

## The Coleopterists Society

---

Oviposition Behavior, Guilds, Distribution and New Host Records for the Genus *Mimosestes* Bridwell (Coleoptera: Bruchidae) from Colombia, Ecuador, Venezuela and Mexico

Author(s): Clarence Dan Johnson and David H. Siemens

Source: *The Coleopterists Bulletin*, Vol. 50, No. 2 (Jun., 1996), pp. 155-160

Published by: The Coleopterists Society

Stable URL: <http://www.jstor.org/stable/4009219>

Accessed: 23/10/2008 15:27

---

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=cole>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit organization founded in 1995 to build trusted digital archives for scholarship. We work with the scholarly community to preserve their work and the materials they rely upon, and to build a common research platform that promotes the discovery and use of these resources. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).



*The Coleopterists Society* is collaborating with JSTOR to digitize, preserve and extend access to *The Coleopterists Bulletin*.

**OVIPOSITION BEHAVIOR, GUILDS, DISTRIBUTION AND NEW HOST  
RECORDS FOR THE GENUS *MIMOSESTES* BRIDWELL  
(COLEOPTERA: BRUCHIDAE) FROM COLOMBIA, ECUADOR,  
VENEZUELA AND MEXICO**

CLARENCE DAN JOHNSON AND DAVID H. SIEMENS<sup>1</sup>  
Department of Biological Sciences, Northern Arizona University,  
Flagstaff, AZ 86011, U.S.A.

**Abstract**

*Mimosestes brevicornis* (Sharp), *M. cinerifer* (Fähræus), *M. enterolobii* Kingsolver and Johnson, *M. humeralis* (Gyllenhal), *M. insularis* Kingsolver and Johnson and *M. mimosae* (Fabricius) cement eggs to the outside of the pod valves of their host plants as do all other species of *Mimosestes* Bridwell that have been studied. The host plants of *M. insularis* are *Prosopis juliflora* (Sw.) DC., *P. pallida* (H. & B. ex Willdenow) H. B. K., and three species of *Acacia* Miller. *Mimosestes mimosae* feeds in seeds of *Caesalpinia coriaria* (Jacquin) Willdenow, *C. sclerocarpa* Standley, *Parkinsonia aculeata* L. and 14 species of *Acacia*. *Mimosestes brevicornis* feeds in seeds of *Acacia farnesiana* (L.) Willdenow, *A. tortuosa* (L.) Willdenow and *A. gentlei* Standley. All host plants of *Mimosestes* are in the family Leguminosae. *Mimosestes brevicornis*, a relatively uncommon species, is reported for the first time from South America (Colombia). *Mimosestes insularis* and *M. mimosae* not only occur as far south as northern South America, but they are common in Colombia and Venezuela.

---

Most of the research on *Mimosestes* Bridwell has been conducted on its taxonomy and host plants (e.g., Kingsolver and Johnson 1978, Johnson 1983a, Nilsson and Johnson 1993, Johnson and Seeno 1993). Bruchid oviposition guilds (Johnson 1981), possible coevolution between *Mimosestes* and its hosts (Johnson 1987), ant predation on *Mimosestes* eggs (Traveset 1990), and pre-dispersal seed predation by *Mimosestes* (Traveset 1991) have also been topics for research on species in this genus.

In this paper we list new host plants and new distributions for *M. brevicornis* (Sharp), *M. insularis* Kingsolver and Johnson, *M. mimosae* (Fabricius) and *M. nubigenis* (Motschulsky) and describe and discuss the relationships between these bruchids and their hosts. We describe also the oviposition behavior of these species and that of *Mimosestes cinerifer* (Fähræus), *M. enterolobii* Kingsolver and Johnson, and *M. humeralis* (Gyllenhal) for their inclusion into a scheme of bruchid oviposition guilds (Johnson 1981).

The distribution of species of *Mimosestes* is primarily in North, Central, and northern South America, but also extends to Brazil.

**Methods and Materials**

Specimens used in this study were acquired during specialized collecting trips to the study areas (Appendix 1). Our technique for rearing bruchids is to collect seeds and voucher specimens of plants in the field (Johnson and Siemsen 1995).

---

<sup>1</sup> Present address: Division of Biological Sciences, University of Montana, Missoula MT 59812.

