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Some spiders of dead wood in living trees in Wytham Woods, near Oxford

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Introduction

During a quantitative study of the fauna of small dead wood, in winter and summer 1969, 253 samples were taken of dead wood still on trees in Wytham Woods, in the old county of Berkshire (now included in Oxfordshire). The tree species sampled were those contributing most to this resource on a 1.2 ha study area in almost closed canopy woodland on the north side of Wytham Great Wood. The area is illustrated in the left hand bottom quarter of an aerial photograph and sketch map (Plate 10 and fig. 20) in Elton (1966). We sampled oak (*Quercus robur* L. introgressed with *petraea* (Mattuschka) Liebl.) (which contributed 56% of the estimated total of "aerial" dead wood), sycamore (*Acer pseudoplatanus* L.) (22%), ash (*Fraxinus excelsior* L.) (16%) and hawthorn (*Crataegus monogyna* Jacq.) (3.3%). Ash and sycamore saplings (understorey) were sampled as well as canopy trees. The other trees and shrubs on the study area (not sampled, as their contribution was so small) were: beech, field maple, Scots pine, elder, spindle, hazel, willow, dogwood, birch, wayfaring tree and horse chestnut.

The samples were all of *ca* 400 cc in volume and therefore varied in length according to their diameters (which were between 2 and 12 cm). Only 57 samples had really loose bark, but 152 had some sort of cover from loose bark, lichen and old burrows.

No sample was taken from closer to the ground than 0.20 m so that all were in Elton's (1966) Field Layer (0.15-1.85 m), Shrub Layer (> 1.85-4.6 m) or Canopy (> 4.6 m). Some of the spider species may well also occur in the Ground Zone (< 0.15 m) but this layer was not sampled.

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Results

Table 1 shows that there were 19 species of spiders. (Immatures which could not be determined at least as far as genus are not included.) Two species of pseudoscorpion and three of harvestmen are also given.

Although different numbers of samples were taken from the four tree species, oak and hawthorn were clearly much richer in spider species than were ash and sycamore.

The two common species

Only two species, *Theridion pallens* Blackwall (Fam. Theridiidae) and *Thyreosthenius parasiticus* (Westring) (Fam. Linyphiidae), were at all frequent, occurring respectively in 19 and 18 of the total samples (253). They were found on all four tree species in both canopy and understorey trees.

However, *T. pallens* occurred in only winter samples (taken weekly between 3 February and 11 March), in 12% of the 156 samples. The total of 23 specimens included 16 immatures which Dr Duffey assures us are this species. For *T. pallens* the punch-cards in the Wytham Ecological Survey at Oxford have complementary data, showing for spring (8 cards) and summer (11 cards) that adults of this "hunter in the canopy" (as Elton, 1966, called it) live on the foliage of trees (including oak, sycamore, hazel, birch, hornbeam and horse chestnut), producing characteristic white, spiky egg sacs under leaves (13 cards) where they may feed on aphids* as well as on other prey. Turnbull (1960) working in another part of Wytham Woods in pure oak woodland, surrounded by mixed deciduous woodland,

* Mr Elton and Dr B. M. Hobby found the remains of the black-bodied aphids *Periphyllus acericola* (Walker) (Hemiptera-Homoptera, Chaitophoridae) in the webbing of this spider on the underside of sycamore leaves at 1.2-3 m above the ground in a thinned larch plantation, Bagley Wood, Berkshire, on 2 July 1941. Two years later (8 July 1943) adults of *T. pallens* were found with cocoons, associated with some yellow aphids on the under side of hazel leaves in a garden hedge at Fifield, Oxon. Professor G. C. Varley has found old cocoons of *T. pallens* amid a dense population of sessile nymphs of the whitefly, *Aleurotrachelus jelineckii* (Frauenfeld) (Hemiptera-Homoptera, Aleurodidae) on the under side of leaves of *Viburnum tinus* L. outside Keble College, Oxford (November 1975).

