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RESISTANCE IN BUTTERFLY FOODPLANTS

Plant resistance to insect attack has been studied largely in connection with agricultural practices and crop plant breeding (Beck 1965, *Ann. Rev. Entomol.* 10: 207-232), although the principles gained therefrom should apply to natural situations as well. Butterfly larval foodplants in the wild likewise have probably developed strains that are resistant to attack. This fact would account for spotty or discontinuous distributions of some species, although the effect would be difficult to distinguish from extinction due to other causes. In the field, one frequently encounters areas where a known foodplant is present but the butterfly is absent. E.g., *Papilio indra fordi* Comstock & Martin feeds on *Cymopterus panamintensis* Coult. & Rose but not on the subspecies *acutifolius* (Coult. & Rose) Munz (Shields, Emmel, & Breedlove 1969, *J. Res. Lepid.* 8: 21-36). Toxic secondary plant substances may act as repellents; ecdysone or juvenile hormone or their analogues in plants may protect them from attack (Fraenkel 1969, *Entomol. Exp. Appl.* 12: 473-486; Hsiao 1969, *Entomol. Exp. Appl.* 12: 777-788). Plant resistance can disturb the insect's normal behavior, growth, and survival (Beck, 1965).

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