

BLASTOBASINE COLEOPHORID MOTHS AS PREY FOR THE AUSTRALIAN ARANEID SPIDER *CELAENIA CALOTOIDES* RAINBOW. *Memoirs of the Queensland Museum* 49(1): 28. 2003:- The Australasian araneid *Celaenia* Thorell, and species of *Ordgarius* Keyserling, *Cladomelea* Simon and *Mastophora* Holmberg ('bolas' spiders), have unique life-history strategies. As older juvenile and adult females, all are thought to be obligate predators of Lepidoptera, using complex chemical mimicry of female sex pheromones to attract male moths of only a few species (Eberhard, 1977; Stowe et al., 1987; Yeargan, 1988, 1994; Haynes et al., 1996). Young juveniles and males of some taxa also attract male nematoceran Diptera (Eberhard, 1980; Yeargan & Quate, 1996, 1997). Stowe et al. (1987) showed that 3 molecules released by *M. cornigera* (Hentz) ([Z]-9-tetradecenyl, [Z]-9-tetradecenyl & [Z]-11-hexadecenyl) are identical to sex pheromone components of some prey moth species. Gemeno et al. (2000) showed that *M. hutchinsoni* Gertsch females produce an allomone blend that mimics, in both composition and blend ratio, the sex pheromone of the noctuid moth *Lacinipolia renigera* (Stephens). Web reduction is characteristic of this group with a single line of sticky silk used to capture flying moths. In *Celaenia* no web snare is made, and moths are grasped directly with the enlarged, spined legs I and II (pers. obs.).

Of 11 species of *Celaenia* (7 from Australia), few specific prey records are available (Table 1). Notes on *C. kinbergi* are listed under *C. excavata* L. Koch, the senior synonym. Roberts (1937) collected several moths dropped by a female *C. excavata*, and suggested 'olfactory attraction' may be involved, but did not identify any taxa. Mascord (1980) reported that a female of *C. excavata* captured 43 male moths of 'one species' in one month. Observations of two juvenile and one adult female *C. calotoides* Rainbow, 1908 were maintained over five weeks during the Spring of 2002, in Brisbane. Cardboard trays and paper bags were set up as receptacles under the spiders to catch dropped prey items. The female (5mm long; with egg sacs) was observed for 39 days (5 Oct.-13 Nov.). Similarly, an older juvenile (2.5mm long) was observed for 30 days (14 Oct.-13 Nov.) along with a small juvenile (1.5mm long, after having hatched out of the female's first egg sac on 20 Oct.), the latter observed for 12 days between November 1-13. All specimens were observed as they were found, in-situ in a suburban garden (27°30'53"S 153°04'06"E). After laying its third egg sac on 7-8 Oct., the adult female *C. calotoides* captured three male *Blastobasis* Zeller (Gelechioidea, Coleophoridae, Blastobasinae) (Table 2). The larger juvenile spider captured four *Blastobasis* moths during the study period. The small newly-hatched juvenile spider caught one moth during the study period, and this too was a *Blastobasis* species. All specimens appear to be conspecific

(although the genitalia of some were damaged by the spiders whilst feeding), and further observations of moths attracted to house lights in the area revealed the presence of a single, very common species (based on the uniform morphology of the males' genitalia). These data provide the first evidence of a gelechioid moth being targeted by a species of *Celaenia*, and the first record of a newly-hatched juvenile feeding on a lepidopteran (as opposed to a dipteran) after emergence from the egg sac.

Moths referred to herein are lodged at the Queensland Museum, with the adult female *C. calotoides* (QM S60739).