Most of the voucher plant samples that we collected are deposited in the Missouri Botanical Garden, St. Louis, with duplicates in the Deaver Herbarium, Northern Arizona University, Flagstaff. A seed and pod collection of many of these plants is maintained in the C. D. Johnson collection, where the beetles are deposited.

### Results and Discussion

**Bruchid Guilds.** Johnson (1981) described three guilds of bruchids that oviposit either (A) on the pod while on the plant (Mature pod guild), or (B) on seeds while on the plant (Mature seed guild), or (C) on seeds after they had been exposed on the substrate (Scattered seed guild). All species of *Mimosestes* that have been studied are in guild A.

*Caesalpinia coriaria*, *Prosopis juliflora*, and all species of *Acacia* Miller in Appendix 1 have indehiscent fruits (pods) that are fleshy and adhere tightly to seeds. These pods, which are apparently protected from other bruchids by the fleshy pod valves, are oviposited upon by species of *Mimosestes*. They may be dispersed to the ground where the valves rot. Vertebrate animals often feed on the fleshy pod valves directly from the plant or from the ground. They digest the pod valves but do not usually digest the seeds which are voided with the feces. The seeds of these plants are usually only exposed when the pods are on the ground, thus, the indehiscent pods are not fed upon by members of Guild B but rather Guilds A and C (seeds of *P. juliflora* are not known to be fed upon by Guild C).

*Parkinsonia aculeata* L. has tardily dehiscent pods when ripe and relatively thin pod valves with a millimeter or more between the seeds and pod valves. The seeds of this plant are fed upon by all three guilds of bruchids because members of Guild B gain entrance to seeds by entering through exit holes of Guild A bruchids or through cracks between pod valves caused by partial dehiscence. The exposed seeds on the ground are oviposited upon by Guild C bruchids.

**Oviposition Behavior.** *Mimosestes brevicornis*, *M. insularis* and *M. mimosae* glue eggs, often in clumps of two or three, to the outside of the pod valves of their hosts. Their larvae burrow through the pod valve into seeds where they feed, molt several times and pupate. The adults emerge from the seeds through pod valves. We have observed this behavior also in *Mimosestes cinerifer*, *M. enterolobii* and *M. humeralis*, except that they fasten their eggs singly to the outside of pod valves. Other species of *Mimosestes* reported to have this behavior are *M. acaciastes* Kingsolver and Johnson, *M. amicus* (Horn), *M. janzeni* Kingsolver and Johnson and *M. nubigens* (Motschulsky) (Johnson 1981; Traveset 1990). Thus, these species of *Mimosestes* are in Guild A (Johnson 1981).

**Host Relationships.** Host relationships of species of *Mimosestes* have been discussed (Kingsolver and Johnson 1978; Johnson 1987) and need not be repeated here. Prior to this study, however, there were few records of hosts for *Mimosestes* from South America. Based on numbers of host records (Table 1, Appendix 1), the primary hosts of *M. insularis* appear to be *Prosopis juliflora* and *P. pallida*. Its other hosts are three species of *Acacia* (Table 1). *Mimosestes mimosae* feeds in seeds of 14 species of *Acacia* and *Caesalpinia coriaria*, *C. sclerocarpa*, and *Parkinsonia aculeata* (Table 1). *Mimosestes insularis* feeds on three species of *Acacia* in common with *M. mimosae* (Table 1), but is different in that it feeds also in species of *Prosopis*. *Mimosestes mimosae* feeds

**Table 1.** Known hosts for *Mimosestes brevicornis*, *M. insularis*, and *M. mimosae*. Records are from Appendix 1 and Kingsolver and Johnson (1978), Johnson (1983a), Hetz and Johnson (1988), Traveset (1990, 1991, 1992) and Janzen (1980).

