Die untenstehende Arbeit wurde veröffentlicht in:
Proc. 10th Int. Symp. Trichoptera - Nova Suppl. Ent., Keltern 15 (2002): 235-238

Characters for distinguishing *Cyrnus*-females (Trichoptera: Polycentropodidae) in Northern, Eastern and most parts of Central Europe

B. Robert and P. J. Neu

1 Introduction

Determination of caddis fly species is mainly based on external genitalic features. However, until now no such characters nor internal ones for distinguishing the females of the European *Cyrnus*-species have been detected. This may explain, why there is no determination key covering all seven European *Cyrnus*-species. These are *Cyrnus cintranus* McLACHLAN, 1884; *C. crenaticornis* (KOLENATI, 1859); *C. fennicus* KLNGSTEDT, 1937; *C. flavidus* McLACHLAN, 1864; *C. insolutus* McLACHLAN, 1878; *C. montserrati* GONZALEZ & OTERO, 1983 and *C. trimaculatus* (CURTIS, 1834). Two of them have only very limited distributional areas in Europe, *C. montserrati* is only known from Spain and Portugal and *C. cintranus* additionally from central and southwestern France. So the remaining five species are the only ones occuring in Northern, Eastern and Central Europe with the exception of France, where the distributional areas overlap with *C. cintranus*. Inspired by the work of KLINGSTEDT (1937) the authors studied the females of *C. crenaticornis, C. fennicus, C. flavidus, C. insolutus* and *C. trimaculatus* to find easily visible non-genitalic attributes for separating them.

2 Material and methods

For this study females of *C. crenaticornis* (2 specimens), *flavidus* (40), *insolutus* (3) and *trimaculatus* (100) from Germany, of *C. insolutus* (1) from Sweden and of *C. fennicus* (4) from Russia, all preserved in alcohol, have been examined. In his paper KLINGSTEDT (1937) gave detailed descriptions of all these species and he listed several features that showed interspecific variation, but he didn't explain, if they are applicable for both sexes. So the authors used this features for a comparative microscopic study of the five species. During the study non-genitalic characters for separating them could be discovered mainly in the venation and colour of the forewings, segment size of the maxillary palps and shape of the antennae. These diagnostic characters were documented by photographs and used for the construction of a synoptic determination table and a determination key.

3 Characters for determination

3.1 Synoptic determination table

The following synoptic determination table gives the most useful characters for distinguishing *C. crenaticornis*, *fennicus*, *flavidus*, *insolutus* and *trimaculatus*.

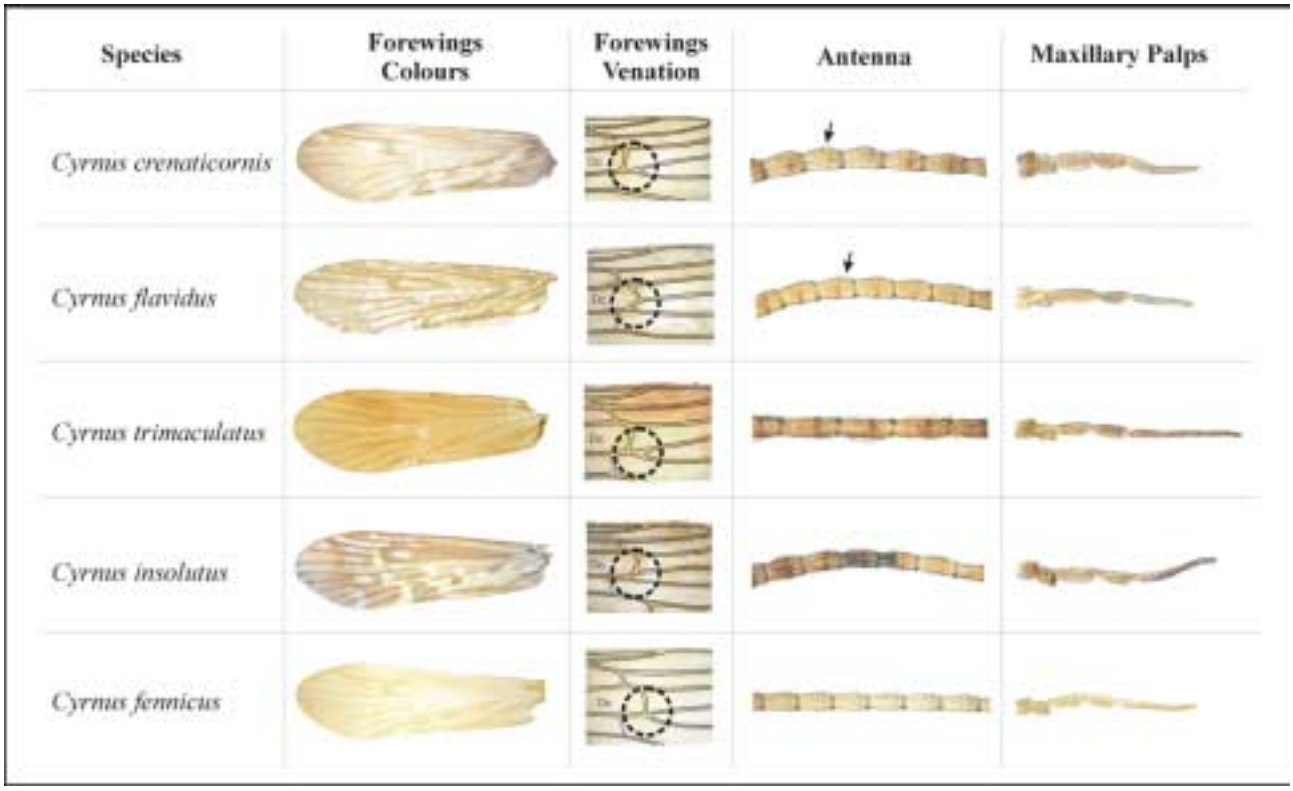
Species	1) Antenna	2) Maxillary palps; ratio of segment 4 to 5	3) Forewings; colour [(1)]; length	4) Forewings; venation	5) Distribution; Europe	6) Fore legs; ratio of proximal spur and tibia	7) Mid legs; ratio of tarsus and tibia
C. crenaticornis	Crenate on inner side from segment 3 on	1 : < 2,5	Pale grey-yellowish; some hyaline spots; length 6-8 mm	Branches of apical fork 2 separating at or beyond the crossvein	Not in the south and southeastern parts	1 : 11-12	1 : 1.2
C. flavidus	Crenate on inner side from segment 8-10 on	1 : < 2,5	Pale grey-yellowish; no hyaline spots; length 8-10 mm	Branches of apical fork 2 separating before the crossvein	Not in the south and southeastern parts	1 : 7-8	1 : >1,3
C. trimaculatus	Not crenate on inner side	1 : > 2,5	deep brown; few hyaline spots in the center and at the hind margin of the wings; length 6-7 mm	Branches of apical fork 2 separating at or beyond the crossvein	Not in the southern parts of the mediterranian area	1 : 4-5	1 : 0.9
C. insolutus	Not crenate on inner side	1 : < 2,5	brownish-yellowish; numerous hyaline spots; length 6-7 mm	Branches of apical fork 2 generally separating before the crossvein, (possibly sometimes at the crossvein) [(2)]	Central, north and northeastern parts	1 : 4-5	1 : 0.9
C. fennicus	Not crenate on inner side	1 : < 2,5	very pale grey-yellowish; very few indistinct hyaline spots; length 6-7 mm	Branches of apical fork 2 separating at or beyond the crossvein	only in Finland, Baltic States, Russia (northern parts)	1 : 4-5	1 : 0.9

