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Admissions / Toelatingen:

M. BARBIER Yvan, rue du Château d'Eau 10, 6340 Philippeville est présenté par MM. L. BAERT et Ch. VERSTRAETEN comme membre assistant et étudie les Hyménoptères.

Mme COGNIAUX-BRIOT, av. de l'Esplanade 55, 1970 Wezembeek Oppem est présentée en tant que membre associé par MM. G. COULON et J. KEKENBOSCH.

Communications / Mededelingen:

1. Dhr. M. POLLET doet de volgende mededeling.

Preliminary results of the investigations on the distribution of dolichopodid flies (Diptera: Dolichopodidae) in Western Flanders (Belgium)

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Introduction

Apart from the collections by COLLART and GOETGHEBUER in the beginning and BEQUAERT in the middle of this century, very few data are known concerning the distribution of dolichopodid flies in Western Flanders. Moreover, most of the existing data were gathered in the coastal area (Blankenberge, De Panne, Knokke, Koksijde). As a result, the fauna of the remaining part of this province was almost completely unknown in this respect. Stimulated by Drs. H. MEUFFELS, the second author started an inventory of Western Flanders in the early 1980s, recently being assisted by the first author. In this paper,

the preliminary results of our investigations are presented. It must be pointed out that this study is still incomplete and large areas still need to be explored. Nevertheless, some general conclusions can be drawn concerning the commoness/rarity and habitat preferences of some species.

The study area, material and methods

The province of Western Flanders is situated in the north west of Belgium. Geographically, four regions can be distinguished: (1) the coast with saltmarshes and dunes, (2) the polders with mainly grasslands and arable fields on a clayish soil, (3) the « Houtland » with cultivated land, woodland and (sparsely distributed) heathland on a sandy to loamy soil, and (4) the « Heuvelland », characterized by its hilly appearance.

Besides literature data and unpublished data from museum collections (identified by Drs. H. MEUFFELS), most of the data in this paper concern insects gathered by the first two authors by means of sweeping. Furthermore, Malaise traps, water traps and pitfall traps were used in 9, 4 and 15 localities respectively. The collected material was preserved and stocked either dry or in a 70% alcohol solution. Doubtful species were always checked by Drs. H. MEUFFELS. The U.T.M.-grid of 2.5 x 2.5 km-squares was used in order to investigate the detailed distribution of the species in Western Flanders.

Results and discussion

1. The investigated area

Figure 1 shows the localities of the sampled 2.5 km U.T.M.-squares. Although 96 U.T.M.-squares were sampled, captures in 15 squares have not been identified yet. Distribution maps are based on the complete data set. As can be seen in fig. 1, the coast line, the polders and the north eastern part of the « Houtland » are rather well studied, whereas the remaining area has been investigated very poorly. Furthermore, very recently the following sites were intensively sampled:
(1) coastal region: the nature reserve « De Westhoek » (De Panne) (coastal dunes), the nature reserve « Het Zwin » (Knokke) (dunes and saltmarshes), « Hannecartbos » (Oostduinkerke) (woodland);
(2) polders: the nature reserve « De Blankaart » (Woumen) (marshland);
(3) the « Houtland »: « Wijnendalebos » (Ichtegem-Torhout) (woodland), « Vloetemveld » (Zedelgem) (woodland, heathland and fenland), « Lippensgoed-Bulskampveld » (Beernem) (woodland and fenland), the nature reserve « De Mandelhoek » (Ingelmunster).

The nature reserve « Het Zwin » at Knokke proved to be remarkably interesting, due to the presence of a large number of exclusively saltmarsh inhabiting species such as *Orthoceratium lacustre, Poecilobothrus principalis, Thinophilus flavipalpis, Dolichopus clavipes, Dolichopus diadema* and *Machaerium maritimae*. Apart from « Het Zwin », the three latter species have only been caught in the saltmarsh of the nature reserve « De Ijzermonding » at Nieuwpoort. Since formerly the Belgian dolichopodid fauna has never been studied intensively, a great number of new species have recently been discovered (MEUFFELS & GROOTAERT, 1987). In this respect, *Medetera brevitarsa, M. jugalis* and *Telmaturgus tumidulus* are only known from Western Flanders. However, this is probably a

