
THE SEASONAL MOVEMENTS OF CLUBIONA BREVIPES Blackwall
AND CLUBIONA COMPTA C.L.Koch ON OAK TREES IN
MONKS WOOD, HUNTINGDONSHIRE.

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Although the spider fauna of woodland is comparatively well known in this country, very little information is available on the ecological niches of many species or of the relative importance of different parts of the woodland ecosystem. In particular, what happens to the rich fauna of the foliage of an oak tree when the leaves fall in the autumn and how important are the cracks and crevices in rough bark for shelter and hibernation? Turnbull (1960) studied aspects of these problems in a Berkshire oak wood. He says that the spring populations of spiders in the canopy were derived partly from those overwintering as eggs and partly from those which overwintered in the ground zone and migrated upwards. Spring movement to the canopy was, he says, completed about the end of May. Turnbull also comments that the ground zone population level remained remarkably constant until the early autumn when a rise in numbers occurred. This rise, he says, corresponds to a decline in the densities of the higher strata and represents a return to the ground for overwintering of species from the field and canopy layers. Turnbull recorded 8 species of Clubiona in the different layers from the ground zone of the canopy but of the 4 reasonably common species only C.brevipes was found mainly in the tree foliage. C.compta was recorded but only occasional specimens taken.

In March 1967 a small project was begun in the oak/ash woodland next to the Monks Wood Experimental Station. Five pairs of oak trees (Quercus robur) were selected, each about 30 cm in diameter and situated between 6 and 12 metres from the south edge of the wood. The canopy was closed but included overgrown hazel (Corylus avellana) and hawthorn (Crateagus oxycanthoides) while the woodland floor was covered with leaf litter and twigs, with very little living vegetation.

The trees in each pair were comparatively young with a "smooth" bark. "Smoothness" in this sense is meant to indicate an absence of cracks and crevices likely to provide hiding places for spiders in the 3 to 6 mm size range. On tree A of each pair, a strip of brown corrugated paper, 15 cm in width was wrapped round the trunk twice at a height of 2 metres and on tree B a similar strip was wrapped twice round the trunk at a height of 50 cm (fig. 1). Each "trap" was held in place by a string tied round the circumference and 2 small nails on which it rested to prevent it slipping down the trunk.

The corrugations of the paper provided refuges for many small invertebrate animals and presumably functioned in a similar way to the

cracks and crevices in the bark of older trees (fig. 2). Each "tunnel" formed by the corrugations measured approximately 3 mm x 3 mm.

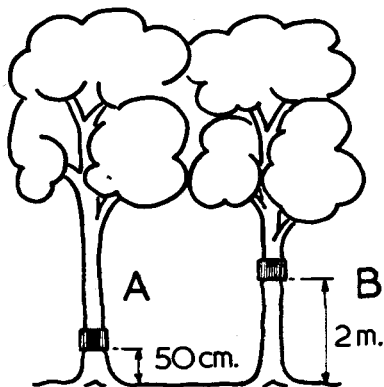


Fig. 1 Arrangement of traps on each pair of trees.

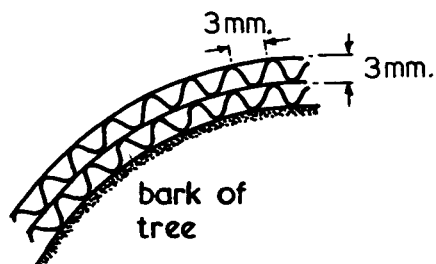


Fig. 2 Enlarged cross-section of corrugated paper trap.

Approximately each month from March 1967 to December 1968 (excepting the period April-October 1967) the traps were removed and fresh paper strips put in their place. Each old strip was placed in a polythene bag and taken back to the laboratory. A piece of cotton wool with a few drops of chloroform was used to anaesthetise the animals before collection. Collecting was done over a tray after separating the corrugated part of the strip from the backing paper so that the animals in the "tunnels" could be reached. About 38 species were recorded including immatures, but only a few were numerically common. Two of these were C. brevipes and C. compta, both widespread and common in this country and usually described as occurring on the foliage of trees and bushes. Locket and Millidge (1951) quote the maturity period of brevipes as April-early June and for compta, April-July, and the size range as follows, compta ♀ 3.5 mm- 6.0 mm, brevipes ♀ 5.0 mm- 7.0 mm; compta ♂ 3.5 mm- 4.5 mm and brevipes ♂ 4.5 mm- 5.5 mm.

In table 1, 17 sampling dates are listed against the total specimens of each species collected in the 5 traps at 50 cm and similarly for the 5 traps at 2 metres. The number of adults in each total is shown in parentheses. C. brevipes did not appear in the traps during the period 13th March to 19th April 1967 but after 6½ months without disturbance (up to 30th October) a total of 1,592 were taken. As the area of each cardboard trap when unrolled is 2,700 sq.cm., there was an average of one C. brevipes to every 17 sq.cm. of the 10 corrugated cardboard strips. Although this large catch obviously indicated a movement of some sort, the long trapping period (spring to autumn) made interpretation difficult. The next trapping period (November-December) produced 93 brevipes suggesting that the movement was still going on. These two collections totalled 1,685 specimens but only 68 (all females) were adult. The remaining 1,617 were nearly all in the subadult condition so that determination of the sex was possible. In the 5 traps at 50 cm there were 372 subadult males to 287 subadult females and in the traps at 2 metres there were 509 subadult males to 344 subadult females.

