

The dolichopodid fauna (Dolichopodidae, Diptera) of a garden habitat : faunistics, habitat preference, phenology and distribution

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Summary

In the scope of a larger sampling campaign, dolichopodid flies (Dolichopodidae, Diptera) were collected in a garden habitat at Ottignies (Prov. Brabant, Belgium) by means of a Malaise trap during the period 25.i. - 21.xi.1981. A total number of 2168 specimens were gathered, belonging to at least 57 species ; in fact, some females of *Medetera* and *Rhaphium* remained unidentified. *Sciapus platypterus*, *Sympycnus pulicarius* and *Chrysotimus molliculus* appeared to be the most abundant species in our samples. Several species of special faunistic interest were noted as *Hercostomus fulvicaudis*, *Lamprochromus elegans*, *Medetera feminina*, *Rhaphium micans* and *Systemus bipartitus*. Data on habitat preference, phenology and distribution areas in Belgium and The Netherlands are given for most of the species. The sexratio observed in *Neurigona quadrifasciata* and *Sciapus platypterus* revealed a predominance of males, whereas the reverse was true for *Chrysotimus molliculus* and *Chrysotus gramineus*. Finally, some remarks are added concerning the originality of the dolichopodid fly fauna of garden habitats and the importance of sampling these and similar sites.

Key words : Diptera, Dolichopodidae, faunistics, Belgium.

Résumé

Des diptères Dolichopodides ont été récoltés à l'aide d'un piège Malaise dans un jardin à Ottignies (prov. Brabant, Belgique) pendant la période du 25.I-21.XI.1981. Un total de 2168 exemplaires ont été capturés, appartenant au moins 57 espèces ; en effet, quelques femelles de *Medetera* et de *Rhaphium* sont restées non identifiées. *Sciapus platypterus*, *Sympycnus pulicarius* et *Chrysotimus molliculus* étaient les espèces les plus abondantes. Des espèces d'un intérêt faunistique particulier comme *Hercostomus fulvicaudis*, *Lamprochromus elegans*, *Medetera feminina*, *Rhaphium micans* et *Systemus bipartitus* ont été trouvées. Des données sur l'habitat, la phénologie et la répartition en Belgique et aux Pays-Bas sont fournies. Chez *Neurigona quadrifasciata* et *Sciapus platypterus*, le nombre de mâles était plus élevé que celui des femelles tandis que chez *Chrysotimus molliculus* et *Chrysotus gramineus* les femelles dominaient.

Mots-clés : Diptères, Dolichopodidae, faunistique belge.

Introduction

Nature reserves mostly show endangered, vulnerable, rare or geographically restricted plant or animal species. This holds true for the higher plants, mammals, reptiles, amphibians and birds but only very recently

also smaller organisms such as insects have been taken into consideration for nature conservancy (e.g. MORRIS, 1981, 1986). As this is quite new, few results are known about the present insect fauna of nature reserves : it is often found that e.g. many interesting carabid beetles are found, while most of the spider species occurring are quite ordinary or vice versa. Otherwise, mostly nature reserves are investigated because the species richness and the number of rare species is generally expected to be very high. Nevertheless, seemingly uninteresting areas such as pastures, arable fields and gardens also need special attention, for these habitats function as reference points for the results obtained in nature reserves. Moreover, previously many insect species of special faunistic interest were found in gardens (POLLET & DE BRUYN, 1987 ; GROOTAERT, 1985 ; FASSOTTE & GROOTAERT, 1981) and arable fields (ALDERWEIRELDT, 1987).

Some years ago, a large sampling campaign was started in order to gather data about the ecology and distribution of dipterous species in Belgium. Results on the Pipunculidae and Syrphidae have already been published (DE MEYER & DE BRUYN, 1986 ; VERLINDEN & DECLEER, 1987). Concerning the dolichopodid fauna of Belgium, recently MEUFFELS & GROOTAERT (1987) published a preliminary check list of the Belgian species. POLLET et al. (1987a) added two species to this list, which consequently comprises 281 species. However, it is very likely that more species will be discovered. In contrast to groups such as hover flies, very little is known about the habitat preference, phenology and distribution areas of most dolichopodid species. In particular for gathering data on their seasonal flying activity, Malaise traps formerly proved to be very appropriate.

In the present paper, we deal with the results on the dolichopodid fauna of a garden habitat at Ottignies (Prov. Brabant, Belgium), collected by means of a Malaise trap.

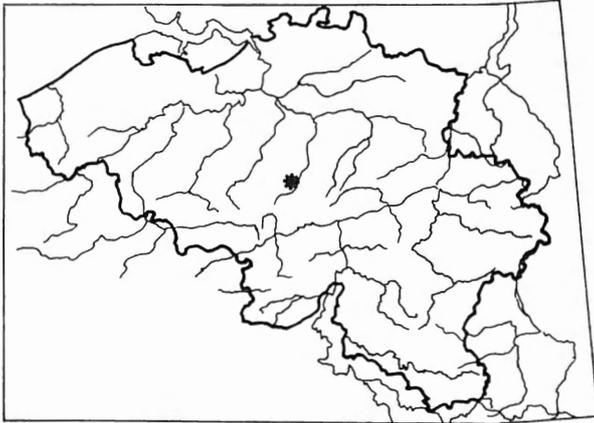


Figure 1.
Location of the sampling site in Belgium.

