

Trichoceridae of Massif Central (France) (Dipt. Nematocera)

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Résumé. — Après les travaux de MACQUART (1834), KEILIN (1912), PIERRE (1924) et plus récemment de THOMAS et VAILLANT (1977), la faune des Trichocerides de France ne semblait comporter que 7 espèces sur les 25 signalées en Europe.

Les auteurs présentent ici la phénologie de 11 espèces capturées dans le seul département du Puy-de-Dôme (Massif central français). Quatre de ces espèces sont nouvelles pour la faune de France : *Trichocera forcipula*, *T. implicata*, *T. japonica*, *T. major*.

Cette faune des Trichocerides de France peut être subdivisée en 2 groupes d'espèces : les espèces à large répartition qui occupent aussi la strate aérienne pendant presque toute l'année (de septembre à mai-juin) et les espèces sténothermes froides, strictement liées aux massifs montagneux, qui ne se rencontrent que brièvement à l'état imaginal (automne et hiver). Dans le premier groupe nous trouvons : *T. annulata*, *T. hiemalis*, *T. saltator*, *T. regelationis* et *T. maculipennis*, et dans le second : *T. forcipula*, *T. dalhae*, *T. implicata*, *T. japonica*, *T. major* et *T. parva*.

Ces liens entre sténochronie et stenotopie d'une part et eurychronie et eurytopie d'autre part, ont été mis en évidence (BRUNHES et VILLEPOUX, sous presse) en ce qui concerne les Limonidés des tourbières d'Auvergne.

The family Trichoceridae is represented in Europe by 25 species (DAHL and ALEXANDER, 1976). These flies, called winter gnats, are confined to the cooler climate. Their main reproduction time is from autumn till spring; only in the mountains at higher altitudes or in subarctic/arctic regions are they to be found in Summer. Their distribution in the Northern and Central Europe is well known owing to the works of Dahl, Mendl and Sary, while the data concerning western and southern Europe are very scarce. From France 5 species were recorded in the old works of MACQUART (1834), KEILIN (1912), PIERRE (1924) and recently 3 species from the Alps by THOMAS and VAILLANT (1977).

In the material collected by J. Brunhes in years 1981-1989 about 200 specimens of Trichoceridae were found, mainly from Massif Central and scarce from Pyrenean mountains. These isolated mountain ranges are the farthest south-western localities for the European species. Eleven species were found, 4 of them new to France.

The key of the majority of the subgenus *Trichocera* species was given in DAHL (1966), and for the *Metatrachocera* species in DAHL (1967b).

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Trichocera (Metatrachocera) forcipula NIELSEN, 1921

Male genitalia illustrated by DAHL (1966), KRZEMINSKI (1983), MARTYNOWSKÝ and STARY (1988).
Female genitalia illustrated by DAHL (1966).

Phenology: all the data available indicate the occurrence of adults in October only, thus confirming the single annual cycle of reproduction postulated by DAHL (1966).

Distribution: European species known from Sweden, Denmark, Western USSR, Alps, Czechoslovakia, Poland. New to France.

Material examined: Massif central: Chambedaze 07.10.1981, 3 ♂, 1 ♀; 10.10-02.11.1981, 1 ♀; Clerziou grottoes, 17.10.1982, 2 ♂, 2 ♀; Chaudefour (near mountain stream), 18.10.1987, 15 ♂, 5 ♀.

Remarks: another member of this subgenus — *T. (M.) lutea* — was found in the French Alps by THOMAS and VAILLANT (1977).

Trichocera (Trichocera) annulata MEIGEN, 1818

Male and female genitalia illustrated by DAHL (1966).

Phenology: adults common from September to November, and from March to April (DAHL, 1966; KRZEMINSKI, 1983).

Distribution: the most widely distributed species among all the family representatives: Western Canada, USA, Europe, Western USSR, Ethiopia, Algeria, South Australia, New Zealand. French records: vicinity of Paris, Pyrenean Mts. (MACQUART, 1834; PIERRE, 1924).

Material examined: Massif Central: Randan forest, 21.04.1989, 1 ♂. Pyrenean Mts., Morlaas (near Pau), 08.04.1987, 1 ♂.

Trichocera (Trichocera) dahlae MENNDL, 1971

Male genitalia illustrated by MENDL, (1971).

Phenology: Mendl reported it as an autumn species, occurring from October to November.

Distribution: Western Germany, Poland (MENDL, 1982). French records: Pyrenean Mts (MENDL, 1982).

Material examined: Massif Central: Bois Noirs (Etui valley), 01.11.1988, 1 ♂.

