

Balaustium spp. In Florida (Acari: Erythraeidae)¹

W.C. Welbourn²

INTRODUCTION: The cosmopolitan genus *Balaustium* was first described from Europe in 1826. Since then approximately 20 species have been described, mostly from the northern hemisphere. Four species are currently recognized in North America: *B. aonidophagus* (Ebeling), *B. dowelli* Smiley, *B. kendalli* Welbourn and *B. putmani* Smiley, but additional species remain undescribed. *Balaustium* is a predator of small insects and mites (Welbourn 1983 and references therein). One species, *B. putmani*, has been studied as a possible biological control agent in orchards (Putman 1970; Cadogan and Laing 1977; Childers and Rock 1981).

Balaustium spp. are commonly found in urban areas, where they appear in large numbers on sidewalks and walls for a brief period during the spring and early summer. It is during this time that they sometimes enter homes and buildings and become pests. There are two records of *Balaustium* spp. from Florida homes (FSCA collection). Newell (1963) reported four cases of *Balaustium* spp. biting humans; of these, three involved mites that had invaded buildings.

Balaustium putmani is known from orchards in Ontario, Canada (Putman 1970; Cadogan and Laing 1977) and North Carolina (Childers and Rock 1981), while *B. dowelli* is known only from Arkansas (Smiley 1964). *Balaustium aonidophagus* (Ebeling) is known only from southern California (Ebeling 1934), and *B. kendalli* is reported from Maine (Welbourn and Jennings 1991). *Balaustium* spp. have also been reported in the literature from California (Struble 1972), Colorado (Hays 1985) and Montana (Fellin 1968). There are at least two undescribed species in Florida.

BIOLOGY: The biology of *B. putmani* was reviewed by Putman (1970) and Cadogan and Laing (1977). The dark red to red-brown eggs are deposited in groups of 6-55 in the late spring and summer. Development usually takes about two weeks, but eggs deposited in the late summer may overwinter as eggs or prelarvae. There are one or two generations per year. The red, hexapod larva, unlike other Erythraeidae, is predatory and can supplement its prey of small insects and mites with pollen (Cadogan and Laing 1977). There are four octopod postlarval instars (protonymph, deutonymph (DN), tritonymph and adult), but only two (DN and adult) are active feeding instars. The fast-moving DN and adult mites are 1-2 mm in length (excluding legs) and usually red in color, but they can vary from reddish brown to orange and sometimes have a metallic green sheen. These predators can also feed on pollen (Grandjean 1946, Cadogan and Laing 1977). *Balaustium* spp. have been observed

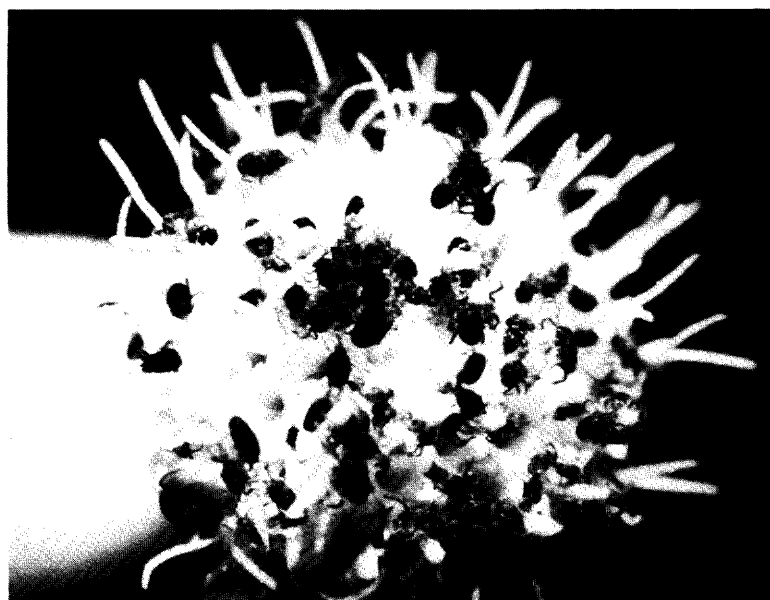


Fig. 1. *Balaustium* sp. on unidentified flower. Photography credit: Robert Buecher.

¹Entomology Contribution No. 812, Bureau of Entomology, Nematology and Plant Pathology - Entomology Section.

