

The theridiid spider *Steatoda nobilis* (Thorell, 1875) in Britain

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Summary

Steatoda nobilis (Thorell, 1875) is recognised as a British species and is redescribed from British material. An outline history of the occurrence of the species in Britain, and its present known distribution, are presented, together with some observations on its behaviour and general biology.

Introduction

Since the mid-1870s *Steatoda nobilis* has been taken in Britain on several occasions. It has always been assumed that these were chance imports, usually in fruit from the Canary Islands, and that they could not have established themselves. However, it is now obvious that since at least 1986 there have been flourishing populations of this species which are now well established in southern Britain, and it can therefore be accepted as a member of the British fauna.

Steatoda nobilis (Thorell, 1875) (Figs. 1–5)

Lithyphantes nobilis Thorell, 1875: 60; Kulczynski, 1899: 376.

Steatoda clarkii O. P. -Cambridge, 1879: 193.

Teutana nobilis; O. P. -Cambridge, 1899: 6; Jackson, 1907: 3; Roewer, 1942: 416; Bonnet, 1959: 4376.

Steatoda nobilis; Levi, 1957: 367; Schmidt, 1971: 428; Jones, 1979: 3; 1987: 7.

Male

Total length: 7.8–10.6 mm. **Carapace:** Length 3.1–4.6 mm, width 2.3–3.4 mm. Dark red-brown with darker radiating striae. Rugose, with sparse short hairs becoming longer and more numerous in cephalic region. Fovea a shallow circular pit. Posteriorly with two areas of stridulatory ridges (Fig. 4). **Eyes:** Subequal; posterior row straight, anterior row recurved. **Chelicerae:** Fang modified; it has a broad, flattened area with a row of tiny denticles on the posterior edge closing on to a large blunt tooth or boss; point of fang scimitar-shaped. **Sternum:** Heart-shaped. Dark red-brown and extending between coxae IV. Mostly covered with strong hairs, all of which arise from modified, elongated bases, similar in form to those in *Steatoda grossa* (C. L. Koch) but far more pronounced. An anterior median longitudinal area is devoid of hairs. **Legs:** I, II=IV, III. Pale yellow-brown with slight darkening distally on tibiae. Little differentiation between hairs and spines on all legs. Hairs most dense and with large hair bases ventrally on all tarsi and metatarsi. Large

hair bases also ventrally on tibiae I and II. Tarsi IV with a ventral row of serrated bristles. **Abdomen** (Figs. 3, 4): Dorsally with rather variable folium of dark purple, cream and white with 4 major and up to 6 minor reddish impressed dots. The pale central area of this folium often contains a pair of short, longitudinal dark bars. Clothed with short hairs which are more dense posteriorly. A ventral pale area often contains a dark spectacle-shaped mark, although in many pale specimens this is reduced to a pair of dark spots. A sclerotised area extends forwards from epigastric fold to form an anterior "collar" round pedicel. The antero-dorsal ridge formed by this sclerotised collar carries 10–12 flattened teeth on either side, each of which in turn bears a single hair or bristle. This structure, in conjunction with the 2 posterior areas of stridulatory ridges on the carapace, forms a complex stridulatory organ. **Palp:** Figs. 1, 2.

Female

Total length: 9.5–14 mm. **Carapace:** Length 4.4 mm, width 3.4 mm. Similar to male, but cephalic region relatively narrower. Dark red-brown as in male but generally smooth, lacking both the rugosity and areas of stridulatory ridges. **Eyes:** As in male. **Chelicerae:** Fang not modified. With a single large cheliceral tooth. **Sternum:** Shape as in male but lacking modified hair bases. **Legs:** As in male but a little more robust. Row of serrated bristles on tarsus IV more strongly developed. **Abdomen:** Dorsally purple-brown with a whitish arcuate stripe on anterior surface. A rather variable folium is present in most immatures but is almost entirely lost at the last moult. Ventral dark, spectacle-shaped mark of male usually obscure, whole area being more or less darkened. **Epigyne** (Fig. 5): Similar in conformation to that of *S. grossa*, but median septum broad with straight, parallel sides while that of *S. grossa* (Fig. 6) is narrower with sigmoid sides.