Study site, material and methods

The garden at Ottignies (mid Belgium, altitude 65 m, prov. Brabant) (Fig. 1) is a lawn surrounded by a large variety of shrubs and trees (*Acer*, *Betula*, *Chaenomeles*, *Cornus*, *Crataegus*, *Fraxinus*, *Juniperus*, *Malus*, *Rosa*, *Salix*, *Sambucus*, *Syringa*, *Viburnum*, ...). The present herb layer consists of both indigenous and adventive plant species. It is situated between two similar gardens and the river Dijle, which is about 5m wide at this place. For more information about the investigated site we refer to FASSOTTE & GROOTAERT (1981).

The Malaise trap used had a white nylon roof and a single black trapezoid vertical wall (2.5m at top, 1m at the lowest point and 3m long). It was designed after a type described by TOWNES (1972). The flies were collected in a jar attached to the highest point of the roof, which was filled to one half with a 70% alcohol solution. The Malaise trap was installed at a distance of 7m from the Dijle, with one end to the river and another to the lawn. The flies were collected at approximately weekly intervals during the period 25.i.-21.xi.1981. Afterwards, capture results were extrapolated into periods of 7.1 days (starting from 1 januari onwards), resulting in exactly 52 periods per year or 4 equal periods per month. The graphs in Fig. 2 are based on these data.

Results

1. - In general

A total of 2168 flies were collected, belonging to at least 57 species (Table 1). Some of these were caught in remarkably high numbers such as *Sciapus platypterus*, *Sympycnus pulicarius* and *Chrysotimus molliculus*, which made up 27.7%, 22.3% and 10.2% of the total number of flies collected respectively. On the other hand, of 30 species less than 5 individuals were found.

Hereafter, most of the species are discussed concerning their habitat selection, commonness and seasonal activity pattern. If not mentioned otherwise, phenology results are compared with the total data set for Belgium and The Netherlands (unpubl. data). Figure 2 presents the seasonal activity patterns of the most abundant dolichopodid species ($n > 50$), based on Malaise trap catches. Species are ranged according to the date, on which 50% of the individuals was gathered.

2. - Distribution, habitat preference and seasonal flying activity

Argyra argentella (ZETTERSTEDT, 1843)

This species seems to be rather scarce and has been found mainly in the southern parts of The Netherlands and in the lower parts of Belgium. At Ottignies, one single male was caught in the period of 26.ix. - 3.x., a very late date. Previously, we saw specimens ranging from 15.vi. to 11.ix., with a peak in the third decad of July. D'ASSIS FONSECA (1978) states vi-ix for England (See under *A. argentina* (Mg.)! Possibly *A. argentella* and *A. argyria* must be considered as a single species, since the distinction between these species is made only on the basis of the colour of the legs and other doubtful and probably varying features.

Argyra argentina (MEIGEN, 1824)

Well distributed in Belgium and The Netherlands, but becoming rather scarce towards the north. As for the preceding species, the activity period of *A. argentina* shows a peak in the last half of July, captures from Belgium and The Netherlands ranging from 31.v. to 7.ix., but later records do also occur: 3.x. and 8.x.1986 (The Netherlands, Sint Pietersberg, leg. B. VAN AARTSEN). Perhaps there is a partial second generation?

Argyra atriceps LOEW, 1857

The distribution area of this species seems to reach its northern limit in Belgium, as in The Netherlands it is only found in the extreme south of the province of Limburg. In Belgium, it is rather scarce (14 U.T.M.-squares), but in Ottignies it was well presented by 106 specimens. The main activity period runs from the very beginning of June to the first week of September (cf. Fig. 2g), although the species can be found as early as 9.v. (1903, Loppem, coll. JACOBS, Brussels, 1 male) and as late as the beginning of November (cf. Fig. 2g). Want of material from other sites prevents us to draw conclusions about generation sequence from the peaks shown by the histogram. Males and females have a more or less equal activity throughout the flying period.

