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Dolichopodid Flies at De Mandelhoek Nature Reserve (Belgium): an example of the importance of small Nature Reserves to Invertebrates

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Summary

During two successive years, extensive inventories on Dolichopodidae (Diptera) were carried out in a small nature reserve (6.5 ha), De Mandelhoek (Ingelmunster, Belgium), using Malaise and water traps, net sweeping, and hand catching. These sampling campaigns revealed not only a very rich dolichopodid fauna (80 species) but also a surprisingly high number of rare species, for some of which large populations could be established. Medetera pseudoapicalis THUNBERG is newly reported for Belgium and two species new to science were also detected.

For the following species, the ecology and distribution in Belgium are discussed in detail: Achalcus cinereus (HALIDAY), A. flavicollis (MEIGEN), Campsicnemus lunibatus LOEW, Dolichopus excisus LOEW, D. signifer HALIDAY, Hercostomus fulvicaudis (HALIDAY), H. silvestris POLLET, Medetera feminina NEGROBOV, M. inspissata COLLIN, M. jugalis COLLIN, M. pseudoapicalis, Sciapus laetus (MEIGEN), Teuchophorus simplex MIK and Thrypticus bellus LOEW. In the frame of nature conservation, despite its small area De Mandelhoek Nature Reserve can be considered as extremely valuable.

Introduction

In western Europe, natural landscape covers only a very small part of the entire area. Also in Belgium, large scale nature reserves are very scarce and the majority comprises small areas of a few hectares. Nevertheless, it is generally thought that vast nature reserves are more valuable than small ones. Indeed, this holds true for large animals such as mammals and birds but has not yet been proven for most invertebrate taxa. Since the latter group contains many taxa which seem very suitable for bio-indicator purposes, they are of growing interest to nature conservancy councils.

Dolichopodidae or long-legged flies are mostly shining metallic green with a somewhat bilaterally compressed body, long legs, characteristic antennae and protruding mouthparts. In many species, males show conspicuous ornaments on legs and/or antennae. Apart from the larvae of *Thrypticus*, most adults as well as larvae are generally considered to be predatory. Dolichopodidae are truly hygrophilous insects. They can often be encountered in very large numbers and in many species at humid sites such as water-meadow forests, peatbog areas, fenlands, reedmarshes, saltmarshes and banks of running and stagnant water bodies. Moreover, many species seem to be confined to specific (micro)habitats. This might be partly due to the fact that they live close to the soil surface and do not fly frequently nor for long distances. In this respect, Dolichopodidae can be considered as potentially important bio-indicators. However, in order to use them as such in the near future, there is still much information to be gathered about their ecology and biology. Therefore, the first author started a methodological study in the middle 80s. From this thorough sampling campaign using different collecting devices (POLLET & GROOTAERT, 1987), it was concluded that Malaise traps and white water traps at soil surface level were the most effective for capturing these flies. Consequently, mainly these two trap types were used during the course of the subsequent large scale survey. The major aim was to get a reliable idea of the fauna composition of most of the habitat types present in our country. Standardization of the sampling was necessary in order to allow comparisons between sites. From the preliminary results of this study (POLLET *et al.*, 1987), common and rarer species could be easily distinguished. In the further discussion of the so-called faunistically interesting species, these were selected on the basis of their occurrence in Belgium and West Flanders in particular.

Study site

A typical example of a small nature reserve in Belgium is De Mandelhoek at Ingelmunster. This is situated in the southern part of the province of West Flanders (Fig. 1). Two centuries ago, the area was known to be marshy grassland regularly flooded by the De Mandel river which borders one side of the area. Later on, a canal was created at the other side, giving the reserve its elongated shape. Due to the broadening and the straightening of the adjacent canal during the early 70s, most of the area was used as a sludge dump and thus heavily disturbed. Fortunately, some habitats were kept free of destruction thanks to their very high soil humidity. Nowadays, De Mandelhoek Nature Reserve is about 6.5 hectares and characterized by its great diversity of different habitat types. They range from willow carrs over different kinds of meadows, reedmarshes and wasteland sites to small and relatively large mostly mesotrophic and eutrophic ponds. The adjacent Mandel river is, unfortunately, heavily polluted. The sampled sites are further described in detail.