Remarks

Steatoda nobilis is very variable in size, with some British females reaching 14 mm in length when gravid. Thus it is currently the largest British *Steatoda*. There are also indications that British specimens are generally rather larger than those from further south. The lengths of specimens taken in Portugal were approximately 7–8 mm for males and 10 mm for females (J. A. Murphy, pers. comm.), and those from Lanzarote and Tenerife were similar. British specimens have shown males to range from 7.8–10.6 mm and females from 9.5–14 mm. However, these measurements were taken from small numbers of individuals.

The genus *Steatoda* is represented in Britain by 5 species and there are several more in Europe; some species from southern Europe are yet to be described. In general, *S. nobilis* can be distinguished from the other British species by its large size and typical coloration, although the latter can be variable and occasionally a female *S. grossa* can reach a similar size. However, the male can be distinguished by the conformation of the palp and usually by the ventral abdominal markings. The female is distinguished by the epigyne.

Occurrence

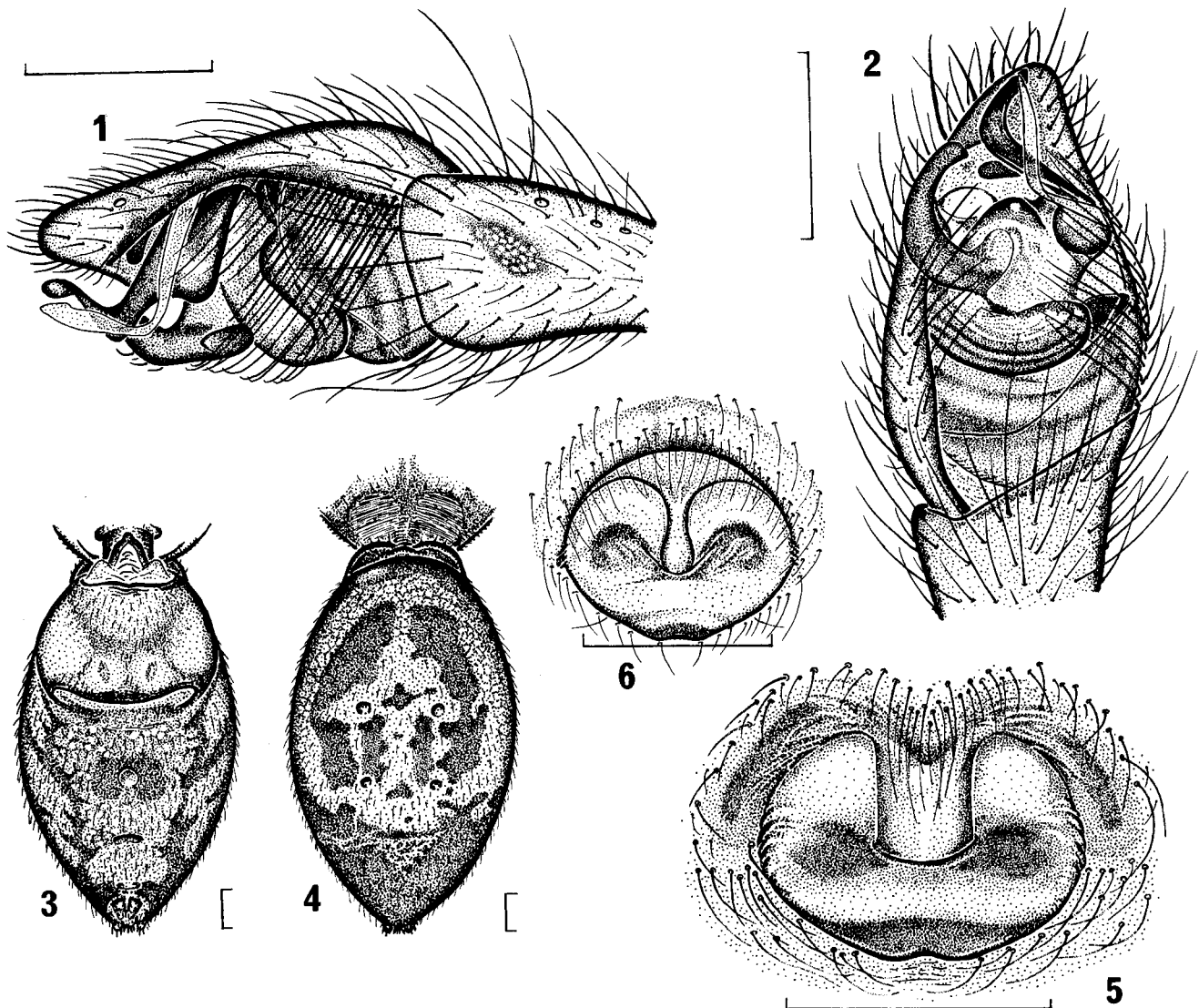
Steatoda nobilis was first described by Thorell (1875) as *Lithyphantes nobilis* from Madeira, and was first reported in Britain, described as *Steatoda clarkii* sp. n., by Pickard-Cambridge (1879), although he had received the specimen, taken by the Rev. Hamlet Clark near Torquay, "some years ago". After examining specimens of *L. nobilis* from Spain and Madeira, Pickard-Cambridge (1899) synonymised *S. clarkii* with that species and tentatively named it *Teutana nobilis*. Eight years later, he described several specimens which had arrived with bananas from the Canary Isles. Jackson (1907) was sent a single female, which he called *Teutana nobilis*, by W. H. Bennett of Hastings who found it "far from any house, and in such a situation that importation was out of the question". Bristowe (1930) listed *T. nobilis* among spiders imported from the Canaries which had not established themselves, and again in 1941 in the *Comity of spiders as "Lithyphantes nobilis (not established G.B.)"*. In his work on the genera *Crustulina* and *Steatoda* in North America, Levi (1957) concluded that the characters used to dis-

