

An annotated catalogue of the insect genus *Chrysemosa*

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Abstract

In this study, an annotated catalogue and a primary key to species of *Chrysemosa* species is provided. Distribution data and/or diagnostic characters are listed under the part of related species. Two species are excluded from the key, because the data provided by previous study is limited and the useful statement is lacking. We have tried our best to offer the valid information of each species and hope these data can be served for integrated study of the genus in the future.

Keywords

Catalogue; key; *Chrysemosa*; species; integrated.

1. Introduction

The genus firstly proposed as *Mesochrysa* by Navás [1] and included a single species. After that, no members were added in the genus. Until 1990, Brooks and Barnard [2] provided a new name *Chrysomesa* to replace the name *Mesochrysa* Navás, 1936, a junior homonym of *Mesochrysa* Navás, 1927 and transferred nine species to the genus. Since then, publications on this genus increased rapidly from the year of 1928 to 2002, but these researches were focused on recorded species occurring in several certain countries. It is visible that the genus is lack of integrated study till now. Herein, we provide an annotated catalogue of this genus and provide a primary key for species identification to offer convenience for integrated study in the future.

2. Materials and methods

Based on the known literature, available data of total 11 species were summarized and listed under the related species, which forming an annotated catalogue of the study.

Catalogue of the genus

3. Results

Chrysemosa Brooks and Barnard, 1990

Navás [1]: 169 (*Mesochrysa* Navás, 1936 (nec Navás, 1927)); Brooks and Barnard [2]: 198 (*Chrysemosa*, a replacement name of *Mesochrysa* Navás, 1936).

Type species. *Mesochrysa stigmata* Navás, 1936, by original designation and monotypy.

3.1. *Chrysemosa andresi* (Navás, 1915)

Navás [3]: 394 (*Chrysopa*, holotype is missing); Esben-Petersen [4]: 514 (*Chrysopa*); Navás [5]: 199 (*Chrysopa*); Hölzel [6]: 7 (*Chrysopa* (*Suarius*)); Hölzel [7]: 43 (*Chrysopa* (*Suarius*)); Hölzel [8]: 51 (*Suarius* (*Prochrysopa*)); Hölzel [9]: 113 (*Chrysopa* (*Suarius*), designated a neotype (in Naturhistorisches Museum, Wien, Austria), type locality: Egypt (Mead)); Hölzel [10]: 58 (*Chrysopa*); Hölzel [11]: 23 (*Suarius*); Brooks and Barnard [2]: 269 (*Chrysemosa*); Ohm and

Hölzel [12]: 295 (*Chrysemosa*); Hölzel et al. [13]: 382 (*Chrysemosa*); Hölzel [14]: 444 (*Chrysemosa*); H. Aspöck and Hölzel [15]: 62 (*Chrysemosa*); Hölzel [16]: 134 (*Chrysemosa*); H. Aspöck et al. [17]: 123 (*Chrysemosa*); Hölzel [18]: 134 (*Chrysemosa*); Hölzel and Ohm [19]: 233 (*Chrysemosa*); El Hamouly and Fadl [20]: 97 (*Chrysemosa*); Letardi et al. [21]: 117 (*Chrysemosa*); Oswald [22]: online database (*Chrysemosa*).

Distribution. Algeria [10, 11, 13, 15, 17, 19, 21, 22]; Egypt [3, 4, 5, 10, 11, 15, 17, 19, 20, 21, 22]; Iran [6, 7, 9, 10, 11, 14, 17, 18, 19, 21, 22]; Oman [10, 11, 14, 16, 17, 18, 21, 22]; Saudi Arabia [10, 11, 16, 17, 18, 19, 21, 22]; Senegal [11, 14, 17, 18, 19, 21, 22]; Sudan [10, 11, 12, 17, 18, 19, 21, 22]; Yemen [11, 14, 16, 17, 18, 21, 22].

Notes. Most characters of this species is similar to *C. jeanneli*. The differences are mentioned as below: the upper and lower spot on distal cubital cell in the forewing are fused, the gonarcular complex has slender arms and the arms has a relatively long dorsal branch in side view.

