

also searched but here only *Pardosa* and *Trochosa* were found.

These were collected and released on more 'typical' habitat of sparsely vegetated chalky soil on field margins left as arable weed strips.

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Identification of Species in the Genus *Dictyna* (Dictynidae)

Currently there are five species in the genus *Dictyna* which you might encounter in Britain. These are small cribellate spiders with adults ranging in size from 1.5-3.5mm. Some have distinctive abdominal patterns when in good condition. But because their appearance depends on both the underlying colour of their skin (which darkens as they age) and the colour and reflectivity of their pale scales and hairs, a selection of individuals from the same species can vary considerably. There is also overlap in their normal habitats across herb/shrub/tree layers.

General characteristics - They belong to a family (Dictynidae) known as small mesh weavers which trap their small prey in irregular tangles of fluffy silk, very often in the dead flower heads of grasses, heather, gorse, juniper and pine. The spiders are to be found within these tangles often at the axils of flowers or leaves/needles.

In general, due to the lack of reliable field characters, confident identification of these species will require microscopic examination of adult specimens.

Male palps can be examined with the whole animal immersed in preservative. For ease of comparison, the left palp (while still on the spider or detached) should be examined in the same orientation as shown in the diagrams. You should be able to see the same structures. You can now refer to the diagram of a *Dictyna* palp on the following page and use the tabular key to identify your male spider.

Female spiders - initially the females can be examined in preservative, with the plane of the epigyne perpendicular to the angle of view. Your specimen can be compared with the illustrations on the following pages.

Differences in the internal plumbing (adnexae) behind the epigyne provide easy separation of the species. Examination of this is likely to be essential for confirmation of *Dictyna pusilla* and where the epigyne and underlying organs are obscured in other species. In recently matured specimens the integument may still be sufficiently transparent for these to be visible, but in many specimens the epigyne will have to be cleared by immersion in a fluid with a low refractive index which can soak into the tissues. With such small spiders the whole animal can be submerged in 100% alcohol to remove most of the remaining water and then immersed in the clearing fluid until the structures become visible. Easily available substances like clove oil or oil of wintergreen can be used but ethylene glycol does a quicker job with no smell. Please refer to the tabular key and illustrations of the adnexae.



