bucsek n. sp.
(Figs. 4a, 4b, 20)

Holotype: ♂, S. Sulawesi, Mt. Sampuraga, 2°10.5′N, 120°45′E, 1.–6.II.1995, 1400 m, leg. Sinjaev & Tarasov, SNM with a museum serial number SZ 10 890.
Paratype: 1 ♀, like holotype, CKB.

Wingspan. Male 24 mm, female 27 mm.

Holotype. Male, antennae strongly pectinated, head, patagium and tegula straw-coloured with brown spots, thorax and abdomen straw-yellow colour, abdomen has on top a row of dark-brown dots. Forewings creamy-white with a brown tint and a dark-brown bands. At the base of basal field in its middle a dark brown spot, on costa rounded dark-brown band, in discal field a thin band, on costa significantly extended, postdiscal band thin, at the bottom half slightly curved
towards discal field, on costa significantly extended. In postdiscal field several dark-brown bands copying veining, on termen narrow zig-zag tape. Costa and cilia ochre. Hindwings pale-yellow, in apical significant brown dusting.

**Female.** Antennae filiform, female habitually the same as male, in apical hindwings more of brown dusting.

**Male genitalia.** Uncus long and bent at the top with a thin spike, valvae broad with strong pubescence, bent at the top on the side of saccular margin, terminated with a spike. Saccus obscure - symmetrically rising from valvae, juxta significant, finished with two peaks, ampulla triangular. Aedeagus with two almost equally large cornutus.

**Similar species.** *Eugoa tessellata* Holloway, 2001 has more brown sprinkled dusting on forewings, discal band is in the lower half of the field bent into the discal field and posdiscal tape is in the bottom half bent into postdiscal field.

**Eugoa zitnani** Bucsek n. sp.

(Figs. 5, 21)

**Holotype:** ♂, Indonesia, S. Sulawesi, Palopo, Puncak, 850 m, 23.–31.XII.1993, leg. Karel Cerny, SNM with a museum serial number SZ 10 891.

**Wingspan.** Male 20 mm.

**Holotype.** Antennae considerably pectinated, head, patagium and tegula ochre, thorax and abdomen ochre, on the thorax few brownish black spots, abdomen on its top with a series of black-brown dots. Forewings ochre with dark-brown dusting and with brownish-black bands. At bottom of the basal field in its middle part a brownish-black stain, on costa rounded brownish-black tape, in discal field is a band, on costa slightly broadened, in discal field two black dots, postdiscal tape wider at costa slightly broadened. On termen a tape, in the third from apex with sharp projections and in 2/3 with a slight bending toward postdiscal. Hindwings light-yellow, in apical significant brown dusting.

**Female.** Unknown.

**Male genitalia.** Uncus long and slightly curved, at the top with a thin spike, valvae broad, with pubescence, on the side of saccular margin at the top curved, terminated with a blunt spike. Saccus obscure – symmetrically rising from valvae, juxta significant with two pointy peaks, triangular, ampulla large, triangular, rounded at the top. Aedeagus with a strong spike, in vesica cornut of the V-shape.

**Derivatio nominis.** The species is named after my friend Dr. Dušan Žitňan, Director of the Institute of Zoology of Slovak Academy of Sciences, Bratislava.
**Eugoa similis** Bucsek n. sp.  
(Figs. 6a, 6b, 22, 23)

**Holotype:** ♂, Puncak Palopo, 1100 m, 28 km from Palopo, Sulawesi, INDONESIA, Date: April 7, 2010, leg. Kenichiro Nakao, SNM with a museum serial number SZ 10 892.

**Paratype:** 1 ♀, Indonesia, S. Sulawesi, Palopo, Puncak, 850 m, 23.–31.XII.1993, leg. Karel Cerny, CKB.

**Wingspan.** Male 22 mm, female 25 mm.

**Holotype.** Male, antennae considerably pectinated, head, patagium and tegula ochre, thorax and abdomen ochre, on the thorax few brownish-black spots, abdomen has a series of black-brown dots on its top. Forewings with dark-brown ochre dusting and with brownish-black bands. In basal field at the base of its middle part is a brownish-black stain, on costa rounded brownish-black tape, in discal field straight tape, on costa slightly extended, in discal field two black dots, postdiscal band straight, at costa slightly extended. Submarginal tape, in 1/3 from apex with a sharp projection and in 2/3 with a small deflection towards postdiscal. Hindwings pale-yellow, in apical significant brown dusting.