3.2. *Chrysemosa commixta* (Tjeder, 1966)

Tjeder [23]: 386 (*Chrysopa* (*Suarius*), type locality: Zimbabwe (Marandellas), holotype in Natural History Museum of Zimbabwe); Hölzel [11]: 23 (*Suarius*); Brooks and Barnard [2] (*Chrysemosa*); Mansell [24]: 176 (*Chrysemosa*); Hölzel and Ohm [25]: 125 (*Chrysemosa*); Oswald [22]: online database (*Chrysemosa*).

Distribution. Namibia [22, 24, 25]; South Africa [22, 26]; Zimbabwe [11, 22, 23].

Notes. This species has most characters of *C. jeanneli*, but it differs from the later in having separated spots on distal cubital cell in the forewing and the strongly curved branch of entoprocessus in side view.

3.3. *Chrysemosa jeanneli* (Navás, 1914)

Navás [27]: 36 (*Chrysopa*, type locality: Kenya (Voi), type in Muséum National d'Histoire Naturelle, Paris, France); Esben-Petersen [4]: 514 (*Chrysopa*); Tjeder [23]: 382 (*Chrysopa* (*Suarius*)); Hölzel [11]: 23 (*Suarius*); Brooks and Barnard [2]: 269 (*Chrysemosa*); Mansell [24]: 176 (*Chrysemosa*); Hölzel and Ohm [25]: 125 (*Chrysemosa*); Legrand et al. [28]: 145 (*Chrysopa*); Youssif et al. [29]: 529 (*Chrysemosa*); Oswald [22]: online database (*Chrysemosa*).

Synonym. *Chrysopa ellenbergeri* Navás, 1919 [1921] [30]: 68 (type locality: South Africa (Steynsburg), type in Muséum National d'Histoire Naturelle, Paris, France); Tjeder [23]: 382 (*Chrysopa*, designated a lectotype and treated it as a junior synonym of *Chrysopa* (*Suarius*) *jeanneli* (Navás, 1914)).

Distribution. Botswana [22, 29]; Egypt [22]; Eswatini [11, 29]; Kenya [22, 23, 27, 28, 29]; Namibia [22, 24, 29]; South Africa [4, 11, 22, 23, 26, 28, 29, 30]; Tanzania [22, 23, 29]; Zimbabwe [11, 22].

Diagnostic characters. Diagnostic characters. Dorsal and lateral margins of toruli have a brown line combined at the area between antennae; the gena has black markings; the maxillary palpi and labial palpi are brown; the scape and pedicel have brown stripes. The wing has spots or shadings; in the forewing, Costal crossveins, crossveins at intersections between pseudomedia and pseudocubitus and gradates are brown (summarized based on the original description of Tjeder [23]).

3.4. *Chrysemosa laristana* (Hölzel, 1982)

Hölzel [9]: 118 (*Suarius*, type locality: Iran (100 km N Bandarabbas), holotype in Collection of H. Aspöck and U. Aspöck); Hölzel [11]: 23 (*Suarius*); Brooks and Barnard [2]: 269 (*Chrysemosa*); H. Aspöck et al. [17]: 124 (*Chrysemosa*); Oswald [22]: online database (*Chrysemosa*).

Distribution. Iran [9, 11, 22].

Notes. The characters are almost the same as *C. jeanneli*. The distinguished external character is its claw without hooked dilation.

3.5. *Chrysemosa mosconica* (Navás, 1931)

Navás [31] (*Chrysopa*, type locality: Somalia ("Boran" [= Buraan] [22]), holotype in Museo Civico di Storia Naturale (Giacomo Doria), Genova, Italy); Brooks and Barnard [2]: 269 (*Chrysopa*); Hölzel and Ohm [32]: 55 (*Suarius*); Ohm and Hölzel [12]: 295 (*Chrysemosa*); Poggi [33]: 429 (*Chrysemosa*); Hölzel [14]: 444 (*Chrysemosa*); Hölzel [16]: 134 (*Chrysemosa*); Hölzel et al. [34]: 354 (*Chrysemosa*); H. Aspöck et al. [17]: 123 (*Chrysemosa*); Hölzel and Ohm [25]: 125 (*Chrysemosa*); Hölzel [18]: 134 (*Chrysemosa*); Oswald [22]: online data (*Chrysemosa*).

