

A contribution to the clarification of *Chrysopa commata*-*Chrysopa phyllochroma* problem

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ABSTRACT: On the basis of available information it may be concluded that the single existing specimen of *Chrysopa phyllochroma* Wesmael, 1841 identified by the author of this species cannot be regarded as a holotype, and it is not suitable for designation as lectotype or neotype of the species. Investigation of the possible variability of the male and female internal genitalia of eidonomically typical *Ch. commata* Kis et Újhelyi, 1965 specimens, detailed comparative examination of male and female genitalia of other *commata*/*phyllochroma*-like forms, and neotype designation for *Ch. phyllochroma* are necessary. Identity of the Asian specimens identified as *Ch. commata* is entirely uncertain without accurate investigation of male genitalia including all of the internal parts.

Several years ago, a paper was published about the Neuroptera fauna of Belgium (LOCK & SAN MARTIN 2013), in which *Chrysopa commata* Kis et Újhelyi, 1965 was mentioned, with remarks as below:

“The species complex *Chrysopa phyllochroma* Wesmael, 1841 and *Chrysopa commata* Kis & Újhelyi, 1965 clearly consists of two species, however, it seems likely that for the description of both species, holotype material of the same species was used and a revision of both species is thus needed.” (In the abstract);

“According to the original description of KIS & ÚJHELYI (1965) and several other identification keys frequently used in Europe (PLANT 1997, KIS et al. 1970), a reliable distinction between both species seems to be the presence (*C. commata*) or absence (*C. phyllochroma*) of black thoracic sutures. However, these black thoracic sutures are also present on the holotype individual that was used by WESMAEL to describe *C. phyllochroma*. These black thoracic sutures can therefore not be used as a reliable distinctive character. Another explanation would be that the black sutures are a good distinctive character but that both holotypes of *C. phyllochroma* and *C. commata* are in fact of the same species. Indeed, the genitalia of the *C. phyllochroma* holotype have never been examined. The presence of a black spot on the scapus, another external character frequently used, is probably not a good characteristic due to geographical variability and this spot can lack in both species (TRÖGER 2003). A revision of these two species is therefore needed and it is advised that till then, it is always indicated which external characters have been used for identification and if possible, the genitalia should be examined.” (In the annotated check list of the same paper.)

Basically, the same opinion is repeated in a recent faunistic paper (DOBOSZ et al. 2019): “*Ch. commata* is characterized by black thoracic sutures. However, LOCK & SAN MARTIN (2013) noted that black thoracic sutures are also present in the holotype of *Ch. phyllochroma* Wesmael, 1841 (!) (also confirmed by Peter Duelli – personal communication), a species

which is normally characterized by the absence of black color on thoracic sutures. These authors also noted that the genitalia of the holotype have not yet been examined. It is probable, therefore, that the holotype of *Ch. phyllochroma* may actually be the *Ch. commata* of the authors, and that the *Ch. phyllochroma* of the authors is one of its synonyms. A revision of these two species is therefore needed to clarify this nomenclature question. The presence of a black spot on the scapus, another external character frequently used, is probably not a good characteristic because of its geographical variability, this spot can be absent in both species (TRÖGER 2003).”

However, the above cited opinion of Tröger (accepted by DOBOSZ et al. 2019) is only an arbitrary statement, because it was not supported by a comparative examination of the male genitalia of “*Chrysopa commata*” specimens with and without dark spot on the scape. Moreover, this author definitely declared that only external features were taken into consideration (TRÖGER 2003: p. 266).

In contrary, the importance of the dark scape spots is emphasised in the original description of *Ch. commata*: “...the presence or absence of the spot on the scape is to be regarded as a constant character, substantiated by the different construction of the genital organs, the species having an immaculate scape is to be considered ... the true *Ch. phyllochroma*, whereas the spotted one is a new species described below”. Similarly, in the key of the monograph on the European Neuropterida (ASPÖCK et al. 1980), the spotted or unspotted scape is the separating character between *Ch. phyllochroma* and *Ch. commata*.

Nevertheless, it is true that a comparative examination of the male genitalia of the type materials of these two species would be necessary, if the holotype of *Ch. phyllochroma* existed really.

Before publishing the description of *Ch. commata* the authors asked informations about „type-specimen, if extant” of *Ch. phyllochroma* from the Royal Belgian Institute of Natural Sciences (RBINS). Dr. Georges Demoulin, sub-director of the institute, informed them that „he found a box in the collection of Selys, containing *Chrysopa* species. Among them there is a specimen which bears two labels. The first reads “*Ch. abbreviata* var. Schneider n° 35”, the second one “*C. phyllochroma* (mihi)”, and “the writing on the second one is Wesmal’s” (sic!). Further on: “The specimen bears no other labels, either locality or date”, and there is no spot on the antennae (KIS & ÚJHELYI 1965). On the basis of the received informations the above cited authors supposed, that the given specimen is “type” of *Chrysopa phyllochroma* Wesmael, 1841.