	Total individuals	No. immatures included	Total no. samples in which species present	Tree Species: Oak	Ash: canopy	Ash: under-storey	Sycamore: canopy	Sycamore: under-storey	Hawth.	Season: Winter	Season: Summer	Layers: Field	Layers: Shrub	Layers: Canopy
Total no. samples in each category				71	39	20	43	30	50	156	97	66	137	50
					59		73							
Allochernes dubius (Cambr.)	3	2	2	1.41	0	0	0	0	2	1.28	0	0	1.46	0
Chernes cimicoides (F.)	3	n.d.	2	2.82	0	0	0	0	0	0	2.06	0	0.73	2
Leiobunum blackwalli Meade	1	n.d.	1	1.41	0	0	0	0	0	0	1.03	0	0.73	0
**? Mitopus morio* (F.) eggs	8	8	1	0	2.56	0	0	0	0	0.64	0	1.52	0	0
Oligolophus agrestis (Meade)	7	n.d.	5	4.23	0	0	0	3.33	2	0	5.15	0	3.65	0
Amaurobius sp.	1	1	1	1.41	0	0	0	0	0	0	1.03	0	0.73	0
Harpactea hombergi (Scopoli)	1	0	1	1.41	0	0	0	0	0	0	1.03	0	0.73	0
Segestria senoculata (L.)	9	5	7	7.04	0	0	2.33	0	2	3.21	2.06	1.52	2.92	4
Clubiona corticalis (Walck.)	2	0	2	1.41	0	0	0	3.33	0	0.64	1.03	1.52	0	2
Clubiona (? brevipes Bl.)	1	1	1	1.41	0	0	0	0	0	0.64	0	0	0.73	0
Anyphaena accentuata (Walck.)	3	2	3	1.41	2.56	0	0	0	2	1.92	0	4.55	0	0
Philodromus sp.	2	2	2	1.41	0	0	2.33	0	0	1.28	0	0	0.73	2
Coelotes atropos (Walck.)	71	70	4	4.23	0	0	0	0	2	0	4.12	1.52	0	6
Anelosimus vittatus (C. L. Koch)	1	1	1	0	0	0	0	0	2	0.64	0	0	0.73	0
†*Theridion mystaceum* L. Koch	9	9	7	4.23	7.69	0	0	3.33	0	1.28	5.15	1.52	2.92	4
Theridion pallens Bl.	23	16	19	4.23	10.26	5	11.63	10.00	6	12.18	0	6.06	8.76	6
Tetragnatha sp.	1	1	1	0	0	0	0	3.33	0	0.64	0	1.52	0	0
Meta merianae (Scopoli)	1	0	1	0	0	0	0	0	2	0	1.03	1.52	0	0
Araneus sp.	1	1	1	0	0	0	0	0	2	0.64	0	0	0.73	0
Zygiella atrica (C. L. Koch)	1	1	1	1.41	0	0	0	0	0	0.64	0	0	0.73	0
Thyreosthenius parasiticus (Westr.)	35	23	18	11.27	5.13	5	2.33	3.33	10	7.69	6.19	7.58	5.11	12
Labulla thoracica (Wider)	1	0	1	0	0	0	0	0	2	0	1.03	1.52	0	0
Lepthyphantes minutus (Bl.)	6	3	6	7.04	0	0	0	0	2	0	6.19	1.52	1.46	6
Linyphia montana (Clerck)	2	1	2	2.82	0	0	0	0	0	0.64	1.03	1.52	0	2
Total no. spider species: 19				14	4	2	4	5	10	13	11	12	12	9
Total no. spider individuals: 191					4		7							

Table 1: Frequency of occurrence of Pseudoscorpiones, Opiliones and Araneae in 400 cc samples of dead wood in trees, Wytham Woods, winter and summer 1969. Figures given are percentage of samples in each category in which each arachnid species occurred. Data are divided according to (1) tree species, (2) season and (3) Elton's (1966) strata in woodland. Total number of samples in which each arachnid species occurred (out of 253) is given, along with total individuals of each species and number of immatures included in former figure.

(n.d. = not distinguished from adults); *J. Phillipson det. 1970; †G. H. Locket det. 1975 as probably this species.

sampled the same layers by sweeping and beating (except that he sampled Low Canopy as used by Elton & Miller (1954) – from 1.8 m to 7.5 m – instead of Shrub Layer as used by Elton (1966)); he also box-sampled the Ground Zone. He found that *T. pallens* was the most abundant spider; it was present in large numbers in all strata except the Ground Zone (Turnbull, 1957). However, Locket & Millidge (1953) say "it is also found amongst low plants and even fallen leaves", i.e. as well as "by beating trees, especially evergreens".

