Response of Epilachna paenulata to two flavonoids, Pinocembrin and quercetin, in a comparative study

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Resumen

We examined the effects of the flavonoids pinocembrin and quercetin on the feeding behavior, survival, and development of the Cucurbitaceae pest Epilachna paenulata (Coleoptera: Coccinellidae). In no-choice experiments, 48 hr-consumption of Cucurbita maxima Duch. leaves treated with pinocembrin at 1, 5, and 50 μg/cm2 was less than one third of that for leaves treated with 0. 1 μg/cm2 of pinocembrin or untreated leaves. Larvae stopped feeding after 9 days of high doses of pinocembrin (5 and 50 μg/cm2), and larval weight and survival were negatively affected by pinocembrin at 1-50 μg/cm2. Delayed mortality in comparison to food-deprived larvae suggests that the mechanism of action for pinocembrin is chronic intoxication, rather than simple starvation from antifeedant effects. In contrast, leaf consumption and larval weight were not significantly affected by quercetin (at 0. 1, 1, 5, and 50 μg/cm2) while mortality rates were only slightly increased. The response of E. paenulata larvae in a choice-test to combinations of pinocembrin at antifeedant doses (5 and 50 μg/cm2) and quercetin at phagostimulant doses (0. 01 and 0. 1 μg/cm2) indicated that the feeding deterrent activity of the former completely overshadowed the stimulant activity of the latter. These results demonstrate the different responses of one insect species to two widely distributed plant flavonoids. Pinocembrin strongly affected survival of E. paenulata while quercetin had only a weak effect without major consequences on the insect life-cycle.

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