---

<i>M. brevicornis</i> :	<i>Acacia farnesiana</i> (L.) Willdenow, <i>A. gentlei</i> Standley, <i>A. tortuosa</i> (L.) Willdenow
<i>M. insularis</i> :	<i>Acacia farnesiana</i> , <i>A. flexuosa</i> Humboldt & Bonpland ex. Willdenow, <i>A. tortuosa</i> , <i>Prosopis juliflora</i> (Sw.) DC., <i>P. pallida</i> (H. & B. ex Willdenow) H. B. K.
<i>M. mimosae</i> :	<i>Acacia bilimekii</i> MacBride, <i>A. cymbispina</i> Sprague and Riley, <i>A. cochliacantha</i> Humboldt & Bonpland ex Willdenow, <i>A. collinsii</i> Safford, <i>A. cornigera</i> (L.) Willdenow, <i>A. farnesiana</i> , <i>A. flexuosa</i> , <i>A. gaumeri</i> Blake, <i>A. globulifera</i> Safford, <i>A. hindsii</i> Bentham, <i>A. hirtipes</i> Safford, <i>A. macracantha</i> Humboldt & Bonpland, <i>A. penatula</i> (Schlechtendal & Chamisso) Bentham, <i>A. tortuosa</i> , <i>Caesalpinia coriaria</i> (Jacquin) Willdenow, <i>C. sclerocarpa</i> Standley, <i>Parkinsonia aculeata</i> L.

---

in *P. aculeata* and two species of *Caesalpinia*. *Mimosestes brevicornis* is known only to feed in seeds of *Acacia farnesiana*, *A. tortuosa* (L.) Willdenow and *A. gentlei* Standley (Table 1, Appendix 1), and, based on our observations, is not abundant in any host.

Most species of *Mimosestes* feed in seeds in indehiscent pod valves, mostly *Acacia* (Kingsolver and Johnson 1978; Johnson 1981). All species of *Algarobius* Bridwell, *Rhipibruchus* Bridwell and *Scutobruchus* Kingsolver feed also in indehiscent pods of *Prosopis* (Kingsolver *et al.* 1977; Johnson 1983*b, c, d*). Conversely, most of the hosts of species in the genus *Merobruchus* have partially dehiscent pod valves, mostly species of *Acacia* (Johnson and Siemens, pers. observations). Undoubtedly many species of bruchids have evolved to feed in seeds, not based upon their chemical content, but upon the structure of the fruits and ease of access to seeds.

*Lysiloma divaricata* (Jacquin) MacBride was reported as a host for *M. mimosae* by Hetz and Johnson (1988). We have determined that this report was in error and should be disregarded.

**Distribution.** Kingsolver and Johnson (1978) described the distribution of *M. insularis* as Hawaii, Puerto Rico, Jamaica and Colombia; *M. brevicornis* as Belize and Guatemala; and *M. mimosae* as Florida, northern Mexico through Central America, to Venezuela, the West Indies and Brazil. *Mimosestes nubi-gens* is a common species from Florida to California and Hawaii in the USA through Mexico and Central America. It is not common in Ecuador and Colombia and has been reared from seeds there (Appendix 1). *Mimosestes brevicornis* is an uncommon species throughout its range. Based on the large numbers of insects that we have reared from seeds and the many localities from which we collected them in northern South America, we regard *M. insularis* and *M. mimosae* to be common there (Appendix 1).

#### Acknowledgments

We are grateful to Margaret Johnson for assistance in the field and lab; to Ron Liesner and Jim Zarucchi for plant identifications; and to NSF Grant BSR88-05861 for financial assistance.

#### Literature Cited

- Hetz, M., and C. D. Johnson. 1988. Hymenopterous parasites of some bruchid beetles of North and Central America. *Journal of Stored Products Research* 24(3):131-143.