²Taxonomic Entomologist, FDACS, Division of Plant Industry, P.O. Box 147100, Gainesville, FL 32614-7100.

in large numbers actively working around the anthers of flowers (Newell 1963; Welbourn unpublished data). The DN and adult can be distinguished from other erythraeid mites by the presence of a pair of glandular structures, usually on tubercles, located just posterior to the eyes and a single tooth on the inner surface of the palpal tibial claw. In the spring and early summer postlarval *Balaustium* congregate in sunny locations. The purpose of these aggregations is not clear, but females collected from aggregations usually start depositing eggs within a short time.

PREY: *Balaustium* spp. usually forage in vegetation, but occasionally they are found on the ground. In Florida they have been found on a wide variety of plants. All active instars of *Balaustium* spp. feed on eggs and early instars of Lepidoptera, Coleoptera, and Diptera (Welbourn 1983 and references therein, Welbourn and Jennings 1991). In addition, Hemiptera, (Psyllidae) (Elmer *et al* 1983) and Homoptera (Aphidae, Diaspididae and Cicadellidae) have been reported as prey for *Balaustium* (Welbourn 1983 and references therein). *Balaustium* will also feed on Tetranychidae, Stigmaeidae and occasionally Phytoseiidae (Welbourn 1983 and references therein). Larval *Balaustium* will feed on Eriophyidae (Putman 1970, Cadogan and Laing 1977), but they are too small for postlarval *Balaustium*. These mites are good general predators and will feed on almost anything they can overpower and/or outrun.

DISTRIBUTION: *Balaustium* spp. are probably distributed throughout Florida, but they have only been reported from the following counties: Alachua, Clay, Dade, Franklin, Indian River, Jackson, Jefferson, Leon, Martin, Levy, Pasco, St. Lucie and Union. In Florida, *Balaustium* spp. are most common in April, but they have been found in February, March and May. There is also a record from October and one from December.

CONTROL: In most cases control is not necessary as these mites are beneficial predators. In cases where they occur on walls or walkways no control is usually needed, because the mites will disappear in a short time. In cases where they invade buildings or houses control may be necessary. Consult your local IFAS extension agent or Insect Control Guide for current control recommendations.

LITERATURE CITED

- Cadogan, B.L. and J.E. Laing. 1977. A technique for rearing the predacious mite, *Balaustium putmani* (Acarina: Erythraeidae), with notes on its biology and life history. Canadian Entomologist 109: 1535-1544.
- Childers, C.C. & G.C. Rock. 1981. Observations on the occurrence and feeding habits of *Balaustium putmani* (Acari: Erythraeidae) in North Carolina apple orchards. International Journal of Acarology 7: 63-68.
- Ebeling, W. 1934. A new predacious mite from southern California (Acarine, Erythraeidae). Pan-Pacific Entomologist 10: 33-34.
- Elmer, A., C. Hagley and C.M. Simpson. 1983. Effect of insecticides on predators of the pear psylla, *Psylla pyricola* (Hemiptera: Psyllidae) in Ontario. Canadian Entomologist 115: 1409-1414.
- Fellin, D.G. 1968. Mites collected from Douglas-fir foliage in Montana. Journal of Economic Entomology 61: 877-878.
- Grandjean, F. 1946. Observations sur les Acariens (9^e série). Bulletin du Museum National d'Histoire Naturelle, 2^e série 13: 337-344.
- Hays, J.L. 1985. The predator-prey interaction of the mite *Balaustium* sp. and the pierid butterfly *Colias alexandra*. Ecology 66: 300-303.
- Newell, I.M. 1963. Feeding habits in the genus *Balaustium* (Acarina: Erythraeidae), with special reference to attacks on man. Journal of Parasitology 49: 498-502.
- Putman, W.L. 1970. Life history and behavior of *Balaustium putmani* (Acarina: Erythraeidae). Annals of the Entomological Society of America 63: 76-81.
- Smiley, R.L. 1964. Two new erythraeids predacious upon cotton bollworm eggs (Acarina: Erythraeidae). Proceedings of the Entomological Society of Washington 66: 110.
- Struble, G.R. 1972. Biology, ecology, and control of the lodgepole needle miner. USDA, Washington, D.C. Technical Bulletin 1458: 1-38.
- Welbourn, W.C. 1983. Potential use of trombidoid and erythraeid mites as biological control agents of insect pests, pp. 103-140. In M.A. Hoy and G.L. Cunningham (eds.) Biological control of pests by mites. University of California. Special Publication 3304: 1-185.
- Welbourn, W.C. and D.T. Jennings. 1991. Two new species of Erythraeidae (Acari: Prostigmata) associated with the spruce budworm, *Choristoneura fumiferana* (Clemens) (Lepidoptera: Tortricidae) in Maine. Canadian Entomologist 123: 567-580.