

SOME BIOLOGICAL NOTES ON KATYDIDS IN FLORIDA CITRUS GROVES ¹

J. T. GRIFFITHS ²

Florida Citrus Experiment Station, Lake Alfred

During the course of observations on injury to Pope Summer oranges in the Vero Beach area, interest in the broad-winged katydid, *Microcentrum rhombifolium* (Sauss.), on citrus in Florida led to observations on the biology of this insect. This katydid has been known for many years to occasionally damage citrus fruits by chewing on the peel as described by Griffiths.³ This paper presents observations on the life history of this katydid and illustrations of the instars.

In 1951 eggs hatched early in the spring and the hatching coincided with the onset of the spring flush of growth on citrus trees. Figure 1 shows eggs which are just about to hatch. These eggs have swelled and hatching would normally occur within a relatively short time. Katydids were first observed to hatch on February 16.

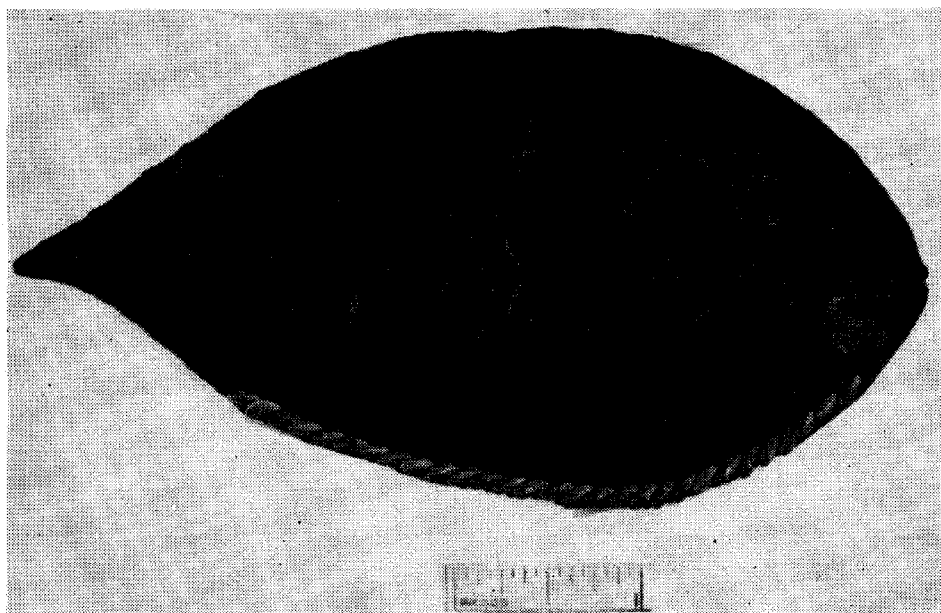


Figure 1. Katydid eggs which are about to hatch. These appear raised and swollen.

¹ Florida Agricultural Experiment Station Journal Series, No. 84.

² Resigned in 1951; present address, Lyons Fertilizer Company, Winter Haven, Florida.

³ Griffiths, J. T. 1952. Observations on peel injury to Pope Summer Oranges in the Vero Beach area. Fla. Ent. (in press).

Individuals hatched on February 16, 1951 were reared to adults in the laboratory. It is probable that their life cycle was longer than would normally have occurred in citrus groves, inasmuch as the katydids were confined in small containers and their diet was probably not as satisfactory as would have been found in nature.

On March 11 the first katydids molted from first to second instar (figure 2). This represented a period of 23 days for the first instar. The first individuals to reach third instar did so on April 2 or after another 23 days. The last nymph to reach third instar did so on April 10.

