

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

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Abstract

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Pseudochrysis (Spintharis) virgo

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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*.

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