Dictyna pusilla female - adnexae
note U-shaped ducts



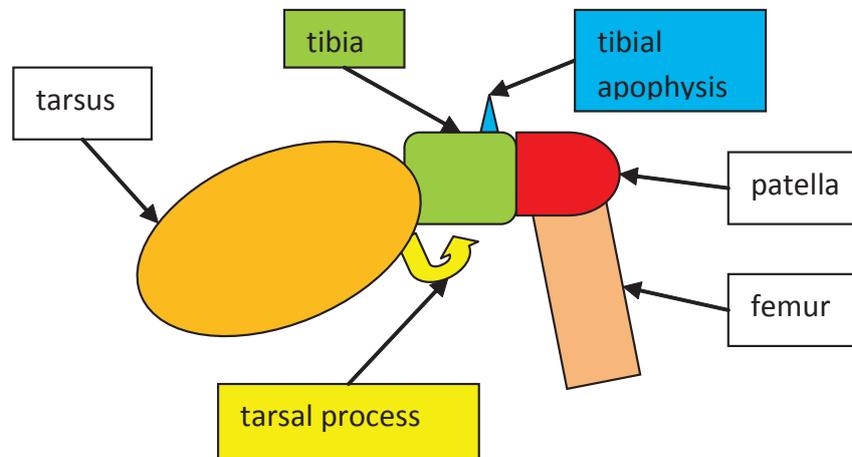
Dictyna pusilla female



Dictyna arundinacea female

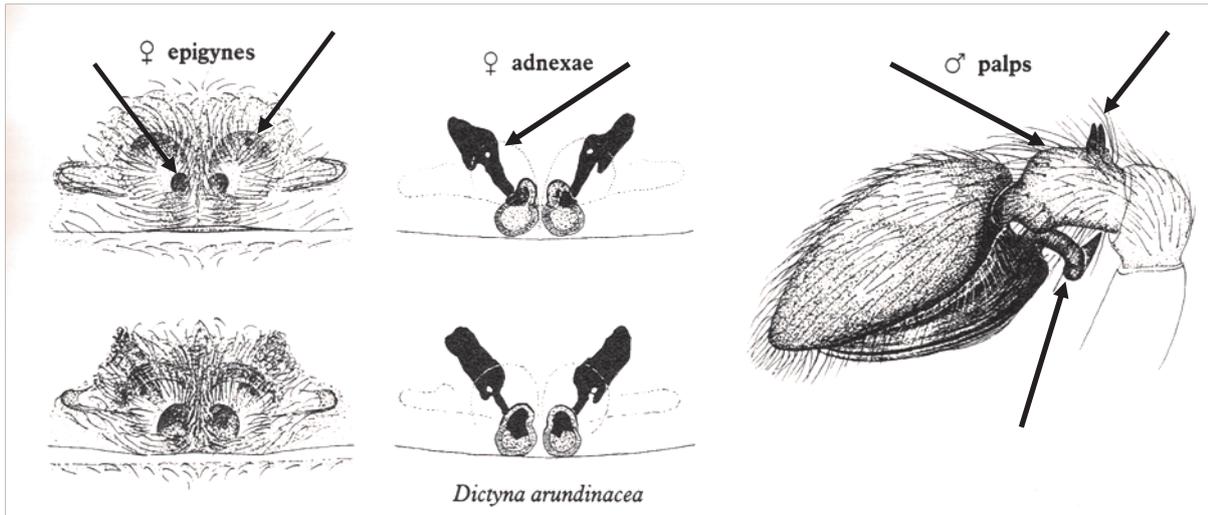
Key features of the *Dictyna* palp:

Terminology: The femur attaches (via two short segments) to the spider. The patella has no outgrowths in *Dictyna*. The tarsus is the terminal segment of the palp developed with various structures to assist in mating and insemination. In *Dictyna* the robust tarsal process is useful for identification by considering shape and orientation. The tibial apophysis is a bifid structure on the upper side of the tibia. The shape of the tibia is also useful, especially for separating *D. arundinacea* and *D. pusilla*.

**Tabular key for *Dictyna* spp.**

	Features of male palps			Females
Species	Tarsal Process	Shape of Tibia	Tibial Apophysis	Cleared adnexae
<i>D. arundinacea</i>	Curled and pointing up to tibia	Oblong	Bifid and removed from the patella joint	Ducts pointing upwards at 45° with thick upper section
<i>D. pusilla</i>	Curled and pointing up to tibia	Almost triangular looking like a cat's head in profile*	Bifid and forming the apex of the triangular tibia	Ducts U-shaped with upper sections curving outwards
<i>D. uncinata</i>	Curved and pointing down	Oblong with ventral extension at tarsal joint	Very long bifid process at patella joint	Like a pair of desk lamps or flowers curving up and outwards
<i>D. major</i>	Curved and pointing down	Oblong	Slightly curved apophysis with twin spurs	Thick structures at 45° with thinner "beaks" pointing down and in to centre
<i>D. latens</i>	Almost straight and pointing backwards	Oblong	Very small apophysis near middle of tibia	Indistinct circular structures

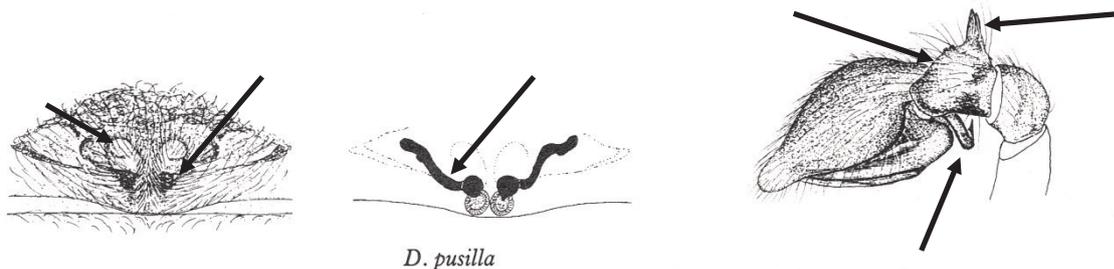
*the shape of the tibia in *D. pusilla* is not accurately represented in Locket & Millidge (1951). This may explain some of the difficulty in separating *D. pusilla* and *D. arundinacea*.

