

SCIENTIFIC NOTES
THREE CHALCIDOID PARASITES OF DIASPINES AND
WHITEFLIES OCCURRING IN FLORIDA
AND THE CARIBBEAN

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Caenohomalopoda shikokuensis (Tachikawa) (Encyrtidae). A collection of diaspine scales from the Sunken Gardens, St. Petersburg, Florida, made by FDB on 20 April 1986, yielded a single specimen of an encyrtid. Using the key to the neotropical Encyrtidae (Noyes, 1980), it ran to the genus *Homalopoda*, but did not match the characters for that genus. Later J. N. identified it as *Caenohomalopoda shikokuensis* described by Tachikawa (1956) from Japan as *Pseudhomalopoda shikokuensis*. Tachikawa (1979) described the genus *Caenohomalopoda* naming *shikokuensis* as the type species and listing as its host the diaspine *Odonaspis penicillata* Green. Subsequently, FDB reared this encyrtid from *O. penicillata* (det. A. Hamon) on *Bambusa multiplex* (Lour.) Roeusch. from Alachua county and from several additional counties in Florida. In October 1987, he reared it from the same host from Grand Cayman, Cayman Islands and in November 1987 collected one female on bamboo at Mayaguez, Puerto Rico. Tachikawa (1979) reported the occurrence of *C. shikokuensis* in Japan and he, as well as Prinsloo (1979, 1983), recorded it from South Africa. Our collections constitute the first records of this genus and species from the New World. Its present known distribution in the New World, based on our records is given in Figure 1. The species is probably much more widely distributed, but is easily overlooked unless a special search is made for it. We assume that the scale and its parasite accompanied *B. multiplex* or a related species of bamboo when it was introduced into the New World from Asia.

Arrhenophagus albitibiae Girault (Encyrtidae). In Florida, *Pseudaulacaspis pentagona* (Targioni) is a major pest of peaches and attacks a wide range of ornamentals. There have been several studies on its natural enemies in Florida. In two earlier studies, (Hughes 1960 and Collins & Whitcomb 1975), parasitism by *Arrhenophagus* sp. was not recorded. In contrast, Ball & Stange (1979) noted high levels of parasitism by a species they referred to as *Arrhenophagus chionaspidis* Aurivillius. This species was known to attack *Aulacaspis rosae* (Bouché), *Quadraspidotus perniciosus* (Comstock) and *Q. forbesi* (Johnson) in the U.S.A., where it occurred from Maryland south to Florida (Gordh 1979). Ball & Stange (1979) pondered this sudden extension of host range and suggested that as it predominately attacked males, it might have been overlooked by earlier investigators. Specimens reared from *P. pentagona*, by R. I. Sailer and FDB in 1985-86 and from *P. cockerelli* (Cooley) by FDB, were submitted to J. N., British Museum (Natural History). They proved to be *Arrhenophagus albitibiae* Girault, a species described from Japan and recorded also from Hong Kong and Sri Lanka but not from the New World. It has frequently been misidentified as *A. chionaspidis* according to Annecke & Prinsloo (1974) who listed as hosts several diaspinines additional to

