

Pseudochrysis Semenov, 1891 is the valid genus name for a group of cuckoo wasps frequently referred to as *Pseudospinolia* Linsenmaier, 1951 (Hymenoptera, Chrysididae)

Paolo Rosa¹, Maurizio Pavesi², Villu Soon³, Oliver Niehuis⁴

¹ Via Belvedere 8/d, I-20881 Bernareggio (MB), Italy

² Museo di Storia Naturale, Corso Venezia 55, I-20122, Milano, Italy

³ Natural History Museum, University of Tartu, Vanemuise 46, 51014 Tartu, Estonia

⁴ Evolutionary Biology and Ecology, Institute of Biology I (Zoology), Albert Ludwig University, Hauptstr. 1, 79104 Freiburg, Germany

<http://zoobank.org/759512A9-D386-470F-A666-59DFBE1CF10C>

Corresponding authors: Paolo Rosa (rosa@chrysis.net); Maurizio Pavesi (maurizio_pavesi@yahoo.com);

Oliver Niehuis (oliver.niehuis@biologie.uni-freiburg.de)

Abstract

Received 31 March 2017

Accepted 11 May 2017

Published 31 May 2017

Academic editor:

Dominique Zimmermann

Key Words

nomenclature

taxonomy

Chrysura humboldti

Chrysis uniformis

Pseudochrysis (Spintharis) virgo

type species

synonymy

The cuckoo wasp genus *Pseudochrysis* Semenov, 1891 is currently treated by several authors as a junior subjective synonym of *Euchroeus* Latreille, 1809, due to a type species designation by O. W. Richards in 1935. In the original description of the genus *Pseudochrysis*, Semenov (1891) distinguished two subordinated taxa within the genus *Pseudochrysis*: the subgenus *Pseudochrysis* and the subgenus *Spintharis* (sensu Dahlbom 1854). Semenov included three species in the subgenus *Spintharis*, but failed to mention any species included in the nominal subgenus. He was the first author, however, who listed in a subsequent publication (Semenov 1892) eleven species to be included in the nominal subgenus. According to the International Code of Zoological Nomenclature (ICZN 1999, Art. 67.2.2), these eleven species are deemed to have been listed in the original description. One of these, *Chrysura humboldti* Dahlbom, 1845, was explicitly designated by Semenov (1892) as type species of *Pseudochrysis*. We therefore consider the designation of *Pseudochrysis (Spintharis) virgo* Semenov, 1891 as type species of *Pseudochrysis* by Richards (1935) as invalid. The currently widely used genus name *Pseudospinolia* Linsenmaier, 1951 (type species *Chrysis uniformis* Dahlbom, 1854) is consequently to be regarded as a junior subjective synonym of *Pseudochrysis*, given the current circumscription of the genus *Pseudospinolia* (including both *Pseudospinolia humboldti* and *Pseudospinolia uniformis*).

Introduction

Semenov¹ (1891: 444) described the genus *Pseudochrysis* at the end of a scientific article entitled “*Pseudochrysis (Spintharis) virgo*, sp. n.”, providing for it a short generic

diagnosis. Before this diagnosis, he announced the full description of the genus *Pseudochrysis* to be given in a forthcoming study on subfamilies, tribes, subtribes, genera, and subgenera of the family Chrysididae. The announced study was published a few months later (Semenov 1892).

In the original description of the genus *Pseudochrysis*, Semenov (1891: 443) subdivided his new genus into two subgenera: the nominal subgenus (*Pseudochrysis*) and the subgenus *Spintharis* sensu Dahlbom, 1854 (nec *Spintharis* Klug, 1845). Dahlbom’s (1854) interpretation of *Spintharis* differed from Klug’s (1845) original one,

¹ The family name of Andrey Petrovich Semenov-Tian-Shanskij (in Russian: Андрей Петрович Семёнов-Тянь-Шанский) was also spelled Semenow, Semenov-Tian-Shansky, Semenov-Tian-Shanskij in different publications on Chrysididae. The name Semenov is here standardised according to Kimsey and Bohart (1991).

possibly because Dahlbom did not know Klug's (1845) work, yet Semenov (1891) explicitly treated *Spintharis* in Dahlbom's sense. Thus, Semenov (1891) did not introduce (and consequently cannot be considered being author of) a new subgenus *Spintharis*.

Semenov (1891: 443) included three species in the subgenus *Spintharis*: *Pseudochrysis (Spintharis) virgo* Semenov, 1891, *P. (S.) limbata* (Dahlbom, 1854), and *P. (S.) singularis* (Spinola, 1838). However, he failed to name any species to be included in the nominal subgenus of his new genus *Pseudochrysis*. This information was provided in the announced second publication (Semenov 1892), in which eleven species were included in the subgenus *Pseudochrysis*. One of these, namely *Chrysura humboldti* Dahlbom, 1845, was explicitly designated as type species of *Pseudochrysis (Pseudochrysis)*.

Despite Semenov's (1892) designation of *Chrysura humboldti* Dahlbom, 1845 as type species of *Pseudochrysis (Pseudochrysis)*, Richards (1935) designated *Pseudochrysis (Spintharis) virgo* Semenov, 1891 as the type species of the genus *Pseudochrysis*. The genus *Pseudochrysis* was consequently considered by many authors as a junior subjective synonym of the genus *Euchroeus* Latreille, 1809, which currently includes (among others) the species *E. virgo* (Semenov, 1891), *E. limbatus* (Dahlbom, 1854), and *E. singularis* (Spinola, 1838). As a result of this, Linsenmaier (1951) described the new genus *Pseudospinolia* to name the group of species previously included by Semenov in his subgenus *Pseudochrysis*.