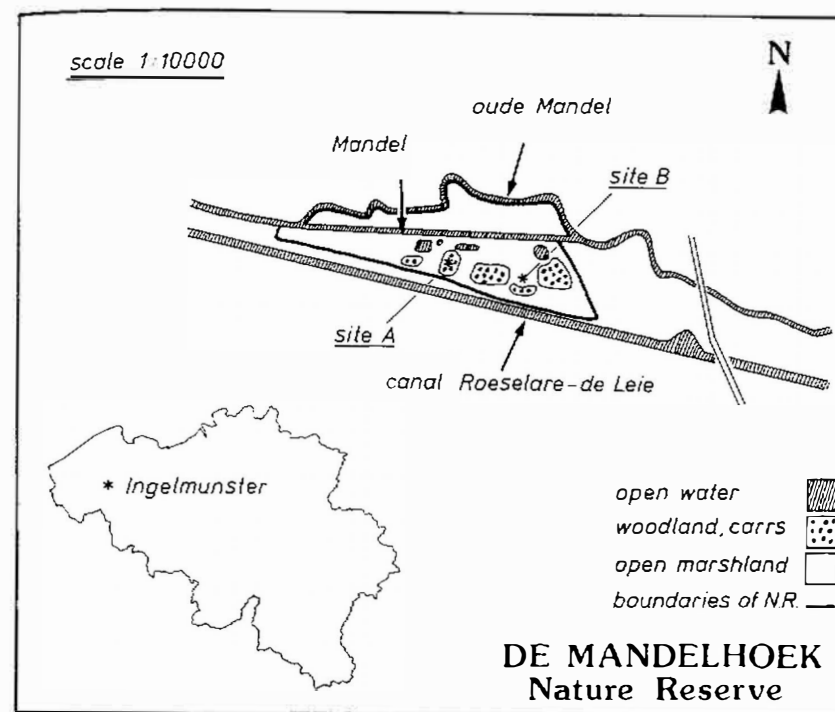


Fig. 1. Location of De Mandelhoek Nature Reserve in Belgium.

Material and methods

The entire sampling campaign consisted of two year cycles during which two different habitat types were investigated:

(I) during 1987, a willow carr (site A, Fig. 1) was sampled. This area was, at least partly, flooded during the entire year. It showed a very highly developed herb layer, which consisted of *Glyceria maxima*, *Lycopus europaeus*, *Stachys palustris*, *Iris pseudacorus* and *Carex pseudocyperus*. *Alisma plantago-aquatica* and *Rumex hydrolapathum* were only abundant in the most humid spots. The drier borders of this willow carr were almost entirely covered by *Urtica dioica*. Light intensity in most of this site was very low, although a small central part was well-lit. Neighbouring habitats were a shortgrazed meadow and a reedmarsh.

A Malaise trap, 2 white and 2 blue water traps were installed during the period 5.IV-13.XII.1987. On 11.VII.1987, 2 red water traps were added for the rest of the sampling period. The Malaise trap was situated in the edge of the willow carr, the side with the collecting jar directed towards the centre of the carr. All water traps (inner diameter \pm 20 cm, depth

± 7 cm) were placed on the soil surface. Since the sampled area showed a humidity-gradient, the traps were rotated during each collection.

(II) during 1988, a meadow habitat (site B, Fig. 1) was studied. This site is situated at about two meters above the surrounding area. *Phragmites australis* and *Scirpus sylvaticus* were the dominant plant species, although a large number of less abundant herbs was also present: *Angelica sylvestris*, *Chrysanthemum leucanthemum*, *Cirsium arvense*, *C. palustre*, *C. vulgare*, *Dipsacus sylvestris*, *Filipendula ulmaria*, *Galium palustre*, *Hypericum maculatum*, *Iris pseudacorus*, *Lathyrus pratensis*, *Linaria vulgaris*, *Lotus uliginosus*, *Lychnis flos-cuculi*, *Medicago lupulina*, *Phalaris arundinacea*, *Ranunculus acris*, *Stachys palustris*, *Symphytum officinale*, *Tanacetum vulgare*, *Trifolium campestre*, *Vicia cracca* and *V. sativa*. This site was bordered by a moderately humid willow woodland with a herb-layer of *Geranium robertianum*, a reedmarsh and some small pools.

A Malaise trap and 6 white water traps were used for sampling this habitat. The Malaise trap was installed close to the woodland edge, the side with the collecting jar directed towards the investigated meadow. The water traps were divided into two groups of three trap units: one group was put upon the soil surface, whereas the other was installed on wooden supports with their upper rim at about 60 cm height. Traps of both groups were placed in a straight line at 10 m intervals. All traps were in operation during the period 9.IV.-22.X.1988.

The collecting jars of the Malaise traps were half filled with a 70% alcohol solution, whereas a 2.5% formalin solution (+ detergent) was used as fixative in the water traps. Except for the early spring and late autumn periods, all traps were emptied at weekly intervals.

Besides these collecting devices, some supplementary water traps and hand catching yielded additional data on dolichopodids beyond the main sites investigated during 1987-1988. These data are also included in the further discussion.

Dolichopodid flies were sorted in the laboratory and examined under a WILD M5 binocular microscope. Identification was performed by means of keys by PARENT (1938), NEGROBOV & STACKELBERG (1972, 1974a,b, 1977), D'ASSIS FONSECA (1978), POLLET (1990a) and some unpublished keys by the second author. The specimens are preserved in part in the Museum of the Royal Belgian Institute of Natural Sciences (Brussels) and in part in the private collection of the first author.

In Results, the rarer species are discussed in relation to records obtained outside the reserve. These comparative records involve other collecting methods used in present investigations. In the lists of capture places per species, sampling methods are abbreviated as follows: HC: hand catching, SW: sweep netting, MT: Malaise trap, WT: water trap and PT: pitfall trap. Nature reserves, Water Reservoirs, Provincial and Military Domains are indicated as NR, WR, PD and MD respectively.