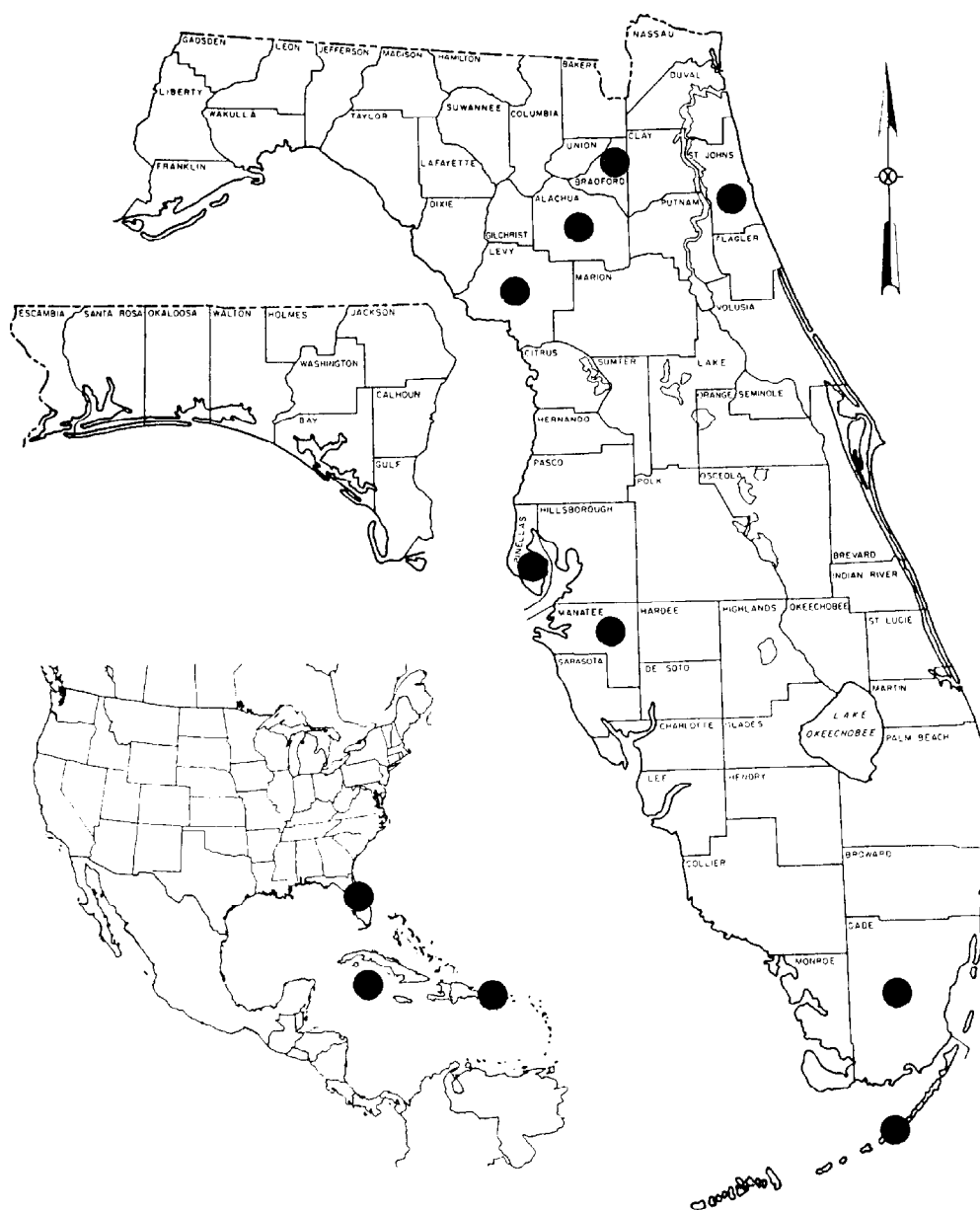


Fig. 1. Distribution of *Caenohomolopoda shikokuensis* in Florida and the Caribbean.

Pseudaulacaspis spp. Its absence from earlier collections, coupled with its present abundance, suggests that it is a recent arrival to Florida and that material reported by Ball & Stange (1979) as *A. chionaspis* was in fact *A. albitibiae*.

