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West Palaearctic species belonging to the subgenus *Orthocladius* s. str. (Diptera, Chironomidae)

Abstract - A list of the species belonging to the subgenus *Orthocladius* s. str. van der Wulp, 1874 known to occur in the West Palaearctic is here reported. Recent changes in nomenclature are described. Only species well known both as adult males and pupae are considered.

Riassunto - *Le specie del sottogenere* Orthocladius *s. str. (Diptera, Chironomidae) nella regione Paleartica occidentale.*

Viene riportata una lista delle specie appartenenti al sottogenere *Orthocladius* s. str. van der Wulp, 1874 presenti nella regione Paleartica Occidentale. Sono descritti i recenti cambiamenti nella nomenclatura. Sono considerate solo le specie note sia come maschi adulti che come pupe.

Key words: *Orthocladius* s. str., Chironomidae, Diptera Nematocera.

INTRODUCTION

Rossaro & Casalegno (2001) described West Palaearctic pupae belonging to the subgenus *Orthocladius* s. str. Pupal exuviae were formerly described by Thienemann (1944) and Langton & Cranston (1991). A key to adult males is in Pinder (1978), Soponis (1977) described Nearctic adult males, pupae, females and larvae with a key to species. An analysis of reared material and an examination of the type species suggested corrections and additions which are summarized in the present article. A detailed description of species (Rossaro, *et al.*, in prep.) and a phylogenetic analysis (Rossaro *et al.*, in press) will be matter of larger separated papers.

MATERIAL AND METHOD

Specimens were mounted according to Sæther (1969), terminology follow Sæther (1980).

RESULTS

Adult males can be separated according to the shape of inferior volsella dorsal lobe into an "*oblidens-rubicundus*" group with a dorsal lobe from short and squared to triangular and a "*rhyacobius-excavatus*" group, with a long and narrow, more or less digitiform dorsal lobe (Rossaro *et al.*, in press). The pupae was separated according to the development of taeniate extensions (Rossaro & Casalegno, 2001) into a "*glabripennis*" group without extensions and an "*obumbratus*" group with extensions; this last group is here further divided into an "*excavatus*" group with small extensions (Rossaro & Casalegno, 1991, Fig. 2.3, sub *ticinoi*) and a "*rhyacobius*" group with well developed extensions (Rossaro & Casalegno, 1991, Fig. 2.4, sub *obumbratus*), see below for changes in nomenclature.

Orthocladius excavatus Brundin, 1947 is here stated as a valid species and not as a junior synonym of *O. obumbratus* Johannes, 1905 (Langton & Cranston, 1991). The examination of adult male lectotypes of *O. obumbratus* and *O. excavatus* emphasizes that they differ by the shape of dorsal lobe of inferior volsella, large and squared in *O. obumbratus*, long and narrow in *O. excavatus*.

Orthocladius rhyacobius Kieffer, 1911 is here stated as a valid species and not as a junior synonym of *O. obumbratus* Johannes, 1905 (Langton & Cranston, 1991). The lectotype of *O. rhyacobius* is a pupal exuvia: it has well developed taeniate extensions and it is identical with pupal exuviae assigned to *O. obumbratus* in Rossaro & Casalegno (2001); reared pupae identical to lectotype gave adult males with a very reduced virga (sometime absent at all); because the *O. obumbratus* lectotype has a well developed virga, these exuviae cannot be assigned to *obumbratus*, but to *rhyacobius*, which becomes a valid species.

Orthocladius ticinoi Rossaro & Prato, 1991 becomes a junior synonym of *O. excavatus* Brundin, 1947 because the adult males of *O. ticinoi* are identical to the lectotype of *O. excavatus*. Both have a virga and a long and narrow dorsal lobe of inferior volsella. The pupal exuviae assigned to *O. ticinoi* in Rossaro & Casalegno (2001) must now be assigned to *O. excavatus*.

Orthocladius pedestris Kieffer, 1911 is confirmed to be a valid species, well separated from *O. excavatus, O. rhyacobius* and *O. obumbratus*, both as pupa (Rossaro & Casalegno, 2001) and as adult male, as can be evidenced from reared material. The adult is characterized by an hooked superior volsella and a relatively long and narrow inferior volsella dorsal lobe.