Dictyna arundinacea

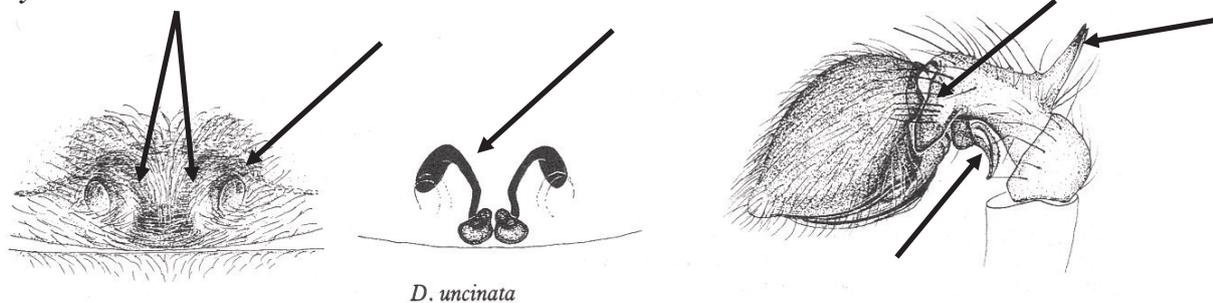
This is the commonest species of *Dictyna*, found throughout the British Isles, making its tangled web and making its egg sacs in the heads of grasses and heather stems.

Male Palp - the tarsal process curls up towards the tibia. The tibia is oblong with a distinct bifid apophysis. This species is easily confused with *D. pusilla* - which is smaller and has a more triangular tibia (see below).

The epigyne has the paired openings of the ducts close together within two large circular areas giving the appearance of a cross-eyed owl. The cleared adnexae are set at about a 45° angle starting thin and becoming abruptly thick. Two examples of the epigyne and adnexae are illustrated above.

Dictyna pusilla

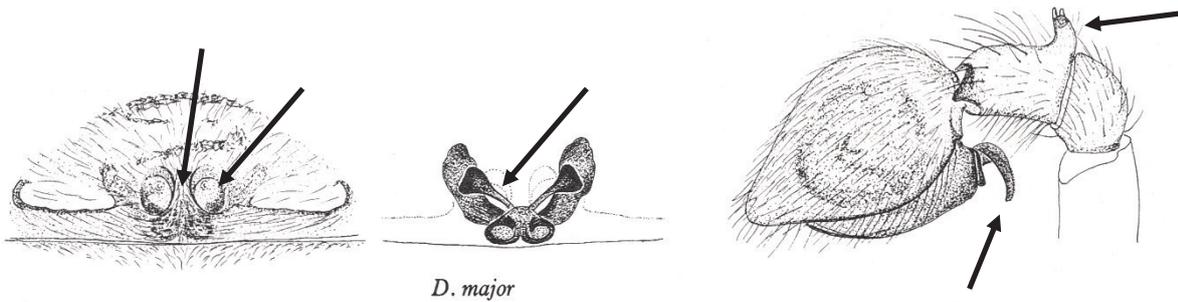
This species has been most commonly found in NE Scotland (with scattered records elsewhere) where it can be abundant on juniper, gorse, yew and pine, making its web in the axils of the needles or spines, often binding dead flowers into the structure. It is also found in grasses and heather, perhaps as a secondary habitat. The male palps are similar to, but smaller than, those of *D. arundinacea* - but the tibia is almost triangular in shape - perhaps like the profile of a cat's head. In the epigyne the paired dark openings of the ducts are set in smaller oval areas compared with *D. arundinacea*. The cleared ducts are fairly uniform in thickness and form a 'U-shape' curving upwards and then outwards. This may be visible in recently matured specimens.

