

Pitfall trapping of spiders in a small stand of oak near Dwingeloo, SW Drenthe (Arachnida: Aranei)

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Abstract: Spiders in a ten years old stand of *Quercus robur* were studied by pitfall trapping. Most species were Linyphiidae, while the most abundant species were Erigonidae. *Gongylidium rufipes* was strongly dominant, with almost 52% of the specimens. The sex ratio for most species was more or less strongly male dominated, but sex ratio seems not stable over the year.

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Introduction

The composition of the spider fauna of South-West Drenthe has not been investigated in detail up till now. This paper is the first result of a study to fill this gap.

The site of the present study is situated in kilometer block 217-536. Originally it was a wet hay field, inundated in autumn and winter by a nearby brook. The brook was canalized in 1950, which put an end to the regime of annual inundations. Following a re-allotment in 1970-1980, the site was planted in 1980 partly with *Quercus robur* L. alone, partly with a mixture of *Q. robur* and *Fraxinus excelsior* L.

The part of the stand consisting of pure oak was studied. The trees were spaced about ten metres from each other. Except for some *Athyrium filix-femina* (L.) Roth, undergrowth was absent. The litter had an average thickness of 2 cm.

Six pitfall traps were placed in a row at distances of 5 m; they consisted of plastic cups, with a diameter of 7 and a depth of 9 cm, protected by a cover of plexiglass and filled with 4% formalin with a few drops of detergent. The traps were left in the field from 1 March 1988 till 28 February 1989. They were checked every fortnight.

Identifications are mainly based on Locket & Millidge (1951, 1953).

Results

(table 1)

During the period of the investigation, altogether 5792 spiders were collected, belonging to 37 species and nine families. Clubionidae, Thomisiidae and Tetragnathidae were represented by only two species each, while Zoridae, Salticidae and Theridiidae each counted only one species. As usually in The Netherlands, the Erigonidae and Linyphiidae dominated both in the number of species and the number of individuals.

The pattern of dominance is shown in fig. 1, where the number of specimens per species is shown logarithmically. The two eudominant species (*Gongylidium rufipes* and *Pardosa amentata*) and the two dominant ones (*Macrargus rufus* and *Microneta viaria*) together form almost 79% of the total number of

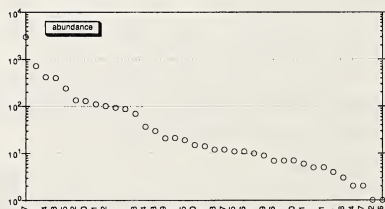


Fig. 1. Descending arrangement of the logarithm of the species abundance; species are referred to by the number preceding them in table 1.

Table 1. Number of males and females of the species collected. The reference number that precedes the species names is for the interpretation of figs. 1-2.

