

NOCTURNAL BEHAVIOR OF SOME DAY-WANDERING ARBOREAL SPIDERS. Devin Carroll

During the course of a recent investigation on night-active spiders in a citrus orchard, I was able to observe the nocturnal behavior of those spiders which do their hunting by day. These included two well-known jumping spiders: *Phidippus johnsoni* (Peckham 1883), and the common but as yet nameless Californian *Thiodina*, sp. *Phidippus*, as might be expected, spends the nights in the familiar heavy silk retreat, with multiple entrances, constructed in a curled leaf or some other enclosed spot. In contrast, *Thiodina* displays a curious habit which I have not seen reported in the literature, that is, they hang upside down for the entire night by a length of dragline several inches long, which is securely anchored to the foliage. All stages of *Thiodina*, from babies to adults, are almost invariably found in this position from the onset of darkness to the return of some daylight in the morning. I have even seen them, on occasion, hanging by their threads in the evening, still finishing up their last meal of the day. Interestingly, the same night-hanging habit is shared in the orchard by two other day-active spiders: the yellow crab *Misumenops lepidus* (Thorell), and the brown lynx *Oxyopes scalaris* Hentz.

I cannot imagine any reasonable explanation for this hanging behavior, except defense. The day-hunting spiders, which depend upon vision, are at a marked disadvantage relative to any large, night-hunting predator, in particular the long-legged arboreal Clubionidae and their relatives. One of the clubionids, *Trachelas pacificus* Chamberlin & Ivie, is an abundant night-hunter in the orchard, and although the hanging behavior obviously did not evolve specifically in citrus orchards, similar spiders are found in almost every bushy or forest habitat. Since spiders are a favorite food of at least *Trachelas* and undoubtedly most other related spiders, they would be expected to exert considerable pressure on the diurnal wanderers. The hanging is an excellent defense. All the hanging spider need do is drop as soon as anything disturbs the dragline. The clubionids, which need to contact a prey to find it, are not likely, wandering at random in the three-dimensional maze of foliage, to quickly find the prey a second time. Meanwhile, the day-spider has plenty of time to anchor another dragline and hang safely, waiting for the next alarm. Just this type of reaction was observed for a medium-sized *Misumenops*, which actually had a dragline anchored at two spots. When a *Trachelas* came into contact with the thomisid dragline, it attempted to move out across it. This quite commonly occurs on the numerous draglines that are left by nearly all wandering spiders as they move about in the foliage, each one using the bridges left by the others as they move from branch to branch. This time, however, the crab spider quickly broke the line, and was left hanging from one end, safe from the *Trachelas* on the other. I do not know if this defense

is 100% effective, nor how it compares to the alternate defensive strategy used by *Phidippus*, i.e. heavy silk retreats, but it is interesting to note that the only spider observed to have fallen prey to a *Trachelas* was a smaller *Trachelas*.

In addition to the defensive advantage gained by the hanging spider, this behavior offers a practical tool to the araneologist fanatic enough to spend his nights in the field. Hanging spiders are, with the aid of a flashlight, much easier to find than the same spiders wandering around the foliage during the day. Indeed, I have found this method of sampling to be far superior to the traditional beating or day-search methods, for the three species which have this habit. The principal disadvantage is the inability to conduct comparative studies with non-hanging spiders such as *Phidippus johnsoni*. However, in view of the fact that three spiders from three different families were observed to night-hang, it seems likely that many other species will be found to exhibit the same or similar behavior.