

EVANIA APPENDIGASTER (L.), A COCKROACH EGG PARASITOID
(HYMENOPTERA: EVANIIDAE)¹

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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 U.S. record of this probably Oriental species is a specimen captured in Washington, D.C. June 5, 1879. The general body shape (fig. 1) 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).

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 (fig. 2) (distance about twice length of midcoxa) is diagnostic.



BIOLOGY: Upon finding a cockroach egg case, the female vibrates her antennae over it. Before long the female lays 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 15-30 minutes. Only one white egg is oviposited. The developing larva undergoes 5 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

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teeth. This unusual armature enables the larva to cut through the tough shell of the host egg. The next 2 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 3 generations per year in some areas, but no information is available for the southeastern United States. 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 2 to 3 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 Tetrastichus hagenowii (Ratzeburg) (Eulophidae) which can attain a maximum parasitism rate of 57% of the P. americana and also parasitizes (accidentally) the ensign wasp. T. 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 2 aforementioned parasitoids in the same area.

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 U.S. and extends northward to New York City. In Florida, captures have been made in Alachua, Dade, Duval, Monroe, Orange, Pinellas, Seminole, and Union counties.

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