Dictyna uncinata

This species is often found by beating bushes and trees but also occurs on lower vegetation in dead flower heads. It has been found on railings by the River Tay.

The openings on the epigyne are well separated (see arrows) compared with the previous species, with a broad ridge between them. The cleared adnexae look like a pair of droopy flower heads or desk lamps with the shades turned out and down.

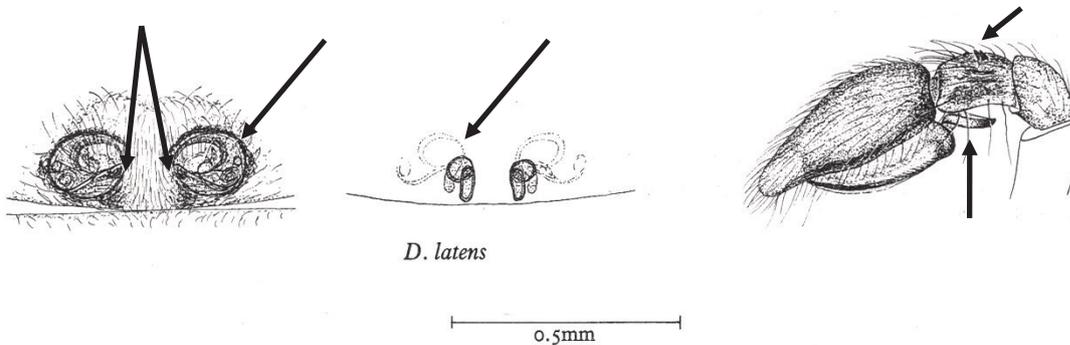
The palp has a downward curving tarsal process (as in *D. major*) and a long, slender bifid tibial apophysis. The tibia also has a broad, sword-like downward projection (see left hand arrow in palp illustration).

Dictyna major*D. major*

This is a rare species associated with freshwater and coastal shoreline debris and sand dunes in Scotland. It is under threat from habitat loss and human pressures on shores. They make their egg sacs amongst strandline debris and the adults can be found wandering over the sand dunes/shore in late spring and early summer.

This species does have a distinctive and fairly reliable three pointed cardiac mark on its abdomen. The palp, with its downward curving tarsal process and bent tibial apophysis with a pair of tubercles is easily recognised. Compare with *D. uncinata* which has a similar tarsal process.

The epigyne is perhaps most similar to *D. pusilla* but the adnexae have thick V-shaped structures, with thinner "beaks" pointing down to the centre. Like a pair of storks arguing over a delivery!

Dictyna latens*D. latens*

0.5mm

This is a species of grassland, heath and scrub - usually found on heather and gorse. Widely distributed in southern Britain but only reaching SW Scotland.

The epigyne has fairly distinctive circular structures separated by a broad ridge (double arrows). The adnexae are indistinct circular structures and should not be confused with any of the other species.

The palp, at first sight, is lacking a tibial apophysis - but it is very small and near the centre of the upper surface. The tarsal process is backward pointing.

In life the spider is dark with distinctive white hairs and examination of palp or epigyne should make it readily identifiable.

Acknowledgements

I am grateful to Michael Roberts for permission to use his excellent B&W illustrations of *Dictyna* palps and epigynes.

References:

- Roberts, M.J., 1985. *The Spiders of Great Britain and Ireland*. Vol 1. Harley Books. See pp. 50-51 for descriptions & Vol 3. for plates 4-6.
 Roberts, M.J., 1995. *Spiders of Britain & Northern Europe*. Collins Field Guide. Harper Collins, London. See pp. 82-5 for descriptions & plate I.
 Locket, G.H. & Millidge, A.F., 1951. *British Spiders*. Vol. I. Ray Society, London. See pp. 56-62.

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