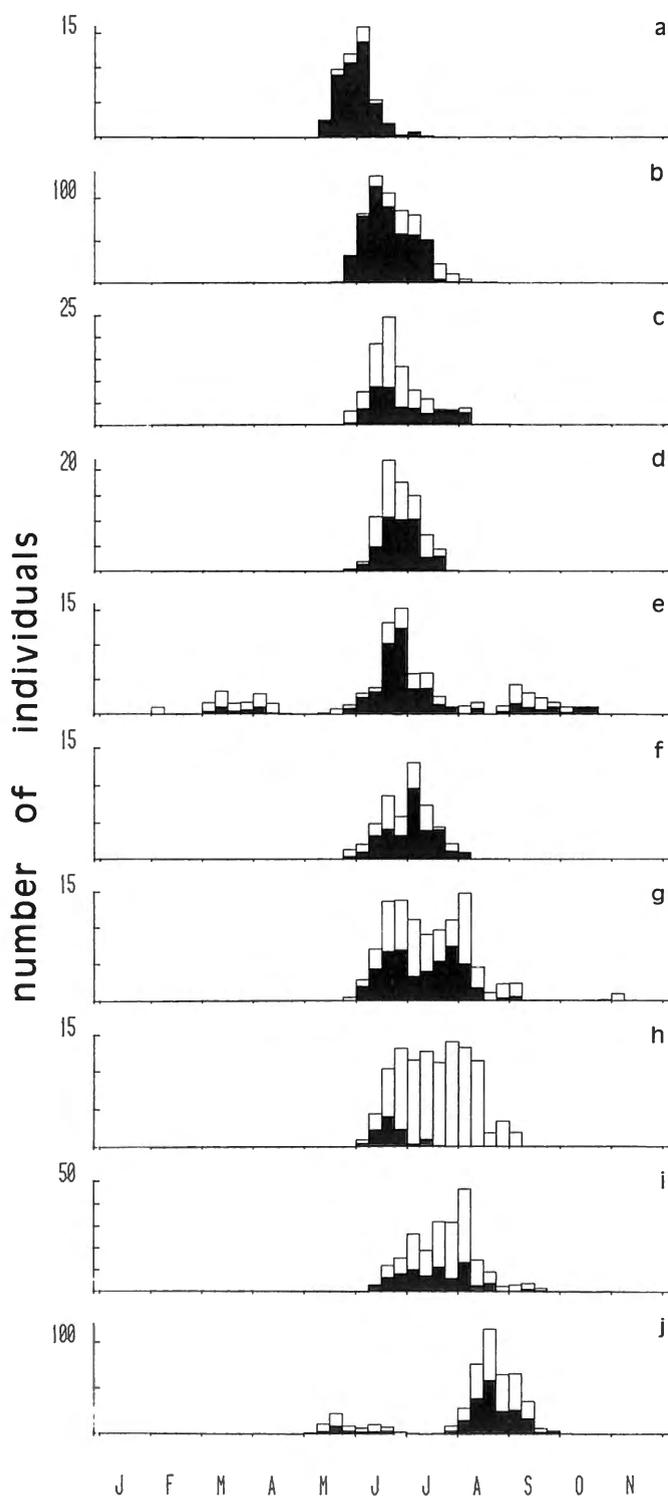


Figure 2.
Seasonal distribution of the most abundant dolichopodid species ($n > 50$), collected by means of a Malaise trap (black columns : males, white columns : females). For more information about the extrapolation of the original data, see text a. *Neurigona quadrifasciata*; b. *Sciapus platypterus*; c. *Dolichopus unguulatus*; d. *Dolichopus longicornis*; e. *Campsicnemus curvipes*; f. *Dolichopus subpennatus*; g. *Argyra atriceps*; h. *Chrysotus gramineus*; i. *Chrysotimus molliculus*; j. *Sympycenus pulicarius*.

Argyra grata LOEW, 1857

A scarce species in Belgium (known from 15 U.T.M. 10 km-squares) and The Netherlands (6 U.T.M.-squares, but not uncommon in the south of the province of Limburg). Extreme dates : 3.vi. and 13.viii. To our current knowledge, this species prefers canopy by trees or shrubs.

Bathycranium bicolorillum (ZETTERSTEDT, 1843)

Rare in both Belgium (10 U.T.M.-squares, only in the lower parts) and The Netherlands (5 U.T.M.-squares). This species mostly occurs in damp woods and wooded marshes, as was observed by PARENT (1938) and CHANDLER (1966). Its flying period extends from the beginning of July to the first week of October.

Campsicnemus curvipes (FALLEN, 1823)

This is chiefly a denizen of forest floors, as appears e.g. from the study of POLLET et al. (1986) and POLLET & GROOTAERT (1987). When comparing the numbers of this species caught by Malaise traps during the study of POLLET & GROOTAERT (1987) with the present results, remarkable large numbers were collected at Ottignies. Nevertheless, at Wijnendalebos, *C. curvipes* was caught by thousands of individuals at the soil surface level. As can be concluded from Fig. 2e, three activity peaks are apparent, but the highest activity is reached during the period June-July, which corresponds with the findings of POLLET et al. (1986). However, within those periods and between them, there are more small peaks, pointing either to a succession of short generations or effects of climatological fluctuations. POLLET et al. (1986) found only females of *C. curvipes/scambus* from November to the beginning of March, suggesting that only this sexe might be active during winter.

Campsicnemus lumbatus LOEW, 1857

This species was considered to be very rare in The Netherlands, until it appeared in numbers on the floating leaves of nymphaeids during an investigation of a nymphaeid-dominated system in the neighbourhood of Nijmegen in 1977 (VAN DER VELDE et al., 1986). The species was caught in 1983 at Pannerden (The Netherlands) by B. VAN AARTSEN in a similar situation. Other captures are rare and always in environments abounding with open water. In Belgium, the species is also known from very few locations only (POLLET et al., 1988 b). Certainly, the female caught at Ottignies was out of its normal habitat and probably originated from the river banks of the Dije. Moreover, it has already been reported from similar habitats (POLLET et al., 1988 b). Noteworthy is the capture of a female at light in the evening of 4.viii.1969 at De Hamert (The Netherlands), at some distance of water.