Results

Table 1 lists the dolichopodid species, collected during 1987-1988 by Malaise traps, water traps, hand catching and net sweeping. Nomenclature is according to MEUFFELS & GROOTAERT (1987). During the two sampling campaigns 10659 specimens, belonging to at least 74 species, were collected by Malaise and water traps. Net sweeping and hand catching together with additional water trapping in diverse sites of the nature reserve yielded another 7 species and as a result, a total of at least 81 species was obtained. The exact species number could not be determined since some females of *Medetera* and *Teuchophorus* species as well as both sexes of the *Chrysotus gramineus* group could not be identified to species level. In fact, several authors assume that *C. microcerus* KOWARZ, 1874, *C. gramineus* (FALLÉN, 1823) and *C. varians* KOWARZ, 1874 constitute only one true species (NEGROBOV, 1991; COLE, pers. comm.). Furthermore, the key for *Teuchophorus* females by D'ASSIS FONSECA (1978) is not very reliable; only *T. spinigerellus* (ZETTERSTEDT, 1843) can unequivocally be distinguished from the others by its brilliant blue frons (green in the other species).

Besides a large number of eurytopic species, some true woodland species such as many *Hercostomus* and *Dolichopus* species appeared to reach high abundances in the reserve. Further, *Argyra atriceps* LOEW, 1857, *A. grata* LOEW, 1857, *Dolichopus urbanus* MEIGEN, 1824 and *Teuchophorus simplex* MIK, 1880 can be termed true inland species with a main distribution in the central and southern parts of Belgium. For these species, thus far De Mandelhoek Nature Reserve is the most northwestern limit of their distribution area established in our country.

In this contribution, we only consider the species of special faunistic interest. In this respect, 14 species which are regarded as rare, are discussed in detail. Table 2 gives the numbers of these species, collected per trap type. For each species, all Belgian distribution data, collected until 1990, are listed and its ecology is discussed. In another paper (POLLET, in prep.), the ecological aspects of the captured species (colour preference, macro- and micro-habitat preference, phenology) will be presented. In the case of the *Achalcus* species, distribution data are not included here as a revision of this genus is currently under consideration by the first author.

Achalcus cinereus (HALIDAY, 1851)

Thus far, this species has been collected at 18 localities in Belgium. It does not seem to have a very specific habitat preference: although it is mainly found in humid woodlands and marshlands, it also occurs in dunes and meadows. In the investigated area, it showed, however, a distinct preference for the dark woodland site. Although its biology is still unknown, it seems to be a predominant winter species, showing its main activity from late autumn till early spring. Nevertheless, it was collected during almost the entire sampling period except for the summer months (July-August). In this respect, a freshly emerged specimen was observed at

the beginning of September, which implies that the larval development takes place during summer.

***Achalcus flavicollis* (MEIGEN, 1824)**

Also known from 14 localities in Belgium. In contrast to the previous species, *A. flavicollis* obviously prefers more open habitats such as meadows, reedmarshes and other marshland types, borders of woodlands and river banks (see Table 2). Moreover, this species is mainly active during summer with an activity peak at the beginning of July.

***Campicnemus lumbatus* LOEW, 1857**

C. lumbatus is one of the smaller species of this genus in Europe. Some time ago, it was considered as very rare both in Belgium and The Netherlands. In 1985, however, VAN DER VELDE *et al.* (1985) reported that it proved to be one of the dominant dolichopodid species on the floating leaves of Nymphaeid plants in freshwater aquatic systems in The Netherlands. Since then, *C. lumbatus* has been found at a rather large number of sites particularly in Belgium. Thus far, it is known from marshland, woodland (POLLET & GROOTAERT, 1987), cattlepools amid heathland (POLLET, 1991) and on riverbanks (POLLET *et al.*, 1988). Although it has never been collected in large numbers, it seems to prefer marshland bordering rather small to large mesotrophic or eutrophic ponds. In De Mandelhoek Nature Reserve, 15 specimens were collected exclusively in the willow carr and an adjacent very humid poplar stand, both habitats showing a muddy soil.

***Dolichopus excisus* LOEW, 1859**

WEST FLANDERS: 2♀♀, 31.VII-14.VIII.1982, PT; 1♀, 14-28.VIII.1982; 2♂♂, 2♀♀, 28.VII.1982, SW; 1♀, 3.VII.1983, SW, Damme, De Oude Stadswallen NR (leg. K. DECLER); 1♀, 6-13.VIII.1988, Harelbeke, De Gavers NR, WT (leg. M. POLLET & I. BAPTISTE); 1♂, Hoeke (pond), 05.VII.1982, SW (leg. C. VERBEKE); 1♂, 21-29.V.1988; 1♂, 29.V-5.VI.1988; 1♀, 5-19.VI.1988; 1♀, 19.VI-2.VII.1988; 3♀♀, 7-13.VIII.1988; 1♂, 2♀♀, 13-21.VIII.1988; 3♂♂, 2♀♀, 21-27.VII-1.1988; 1♂, 27.VIII-10.IX.1988, Ingelmunster, De Mandelhoek NR, WT + MT (leg. M. POLLET & L. DE COOMAN); EAST FLANDERS: 1♂, 1♀, 14.V-25.VII.1988, WT; 1♀, 16.VIII.1989, SW, St. Laureins, De Vrouwenshoekkreek NR (leg. M. POLLET); 1♀, St. Jan-in-Eremo, De Oostpolderkreek NR, 14.V-25.VII.1988; 1♂, 1♀, De Meykenshoekkreek, 22.VI-24.V.1990; 1♂, 1♀, De Roeselarekreek NR, 24.V-16.VI.1990, all with WT (leg. M. POLLET); ANTWERPEN: 1♂, Bornem, 18.VI.1939 (coll. KBIN); 1♀, Ekeren, De Oude Landen NR, 27.VI-3.VII.1988, MT (leg. L. DE BRUYN); BRABANT: Woluwé (PARENT, 1924).