To see clearly the position of the specimen, which was regarded by LOCK & SAN MARTIN (2013) and DOBOSZ et al. (2019) definitely as holotype of *Ch. phyllochroma*, I requested information about it from Dr. Thierry Backeljau, head of the Operational Directorate Taxonomy and Phylogeny, RBINS. He transmitted this request to his colleagues working in the insect collections. At last, Jérôme Constant (from the same institution) was so kind to send me some written remarks and photographs about the given specimen and its labels. Besides a millimeter scale sheet was added to the photo of the insect. (The forewings, fortunately, are tightly together, practically in a vertical plain above the middle line of the abdomen, consequently their length may be compared correctly to the scale.)

On the basis of these informations, and the informations available in the original description of *Ch. phyllochroma* (WESMAEL 1841) as well as in the paper of KIS & ÚJHELYI (1965) the followings may be concluded:

- *Chrysopa phyllochroma* Wesmael, 1841 was described by the author without type designation;
- only a single specimen identified by WESMAEL (1841) as *Ch. phyllochroma* exists;
- the pin of this specimen bears a “TYPE” label;
- this specimen is that one, which was regarded by KIS & ÚJHELYI (1965) as the putative “type” of *Ch. phyllochroma*;
- the application of “TYPE” label happened in 1965 or later, because only the two identification labels existed on the pin of the given specimen when KIS & ÚJHELYI (1965) received informations from Dr. G. Demoulin. It is confirmed by the fourth label (Figs 1–2):

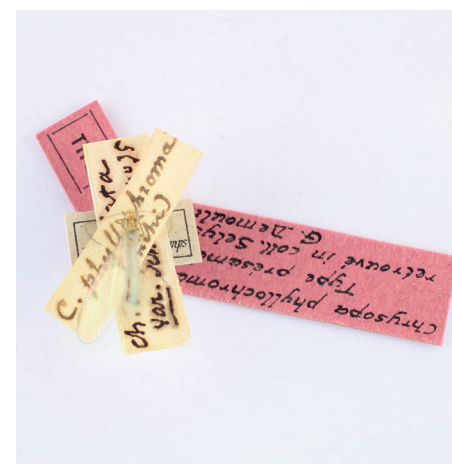


Fig. 1. Labels of *Chrysopa phyllochroma* specimen identified by Wesmael below the pinned insect. Photograph was taken by Jerome Constant (RBINS)

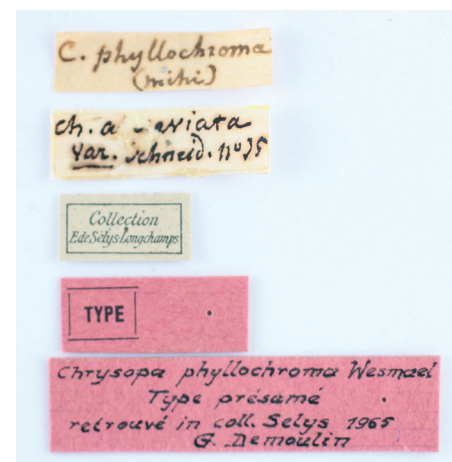


Fig. 2. Labels of *Chrysopa phyllochroma* specimen identified by Wesmael, removed from the pin, but in original sequence. Photograph was taken by Jerome Constant (RBINS)

“*Chrysopa phyllochroma* Wesmael
suspected Type
turned up from the Selys collection 1965
G. Demoulin”

Although KIS & ÚJHELYI (1965) supposed the given specimen as “type” of *Ch. phyllochroma*, they did not fix definitively that it is the holotype of the species by monotypy (Code 73.1.2.). A type label without concerning publication has not any taxonomical/nomenclatural meaning (Code 72.4.7.).

Consequently, in this moment there is no fixed holotype (or designed lecto or neotype) specimen of the species *Ch. phyllochroma*. The given specimen is not suitable for fixation of the holotype by monotypy, as it was not stated or implied in the original description that the new species was based on a single specimen, and there is no other evidence for it (Code 73.1.2.). On the contrary, it seems to be sure that the description was made on the basis of examination of more than one specimen, because not a single measurement, but a space of measurements (“6–6½ li”) is given as the length of the wing. It is not concerning to a theoretically supposed length variability, but giving the real data, as only a single number shows the length of the wing in cases of some other species (e.g., *Chrysopa perla* – “6½ li”, “*Chrysopa ciliata*”, now *Chrysotropia ciliata* – “7 li”, or *Hemerobius variegatus* – “3 li”) in the paper which contains – among others – the original description of *Ch. phyllochroma*.

