

PROJECT NO: 4405 (Termination Report)

TITLE: A Braconid Egg/Larval Parasitoid of the Codling Moth

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Accomplishments: This project contributed to the proposal and subsequent SARE grant that brought in over \$270,000 for tree fruit research in the Pacific Northwest.

Significant contributions from this research project can be found in the following publications. All these publications acknowledge the generous support of the Tree Fruit Research Commission over the past years.

Publications

1. Brown, J. J., D. Reed-Larsen and J. Ahl. Physiological relationship between a diapausing endoparasitoid (*Ascogaster quadridentata*) and its dormant host (*Cydia pomonella*). Arch. Insect Biochem. and Physiol. **13**(3/4): 229-38. 1990.
2. Espelie, K. E. and John J. Brown. Cuticular hydrocarbons of species which interact on four trophic levels: Apple, *Malus pumila* Mill.; codling moth, *Cydia pomonella* L.; a hymenopteran parasitoid, *Ascogaster quadridentata* Wesmael; and a hyperparasite, *Perilampus fulvicornis* Ashmead. Comp. Biochem. Physiol. **95B**(1): 131-6. 1990.
3. Reed-Larsen, D. A. and J. J. Brown. Embryonic castration of the codling moth *Cydia pomonella* by an endoparasitoid, *Ascogaster quadridentata* Wesmael. J. Insect Physiol. **36**(2): 111-8. 1990.
4. Jones, D., T. Taylor, R. Farkas, J. Chelliah, B. Haene, J. Brown and D. Reed-Larsen. Intercession of parasitic wasps (Cheloninae) in host development and biochemical pathways. Advances in Invertebrate Reproduction **5**: 157-62. 1990.
5. Espelie, K. E., E. A. Bernays and J. J. Brown. Plant and insect cuticular lipids serve as behavioral cues for insects. Arch. Insect Biochem. and Physiol. **17**: 223-233. 1991.

6. Brown, J. J. Diapause. **Chapter 2.4.** In Tortricoid Pests, Their Biology, Natural Enemies and Control. Elsevier Sci. Publ. Amsterdam, THE NETHERLANDS. 1991.
7. Brown, J. J. Host/parasitoid interactions: An overview. Biological Control **1**:81-82. 1991.
8. Brown, J. J. and D. Reed-Larsen. Ecdysteroids and insect host/Parasitoid interactions. Biological Control **1**: 135-142. 1991.
9. Brown, J. J. and Y. Kainoh. Host (*Adoxophyes* sp.) castration by *Ascogaster reticulatus*. Ann Entomol. Soc. Am. **85**:67-71 1992.
10. Brown, J. J., M. Kiuchi, Y. Kainoh and S. Takeda *In Vitro* release of ecdysteroids by an endoparasitoid, *Ascogaster reticulatus* Watanabe. J. Insect Physiol. **39**: 229-234 1993.
11. Brown, J. J. Insect Growth Regulators. Good Fruit Grower. **44**:56-58, 1993.
12. Kainoh, Y. and J. J. Brown. Amino acids as oviposition stimulants for the egg-larval parasitoid, *Chelonus* sp. near *curvimaculatus* (Hymenoptera: Braconidae). Biological Control. **4**:22-25 1994.
13. Brown, J. J. Effects of a nonsteroidal ecdysone agonist (Tebufenozide) on host/parasitoid interactions. Archs Insect Biochem & Physiol. **26**:235-248 1994.
14. Brown, J.J. Codling moth integrated pest management. Proc. Washington St. Hort. Assn **89**:68-71 1994
15. Friedlander, M. and J. J. Brown Mimic® a non-ecdysteroidal ecdysone agonist, induces spermatogenesis reinitiation in isolated abdomens of diapausing codling moth larvae; (*Cydia pomonella*). J. Insect Physiol. **41**:403-411. 1995.
16. Brown, J. J. and M. Friedlander Influence of parasitism on spermatogenesis in the codling moth. J. Insect Physiol. **41**: 957-963 1995.
17. Brown, J. J. The compatibility of tebufenozide with a laboratory lepidopteran host/hymenopteran parasitoid population. Biological Control **6**: 96-104. 1996
28. Gut, L. J., J. F. Brunner, Glenn Thayer and John Brown. SARE Project: production of apples without the input of broad-spectrum insecticides. Proc. Wash. State Hort. Assoc. **91**: 239-241 1996..
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20. Reed, D. and J. J. Brown. Host/Parasitoid interactions: Critical timing of parasitoid-derived products. In Press J. of Insect Physiology 1997.