13- 20.vi	20- 27.vi	27.vi- 4.vii	4- 11.vii	11- 18.vii	18- 25.vii	25.vii- 1.viii	1- 8.viii	8- 15.viii	15- 22.viii	22- 29.viii	29.viii- 5.ix	5- 12.ix	12- 19.ix	19- 26.ix	26.ix- 3.x	3- 10.x	10- 17.x	17- 24.x	24- 31.x	31.x- 7.xi	7- 14.xi	14- 21.xi	Total number
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3/1	14/4	10/2	1/2	4/2	1/1	1/	/1	1/1	-	-	1/2	2/3	/1	1/2	1/	/1	1/	1/	-	-	-	-	57/35
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117/18	58/12	51/32	53/17	18/24	2/16	1/3	1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	464/136
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5/8	3/1	2/	/1	-	1/	3/5	12/10	28/28	61/53	24/34	22/43	28/30	6/6	/2	-	-	-	-	-	-	-	-	219/265
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Table 1 :
Dolichopodidae caught at Ottignies during 1981.

Campsicnemus scambus (FALLEN, 1823)

That only one male and one female were caught of this not uncommon species, probably has its cause in the fact that it is a mainly soil-dwelling dolichopodid fly, comparable with *C. curvipes* (cf. POLLET et al., 1986; POLLET & GROOTAERT, 1987). *C. scambus* is indeed quite common but occurs in large numbers only in humid woodlands and peatmoors (POLLET et al., 1988 a). Moreover, together with the related *C. curvipes*, it is one of the dominant species of humid deciduous woodland on loamy soil (POLLET & GROOTAERT, 1987).

Chrysotimus flaviventris (VON ROSER, 1840)
(= *concinus* (ZETTERSTEDT, 1843))

Not yet found in The Netherlands and scarce in Belgium, but found distributed all over the country (15 U.T.M.-squares). *C. flaviventris* can be considered as a stenotopic woodland species (cf. POLLET & GROOTAERT, 1987).

Chrysotimus molliculus (FALLEN, 1823)

Rather common and well distributed in Belgium and The Netherlands. With a total amount of 221 specimens, it is the third species in number at Ottignies. There is only one activity period from about half June till half September and the greatest activity is reached towards the end of July and the beginning of August (cf. Fig. 2i). *C. molliculus* also proved to be fairly abundant in a garden at Schoten, where it was active from the last week of June till the first week of August (POLLET & DE BRUYN, 1987). Besides the fact that the flying activity of this species was much more extended in the present study, the species also reached its highest activity two weeks later as compared to the findings of POLLET & DE BRUYN (1987). Climatological factors are most probably the main causes for this discrepancy. At Ottignies, nearly twice as much females as males were caught. Practically nothing seems to be known about the ecology of this species, although it seems to occur mainly in canopied areas.

Genus Chrysotus

This genus requires a revision, at least of the species group including *Chrysotus gramineus* (FALLEN, 1823). All *Chrysotus* species are known as sun-loving insects, to be found running on the leaves of herbs and shrubs. Usually great numbers of several species are present, but because they only reluctantly fly, relatively few specimens are caught with Malaise traps or in water traps on soil surface level (POLLET & GROOTAERT, 1987). *C. gramineus*, *C. cilipes* MEIGEN, 1824, *C. cupreus* MACQUART, 1827 and *C. neglectus* (WIEDEMANN, 1817) are rather common species in Belgium

and The Netherlands. However, thus far *C. cupreus* has not been recorded yet from the province of Western Flanders (POLLET et al., 1987b). *Chrysotus angulicornis* KOWARZ, 1874 has not been collected yet in The Netherlands and is reputed to be scarce in Belgium, but probably it is often confused with *C. gramineus* or other related species. *C. gramineus* demonstrated a flying activity from early June till the very beginning of September (cf. Fig. 2h). As compared to the findings at Schoten (POLLET & DE BRUYN, 1987), activity began three weeks earlier at Ottignies, whereas the activity period of this species at the former site appeared to be almost exclusively restricted to July and August. Common to both sites investigated was the remarkably brief activity period of the males in the beginning of the seasonal flying activity period. As a result of the shift mentioned before, at Schoten active males were observed only during July and at Ottignies mainly during June.

Dolichopus acuticornis WIEDEMANN, 1817

According to LUNDBECK (1912), generally occurring near the coast; this holds good for Belgium and The Netherlands: more inland it is indeed a less common species. When considering the province of Western Flanders (Belgium) only, apart from one capture at Zedelgem, *D. acuticornis* was recorded exclusively from the dunes along the sea coast (POLLET et al., 1987b). Contrary to this, EMEIS (1964) calls it a "eurytopic" species: he found it in all sorts of deciduous woodland, on heath and moors, in marshes and also on the coast.

