SOME NATURAL ENEMIES OF THE WHITE PEACH SCALE, *PSEUDAULACASPIA PENTAGONA* (TARGIONI) (IIOMOPTERA: COCCOIDEA) IN FLORIDA ¹

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The white peach scale, *Pseudaulacaspis pentagona* (Targioni), was first observed in Florida in 1889 on peach trees in the vicinity of Molino (Gossard, 1902). Since that time *P. pentagona* has spread throughout the state and is now known to attack more than 60 species of plants (Riddick, 1955).

The natural enemies of the white peach scale have been adequately recorded in many areas of the world (Anonymous, 1944; Bennett, 1956; Simmonds, 1958). However, except for an early report by Gossard (1902) telling of the twice-stabbed lady beetle, *Chilocorus stigma* (Say), feeding on white peach scale, published records of natural enemies of this scale in Florida are lacking. The records of parasites and predators which follow were gathered during the period May 1, 1959, to October 1, 1959, primarily from Alachua County.

METHODS

Careful examinations of white peach scale infestations were made in 8 separate field locations in Alachua County and all parasites and predators observed were collected. Small sections of scale-infested twigs and branches were returned to the laboratory from the collection sites and placed in emergence boxes. Twenty-three samples, each consisting of at least 300 scales were gathered with a minimum of 2 samples coming from each of the collection areas. In addition, to establish authentic parasitophagous relationships, parasitized scales from each collection area were placed individually in 1-dram vials where they were kept until the adult parasites emerged. Dissections of scales were also carried out under a microscope.

Through the cooperation of Mr. Harold Denmark, Chief Entomologist with the State Plant Board of Florida, arrangements were made to have plant material infested with *P. pentagona* sent to the author in Gainesville by State Plant Board field inspectors working in various parts of Florida. In this manner small quantities of white peach scale were obtained from Baker, Jefferson, Lake, Orange, and Volusia Counties. Recoveries made from this material have been recorded here; however, many additional samples of *P. pentagona* would be required before an accurate estimate

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could be made of the distribution and abundance of natural enemies of this scale within these 5 counties.

RESULTS AND DISCUSSION

Two species of primary hymenopterous parasites were reared from field-collected samples of white peach scale. In addition, 2 hyperparasitic species were recovered.

The most common and most effective parasite of the white peach scale in Florida appears to be the culophid _Prospaltella berlesei_ (Howard). This species is endoparasitic in nature and attacks second-instar scales, principally females. The parasite was recovered from every area in the state in which samples of _P. pentagona_ were secured.

There was no attempt to make detailed counts to determine the percentage of scales attacked by _P. berlesei_ on the various samples. Spot counts indicated, however, that there can be a great variation in the degree of parasitism, even within small areas. Despite local variations in effectiveness, _P. berlesei_ must be considered an important agent in the control of the white peach scale in Florida.

The second of the primary parasites recovered from _P. pentagona_ was _Aspidiotiphagus citrinus_ (Crawford). This species was far less common than _Prospaltella berlesei_, being recorded from only 2 of the 8 collection areas in Alachua County, and from a single area in Baker County. _A. citrinus_ attacks second-instar male and female scales and is an endoparasite.

It is surprising that _A. citrinus_ was not recovered more commonly since this species has been recorded attacking purple scale, _Lepidosaphes beckii_ (Newman), and Florida red scale, _Chrysomphalus aonidum_ (Linnaeus) (Muma, 1955), and is presumed to be distributed throughout the State of Florida. Seasonal variations in population of this parasite might account for the poor recovery record since all investigations were conducted during the summer months.

The effectiveness of _Prospaltella berlesei_ was reduced considerably by the hyperparasite _Thyesius flavopalliatus_ (Ashmead), which was commonly found attacking pupae of the primary parasite within the mummified bodies of _P. pentagona_ (Fig. 1). _T. flavopalliatus_ was recovered from every collection area with the exception of Lake County. Small numbers of the eulophid _Ablerus elisiocampa_ (Ashmead), recorded as a hyperparasite on _Prospaltella aurantii_ (Howard) by Muma (1959), were also recovered from white peach scale. The identity of the primary parasite through which _Ablerus elisiocampa_ was developing was not definitely established, but in all probability it was _Prospaltella berlesei_.

Three species of coccinellids were found feeding on white peach scale. Two of these species, the twice-stabbed lady beetle, _Chilocorus stigma_ (Say), and _Lindorus lophanthae_ (Blaisdell) were common and very effective predators. The third species, _Exoecus childreni_ Mulsant, was found only occasionally and never in large numbers.

Further investigation would undoubtedly uncover additional coccinellids predacious on _P. pentagona_ in Florida since several of the species listed by Merrill (1922) as occurring in Florida are known to attack white peach scale in other geographical areas (Bennett and Hughes, 1959).
In addition to the coccinellids, a species of thrips, a lepidopterous larva, and a chrysoeid larva were recorded in association with white peach scale. The thrips, Haplothrips sp. nr. americanus (Hood), was quite common, particularly when scale infestations were heavy. This thrips species is apparently a scavenger rather than a predator.

Larvae of the cosmoterygid moth, Pyrodes rileyi (Walsingham), were recovered regularly from white peach scale material. The larvae tunnel among encrusted scales, living as scavengers.

Several larvae of an unidentified chrysoeid were collected in association with P. pentagona infestations in the Gainesville area. While the larvae were apparently feeding on one or more stages of the scale, the number of these predators was so small as to make them economically unimportant.

**Summary**

An investigation of the natural enemies of white peach scale, Pseudaulacaspis pentagona (Targioni), was conducted in Alachua County, Florida, during the summer of 1959. Two parasites, Prospaltella berlesei (Howard) and Aspidiotiphagus cirinus (Crawford), along with the coccinellid predators Chilocorus stigma (Say), Lindorus lophanthae (Blaisdell), and Exochomus childreni Mulsant, were recorded as attacking P. pentagona. Thysanus flavopalliatius (Ashmead), a secondary parasite through P. berlesei, was very common.
LITERATURE CITED


Hughes: Natural Enemies of the White Peach Scale

A Lygaeid New to the United States List (Hemiptera).—*Pachybrachius neotropicalis* (Kirkaldy 1909), earlier known by the preoccupied name *serripes* (Fabr. 1803), is widely distributed in the Neotropical Region, including the West Indies, but has not been reported heretofore from the United States. I have recently seen a male and a female from Miami, Florida, in the collection of the State Plant Board of Florida. These were taken in traps, situated about 5 miles apart, on November 23 and November 25, 1959, respectively.

*P. neotropicalis* is nearly twice as large (9½ to 10 mm.) as the largest *Pachybrachius* reported previously from the United States, and is further distinguished easily by the much more slender front femora and the blackish pronotum with four very small, rusty spots on the posterior lobe. As in *P. alboinjectus* Barber, the basal portion of the fourth antennal segment is very broadly white.—ROLAND F. HUSSEY, Biology Department, University of Florida, Gainesville.

JOSEPH WILLIAM DECKER

Word has recently been received of the death of J. William Decker, 76 years of age. Mr. Decker was associated with the Fort Clinch State Park for 19 years and was responsible for the development of the excellent museum associated with the old fort. Last year he retired from the State Park Service and was engaged in the development of a private museum at Fernandina Beach at the time of his death. He is survived by his wife, Mrs. Sadie Decker, and son, Douglas William Decker, who plan to complete and operate the private museum. Mr. Decker trained as an engraver and silversmith in Germany as a young man. In addition to his many historical interests, he was a naturalist in the very broadest sense. His interest in insects is evident from his many years of membership in Florida Entomological Society.