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THE PRIMARY ORB WEB OF *ULOBORUS FEROKUS* BRADOO (ARANEAE: ULOBORIDAE)

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THE occurrence of primary orb web has been reported[1-4] in a few spider species of the family Uloboridae. It is exclusively made by the second stage spiderlings after they emerge from the cocoon and not by the first instar[1] as reported by Szlep[3], who overlooked the fact that the first (pre-eclosion) moult is completed within the cocoon. The present note gives some new and interesting features on the primary orbs of *Uloborus ferokus* living as a commensal on the web sheets of the social spider *Stegodyphus sarasinorum*[5,6].

The primary orbs differ markedly from the typical orbs in several features and they represent the first kind of orb web found in the life history of uloborid spiders. Nothing equivalent to primary orb of Uloboridae seems to be present in the orb weavers of the family Araneidae. After emergence from the cocoon, the second instar spiderlings of *U. ferokus* show a geonegative behaviour and explore the host web. They leave fine drag lines and spin horizontal primary orbs daily, early in the morning. But these tiny orbs get quickly damaged due to wind, rain or by prey capture activities, so that these orbs are not observed later in the day. Nor do they make successive orbs on the same day. The commensal spiderlings thus spend the rest of the day on the host web (figure 1) from which they procure their nourishment in the form of minute prey.[5]

The primary orb is about 1 cm in diameter. It consists of frame threads that are fixed on the host web, a central hub, primary radii, a permanent spiral thread, secondary radii and 3 to 5 stabilimenta. The

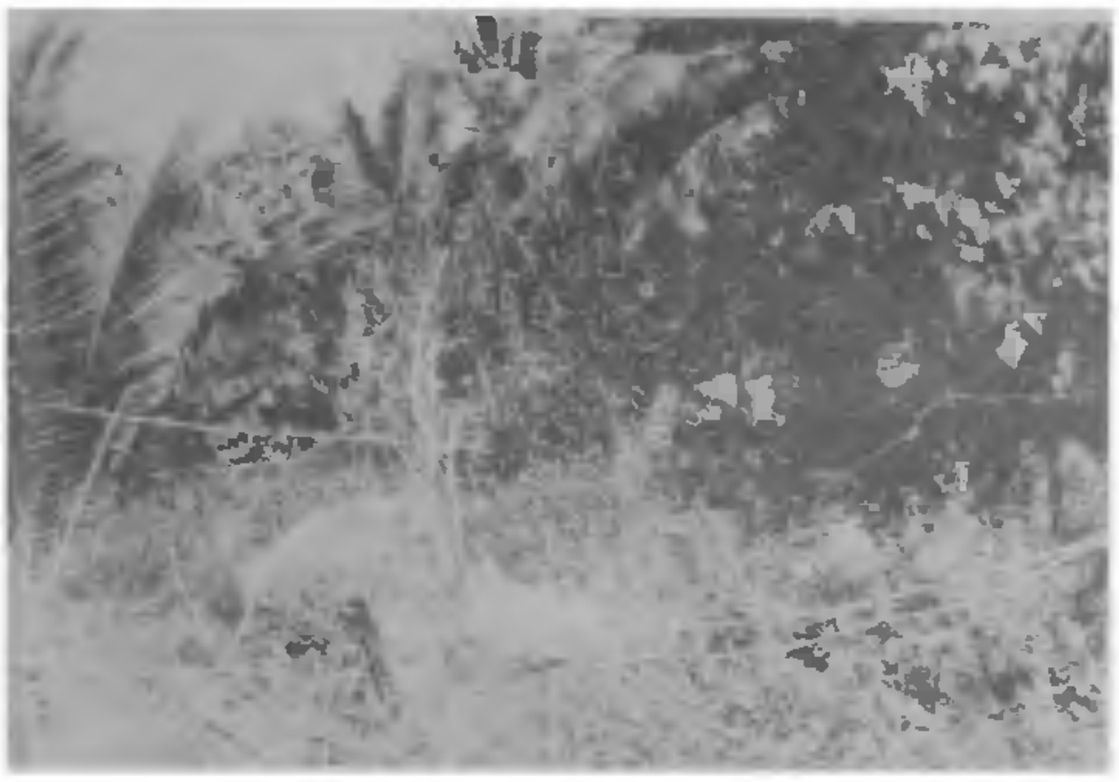

Figure 1. Nest and web sheets of *Stegodyphus sarasinorum* on bamboo fence.