This rare species has thus far been recorded from 11 different sites in Belgium. It can be considered a stenotopic species, mainly occurring in reedmarshes, meadows and other marshlands (see also Table 2). Contrary to its closely related congeners, *D. latilimbatus* MACQUART, 1827 and *D.*

nubilus MEIGEN, 1824, *D. excisus* might be univoltine with a long activity period from June till September.

***Dolichopus signifer* HALIDAY, 1831**

WEST FLANDERS: 1♂, De Panne, 1-12.IX.1931 (leg. M. GOETGHEBUER); 1♀, Ingelmunster, De Mandelhoek NR, 10.V.1987, SW (leg. M. POLLET); 1♂, Woumen, De Blankaart NR, 23.VIII.1985, SW (leg. K. DECLER).

There are only three capture sites known for this species, all situated in West Flanders. Although very little literature data are known about this species, it is most probably a marshland species (STARK, pers. comm.).

***Hercostomus fulvicaudis* (HALIDAY, 1851)**

WEST FLANDERS: 1♂, 7-14.VI.1987; 2♂♂, 2♀♀, 28.VI-4.VII.1987; 2♀♀, 4-11.VII.1987; 3♀♀, 11-18.VII.1987; 5♂♂, 3♀♀, 18-25.VII.1987; 2♀♀, 25.VII-2.VIII.1987; 1♀, 2-9.VIII.1987; 1♂, 9-16.VIII.1987; 1♀, 18-27.VI.1988; 1♂, 4♀♀, 27.VI-2.VII.1988; 2♂♂, 14♀♀, 2-11.VII.1988; 2♀♀, 11-16.VII.1988; 4♀♀, 16-23.VII.1988; 2♀♀, 23-29.VII.1988; 1♀, 29.VII-7.VIII.1988, MT + WT; 2♂♂, 11.VII.1987, SW, Ingelmunster, De Mandelhoek NR (leg. M. POLLET & L. DE COOMAN); EAST FLANDERS: ? 1♀, Oostakker, 30.VII.1934 (leg. A. COLLART) (see COLLART, 1935); ? "Bas-Escaut, bois" (GOETGHEBUER, 1930); HAINAUT: 1♀, Dergneau (poplar woodland), 9.VI-10.VII.1989, PT (leg. K. DESENDER); BRABANT: 1♂, Ottignies (garden), 4-11.VII.1981, MT (leg. P. DESSART) (see MEUFFELS *et al.*, 1989).

This species has only been recorded with absolute certainty from 3 localities in Belgium since the records from Oostakker and the Bas-Escaut region could not be checked by us. In this regard, the latter records are not considered to be valid as females of *H. fulvicaudis* and the closely related *H. praeceps* LOEW, 1869 are very difficult to distinguish. Contrary to its global rarity, during our two sampling campaigns in De Mandelhoek Nature Reserve, 12 males and 42 females were collected. This makes the area of particular interest since it contains the largest population of this species in Belgium discovered thus far. This species is typical for humid wooded areas but occurs both in well-lit and dark woodland types (see Table 2). *H. fulvicaudis* appears to be univoltine with its activity peak during July. It is also noteworthy that females are considerably more active than males.

***Hercostomus silvestris* POLLET, 1990**

Distribution in Belgium (see POLLET, 1990a,b).

Additional data: EAST FLANDERS: 1♀, 16.VII.1989, SW; 2♂♂, 1♀, 16.VII-16.VIII.1989, WT; 1♀, 16.VIII-16.IX.1989, WT, Eeklo, Het Leen PD (leg. M. POLLET); 6♀♀, St. Laureins, De Vrouwenshoekkreek, 16.VI-15.VII.1990, WT (leg. M. POLLET).

H. silvestris has only very recently been described, although it was present in several museum collections. However, it was nearly always over-

looked and identified as *H. assimilis* or *H. aerosus*. A thorough examination of all specimens of the so-called *H. assimilis* revealed the presence of three separate species (POLLET, 1990a). In Belgium, *H. silvestris* was found very abundantly only at De Mandelhoek Nature Reserve and at Wijnendalebos (Ichtegem-Torhout). Thus far, this species has been discovered at 13 sites in Belgium. It is a stenotopic species of humid deciduous woodlands on loamy soils. In woodlands on sandy soils, it is always encountered in very small numbers. It has only one generation per year and exhibits its highest activity during June-July. For more information, see POLLET (1990a,b).