tinguish the genera *Lithyphantes*, *Teutana* and *Asagena* were not applicable on a world-wide basis, being based solely on the European fauna. Thus all species previously assigned to these genera are congeneric and should be assigned to *Steatoda* Sundevall, 1833.

The next occurrence of the species in Britain was recorded by Jones (1979). A single female was found, and observed in some detail during the winter of 1978/9. However, despite a search of the locality no further specimens were found.

It was not until 1986 that *S. nobilis* was again discovered by D. J., this time in large numbers in several areas of suburban and central Portsmouth. These populations have continued to thrive through at least one very cold winter, including a two-week period during which the temperature did not rise above freezing point, and two cool summers. This ability to survive such low temperatures seems surprising in a species thought to originate in the Canary Isles and Madeira.

In May 1989 a large subadult male *Steatoda* was taken by R. S. in a house in Swanage, Dorset. This moulted 2 weeks later and was found to be *S. nobilis*. A female was



Figs. 1-5: *Steatoda nobilis* (Thorell). 1 Left male palp, ectal view; 2 Left male palp, ventral view; 3 Male abdomen, ventral view; 4 Male abdomen, dorsal view; 5 Epigyne.

Fig. 6: *Steatoda grossa* (C. L. Koch). Epigyne. Scale lines = 0.5 mm.

found shortly afterwards by R. S. in a stone wall about 250 m from the original location. Subsequent searching has revealed that the species is common in central southern Swanage, particularly on the limestone walls which abound in the area. It is also evident that the spiders are spreading quite rapidly as some walls, built within the last 18 months, have been well colonised already (P. Merrett, pers. comm.).

Harvey (1990) reported a population of *S. nobilis* occurring in a house and garden in Westcliff-on-Sea, Essex. In the same year a single female with an egg-sac was found in Littlehampton, West Sussex (C. Topping, pers. comm.); a male has since been found in the same area. The following year, Warrell *et al.* (1991) recorded a case of a young woman being bitten by a female *S. nobilis* in Worthing, Sussex.

Outside Britain the species has been recorded from Madeira, the Canary Islands (Lanzarote and Tenerife), and has been found in abundance near Viana do Castelo (Minho Province) in northern Portugal (J. A. Murphy, pers. comm.). It has also been reported from Corsica (A. Canard, pers. comm.). Pickard-Cambridge (1899) examined specimens from "Spain and Madeira" but did not specify a more accurate provenance. Schmidt (1971) recorded *S. nobilis* from Germany, but did not suggest that this reflected anything other than chance imports with bananas from the Canary Islands.