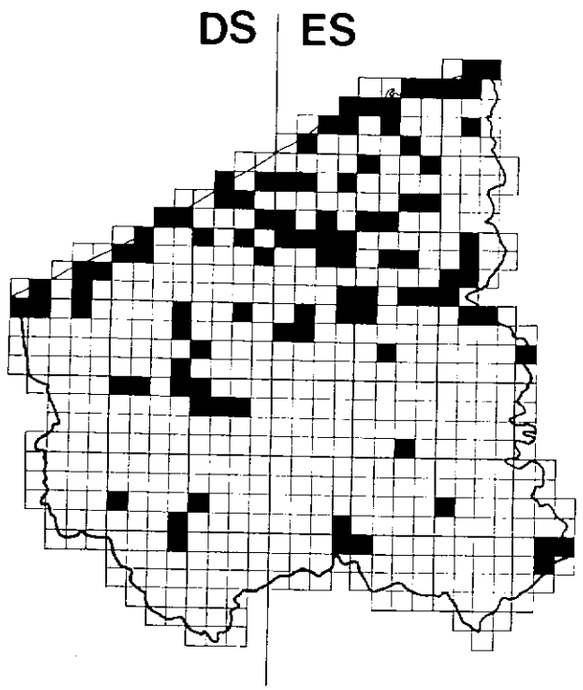

Figure 1. Distribution of the sampled 2.5 km U.T.M.-squares in Western Flanders (black).

reflection of the thoroughness of the sampling campaign (as compared to the other provinces) rather than the actual restricted occurrences of these species.

2. Commoness and rarity of species

Table 1 presents the list of the dolichopodid species from Western Flanders, with an indication of the number of 2.5 km U.T.M.-squares in which each particular species was caught. A total of 174 species was collected, which is more than 60% of the Belgian dolichopodid fauna. Although the results presented here are only preliminary, a distinction can be made between very common and rarer species. In our study, *Dolichopus ungulatus* was the most common dolichopodid species found (45 U.T.M.-squares), followed by *Dolichopus plumipes* (38), *Sympycnus pulicarius* (37), *Dolichopus brevipennis* (32) and *Campsicnemus curvipes* (31). These species can be encountered in various habitats, although a high soil humidity is preferred. On the other hand, almost 50% of the total number of species has been collected in less than 5 U.T.M.-squares. Although those species are obviously rarer than the species mentioned before, most of their distributions are very probably not as restricted as might be deduced from the distribution data. Undoubtedly, further inquiry will reveal new localities.

In the genus *Sciapus, S. platypterus* and *S. wiedemanni* appear to be the most common species. Both EMEIS (1964) and POLLET & GROOTAERT (in press) recorded that the former species prefers dark woodland sites, while *S. wiedemanni* is mostly found in more open habitats, including well-lit woodland.

Medetera truncorum, M. saxatilis, M. jacula and, to a lesser extent, *M. pallipes* were the most frequently found representatives of the genus *Medetera*. These species can often be found together in extremely large numbers on the trunks of different kinds of trees (e.g. poplar, oak). In the genus *Chrysotus, C. gramineus* and *C. neglectus* can be considered as the most common species, which corresponds with the findings of MEUFFELS (1981) for the Netherlands. In contrast to the latter authors results for the Netherlands, in our study *C. cilipes* seems to be much rarer, whereas *C. suavis* is much more common. *C. gramineus* is found in dry as well as in humid habitats and can be considered as the least hygrophilous species of the genus. On the contrary, *C. laesus* and *C. suavis* mainly occur at the borders of ponds and fens.

Among the *Argyra* species, *A. leucocephala* is the most common. Most *Argyra* species are pronouncedly hygrophilous and fly very quickly along small streams and the borders of ditches. Although *A. elongata* is considered to be extremely rare (MEUFFELS, pers. comm.), it has been found in considerable numbers in the nature reserve « De Blankaart » at Woumen.