Dolichopus argyrotarsis WAHLBERG, 1850

A rare species in Belgium (9 U.T.M.-squares) and The Netherlands (6 U.T.M.-squares). Probably a woodland species (cf. POLLET et al., in press b).

Dolichopus brevipennis MEIGEN, 1824

A rather common and well distributed species in Belgium and The Netherlands, commonest towards the north. It prefers open areas and is particularly abundant near open water.

Dolichopus cilifemoratus MACQUART, 1827
(= *pseudocilifemoratus* STACKELBERG, 1930)

A rare species in Belgium (6 U.T.M.-squares), not yet found in The Netherlands.

Dolichopus claviger STANNIUS, 1831

This species is common in the coastal regions of both Belgium and The Netherlands, but less so in the interior. According to EMEIS (1964) and POLLET &

GROOTAERT (1987), it is a typical woodland dweller, although it can be considered as a eurytopic woodland species especially in the northern parts of Belgium.

***Dolichopus longicornis* STANNIUS, 1831**

This common and well distributed species showed at Ottignies a short period of activity, from the beginning of June till the third decad of July (cr. Fig. 2d). Maximum activity was reached during the second half of June. As compared with a histogram of other captures from Belgium and The Netherlands, it appears that the activity period usually extends to the first week of August and that there is yet a smaller number of specimens to be found till the beginning of October. Generally, there is a peak of activity in the month of July, but apparently in some years the activity period is shifted backwards or forwards. For England D'ASSIS FONSECA (1978) gives vi-viii.

***Dolichopus plumipes* (SCOPOLI, 1763)**

A very low number of this species was caught at Ottignies, although it is found nearly everywhere in Belgium and The Netherlands. It is known as extremely eurytopic (EMEIS, 1964 ; POLLET et al., 1987b). Nevertheless, it seems to be most abundant in meadows and in the direct vicinity of open water.

***Dolichopus simplex* MEIGEN, 1824**

An eurytopic species, according to EMEIS (1964), more common in lowland habitats and therefore less common in Belgium than in The Netherlands. Its distribution is most probably closely related to the presence of peatbog areas, as it appeared to be strikingly abundant in such habitat types (POLLET et al., 1988 a).

***Dolichopus subpennatus* D'ASSIS FONSECA, 1976**

A not uncommon species in Belgium and The Netherlands, represented in Ottignies by 51 specimens. A single activity period is found from the end of May till the beginning of August, with a peak in the beginning of August (cf. Fig. 2f) ; 14.v and 6.ix are the extreme dates on which this species has been found in Belgium and in The Netherlands. As compared to males, females exhibited a remarkably low flying activity. Owing to its former confusion with *D. pennatus* MEIGEN, 1824, very little can be said with absolute certainty about the preferred biotopes of both species. According to our current knowledge, *D. pennatus* is most frequently encountered in woodland (POLLET & GROOTAERT, 1987) and meadow habitats, whereas *D. subpennatus* has most often be found near open water e.g. on river banks (POLLET et al., 1988 c). Nevertheless, both species can be found together at particular sites.

***Dolichopus trivialis* HALIDAY, 1832**

A rather common species in Belgium and The Netherlands, mainly occurring in canopied areas.

***Dolichopus unguatus* (LINNAEUS, 1758)**

A very common species, in fact the most common of the larger species of Dolichopodidae, only poorly represented in the sample taken at Ottignies. Like the major part of *Dolichopus* species, it appears to use its wings only rarely, but is usually observed sitting or running about on leaves, stones and the like. It is clearly an univoltine species with a peak in the second half of June. At Ottignies, the peak of activity is about a week earlier than is found in general (cf. Fig. 2c) ; this is most probably due to weather conditions.

***Dolichopus urbanus* MEIGEN, 1824**

Less common than the previous species. Its distribution area seems to be restricted to the central and southern parts of Belgium (POLLET et al., 1988 b). It is mainly found in marshy habitats, often near by humid woodlands.

***Hercostomus brevicornis* (STAEGER, 1842)**

A common species of deciduous and coniferous woodlands in Belgium (cf. POLLET et al., 1988 a). In the Netherlands, this species is common in the southern parts only and can be termed rather rare in the northern half of the country. Compared with the sibling *H. celer*, *H. brevicornis* is a more inland species, nearly lacking in coastal regions, whereas *H. celer* is much more common towards the coast. At Ottignies, only 26 specimens were captured, most of which were collected within a relatively short period (end of June till the beginning of August). At Schoten, flying activity started during the second week of July and activity extended till the third week of September (POLLET & DE BRUYN, 1987). Combined dates of 1149 specimens caught at different sites in Belgium and The Netherlands pointed out to a much longer activity period, with a peak about half July.

***Hercostomus cupreus* (FALLEN, 1823)**

Common and well distributed in Belgium and The Netherlands. This species seems to prefer woodlands, although it has often been found in moorland too. In humid deciduous woodland on loamy soil, it appeared to be one of the dominant species (POLLET et al., 1986 ; POLLET & GROOTAERT, 1987). *H. cupreus* can be considered as a true spring species with its main activity from the second half of May to the end of July. An activity peak is reached during June.