Biology

Abroad, *S. nobilis* has been found in a variety of situations. In Lanzarote it has been found on stiff-leaved plants such as cacti and agaves, in roadside cuttings and on buildings. In Tenerife it has occurred on low plants and under *Eucalyptus* bark, and in Portugal on telegraph poles and in rocky cuttings.

In Britain it has occurred on and inside buildings, on concrete fence posts, stone walls and occasionally amongst Ivy (*Hedera* sp.) on walls. The immatures have been found on low-growing plants and hedges.

The fully developed web of *S. nobilis* can bear a superficial resemblance to that of a *Tegenaria*, but is unmistakable on closer examination owing to its unusually strong silk. A distinct tube retreat, the base of which is usually located in a deep crack or hole, opens under an undulating sheet which is supported above and below by a tangle of silk lines of the usual theridiid type. This web, formed from an extremely strong silk, develops slowly, starting as a typical theridiid tangled web and gradually taking on the characteristic form over a period of several days. The spider spends the daylight hours deep in the retreat, but as the light fades it moves into the upper part of the tube. Prey is captured in typical theridiid fashion, silk being wrapped round the victim with the fourth pair of legs before biting. All the spider's liquid requirements are apparently obtained from its prey; individuals in the laboratory seem to thrive without water and in extremely dry conditions.

Mating behaviour has been observed on a number of occasions, originally by Locket (1979) and latterly several times by the present authors. There seems to be some variation in the behaviour of the male as observed by both

R. S. and D. J., possibly owing to the rather artificial conditions in which the specimens were kept. The behaviour noted on nearly all occasions by us involved the male shaking and plucking the web as he approached the female. The abdomen was also vibrated rapidly in short bursts.

However, in Locket's original description he noted "a curious dancing movement with the second pair of legs. They were moved up and down (synchronised), the movement being slow at first . . . and getting more rapid, the whole body being finally involved". Only on one occasion was this behaviour seen by one of us (R. S.). This took place in a much larger container where the female had spun a more normal web. Also it was known that both specimens were virgin. The male rapidly located the female's web and proceeded to approach across the sheet and into the mouth of the tube. During this time the male maintained a rhythmic, synchronised plucking or tapping of the web with the second pair of legs. This was accompanied by brief bursts of abdominal vibration. The first pair of legs was held out in front feeling for the female. On contact there was a little sparring before the first pair of legs of the female were pushed against the web beneath by the first legs of the male. The male then made repeated "jabs" at the epigyne with alternate palps until the left palp was inserted. This insertion lasted for 11 minutes after which the male retreated 2–3 cm and proceeded to lay down a little silk and then to pass both palps through the chelicerae. The laying down of a small amount of silk across the tube at various times during mating has often been observed. After about 5 minutes the male again moved towards the female with the same action of the second legs and inserted the right palp after "jabbing" at the abdomen several times. This insertion lasted 14 minutes and was again ended by the male retreating a few cm. At this point the male was removed from the web. Two days later, the same male was introduced to this female's web, but this time very little courtship took place, being limited to a small amount of web plucking and abdominal vibration. Insertions were made as before but lasted only 2, 1.5 and 1 min. The male then remained in the retreat of the female until the next day, a period of some 20 h. Similar cohabitation has been observed on several occasions.

The periods of time between mating, egg-laying and emergence of the spiderlings are extremely variable, probably being much influenced by temperature. However, a female raised by R. S. in stable warm laboratory conditions with an abundant supply of food (mealworm beetles and larvae), has produced 4 egg-sacs at approximately 3-monthly intervals since the end of June 1991. Whether a female can produce egg-sacs at this rate over long periods (a female has been kept in captivity for 5½ years) and with only one mating is unknown. Locket (1979) recorded one female storing sperm for 18 months.

Acknowledgements

John and Frances Murphy, Dr Peter Merrett, Dr Chris Topping, Peter Harvey and Dr Alain Canard supplied valuable details of locations. John Murphy also supplied useful literature. To all these our grateful thanks are due.

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