According to the 4th Edition of the International Code of Zoological Nomenclature (ICZN 1999, Art. 67.2.2), Semenov's (1892) designation of a type species of *Pseudochrysis* is valid and Richards' (1935) designation consequently is invalid. The valid type species of the genus *Pseudochrysis* is *Chrysura humboldti* Dahlbom, 1845. Moreover, despite the use of the genus name *Pseudospinolia* in the recent literature (especially by authors from Europe and the New World), a significant number of authors (especially from Russia) use the genus name *Pseudochrysis* instead. We therefore treat *Pseudochrysis* as a valid genus and consider *Pseudospinolia* as a junior subjective synonym of it.

Results and discussion

Article 43.1 of the ICZN (1999) [Statement of the Principle of Coordination applied to genus-group names] states: "A name established for a taxon at either rank in the genus group is deemed to have been simultaneously established by the same author for a nominal taxon at the other rank in the group; both nominal taxa have the same type species, whether it was fixed originally or subsequently." Thus, Semenov (1891: 444), when describing the nominal genus *Pseudochrysis*, is deemed to have described the nominal subgenus *Pseudochrysis* at the same time. Since all three species listed by Semenov (1891: 444) and included in the genus *Pseudochrysis* are unam-

biguously assigned to the subgenus *Spintharis*, the nominal subgenus *Pseudochrysis* was initially established with no species included.

Semenov (1891, 1892) treated *Euchroeus* Latreille, 1809, *Spintharis* Klug, 1845, *Spinolia* Dahlbom, 1854, *Brugmoia* Radoszkowski, 1877 as subgenera of his newly described genus *Pseudochrysis*, thus disregarding precedence of these genera upon *Pseudochrysis*. The way to treat the higher taxonomic ranks, such as "*Tribus* Chrysididae" and "*Subtribus* Pseudochrysidae" (Semenov 1892), appears unusual as well, considering current standards. It is to be stressed, however, that at the time Semenov published his studies, precisely codified nomenclatorial rules did not exist, and conventions and unwritten rules about it varied across disciplines, countries, and languages. At the 1st (Paris 1889) and 2nd (Moscow 1892) International Zoological Congresses, the need to establish common, widely accepted international rules for all branches of zoology was emphasized. The discussion resulted in the "International Rules on Zoological Nomenclature", first proposed at the 3rd International Congress for Zoology (Leiden 1895) and published in three languages (French, English, and German) in 1905.

In cases in which the description of a new genus or of a new subgenus does not include any species, Article 67.2.2 of the ICZN (1999) states: "If a nominal genus or subgenus was established before 1931 without included nominal species [Art. 12], the nominal species that were first subsequently and expressly included in it are deemed to be the only originally included nominal species". According to this statement, a nominal genus or subgenus before 1931 can have been validly established without any originally included nominal species. The nominal subgenus *Pseudochrysis* is therefore validly established, despite having no nominal species included in it, and the author and the date of publication of the nominal subgenus are Semenov, 1891.

Semenov (1892: 486), in the section "*Enumeratio specierum generis Pseudochrysis m.*", was the first author who explicitly stated what species were to be included in *Pseudochrysis (Pseudochrysis)*. According to Article 67.2.2 of the ICZN (1999), the species originally included in the subgenus *Pseudochrysis* are those, and only those, listed by Semenov (1892). He included eleven species: *P. humboldti* (Dahlbom, 1845), *P. incrassata* (Spinola, 1838), *P. gratiosa* (Mocsáry, 1889), *P. coeruleiventris* (Abeille de Perrin, 1878), *P. transversa* (Dahlbom, 1854), *P. kohli* (Mocsáry, 1889), *P. marqueti* (du Buysson, 1887), *P. aureicollis* (Abeille de Perrin, 1878), *P. uniformis* (Dahlbom, 1854), *P. durnovi* (Radoszkowski, 1866) [incorrect subsequent spelling of *dournovii*], and *P. neglecta* (Shuckard, 1837).

Semenov (1892: 485) in his paragraph "*Tabula differentialis subgenerum generis Pseudochrysis m.*" provided a key to the subgenera of the genus *Pseudochrysis*, in which he also designated a type species of each subgenus: *Spintharina* Semenov, 1892 (type species: *Chrysis vagans* Radoszkowski, 1877); *Spintharis* Dahlbom, 1854 (type

species: *Pseudochrysis (Spintharis) virgo* Semenov, 1891; *Brugmoja* Radoszkowski, 1877 [incorrect subsequent spelling of *Brugmoia*] (type species: *Brugmoia pellucida* Radoszkowski, 1877); *Euchroeus* Latreille, 1809 (type species: *Chrysis purpurata* Fabricius, 1787); *Spinolia* Dahlbom, 1854 (type species: *Chrysis lamprosoma* Förster, 1853); *Pseudochrysis* Semenov, 1891 (type species: *Chrysura humboldti* Dahlbom, 1845); *Achrysis* Semenov, 1892 (type species: *Chrysis unicolor* Dahlbom, 1831).

Richards (1935: 158), dealing with the genus group names *Spintharis* Klug and *Pseudochrysis* Semenov, wrote: “*Pseudochrysis* Semenow [...] was erected for two species *Spintharis (P.) virgo* Semenow, 1891 and *Euchroeus limbatus* Dahlbom, 1854. *S. virgo* Sem. is here fixed as type”. This statement is in conflict with Semenov’s original description (1891) in at least two points: (1) Semenov (1891) described “*Pseudochrysis (Spintharis) virgo*, sp. n.” in the genus *Pseudochrysis* with *Spintharis* as subgenus, not in the genus *Spintharis* with *Pseudochrysis* as subgenus; (2) the number of species included by Semenov (1891) in the subgenus *Spintharis* are actually three: *Pseudochrysis (Spintharis) virgo*, *Pseudochrysis (Spintharis) limbata* (= *Euchroeus limbatus*), and *Spintharis singularis*.

