From Foe to Friend

Secondary metabolites turn a seed predator into a seed disperser

Abstract: Many ripe fruits contain defensive chemicals, secondary metabolites (SMs), in concentrations that deter consumption by vertebrates. The directed-deterrence hypothesis states that SMs in ripe fruits are deterrents to seed predators but have little or no effect on seed dispersers. Indeed, studies have demonstrated class-dependent deterrence where frugivorous birds were able to cope with fruit’s SMs while granivorous rodents were deterred by them. Here we show the use of the "mustard oil bomb" (MOB) to enhance seed dispersal by converting a seed predator to a seed disperser at an ecological time scale. This is achieved by a unique compartmentalization between glucosinolates that are found only in the pulp and the myrosinase enzyme found only in the seeds of ripe fruits, causing activation of the MOB upon seed and pulp co-consumption, resulting in the first reported evidence of SMs promoting seed dispersal by mammals.