Elton (1966) quotes Nielsen (1932) who found that in Denmark *T. pallens* over-winters on the ground or in the Ground Zone, but in our study these over-wintering spiders were at all heights up to 6.0 m above the ground (in 6% of all the samples taken from the Field Layer, in nearly 9% of all those taken from the Shrub Layer and 6% of all those from the Canopy, i.e. taking account of all 253 samples). The same picture is repeated, but more emphatically, if one examines the winter samples alone, since *T. pallens* was found only then in our samples. In the 156 winter samples, it occurred in 9% of the Field Layer samples, in 14.8% of those from the Shrub Layer and in 9.7% of those from the Canopy. Our samples suggest that, in winter, *T. pallens* was probably tucked away in crevices of any cover available, especially that provided by loose bark, and not moving on the surface.

For 11 samples (of which only one had *T. pallens*), no data are available on the presence or absence of loose bark. Only 57 of the remaining 242 samples had really loose bark. The figures for the spider are so small that a formal χ^2 test shows no significance between the presence of the spider and the presence or absence of loose bark. However, the fact that *T. pallens* was present in 17.5% of the samples with loose bark and in only 4.3% of those without loose bark is suggestive of the importance to the spider of this kind of cover. Table 2 shows the percentage of the surface area (estimated) and roughly the area that this represented of each kind of cover. The area of

Sample no.	Tree sp.	Loose bark % total area (*ca* area cm²)	Foliose lichens (*ca* area cm²)	Degree of burrowedness of wood	Cubical red rot % volume of sample	Moss: % total area	No. *T. pallens* present
14	oak	0	24%(60)	0	5%	2%	2
20	oak	0	0	0	0	0	1
40	oak	0	25%(60)	0	0	0	1
42	ash	2%(10)	0	0	0	0	1
49	ash	2%(10)	0	0	0	0	1
50	ash	75%(190)	0	0	0	0	1
58	ash	0	0	0	0	0	1
67	ash	33%(270)	0	NDA	NDA	0	2
85	syc.	NDA	0	0	0	0	1
92	syc.	0	0	1	0	0	1
101	syc.	75%(640)	0	0	0	0	3
102	syc.	75%(590)	0	1	0	0	1
103	syc.	0	0	0	0	0	1
110	syc.	37%(200)	0	0	0	0	1
118	syc.	P	0	0	0	0	1
126	syc.	98%(260)	0	0	0	0	1
140	hawth.	100%(540)	0	0	0	0	1
142	hawth.	0	2%(20)	NDA	0	0	1
154	hawth.	0	0	0	0	0	1

Table 2: Samples in which *Theridion pallens* was found, showing numbers of individuals and percentages of total bark surface area of each sample having each kind of potential cover. (Approximate actual areas of loose bark and foliose lichens given in brackets.)

NDA = No data available; P = Present, but amount not recorded; Degree of burrowedness of wood (i.e. old insect burrows); 1 = few burrows, 2 = moderately burrowed, 3 = much burrowed.

loose bark and foliose lichens present varied between about 10 and 640 cm^2, but there was no correlation between the number of *T. pallens* in a sample and the area of this cover.

Besides the samples with loose bark, three further samples containing the spider had some foliose lichens and one of these also had a little cracked red rot. Only four samples containing the spider had no cover. Of all the samples with the spider, only one (of 19) had a little moss, only one (of 18 with data) a little red rot, cubically cracked (though such cracks appear usually to be too narrow for even a small spider), only two (of 17) a very few burrows, three (of 19) had foliose lichens and 10 (of 18) had loose bark. A χ^2 test on the effect of presence or absence of the last three kinds of cover (taken together) suggests that cover was important to *T. pallens* though the figures are not significant (χ^2 = 3.147, 1 d.f., $p < 0.10 > 0.05$), (152 samples with this cover, 82 samples with no cover, 19 samples with data missing).

Support for these results lies in the fact that Curtis & Morton (1974) did not find this species in their winter study of the active, therefore trappable, surface spider fauna of oak, birch and Scots pine trunks on the island of Inchcailloch, Loch Lomond. They sampled spiders moving about on the surface of nine trees by means of corrugated paper wrapped twice around each trunk at about 1.5 m above the ground, thus providing additional, removable "cracks and crevices in the bark" and especially tunnels *ca* 3 x 3 mm across. Their study was done "in the winter months of 1971-72", so that *T. pallens* could already have been in its hibernation sites when they started work. Furthermore these sites are likely to have been on the branches, where we found them, not on the main trunk. The distribution map for this species (Locket, Millidge & Merrett, 1974) shows that its range extends throughout England and Scotland as far north as Inverness, so the spider is probably in their study area.