num-ber	species	m	f
CLUBIONIDAE			
1	<i>Clubiona lutescens</i> (Westring)	15	6
2	<i>Clubiona phragmitis</i> C. L. Koch	2	3
ZORIDAE			
3	<i>Zora spinimana</i> (Sundevall)	9	5
THOMISIDAE			
4	<i>Oxyptila trux</i> (Blackwall)	5	2
5	<i>Xysticus cristatus</i> (Clerck)	10	0
SALTICIDAE			
6	<i>Euophrys frontalis</i> (Walckenaer)	4	0
LYCOSIDAE			
7	<i>Pardosa amentata</i> (Clerck)	654	76
8	<i>Pardosa lugubris</i> (Walckenaer)	67	21
9	<i>Pirata hygrophilus</i> Thorell	46	48
10	<i>Trochosa terricola</i> Thorell	64	66
THERIDIIDAE			
11	<i>Robertus lividus</i> (Blackwall)	4	2
TETRAGNATHIDAE			
12	<i>Meta merianae</i> Scopoli	1	0
13	<i>Pachygnatha clercki</i> Sundevall	22	48
ERIGONIDAE			
14	<i>Diplocephalus picinus</i> (Blackwall)	22	15
15	<i>Erigone atra</i> (Blackwall)	116	124
16	<i>Erigone dentipalpis</i> (Wider)	11	0
17	<i>Gongylidium rufipes</i> (Sundevall)	1596	1397
18	<i>Oedothorax fuscus</i> (Blackwall)	3	0
19	<i>Walckenaeria acuminata</i> Blackwall	5	4
20	<i>Walckenaeria nudipalpis</i> (Westring)	4	3
LINYPHIIDAE			
21	<i>Bathyphanes parvulus</i> (Westring)	5	0
22	<i>Centromerus sylvaticus</i> (Blackwall)	72	63
23	<i>Diplostyla concolor</i> (Wider)	3	9
24	<i>Drapetisca socialis</i> (Sundevall)	2	0
25	<i>Kaestneria dorsalis</i> (Wider)	8	3
26	<i>Kaestneria pullata</i> (O. P. Cambridge)	0	7
27	<i>Lepthyphantes alacris</i> (Blackwall)	2	0
28	<i>Lepthyphantes flavipes</i> (Blackwall)	16	14
29	<i>Lepthyphantes mengei</i> Kulczinski	7	14
30	<i>Lepthyphantes pallidus</i> (O. P. Cambridge)	8	7
31	<i>Lepthyphantes tenuis</i> (Blackwall)	42	70
32	<i>Lepthyphantes zimmermanni</i> Bertkau	47	55
33	<i>Macrargus rufus</i> (Wider)	207	199
34	<i>Microneta viaria</i> (Blackwall)	191	229
35	<i>Neriene clathrata</i> (Sundevall)	15	4
36	<i>Porrhomma pallidum</i> Jackson	0	1
37	<i>Saaristoa abnormis</i> (Blackwall)	9	3

specimens. *Gongylidium rufipes* dominated for most of the sampling period. *P. amentata* and *G. rufipes* are more or less hygrophilous species, *M. rufus* has a less marked preference

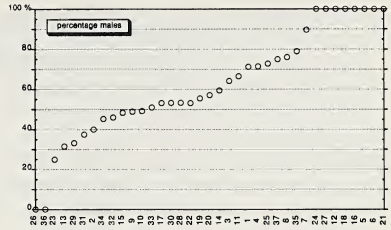


Fig. 2. Sex ratio ($100 \times \delta / (\delta + \varphi)$), arranged in ascending order; species are referred to by the number preceding them in table 1. Note the large proportion of species with a sex ratio $> 50\%$.

for a moist habitat. *M. viaria* may be called hylobiont – hemihyrobiont. All species are common in The Netherlands.

The high numbers occupied by a few of the species of the community result in a comparatively low Shannon-Weaver index of diversity: 2.4471, computed over the total catch and a similarly low value of log Series alpha of 5.29 (Lewis & Taylor, 1972). This is indicative of a less than favourable habitat for spiders. The main element may be the lack of undergrowth, that is related to the young age of the stand. Typical forest-dwelling spiders do not yet occur, whereas the moisture-adapted faune that originally must have occurred here is in the decline.

The sex ratio (as a percentage of the number of males of the total number, fig. 2) over the total catch over all species is 56.9%. The excess of males indicated by this figure is expounded in more detail in fig. 2. Of the 37 species, not

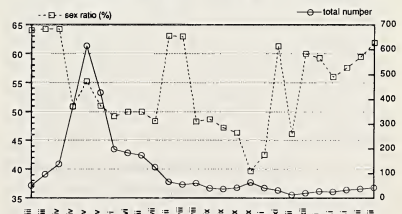


Fig. 3. Sex ratio ($100 \times \delta / (\delta + \varphi)$), left Y-axis and total number of specimens caught (right Y-axis) of *Gongylidium rufipes* over the course of the sampling period.

less than 25 have a sex ratio higher than 50%. The explanation may vary from species to species, but it seems probable that the general cause will be a higher activity level of the male specimens, that gives them a higher chance of being caught by the pitfall method. Yet, this appears not to be the complete explanation, as, at least in the most abundant *G. rufipes*, the sex ratio changes strongly over the year (fig. 3).

Notable is the strong excess of males in *Pardosa amentata*, with a sex ratio of 89.5%, calculated over no less than 730 specimens.

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