Trichocera (Trichocera) hiemalis (DE GEER), 1776

Male and female genitalia illustrated by DAHL (1966, 1967a).

Phenology: though found from early autumn till late spring (except for subarctic/arctic regions of summer occurrence: DAHL, 1970), the data available suggest two main peaks of frequency: October-November and April.

Distribution : Central and Northern Holarctic. French records : common in France (MACQUART, 1834 ; KEILIN, 1912 ; PIERRE, 1924).

Material examined : Massif Central : Chambedaze, 07.10.1981, 1 ♀ ; 22.04.1981, 2 ♀ ; 20.10.1981, 8 ♀ ; Pont de Clamouze (peat bog), 22.10.1982, 4 ♀ ; St. Victor-La Rivière-Courbange (on snow), 12.12.1982, 1 ♀ ; Croix St.-Robert (betulaie), 25.09.1983, 2 ♀ ; Croix St.-Robert (peat bog), 09.10.1988, 1 ♂ ; Puy Mary (peat bog), 01.10.1983 (1550 m), 6 ♀ ; Chaudefour, (on crests), 28.10.1984, 2 ♀ ; Chaudefour (near torrent), 23.04.1987, 1 ♂ ; 18.10.1987, 1 ♂, 7 ♀ ; Chaudefour (La Biche waterfall), 23.04.1987, 1 ♀ ; Bois Noirs (Snidre), 26.03.1989, 1 ♂ ; Puy de la Vache, 05.02.1989, 1 ♀ ; Etui valley (peat bog), 01.11.1988, 3 ♀ ; Chambedaze, 07.10.1981, 2 ♀ ; 13.05.1985, 1 ♀ ; 17.05.1985, 1 ♀ ; Pyrenean Mts : Morlaas (near Pau), 31.03.1989, 1 ♀.

Trichocera (Trichocera) implicata DAHL, 1976

Male genitalia illustrated by DAHL (1976).

Phenology : adults were found in autumn, rarely in winter months.

Distribution : European species : Alps, Sweden, New for **France**.

Material examined : Massif Central : Chambedaze, 2.10.1981, 1 ♂.

Trichocera (Trichocera) japonica MATSUMURA, 1915

Male genitalia illustrated by DAHL (1967a), female genitalia illustrated by DAHL (1967b).

Phenology : in subarctic/arctic regions adults found from august till November. However, the data from Japan indicate also a spring peak, not observed in Europe and Canada (DAHL, 1970).

Distribution : Japan, Alaska, Northern Canada, Sweden, Finland. New to France.

Material examined : Massif Central : Chambedaze, 07.10.1981, 2 ♂ ; 02.11.1981, 5 ♀ ; 13.10.1984, 3 ♂ ; 20.10.1981, 1 ♂ ; Puy Mary (peat bog) (1550 m), 01.10.1983, 1 ♂ ; Chaudefour (on crests), 13.10.1984, 3 ♂ ; Chaudefour (near mountain stream), 18.10.1987, 5 ♂, 1 ♀ ; (near mountain stream), 23.10.1988, 1 ♂ ; Chambedaze, 1 ♀ ; 2 ♂.

Trichocera (Trichocera) maculipennis MEIGEN, 1818

Male and female genitalia illustrated by DAHL (1966).

Phenology : the species is coprophagous, synantropic and requires higher temperature for the larval development than other species of the genus. Found generally from Spring to Autumn, i.e. also during the summer months. Rare in winter, mainly met in the mines, caves or other sheltered places (DAHL, 1966).

Distribution : very wide, Holarctic, Kerguelen Is., India. French records : see PIERRE (1924).

Material examined : Massif Central : La Barthe (peat bog), 11.06.1984, 1 ♀.

Trichocera (Trichocera) major EDWARDS, 1921

Male genitalia illustrated by DAHL (1966) and KRZEMINSKI (1983), female genitalia illustrated by DAHL (1966).

Phenology: the present and Polish data confirm the observation made by DAHL (1966) for Fennoscandia, that this species is to be found only from October to December and has only one generation a year. Adults never met in large swarms; single specimens are often found on snow.

Distribution: Northern and Central Europe, Alps, Western USSR, North America. New for France.

Material examined: Massif Central: Chambedaze, 07.10.1981, 1 ♂, 1 ♀; Pont de Clamouze (peat bog), 22.10.1982, 1 ♂; Goules col (on snow), 18.12.1983, 1 ♂; Servièrè (on snow), 09.12.1984, 1 ♂; 01.12.1985, 1 ♂; Puy de Dôme (on snow), 05.12.1987, 1 ♂, 1 ♀; Bois Noirs (Vallée de l'Etui) (peat bog), 01.11.1988, 3 ♀.