The other common spider in our samples, *Thyreosthenius parasiticus*, occurred in both winter and summer samples (the latter were taken at weekly intervals in August 1969). This species was present in nearly 8% of the 156 winter samples and 6% of the 97 taken in summer. It was found on all four species of trees sampled – in 11% of the 71 oak samples, 5% of 59 ash samples, 3% of 73 sycamore samples and 11% of 50 hawthorn samples.

The remarkable thing about its frequency of occurrence was that despite these facts it had never before been recorded from the Wytham area though spiders are a comparatively well-collected group there. However, the most thorough collecting in the past has been by Turnbull (1960) who extracted spiders from the litter in Tullgren funnels, swept the Field Layer and beat the Low and High Canopy, and by Duffey (1956, 1962a, b) who studied mainly the grassland areas. The spider was said by Locket & Millidge (1953) to live "In subterranean places (e.g. disused sewers, inspection pits, cellars, mines), outhouses, birds' nests [and to be] widespread throughout the British Isles; infrequent."

Before we found *T. parasiticus* as a regular inhabitant of dead and dying wood in trees, the only indications that it really is a woodland species and that trees might feature largely in its habitat requirements came from Bristowe's (1958) record of this spider from a rook's nest and Mr Locket's unpublished record from an old crow's nest from the top of an elm tree (pers. comm.). The first published report of the spider from trees themselves is by Curtis & Morton (1974) in winter 1971-72; they found 1♂ 2♀♀ in their tree trunk traps at two of their sites on the island in Loch Lomond. This shows that the spider can be active on the surface of the trunk in winter, but it was an insignificant part of the surface fauna.

There are many more unpublished records of odd individuals from woodland tree habitats. Dr Merrett has kindly allowed us to publish the following: "John Crocker has found it in old oakwoods in Leics. in accumulated litter around bases of trees, from dead leaves in holes in trees, in twiggy clusters against trunk, on trunk of tree, under slab outside house in wood; I have found it among heather in the New Forest, and among heather but near an old pine stump in Suffolk; Mrs Crowson has taken it in a number of woodland sites in Scotland . . . (oakwoods)." Cooke (1967) found it in a "Thin layer of moss and lichen encrusting a large boulder" in Rothiemurchus Forest. Mackie's (1962) record for it "in long grass at Lyme Park, Disley (Cheshire)" gives no indication of the major habitat of the spider.

Dr P. Merrett has since looked for and found this spider under loose bark of aerial dead wood and large fallen logs (beech and oak) in woodlands in Dorset, Hampshire and Sussex (pers. comm.).

Table 3 for our samples shows that, as with *T. pallens*, the figures for *T. parasiticus* are too small to demonstrate statistically significant differences between the distribution of the spider and the presence or absence of cover of various sorts; they are, however, again suggestive of the importance of cover to this spider. *T. parasiticus* was present in 14% of the 57 samples with really loose bark, but in only 5.4% of the 185 samples without this cover. Eight of the 18 samples with the spider had loose bark (five had all their bark loose and a further three had from a quarter to two-thirds of it loose). The areas of loose bark and foliose lichen were roughly between 20 and 400 cm^2, and again there was no relationship between the number of *T. parasiticus* in a sample and the area of this cover. Besides these eight loose-barked samples, three more samples had foliose lichens as their principal cover, one was much burrowed and one moderately burrowed by insects; two more were largely red-rotted, with cracks in the cubical rot; a third of one sample was covered with mosses and had a few burrows; one had only a trace of cubical red-rot. Only one sample had no cover of any sort, but at least five of the 18 samples offered more than one kind. Again, if the presence or absence of at least one of the first three kinds of cover (loose bark, foliose lichens and insect burrows) and occurrence of *T. parasiticus* are tested, the results are suggestive of the importance of cover to this species, the figures being drawn from both winter and summer (χ^2 = 3.147, 1 d.f., p $< 0.10 > 0.05$).

The less common species

Table 1 shows that only eight other spider species occurred in more than one sample (of the 253): *Segestria senoculata* (L.)*‡ and *Theridion mystaceum* L. Koch in seven samples, *Lepthyphantes minutus* (Blackwall)*† in six, *Coelotes atropos* (Walckenaer)* in four, *Anyphaena accentuata* (Walckenaer)*‡ in three, and *Clubiona corticalis* (Walckenaer)*†, *Philodromus* sp.* and *Linyphia montana* (Clerck) each in two samples. Most of these are to be expected since