Hercostomus fulvicaudis (HALIDAY, 1851)

A very rare species, in Belgium only known from 1 female, 30.vii.1934, caught by A. COLLART near Oostakker (COLLART, 1935). However, this specimen might be wrongly identified, since differences between the females of this species and the closely related *H. praeceps* are not very distinct. In The Netherlands, two specimens were found: 1 male, 1.vii.1940, J.C.H. DE MEIJERE, Amsterdam-Noord (cf. MEUFFELS, 1978) and 1 male, 13.vii.1971, B. VAN AARTSEN, Lelystad (cf. MEUFFELS, 1974).

Hercostomus nanus (MACQUART, 1827)

An uncommon species in both Belgium and The Netherlands. It has been mainly found in marshy habitats near open water.

Hercostomus rusticus (MEIGEN, 1824)

Scarce in Belgium (9 U.T.M.-squares) and found in The Netherlands only in the south of the province of Limburg (3 U.T.M.-squares).

Hypophyllus obscurellus (FALLEN, 1823)

This species can be termed a stenotopic woodland species, occurring mainly on the soil surface. POLLET et al. (1986) proved that this dolichopodid fly preferred the most humid sites within a deciduous woodland area. It is not very common in Belgium, whereas it is rather scarce in The Netherlands.

Lamprochromus elegans (MEIGEN, 1830)

Very scarce in Belgium (6 U.T.M.-squares) and The Netherlands (7 U.T.M.-squares). It occurs most abundantly in marshland. Note that in fact the name *bifasciatus* (MACQUART, 1827) should be used.

Genus Medetera

Most species of this genus are tree trunkdwellers and only females are often found in Malaise traps (POLLET & GROOTAERT, 1987). This is either a reflection of the higher abundance of females - compared to males -, occurring in the field, or a more pronounced flying activity of the former sex. *Medetera dendrobaena* KOWARZ, 1877, *M. jacula* (FALLEN, 1823), *M. pallipes* (ZETTERSTEDT, 1843) and *M. truncorum* MEIGEN, 1824 are all common species. *M. muralis* MEIGEN, 1824 seems to be rare (5 and 4 U.T.M.-squares in Belgium and The Netherlands resp.), whereas *M. feminina* NEGROBOV, 1967 has been recorded only very recently as new to the Belgian fauna (GROOTAERT, et al., 1987).

Neurigona quadrifasciata (FABRICIUS, 1781)

A typical woodland species, found in particular on smooth-barked trees such as beeches (cf. EMEIS, 1964). Almost no females were caught in the Malaise trap at Ottignies. This points out that this sex has a behaviour different from that of the males, even more pronounced than is observed in *Sciapus platypterus*, which is otherwise a comparable species as concerns its preferred microhabitat. At Ottignies there was a short activity period from mid May till the second week of July (cf. Fig. 2a). Captures decreased remarkably fast during the second half of June.

Rhaphium appendiculatum ZETTERSTEDT, 1849

A species with a long activity period (from second half of April till the end of September), probably with several overlapping generations. This is chiefly a woodland species, not uncommon and widely distributed in Belgium and The Netherlands, but less so in the coastal regions.

Rhaphium caliginosum MEIGEN, 1824

This species seems to have two long periods of activity (from the end of April till the end of June and from the end of June till half September). It is rather common, chiefly found in wooded areas in Belgium and The Netherlands and occurs regularly along the coast too.

Rhaphium commune (MEIGEN, 1824)

A rather common species in Belgium, especially so in the central parts. In the Netherlands, it seems to be scarce, except in the south of the province of Limburg. It has been found in both deciduous and coniferous woodland and along river banks (POLLET et al., 1988 b). *R. commune* seems to have a long activity period from the middle of April till the beginning of October, showing a peak during June.

Rhaphium micans (MEIGEN, 1824)

A scarce species in Belgium (6 U.T.M.-squares) and The Netherlands (8 U.T.M.-squares).

Sciapus platypterus (FABRICIUS, 1805)

With a total of 600 species, *S. platypterus* is the dominant species caught at Ottignies. There is only one period of flying activity from the end of May to the beginning of August. Remarkable is the observed sex ratio: not more than 23% of all specimens collected were females. This is in full agreement with the findings of POLLET & GROOTAERT (1987), who found that males accounted for more than 65% of the total number of individuals found in a Malaise trap. In the

present study, at the beginning of the activity period, almost only males were caught. From the second half of June more females appeared, whereas at the end of the activity period, the females outnumbered the males, but then the total amount of specimens had become already small (cf. Fig. 2b). A histogram based on the known data of this species in the two countries (data collected at Ottignies not included) gives quite another impression. Here, the females make up the majority of the total amount (306 out of 519 specimens, i.e. 59%). Thus females were obviously more readily caught with the sweeping net than with a Malaise trap. *S. platypterus* is chiefly a species of deciduous woodland, loving canopy and is observed preferably sitting on the foliage and tree-trunks (cf. EMEIS, 1964). This species is rather common and well distributed all over Belgium and The Netherlands.