As does the preceding genus, *Rhaphium* species occur almost exclusively near water. *R. caliginosum* is by far the most common and appears to be quite eurytopic. The other species are more restricted to particular habitat types e.g. *R. crassipes* occurs mainly in rather moist woodland sites with a strongly developed herb layer (e.g. *Rubus* sp., *Urtica dioica*), while *R. laticorne* prefers the open borders of ponds and rivers.

Within the genus *Campsicnemus, C. curvipes, C. picticornis* and *C. scambus* were most frequently found, although they demonstrate preferences for different micro-habitats. Furthermore, *C. loripes* occurs abundantly in rather humid coniferous forest sites, whereas *C. alpinus* is completely restricted to *Calluna* heathland.

As previously mentioned, *Dolichopus ungulatus, D. plumipes* and *D. brevipennis* are the most common species of the very large genus *Dolichopus*, which comprises 37 species in Western Flanders. Besides the former eurytopic species, also stenotopic dune (*D. acuticornis, D. migrans*), saltmarsh (*D. clavipes, D. diadema, D. strigipes*), heathland (*D. atripes, D. tanythrix*), fenland (*D. atratus, D. vitripennis*) and woodland (*D. pennatus, D. discifer, D. wahlbergi*) inhabiting species were noted. The very closely related genus *Hercostomus* has 8 relatively common species. Finally, the occurrence of *Hydrophorus* species seems to be determined by the presence of very shallow water.

3. Distribution patterns

Figure 2 give the distribution maps of some selected dolichopodid species.

Machaerium maritimae is considered a thalasso-halobiontic species, exclusively occurring in saltmarshes (D'ASSIS FONSECA, 1978; PARENT, 1938). In Western Flanders, it was found on the only two saltmarshes present, namely the nature reserve « De Ijzermonding » at Nieuwpoort and the nature reserve « Het Zwin » at Knokke (Fig. 2a).

Dolichopus acuticornis (Fig. 2b) appears to be a sea coast species also; however, in contrast to the preceding species, it occurs mainly in the dunes. Contrary to our results and