It must be emphasized that Semenov (1891) unambiguously included the three species *P. virgo*, *P. limbatus*, and *P. singularis* in the subgenus *Spintharis*, not in the nominal subgenus *Pseudochrysis*, the latter being described with no species included. Richards’ (1935) designation is thus incompatible with Semenov’s intended classification. Semenov (1891), in the original description of the genus *Pseudochrysis*, did not include *P. virgo* in *Pseudochrysis (Pseudochrysis)*, but in *Pseudochrysis (Spintharis)*, and subsequently (1892) designated *P. (S.) virgo* as type species of the subgenus *Spintharis*. Given that Semenov (1892) had already designated *Chrysura humboldti* Dahlbom, 1845 as type species of *Pseudochrysis (Pseudochrysis)*, Richards’ (1935) designation of *P. virgo* as type species of *Pseudochrysis* was both invalid and unnecessary.

Linsenmaier (1951: 26) adopted Richards’ (1935) interpretation of the type species of the genus *Pseudochrysis*, which made *Pseudochrysis* a junior subjective synonym of the genus *Euchroeus*. He realized that there was no valid name available to refer to those species by Semenov (1891, 1892) included in his subgenus *Pseudochrysis*. Linsenmaier (1951: 31) consequently described *Pseudospinolia* as a new subgenus of *Euchroeus*, with *Chrysis uniformis* Dahlbom, 1854 as type species. *Pseudospinolia* was raised by Bohart and Kimsey (1980) to genus rank and synonymized by Kimsey (1983) with *Spinolia* Dahlbom, 1854. In the most recent generic revision of the family, Kimsey and Bohart (1991) granted *Pseudospinolia* the rank of the genus. However, both the names *Pseudospinolia* and *Pseudochrysis* as well as the taxonomic rank have been used heterogeneously by different authors.

We investigated the use of *Pseudospinolia* and *Pseudochrysis* in more than 1,300 publications, spanning

more than a century. Prior to Linsenmaier’s (1951) description of *Pseudospinolia*, *Pseudochrysis* Semenov was treated as a valid genus by the most important authors of that time. For example, Semenov’s (1892) classification was followed by Bischoff (1910, 1913, 1935), Hellén (1920, 1935), Maidl (1922), Noskiewicz (1922), Banzhaf (1930), Invrea (1930, 1933, 1935), Drogoszewski (1934), Špaček (1934, 1935), Bernard (1935), Molitor (1935), Crèvecoeur and Maréchal (1936, 1939), Grandi (1936), Berland and Bernard (1938), Atanassov (1940), Ceballos (1941), Giner Mari (1942), Balthasar (1946, 1948), Edney (1947), Cavro (1950), Enslin (1950), and Hammer (1950). Only du Buysson (1896) considered *Pseudochrysis* as a synonym of *Chrysis*. However, Trautmann and Trautmann (1919), and Trautmann (1922, 1926, 1927) deeply modified the original interpretation given by Semenov, including in *Pseudochrysis* several species belonging to different species groups of the genus *Chrysis* Linnaeus, 1761 (*C. amasina* Mocsáry, 1889; *C. bihamata* Spinola, 1838; *C. verna* Dahlbom, 1854; *C. pallidicornis* Spinola, 1838; *C. abeillei* Gribodo, 1879; *C. rufitarsis* Brullé, 1833), based on the combination of the following characters: “mouth parts elongate over the mandible tip, forewing radial cell more or less open, apical margin of the third tergite full-rim to quadrangular. These species often resemble many species of the genus *Chrysis* in habitus” (Trautmann 1927: 91).

Even after Linsenmaier’s (1951) description of *Pseudospinolia*, the name *Pseudochrysis* remained in use by a significant number of authors till today: Balthasar (1952, 1953, 1954a, 1954b), Invrea (1952, 1955), Tsuneki (1953), Semenov and Nikol’skaja (1954), Fahlander (1954), Zimmermann (1954), de Beaumont (1955), Haupt (1956), Kusdas (1956, 1958), Grandi (1957, 1962), Negru (1960), Móczár (1964, 1967), Hozak and Zeman (1966), Ressler (1966), Balthasar et al. (1967), Semenov (1967), Suárez (1969), Tumšs and Maršakovs (1970), Atanassov (1972), Banaszak (1975, 1980), Kofler (1975), Berland (1976), Nikol’skaya (1978), Skibinska (1982), Zvantsov (1988), Blagoveschenskaya (1990, 1994), Doronin (1996), Kuznetzova (1990), Buganin et al. (2000), Tarbinsky (2000, 2004), Krivonogova and Rudoiskatel (2004), Vinokurov (2004, 2005, 2006), Kalniņš et al. (2007), Rudoiskatel (2007, 2008, 2011), Kochetkov et al. (2008), Brustilo and Martinov (2008), and Kochetkov (2012). In total, we found that 49 authors used the name *Pseudochrysis* in 51 scientific articles, either as a valid genus or as a subgenus of *Spinolia*. On the other hand, we found that 99 authors used the name *Pseudospinolia* as either a valid genus or as a subgenus of *Euchroeus* in 114 scientific publications. Thus, the name *Pseudochrysis* has been used till today, although to a lesser extent than *Pseudospinolia*.

The relevant type specimens of *Chrysura humboldti* (see Rosa and Vårdal 2015), *Chrysis singularis* (see Rosa and Xu 2015) and *Pseudochrysis virgo* (Rosa, Belokobylskij and Fedorova, in litt.) have been studied. Only the type specimen of *Chrysis uniformis* remained unavailable. Dahlbom’s (1854) description of *Chrysis uniformis*

is based on a (single?) specimen from Loew's collection, collected in Asia Minor. The first author (P. R.) unsuccessfully searched for the type in the museum collections of Copenhagen, London, Lund, Stockholm, and Vienna, where Loew's specimens are supposedly deposited. The type of *Chrysis uniformis* is therefore currently thought to be lost. However, its unique morphology and coloration make *Pseudochrysis uniformis* an easily recognizable species. It is widespread, locally common (ranging from the Mediterranean region to Central Asia; Linsenmaier 1959; Semenov and Nikol'skaja 1954) and not known to be involved in any major taxonomic problem. We therefore currently consider a neotype designation as unnecessary.