TRAPPING PERIOD			C. BREVIPES			C. COMPTA		
			50 cm	2 m	No. Adult	50 cm	2 m	No. Adult
Mar. 13-29	1967	0	0		0	0		
" 29-Apr. 19	"	0	0		4	3	(4♀)	
Apr. 19-Oct. 30	"	689	903	(66♀)	1	0	(0)	
Oct. 30-Jan. 2	1968	25	68	(2♀)	0	1	(0)	
Jan. 2-Feb. 19	"	4	3	(0)	0	0		
Feb. 19-Mar. 15	"	2	4	(0)	1	0	(0)	
Mar. 15-Apr. 10	"	2	1	(0)	0	0		
Apr. 10-May 8	"	5	5	(0)	15	15	(28♀, 1♂)	
May 8-June 25	"	0	1	(1♀)	44	53	(97♀)	
June 25-July 15	"	0	0		1	6	(7♀)	
July 15-Aug. 5	"	0	0		2	2	(4♀)	
Aug. 5-Sept. 5	"	9	1	(2♀)	2	3	(5♀)	
Sept. 5-23	"	49	84	(2♀)	2	1	(0)	
Sept. 23-Oct. 16	"	186	244	(6♀)	2	0	(1♀)	
Oct. 16-28	"	43	58	(5♀)	0	0		
Oct. 28-Nov. 25	"	41	75	(0)	0	1	(1♀)	
Nov. 25-Dec. 16	"	1	0	(0)	0	0		

Table 1. Numbers of Clubiona brevipes and C. compta taken in the corrugated-paper traps at 50 cm and 2 metres.

The figures show quite clearly that the catch at 2 metres was significantly larger than the catch at 50 cm, 971 to 714. This happened again in the second autumn, 461 to 319, and it seems reasonable to suppose that this represents a downward movement to overwintering quarters during which a greater proportion of spiders took the first suitable retreat rather than wandering further down the tree trunk. However, if no traps had been available on these trees, one supposes that the greater part of the large numbers of brevipes recorded would have reached ground level because no suitable cracks and crevices would have been found.

After 2nd January 1968 the movement had ceased and very few specimens (from 0-10), were taken in the monthly collections throughout the first 8 months of the year. In the period 8th May to 5th August, only one specimen was taken. These very low numbers throughout spring and summer suggest that the reproductive cycle, for example egg-laying, takes place on other parts of the tree.

My own records of females with egg-sacs include; within a curled leaf on an oak tree, in a disused bird's nest and within the hollow stem of a dead teasel (Dipsacus fullonum). In September 1968 large numbers again appeared in the traps, nearly all subadult, and were found within silk retreats spun in the "tunnels" formed by the corrugations. The very few adult females taken were presumably survivors of the current generation which were to overwinter until the following spring. The downward migration to hibernation quarters lasts several weeks, from early September until the latter part of November. The movement terminated abruptly; from 28th October to 25th November 116 subadults were taken, but from 25th

November to 16th December only one specimen was caught.

Clubiona compta, a potential competitor with C.brevipes seems to have a very different seasonal movement. Although it also lives in the canopy of trees there was no evidence of a downward migration in the autumn. However, it is possible that this species does not hibernate in refuges in the tree bark, where it would be competing with C.brevipes, but moves down to the leaf-litter on the forest floor. In the early spring occasional specimens were taken in the traps (both subadult and adult females) but in the period 10th April to 25th June there was a sudden increase in numbers. The 127 specimens taken during this period were all females, apart from one male (the only one recorded during the whole trapping period) and an immature female. From 8th May to 25th June the numbers of C.compta declined sharply but a small number (all adult females) continued to occur until 16th October and the last female was taken in the trapping period 28th October to 25th November. The height of the traps seemed to have little influence on the numbers of C.compta trapped although from 8th May to 15th July, 59 females were taken in the higher traps and 45 in the lower. These records show that C.brevipes used the bark traps extensively for overwintering but constructed the egg-cocoon elsewhere, while C.compta hibernates in a completely different woodland habitat but seems to accept the traps as a suitable refuge for egg-laying. These two species which are morphologically very similar do not, therefore, compete either during the reproductive period or when searching for an overwintering refuge.

So far, these species have been discussed only in relation to the use made by them of the experimental trees. There are sufficient records however of both species being swept from tall herbaceous plants, and occurring in leaf-litter of fens and heaths where there may be only scattered trees and bushes, to suggest that in the ecological sense they are widely dispersed. Nevertheless the very large numbers of C.brevipes and its apparent readiness to hibernate in the first suitable crevice as it moves down the tree in the autumn indicates a preference for the tree habitat compared with other types of vegetation. C.compta was much less numerous on the ten trees and may be equally well adapted to other habitats such as bushes and field-layer vegetation.

References.

- LOCKET, G.H. and MILLIDGE, A.F. 1951: British Spiders. Vol.1. Ray Soc.
TURNBULL, A.L. 1960: The Spider Population of a stand of Oak (Quercus robur L.) in Wytham Wood, Berks. England.
Canadian Entomologist 92 : 110-24.