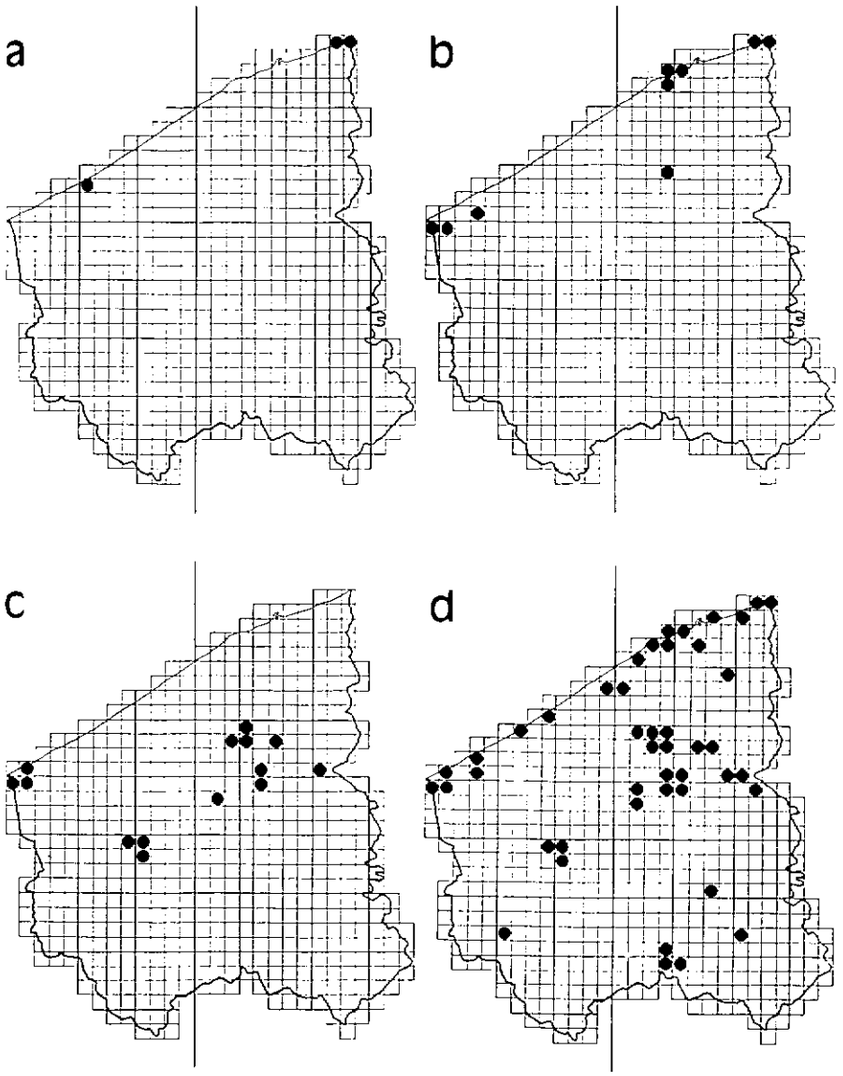

Figure 2. Distribution of *Machaerium maritimae* (a), *Dolichopus acuticornis* (b), *Hercostomus pilifer* (c) and *Dolichopus ungulatus* (d).

the findings of LUNDBECK (1912) and D'ASSIS FONSECA (1978), EMEIS (1964) claimed that this species was mostly found in different kinds of deciduous woodland in Schleswig-Holstein, although it was collected in other habitats too such as woodland borders, heathland, moorland and coastal dunes. The capture in a garden at Snellegem (ES06D) is obviously separated from the other localities. Nevertheless, in all cases the soil was purely sandy.

Formerly *Hercostomus pilifer* was considered as typically littoral (GOETGHEBUER, 1934). As can be seen in Fig. 2c, this species was mostly found in woodland areas, more inland. POLLET et al. (1986) even showed that *H. pilifer* prefers dark woodland sites. Its occurrence in the nature reserve « De Westhoek » at De Panne might be due to the presence of extensive shrub vegetations, especially of *Hippophaë rhamnoides* L. and *Sambucus nigra* L.

D. ungulatus was found in more than half of the localities investigated. As it is a very eurytopic species, no clear distribution pattern is evident (Fig. 2d).

4. Concluding remarks

When gathering distribution data on dolichopodid flies, one is confronted with problems both general to invertebrate research and specific to Dolichopodidae:

(1) in sharp contrast to other well studied groups such as hover flies (Syrphidae) and ground beetles (Carabidae), in Belgium dolichopodid flies have been collected in only few cases. Moreover, a very small number of scientists have ever dealt with this group. As a result, there is a lack of data gathered before 1950, which excludes the possibility of making a comparison of the present fauna with the pre-1950 fauna;

(2) apart from some species of the genera *Campsicnemus, Rhaphium, Dolichopus* and *Hercostomus*, which show two generations a year, and species with a long flight period such as *Dolichopus plumipes*, most species have a very short activity period e.g. *Rhaphium crassipes* can only be found from the beginning of May till the beginning of July, whereas the activity period of *Hercostomus chrysozygos* only takes 1.5 months (end of June-beginning of August). Similarly, *Achalcus cinereus* is most active during winter and early spring (cf. COLLART, 1953). Consequently it is impossible to investigate a complete area during one season;

(3) many dolichopodid species are very selective concerning their microhabitat (EMEIS, 1964; POLLET & GROOTAERT, in press). Furthermore, they seem to be quite vulnerable to climatological and environmental changes;

(4) the most frequently used sampling technique, especially in large scale studies, is sweeping. Although other methods such as Malaise traps, water traps and pitfall traps often prove to be very efficient, they are not favourable for collecting distribution data in a very short period;

(5) most dolichopodid species can be found on herbage and are easily collected by sweeping. However, many species occur on the soil surface (e.g. *Campsicnemus* sp., *Teuchophorus* sp.), on the water surface (*Hydrophorus* sp.) or on tree trunks (e.g. *Scapius* sp., *Medetera* sp., *Neurigona quadrifasciata*). Moreover, several species of the genera *Argyra* and *Rhaphium* (especially males) are very active and frequent flyers. Subsequently, all these species are hard to catch by sweeping so that other sampling techniques can be very useful.