We asked for the opinion of some current or former Commissioners on ICZN. Alberto Ballerio and the former presidents Alessandro Minelli and Denis Brothers fully support our nomenclatorial point of view; Douglas Yanega and Miguel A. Alonso Zarazaga conversely disagree on our interpretation, stating that *P. humboldti* was not listed in the first article (Semenov 1891) and consequently cannot be selected as type species of *Pseudochrysis*. It was also suggested that the chrysidologist community should find an agreement about the way to solve the case. We asked for the opinion of hymenopterists currently dealing with Chrysididae or other Hymenoptera. Michael Madl (Austria), Toshko Ljubomirov (Bulgaria), Zaifu Xu (China), David Baldock (England), Juho Paukkunen (Finland), Werner Arens and Christian Schmid-Egger (Germany), Afrouz Farhad (Iran), Gian Luca Agnoli, Guido Pagliano, Fabrizio Rigato and Marcello Romano (Italy), Eduardas Budrys and Svetlana Orlovskytė (Lithuania), Nico Schneider (Luxembourg), Frode Ødegaard (Norway), Bogdan Wiśniowski (Poland), Andrej Gogala (Slovenia), Leopoldo Castro (Spain), Alexander Berg and Mattias Forshage (Sweden), Marco Bernasconi (Switzerland), Erol Yıldırım (Turkey), and Kateryna Martynova (Ukraine) fully support our viewpoint, while Lynn S. Kimsey (U.S.A.) follows Yanega's opinion.

Conclusions

By applying Art. 67.2.2 (ICZN 1999) and in agreement with the majority of hymenopterologists working on cuckoo wasps, we recognize *Chrysura humboldti* Dahlbom, 1845 as the type species of *Pseudochrysis* Semenov, 1891, and propose the following synonymy: *Pseudochrysis* Semenov, 1891 (type species: *Chrysura humboldti* Dahlbom, 1845) = *Pseudospinolia* Linsenmaier, 1951 (type species: *Chrysis uniformis* Dahlbom, 1854) **syn. nov.** *Pseudospinolia* is a junior subjective synonym of *Pseudochrysis*.

Acknowledgements

We thank G. L. Agnoli, W. Arens, D. Baldock, A. Ballerio, A. Berg, M. Bernasconi, D. Brothers, E. Budrys, L.

Castro, A. Farhad, M. Forshage, L. S. Kimsey, A. Gogala, T. Ljubomirov, M. Madl, K. Martynova, A. Minelli, S. Orlovskytė, F. Ødegaard, G. Pagliano, J. Paukkunen, F. Rigato, M. Romano, C. Schmid-Egger, N. Schneider, B. Wiśniowski, Z. Xu, D. Yanega, E. Yıldırım, M. A. Alonso-Zarazaga, H. Zettel, and the editor of the Deutsche Entomologische Zeitschrift, D. Zimmermann, for replying to our inquiry or for reviewing our manuscript. Parts of this work were supported by the Germany Research Foundation (DFG; NI 1387/2-1).

References

- Abeille de Perrin E (1878) Diagnoses de Chrysidés nouvelles. Published by the author, Marseille, 6 pp.
- Ashmead WH (1902) Classification of the fossorial, predaceous and parasitic wasps, or the superfamily Vespoidea. The Canadian Entomologist 34(9): 219–231. <https://doi.org/10.4039/Ent34219-9>
- Atanassov N (1940) Beitrag zum Studium der Goldwespen Bulgariens (Chrysididae-Hymenoptera). Mitteilungen der bulgarischen entomologischen Gesellschaft 11: 203–216.
- Atanassov N (1972) Arten Hymenoptera von West-Balkan-Gebirge: I. Teil. Bulletin de l'Institut de Zoologie et Musée, Académie Bulgare des Sciences 35: 179–228.
- Balthasar V (1946) Prodromus chrysididarum Rei Publicae Cechoslovakiae. Acta Entomologica Musei Nationalis Pragae 24: 223–260.
- Balthasar V (1948) Chrysididae, Sphegidae and Scoliididae of the environs of Parkan and Kovacov-hills CSR-Slovakia). Opuscula hymenopterologica VII. Casopis Československé společnosti entomologické 45(3–4): 133–146.
- Balthasar V (1953 [«1951»]) Monographie des chrysidides de Palestine et des pays limitrophes. Acta Entomologica Musei Nationalis Pragae 27 (Supplementum 2): 1–317.
- Balthasar V (1954a [‘1952’]) Wissenschaftliche Ergebnisse der zoologischen Expedition des National-Museum in Prag nach der Türkei. 11. Hymenoptera III. Chrysididae. Acta Entomologica Musei Nationalis Pragae 28(400): 71–76.
- Balthasar V (1954b) Zlatěnky – Chryridoidea (Řád: Blanokřídli – Hymenoptera). Fauna ČSR, Československá Akademie Věd, Praha, 3: 1–272.
- Balthasar V, Hubrant M, Hubrant E (1967) Beitrag zur Kenntnis der Hymenopteren Bulgariens (Chrysididae, Sphecidae). Acta faunistica Entomologica Musei Nationalis Pragae 12(125): 161–176.
- Banaszak J (1975) Records of Chrysididae (Hymenoptera) from southern Poland. Polskie Pismo Entomologiczne 45: 23–32.
- Banaszak J (1980) Złotolitki. Chrysididae. Katalog Fauny Polski, Polska Akademia Nauk, Instytut Zoologii. Państwowe Wydawnictwo Naukowe, Warszawa 35: 1–47.
- Banzhaf W (1930) Ein Beitrag zur Hymenopterenfauna Pommerns. Stettiner Entomologische Zeitung 91: 129–130.
- Beaumont J de (1955) Hyménoptères des environs de Neuchâtel. Deuxième partie. Bulletin de la Société Neuchâteloise des Sciences Naturelles 78: 17–30.
- Berland L, Bernard F (1938) Hyménoptères vespiformes. III. (Cleftidae, Chrysidae, Trigonalidae). Faune de France. Vol. 34. Paul Lechevalier et Fils, Paris, 145 pp.
- Berland L (1976) Atlas des Hyménoptères de France, Belgique, Suisse. Tome II. Porte-Aiguillon: Bethyloides (fin), Scolioïdes, Formi-