Orthocladius obumbratus Johannes, 1905 was examined from lectotype. The short and squared inferior volsella dorsal lobe emphasizes that it is nearer to the "*oblidens-rubicundus*" group than to the "*rhyacobius-excavatus*" group. In Soponis (1977) adults assigned to *O. obumbratus* (not belonging to type material) were associated with pupae similar to the "*rhyacobius*" group. We have never found adult males belonging to the "*oblidens-rubicundus*" group associated with pupae of the "*rhyacobius*" group in West Palaearctic; this association could be present in Nearctic, so *O. obumbratus* for now remains a valid species.

Orthocladius glabripennis (Goetghebuer, 1921) was examined from lectotype. It is a pinned specimen lacking genitalia. At present it is impossible to be certain about the species identity without genitalia. Pinder & Cranston (1976) figured the genitalia, which belong to the "*oblidens-rubicundus*" group; genitalia were probably mounted on a slide, which is not present at the IRSNB (Institut Royal des Sciences Naturelles, de Belgique), where the lectotype is deposited; if genitalia are really lost *O. glabripennis* should become a *nomen dubium*.

Orthocladius marchettii Rossaro & Prato, 1991 is associated with pupal exuviae without taeniate extensions. The genitalia of *O. marchettii* are near to O. *decoratus* (Holmgren, 1869), but the latter species has a strict Arctic distribution, whereas *O. marchettii* is restricted to the Mediterranean area (Apennines). At present both are considered valid species.

Orthocladius maius Goetghebuer, 1942 was examined from the holotype. It is a small species. The adult belongs to the "*oblidens-rubicundus*" group, which is not easily separated from other species in the group. The pupa (Langton & Cranston, 1991) has no taeniate extensions. The association of the pupa with the adult male confirms that it is a valid species.

Orthocladius decoratus (Holmgren, 1869) was examined from the holotype. Pupae associated to adults of *O. decoratus* were recently collected from Spitzbergen (Bear Island) from the 3rd author. The adult male is characterised by a well developed virga, an hooked superior volsella and a relatively long and narrow dorsal lobe of inferior volsella, similar to lobe observed in *marchettii* and *rhyacobius*. The pupa is quite similar to *rhyacobius*.

Orthocladius trigonolabis Edwards, 1924 was examined from the holotype. The adult is easily separated by a very developed tooth shaped crista dorsalis. Pupae associated to adults were examined from Brundin's collection. They are characterized by very long genital sheaths.

Orthocladius dentifer Brundin, 1947 was examined from the holotype. He has a moderately developed rounded crista dorsalis. The pupae belong to the "*glabripennis*" group, without taeniate extensions.

Reared material of *O. oblidens* (Walker, 1856), *O. rubicundus* (Meigen, 1818) and *O. rivinus* Kieffer, 1915 shows that these species have a very similar adult male, with a short and squared inferior volsella dorsal lobe (they constitute the "*oblidens-rubicundus*" group). The characters given by Pinder (1978) to separate species are untenable. *O. rubicundus* has very thin dorsocentrals, which are normally developed in the other 2 species. *O. rivinus* and *O. oblidens* differ somewhat by the shape of inferior volsella.

THE WEST PALAEARCTIC SPECIES KNOWN

At present the following species known both as adult males and pupae are considered valid from West Palaearctic (Soòs & Papp, 1991, Langton & Cranston,

1991, Rossaro & Casalegno, 2001) (the species names are followed by junior synonyms):