Acknowledgements

The authors are very grateful to Drs. H. MEUFFELS for checking the doubtful species and his cooperation in gathering data on dolichopodid species from Western Flanders. Many thanks are also due to Mr. K. ROCHE for his reading of the manuscript.

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Table 1. List of dolichopodid species (Diptera: Dolichopodidae), found thusfar in the province of Western Flanders (Belgium) (numbers indicate the number of 2.5 U.T.M. - squares in which the corresponding species has been found).

Species	No.
(1) Sciapus contristans (WIEDEMANN, 1817)	2
(2) Sciapus laetus (MEIGEN, 1838)	3
(3) Sciapus lobipes (MEIGEN, 1824)	3
(4) Sciapus longulus (FALLEN, 1823)	1
(5) Sciapus maritimus BECKER, 1918	3
(6) Sciapus platypterus (FABRICIUS, 1805)	12
(7) Sciapus ululis (RADDATZ, 1873)	4
(8) Sciapus wiedemanni (FALLEN, 1823)	15
(9) Neurigona quadrifasciata (FABRICIUS, 1781)	7
(10) Medetera abstrusa THUNEBERG, 1966	2
(11) Medetera brevitarsa PARENT, 1927	1
(12) Medetera dendrobaena KOWARZ, 1877	12
(13) Medetera diadema (LINNAEUS, 1776)	11
(14) Medetera flavipes (MEIGEN, 1824)	2
(15) Medetera impiera COLLIN, 1941	7
(16) Medetera infumata LOEW, 1857	1
(17) Medetera jacula (FALLEN, 1823)	11
(18) Medetera jugalis COLLIN, 1941	2
(19) Medetera limacea LOEW, 1857	7
(20) Medetera muralis MEIGEN, 1824	3
(21) Medetera oscillans ALLEN, 1976	2
(22) Medetera pallipes (ZETTERSTEDT, 1843)	15
(23) Medetera parenti STACKELBERG, 1945	1
(24) Medetera perfida PARENT, 1932	2
(25) Medetera petrophila KOWARZ, 1877	1
(26) Medetera petrophiloides PARENT, 1926	6
(27) Medetera plumbella MEIGEN, 1824	9
(28) Medetera saxatilis COLLIN, 1941	21
(29) Medetera senicula KOWARZ, 1877	2
(30) Medetera tristis (ZETTERSTEDT, 1838)	3
(31) Medetera truncorum (MEIGEN, 1824)	23
(32) Thrypticus bellus LOEW, 1869	3
(33) Thrypticus pruinosus PARENT, 1932	1
(34) Thrypticus tarsalis PARENT, 1932	3
(35) Achalcus cinereus (HALIDAY, 1851)	3
(36) Systenus pallipes (VON ROSER, 1840)	1
(37) Chrysotus argulicornis KOWARZ, 1874	2
(38) Chrysotus blepharosceles KOWARZ, 1874	6
(39) Chrysotus cilipes MEIGEN, 1824	7
(40) Chrysotus femoratus ZETTERSTEDT, 1834	8
(41) Chrysotus gramineus (FALLEN, 1823)	20
(42) Chrysotus laesus (WIEDEMANN, 1817)	2
(43) Chrysotus neglectus (WIEDEMANN, 1817)	18
(44) Chrysotus palustris VERRALL, 1876	9
(45) Chrysotus pulchellus KOWARZ, 1874	5
(46) Chrysotus suavis LOEW, 1857	16
(47) Chrysotus varians KOWARZ, 1874	3
(48) Diaphorus nigricans MEIGEN, 1824	6
(49) Diaphorus oculatus (FALLEN, 1823)	3
(50) Melanostolus melancholicus (LOEW, 1869)	2
(51) Argyra argentella (ZETTERSTEDT, 1843)	7
(52) Argyra argentina (MEIGEN, 1824)	1
(53) Argyra argyria (MEIGEN, 1824)	3