- coides, Pompiloides, Vespoides, Sphécoides, Apoides. Société Nouvelle des éditions Boubée, Paris, 198 pp.
- Bernard F (1935) Hyménoptères prédateurs des environs de Fréjus. *Annales de la Société Entomologique de France* 104: 31–72.
- Bischoff H (1910) Die Chrysididen des Königlichen Zoologischen Museums zu Berlin. *Mitteilungen aus dem Zoologischen Museum in Berlin* 4: 425–493.
- Bischoff H (1913) Hymenoptera fam. Chrysididae. In: Wytsman P (Ed.) *Genera insectorum*, Brussels, 151: 1–86 pp.
- Bischoff H (1935) Chrysididae. In: Nadig A, Nadig A (Eds) *Beitrag zur Kenntnis der Hymenopterenfauna von Marokko und Westalgerien. Zweiter Teil: Scoliidæ, Tiphidiæ, Mutillidæ, Psammocharidæ, Chrysididæ. Jahresbericht der Naturforschenden Gesellschaft Graubündens* 73: 3–21.
- Blagoveschenskaya NN (1990) [Wasp entomophages of Middle Volga. Ecology of insects and their protection]. [Interuniversity collection of scientific papers]. Ulyanovsk, USPI, 5–29. [In Russian]
- Blagoveschenskaya NN (1994) [Catalog of the stinging Hymenoptera (suborder Aculeata) in the Ulyanovsk region]. [Insect of the Ulyanovsk region]. MGU, Ulyanovsk, 82–94. [In Russian]
- Bohart RM, Kimsey LS (1980) A generic synopsis of the Chrysididae of America North of Mexico (Hymenoptera). *Journal of the Kansas Entomological Society* 53(1): 137–148.
- Brullé GA (1832–1833) *Expédition scientifique de Morée. Section des Sciences Physiques. Tome III. Zoologie. Ire Partie. Zoologie. Deuxième section. – Des animaux articulés. F.G. Levrault, Paris* 400 pp. (1832) 1–288, (1833) 289–400. [Dating after Sherborn and Woodward 1901 and Evenhuis 1997]
- Brustilo EV, Martynov VV (2008) [Materials to the knowledge of the chrysidid wasps (Hymenoptera, Chrysididae) from Eastern Ukraine]. [Live animals in conditions of anthropogenic press. Proceedings of the X International scientific-practical environmental conference, Belgorod, 15–18 September 2008]. *CPI Politerra*, 33–34. [In Russian]
- Buganin SI, Isaev A, Kharisov MA (2000) [Results and prospects of studying the fauna of the superfamily of wasps Chrysididae in the Ulyanovsk region]. In: [Insects and arachnids of the Ulyanovsk region]. Ulyanovsk, 145–150. [In Russian]
- Buysson R du (1887) *Descriptions de Chrysidides nouvelles. Revue d'Entomologie* 6: 167–201.
- Buysson R du (1891–1896) *Species des Hyménoptères d'Europe & d'Algérie. Tome Sixième. Les Chrysidés. Vve Dubosclard, Paris*, I–XII + 13–758 + 64 unnumbered pages + 32 pls. (1891) 1–88, (1892) 89–208, (1893) 209–272, (1894) 273–400, (1895) 401–624, (1896) 625–756 + 1*–22*, (1891–1896) 64 unnumbered pages + 32 pls. [Dating after Derksen and Scheiding 1963].
- Cavro E (1950) *Catalogue des Hyménoptères du Département du Nord et Régions limitrophes. Bulletin de la Société Entomologique du Nord de la France* 52 (Supplement): 6–11. [Chrysididae]
- Ceballos G (1941) *Las Tribus de los Himenópteros de España. Consejo Superior de Investigaciones Científicas. Instituto Español de Entomología, Madrid*, 420 pp.
- Crèvecoeur A, Maréchal P (1936) *Matériaux pour servir à l'établissement d'un nouveau Catalogue des Hyménoptères de Belgique. VI. Bulletin et Annales de la Société Royale Belge* 76: 237–257.
- Crèvecoeur A, Maréchal P (1939) *Matériaux pour servir à l'établissement d'un nouveau Catalogue des Hyménoptères de Belgique. IX. Bulletin et Annales de la Société Royale Belge* 79: 439–449.