**Female.** Antennae filiform, female habitually the same as male, slightly darker.

**Male genitalia.** Uncus long and slightly curved at the top with a thin spike, valvae wide, with the pubescence, on the side of saccular margin at the top curved, terminated with a sharp point. Saccus obscure - symmetrically rising from valvae, juxta significant with two pointy peaks, triangular, ampulla triangular, rounded at the top. Aedeagus with a strong tip with multiple peaks, in vesica two small cornuti.

**Female genitalia.** Without any major characters, the whole corpus bursae with cornuti.

**Similar species.** *Eugoa zitnani* – very similar, the reliable distinction is possible only by comparing the genitalia.

**Eugoa kareli** Bucsek n. sp.  
(Figs. 7a, 7b, 7c, 24, 25)

**Holotype:** ♂, Indonesia, S. Sulawesi, Palopo, Puncak, 850 m, 23.–31.XII.1993, leg. Karel Cerny, SNM with a museum serial number SZ 10 893.

**Paratypes:** 2 ♀♀, Gunung Makaroewa, 800 m, Bantimurung NP, Sulawesi, INDONESIA, Date: April 8, 2010, leg. Kenichiro Nakao, CKC, 1 ♀, Puncak Palopo, 1100 m, 30 km from Palopo, Sulawesi, INONESIA, Date: April 5, 2010, Collect: Kenichiro Nakao, 1 ♂ like holotype, CKB.
Wingspan. Male 25–27 mm, female 27–28 mm. 

Holotype. Male, 27 mm, antennae only lightly pectinated, head, patagium and tegula pale-ochre, thorax and abdomen light ochre, on thorax few brownish-black spots, abdomen straw-colored. Forewings pale-ochre with dark brown dusting with brownish-black bands. At the base of basal field in its middle part is brownish-black stain, on costa rounded brownish black tape, in discal field more or less straight tape, on costa slightly extended, in discal field two black dots, postdiscal tape straight at the ends slightly angled towards termen, at costa slightly extended. Submarginal tape in 1/3 and in 2/3 from apex with sharp projections. Termen ochre-yellow, cilia ochre, among them dark-brown cilia. Hindwings pale-yellow, in apical brown dusting.

Female. Antennae filiform, female slightly lighter than the male. Postdiscal tape is slightly wavy, on the hindwings dusting, on apical more pronounced.

Male genitalia. Uncus long, pointed and bent in 90 degrees angle, from the base on the inner side a very significant blunt projection, valvae at the base broad, with pubescence, from 1/3 strongly narrowed and curved and blunt terminated with two (left valvae) and three (right valve) spikes. Saccus obscure, slightly stands out from valvae. Aedeagus without major characters.

Female genitalia. In the 7th aedeagus segment sclerotized bends in the shape of V and distinctive signa. Ductus bursae distinctive pear-shaped, corpus bursae is a bit smaller and oval, appendix bursae is much larger, of irregular shape, without any major characters.

Similar species. Eugoa zitnani, Eugoa similis – Eugoa kareli has antennae only gently pectinated, does not have line of dots on top side of the abdomen and it is larger species.

Derivatio nominis. The species is named after the first name of my sincere friend Dr. Karel Černý, Innsbruck.

Eugoa tanimbara Bucsek n. sp.
(Figs. 8, 26)

Holotype: ♂, INDONESIA, Tanimbar islands, Jamdena, 15.1.2007, Martin Obořil leg., SNM with a museum serial number SZ 10 894.

Wingspan. Male 18 mm.

Holotype. Antennae gently pectinated, head, patagium and tegula cream, thorax and abdomen cream with a yellow tint. Forewings cream-brown with brown dusting and with brown and dark-brown structures. In basal filed at the base in its middle part a dark-brown spot, on costa more or less rounded, dark-brown band, in discal field wavy brown tape, tape on costa extended and dark-brown, in discal field two dark brown dots, postdiscal tape on costa dark-brown,
distinctively extended, passes into brown narrow tape which is from the center to dorsum clearly bent into the discal field. Submarginal tape obscure, discrete, in 1/3 and 2/3 from the apex with distinct projection to submarginal field. Cilia cream, dark-brown cilia among them. Hindwings cream with a hint of yellow, in apical brown dusting.