All but one of the four listed *Medetera* species are recorded as new to the Belgian fauna from 1987 onwards, but as most species of this genus are true tree trunk dwellers, they are mostly overlooked by insect collectors.

Medetera feminina NEGROBOV, 1967

WEST FLANDERS: 1♂, 3♀, Oostende, Maria Hendrika park, IV.1987 (bred from larvae) (leg. G. HAGHEBAERT) (see GROOTAERT *et al.*, 1987); 1♀, 17-24.V.1987; 1♂, 18-26.IX.1987, Veldegem (garden), MT (leg. M. POLLET & K. POLLET); 1♂, 1♀, Wingene, De Gulke Putten NR, 22.VI-6.VII.1987, MT (leg. K. DECLER);
BRABANT: 1♂, Ottignies (garden), 20-27.VI.1981, MT (leg. C. FASSOTTE) (see MEUFFELS *et al.*, 1989);
HAINAUT: 1♀, 7-14.VI.1986; 1♀, 14-21.VI.1986; 1♀, 28.VII-04.VIII.1986; 1♂, 27.IX-04.X.1986, Virelles, l'Etang de Virelles NR, MT (leg. N. MAGIS) (see GROOTAERT *et al.*, 1988);

Only 4 records of *M. feminina* could be added since its discovery in Belgium during 1987 (GROOTAERT *et al.*, 1987). It is mostly found in well-lit wooded areas such as gardens, wooded marshland and parks.

Medetera inspissata (COLLIN, 1952)

WEST FLANDERS: 1♂, 2-11.VII.1988; 1♂, 13-21.VIII.1988, Ingelmunster, De Mandelhoek NR, MT (leg. M. POLLET & L. DE COOMAN);
HAINAUT: 1♂, Virelles, l'Etang de Virelles NR, 14-21.VI.1986, MT (leg. N. MAGIS) (see GROOTAERT, *et al.*, 1988).

Apart from the captures in De Mandelhoek Nature Reserve, *M. inspissata* was previously only collected during a sampling campaign at Virelles (GROOTAERT *et al.*, 1988). Thus far, this species was only caught in wooded marshland habitats.

Medetera jugalis COLLIN, 1941

WEST FLANDERS: 1♂, Houthulst, Houthulstbos MD, 16.VIII-20.X.1988, WT (leg. M. POLLET); 1♂, 25.V-1.VI.1986; 2♂♂, 14-22.VI.1986; 1♂, 23-30.VIII.1986; 1♂, 24-31.V.1987; 1♂, 31.V-6.VI.1987; 1♂, 29.VIII-13.IX.1987; 1♂, 12-26.X.1987, Ichtegem-Torhout, Wijnendalebos (woodland), MT + WT (leg. M. POLLET); 1♂, Ingelmunster, De Mandelhoek NR, 02.VII.1988, HC (leg. M. POLLET); 1♂, 26.V-9.

VI.1987; 1♂, 15-28.X.1987, Oostduinkerke, Hannecartbos (woodland), MT (leg. M. POLLET); 1♀, 22-30.VIII.1987; 2♂♂, 5♀♀, 6-13.IX.1987; 1♀, 13-18.IX.1987, Veldegem (garden), MT (leg. M. POLLET & K. POLLET); 4♂♂, 5♀♀, Veldegem (orchard), 12.VI.1988, HC (leg. M. POLLET); 1♂, 8-22.VI.1986; 1♂, 6-13.VII.1986; 2♂♂, 6-13.VI.1987; 1♂, 11-18.VII.1987; 1♂, 1♀, 13-20.VII.1986, Raversijde, Prins Karel Domain, MT (leg. G. HAGHEBAERT) (see POLLET *et al.*, 1988);
EAST FLANDERS: 5♀♀, St. Laureins, De Vrouwkenshoekkreek NR, 25.VII.1988, HC (leg. M. POLLET);
HAINAUT: 1♂, 14-19.V.1986; 1♂, 19-25.V.1986; 1♂, 14-21.IX.1986; 1♂, 6-13.X.1986, Virelles, l'Etang de Virelles NR, MT (leg. N. MAGIS) (see GROOTAERT, *et al.*, 1988);
NAMUR: 1♂, Gembloux (orchard), 30.VIII.1988, SW (leg. C. FASSOTTE).

In 1986, *M. jugalis* was captured for the first time in our country (POLLET *et al.*, 1988), but since then it appeared to be rather common. This species probably prefers open marshlands and orchards, where it is often found on Poplar trees. As *M. feminina*, this species might be bivoltine.

Medetera pseudoapicalis THUNBERG, 1955

WEST FLANDERS: 1♂, Ichtegem-Torhout, Wijnendalebos (woodland), 17-24.V.1987, MT (leg. M. POLLET); 1♂, 26.IV-2.V.1987; 1♂, 16-23.IV.1988; 2♂♂, 30.IV-8.V.1988, Ingelmunster, De Mandelhoek NR, MT (leg. M. POLLET & L. DE COOMAN); 1♂, Wingene, De Gulke Putten NR, 27.IV-4.VI.1987, MT (leg. K. DECLER);
BRABANT: 1♂, St. Genesius-Rode, Zoniënwood, bred from larva found under bark of dead beech tree (leg. M. POLLET);
HAINAUT: 1♂, 4-11.V.1986; 2♂♂, 19-25.V.1986; 1♂, 1-8.VI.1986; 5♂♂, 8-14.VI.1986; 1♂, 14-21.VI.1986; 1♂, 14-21.VII.1986, Virelles, l'Etang de Virelles, MT (leg. N. MAGIS).