stabilimenta have not been recorded from the primary orbs of *U. walckenaerius* and *U. plumipes* by Szlep[3]. The cribellar sticky spiral (hackled band) as found in the typical orb webs of *Uloborus* (figure 2) is not found in the primary orb, because the cribellum and calamistrum develop only from the third instar spiderlings to adult. The longevity of the second instar *U. ferokus* varies from 8 to 13 days under natural conditions and hence no primary orbs are made by any of the later stages.

The permanent spiral thread of primary orb corresponds to the temporary spiral of the typical orb but it is not removed in the primary orb. The hub in a primary orb has 7 rounds, consisting of hub threads that are connected with the primary radii in such a manner that the hub appears to have angular, polygonal and hexagonal cells, forming a platform, on the ventral side of which the spiderling rests in a typical uloborid manner. The number of primary radii varies from 34 to 38, secondary radii 46–58 and the permanent spiral has 16 to 20 rounds. The secondary radii are very fine and not easily visible to the naked eye. They can only be seen under a microscope or when the spiderling is actually laying these in the primary orb.

The construction of primary orb involves the same behavioural features as found in the typical orb construction described by Eberhard[7,8], in *U. diversus*. The primary orb spinning in *U. ferokus* begins with laying a frame of drag lines. Then it determines the centre and spins a few primary radii that are fixed with the frame threads. The spiderling joins these radii at the centre to lay the foundation for the hub. It makes a few circles at the hub and again spins more primary radii. Sometimes, it returns to the centre to strengthen the hub and extends it outwards by moving out in circles, spinning new hub threads from radius to radius. The primary radii are laid slowly as the spider moves out towards the frame, and again a new radius is laid while it returns to the hub along the previous radius. The radii and the hub spinning activity continues together. On completing these, the spider moves to the hub, makes a few web-pulls in different directions and spins the permanent spiral continuously, moving out from radius to radius in a circular order on the ventral side of the orb till it reaches the periphery of the web. It then returns to the hub for a brief rest and starts adding fine secondary radii in open spaces present in between the primary radii. Then it spins the stabilimenta like the adult spiders.

The presence of stabilimenta in the primary orbs of *U. ferokus* raises some doubt on the possible functions of these structures in spider's web as suggested for other spiders by a number of workers[9,10]. The primary orb spinning is completed in about 60 to 115 min out of which more than 50 min are required in the spinning of secondary radii. No intermediate web type was noticed between the primary orb and the typical orb web.