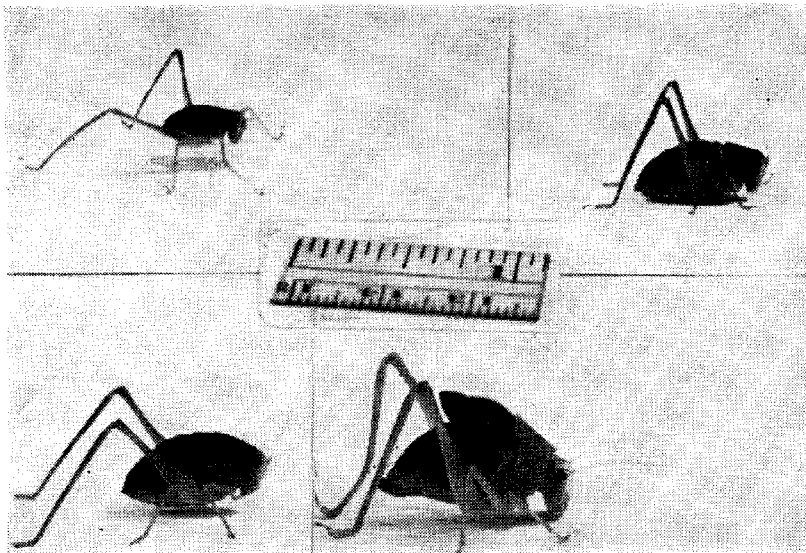


Figure 2. The four instars of the broad-winged katydid, *Microcentrum rhombofolium* (Sauss.). Upper left, 1st instar; upper right, 2nd instar; lower left, 3rd instar; and lower right, 4th instar.

In the third instar (figure 2) a distinctive line appears on the dorsal side of the abdomen. This is usually light yellow and extends along the mid-dorsal line of the thorax. As it emerges behind the small wing pads it separates and forms two distinct lines down the lateral margin of the dorsal abdominal area. This is a distinctive marking which readily places the individual in third instar. It is not present as a pronounced line in second instar.

The first individuals to reach fourth instar did so on April 13 and the last one on April 28. Wing pads appeared in the third and were pronounced in the last instar. The first adult (figure 3) emerged on May 1 and the last two on May 8. The

life cycle from hatching to adulthood extended over a period of almost three months. Observations in the field showed that katydids in similar stages to those in the laboratory were found at approximately the same times. Adults were first observed during the latter part of April.

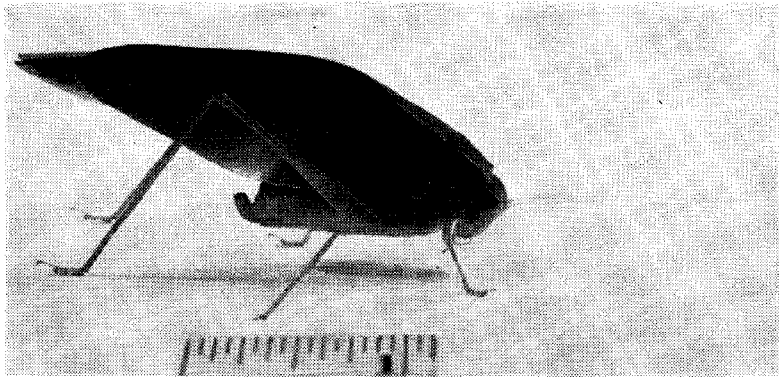


Figure 3. Adult female of the broad-winged katydid.

A second hatch occurred in the summer of 1951. Another hatch was observed about September 1 and on January 1, 1952 second and third instar nymphs were seen in the field. It is apparent from this that the life cycle is probably continuous throughout the year with, perhaps, three or more generations occurring annually. Whether hatching and nymphal development is normal in most winters is unknown, but in the period of rather mild temperature during November and December of 1951 it was apparent that hatching had occurred in a number of groves and that nymphs were present in January of 1952.

This katydid is seldom of major economic importance to citrus. It has been definitely established that it can injure fruit and does so on occasion although fruit injury amounting to economic loss is probably rare. Foliage injury, particularly to young trees, can be extremely severe. In the fall of 1951 observations in a young grove indicated that katydid injury was the major factor in partial defoliation of numerous trees. This injury was widespread over a 60 acre block and chlordane sprays were applied to control the insect. Since a number of eggs are laid on a single leaf, if these eggs hatch, a fairly large population of katydids will be present with a limited leaf area for food. The damage by these rapidly growing nymphs can on occasion be most severe.