Thus far, *M. pseudoapicalis* has not been recorded formally as new to the Belgian fauna, although it is known from 5 different localities, mainly humid woodlands. This species seems to exhibit an activity peak during summer only.

Sciapus laetus (MEIGEN, 1838)

WEST FLANDERS: 2♀♀, Blankenberge, 8.VIII.1951 (leg. M. BEQUART) (see BEQUART, 1955); 1♀, Ingelmunster, De Mandelhoek NR, 23-29.VII.1988, WT (leg. M. POLLET & L. DE COOMAN); 1♀, Knokke-aan-zee, 6.VIII.1950 (leg. M. BEQUART) (see BEQUART, 1955); 1♂, Nieuwpoort, Brandaris MD, 22.VII-5.VIII.1989 (leg. G. HAGHEBAERT *et al.*); 2♀♀, 7-21.VII.1987; 1♀, 18-30.VIII.1987, Oostduinkerke, Hannecartbos (reedmarsh), PT (leg. J.-P. MAELFAIT *et al.*); 1♂, Zæbrugge, De Fonteintjes NR, 2.VIII.1982, SW (leg. C. VERBEKE); 2♂♂, 11♀♀, Zæbrugge, De Fonteintjes NR, 31.VII-14.VIII.1984, PT (leg. K. DECLER);
EAST FLANDERS: 1♀, St. Jan-in-Eremo, De Meykenshoekkreek, 11.VIII-16.IX.1990, WT (leg. M. POLLET);
ANTWERPEN: 1♀, Ekeren, De Oude Landen NR, 11-17.VII.1988, MT (leg. L. DE BRUYN).

Out of the 9 capture sites of *Sciapus laetus*, five are situated within the coastal dunes. Although this seems to be the typical habitat for this spe-

cies, it is known from inland sites too such as the Ardennes (Belgium) and Pyrénées (France) (PARENT, 1938). In its preferred habitats, it occurs on the sandy soil surface or in the low vegetation at rather moist places. This is in sharp contrast to most of its congeners, which are confined to tree trunks or occur mainly on foliage. *S. laetus* is clearly univoltine with an activity peak during July-August.

Teuchophorus simplex Mlk, 1880

WEST FLANDERS: 1♂, 30.VIII-6.IX.1987; 1♂, 13-20.IX.1987, Ingelmunster, De Mandelhoeck NR, WT (leg. M. POLLET & L. DE COOMAN); 1♂, Tiegem, Nederbeekbos (woodland), 17.VIII.1989, SW (leg. M. POLLET); 2♂♂, 11.VII.1989; 1♂, 16.VIII.1989, Wortegem, Bouvelobos (woodland), SW (leg. M. POLLET);
BRABANT: 2♂♂, 1♀, Hoeilaart, Zoniënwood (woodland), 12.VIII.1987, SW (leg. H. SPERS);
NAMUR: 1♂, Houyet, 14.VII.1937 (leg. A. COLLART).

In contrast to the other and more common species of this genus, *Teuchophorus simplex* is only known from 5 localities in Belgium. It apparently prefers cool and very humid deciduous woodlands, where it can be encountered near open water, sometimes together with *T. calcaratus*. This species is mainly active during late summer (August).

Thrypticus bellus Lœw, 1869

WEST FLANDERS: 1♂, De Panne, 11.IX.1930 (leg. M. GOETGHEBUER); 1♂, 8-15.VI.1960; 1♂, 13.VI.1960, De Panne (leg. M. BEQUART); 1♂, Ettelgem (pond), 23.VIII.1983, SW (leg. C. VERBEKE); 1♀, Ingelmunster, De Mandelhoeck NR, 29.V-5.VI.1988, MT (leg. M. POLLET & L. DE COOMAN); 1♀, Wevelgem, De Keuntjes NR, 3.VII.1984, SW (leg. M. POLLET); 1♀, Woumen, De Blankaart WR, 7-11.VIII.1986, MT (leg. B. GODDERIS); 1♂, Zandvoorde, De Zoutekreek (creek), 18-25.VI.1988, MT (leg. G. HAGHEBAERT);
EAST FLANDERS: 1♀, Melle, 9.VI.1938 (leg. M. BEQUART); 1♂, 2♀♀, St. Jan-in-Eremo, 24.VIII.1936 (leg. M. GOETGHEBUER); 2♂♂, 2♀♀, St. Jan-in-Eremo, 6.VIII.1960 (leg. M. BEQUART); ? "Bas-Escaut, marais et étangs" (GOETGHEBUER, 1930);
LIMBURG: 1♀, Zonhoven, De Slangebeekbronnen NR, 16.VIII.1987, SW (leg. M. POLLET);
LUXEMBOURG: 1♀, Ethe-Buzenol, 30.VI-4.VII.1980, MT (leg. P. GROOTAERT).