Synonym. *Chrysopa* (*Suarius*) *simillima* Tjeder, 1966 [23]: 389 (type locality: Djibouti; holotype in Muséum National d'Histoire Naturelle, Paris, France); Hölzel [35]: 172 (*Suarius*); Brooks and Barnard [2]: 269 (*Chrysemosa*); Hölzel and Ohm [30]: 55 (*Suarius*, treated it a junior synonym of *Suarius mosconica* (Navás, 1931)).

Distribution. Djibouti [17, 18, 22, 23, 32, 34, 35]; Ethiopia [17, 22, 34]; Oman [14, 16, 17, 18, 22, 32]; Saudi Arabia [14, 16, 18, 22, 31, 32, 34, 35]; Somalia [14, 17, 18, 22, 25, 32, 34]; Sudan [14, 17, 18, 22, 32, 34, 35]; Yemen [18, 22, 34].

Diagnostic characters. The head is yellowish brown and does not have distinct markings; palpi are dark; the coloration of the scape is darker than the frons. In the forewing, most crossveins are marked with brown (summarized based on the description of *C. simillima* in Tjeder [23]).

Notes. Hölzel and Ohm [32] stated *C. mosconica* occurs in Sudan, Djibouti, Somalia, Arbién and Oman, which were remarked on Map 9 of Hölzel [11], but we did not discover the related remarks on the map.

3.6. *Chrysemosa parva* (Tjeder, 1966)

Tjeder [23]: 380 (*Chrysopa* (*Suarius*), type locality: South Africa (Kalahari Gemsbok National Park), holotype in Museum of Zoology and Entomology of Lund University, Lund, Sweden); Hölzel et al. [36]: 67 (*Chrysemosa*); Brooks and Barnard [2]: 269 (*Chrysemosa*); Mansell [24]: 176 (*Chrysemosa*); Hölzel and Ohm [25]: 125 (*Chrysemosa*); Oswald [22]: online data (*Chrysemosa*).

Distribution. Botswana [22, 36]; Namibia [11, 22, 24, 36]; South Africa [22, 26, 36].

Diagnostic characters. The gena has black markings; the third maxillary palpi and labial palpi are brown; the scape and pedicel have brown stripes. The wing is lack of spots or shadings; in the forewing, crossveins near subcosta, crossveins at intersections between pseudomedia and pseudocubitus and gradates are brown (summarized based on the original description of Tjeder [23]).

3.7. *Chrysemosa piresi* (Hölzel & Ohm, 1982)

Hölzel and Ohm [37]: 85 (*Suarius*, type locality: Cabo Verde (Mindelo), holotype in Collection of Hölzel); Brooks and Barnard [2]: 269 (*Chrysemosa*); Hölzel et al. [13]: 382 (*Chrysemosa*); Hölzel and Ohm [25]: 125 (*Chrysemosa*); Monserrant and Martin [38]: 77 (*Suarius*); Aistleiner and Hölzel [39]: 122 (*Suarius*); Oswald [22]: online database (*Chrysemosa*).

Distribution. Cabo Verde [13, 22, 37, 38, 39].

Notes. This species and *C. jeanneli* share the most characters. The differences are presented in the key part.

3.8. *Chrysemosa senegalensis* Hölzel et al., 1994

Hölzel et al. [13]: 382 (*Chrysemosa*, type locality: Senegal (E M'Bour), holotype in the Collection of Hölzel); Oswald [22]: online database (*Chrysemosa*).

Distribution. Senegal [13, 22].

Diagnostic characters. Frons has red suffusions; palpi are brown; the scape do not have any stripes. The pronotum is green. The wing does not have spots or shadings; pretristigma indistinct. In the forewing, the coloration of costal crossveins near subcosta, crossveins at intersectionss between pseudomedia and pseudocubitus and terminals of gradates is brown (summarized based on the description of Hölzel et al. [13]).

3.9. *Chrysemosa sodomensis* (Hölzel, 1982)

Hölzel [9]: 116 (*Suarius*, type locality: Israel (En Gedi), holotype in Collection of Hölzel); Hölzel [10]: 58 (*Suarius*); [11] (*Suarius*); Brooks and Barnard [2]: 269 (*Chrysemosa*); Hölzel [14] (*Chrysemosa*); H. Aspöck and Hölzel [15]: 62 (*Chrysemosa*); Hölzel [16]: 134 (*Chrysemosa*); H. Aspöck et al. [17]: 123 (*Chrysemosa*); Oswald [22]: online database (*Chrysemosa*).