- Dahlbom AG (1831) *Exercitationes Hymenopterologicae. Ad illustrandum Faunam Svecicam. Monographia Chrysididum Sveciae (Familia Hymenopterorum Octava Latreille). Pars II & III (partim). Berlingianis, Londini Gothorum [= Lund]*, 14 pp. & 16 pp. [Pars II pp. 19–32; Pars III, 33–48, Chrysididae 33–36]
- Dahlbom AG (1845) *Dispositio Methodica Specierum Hymenopterorum, secundum Familias Insectorum naturales. Particula secunda. Dissert. Berlingianis, Lund*, 20 pp. <http://dx.doi.org/10.5962/bhl.title.66977>
- Dahlbom AG (1854) *Hymenoptera europaea praecipue borealia, formis typicis nonnullis specierum generumve exoticorum propter nexum systematicum associatis, per familias, genera, species et varietates disposita atque descripta. 2. Chrysis in sensu Linnæano. Friedrich Nicolai, Berlin*, 412 pp. + 12 pls. <http://dx.doi.org/10.5962/bhl.title.15890>
- Doronin M (1996) The hosts of some cuckoo wasps (Hymenoptera, Chrysididae) in Latvia. *Latvijas Entomologs* 35: 17–19.
- Drogoszewski K (1934) *Neue für Zentralpolens Fauna Akuleaten. Polskie Pismo Entomologiczne* 13(1–4): 125–131.
- Edney EB (1947) *The Holonychinae (Family Chrysididae) of South Africa. Part I: The tribes Pseudochrysidini Bischoff; Parnopini Aaron; Allocoeliini Mocsáry. Occasional Papers of the National Museum of Southern Rhodesia* 13: 168–205.
- Enslin E (1950) On the Chrysididae from Cyprus. *Annals and Magazine of Natural History, series 12*, 3(32): 656–671.
- Fabricius JC (1787) *Mantissa Insectorum sistens eorum species nuper detectas adiectis characteribus genericis, differentiis specificis, emendationibus, observationibus. Tomo I. Impensis Christ. Gottl. Proft., Hafniae [= Copenhagen]*, 348 pp. <https://doi.org/10.5962/bhl.title.36471>
- Fahlander K (1954) *Hymenoptera från Gästrikland. Entomologisk Tidskrift* 75: 249–254.
- Förster A (1853) *Eine Centurie neuer Hymenopteren. Beschreibungen. Neue Arten aus der Familie der Chrysididen. Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westfalens* 10: 266–362.
- Giner Mari J (1942) *Contribución al conocimiento de la fauna himenopterológica de España. II. Eos* 18(1): 69–95.
- Grandi G (1936) *Contributi alla conoscenza degli Imenotteri Aculeati. XVI. Bolletino del Laboratorio di Entomologia di Bologna* 15: 253–344.
- Grandi G (1957) *Campagna di ricerche dell'Istituto di Entomologia dell'Università di Bologna nel Parco Nazionale d'Abruzzo. Bollettino dell'Istituto di Entomologia di Bologna* 23: 162–165.
- Grandi G (1962) *Elenco degli imenotteri aculeati entrati a far parte della mia collezione negli anni 1960–61. Bollettino dell'Istituto di Entomologia di Bologna* 26: 7.
- Gribodo G (1879) *Note Imenotterologiche. Annali del Museo civico di Storia naturale di Genova* 14: 325–347.
- Hammer K (1950) *Über einige von Kjell Kolthoff und anderen in China gesammelten Hymenoptera. Chrysididae, Cleptidae, Mutillidae. Arkiv för Zoologi* 42A (8): 1–12.
- Haupt H (1956) *Die unechten und echten Goldwespen Mitteleuropas (Cleptes et Chrysididae). Abhandlungen und Berichte aus dem Staatlichen Museum für Tierkunde in Dresden* 23: 15–139.
- Hellén W (1920 [1919]) *Über finländische Goldwespen. Meddelanden af Societas pro Fauna et Flora Fennica* 46: 203–213.
- Hellén W (1935) *Cleptidae & Chrysididae. In: Forsius R & Hellén W (Eds.), Enumeratio insectorum Fenniae: 1. Symphyta et Aculeata. Hymenoptera. Helsingin hyönteisvaihtoyhdistys*, 8 pp.

