

**Partial translation of "Erste Nachweise sowie Kenntnisse zur Biologie von *Cyclosa oculata* (Araneae: Araneidae) in der Schweiz" [First records and data about the biology of *Cyclosa oculata* (Araneae: Araneidae) in Switzerland] by Zschokke & Bolzern. *Arachnologische Mitteilungen* 33: 11–17**

*Note: the original paper focuses on the first records of *Cyclosa oculata* in Switzerland. In addition, it contains some information on the biology of *Cyclosa oculata*, which may be of interest to researchers who do not understand German. Therefore, I translated these parts into English:*

## **Results**

We found *C. oculata* always near the ground (the hub was on average 13.2 SD 4.0 cm above the ground). All webs were found to have detritus stabilimenta (3.5 SD 0.7 cm long), which were interrupted by a short open space, just large enough for the spider to fit in. Together, stabilimentum and spider thus appear as one object, resembling a dry twig (Fig. 4). In June 2006, several of the *C. oculata* females had cocoons incorporated into their stabilimenta.

In the laboratory, we made the following observations: *C. oculata* never completely removed its web, but – in situation where other spiders completely remove their web (i.e. moulting, rain) – *C. oculata* builds a resting web with 6–8 radii (Fig. 6), which includes a stabilimentum. Based on some field observations of resting webs, we believe that also in the field, *C. oculata* never completely removes its web. Also, in these resting webs, *C. oculata* sits in the small open space within the stabilimentum. As the stabilimentum of *C. oculata* is continually re-used, these stabilimenta are really long-lived. In the laboratory, we put pieces of a dry leave into the web of a *C. oculata* individual, which incorporated some of these pieces into its stabilimentum, where they remained until the death of the spider (due to old age) four months later. In cases where we had destroyed the web entirely but left the remains of the stabilimentum with the spider (e.g. when capturing the spider in the field), *C. oculata* usually re-used the stabilimentum in its new web. A similar behaviour was observed in *C. turbinata* (Rovner 1976), but not in *C. conica* (own observations).

Interestingly, adult males stayed in their web after their final moult for a few days, but I could never observe them to catch any prey, even if some sticky spirals had remained in their web.

In the laboratory, we could also observe *C. oculata* what appeared to be feeding from prey remains in its stabilimentum. In addition, we observed *C. oculata*, in cases where the web had not been damaged at all over a few days, to simply add a few sticky spiral loops near the hub instead of rebuilding the entire web. However, these last two observations may be laboratory artefacts.

To observe web building, we recorded web building in the laboratory of 21 webs built by three different spiders, using the method of Benjamin & Zschokke (2002). In these webs, we made the following observations:

Auxiliary spiral: average 4 SD 0.5 loops, no U-turns (Fig. 8) Other *Cyclosa* species are known to incorporate U-turns; e.g. *C. insulana* or *C. walckenaerius* (Zschokke & Vollrath 1995, unpublished observations).

Sticky spiral: on average 15.5 SD 3.2 loops, some U-turns (Fig. 9)

Hub spiral: average 8.3 SD 3.2 loops, several U-turns. This large number of hub spiral loops and U-turns in the hub spiral is probably linked to the long-lasting stabilimentum.

## **Discussion**

The longevity of the stabilimentum is unique among central European spiders. This aspect of the behaviour of *C. oculata*, as well as the incorporation of egg cocoons into the stabilimentum and the use of resting webs are similar to the behaviour of tropical *Cyclosa* species, thus supporting the hypothesis by Simon (1929) that *C. oculata* has a tropical origin.

The fact that *C. oculata* build the mentioned resting webs und sit on their hub, instead of hiding somewhere in the surrounding vegetation as other spiders do when they have no web functional for catching prey, suggests that *C. oculata* is well protected from predators in these webs. Together with the – at least for our eyes – excellent camouflage through the stabilimentum, this supports the findings of Chou *et al.* (2005) and Gonzaga & Vasconcellos-Neto (2005) that detritus stabilimenta, as they are built by *C. oculata*, serve to camouflage the spider and not to attract prey insects, as it has been suggested by other authors for the stabilimenta in other orb-webs. (cf. Herberstein et al. 2000).

*Translated by Samuel Zschokke*

*This translation, as well as the full original publication with the figures and the list of references is available from: <https://bio.staern.li/abstracts.php?no=2&lang=en&ref=zschoke2007am>*