(54) Argyra atriceps LOEW, 1857	1
(55) Argyra diaphana (FABRICIUS, 1843)	9
(56) Argyra elongata (ZETTERSTEDT, 1843)	3
(57) Argyra leucocephala (MEIGEN, 1824)	16
(58) Argyra perplexa BECKER, 1918	5
(59) Argyra vestita (WIEDEMANN, 1817)	4
(60) Rhaphium antennatum (CARLIER, 1835)	13
(61) Rhaphium appendiculatum (ZETTERSTEDT, 1849)	10
(62) Rhaphium brevicorne CURTIS, 1835	3
(63) Rhaphium caliginosum MEIGEN, 1824	24
(64) Rhaphium commune (MEIGEN, 1824)	3
(65) Rhaphium consobrinum ZETTERSTEDT, 1843	3
(66) Rhaphium crassipes (MEIGEN, 1824)	7
(67) Rhaphium elegantulum (MEIGEN, 1824)	3
(68) Rhaphium fasciatum MEIGEN, 1824	4
(69) Rhaphium fascipes (MEIGEN, 1824)	2
(70) Rhaphium laticorne (FALLEN, 1823)	4
(71) Rhaphium monotrichum LOEW, 1850	2
(72) Rhaphium penicillatum LOEW, 1850	2
(73) Rhaphium riparium (MEIGEN, 1824)	1
(74) Anepsiomyia flaviventris (MEIGEN, 1824)	12
(75) Bathycranium bicolorellum (ZETTERSTEDT, 1843)	6
(76) Campsicnemus armatus (ZETTERSTEDT, 1849)	15
(77) Campsicnemus curvipes (FALLEN, 1823)	31
(78) Campsicnemus loripes (HALIDAY, 1862)	5
(79) Campsicnemus lumbatus LOEW, 1857	4
(80) Campsicnemus magius (LOEW, 1845)	2
(81) Campsicnemus pectinulatus LOEW, 1864	4
(82) Campsicnemus picticornis (ZETTERSTEDT, 1843)	22
(83) Campsicnemus scambus (FALLEN, 1823)	19
(84) Campsicnemus umbripennis LOEW, 1856	1
(85) Campsicnemus alpinus (HALIDAY, 1873)	2
(86) Chrysotimus flaviventris (VON ROSER, 1840)	1
(87) Chrysotimus molliculus (FALLEN, 1823)	11
(88) Lamprochromus elegans (MEIGEN, 1838)	4
(89) Micromorphus albipes (ZETTERSTEDT, 1843)	16
(90) Sympycnus pulicarius (FALLEN, 1823)	1
(91) Syntormon aulicus (MEIGEN, 1824)	1
(92) Syntormon denticulatus (ZETTERSTEDT, 1843)	6
(93) Syntormon filiger VERRALL, 1912	4
(94) Syntormon monilis (HALIDAY, 1851)	1
(95) Syntormon pallipes (FABRICIUS, 1794)	17
(96) Syntormon pumilus (MEIGEN, 1824)	1
(97) Syntormon tarsatus (FALLEN, 1823)	4
(98) Teuchophorus monacanthus LOEW, 1859	6
(99) Teuchophorus nigricoxa (VON ROSER, 1840)	1
(100) Teuchophorus spinigerellus (ZETTERSTEDT, 1843)	13
(101) Xanthochlorus ornatus (HALIDAY, 1832)	12
(102) Xanthochlorus tenellus (WIEDEMANN, 1817)	1
(103) Dolichopus acuticornis (WIEDEMANN, 1817)	1
(104) Dolichopus atratus (MEIGEN, 1824)	1
(105) Dolichopus atripes (MEIGEN, 1824)	1
(106) Dolichopus brevipennis MEIGEN, 1824	1
(107) Dolichopus campestris (MEIGEN, 1824)	2
(108) Dolichopus claviger (STANNIUS, 1831)	11
(109) Dolichopus clavipes (HALIDAY, 1831)	3
(110) Dolichopus discifer STANNIUS, 1831	4
(111) Dolichopus excisus LOEW, 1859	2
(112) Dolichopus festivus (HALIDAY, 1854)	1
(113) Dolichopus griseipennis (STANNIUS, 1831)	13
(114) Dolichopus latilimbatus MACQUART, 1827	17
(115) Dolichopus lepidus (STAEGER, 1842)	1
