

ment of a valuable detection, monitoring or management tool for use in pest management strategies.

Role of a polydnavirus in the interaction between an ichneumonid parasitoid and its spruce budworm host

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The wasp, *Enytus montanus* (Ichneumonidae: Campopleginae), is a common parasitoid of endemic-phase spruce budworm, *Choristoneura fumiferana*, populations in Quebec. The surface of its egg has a layer of "chorionic projections" within which viral particles are imbedded. These particles fit the description of typical ichneumonid polydnaviruses (PDV): (i) they are produced in the calyx of the ovary, (ii) their shape and structure closely resemble those of previously described ichneumonid PDVs, and (iii) they contain polydisperse DNA. Following oviposition, the virus is believed to diffuse away from the egg, infecting host tissues where some of its genes may be expressed. Presumably, such PDV-induced proteins facilitate the development of the parasitoid in its host.

Parasitism of sixth-instar spruce budworm larvae by *E. montanus* induced an important increase in the duration of the host instar (controls: 6.5 days, parasitized: 13.0 days), which was duplicated by injection of PDV-laden calyx fluid (0.1 and 0.5 female equivalents). First-instar larvae of *E. montanus*, as well as small glass rods implanted in parasitized spruce budworm larvae, were partially encapsulated, but the capsules were not melanized, suggesting that the effect of *E. montanus* PDV on spruce budworm immunity is limited to an inhibition of melanization. A new polypeptide of 80 kDa (as assessed by SDS-PAGE) appeared in the hemolymph of sixth-instar spruce budworm larvae shortly (3 hours) after parasitization by *E. montanus*. Whether this polypeptide is the result of PDV gene expression remains to be determined.

Juvenile hormone production in adult female *Choristoneura fumiferana*

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We have defined the assay conditions for measuring the *in vitro* rates of juvenile hormone (JH) biosynthesis by the corpora allata (CA) of spruce budworm (SBW) female moths, using the method of Tobe & Pratt (1974, *Biochem. J.* 144: 107-113). Incubation of CA for 2 hours in a medium containing high-specific activity (final, 79 Ci/mmol) [³H] L-methionine, at a concentration of 20 μM, allowed measurement of fmol quantities of JH I, II, and III separated by HPLC (detection limit: 0.1 fmol·h⁻¹/CA pair).

In virgin SBW females, JH production appeared to follow a developmental pattern similar to that described for *Manduca sexta* (see *Biol. Bull.* 146: 377-392; *J. Insect Physiol.* 20: 1173-1180). Corpora allata became activated in pharate adults on the day before emergence and JH production reached a plateau (total JH, ca. 13 fmol·h⁻¹/CA pair) 12-24 h post-eclosion, coincident with the mating period. The major homologue produced is JH II. Vitellogenin (Vg) production began 2 days prior to CA activation, indication that Vg synthesis was not a JH-dependent process. However, JH appeared to facilitate Vg uptake following emergence. Mating resulted in an increase in the proportion of JH I produced as well as a decrease in Vg titer in the hemolymph. The possible role of JH in the regulation of SBW migratory behaviour is discussed.

Host plant quality influences the reproductive biology of *Choristoneura fumiferana*

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We examined the possible impact of male larval food sources on the reproductive success of spruce budworm, *Choristoneura fumiferana*, females. Following mating with males reared on young balsam fir foliage (YF) (endemic situation), spruce budworm females were less likely to resume calling (the emission of the sex pheromone) and remate than those mated with males reared on either old balsam fir foliage (OF) (epidemic situation) or McMorran's artificial diet (AD). Furthermore, females that resumed calling after mating with males on YF (but did not remate) had fecundity and percent fertility similar to those that remained refractory. However, those mated with males reared on OF and AD that resumed calling were significantly less fecund