**Female.** Unknown.

**Male genitalia.** Uncus significant, towards the top slightly widened, terminated with tip, on top side with strong pubescence, valvae on the base broad, with slight pubescence, in the last third of strongly narrowed, terminated with two sharp spikes, outside spike much shorter. Transtilla with a distinct field of small cornutus, saccus obscure, slightly rises from valvae. Aedeagus pear-shaped, a large bent cornut in it.

*Eugoa floresicola* Bucsek n. sp.

(Figs. 9a, 9b, 27, 28)

**Holotype:** ♂ INDONESIA, prov. Nusa Tenggara, Flores, Labuan Bajo, 60 m, 8°32'15"N, 119°53'51"E, 12.III.2016, leg. K. Černý, SNM with a museum serial number SZ 10 895.


**Wingspan.** Male 14–15 mm, female 15–16 mm.

**Holotype.** Male, 15 mm, antennae gently pectinated, from the base to 1/4 coloured black, head and patagium cream-brown, tegula in 2/3 black, thorax black, abdomen light-ochre, on thorax few brownish-black spots, abdomen halfway cream-brown, second half towards anal black. Forewings cream-brown with black-brown tint. Basal field black-brown, discal field cream-brown, discal dot black, postdiscal field up to termen black-brown dusted, on the apex oblique black spot, cilia ochre-brown, among them a black-brown cilia. Hindwings cream with yellow tint, in apical wide black-brown band.

**Female.** Antennae filiform, female is slightly lighter than the male, more tinted to dark brown.

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Male genitalia. Uncus long, on top with two tips, the tip placed on the outside is smaller, triangular, valvae along its length more or less equally wide, at the top slightly narrowed, terminated round. In valvae distinct, sclerotized structures. Saccus very significant, on both sides with a large round projections, middle part slightly bent outwards. Aedeagus with one strong and straight cornut.

Female genitalia. Corpus bursae ovoid, in the bottom half distinctively filled up cornutus. Similar species. Eugoa bipuncta Heylaerts (Figs. 10a, 10b, 29, 30): this species has whole antennae brown, overall habitus is tuned in brown colours, abdomen is monochromatic ochre-brown. Uncus is only with one bent hook on the top, valvae without significant structures and bottom part of saccus is bent inwards. The female has in corpus bursae a smaller field of cornutus but cornutus are bigger than in Eugoa floresicola.

Eugoa eeckei Strand, 1922
(Fig. 11)


Wingspan. Male 18 mm
Type locality. Celebes = Sulawesi, Maros.
Note. The species is for the first time presented photographically. Holotype is deposited in NBC.

Eugoa ?euryphaea Hampson, 1914
(Figs. 12a, 12b, 31)


Wingspan. Male 20 mm, female 24 mm.
Type locality. India, Sikhim = Sikkim.
Similar species. Eugoa unicolora Bucsek (Figs. 13, 32), Eugoa brunnea Hampson (Figs. 14, 33): Eugoa ?euryphaea Hampson has a sharper apex on the forewings, lacks a dot in discal and postdical fields. Significant differences are also in width and shape of valvae. Also important are the distances of the occurrence of individual species: Eugoa brunnea Hampson is probably endemic to Taiwan, the nearest occurrence of Eugoa unicolora Bucsek is in Thailand (Chiang Mai).
Note. The species is described by the female who was caught in altitude 2800 fts (about 850 meters), published male was caught in Aruchanal, prov. Etalin in altitude 700 m. The locations are in distance about 700–800 km. Reliable confirmation will be possible after obtaining more numerous comparative material.
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FIGURES 7–11. Adults of Eugoa spp. 7a. E. kareli n.sp., HT, ♂. 7b. E. kareli n.sp., PT, ♀. 7c. E. kareli n.sp., PT, ♀. 8. E. tanimbara n.sp., HT, ♂. 9a. E. floresicola n.sp., HT, ♂. 9b. E. floresicola n.sp., PT, ♀. 10a. E. bipuncta Heylaerts, 1891, ♂ from Pahang, Malaysia. 10b. E. bipuncta Heylaerts, 1891, ♀ from Pahang, Malaysia. 11. E. eeckei Strand, 1922, HT, ♂ with original label.

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