***Sciapus vialis* (RADDATZ, 1873)**

A rather uncommon species in both countries.

***Sympycnus pulicarius* (FALLEN, 1823)**

A very common species nearly everywhere in Belgium and The Netherlands, found in a wide range of different habitat types (EMEIS, 1984 ; POLLET et al., 1987b). From a comparison of two histograms (one based on the data from Ottignies, the other combining all data from Belgium and The Netherlands), it clearly appeared that this species shows two main periods of activity namely one from the beginning of May to about half July, the second from half July to mid October onwards (cf. Fig. 2j). At Ottignies, the first of the main generations was relatively small in numbers, perhaps due to the rather rainy weather during the months of May and June.

***Syntormon denticulatus* (ZETTERSTEDT, 1843)**

Generally considered as a rather rare species, as it was formerly known from only 4 localities in both Belgium and The Netherlands respectively. However, recent collections revealed several new localities for this species in Belgium (POLLET, unpubl. data). The capture of 33 specimens at Ottignies is remarkable, since POLLET & GROOTAERT (1987) showed that this species is predominantly soil-dwelling and generally found only in small numbers in Malaise traps. Captures are running from the end of June till the first half of November. D'ASSIS FONSECA (1978) even states i-xi. As a result, this species might hibernate at least partly in the adult stage.

***Syntormon (Drymonaeca) aulicus* (MEIGEN, 1824)**

A rare species (9 U.T.M.-squares in Belgium, not yet recorded from The Netherlands).

***Systemus bipartitus* (LOEW, 1850)**

As all *Systemus* species, this species is seldom met with. Moreover, most species of this genus are obtained by rearing. In Belgium, thus far it was known from 3 U.T.M.-squares (the capture at Ottignies not included). In The Netherlands it has only been recorded from Delden (MEUFFELS, 1978).

***Xanthochlorus tenellus* (WIEDEMANN, 1817)**

Not uncommon in both Belgium and The Netherlands. It is generally considered as a species of rather dry woodlands on a sandy soil, but seems not be confined to these habitats (cf. EMEIS, 1964).

3. - Sex ratios in the most abundant species

Figure 3 summarizes the proportions of males and females for the 10 most abundant species, all but one represented by more than 50 specimens. Table 2 gives the sex data. Amazingly high percentages of males were found in *Neurigona quadrifasciata* and *Sciapus platypterus*, whereas in *Chrysotimus molliculus* and *Chrysotus gramineus* females were distinctly dominant in our samples. The sexes of the remaining species were found in comparable numbers. Except for POLLET & GROOTAERT (1987) and POLLET & DE BRUYN (1987), no literature data dealt with these phenomena. As mentioned before, *S. platypterus* behaved similarly in a woodland habitat (POLLET & GROOTAERT, 1987). Moreover, males of *C. molliculus* and *C. gramineus* were also found in rather small proportions in a garden habitat at Schoten (39.51% and 30.96% resp., cf. POLLET & DE BRUYN, 1987). However, the capture rate of both sexes by Malaise traps does not necessarily imply the same ratio occurring in the field. Moreover, a higher proportion of the one sex caught by Malaise traps might suggest a more pronounced flying activity, although other factors must also be taken into consideration. For example, the high numbers of males of *S. platypterus* are most likely not only due to a more frequent flying behaviour. Most probably the habit of climbing up vertical surfaces is also related to it. As was proved by POLLET & GROOTAERT (1987), females of *S. platypterus* were relatively more numerous in blue water traps in the woodland site investigated. Nevertheless, only overall ratios can be compared (e.g. Malaise traps versus water traps) and attempts in estimating the relative abundances of the two sexes as well as the densities of the different species cannot be made on the basis of these sampling techniques only. As a result,