All members of the genus *Thrypticus* are believed to have plant-mining larvae, which is unique within the European Dolichopodidae. Adults are not frequently collected and always in very small numbers. This might be due to the fact that they mainly live within the vegetation. Although *Thrypticus bellus* seems to be the most common species of this genus in our country, not more than 12 records could be checked, referring to 10 different locations. All of these specimens were collected either by Malaise traps or sweepnet collections. This species obviously demonstrates a preference for humid situations such as reedmarshes and the borders of ponds. It has been caught from the beginning of June till mid September.

Conclusion

Undoubtedly, despite its rather small area De Mandelhoeck Nature Reserve can be considered as very valuable for nature conservation when considering its dolichopodid fauna. This conclusion will most probably also be drawn from the results of other invertebrate investigations. Besides the very large species richness of the area, a surprisingly high number of rare species was encountered, some of which are hitherto known only from very few sites in Belgium. Moreover, the populations of *H. chalybeus* (WIEDEMANN, 1817), *H. fulvicaudis* and *H. silvestris* found in the reserve were the largest thus far established in our country. Furthermore, its fauna also contains some southern species, which distribution areas reach here their northern limits in Belgium (*Argyra atriceps*, *A. grata*, *Nodicornis nodicornis* and *Dolichopus urbanus*). These species are found most abundantly in the central and southern parts of Belgium (see POLLET *et al.*, 1988).

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Table 1. List of all dolichopodid flies collected with Malaise traps and water traps in De Mandelhoek Nature Reserve (Ingelmunster, Belgium) during 1987-1988 (♂♂/♀♀). Records from net sweeping, hand catching or additional water traps are indicated by "+".

Dolichopodid species	Total 1987	Total 1988
Achalus cinereus (HALIDAY, 1851)	11/25	/1
Achalus flavicollis (MEIGEN, 1824)	1/1	8/4
Anepsomyia flaviventris (MEIGEN, 1824)	-	/1
Argyra atriceps LOEW, 1857	1/	2/
Argyra grata LOEW, 1857	+	6/10
Argyra leucocephala (MEIGEN, 1824)	5/2	5/22
Argyra perplexa BECKER, 1918	-	/8
Bathycranium bicolorellum (ZETTERSTEDT, 1843)	6/7	-
Campsicnemus curvipes (FALLÉN, 1823)	1786/1081	52/43
Campsicnemus lumbatus LOEW, 1857	2/3	+
Campsicnemus picticornis (ZETTERSTEDT, 1843)	104/49	2/4
Campsicnemus scambus (FALLÉN, 1823)	650/253	/4
Chrysotimus molliculus (FALLÉN, 1823)	7/3	12/41
Chrysotus cilipes MEIGEN, 1824	-	/5
Chrysotus gramineus (FALLÉN, 1823)	4/	500/
Chrysotus neglectus (WIEDEMANN, 1817)	9/12	36/68
Chrysotus suavis LOEW, 1857	+	/1
Chrysotus varians KOWARZ, 1874	+	195/
Chrysotus sp. (females)	/38	/622
Dolichopus brevipennis MEIGEN, 1824	18/7	8/5
Dolichopus claviger STANNIUS, 1831	8/4	33/52
Dolichopus excisus LOEW, 1859	-	7/7
Dolichopus griseipennis STANNIUS, 1831	-	1/2
Dolichopus latilimbatus MACQUART, 1827	76/36	4/4
Dolichopus longicornis STANNIUS, 1831	2/3	8/8
Dolichopus nubilus MEIGEN, 1824	10/12	1/4
Dolichopus pennatus MEIGEN, 1824	93/64	21/67
Dolichopus plumipes (SCOPOLI, 1763)	128/42	122/87
Dolichopus popularis WIEDEMANN, 1817	151/23	39/74
Dolichopus signifer HALIDAY, 1831	+	-
Dolichopus subpennatus D'ASSIS FONSECA, 1976	4/2	3/
Dolichopus trivialis HALIDAY, 1832	-	1/5
Dolichopus ungulatus (LINNAEUS, 1758)	157/28	102/81
Dolichopus urbanus MEIGEN, 1824	1/	-
Hercostomus celer (MEIGEN, 1824)	-	/1
Hercostomus chalybeus (WIEDEMANN, 1817)	419/441	26/44
Hercostomus chrysozygos (WIEDEMANN, 1817)	8/25	49/93
Hercostomus cupreus (FALLÉN, 1823)	76/8	2/3
Hercostomus fulvicaudis (HALIDAY, 1851)	9/14	3/28
Hercostomus metallicus (STANNIUS, 1831)	70/54	4/9

Table 1 (cont.)