- ***Orthocladius decoratus*** (Holmgren, 1869)
- ***Orthocladius dentifer*** Brundin, 1947; Orthocladius sp. indet. oblidens sensu Langton, 1984: 154, nec Walker, 1856 (Langton, pers. comm.); Orthocladius Pe 4 Langton, 1991: 186 (Langton, pers. comm.)
- ***Orthocladius excavatus*** Brundin, 1947: 20; Orthocladius Pe 7 Langton, 1984: 155, Langton, 1991: 190 a tentative synonym; Orthocladius ticinoi, Rossaro e Prato, 1991, synonymy here designated.
- ***Orthocladius frigidus*** (Zetterstedt, 1838)
- ***Orthocladius glabripennis*** (Goetghebuer, 1921); Orthocladius atripluma Kieffer, 1923 (Langton & Cranston, 1991); Orthocladius mitisi Goetghebuer, 1938 (Langton & Cranston, 1991); Orthocladius Pe 5 Langton, 1984 (Langton, 1991: 188, Langton & Cranston, 1991)
- ***Orthocladius maius*** Goetghebuer, 1942; Orthocladius Pe 6 Langton, 1984 (Langton, 1991: 188, Langton & Cranston, 1991)
- ***Orthocladius marchettii*** Rossaro & Prato, 1991
- ***Orthocladius oblidens*** (Walker, 1856); Orthocladius lenzi Kieffer, 1924 (Langton & Cranston, 1991); Orthocladius sp A Pinder, 1978 (Langton, 1991: 184, Langton & Cranston, 1991); Orthocladius Pe 2 Langton, 1984: 150 (Langton & Cranston, 1991) nec Chironomus oblidens Walker, 1856, sensu Langton, 1984: 154 (Langton & Cranston, 1991); Orthocladius pinderi Rossaro & Prato, 1991 (Rossaro & Casalegno, 2001)
- ***Orthocladius obumbratus*** Johannsen, 1905
- ***Orthocladius pedestris*** Kieffer, 1909; *Orthocladius tubicola* Kieffer, 1909 (Langton & Cranston, 1991); *Orthocladius* Pe 10 Langton, 1984: 158 (Langton, 1991: 191, Langton & Cranston, 1991); *O. rhyacobius* sensu Langton, 1984: 158 (Langton & Cranston, 1991) nec Kieffer, 1911
- ***Orthocladius rhyacobius*** Kieffer, 1911; *O. rhyacophilus* Kieffer, 1911 (Langton & Cranston, 1991); *O. dispar* Goetghebuer, 1942; *Orthocladius* Pe 9 Langton, 1984: 155, Langton, 1991: 190, Langton & Cranston, 1991; *O. obumbratus* sensu Langton & Cranston (1991) nec Johannes 1905; *O. obumbratus* sensu Rossaro & Casalegno (2001) nec Johannes 1905
- ***Orthocladius rivinus*** Kieffer, 1915; *Orthocladius* Pe 3, Langton, 1984: 150 (Langton, 1991: 186, Langton & Cranston, 1991); *O. mariellae* Rossaro & Prato, 1991 (Rossaro, 1991)
- ***Orthocladius rubicundus*** (Meigen, 1818); *O. saxicola* Kieffer, 1911 (Langton & Cranston, 1991); *O. curtiseta* Sæther, 1973 (Langton & Cranston, 1991)

- ***Orthocladius ruffoi*** Rossaro & Prato, 1991; *Rheorthocladius* sp. A Thienemann, 1944 (Rossaro & Prato, 1991); *Orthocladius* Pe 1, Langton, 1984: 149 (Rossaro & Prato, 1991)
- ***Orthocladius trigonolabis*** Edwards, 1924; *Orthocladius aquilonaris* Goetghebuer, 1940 (Brundin, 1956)
- ***Orthocladius vaillanti*** Langton & Cranston, 1991 ; *Orthocladius* Pe 13 Langton, 1991: 184 (Caldwell, 1999)
- ***Orthocladius wetterensis*** Brundin, 1956 ; *Orthocladius* Pe 8, Langton, 1984: 156, Langton, 1991: 190 (Langton & Cranston, 1991) ; *O. rachelae* Rossaro & Prato, 1991 (Rossaro, 1991)

DISCUSSION

The association of pupal exuviae with adult males is strongly recommended in routine species determination within the subgenus *Orthocladius* s. str. Unfortunately type materials are generally adult males, without associated pupae, in some case type materials are pupae without associated adults (Langton & Cranston, 1991). An accurate comparison of reared material with types allowed to clarify the status of most West Palaerctic species, but outside West Palaearctic many Japanese and Nearctic species are probably junior synonyms of West Palaearctic species. The formal statement of synonymy can be performed only after type material examination will be allowed.

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