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Biological Control with Insects: The Asian Hydrilla Moth ¹

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(*Parapoynx diminutalis* Snellen Lepidoptera:
Pyrilidae: Nymphulinae)

Host : *Hydrilla verticillata* (L.f.) Royle
(Hydrocharitaceae)

The subfamily Nymphulinae comprises a group of moths that are almost all aquatic. About 18 species occur in Florida. Caterpillars in the genus *Parapoynx* can be distinguished from other aquatic species by the presence of branched gills on all segments of the body except for the head and prothorax. Four native species of *Parapoynx* are commonly found in Florida (*P. maculalis* (Clemens), *P. obscuralis* (Grote), *P. seminealis* (Walker), and *P. allionealis* (Walker)). Another species first reported in 1976 as feeding on hydrilla in experimental pools in Fort Lauderdale was identified as *P. diminutalis*. This species was previously known only from Asia. It had once been considered a potential biological control agent, although it was never imported for this purpose. Its adventive introduction into Florida probably occurred by being imported with aquatic plants.

The female moths lay their eggs in masses of about 30 eggs each. The eggs are placed on hydrilla leaves and stems that are exposed at the surface of the water. Eggs hatch in 4 to 6 days. Larval development

requires 21 to 35 days at 22.2°C, but this varies inversely with temperature.

Neonates feed by scraping the leaf surface or by "notching" the leaf margin. First and second instars sometimes feed from within a simple case made by attaching a small piece of leaf over themselves. Later instars make tubular cases from stems or leaves that they attach to one another with silk. The larvae browse on hydrilla from within these cases, often consuming entire leaves as well as portions of the stems. When larval populations are high, they completely defoliate the stems. This most often occurs on hydrilla that is being cultivated, however. Predators presumably keep field populations in check. Nonetheless, complete defoliation of large patches of hydrilla at field sites sometimes creates holes in hydrilla beds. Closer examination usually reveals that the hydrilla remains in these holes but that the stems are leafless. The defoliated stems usually recover. Adults emerge, mate, oviposit, and die within 5 to 7 days. Total generation times range from 29 to 44 days at 30°C.

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