

The Hoverflies (Diptera, Syrphidae) of Białowieża Primeval Forest

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The Białowieża Forest complex totalling 1240 km² straddles the Polish-Belorussian border, with the western part consisting of 580 km² belonging to Poland. Geographically it lies between longitudes 23°31'-24°57'N. The forest is the largest natural forest area lying in the European Lowland and is a unique natural site closely related to primeval forests. In 1977 Białowieża Primeval Forest became a UNESCO Man and Biosphere Reserve, and in 1979 it was classified a World Heritage Site.

Białowieża Primeval Forest lies in the mixed deciduous-coniferous forest zone, where spruce, pine, oak, alder, maple, ash and hornbeam are typical species of tree, and where most types of tree stands contains at least some mix of spruce. The forest flora consists of 990 species of vascular plants, 308 species of mosses and liverworts, 200 species of lichens and more than 1000 species of fungi. In the Polish part of the forest 11,000 animal species occur, with invertebrates (including insects) being the largest group or approximately 8,500 species. The largest area covers dry forest ground, but streams and marshes can be found throughout the forest. The most common of the 113 described plant communities is oak-linden-hornbeam forest covering 46% of the total area. Some small peat bogs can be found in the pine forested areas. The forest soils are mainly sands and post-glaciation gravels with scarce fragments of dune sands occurring at its southern borders. There is a strict reserve, Białowieża National Park covering just over 47 km², which is not accessible to visiting tourists. The climate of the forest is a sub-continental one, characterized by long periods of snow cover, averaging 92 days, and a growing season of only 185 days. Mean July temperature is +17.6°C, whilst in January it is -4.3°C. Mean annual rainfall is 626mm.

Our aim, in July 1994, was to sample the hoverfly community of the Białowieża Forest, to perform several experiments on hoverfly mimicry and to assess the feasibility of future field studies in the forest.

The Syrphidae were collected over a period of 10 days, between 18 July 1994 and 28 July 1994, from the National park and from areas along disused railway tracks running through the forest. It was sunny during the study period, with temperatures of between 26-35°C. The hoverflies were generally caught during the early part of the day, between 7.00 and 14.00 hours CET, using an entomological net. Some specimens were identified on site, whilst others were brought back to Nottingham University, (UK) for identification.

Table 1 lists the species found and summaries the data associated with them. Codes used to define the associated plant species (letters A through N), the habitat (numbers 1 to 6) and the relative abundance (o, c, a and 1) are clarified below.

Table 1. Syrphidae of Białowieża Primeval Forest and associated plant, habitat and abundance data.