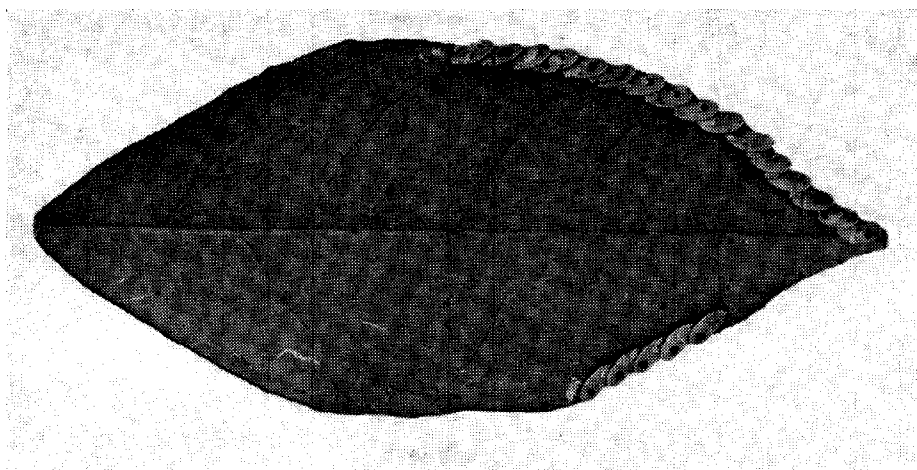


Figure 4. Emergence holes in parasitized katydid eggs made by *Anastatus mirabilis* (Walsh). Note the flattened appearance of these eggs as contrasted with those in Figure 1.

Eggs of this katydid are commonly parasitized and parasitism is a major factor in the normal control of this insect pest. The eggs have a flat appearance (figure 4) and round emergence holes of the parasite are very evident. The most common parasite is *Anastatus mirabilis* (Walsh),⁴ a member of the family Eupelmidae. Usually when parasitism occurs, all eggs of a group on a single leaf will be parasitized.

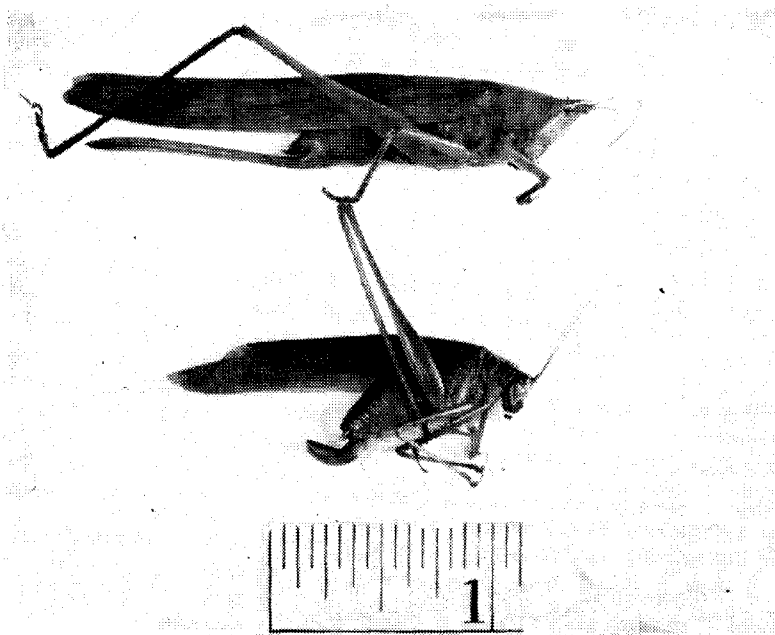


Figure 5. Two katydids which are sometimes found in citrus groves, *Neoconocephalus triops*, above, and *Scudderia* sp. below.

⁴ Identification by Mr. A. D. Gahan of the Bureau of Entomology and Plant Quarantine.

The broad-winged katydid is the most common species found on citrus in Florida, however, two other species regularly encountered are pictured in figure 5. One is the species *Neoconocephalus triops* (L.) and the other belongs to the genus *Scudderia*. Positive identification of this specimen was not made. No information on the life cycles of these two species is available.

SUMMARY

The broad-winged katydid *Microcentrum rhombifolium* (Sauss.) is a common insect found in citrus groves in Florida. Only rarely does it accomplish major injury and this is usually confined to young trees. It passes through four instars which take a period of approximately three months from egg to adult. Its eggs are highly parasitized by a Hymenopterous insect of the family Eupelmidae, *Anastatus mirabilis* (Walsh).

