PARASITOIDS ATTACKING EMERALD ASH BORERS IN WESTERN PENNSYLVANIA AND THEIR POTENTIAL USE IN BIOLOGICAL CONTROL

J.J. Duan [1], R.W. Fuester[1], J. Wildonger[1], P.B. Taylor[1], S. Barth[1], and S-E. Spichiger[2]

[1]USDA Agriculture Research Service, Beneficial Insects Introduction Research, Newark, DE 19713

[2]Pennsylvania Department of Agriculture, Bureau of Plant Industry, Harrisburg, PA 17110

ABSTRACT

Current biological control programs against the emerald ash borer (EAB, *Agrilus planipennis* Fairmaire) have primarily focused on the introduction and releases of exotic parasitoids from China, home of the pest origin. However, recent field surveys in Michigan indicate that some North American native or extant parasitoids have become associated with EAB and play some role in suppressing the local populations of EAB. The objective of the present study is twofold: (1) to investigate if any extant parasitoid guilds have become associated with emerald ash borers in western Pennsylvania, where the pest was first discovered in 2007; and (2) to study the most abundant parasitoid for future development of augmentative biological control programs against EAB.

A total of 44 green (*Fraxinus pennsylvanica* Marshall) ash trees (average d.b.h. = 21.5 cm ranging from 10 to 45 cm) with obvious symptoms of EAB infestation (woodpecker pecks and thin canopy covers) were randomly located in Cranberry Township from 11 March to 23 October 2008, and sampled monthly for presence of various immature stages of emerald ash borers and associated parasitoids. Several species of parasitic Hymenoptera were recovered and collected from these green ash trees infested with late instar EAB larvae, prepupae, and/or pupae, including the most abundant species, *Balcha indica* (Mani & Kaul), accounting for 82 percent of all the parasitoids recovered. These parasitoids together resulted in approximately 3.6 percent parasitism of EAB in the field. Laboratory assays further indicated that *B. indica* and another eupelmid wasp (*Eupelmus* sp.) are solitary ectoparasitoids of EAB larvae, prepupae and pupae. In addition, both *B. indica* and *Eupelmus* sp. reproduce thelytokously—i.e., virgin females reproducing daughters, and thus may be potentially complementary to the current classical biological control programs against EAB in North America. Studies are currently in progress in our laboratory on the reproductive and development biology and host finding and selection behavior of these two local parasitoids, and eventual development of mass rearing methods for their use in augmentative biological control programs against emerald ash borers in Pennsylvania and elsewhere.