- Hozak A, Zeman V (1966) Beitrag zur Kenntnis der Goldwespen (Hym., Chrysididae) von Nordostböhmen. *Acta Musei Reginahradecensis, Scientiae Naturales* 7: 67–71.
- International Commission on Zoological Nomenclature (ICZN) (1999) *International Code of Zoological Nomenclature. Fourth Edition.* ITZN, London, 306 pp.
- Invea F (1930) Abitudini e comportamenti dei Crisidi italiani. I. I ricoveri. *Bollettino della Società entomologica italiana* 62: 94–98.
- Invea F (1933) Crisidi e Cleptidi della Sila raccolti da A. Doderò. *Bollettino della Società entomologica italiana* 65(9): 197–201.
- Invea F (1935) Crisidi raccolti nell'isola di Cipro dal Sig. Mauromoustakis (Hymen. Chrysididae). *Bollettino della Società entomologica italiana* 67: 102–106.
- Invea F (1952) Imenotteri raccolti da L. Ceresa in Sardegna. I. Crisidi, Mirmosidi e Mutillidi. *Atti della Società italiana di Scienze naturali e del Museo civico di Storia Naturale* 91: 220–228.
- Invea F (1955) Mutillidi e Crisidi nelle montagne italiane. *Bollettino di Zoologia* 22: 181–190. <https://doi.org/10.1080/11250005509439197>
- Kalniņš M, Juceviča E, Karpa A, Salmane I, Poppels A, Teļņovs D (2007) Invertebrates. In: Pilāts V (Ed.) *Biodiversity in Gauja National Park.* Gauja National Park Administration, Sigulda, 106–149.
- Kimsey LS, Bohart RM (1991 [1990]) *The Chrysidid Wasps of the World.* Oxford Press, New York, 652 pp.
- Kimsey LS (1983) Review of the Euchroeine Chrysidids (Hymenoptera: Chrysididae). *Pan-Pacific Entomologist* 59(1–4): 140–147.
- Klug F (1845) *Symbolae physicae seu icones et descriptiones insectorum quae ex itinere per Africam borealem et Asiam occidentalem Friderici Guilelmi Hemprich et Christiani Godofredi Ehrenberg medicinae et chirurgiae doctorum studio novae aut illustratae redierunt.* Decas Quinta. Officina Academica, Berolini [= Berlin], 41 unnumbered pages + pls. 41–50.
- Kochetkov DN (2012) [The Wasps (Hymenoptera: Aculeata) in the Ryazan region]. *Proceedings of the Oka State Biosphere Reserve* 27: 238–251. [In Russian]
- Kochetkov DN, Bolschakova MM, Butenko OM, Pryklonski SG (2008) [Stinging Hymenoptera (Aculeata) of the Oka Reserve]. In: [Monitoring of rare species of animals and plants and their habitat in the Ryazan region]. Ryazan, 257–273. [In Russian]
- Kofler A (1975) Die Goldwespen Osttirols (Insecta: Hymenoptera, Chrysididae). *Carinthia II* 165(85): 343–356.
- Krivosogova LA, Rudoiskatel PV (2004) Materials on the wasp fauna (Hymenoptera, Vespoidea) of the Middle Taiga subzone. *Ural Ecological mechanisms of dynamics and stability of biota. Materials of the Conference of the young scientist, Ekaterinburg*, 108–109. [In Russian]
- Kusdas K (1956) Beitrag zur Kenntnis der Goldwespenfauna (Chrysididae und Cleptidae) Oberösterreichs unter besonderer Berücksichtigung des Großraumes von Linz. *Naturkundliches Jahrbuch der Stadt Linz*, 307–326.
- Kusdas K (1958) Beitrag zur Kenntnis der Goldwespenfauna von Triest. *Zeitschrift der Wiener Entomologischen Gesellschaft* 43: 213–222.
- Kuznetzova VT (1990) Hymenoptera of the reserve „Galichya Mountain“ (Annotated list of species). *Flora and fauna reserves*, 86 pp. [In Russian]
- Latreille PA (1809) *Genera crustaceorum et insectorum secundum ordinem naturalem in familias disposita, iconibus exemplisque plurimis explicata.* Tomus quartus et ultimus. Amand Koenig, Parisiis et Argentorati [= Paris and Strasbourg], 399 pp.
- Linsenmaier W (1951) Die europäischen Chrysididen (Hymenoptera). Versuch einer natürlichen Ordnung mit Diagnosen. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 24(1): 1–110.
- Linsenmaier W (1959) Revision der Familie Chrysididae (Hymenoptera) mit besonderer Berücksichtigung der europäischen Spezies. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 32(1): 1–232.
- Maidl F (1922) Beiträge zur Hymenopterenfauna Dalmatiens, Montenegro und Albanien. I. Teil: Aculeata und Chrysididae. *Annalen des Naturhistorischen Museums in Wien* 35: 36–43.
- Mocsáry A (1889) *Monographia Chrysididarum orbis terrarum universi. Musæi Nat. Hungarici Adiuncto, Academiæ Scientiarum Hungaricæ Socio. Typis Societatis Franklinianæ, Budapest*, 643 pp.
- Móczár L (1964) Ergebnisse der Revision der Goldwespenfauna des Karpatenbeckens (Hymenoptera: Chrysididae). *Acta Zoologica Academiae Scientiarum Hungaricæ* 10: 433–450.
- Móczár L (1967) Fémдарázsalkatúak - Chrysidoida. In: *Magyarország Állatvilága. Fauna Hungariae, XIII, 2. Akadémiai Kiadó, Budapest*, 118 pp.
- Molitor A (1935) Notizen betreffend Vorkommen, Ökologie und Phänologie der Chrysididen Niederösterreichs und des Burgenlandes. *Konowia* 14: 1–7.
- Negru S (1960) Die Goldwespen (Hymenoptera Chrysididae) aus der Sammlung der naturwissenschaftlichen Fakultät der „Babes-Bolyai“ Universität, Cluj. *Travaux du Muséum National d'Histoire Naturelle „Grigore Antipa“* 2: 401–405.
- Nikol'skaya MN (1978) [Chrysidoida]. In: Medvedev GS (Ed.) [Key to the insects of the European part of the USSR]. *Nauka, Leningrad*, 3(1): 58–71. [In Russian]
- Noskiewicz J (1922) Les Insectes des environs de Leopold. *Chrysididae (Hym.)*. *Polskie Pismo Entomologiczne* 1: 44–48.
- Radoszkowski O (1866) Énumération des espèces de Chrysidides de Russie. *Horae Societatis Entomologicae Rossicae* 3: 295–310.
- Radoszkowski O (1877) Chrysidiformis, Mutillidae et Sphegidae. In: [Voyage au Turkestan d'Alexis Fedtschenko]. *Sankt-Petersburg*, (14) 2(5): 1–87 + 8 pls. [In Russian]
- Ressl F (1966) Die Goldwespenfauna des südwestlichen Niederösterreich (Bezirk Scheibbs). *Entomologisches Nachrichtenblatt* 13(8–9): 85–90.
- Richards OW (1935) Notes on the nomenclature of the Aculeate Hymenoptera, with special reference to British genera and species. *Transactions of the Royal Entomological Society* 83(1): 143–176. <https://doi.org/10.1111/j.1365-2311.1935.tb00420.x>
- Rosa P, Vårdal H (2015) An annotated catalogue of the types of Chrysididae (Hymenoptera) at the Swedish Museum of Natural History, Stockholm, with brief historical notes. *ZooKeys* 495: 79–132. <https://doi.org/10.3897/zookeys.495.9356>
- Rosa P, Xu Z-f (2015) Annotated type catalogue of the Chrysididae (Insecta, Hymenoptera) deposited in the collection of Maximilian Spinola (1780–1857), Turin. *ZooKeys* 471: 1–96. <https://doi.org/10.3897/zookeys.486.8753>
- Rudoiskatel PV (2007) Concerning the fauna of Chrysididae, Vespididae et Sphecidae of the “Denezhkin Stone” Reservation. *Mountain ecosystems and their components. Proceedings of the international scientific-practical conference*, 75–76. [In Russian]
- Rudoiskatel PV (2008) [Materials of the cuckoo wasp fauna (Hymenoptera, Chrysididae) of the Sverdlovsk Region]. *Proceedings of the Stavropol branch of the Russian Entomological Society* 4: 141–142. [In Russian]