Literature Cited

- EBERHARD, W.G. 1977. Aggressive chemical mimicry by a bolas spider. *Science* 198: 1173-1175.
 1980. The natural history and behavior of the bolas spider *Mastophora dizzydeani* sp. n. (Araneidae). *Psyche* 87: 143-169.
 FORSTER, R.R. & FORSTER, L.M. 1999. Spiders of New Zealand and their worldwide kin. (University of Otago Press: Dunedin).
 GEMENO, C., YEARGAN, K.V. & HAYNES, K.F. 2000. Aggressive chemical mimicry by the bolas spider *Mastophora hutchinsoni*: identification and quantification of a major prey's sex pheromone components in the spider's volatile emissions. *Journal of Chemical Ecology* 26(5): 1235-1243.
 MASCORD, R. 1980. Spiders of Australia, a field guide. Reed Publishers, Singapore.
 HAYNES, K.F., YEARGAN, K.V., MILLAR, J.G. & CHASTAIN, B.B. 1996. Identification of the sex pheromone of *Tetanolita mynesalis* (Lepidoptera: Noctuidae), a prey species for the bolas spider *Mastophora hutchinsoni*. *Journal of Chemical Ecology* 22: 75-89.
 HICKMAN, V.V. 1970. Three Tasmanian spiders of the genus *Celaenia* Thorell (Araneida) with notes on their biology. *Papers and Proceedings of the Royal Society of Tasmania* 105: 75-82.
 RAINBOW, W.J. 1908. Studies in Australian Araneidae. *Records of the Australian Museum* 7(1): 44-46.
 ROBERTS, N.L. 1937. Some notes on the bird-dung spider (*Celaenia excavata*). *Proceedings of the Royal Zoological Society of New South Wales*: 23-28.
 STOWE, M.K., TURLINSON, J.H. & HEATH, R.R. 1987. Chemical mimicry: bolas spiders emit components of moth prey species sex pheromones. *Science* 236: 964-967.
 YEARGAN, K.V. 1988. Ecology of a bolas spider, *Mastophora hutchinsoni*: phenology, hunting tactics, and evidence for aggressive chemical mimicry. *Oecologia* 74: 524-530.
 1994. Biology of bolas spiders. *Annual Review of Entomology* 39: 81-99.
 YEARGAN, K.V. & QUATE, L.W. 1996. Juvenile bolas spiders attract psychodid flies. *Oecologia* 106: 266-271.
 1997. Adult male bolas spiders retain juvenile hunting tactics. *Oecologia* 112: 572-276.
 ZILLMAN, E. 1988. Observations on the bird-dropping spider. *Queensland Naturalist* 28(5-6): 28-31.

Michael G. Rix, Queensland Museum, PO Box 3300, South Brisbane 4101, Australia; 8 May 2003.

TABLE 1. Published prey records for spiders in *Celaenia*.

Spider	Loc.	Prey	Reference
Adult ♀ <i>C. excavata</i>	Qld, Aus.	<i>Spodoptera mauritia</i> (Lepidoptera, Noctuoidea, Noctuidae, Amphipyridae)	Zillman, 1988
Adult ♀ <i>Celaenia</i> sp.	NZ	'Tortrix moths' (Lepidoptera, Tortricidae, Tortricidae)	Forster & Forster, 1999
Juvenile <i>Celaenia</i> sp.	NZ	'Moth flies' (Diptera, Nematocera, Psychodoidea, Psychodidae)	Forster & Forster, 1999
Adult ♀ <i>C. distincta</i>	Tas., Aus.	'Night-flying moths'	Hickman, 1970
Adult ♀ <i>C. atkinsoni</i>	Tas., Aus.	'Small moths'	Hickman, 1970

TABLE 2. Moth prey (*Blastobasis* sp.) records for adult and juvenile *C. calotoides* in Brisbane. Length is taken longitudinally from head to wing tips, after specimens had been wrapped with silk by spiders.

Prey moth ref.	Spider	Length	Date captured
A1	♂ adult	8.5mm	11-12/10/02
A2	♂ adult	7.0mm	9-10/11/02
A3	♂ adult	7.5mm	12-13/11/02
J1	♂ older juvenile	5.5mm	22/10/02
J2	♂ older juvenile	5.5mm	24/10/02
J3	♂ older juvenile	5.0mm	1-2/11/02
J4	♂ older juvenile	6.5mm	5/11/02
B1	♂ small juvenile	6.0mm	11/11/02