	List of Species	Found On	Found At	Abundance
1	<i>Ceriana conopsoidea</i> (Linnaeus, 1758)	J	1	o
2	<i>Cheilosia carbonaria</i> Egger, 1860	A	2	c
3	<i>Cheilosia illustrata</i> (Harris, [1780])	A	1	l
4	<i>Cheilosia impressa</i> Loew, 1840	A	1	o
5	<i>Cheilosia velutina</i> Loew, 1840	A	1	l
6	<i>Cheilosia vernalis/zetterstedti</i> (Fallén, 1817)	J	1	l
7	<i>Chrysogaster solstitialis</i> (Fallén, 1817)	A	1	o
8	<i>Chrysotoxum bicinctum</i> (Linnaeus, 1758)	J	1	l
9	<i>Epistrophe nitidicollis</i> (Meigen, 1822)	A	2	o
10	<i>Episyrphus balteatus</i> (De Geer, 1776)	A,I	1,2,3	a
11	<i>Eristalinus sepulchralis</i> (Linnaeus, 1758)	A	1	o
12	<i>Eristalis abusiva</i> Collin, 1931	C	5	l
13	<i>Eristalis anthophorina</i> (Fallén, 1817)	A	6	l
14	<i>Eristalis arbustorum</i> (Linnaeus, 1758)	A,C,D,E	1,2,5	a
15	<i>Eristalis horticola</i> (De Geer, 1776)	A,C,E	1,2,5	a
16	<i>Eristalis intricaria</i> (Linnaeus, 1758)	A,C	1,5	o
17	<i>Eristalis pertinax</i> (Scopoli, 1763)	A,E,F	1,2,5,6	a
18	<i>Eristalis tenax</i> (Linnaeus, 1758)	A,C,J	1,2,5,6	a
19	<i>Eupeodes corollae</i> (Fabricius, 1794)	E	1	a
20	<i>Eupeodes latifasciatus</i> (Macquart, 1829)	G	1	o
21	<i>Eupeodes luniger</i> (Meigen, 1822)	E,H	1	l
22	<i>Eurimyia lineata</i> (Fabricius, 1787)	A,E	1,5	o
23	<i>Ferdinandea cuprea</i> (Scopoli, 1763)	I	4	l
24	<i>Helophilus hybridus</i> (Loew, 1846)	C,E,J	1,5,6	c
25	<i>Helophilus pendulus</i> (Linnaeus, 1758)	E,F,J	1,6	c
26	<i>Heringia heringi</i> (Zetterstedt, 1843)	A	1	l
27	<i>Melangyna umbellatarum</i> (Fabricius, 1794)	J	1	l
28	<i>Melanostoma mellinum</i> (Linnaeus, 1758)	A,C,E	1,5	a
29	<i>Meliscaeva auricollis</i> (Meigen, 1822)	A,C	1	o
30	<i>Meliscaeva cinctella</i> (Zetterstedt, 1843)	A,G,J	1,2,5	c
31	<i>Myathropa florea</i> (Linnaeus, 1758)	A,C,J	1	a
32	<i>Parasyrphus annulatus</i> (Zetterstedt, 1838)	J	1,5	o
33	<i>Parasyrphus lineola</i> (Zetterstedt, 1843)	A,D,E	1	c
34	<i>Parasyrphus nigratarsis</i> (Zetterstedt, 1843)	A	1,2,5	l
35	<i>Parasyrphus vittiger</i> (Zetterstedt, 1843)	A,J	1	o
36	<i>Platycheirus albimanus</i> (Fabricius, 1781)	J	1,5	o
37	<i>Platycheirus clypeatus</i> (Meigen, 1822)	A	6	o
38	<i>Rhingia campestris</i> Meigen, 1822	K	1,2	o
39	<i>Scaeva pyrastris</i> (Linnaeus, 1758)	A	1	o
40	<i>Scaeva selenitica</i> (Meigen, 1822)	A,J	1	o
41	<i>Sphaerophoria menthastri</i> (Linnaeus, 1758)	A,G,J	1	a
42	<i>Sphaerophoria scripta</i> (Linnaeus, 1758)	C,E,G	1,2	a

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43	<i>Syrirta pipiens</i> (Linnaeus, 1758)	A,E	1,2	a
44	<i>Sryphus ribesii</i> (Linnaeus, 1758)	A,C,G,L,M,N	1,2,3,5	a
45	<i>Syrphus vitripennis</i> Meigen, 1822	A,E	1	a
46	<i>Temnostoma apiforme</i> (Fabricius, 1794)	C	5	1
47	<i>Temnostoma meridionale</i> Krivosheina & Mamaev, 1967	C	5	1
48	<i>Temnostoma vespiforme</i> (Linnaeus, 1758)	A	3	1
49	<i>Volucella bombylans</i> (Linnaeus, 1758)	C	5	o
50	<i>Volucella pellucens</i> (Linnaeus, 1758)	A,C	1,2,5	c
51	<i>Xanthandrus comptus</i> (Harris, [1780])	A	1	1
52	<i>Xanthogramma pedissequum</i> (Harris, 1776)	E	1	1
53	<i>Xylota segnis</i> (Linnaeus, 1758)	J	1	1

FOUND ON

A = White flowered Umbelliferae with narrow leaflets, e.g. Wild Carrot (*Daucus carota*)

B = White flowered Umbelliferae with broad leaflets, e.g. Hogweed (*Heracleum sphondylium*)

C = Tiliaceae, Lime (*Tilia* sp)

D = Flying among/resting on Grass spp

E = Convolvulaceae, Field Bindweed (*Convolvulus arvensis*)

F = Compositae, e.g. Oxeye Daisy (*Chrysanthemum leucanthemum*)

G = Rubiaceae, Bedstraw (*Galium* sp)

H = Geraniaceae, Cranesbill (*Geranium* sp)

I = Flying among woodland tree spp

J = Flying among various herbaceous plants

K = Caryophyllaceae, Red Campion (*Silene dioica*)

L = Leguminosae, Ribbed Melilot (*Melilotus officinalis*)

M = Dipsacaceae, Field Scabious (*Knautia arvensis*)

N = Leguminosae, Yellow and Purple Lucerne (*Medicago sativa*)

FOUND AT

1 = Along a disused (3 months) railway track at Grudki Station

2 = Tree lined lake side by Hotel Iwa

3 = Restricted Reserve in mixed woodland by a stream

4 = Near Bison Reserve in mixed woodland

5 = Along road verge in Bialowieza village

6 = Wetland meadow on outskirts of Białowieza village

ABUNDANCE

o = Occasional

c = Common

a = Abundant

1 = 1 specimen caught

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