Trichocera (Trichocera) parva (MEIGEN), 1804

Phenology: one main peak of adults frequently in autumn, about October. Specimens are also, in spring, found in subboreal region (DAHL, 1970).

Distribution: Northern and Central Europe, Western USSR. French records: MACQUART (1834), French Alps: Belledonne (700 m) (THOMAS and VAILLANT, 1977).

Material examined: Massif Central: Chambedaze, 07.10.1981, 1 ♂; Croix St. Robert, 25.09.1983, 41 ♂; Puy Mary (pet bog), 1550 m, 8 ♂; Bois Noirs, 16.10.1986, 2 ♀; Chaudefour (mountain stream), 18.10.1987, 7 ♂; Chaudefour (near torrent), 23.10.1988, 1 ♂.

Trichocera (Trichocera) regelationis (LINNÉ), 1758

Male and female genitalia illustrated by DAHL (1966).

Phenology: one of the most abundant species. Adults are found throughout all the autumn, winter and spring months.

Distribution: widely distributed over holarctis, Falkland Is. French records: common in France (PIERRE, 1924).

Material examined: Chambedaze, 02.11.1981, 2 ♂; 13.10.1984, 1 ♂, 1 ♀; Le Gelas-Pavin, 15.05.1982, 2 ♂; Chaudefour, 05.06.1983 (1250 m), 1 ♂, 1 ♀; 23.04.1987, 1 ♂; 18.10.1987, 4 ♂, 1 ♀; (swamp), 16.09.1983, 1 ♂; Chaudefour (near mountain stream), 23.10.1988, 1 ♂, 1 ♀; Cunlhat (700 m), 29.06.1983, 1 ♂; Croix St. Robert, 25.09.1983, 1 ♂; La Barthe (peat bog), 30.10.1984, 1 ♀; Segonzat (on snow), 18.02.1986, 1 ♂; Clermont, 28.02.1986, 1 ♂; Bois Noirs (Etui valley) (peat bog), 0.11.1988, 5 ♂; Randan forest, 21.04.1988, 1 ♂, 2 ♀; Bois Noirs (Snidre), 26.03.1989, 1 ♀; Terrasson, 20.07.1989, 1 ♂.

Trichocera (Trichocera) saltator (HARRIS), 1776

Male and female genitalia illustrated by DAHL (1966). Additional character assisting the identification of males and females : vein Sc without or with a very few setae ventrally (LAURENCE, 1957).

Phenology : common from autumn till spring.

Distribution : Northern and Central Europe, Japan. French records : near Paris (very rare) (PIERRE, 1924 ; referred to as *T. fuscata*, the synonym).

Material examined : Massif Central : Chambedaze, 07.10.1981, 1 ♂ ; 02.11.1981, 6 ♂ ; Clerziou grottoes, 22.10.1982, 2 ♀ ; Pont de Clamouze (peat bog), 22.10.1982, 2 ♀ ; St. Victor-La-Rivière-Courbange (on snow), 12.12.1982, 2 ♀ ; Croix St.-Robert, 25.09.1983, 1 ♂, 1 ♀ ; Marais de Limagne (peat bog), 24.04.1984, 1 ♂, 1 ♀ ; La Barthe (peat bog), 30.10.1984, 1 ♀ ; Chaudefour, 23.04.1987, 1 ♂ ; 18.10.1987, 4 ♀ ; Chaudefour (near torrent), 23.10.1988, 1 ♂ ; Fontanas, 27.11.1987, 1 ♂ ; Puy-de-Dôme (on snow), 05.12.1987, 1 ♀ ; Bois Noirs (Etui valley) (peat bog), 01.11.1988, 5 ♂ ; Randan forest, 21.04.1988, 3 ♂ ; Pyrenean Mts : Morlaas (near Pau), Forêt Lahitou, 31.03.1989, 1 ♂, 1 ♀.

REMARKS

The present data from France confirm the earlier observations that the European Trichoceridae can be divided roughly in two groups, according to their phenology : species of widespread distribution, not confined to mountains regions, with the adults occurring from Autumn till late Spring (*T. annulata*, *T. hiemalis*, *T. saltator*, *T. regeltionis* and *T. maculipennis* — the three first found as far south as Pyrenean Mts.), and the group of probably more cool-adapted species, found mainly in mountains, with Autumn-Winter adults occurrence (*T. forcipula*, *T. dahlae*, *T. implicata*, *T. japonica*, *T. major* and *T. parva*).

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