Tabl. 1: Synoptic determination table for the females of the Northern, Eastern and Central European *Cyrnus*-species.

(1) = The description of the colours and the following photographs refer to alcohol material seen through a microscope with a white backround.

(2) = KLINGSTEDT (1937) states that in *C. insolutus* the branches of apical fork 2 can also separate at the crossvein (= sessile). In the few specimens the authors could study this was not observed, but it should be stressed, that the part of the two branches of fork 2 before the crossvein is very short (much shorter as in *C. flavidus*) in general. So if one uses only a smaller magnification it looks as if fork 2 is sessile. This problem needs to be further studied. Because of this unsolved problem the character is not used in the determination key yet.

The most important characters (No. 1 - 4 from table 1) are shown in the following photographs.



3.2 Determination key

From the above given data the following determination key has been constructed:

1. Antennae crenate on inner side	**2**
- Antennae not crenate on inner side	**3**
2. In forewings branches of apical fork 2 separating at or beyond the crossvein; antennae crenate from segment 3 on	***C. crenaticornis***
- In forewings branches of apical fork 2 separating before the crossvein; antennae crenate from segment 8-10 on	***C. flavidus***
3. Ratio of segment 4 to 5 of the maxillary palps is 1 : > 2.5	***C. trimaculatus***
(*C. cintranus* occurs only in central and southwestern France, Spain and Portugal)	(***C. cintranus***)
- Ratio of segment 4 to 5 of the maxillary palps is 1 : < 2.5	**4**
4. Forewings with numerous hyaline spots and a brownish-yellowish colour	***C. insolutus***
- Forewings with very few hyaline spots and a very pale grey-yellowish colour	***C. fennicus***

4 Discussion

Because only few specimens of *C. crenaticornis*, *fennicus* and *insolutus* could be examined and the sampling sites in general represent only a limited region of the whole distributional areas of all five species, the diagnostic characters should be tested on material from other parts of their ranges too. In our material the presented features showed no remarkable intraspecific variation. In collaboration with Dr. M.A. González (Santiago de Compostela, Spain) a determination key for the

females of all European *Cyrnus*-species is in preparation. Therefore the authors are very interested in any experience, which will be made when using this determination key.

Acknowledgements
We thank Dr. Wolfram Mey (Berlin) who gratefully provided us with material of *C. fennicus* and *C. insolutus* and Dr. Vladimir Ivanov (St. Petersburg) for his information about the distribution of *C. fennicus* in Northern Europe. We are also grateful to Dr. M.A. González for his constructive comments on earlier drafts of this poster.

5 References

KLINGSTEDT, H. (1937): A taxonomical survey of the genus Cyrnus Steph. including the description of a new species, with some remarks on the principles of taxonomy. - Acta Soc. pro Fauna et Flora Fenn. 60: 573-598, Helsinki.

Authors adresses:
Berthold Robert, Bestener Str. 235, D-46282 Dorsten, Germany; E-mail: berthold.robert@t-online.de
Peter J. Neu, Rot-Kreuz-Str. 2, D-54634 Bitburg, Germany; E-mail: upnbit@aol.com