- Janzen, D. H. 1980.** Specificity of seed-attacking beetles in a Costa Rican deciduous forest. *Journal of Ecology* 68:929–952.
- Johnson, C. D. 1981.** Interactions between bruchid (Coleoptera) feeding guilds and behavioral patterns of pods of the Leguminosae. *Environmental Entomology* 10: 249–253.
- Johnson, C. D. 1983a.** *Mimosestes playazul*, new species, with new host records for other *Mimosestes* (Coleoptera: Bruchidae). *Annals of the Entomological Society of America* 76(4):816–820.
- Johnson, C. D. 1983b.** Handbook on seed insects of *Prosopis* species. Ecology, Control, and Identification of seed-infesting Insects of New World *Prosopis* (Leguminosae). The Food and Agriculture Organization of the United Nations. 55 pp.
- Johnson, C. D. 1983c.** Guide des Insectes Parasites des Semences de *Prosopis*. Ecologie, Moyens de Lutte, Identification. Organisation des Nations Unies pour L'Alimentation et L'Agriculture. 64 pp.
- Johnson, C. D. 1983d.** Manual sobre Insectos que Infestan la Semilla de *Prosopis*. Ecología, Control, e Identificación de Insectos del Nuevo Mundo que Infestan la Semilla de *Prosopis* (Leguminosae). Organización de las Naciones Unidas para la Agricultura y la Alimentación. 59 pp.
- Johnson, C. D. 1987.** Relationships between *Mimosestes* (Coleoptera) and *Acacia* (Leguminosae): Is there coevolution between these genera? [pp. 347–352]. In: V. Labeyrie, G. Fabres and D. Lachaise (editors), *Insect-Plants*, Proceedings of the 6th International Symposium on Insect-Plant Relationships (PAU 1986). Series Entomologica, Volume 41. W. Junk, The Hague. xv + 459 pp.
- Johnson, C. D., and D. H. Siemens. 1995.** Bruchid guilds, host preferences, and new host records from Latin America and Texas for the genus *Stator* Bridwell (Coleoptera: Bruchidae). *Coleopterists Bulletin* 49(2):133–142
- Johnson, C. D., and T. N. Seeno. 1993.** *Mimosestes nubigens* (Motschulsky) established in California (Coleoptera: Bruchidae). *Pan-Pacific Entomologist* 69(2):190.
- Kingsolver, J. M., et al. 1977.** *Prosopis* fruits as a resource for invertebrates [Chapter 6, pp. 108–122]. In: B. B. Simpson (editor), *Mesquite Its Biology in Two Desert Scrub Ecosystems*. US/IBP Synthesis Series 4. Dowden, Hutchinson and Ross, Stroudsburg, PA. 250 pp.
- Kingsolver, J. M., and C. D. Johnson. 1978.** Systematics of the Genus *Mimosestes* (Coleoptera: Bruchidae). United States Department of Agriculture, Technical Bulletin 1590. 106 pp.
- Nilsson, J. A., and C. D. Johnson. 1993.** Laboratory hybridization of *Stator beali* and *S. limbatus*, with new host records for *S. limbatus* and *Mimosestes amicus* (Coleoptera: Bruchidae). *Southwestern Naturalist* 38(4):385–387.
- Traveset, A. 1990.** Bruchid egg mortality on *Acacia farnesiana* caused by ants and abiotic factors. *Ecological Entomology* 15(4):463–467.
- Traveset, A. 1991.** Pre-dispersal seed predation in Central American *Acacia farnesiana*: Factors affecting the abundance of co-occurring bruchid beetles. *Oecologia* 87: 570–576.
- Traveset, A. 1992.** Effect of vertebrate frugivores on bruchid beetles that prey on *Acacia farnesiana* seeds. *Oikos* 63(2):200–206.

(Received 13 January 1995; accepted 24 April 1995. Publication funded by the Patricia Vaurie bequest)

**Appendix 1.** New host and distribution records for some species of *Mimosestes* from Colombia, Venezuela and Mexico. The collection numbers refer to lot numbers in the field notebooks of C. D. Johnson.

***Mimosestes brevicornis* (Sharp)**

*Acacia farnesiana* (Linnaeus) Willdenow. **Colombia.** *Cundinamarca*: ca 2400', 1 km NE Anapoima, X-17-84 (#3536-84).

*Acacia tortuosa.* **Colombia.** *Magdalena*: 49 km W Puebloviejo, X-30-83 (#3169-83).

***Mimosestes insularis* Kingsolver and Johnson**

*Acacia flexuosa*. **Venezuela**. *Carabobo*: 3 km W Puerto Cabello, I-19-85 (#3694-85, 3696-85 & 3699-85); Puerto Cabello, II-12-89 (#4432-89 & 4433-89). *Lara*: ca. 2200', 47 km W Barquisimeto, I-21-85 (#3714-85). *Anzoategui*: ca 700', 6 km N Anaco, II-19-85 (#4115-85).