Distribution. Israel [9, 15, 17, 22]; Palestine [10]; Saudi Arabia [10, 11, 16, 17, 22].

Notes. Most characters of *C. jeanneli* also exist in this species. The distribution of spots on distal cubital cell in the forewing and the shape of gonarcual arm are the exceptional. In this species, the upper and lower spot are fused and dorsal branch of the arm is elongate in side view.

3.10. *Chrysemosa stigmata* (Navás, 1936)

Navás [1]: 169 (*Mesochrysa*, type locality: Namibia (Okaundua farm, “bei Okahandja” [near Okahandja], holotype is destroyed during the World War II); Brooks and Barnard [2]: 269 (*Chrysemosa*); Hölzel and Ohm [25]: 125 (*Chrysemosa*); Oswald [22]: online database (*Chrysemosa*).

Distribution. Namibia [1, 22].

Notes. The original description of this species included: (1) toruli have black marking combined at the area between antennae; (2) palpi are brown; (3) the wing has distinct shadings; (4) the coloration of some crossveins is brown. These data is useless for species identification. Thus, it can not be listed in the key at present.

3.11. *Chrysemosa umbralis* (Navás, 1933)

Navás [40]: 211 (*Chrysopa*, type locality: “Kenya” [actually Madagascar, corrected by Oswald [22]] (Amparandandrava), holotype in Muséum National d’Histoire Naturelle, Paris, France); Navás [41]: 60 (*Chrysopa*); Hölzel [11]: 23 (*Suarius*); Brooks and Barnard [2]: 269 (*Chrysemosa*); Hölzel and Ohm [42]: 269 (*Chrysemosa*); Hölzel and Ohm [43]: 175 (*Chrysemosa*); Ohm and Hölzel [44]: 230 (*Chrysemosa*); Ohm and Hölzel [45]: 189 (*Chrysemosa*); Hölzel and Ohm [25]: 125 (*Chrysemosa*); Ohm and Hölzel [46]: 237 (*Chrysemosa*); Penny [47]: 665 (*Chrysemosa*); Legrand et al. [28] (*Chrysopa*); Thierry and Canard [48]: 80 (*Chrysemosa*); Oswald [22]: online database (*Chrysemosa*).

Distribution. Comoros [22, 45, 46]; Madagascar [11, 22, 25, 28, 40, 41, 42, 45, 47]; Mauritius [22, 42, 44, 45, 46]; French Réunion [22, 44, 45, 46, 48].

Notes. This species may be conspecific with *C. jeanneli*. Unfortunately, the abdomen of the type materials is missing. This conclusion cannot be proved at present [23]. In regard of the case, we do not decide to include it in the key of the species.

Key to species of the genus

1). Forewing without spots or shadings...2

Forewing with spots or shadings...3

2). Gradates of forewing entirely plale green...*C. parva* (Tjeder, 1966)

Gradates of forewing with black terminals...*C. senegalensis* (Hölzel et al., 1994)

3). Claw without hooked dilation...*C. laristana* (Hölzel, 1982)

Claw with hooked dilaton...4

4). Toruli without any lines...*C. simillima* (Tjeder, 1966) (= *C. mosconica* (Navás, 1931))

Toruli with black lines...5

5). Upper spot and lower spot fused on distal cubital cell in the forewing...6

Upper spot and lower spot not fused on distal cubital cell in the forewing...7

6). Gonarcular arm wide, with dorsal branch well elongate in side view...*C. sodomensis* (Hölzel, 1982)

Gonarcular arm wide, with dorsal branch not well elongate in side view...*C. andresi* (Navás, 1915)

7). Ventral branch of entoprocessus strongly curved dorsally in side view...*C. commixta* (Tjeder, 1966)

Ventral branch of entoprocessus strongly curved dorsally in side view...8

8). Forewing with lower spot on distal cubital cell large [37]; ventral branch of gonarcular arm relatively long in side view; mediuncus relatively short in dorsal and side view...*C. jeanneli* (Navás, 1914)

Forewing with lower spot on distal cubital cell relatively small [37]; ventral branch of gonarcular arm relatively short in side view; mediuncus relatively long in dorsal and side view...*C. piresi* (Hölzel & Ohm, 1982)

Notes. *C. stigmata* and *C. umbralis* are not listed in the key. Reasons are provided in the notes part of the two species.

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