(116) Dolichopus linearis (MEIGEN, 1824)	7
(117) Dolichopus longicornis (STANNIUS, 1831)	24
(118) Dolichopus longitarsis STANNIUS, 1831	1
(119) Dolichopus migrans ZETTERSTEDT, 1843	4
(120) Dolichopus nitidus FALLEN, 1823	3
(121) Dolichopus notatus STALGER, 1842	1
(122) Dolichopus nubilus (MEIGEN, 1824)	28
(123) Dolichopus pennatus (MEIGEN, 1824)	13
(124) Dolichopus plantitarsis FALLEN, 1823	2
(125) Dolichopus plumipes (SCOPOLI, 1763)	36
(126) Dolichopus plumitarsis WIEDEMANN, 1817	2
(127) Dolichopus popularis (WIEDEMANN, 1817)	14
(128) Dolichopus sabinus (HALIDAY, 1838)	6
(129) Dolichopus signatus MEIGEN, 1824	11
(130) Dolichopus signifer HALIDAY, 1838	1
(131) Dolichopus simplex MEIGEN, 1824	1
(132) Dolichopus strigipes VERRALL, 1879	2
(133) Dolichopus subpennatus D'ASSIS DE FONSECA, 1979	7
(134) Dolichopus tanythrix LOEW, 1869	5
(135) Dolichopus trivialis HALIDAY, 1832	12
(136) Dolichopus ungulatus (LINNAEUS, 1758)	45
(137) Dolichopus vitripennis MEIGEN, 1824	2
(138) Dolichopus wahlbergi ZETTERSTEDT, 1843	8
(139) Dolichopus diadema HALIDAY, 1831	3
(140) Hercostomus aerosus (FALLEN, 1823)	16
(141) Hercostomus angustrifrons (STAEGER, 1842)	2
(142) Hercostomus assimilis (STAEGER, 1842)	11
(143) Hercostomus brevicornis (STAEGER, 1842)	2
(144) Hercostomus celer (MEIGEN, 1824)	19
(145) Hercostomus chalybeus (WIEDEMANN, 1817)	6
(146) Hercostomus chetifer (WALKER, 1849)	1
(147) Hercostomus chrysozygos (WIEDEMANN, 1817)	16
(148) Hercostomus cupreus (FALLEN, 1823)	17
(149) Hercostomus gracilis (STANNIUS, 1831)	14
(150) Hercostomus metallicus (STANNIUS, 1831)	18
(151) Hercostomus nanus (MACQUART, 1827)	8
(152) Hercostomus nigripennis (FALLEN, 1823)	10
(153) Hercostomus nigriplantis (STANNIUS, 1831)	9
(154) Hercostomus pilifer (LOEW, 1859)	14
(155) Hypophyllus obscurellus (FALLEN, 1823)	13
(156) Muscidideicus praetextatus (HALIDAY, 1855)	2
(157) Poecilobothrus ducalis (LOEW, 1857)	6
(158) Poecilobothrus nobilitatus (LINNAEUS, 1767)	22
(159) Poecilobothrus principalis (LOEW, 1861)	2
(160) Tachytrechus insignis (STANNIUS, 1831)	4
(161) Tachytrechus notatus (STANNIUS, 1831)	1
(162) Aphrosylus ferox HALIDAY, 1851	5
(163) Hydrophorus balticus (MEIGEN, 1824)	2
(164) Hydrophorus bipunctatus (LEHMANN, 1822)	6
(165) Hydrophorus oceanus (MACQUART, 1838)	7
(166) Hydrophorus praecox (LEHMANN, 1822)	8
(167) Hydrophorus viridis (MEIGEN, 1824)	2
(168) Machaerium maritimae HALIDAY, 1832	3
(169) Orthoceratium lacustre (SCOPOLI, 1763)	3
(170) Scellus notatus (FABRICIUS, 1781)	9
(171) Schoenophilus versutus (HALIDAY, 1851)	5
(172) Telmaturgus tumidulus (RADDATZ, 1873)	1
(173) Thinophilus flavipalpis (ZETTERSTEDT, 1843)	2
(174) Thinophilus ruficornis (HALIDAY, 1838)	1