*Acacia tortuosa*. **Venezuela**. *Carabobo*: Puerto Cabello, VII-10-82 & VII-12-82 (#2399-82 & 2418-82). *Prosopis juliflora*. **Venezuela**. *Carabobo*: Puerto Cabello, VII-12-82 (#2416-82); 3 km S Puerto Cabello, VII-12-84 (#3353-84). *Miranda*: 14 km E Cupira, IX-30-83 (#2948-83). *Falcon*: Coro, IX-21-83 & VII-18-84 (#2852-83 & 3374-84); 33 km S Coro, IX-19-83 (#2828-83); Guaibacoa, IX-18-83 (#2818-83); near Guaibacoa, VII-18-84 (#3372-84); 15 km S La Cruz de Taratara, IX-19-83 (#2832-83); 2 km W Churuguara, IX-19-83 (#2839-83); 34 km NW Churuguara, VII-17-84 (#3369-84); 1 km S Pueblo Nuevo, Peninsula de Paraguana, IX-20-83 (#2844-83). *Lara*: 17 km N Barquisimeto, VII-13-84 (#3356-84). *Zulia*: ca 50', 19 km NE Ancon de Iturre, I-29-85 (#3836-85). *Anzoategui*: ca 600', 33 km E Aragua de Barcelona, II-19-85 (#4089-85); ca 400', 13 km E Aragua de Barcelona, II-19-85 (#4096-85); ca 400', 2 km E Aragua de Barcelona, II-19-85 (#4112-85); ca 300', 12 km N San Mateo, II-20-85 (#4117-85). *Sucre*: 5 km S Cumana, VIII-6-84 (#3445-84); 4 km S Cumana, X-3-83 (#2969-83). **Colombia**. *Magdalena*: 49 km W Puebloviejo, X-30-83 (#3168-83); 9 km S Santa Marta, X-31-83 (#3171-83).

***Mimosestes mimosae* (Fabricius)**

*Acacia bilimekii* MacBride. **Mexico**. *Puebla*: ca 4700', 10 mi SE Acatlan, IV-3-79 (#1105-79). *Acacia cymbispina*. **Mexico**. *Sinaloa*: 9 mi N Mazatlan, II-10-93 (#4940-93). *Acacia farnesiana*. **Venezuela**. *Merida*: 18 km SW Merida, II-20-89 (#4522-89). **Colombia**. *Cundinamarca*: 1700', 1 km E Boqueron, VIII-15-84 (#3460-84); ca 2400', 1 km NE Anapoima, X-17-84 (#3536-84). *Huila*: 1900', 16 km N Gigante, XI-8-84 (#3616-84). *Antioquia*: 660 m, 63 km NW Medellin, X-25-83 (#3096-83). *Acacia flexuosa*. **Venezuela**. *Guarico*: 700', 16 km W Chaguaramas, II-9-85 (#3959-85). *Falcon*: Guaibacoa, IX-18-83 (#2820-83). *Anzoategui*: ca 200', 22 km N San Mateo, II-20-85 (#4119-85).

*Acacia macracantha*. **Venezuela**. *Distrito Federal*: 42 km SW Caracas, VII-11-84 (#3340-84). *Carabobo*: Puerto Cabello, VII-12-84 (#3344-84 & 3345-84). *Falcon*: 25 km E Churuguara, VII-17-84 (#3367-84). *Lara*: 24 km W Barquisimeto, II-15-89 (#4450-89); 9 km E Carora, II-15-89 (#4454-89); 10 km E Carora, II-15-89 (#4464-89). *Aragua*: 11 km SE Carmen de Cura, III-25-89 (#4837-89). *Guarico*: Valle de la Pascua, III-6-89 (#4636-89). *Merida*: 18 km SW Merida, II-20-89 (#4521-89). *Zulia*: 12 km E Lagunillas, VII-19-84 (#3376-84). *Bolivar*: 22 km SE Upata, VII-30-84 (#3414-84); 14 km SE Upata, III-11-89 (#4715-89); Villa Lola, III-13-89 (#4751-89). *Anzoategui*: 60 km NW Aragua de Barcelona, III-6-89 (#4657-89). *Sucre*: 19 km S Cumana, VIII-6-84 (#3446-84 & 3447-84). **Colombia**. *Cundinamarca*: 1300', 4 km N Tocaima, VIII-16-84 (#3479-84); 1000 m, Cachipay, X-21-83 (#3071-83).

