The Mechanism of Female Parasitoid Wasps, That Do Not Oviposit in the Hosts, Interrupt the Oviposition of the Other Female Wasps

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Parasitic wasps (parasitoids) are often applied as biological controls in agriculture, but it is difficult to achieve 100% control of pests with parasitoids alone. This study aims to find possible mechanisms why parasitoids (Cotesia kariyai) cannot parasitize the hosts at 100% (Mythimna separata larvae). This was confirmed by my observation that, when a multiple number of parasitoids and a multiple hosts put in a Petri dish together, the parasitization rate was not 100%. During the course of this experiment, I identified the wasps that contribute to the production of the unparasitized hosts. I called these wasps as tong-tong wasps. The tong-tong wasps showed ovipositing behavior for a longer period of time than normal ones. During this period, they stuck their ovipositors into multiple sites of the host's back to cause violent moving of the hosts, which may in turn interfere with ovipositing of the other parasitoids. Furthermore, I found that the tong-tong wasps did not oviposit the hosts, but instead, they gave the hosts a substance (venom) that interferes oviposition of the other wasps. In addition, I found that 8% of the cocoon mass were the tong-tong wasps, suggesting the possibility that the tong-tong behavior was genetically regulated. If the parasitoid wasps showing the tong-tong behavior can be eliminated (genetically), pest control with parasitic wasps alone can be achieved.

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