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FOREST HEALTH BULLETIN

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Figure 1. Wasp laying eggs inside a host caterpillar.

Figure 2. Stinger adapted for defense.

WASPS: LITTLE-KNOWN ALLIES

INTRODUCTION

Mention wasp and most people think about an aggressive, flying insect with a sharp, painful sting. Entomologists think about a group of insects, the majority of which, most of us never see. Wasps are found in the order Hymenoptera, which also contains bees and ants. Hymenoptera is one of the largest insect orders with over 100,000 known species. Parasitoid wasps are the most diverse group of insects in this order.

Predator, parasite and herbivore describe wasp roles with which many people are familiar. Parasitoid though isn't a term that you hear every day. However, it describes one of the most common behaviors in the animal kingdom. Normally, the term parasite describes organisms that use others to complete their life cycles. However, the more accurate description of what more commonly occurs is parasitoidy. This results in host death due to physical damage or consumption. Sometimes it leaves a host sterile. In contrast, parasitism does not require a long-term negative effect on a host.

HOW DO THEY WORK?

Typically (in regard to insects), eggs are laid on or in a host (fig. 1). Once the eggs hatch, a parasitoid larva feeds inside or on its host sometimes avoiding critical areas that would kill the host more quickly. A larva leaves its host once the larva reaches its final stage of development. This usually kills the host. Many parasitoids are specialist using only one type of host or one species such as caterpillars, other wasps, ants and beetle larvae. Parasitoid wasps do not have stingers, per se, in the same sense as the wasps we usually see.

Social wasps have stingers that allow for repeated stinging (fig. 2). Parasitoid wasps have ovipositors for the purpose of laying eggs (fig. 3).

HOW DO THEY FIND A HOST?

Host finding methods vary from one parasitoid to the next. In most cases, a parasitoid may find a host using chemical cues. These cues may be the chemicals given off by a stressed plant, which also attracts a parasitoid's host. In other cases, parasitoids can be attracted by host mating pheromones or a specific host secretion.

BENEFITS

Population control of other organisms is one of the most important roles of a parasitoid. Hundreds of thousands of insect species are found across the globe, and many of them have parasitoids associated with them. This group of insects is used in the experimental development of biological control (biological organisms used as a treatment for a pest) for numerous insect pests including the emerald ash borer.

Figure 3. Spathius sp. Ovipositor adapted for laying eggs in a host.

PHOTO CREDITS

Figure 1 — Scott Bauer, USDA Agricultural Research Service, Bugwood.org

Figure 2 — Forest & Kim Starr, Starr Environmental, Bugwood.org

Figure 3 — David Cappaert, Michigan State University, Bugwood.org