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PROXIMATE MECHANISM OF BEHAVIORAL MANIPULATION OF AN ORB-WEAVER SPIDER HOST BY A PARASITOID WASP

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Some ichneumonid wasps induce modifications in the web building behavior of spider hosts to produce resistant webs. The exact mechanism of spider manipulation is unknown, however recent evidence has showed that it might be related to ecdysis. This fact resulted in us hypothesizing that the presence of parasitoid wasp larvae would induce the increase of 20-OH-ecdisone (20E) levels in their spider hosts just before pupation. These higher 20E levels would elicit a behavioral response of the parasitized spiders, to build molting webs. In the present study, we evaluated this hypothesis, by testing whether the that 20E levels in parasitized spiders that already present modified web-building behavior are higher than those in unparasitized spiders, and whether they are higher than parasitized spiders performing unmodified web building behavior. The levels of 20E were analyzed by liquid chromatography in combination with mass spectrometer. We utilized two orb-weaver spiders *Cyclosa morretes* and *C. fililineata* parasitized by the wasps *Polysphincta janzeni* and *P. sp. nr. purcelli*, respectively, as models. For both species, concentrations of 20E product ion 371 and 445 (pg/mL/mg) were higher in spiders parasitized by third stage larva than in all other analyzed categories. We conclude that the seeming lack of control of parasitized *C. morretes* and *C. fililineata*, just before pupation could be induced by the anachronic activation of mechanisms that were originally involved in changing the spider's exoskeleton before maturation. This phenomenon could be achieved by increasing the levels of ecdysone during feeding by the parasitoid's larva on the spider host. Thus, the exposition to ecdysone probably induces innate behaviors performed during the construction of simplified resistant web architectures that are utilized to endure the molting period. These modifications increase web stability and protection for the spider during periods of higher susceptibility to predators and prevent the risk of webs collapsing.

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