

2006. Levey, D.J., J.J. Tewksbury, and M.L. Cipollini. A field test of the directed deterrence hypothesis in two species of wild chili. *Oecologia* 150: 61-68.

Abstract: The directed deterrence hypothesis posits that secondary metabolites in ripe fruit function to deter fruit consumption by vertebrates that do not disperse seeds, while not impacting consumption by those that do. We tested the hypothesis in two species of wild chilies (*Capsicum* spp.). Both produce fruits that contain capsaicinoids, the compounds responsible for the pungency of chilies. Previous work suggests seed-dispersing birds but not seed-destroying rodents consume chili fruits, presumably because rodents are deterred by capsaicin. However, fruit removal from chili plants by rodents and other mammals has not been previously explored. Because laboratory rodents can develop a preference for capsaicin, it is quite possible that wild rodents are natural consumers of chili fruits. We monitored the fate of 125 marked fruits of *Capsicum chacoense* and 291 fruits of *Capsicum annuum*. For both species, essentially all fruit removal occurred during the day, when rodents are inactive. Video monitoring revealed fruit removal only by birds, mostly by species known to disperse chili seeds in viable condition. Furthermore, these species are from taxonomic groups that tend to specialize on lipid-rich fruits. Both species of chili produce fruits that are usually high in lipids (35% in *C. chacoense*, 24% in *C. annuum*). These results support the directed deterrence hypothesis and suggest that fruiting plants distinguish between seed predators and seed dispersers by producing fruits that repel the former and attract the latter.