- Rudoiskatel PV (2011) Fauna and ecological peculiarities of chrysidid wasps (Hymenoptera: Chrysididae) of the Sverdlovsk region. Ecology: through time and distance. Materials Conference Young Scientists, 11–15 April 2011. Ekaterinburg, 164–169. [In Russian]
- Semenov A (1891) *Pseudochrysis (Spintharis) virgo*, sp. n. Horae Societatis Entomologicae Rossicae 25: 441–444.
- Semenov A (1892) De genere *Pseudochrysis* m. Horae Societatis Entomologicae Rossicae 26: 480–491.
- Semenov-Tian-Shanskij A, Nikol'skaya MN (1954) Cuckoo-wasps (Hymenoptera, Chrysididae) of Tajikistan. Trudy Zoologicheskogo Instituta Akademii Nauk SSSR 15: 89–137. [In Russian]
- Semenov-Tian-Shanskij A (1967) New species of gold wasps (Hymenoptera, Chrysididae). Trudy Zoologicheskogo Instituta Akademii Nauk SSSR 43: 118–184. [In Russian]
- Shuckard WE (1837) Description of the genera and species of the British Chrysididae. The Entomological Magazine 4: 156–177.
- Skibinska E (1982) Chrysididae (Hymenoptera) of Warsaw and Mazovia. Memorabilia Zoologica 36: 61–72.
- Špaček K (1934) Úlohy zlatěnek v českém Podkrkonoší (Hym. Chrysididae). Časopis Československé Společnosti Entomoloické 31: 138–139.
- Špaček K (1935) Zoogeographische und oekologische Beiträge zur Erforschung der Chrysididenfauna in der Tschechoslowakei. I. Časopis Československé Společnosti Entomoloické 32: 111–120.
- Spinola M (1838) Compte rendu des hyménoptères recueillis par M. Fischer pendant son voyage en Égypte, et communiqués par M. le docteur Waltl a Maximilien Spinola. Annales de la Société Entomologique de France 7: 437–457.
- Suárez FJ (1969) Crisididos de la Provincia de Almería (Hymenoptera: Chrysididae y Cleptidae). Archivos del Instituto de Aclimatación 14: 65–75.
- Tarbinsky YS (2000) The gold wasps of the genus *Brugmoia* (Hymenoptera, Chrysididae) of the Tien-Shan and adjacent territories. Vestnik zoologii 34(3): 23–27 [In Russian].
- Tarbinsky YS (2004) A review of the family Chrysididae (Hymenoptera) of the fauna of Tien Shan and adjacent territories. Euroasian Entomological Journal 3(3): 243–249.
- Trautmann G, Trautmann W (1919) Die Goldwespenfauna Frankens. Zeitschrift für wissenschaftliche Insektenbiologie 15: 30–36.
- Trautmann W (1922) Untersuchungen an einigen Goldwespenformen. Deutsche Entomologische Zeitschrift 1922: 219–223.
- Trautmann W (1926) Untersuchungen an einigen Goldwespenformen. Entomologische Zeitschrift 40: 4–12.
- Trautmann W (1927) Die Goldwespen Europas. Uschmann, Weimar, 194 pp.
- Tsuneki K (1953) Chrysididae of Manchuria (Hymenoptera). Mushi 25(8): 53–61.
- Tumšs V, Maršakovs V (1970) Zinas par Latvijas krāsnlapsenēm (Hymenoptera, Chrysididae). Zoologijas muzeja raksti 4: 89–96.
- Vinokurov NV (2004) Chrysidids (Hymenoptera, Chrysididae) from specially protected eco-resort region of Caucasian Mineral Waters. Actual problems of preserving the stability of living systems. Materials of the VIII International scientific ecologic conference] 27–29 September 2004, Belgorod, 33–34. [In Russian]
- Vinokurov NV (2005) [Fauna of chrysidid (Hymenoptera, Chrysididae) in xylophilous insect communities in the central Caucasus and Ciscaucasus]. [Materials of the Nalchik international conference] 1: 89–90. [In Russian]
- Vinokurov NV (2006) Daily activity and seasonal dynamics of chrysidid wasps (Hymenoptera, Chrysididae) in Central Ciscaucasia. Ecological problems of mountain territories. Collection of scientific articles, 19–20. [In Russian]
- Zimmermann S (1954) Hymenoptera-Tubulifera: Cleptidae, Chrysididae. Teil XVI. Catalogus Faunae Austriae, Springer-Verlag, Wien, 1–10.
- Zvantsov AB (1988) Fauna and geographical distribution of the chrysidid wasps (Hymenoptera, Chrysididae) in the Moscow region. Insects of the Moscow region. Problems of inventory and protection, 80–97. [In Russian]

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Deutsche Entomologische Zeitschrift \(Berliner Entomologische Zeitschrift und Deutsche Entomologische Zeitschrift in Vereinigung\)](#)

Jahr/Year: 2017

Band/Volume: [NF_64](#)

Autor(en)/Author(s): Rosa Paolo, Pavesi Maurizio, Soon Villu, Niehuis Oliver

Artikel/Article: [Pseudochrysis Semenov, 1891 is the valid genus name for a group of cuckoo wasps frequently referred to as Pseudospinolia Linsenmaier, 1951 \(Hymenoptera, Chrysididae\) 69-75](#)