UF IFAS Extension UNIVERSITY of FLORIDA

EENY-162

A Cockroach Egg Parasitoid, *Evania appendigaster* (Linnaeus) (Hymenoptera: Evaniidae)[1]

Lionel A. Stange[2]

The Featured Creatures collection provides in-depth profiles of insects, nematodes, arachnids and other organisms relevant to Florida. These profiles are intended for the use of interested laypersons with some knowledge of biology as well as academic audiences.

Introduction

Household cockroaches (*Blatta orientalis* L.; *Periplaneta americana* (L.); Periplaneta australasiae (F.)) are parasitized by an imported ensign wasp, *Evania appendigaster* (L.). Adult wasps are occasionally seen in city buildings and homes. The earliest US record of this probably oriental species is a specimen captured in Washington, DC June 5, 1879. The general body shape provides an easy recognition feature of this family since no other Hymenoptera have the abdominal petiole attached near the top of the propodeum, with the rest of the abdomen (gaster) small, laterally compressed, oval (male) to subtriangular (female) giving the appearance of a small hand flag, hence the common name of the family "ensign wasps." A systematic account is given by Townes (1949) and biological considerations by Cameron (1957).

Distribution

Probably of Oriental origin, but now widely ranging in tropical and subtropical areas of the world, northward into Palearctic and Nearctic regions. It is common in much of the southern US and extends northward to New York City.

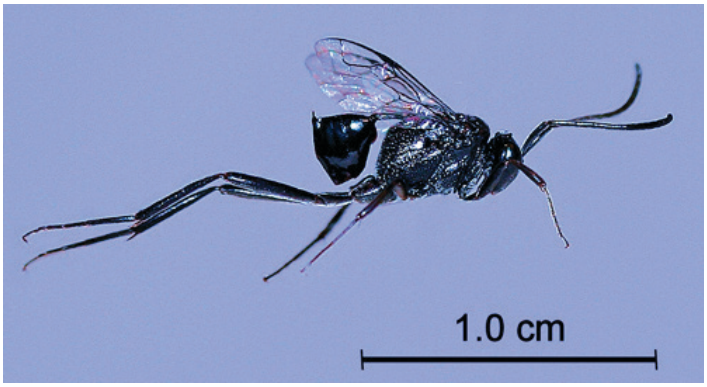

Figure 1. Adult *Evania appendigaster* (L.), a cockroach egg parasitiod. Credits: Donald Hall, UF/IFAS

Identification

The large size of this all-black species (length of forewing 5.5 to 7.0 mm) readily distinguishes it from all other species (at most with forewing length of 5.0 mm) in the Nearctic Region except for *Prosevania petiolatus* (Brullé) which is not recorded from Florida, but occurs in Georgia. From *P. petiolatus* and other species, the wide separation of the midcoxae from the hindcoxae (distance about twice length of midcoxa) is diagnostic.

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2. Lionel A. Stange, Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, FL.

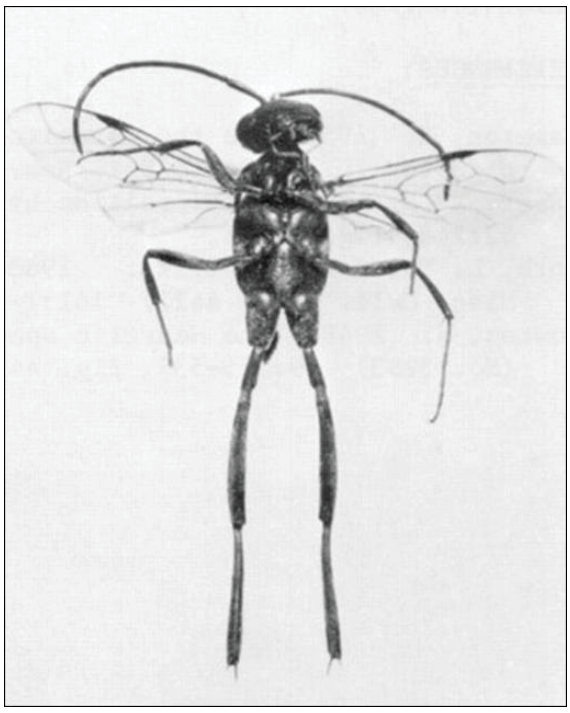

Figure 2. Ventral view of an adult *Evania appendigaster* (L.), a cockroach egg parasitiod, showing the wide separation of the midcoxae from the hindcoxae.
Credits: Division of Plant Industry