Sample no.	Tree sp.	Loose bark % total area (*ca* area cm²)	Foliose lichens (*ca* area cm²)	Degree of burrowedness of wood	Cubical red rot: % volume of sample	Moss % total area	No. *T. parasiticus* present
12	oak	100%(350)	5%(20)	3	0	0	1
26	oak	0	0	0	2%	0	1
32	oak	0	0	3	0	0	1
35	oak	100%(140)	2%(3)	2	0	2%	7
179	oak	0	25%(60)	0	5%	0	1
182	oak	100%(260)	0	0	0	0	2
183	oak	100%(260)	0	1	0	0	4
184	oak	0	0	2	0	0	1
65	ash	67%(260)	0	0	0	0	2
67	ash	33%(270)	0	NDA	NDA	0	1
191	ash	0	0	0	0	0	1
106	syc.	0	16%(40)	0	0	0	1
112	syc.	25%(220)	0	0	0	0	1
128	hawth.	0	5%(20)	2	P	0	5
130	hawth.	0	0	1	0	33%	1
139	hawth.	100%(400)	0	NDA	NDA	0	1
150	hawth.	0	0	0	96%	0	1
250	hawth.	0	0	1	78%	25%	3

Table 3: Samples in which *Thyreosthenius parasiticus* was found, showing numbers of individuals and percentages of total bark surface area of each sample having each kind of potential cover. (Approximate actual areas of loose bark and foliose lichens given in brackets.)

NDA = No data available; P = Present, but amount not recorded; Degree of burrowedness of wood (i.e. old insect burrows); 1 = few burrows, 2 = moderately burrowed, 3 = much burrowed.

they have been found arboreally before by Larkin & Elbourn (1964, marked *) and Elbourn (1970, marked †) in dead branches or artificial "logs", and on the surface of the main trunk by Curtis & Morton (1974, marked ‡).

The large number of *Coelotes atropos* (71, including 70 immatures, in only four samples) highlights the fact that the young of this species remain with their mother till they have reached a more advanced stage of growth than do the young of any other British spider (Bristowe, 1958). Here, one hawthorn sample contained 43 immature *C. atropos* and one oak sample had 1♀ and 17 immatures. All were in samples collected in summer.

Theridion mystaceum was the second most frequent theridiid in these dead wood samples; Turnbull (1960) also found it to be the second most abundant theridiid to *T. pallens* in his study of oak trees in Wytham Woods. Unlike *T. pallens*, it occured in our summer samples as well as in the winter ones.

Like *T. pallens, Clubiona* (?*brevipes* Blackwall) (one immature specimen) and *Anyphaena accentuata* (three specimens, of which two were immature) occurred in only winter-collected samples of dead wood; like *T. pallens* they spend the summer in the foliage of trees and shrubs, from which they can be beaten (Locket & Millidge, 1951).

Only a single immature *Amaurobius* sp. was found in our samples; Larkin & Elbourn (1964) also found only a single *Amaurobius fenestralis* (Stroem) in their natural samples of dead oak branches on trees, but none in their sawdust-filled Fager-type artificial oak boxes (Fager, 1968) (see their full MS in the Wytham Ecological Survey). Their natural samples, like ours, came from smallish branches.

Furthermore, though their experimental boxes were attached to the main trunks of oak trees (at 1.2 and 4 m above the ground), they were merely packed with untreated sawdust and no extra cover or shelter was provided within the boxes for animals which could not burrow. It is scarcely surprising therefore that no *Amaurobius* spp. appeared in them.

However, both *A. fenestralis* and *A. similis* (Blackwall) have been found on a number of occasions in Wytham Woods, the former, according to Locket & Millidge (1951), being more frequent in the north (of the British Isles) and the latter in the south. The surprising thing is that only a single specimen of an *Amaurobius* sp. was found among our 19 spider species though *A. fenestralis* was abundant in both Elbourn's (1970) Wytham study and Curtis & Morton's (1974) Scottish study.

The reasons seem to be first that both these studies provided ideal cover for the spider (the former: sawdust-filled Fager-type oak boxes with extra cover for non-burrowers provided inside 60% of them, and the latter: corrugated paper); secondly, this cover was attached to the main trunk of the tree.

Elbourn's oak boxes, attached at 1.2 m above the ground, provided various combinations of added "structure" and "nutrient" as well as "control" boxes with neither; and one other set had two long tubular "boreholes" running through the length of each box. Each experimental set-up was replicated four times. The four boxes with boreholes had 17 of the total 45 *Amaurobius fenestralis* found (i.e. more than a third), while the remaining 12 boxes housed the other 28 specimens.