*Acacia tortuosa*. **Venezuela**. *Falcon*: 10 km S Guaibacoa, IX-18-83 (#2823-83). **Colombia**. *Magdalena*: 49 km W Puebloviejo, X-30-83 (#3169-83). *Caesalpinia coriaria*. **Venezuela**. *Distrito Federal*: ca 200', 3 km E Los Caracas, II-5-85 (#3904-85). *Guarico*: 700', 16 km W Chaguaramas, II-9-85 (#3963-85); ca 500', 29 km SW El Sombrero, II-9-85 (#3952-85). *Miranda*: ca 300', Sta. Teresa, I-16-85 (#3631-85); Cua, II-7-89 (#4385-89). *Bolivar*: 59 km SE Upata, VII-30-84 (#3416-84); 800', 45 km SE Upata, II-13-85 (#4005-85); 14 km SE Upata, III-11-89 (#4717-89). *Anzoategui*: ca 600', 33 km E Aragua de Barcelona, II-19-85 (#4090-85). *Falcon*: 11 km SE Coro, IX-18-83 (#2827-83); 6 km W Santa Ana, Peninsula de Paraguana, IX-19-83 (#2846-83). *Zulia*: ca 50', 5 km E Ancon de Iturre, I-29-85 (#3838-85); ca 100', 21 km SE Cabimas, I-30-85 (#3846-85); Jardin Botanico de Maracaibo, IX-22-83 (#2854-83).

*Parkinsonia aculeata*. **Venezuela**. *Carabobo*: 3 km W Puerto Cabello, VII-12-84 & II-13-89 (#3346-84 & 4434-89, 4435-89), I-19-85 (#3697-85 & 3698-85). *Lara*: 5 km E Barquisimeto, VII-11-82 (#2409-82). *Distrito Federal*: Macuto, VII-10-84 (#3339-84). *Merida*: ca 2600', Lagunillas, II-20-89 (#4525-89). *Tachira*: 23 km N San Cristobal, IX-

25-83 (#2902-83). San Antonio de Tachira, VII-22-84 (#3381-84); Lobatera, 26 km N San Cristobal, VII-22-84 (#3387-84); ca 3100', 27 km NW San Cristobal, I-26-85 (#3788-85). **Colombia.** *Cundinamarca*: ca 1100', 9 km N Girardot, X-17-84 (#3544-84).

***Mimosestes nubigens* (Motschulsky)**

*Acacia farnesiana.* **Ecuador.** *Los Rios*: 29 km S Babahoyo, I-12-89 (#4156-89). *El Oro*: 5 km W Portovelo, VIII-31-83 (#2688-83). **Colombia.** *Valle del Cauca*: Santa Elena, XI-7-83 (#3193-83 & 3198-83); ca 900 m, 14 km N Roldanillo, VIII-20-83 (#2565-83).

The Coleopterists Bulletin, 50(2):160–161. 1996.

**SCIENTIFIC NOTES**

**Death-Feigning Observed in *Hippopsis lemniscata* (Fabricius)  
(Coleoptera: Cerambycidae)**

On July 20, 1992, in Northford, Connecticut, I noticed an individual *Hippopsis lemniscata* (Fabricius) oriented head upward about 1 meter above the ground on the upright stem of a *Eupatorium* in a flower bed. I moved toward it and leaned to one side to get a better look, but the beetle shifted position so that the stem remained between it and me. When I leaned the other way, it circled back so that the stem again remained between us. As I raised my camera to videotape this evasive behavior, the beetle dropped off the stem and out of sight.

After several seconds, I located the *Hippopsis* about 30 cm above the ground. It was supported almost horizontally, ventral surface up, between two leaflets of an *Astilbe* leaf. The antennae were held rigidly forward, almost parallel to each other and in line with the body. Only the distal three-fifths of its antennae, resting on one leaflet, and the apical one-third of its elytra on the other leaflet supported the beetle; most of the body was unsupported (Fig. 1). The legs were held against the ventral body surface. It remained motionless in this position for at least 60 seconds. Finally, the beetle dropped between the leaflets, and I could not relocate it in the ground cover.

In July 1993, I induced similar death-feigning behavior in another *H. lemniscata* by



**Fig. 1.** *Hippopsis lemniscata* partly supported by *Astilbe* leaflets. Image from videotape (camera aimed vertically downward). About 1.5× natural size.