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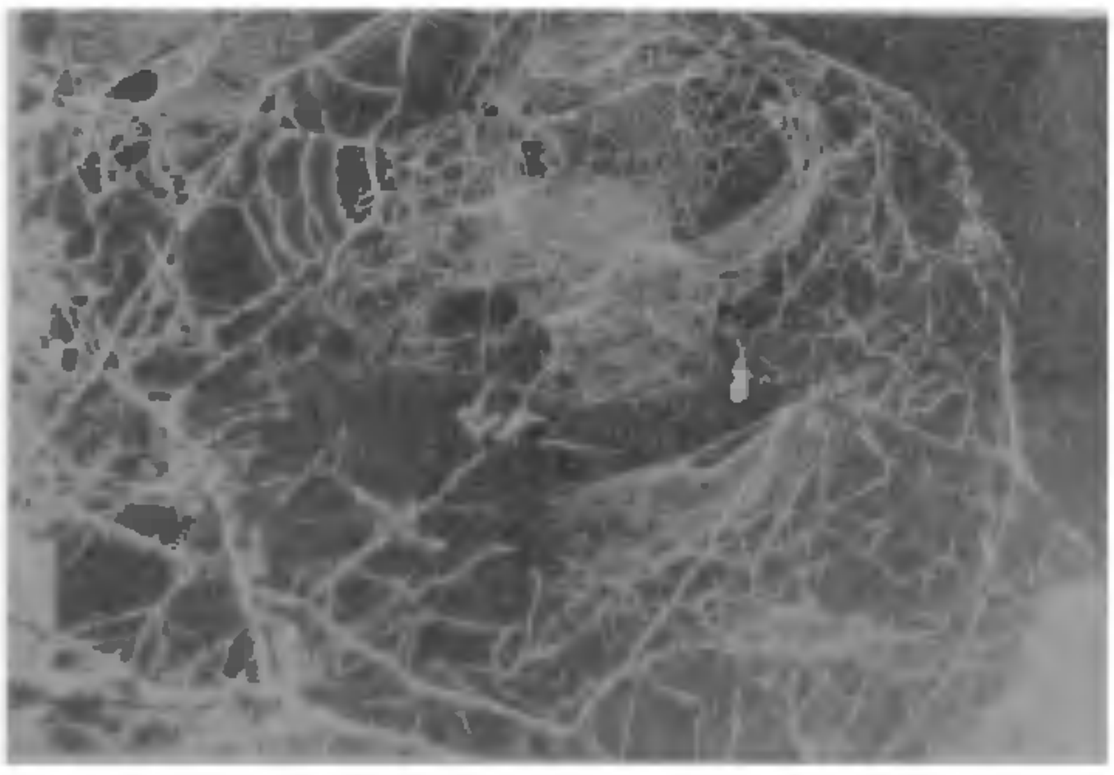

Figure 2. Typical orb webs of commensal spider *Uloborus ferokus* as seen in the damaged areas of the host web.

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NEWS

SCIENCE *VS.* TECHNOLOGY IN CHINA

. . . "In the US and other advanced capitalist nations most of the distinctions between science and technology have become blurred, and technology appears as a natural extension of science rather than as something essentially different. But in China the distinction condinues to be pronounced. A bright Chinese boy about to take the college entrance examinations might well perceive those differences as follows: If accepted into a science department, he is assured of at least four years of higher education and has a reasonably good chance of going on to graduate school. Furthermore, a student in science is much more likely than is an engineering student to be admitted to one of the larger and better universities in a major city—an important career and personal consideration. After graduation . . . he dreams of a career in one of the institutes of the Chinese Academy of Sciences or, at worst, in a research facility subordinate to a provincial academy, in one of the production ministries, or even in a national defense research unit. Such dreams are inappropriate for the overwhelming majority of prospective engineering students. Many will end up in a specialized college with only a two- or three-year curriculum, located in one of the smaller and 'duller' towns. Even after graduating from a four-year engineering school, the likelihood of getting into a graduate program would be slim. On graduating, he will be assigned a job in a factory, mine, construction project or other enterprise where his working and living conditions are likely to be greatly inferior to those of the scientist. Obviously, these are generalizations which are not detailed or recognized in either official or unofficial writing, but they help to explain why most middle-school graduates prefer science and not engineering as a major."

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COULD HIBERNATION BENEFIT HUMANS?

. . . "While in deep hibernation, animals are exceptionally resistant to disease and infection. Their mental processes, though apparently suspended, are not impaired. Researchers have found that animals who have been taught prior to hibernation to solve lab problems, can, immediately upon being aroused, accurately remember what they learned. The potential implications of hibernation for humans have long intrigued scientists. Ever since space travel became a realistic prospect, there has been speculation that something akin to hibernation might be advantageous for crewmen making long voyages through the heavens. A more immediate if less glamorous possibility is that periods of induced hibernation would benefit patients undergoing or recovering from certain types of medical treatment."

[(Bill Gilbert in *Smithsonian* 15(11): 60-9, Feb 85) Reproduced with permission from Press Digest, *Current Contents*®, No. 13, April 1, 1985, p. 18 (Published by the Institute for Scientific Information®, Philadelphia, PA, USA.)]