It is an open question whether the given specimen was one of the original type series or not. As it was mentioned above, before 1965 only the two identification labels were on its pin. One: “*Ch. abbreviata* Var. Schneid. n° 35” by handwriting perhaps of Selys Longchamps (n° 35 shows the serial number of the species *Chrysopa abbreviata* in Schneider’s book), the other: „*C. phyllochroma* (mihi)” by handwriting of Wesmael – according to G. Demoulin. The first one was written obviously after the publication of SCHNEIDER’S (1851) monograph. It is possible that Selys revised the earlier identification of Wesmael, but the opposite case is possible also. Even if Wesmael was the first identifier, it is possible that he identified the specimen housed in collection of Selys after 1841, and in this case this specimen was not included in the type series of *Ch. phyllochroma*. This seems to be strengthened by the fore wing of the (erraneously) suspected type specimen, as its length – according to the photograph and the attached scale sent by Jérôme Constant (Fig. 3) – is 12.2 mm = 5.4 (~ 5½) ligne, while in the original description “Long.[itudo] c.[entralis(?)] alis: 6–6½ li.” (It is worth mentioning here that WESMAEL firmly strived to be accurate in measuring of the length; in the case of smaller insects, he regularly used the fourth or even sixth of a ligne.) A further condition against regarding the given specimen as one specimen of the type series is that it has no locality label, while in the case of the specimens used for original description the locality (around Bruxelles) was known. Therefore, it should be concluded that the given specimen is not suitable for designation as a lectotype (Code 74.1).

To designate a neotype of *Ch. phyllochroma* for clarifying its taxonomic status (Code 75.3) (and taxonomic status of *Ch. commata*) is necessary obviously. For this aim should be investigated (including detailed and accurate investigation of genitalia) several specimens, which eidonomically are *Ch. phyllochroma*, has locality label, and according to this label were collected somewhere around Bruxelles, and after it to choose one of them as neotype.



Fig. 3. *Chrysopa phyllochroma* specimen identified by Wesmael, lateral view. 1 square of the scale sheet = 1 mm. Photograph was taken by Jerome Constant (RBINS)

However, there are two eidonomical “forms” which were regarded as *Ch. phyllochroma*: one of them with darkened thoracal sutures, the other without these. According to Gilles San Martin (personal letter), when she revised the Belgian collection of Chrysopidae of RBINS, she found both of these “forms” of *Ch. phyllochroma*. When Wesmael described the species, he ignored this character, but it may be supposed that both forms were represented also in the (probable lost) type series. Though more specimens with darkened thoracal sutures were found by San Martin in the collection of RINSB than without these, for the sake of the nomenclatural stability, the “form” without darkened sutures should be preferred for designation of the neotype of the given species.

Notwithstanding, the question whether the specimens with dark thoracal sutures and with or without spot on the scapus are conspecific ones or not is remaining to answer. To solve this problem, it is necessary to examine the possible variability of male genitalia of eidonomically typical *Ch. commata* specimens, and to compare it to the male genitalia of specimens without scape spot from western part of Europe. Besides, a detailed comparative examination of female internal genitalia of these insects would also be desirable.

In the monograph of British Neuroptera (KILLINGTON 1937) a detailed description of the “*Chrysopa phyllochroma*” is given, and this species is characterised (among others) with immaculate scape, dark thoracal sutures, and figures on the male genitalia are given also. In the paper of KIS & ÚJHELYI (1965) it is mentioned that “Nor was the problem [about *Ch. phyllochroma*] clarified any further by Killington’s ... work” as “the dark color of the thoracic sutures and the structure of the genital organs refer to a species bearing a spot on the antennae” (i.e., their new species, *Ch. commata*). On the contrary, some important details (arrangement, number and shape of gonocristae, shape of entoprocessus in lateral view) of

the male genitalia figured by KILLINGTON (1937) differ significantly from the same structures of *Ch. commata*. Besides, these differ from genitalia of *Ch. phyllochroma* figured by KIS & ÚJHELYI (1965), but might agree, with a rather high probability, with the male genitalia of the “form” (perhaps an undescribed *Chrysopa* species), which has dark thoracal sutures, has not scape spot, and seems to be widely distributed in western part of Europe.

Regarding the Asian specimens identified as *Ch. commata* (e.g., in paper of DOBOSZ et al. 2019), identity is uncertain entirely without accurate investigation of male genitalia including all of the internal parts. Besides, in the above-mentioned paper, the size and arrangement of gonocristae of “*Chrysopa commata*” specimens from Sikhote-Alin (DOBOSZ et al 2019: figs 5d, h, l) differ distinctly from those of the real *Ch. commata* (KIS & ÚJHELYI 1965: figs 6–7).

The necessity of the detailed examination of male genitalia of the Asian “*commata*-like” species is strengthened by the case of *Chrysopa altaica* Hölzel, 1967, which may not be distinguished from *Ch. commata* on the basis of eidonomical characters (SZIRÁKI 1994).

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