

#### IV. Nuts

##### a. Biology

##### 1. Neurocolpus longirostris Knight (Miridae) on pistachios

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A mirid, Neurocolpus longirostris Knight, was first associated with epicarp lesion in pistachios in 1984. This insect, a native of the western United States, is only the second species in the genus identified as an agricultural pest. The type locality for the species is Dayton, Washington and it has been collected in Montana, Wyoming, Washington, and Oregon. It is quite common in California wherever its native host, California buckeye, Aesculus californica, is found in the Sierra Nevada and Coast Range foothills. There is also one collection record from western Nevada near Reno.

The only host on which Neurocolpus longirostris has been found in California has been California buckeye. Henry and Kim, in their revision of the genus Neurocolpus in 1984, also list Ramnus californicus as a host. In July 1988 N. longirostris was collected on flowers of the vine Virgins/Bower, Clematis lequisticifolia, at Dayton, Washington but only in association with smooth sumac, Rhus glabra. In November, 1988 eggs of Neurocolpus were also found at Dayton in woody tissue of smooth sumac.

The damage to pistachios caused by Neurocolpus longirostris is typical of mirid injury to this nut crop. Nymphs hatching from overwintering eggs in April, during pistachio bloom, begin to feed on the small developing nuts. Characteristic pitting is found internally in the soft shell tissue, and external epicarp lesion symptoms begin to develop within 24-48 hours after feeding by the bugs. Soft shelled pistachios attacked by mirids typically abort within 5-10 days. After shell hardening in late May or early June, mirids are no longer able to penetrate the shell tissue and are incapable of causing additional damage to pistachios.

Laboratory studies on developmental rates of Neurocolpus longirostris reared on buckeye flowers at 24°C and 16 to 8 light periods have shown nymphal development through 5 instars in 15-16 days. Adults then live for an additional 45-50 days under caged conditions. Studies on Neurocolpus development under field conditions on buckeye at different elevations in the Sierra Nevada foothills show first egg hatch and appearance of nymphs at the lower elevations (ca. 1000 ft.) in early April. Adults then appear in early May and are found up until the time that buckeye flowers begin to senesce and die. At higher elevations, near the upper limit of buckeye range (ca. 4,000 ft.), eggs hatch in early May and small instar nymphs are



found until early June. Adults begin to appear at this elevation in mid-June and persist until early July. Neurocolpus apparently feeds only on the flowers and fruiting bodies of the host plant. They have not been observed feeding on twigs or foliage; under caged conditions they did not survive when fed exclusively on immature buckeye seed pods.

Several parasites have been reared from eggs of N. longirostris in California. These include a mymarid Erythmelis picinus (Gerault), two species of trichogrammatids, Chaetostricha sp. and Paracentrobia sp., and a signiphorid, Thysanus ater Haliday. The recovery of T. ater from mirid eggs is somewhat unusual as these parasites are more commonly known as primary or hyperparasites of diaspidid scales.

Trapping studies with virgin females and males of longirostris have indicated the presence of a sex pheromone produced by females whereas males apparently produce none.

Control of N. longirostris can be achieved in pistachios through the use of several insecticides including carbaryl, permethrin, and azinphosmethyl applied immediately post-bloom.