Dolichopodid species	Total 1987	Total 1988
<i>Hercostomus nanus</i> (MACQUART, 1827)	11/16	35/45
<i>Hercostomus plagiatus</i> (LOEW, 1857)	74/10	16/19
<i>Hercostomus silvestris</i> POLLET, 1990	141/251	47/71
<i>Medetera abstrusa</i> THUNBERG, 1955	3/	31/
<i>Medetera dendrobaena</i> KOWARZ, 1877	+	+
<i>Medetera diadema</i> (LINNAEUS, 1776)	-	+
<i>Medetera feminina</i> NEGROBOV, 1967	-	1/1
<i>Medetera flavipes</i> MEIGEN, 1824	+	-
<i>Medetera impigra</i> COLLIN, 1941	-	1/
<i>Medetera inspissata</i> (COLLIN, 1952)	-	2/
<i>Medetera jacula</i> (FALLÉN, 1823)	+	-
<i>Medetera jugalis</i> COLLIN, 1941	-	1/
<i>Medetera micacea</i> LOEW, 1857	1/	-
<i>Medetera pallipes</i> (ZETTERSTEDT, 1843)	-	8/28
<i>Medetera pseudoapicalis</i> THUNBERG, 1955	1/	3/
<i>Medetera saxatilis</i> COLLIN, 1941	-	1/2
<i>Medetera truncorum</i> MEIGEN, 1824	+	2/1
<i>Medetera</i> n.sp.	-	1/
<i>Medetera</i> sp. (females)	1/19	1/80
<i>Micromorphus albipes</i> (ZETTERSTEDT, 1845)	-	+
<i>Neurigona quadrifasciata</i> (FABRICIUS, 1781)	-	1/2
<i>Nodicornis nodicornis</i> (MEIGEN, 1824)	+	-
<i>Poecilobothrus nobilitatus</i> (LINNAEUS, 1767)	-	1/2
<i>Rhaphium appendiculatum</i> ZETTERSTEDT, 1849	-	6/2
<i>Rhaphium caliginosum</i> MEIGEN, 1824	9/3	85/60
<i>Rhaphium crassipes</i> (MEIGEN, 1824)	3/2	2/2
<i>Rhaphium fasciatum</i> MEIGEN, 1824	-	1/
<i>Rhaphium fascipes</i> (MEIGEN, 1824)	-	1/1
<i>Rhaphium laticorne</i> (FALLÉN, 1823)	+	1/1
<i>Sciapus laetus</i> (MEIGEN, 1838)	-	1/1
<i>Sciapus platypterus</i> (FABRICIUS, 1805)	-	2/
<i>Sciapus wiedemanni</i> (FALLÉN, 1823)	-	4/6
<i>Sympycnus pulicarius</i> (FALLÉN, 1823)	7/23	131/134
<i>Syntormon denticulatus</i> (ZETTERSTEDT, 1843)	5/6	1/1
<i>Syntormon pallipes</i> (FABRICIUS, 1794)	1/2	1/6
<i>Syntormon pumilus</i> (MEIGEN, 1824)	1/1	2/
<i>Teuchophorus calcaratus</i> (MACQUART, 1828)	42/38	10/78
<i>Teuchophorus monacanthus</i> LOEW, 1859	+	1/
<i>Teuchophorus simplex</i> Mx, 1880	2/	-
<i>Teuchophorus spinigerellus</i> (ZETTERSTEDT, 1843)	7/21	1/3
<i>Teuchophorus</i> sp. (females)	1/1	-
<i>Thrypticus bellus</i> LOEW, 1869	-	1/1
<i>Xanthochlorus ornatus</i> (HALIDAY, 1832)	+	1/12
<i>Xanthochlorus tenellus</i> (WIEDEMANN, 1817)	1/6	1/3

Table 2. Rare species collected in De Mandelhoek Nature Reserve during 1987-1988.

Numbers indicated per trap type and sampling campaign: WT: water traps, MT: Malaise traps, SW: net sweeping, HC: hand catching; ♂♂/♀♀.

Species	WT 1987	MT 1987	SW 1987	WT 1988	MT 1988	HC 1988	Total 1987	Total 1988
<i>Achalcus cinereus</i>	6/19	5/6	-	-	1/1	-	11/25	1/1
<i>A. flavicollis</i>	1/1	1/	-	-	8/4	-	1/1	8/4
<i>Campsicnemus lumbatus</i>	2/3	-	-	-	-	-	2/3	-
<i>Dolichopus excisus</i>	-	-	-	5/7	2/	-	-	7/7
<i>D. signifer</i>	-	-	1/1	-	-	-	1/1	-
<i>Hercostomus fulvicaudis</i>	1/2	9/12	-	1/1	3/27	-	9/14	3/28
<i>H. silvestris</i>	135/223	6/28	-	-	47/71	-	141/251	47/71
<i>Medetera feminina</i>	-	-	-	-	1/1	-	-	1/1
<i>M. inspissata</i>	-	-	-	-	2/	-	-	2/
<i>M. jugalis</i>	-	-	-	-	-	1/	-	1/
<i>M. pseudoapicalis</i>	-	1/	-	-	3/	-	1/	3/
<i>Sciapus laetus</i>	-	-	-	1/1	-	-	-	1/1
<i>Teuchophorus simplex</i>	2/	-	-	-	-	-	2/	-
<i>Thrypticus bellus</i>	-	-	-	-	1/1	-	-	1/1