Biology

Upon finding a cockroach egg case, the female vibrates her antennae over it. Before long, the female lies on her side with her body parallel to the long axis of the egg case with the legs braced against the latter and the body against a substrate. After a good deal of hard work and much wriggling of the abdomen, she eventually penetrates the tough integument of the egg case and inserts her ovipositor. This usually takes from 15 to 30 minutes. Only one white egg is oviposited. The developing larva undergoes five molts during which time it devours all of the eggs. Each larval instar has distinctive mandibles. The first instar has sharply pointed mandibles with a row of small teeth. This unusual armature enables the larva to cut through the tough shell of the host egg. The next two instars have longer, tridentate mandibles without the serration. The penultimate and mature larva have stockier mandibles with the tridentate cutting edge replaced by a narrow curved ventral denticle and a long blunt dorsal one. Maximum larval length is about 8 mm. Pupation occurs within the egg case without a cocoon. There are at least three generations per year in some areas, but no information is available for the southeastern US. At maturity the adult makes its escape through a small round jagged hole which it cuts near the end of one of the long sides of the egg case. The adults live two to three weeks. They are sometimes attracted to flowers such as parsley and fennel and also to honeydew. They are not known to sting humans.

Biological Control Potential

Parasitism of cockroaches by *E. appendigaster* reached 29% in populations of *P. americana* in the Middle East. No data are available for the United States. The most important competitor is *Aprostocetus hagenowii* (Ratzeburg) (Eulophidae) which can attain a maximum parasitism rate of 57% of the *P. americana* and also parasitizes (accidentally) the ensign wasp. *A. hagenowii* has more generations, faster developmental rate, higher productivity, and can better withstand desiccation. However, *E. appendigaster* can destroy the egg case with a single oviposited egg. Cameron (1957) speculates that at least 50% control of cockroaches could be attained by mass releases of the two aforementioned parasitoids in the same area.

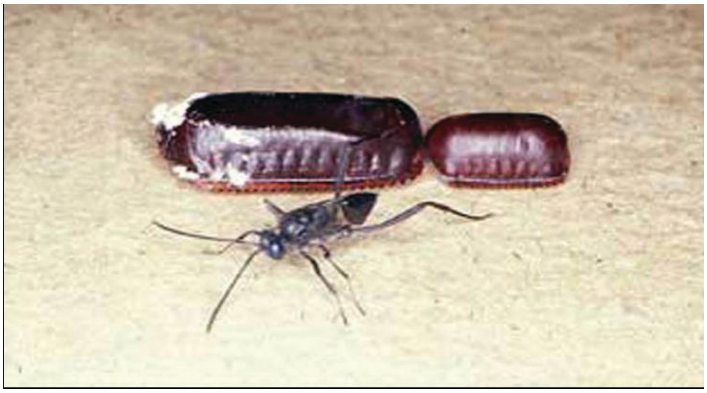

Figure 3. Adult ensign wasp, a cockroach parasitoid, in front of a Florida woods cockroach egg case (left) and American cockroach egg case (right).
Credits: Daniel Suiter, University of Georgia

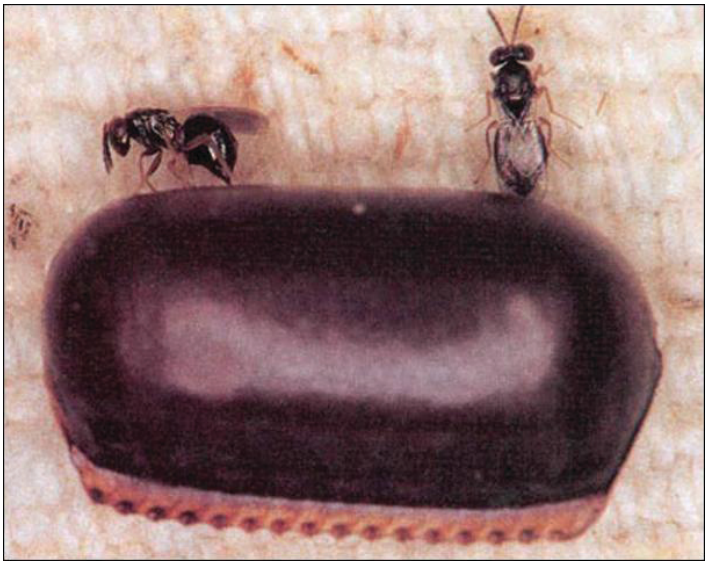

Figure 4. *Aprostocetus hagenowii* (Ratzeburg) is one of several parasitic wasps that attack American cockroach, *Periplaneta americana* (Linnaeus), oothecae.
Credits: Daniel Suiter, University of Georgia

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