

Web robbery by mature male orb-weaving spiders

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Introduction

Male araneids are generally thought to cease feeding after becoming mature, and dedicate themselves to finding mates (e.g. Bristowe, 1958, p. 66). This note reports observations which contradict this idea: mature males of four species were seen stealing webs from immature *Metazygia gregalis* (O. P.-Cambr.) spiders and capturing prey there, two others were found on complete orbs apparently made by other *Metazygia* species, and one captured prey without a web.

Observations were made at night near Cali, Colombia (el. 1000 m) and on Barro Colorado Island, Canal Zone (el. 20 m). The spiders which were robbed of their webs were common at each site, *M. gregalis* in barbed wire fences in open areas near Cali, *M. dilatata* (F. O. P.-Cambr.) on buildings on Barro Colorado Island, and *M. pallidula* (Keys.) in branches at the edge of Gatun Lake, Canal Zone. All these species spin their webs early in the evening, and abandon or destroy them near daybreak.

Results

Observations at Cali

Tetragnatha sp.

A mature male *Tetragnatha* was seen at the hub of a newly constructed orb web, with a late instar *M. gregalis* resting on an anchor thread. The structure of the web, especially the relatively close spacing of the sticky spiral, the vertical orientation of the web plane, and the structure of the centre of the hub (tightly spaced, irregularly arranged lines without a

clear hole) was typical of *Metazygia* rather than *Tetragnatha*.

As we watched, the *Tetragnatha* male captured two small prey which became trapped in the web, and then moved to the upper edge of the web. The *M. gregalis* then moved slowly to the hub, but the *Tetragnatha*, after a short pause, turned to move back toward the centre. Each spider jerked the web several times, and then the *M. gregalis* (which was substantially smaller) returned to the edge as the *Tetragnatha* resumed its position at the hub. This sequence of events reinforces the impression that the *Tetragnatha* had stolen the web.

Larinia directa (Hentz)

On three separate occasions we noted webs of typical *M. gregalis* design which early in the evening had immature *M. gregalis* at the hub, but were later occupied by mature male *L. directa*, with the *M. gregalis* either at the edge or gone. In one case we saw the *L. directa* walk onto the web and displace the resident *M. gregalis*. These male usurpers responded very actively to insects which hit the webs.

Eustala fuscovittata (Keys.)

On two occasions we saw the same sequence of events as described for *L. directa*, but with mature male *E. fuscovittata* displacing immature *M. gregalis*.

Metazygia gregalis

On one occasion we saw a mature male *M. gregalis* take over an immature conspecific's web and subsequently capture prey there. On several other occasions mature males occupied webs which had previously been inhabited by immature *M. gregalis*.

Eriophora edax (Blackwall)

A mature male *E. edax* was noted at night in a *Pithecelobium dulce* tree near a pair of reduviid bugs (*Zelus* sp.) which were courting. The spider was resting on several lines strung loosely among leaves and twigs, but had no sign of a web and there was no other spider nearby. When the bugs were revisited 15-30 minutes later, they were wrapped in silk and the male spider, still without any sign of a web, was feeding on them.

Observations at Barro Colorado

Eustala sp.

A mature male *Eustala* sp. was found at about

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21.00 at the hub of a new orb which appeared – because of its structure and the presence of a number of other very similar orbs nearby with *Metazygia pallidula* at the hubs – to have been made by a *M. pallidula*.

Metazygia dubia (Keys.)

A mature male *M. dubia* was found at 07.00 at the hub of what, judging by size, web design, and the presence of numerous very similar webs nearby, was probably the web of a mature female *M. dilatata*. It is possible that this was not the result of an usurpation, but that the male took possession of an abandoned web. Other nearby webs were deserted, and all mature female *M. dilatata* observed were substantially larger than this male.

Discussion

Web robbery has been observed in several other orb weavers (both araneids and uloborids), but mature males have not been involved. In *Cyrtophora citricola* Forskål (Blanke, 1972), *Metabus gravidus* (O. P.-Cambr.) (Buskirk, 1975), and *Uloborus republicanus* (Lubin, in prep., Eberhard, unpublished), conspecific females and immatures displace each other in

communal webs, while in *Argiope aurantia* Lucas and *A. trifasciata* (Forskål) both inter- and intra-specific changes have been observed (Enders, 1974). Web robbery is apparently uncommon, however, in *Uloborus diversus* Marx (Eberhard, 1971), and robbery by individuals other than adult males was not observed in this study (Table 1). Mature male araneids apparently almost never build webs of their own (Eberhard, 1977), but in some species (e.g. *Nephila maculata* (Fabr.), Robinson & Robinson, 1973) they sometimes capture prey in the webs of conspecific females which they are visiting, presumably in search of mates.

Although our observations are thus new, the number of robberies we observed leads us to suspect that web robbery by mature males is not a “freak” phenomenon. In addition, robber males apparently exercised discrimination in choosing victims of approximately their own size or slightly smaller (Table 1). This is reasonable since on one hand they would not be able to displace individuals larger than themselves, and on the other the webs of spiders much smaller than themselves would be smaller and more fragile, and thus less effective traps. The fact that the males make this distinction argues that web robbery is frequent enough to be an evolutionarily significant phenomenon.

The lack of previous observations may be due to two factors. In the first place, the frequency of robbery is not high in terms of number of webs available for study. In 17 nights of observation involving 1029 *M. gregalis* webs, the frequency of displacement of the apparent owner was only 1.4% (the only spiders which displaced others were mature males), and thus robbery is only likely to be seen when large numbers of webs (in the order of hundreds) are checked (the apparent inordinately high rate of victimization of *Metazygia* may be an artifact of the high densities of their populations, which permitted rapid inspection of many webs). Secondly, mature male araneids are generally nocturnal, while most arachnologists are diurnal.

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Spider size

	1 (1.5)	2 (2.2)	3 (2.6)	4 (3.1)	5 (4.8)	6 (5.6)	7 (6.2)
Number of spiders seen	187	260	186	201	79	49	67
Number of spiders robbed	1	1	2	7	3	0	0
% of spiders robbed	0.5	0.4	2.1	3.5	3.8	0	0

Table 1: Relation between frequency of web robbery and size of victimized spiders (all *Metazygia gregalis*). Spider size was determined by estimation in the field, and except for class 7, which probably corresponds to mature females (class 6) which are swollen with maturing eggs, the sizes probably represent nymphal instars (body lengths in mm of sample spiders are included in parentheses). Robberies were by mature males of *Larinia directa*, *Eustala fuscovittata*, and *Metazygia gregalis*; in all three species the mature males fall in size classes 5 and 6. The males show a significant tendency to rob webs from spiders close to their own size.

by the Comité de Investigaciones of the Universidad del Valle. Specimens of all species from this study are deposited in the Museum of Comparative Zoology, Harvard University, Cambridge, Mass. 02138.

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