Euderomphale vittata Dozier (Eulophidae). During the 1960's, the spiralling whitefly, *Aleurodicus dispersus* Russell, swept northward from the Florida Keys to central Florida where it was reported to be a pest of several ornamentals including coconuts and seagrape (Russell 1965, Cherry 1980) and was suspected (erroneously) of being a vector of the lethal yellowing disease of coconuts (Weems 1971). After several years, its populations subsided and it has since become, at most, a sporadic, minor pest. In 1982, R. I. Sailer attempted the introduction of two natural enemies, the coccinellid

Nephaspis oculatus (Blatchley) (introduced under the name *N. amnicola* Wingo) and the aphelinid *Encarsia* sp. near *haitiensis* Dozier, from Hawaii. Later, he found that *N. oculatus* already occurred in Florida and could find no evidence that *Encarsia* had become established, or contributed to the decline of the whitefly populations. Instead of the introduced natural enemies, he consistently reared a eulophid parasite which had been determined only as *Euderomphale* sp. In 1985, FDB reared a few specimens of this parasite from *A. dispersus* on coconut and seagrape, *Coccoloba uvifera* (L.) L., and suggested that they might be *Euderomphale vittata* Dozier, described from *Aleurodicus* sp. on *Calophyllum calaba* Jacq. (= *antillarum* Britton) from Puerto Rico (Dozier 1933). This identification was confirmed by M. E. Schauff, USDA, Beltsville Md., who knew of no other records from continental North America, but had records from Puerto Rico and Jamaica. In 1986, FDB and R. M. Baranowski reared it from *A. dispersus*, collected on coconut and tropical almond *Terminalia catappa* L., in the Cayman Islands. Its arrival and effectiveness in controlling *A. dispersus* in Florida appear to constitute an example of fortuitous biological control of a serious pest.

The three chalcidoids discussed above are all primary parasites of their respective hosts. None was deliberately introduced. It is probable that, at the time of its discovery, *C. shikokuensis* had been a long time resident in Florida, but remained undetected. On the other hand, we conclude that *A. albitibiae* and *E. vittata* were comparatively recent arrivals at the time of their detection. These examples demonstrate the need for a systematic survey to determine the natural enemy complex of the Homoptera of Florida to ascertain what species are already present, as a prerequisite to the introduction of biocontrol agents.

Dr. M. E. Schauff, Systematic Entomology Laboratory, Agricultural Research Service, USDA, confirmed the identification and provided information on the distribution of *Euderomphale vittata*. Dr. A. B. Hamon, Bureau of Entomology, Div. Plant Industry, Florida Dept. Agric. & Consumer Services identified the whitefly and scale hosts of the parasites discussed in this note. Discussions with the late Professor Reece I. Sailor stimulated the initial investigations on *A. dispersus* which led to the studies on the other species. We also thank Drs. J. H. Frank, V. K. Gupta and D. H. Habeck for their critical review of the manuscript. Published as Florida Agricultural Experiment Station, Journal Series No. 9325.

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SURVEY OF PREDATORS OF THE BROAD MITE IN SOUTHERN FLORIDA

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The broad mite (BM) *Polyphagotarsonemus latus* is one of the major pests of lime (*Citrus latifolia* Tan.) in southern Florida. Broad mites reduce the market value of the crop by feeding on the fruit surface and causing silvering of the fruit (Campbell 1979). Since reaching pest status in 1968, broad mites have been controlled exclusively with pesticides (Wolfenbarger 1974). Few acaricides are effective against the broad mite (Brown & Jones 1983), and the use of broad spectrum pesticides to control various pests of limes has eliminated or reduced levels of naturally occurring predators of the broad mite. Therefore, an integrated pest management program (IPM) for limes must include development of control tactics which are compatible with natural enemies.

The potential of phytoseiid mites as predators of the broad mite has been reported for other areas (Badii & McMurtry 1984, McMurtry et al. 1984) but has not been examined in the lime tree agro-ecosystem in Florida. The major objective of this study was to identify the predaceous mites on lime fruits and to measure their impact on the broad mite.

Selection of a sampling unit. Two preliminary surveys were conducted to determine the relative frequency of predaceous mites on fruits, leaves and flowers. Initially, twenty small fruits (4 cm or less in diameter) and 80 new leaves were collected weekly (August-December 1984) from a lime orchard near Homestead, Florida. Fruits and leaves were placed separately in plastic bags. These were placed in an ice chest (ca.