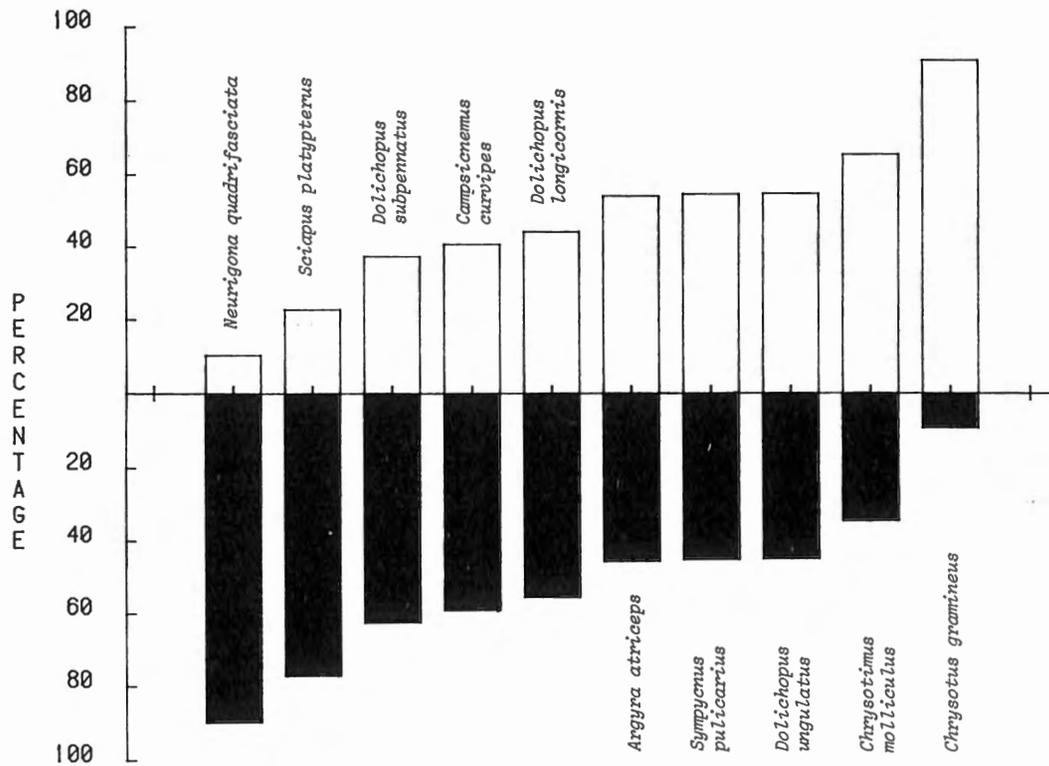


Figure 3. Sex ratio in the most abundant dolichopodid species (n > 50), collected by means of a Malaise trap (black columns : males, white columns : females) ; 1 : *Neurigona quadrifasciata*, 2 : *Sciapus platypterus*, 3 : *Dolichopus subpennatus*, 4 : *Campsicnemus curvipes*, 5 : *Dolichopus longicornis*, 6 : *Argyra atriceps*, 7 : *Sympycnus pulicarius*, 8 : *Dolichopus unguulatus*, 9 : *Chrysotimus molliculus*, 10 : *Chrysotus gramineus*.

according to our knowledge, only emergence traps seem to be appropriate for this purpose. Nevertheless, Malaise traps, water traps and pitfall traps have already proved their usefulness in establishing whether discrepancies in ratios do occur. However, we are still far from explaining every single phenomenon observed.

4. - Conclusive remarks

A comparison of the species lists of dolichopodid flies collected in the garden habitats at Schoten and Ottignies revealed that these sites had 21 species in common, six out of which were caught in relatively high to very high

numbers. A number of these are known as predominant woodland species (*Campsicnemus curvipes*, *C. scambus*, *Hercostomus brevicornis*, *H. cupreus*, *Rhaphium appendiculatum*, *Sciapus platypterus*), whereas others

Table 2 : Proportions of males and females in the most abundant species from Malaise trap samples at Ottignies (n > 50), expressed as the percentage on the total number (n) of each species collected. Species are ranged according to a decreasing proportion of the male sex.

	males (%)	females (%)	n
<i>Neurigona quadrifasciata</i>	89.80	10.20	49
<i>Sciapus platypterus</i>	77.33	22.67	600
<i>Dolichopus subpennatus</i>	62.75	37.25	51
<i>Campsicnemus curvipes</i>	59.30	40.70	86
<i>Dolichopus longicornis</i>	55.70	44.30	79
<i>Argyra atriceps</i>	45.71	54.29	105
<i>Sympycnus pulicarius</i>	45.25	54.75	484
<i>Dolichopus unguulatus</i>	45.05	54.95	91
<i>Chrysotimus molliculus</i>	34.39	65.61	221
<i>Chrysotus gramineus</i>	9.17	90.83	109

are mostly found in well-lit canopied areas (*Chrysotimus molliculus*, *Dolichopus longicornis*, *Medetera dendrobaena*, *M. jacula*, *M. pallipes*, *M. truncorum*). The remaining species can be termed eurytopic (*Chrysotus gramineus*, *C. neglectus*, *Dolichopus brevipennis*, *D. plumipes*, *D. simplex*, *D. unguatus*, *Sympycnus pulicarius*). Besides the previously mentioned rather common species, each site showed some species of special faunistic interest. At Schoten, we found two species characteristic for open humid places on sandy soil (*Chrysotus pulchellus*, *Diaphorus nigricans*). Most of the faunistic interesting species collected at Ottignies are known to occur mainly in humid eutrophic situations near open water. As a result, they most probably originate from the river-banks of the adjacent river Dijle. For others such as *Medetera muralis*, *M.*

feminina and *Systemus bipartitus*, ecological requirements are still completely unknown. Thus it may be concluded that the dolichopodid fauna composition of garden habitats is strongly affected by the character of the neighbouring habitats. However, this does not imply that conditions in the garden itself are suboptimal for all species found. Only by means of a further inquiry of similar "ordinary" sites, we will be able to find out whether gardens have their own specific dolichopodid fauna.

Acknowledgments

Many thanks are due to Ir. P. DESSART for taking the samples and to Ir. C. FASSOTTE for her help with sorting out the samples.

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