

Potential of *Cybocephalus binotatus* Grouvelle for Biological Control of Cycad Scale, *Aulacaspis yasumatsui* Takagi, in Taiwan

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The armored scale, *Aulacaspis yasumatsui* Takagi, was described from specimens collected on a *Cycas* species by Dr. Keizo Yasumatsui in 1972 in Bangkok, Thailand (Takagi, 1977). These specimens were collected as part of a field survey funded by the Ministry of Education and Japanese Government on the biological control of rice stem-borers, aphids, diaspine scales and phytophagous mites in South East Asia. In 1996, severe infestations of *A. yasumatsui* were discovered on *Cycas* species at Montgomery Foundation in Southern Florida, which contains one of the largest and finest collections of palms and cycads in the world. Since then this pest has spread to most of Florida. It has also been found in other countries such as Cayman Islands, St. John, Hawaii and Hong Kong. The cycad scale, *Aulacaspis yasumatsui* is now a pest in Taiwan, affecting mainly an indigenous species of cycad, *Cycas taitungensis* and causing a major threat to a cycad protected area. Two natural enemies, namely, a predatory beetle, *Cybocephalus binotatus* Grouvelle and a parasitoid, *Coccobius fulvus* have been identified in Thailand and have been used successfully in Florida for biological control of the cycad scale. This research includes a field survey to determine the extent of infestation in the field and to identify natural enemies of this scale in Taiwan. The predator *Cybocephalus binotatus* Grouvelle is the main focus for biological control of the scale. The *C. binotatus* has been imported from its native Thailand to the "National Pingtung University of Science and Technology" quarantine laboratory where it is screened. The investigation is being carried out to determine important biological parameters such as Life Table and Life History, Fecundity, Sex ratio and Longevity as well as ecological factors such as predation differences between male and female beetles, functional responses, interference and selective efficiency, which will contribute to a better understanding of the beetles' dispersion in different geographical and climatic regions of Taiwan as well as their value as biological agents against the cycad scale, *Aulacaspis yasumatsui*.