

SCIENTIFIC NAME: *Banksula melones*
COMMON NAME: Melones cave harvestman
CLASS, FAMILY: Arachnida, Phalangodidae

ORIGINAL DESCRIPTION: Briggs, T.S. 1974. Phalangodidae from caves in the Sierra Nevada (California) with a redescription of the type genus (Opiliones: Phalangodidae). Occasional Papers of the California Academy of Sciences 108:8, figs. 27-28 (lateral and ventral views of penis).

TYPE MATERIAL: *Holotype:* Male – California: Tuolumne Co.: middle level, Quarry Cave, near Columbia, 24 May 1969, G. Leong, W. Rauscher, and T. Briggs. Deposited in California Academy of Sciences, type #11968. *Allotype:* Female – same data as holotype, deposited in CAS.

RANKING/STATUS: G2G3S2 (NatureServe – CNDDDB); VU/A2c (IUCN)

GENERAL DESCRIPTION: A minute troglobitic harvestman; body yellowish-orange, appendages white to yellowish white. Tarsal formula 4-6-5-6.

DIAGNOSTIC CHARACTERS: Ubick and Briggs (2002) state that *Banksula* are "unique among the Nearctic phalangodids in having a row of setiferous dorsal tubercles on the palpi femur, and a penis with a bifurcate ventral plate with ventrally positioned prongs." This species co-occurred with *Banksula grahami*. It can be distinguished from that species by its larger body size (holotype male length about 2.22 mm for *melones* vs. 1.63 mm for *grahami*), well-developed eyes, and pointed parastylar lobes on the glans penis.

OTHER ILLUSTRATIONS:

Briggs and Ubick (1981, fig. 1) map the species' distribution along the Stanislaus River. Ubick and Briggs (2002) provide a scanning electron micrograph of the venter of the female (fig. 8), an area cladogram for the *Banksula* species in Central California (fig. 9), and electron micrographs of the male genitalia (figs. 54-57).

DISTRIBUTION: Restricted to the karst region of the Stanislaus River in Calaveras and Tuolumne counties.

HABITAT: *Banksula melones* is a cave-dweller, as are all species in the genus except *Banksula incredula*. This species has the largest, most well-developed eyes in the genus (except for *B. incredula*, which lives above ground), and has occasionally been found in the twilight zone of caves, though most collections are from permanently dark regions. Ecological studies in McLean's Cave, where *B. melones* co-occurred with *B. grahami*, revealed that both species were found near the base of a broad talus cone that formed as debris gradually moved through two small entrances to the lower levels of the cave. Cave temperatures ranged from 14-16°C and humidity was 82-97%.

LIFE HISTORY/BEHAVIOR: Individuals are found under rocks, in wall crevices, or walking across the cave floor or walls. They are apparently not attracted to pitfall traps baited with various substances (Elliott 1978), and are most easily collected by hand. They move much more slowly than spiders (though more quickly than individuals of *B. grahami*) and tend to become motionless when disturbed, remaining so for up to several minutes. Feeding observations on captive adults and juveniles showed that the species preys on micro-arthropods, preferring Collembola to Psocoptera; some individuals lived 43 days without food (Rudolph 1979). The life span is probably several years, and based on collections at a transplant site (see Notes), juveniles are believed to molt every several months. The species appears to be most active in winter and spring.

NOTES: Construction of the New Melones dam in the late 1970s inundated at least 30 caves along the main and south forks of the Stanislaus River, including McLean's Cave. At the time of the dam construction, *B. melones* was known only from McLean's Cave and a nearby cave threatened by quarrying. Therefore, an ambitious project was undertaken to transplant *Banksula melones* and *Banksula grahami* (as well as about 30 other cavernicolous species) from McLean's Cave to a new location, an abandoned mine shaft subsequently referred to as "Transplant Mine" (Elliott 1978). Two transplants were made, one in 1975 and a second in 1978. Subsequent investigations (Rudolph 1979) revealed that the effort was successful and that the *Banksula* species were reproducing at the new site. However, when visited 1986, no *B. grahami* were located, though *B. melones* seemed well-established, with over 50 individuals seen (Ubick and Briggs 2002). On a subsequent visit in 1996, that population appeared to be on the decline, and only 6 individuals were observed. Fortunately, after the species was transplanted in the 1970s, it was also found in a number of nearby caves.

SELECTED REFERENCES:

- Briggs, T.S. and D. Ubick. 1981. Studies on cave harvestmen of the central Sierra Nevada with descriptions of new species of *Banksula*. Proceedings of the California Academy of Sciences. 42(11):315-322.
- Elliott, W.R. 1978. Final report on the New Melones cave harvestman transplant. Contract #DACW05-78-C-0007, U.S. Army Corps of Engineers, Sacramento District, California.
- Rudolph, D.C. 1979. Final report on the status of the Melones cave harvestman in the Stanislaus River drainage. Contract #14-16-0009-79-009, U. S. Fish and Wildlife Service, Washington, D.C.
- Ubick, D. and T.S. Briggs. 2002. The harvestman family Phalangodidae 4. A review of the genus *Banksula* (Opiliones, Laniatores). The Journal of Arachnology 30:435-451.

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