A. fenestralis was abundant (22 adults, 54 immatures) under the corrugated paper of Curtis & Morton's (1974) study, but only three *T. parasiticus* were trapped in this way, and these workers caught no *T. pallens* though the study was done in winter (see above for possible reasons).

However, since the *Amaurobius* spp. are much larger than the most frequent two spider species in this study, perhaps one would expect the individuals to be widely spaced even on large-sized wood, and perhaps the remarkable thing is how dense they were when a great deal of extra cover was provided artificially on the main trunk in both Elbourn's and Curtis & Morton's studies. The single specimen in our 253 samples of natural small branches should really be compared with their density on natural trunks and large limbs without artificially added cover.

Discussion

It seems that the kind of, and/or situation of, loose bark which is suitable for *T. parasiticus* and *T. pallens* must be different from that needed by *A. fenestralis*, since these studies show that the first two versus the last species are almost mutually exclusive. The larger spider, *A. fenestralis*, appears to need long, tubular crevices in large-sized wood, perhaps to spread its circle of trip wires around the mouth of its tube. There is some support for this idea from the punchcards in the Wytham Ecological Survey: eight cards record *A. fenestralis* from standing trunks and large fallen limbs (elm, birch, beech and ash in Wytham Woods, ash in Wychwood Forest, Oxon, and alder by the R. Feshie, Inverness-shire); there is a record for it in soft wood 'ripe' of mostly hawthorn logs in Wychwood Forest where there were many ancient hawthorns of enormous size; and there are the published records also for this spider from a fallen heron's nest (Donisthorpe, 1935) and from leaf litter in a Devon oak wood (Gabbutt, 1956).

The two smaller species, *T. parasiticus* (in 18 of our samples) and *T. pallens* (in 19 of them), occurred together in only a single sample, as one would expect by chance in 253 samples. It is suggested that both were associated with the presence of cover (notably loose bark, but also with burrows or cover from foliose lichens) though the small numbers mean that the relationships were not statistically significant.

However, both species were widely distributed throughout the study area: the 19 samples with *T. pallens* had been collected from 15 different trees, and the 18 samples with *T. parasiticus* had been taken from 14 trees. Only one ash tree and one hawthorn had both spider species in the samples taken. All the old hawthorns grew at the south end of the study area and *T. parasiticus* was more frequent in this southern half (12 of the 14 trees being here, whereas only 9 of the 15 trees with *T. pallens* were in this half of the area studied).

Table 1 shows the distribution of these two spiders according to tree species; though *T. pallens appears* from these data to prefer sycamore canopy and understorey and ash canopy, while *T. parasiticus appears* to be associated with oak and hawthorn in preference to the other two tree species, the figures are very small and χ^2 tests show no significant differences between the distribution of either spider according to the tree species on which it occurred. However, these results suggest that, if samples with suitably loose bark for these spiders were to be collected from branches of each tree species, the question of possible preferences could be properly investigated in the future.

It seems likely that *T. pallens* hibernates on or near trees where its prey has been dense, while the distribution of *T. parasiticus*, which lives all the year round in dark crevices, may be connected with the abundance of sub-cortical prey. For example, it is worth noting that the most abundant collembolan, the springless hypogastrurid, *Xenylla boerneri* Axelson, was present in 98% of all the hawthorn samples and 80% of all the oak samples, but in only 30-67% of the samples taken from the other trees, canopy and understorey. This is a more likely reason for this spider's possible preference for these two tree species than the fact that their bark may be more fissured than that of ash and sycamore. This fissuring does not apply to all small branches of oak and hawthorn, and these crevices when present are much shallower, providing much less cover, than those on the main trunk which were examined from the point of view of the cover provided for spiders by Curtis & Morton (1974).

Conclusion

Through the use of a collecting technique seldom used by arachnologists (cf. Duffey, 1972), new information about hibernation sites has been revealed about a common spider, *T. pallens*; also a spider which had been associated with the darker buildings of man, *T. parasiticus*, has been found to be widespread in aerial dead wood in woodland. Both require a different sort of shelter in the dead wood from that which *A. fenestralis* would commonly use. *T. pallens*, hibernating, and *T. parasiticus*, living in dead wood all the year, need the same sort of loose-barked shelter. It is possible that tree species may differ in their attractiveness to the two spider species – perhaps because of differences in the abundance and distribution of prey populations. Alternatively, any tree species may be attractive to *T. pallens* in a year of high prey density on the leaves, while any tree may become increasingly attractive to *T. parasiticus* with increasing age and abundance of dead wood with loose bark and sub-cortical prey.

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