

POST-DISPERSAL SEED PREDATION IN A TROPICAL DRY FOREST

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Abstract. Differences between diurnal and nocturnal post-dispersal seed predation patterns were tested along three replicated transects in the dry forest at Palo Verde National Park, Costa Rica. Using corn and kidney beans laid out in cleared areas of the forest, we found that patches were preyed upon significantly more often during the night, but no significant difference was found between seed species taken. Therefore, we conclude that nocturnal predation appears to be a more significant factor in seed predation than chemical or visual differences between these seed types. (JJB)

INTRODUCTION (JJS)

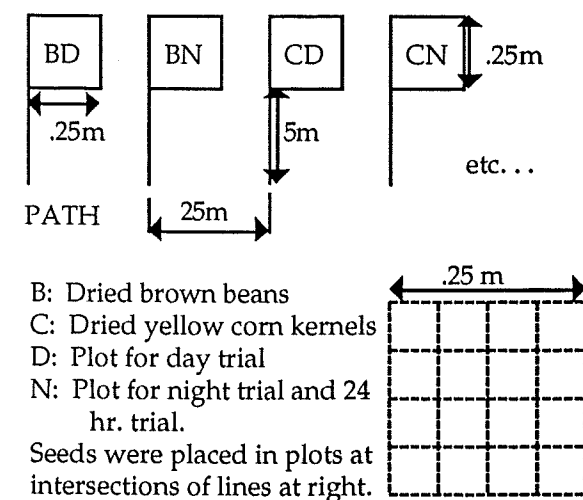
Seed predation prior to germination is an important factor affecting reproductive success in plants. Natural selection should therefore favor mechanisms which reduce the probability of predation and increase the probability of germination. From the perspective of the plant, there are two primary methods to minimize predation: make the seed cryptic to reduce the probability of discovery, or invest in protective measures, such as chemical defense or predator-proof seed coats to reduce the chance of attack. According to Janzen (1982) the dominant seed predators in tropical dry forests in Costa Rica, *Liomys salvini* and *Sigmodon hispidus*, are nocturnal foragers. With this in mind, we tested in a tropical dry forest the hypothesis that more seeds would be taken at night. We also postulated that the grass seed (corn) with lighter color and less chemical defenses (Janzen 1971), would be preyed upon more than the leguminous seed (bean).

METHODS (JMH)

We placed seed plots along three trails in the Palo Verde dry tropi-

cal forest (Figure 1). The sequence of four plot types was repeated until 80 plots were created, 20 of each type. Plot areas were cleared of debris - this was necessary to prevent misplacement of seeds and to facilitate counting of uneaten seeds.

On day 1 we placed seeds in the day trial plots starting at 0830. We recorded the number of seeds remaining in these plots at 1630, and promptly placed seeds in the night trial plots. We recorded the number of seeds remaining at 0700 on day 2. It should be noted that our night trial included dusk and dawn predation. We returned to the night plots at 1630 on day 2, to record the number of seeds taken during one diel cycle.



RESULTS (KAI)

Of the 20 replicates in each treatment, 2 bean patches and 6 corn patches showed evidence of predation over one diel cycle (Table 1). The number of patches preyed upon at night was significantly higher than those preyed upon during the day ($G_{adj}=11.27, p<0.005$).

During an additional diurnal period of exposure, one bean and one corn patch were preyed upon. A G-test for the significance of seed preference over the entire testing period (36 hours) showed no significant difference between seed types ($G_{adj}=207, p>0.1$).

Table 1. Seed predation levels.

Time	#Patches Preyed On	
	Bean	Corn
Night	2	6
Day	0	0

Note: each treatment had 20 replicates.

DISCUSSION (JAR)

Seeds were preyed on significantly more at night than during the day, supporting our original hypothe-

sis of higher seed predation at night. There was no significant difference, however, between predation rates on beans and corn, in contrast to our initial hypothesis. This finding seems to imply that seed coloration and chemical defenses, at least as represented by these two seed types, are not effective in deterring seed predation.

This conclusion, however, must be qualified due to inadequacies in our experimental design. In the study, we compared only the number of patches attacked, not the number of seeds attacked in each patch. Additional replicates and comparisons of the numbers of each seed type attacked, are needed to test this hypothesis more definitively.

LITERATURE CITED

- Janzen, D.H. 1971. Seed predation by animals. *Ann. Rev. Ecol. and Syst.* : 465-492.
- _____. 1982. Removal of seeds from horse dung by tropical rodents: influence of habitat and amount of dung. *Ecology* 63(6): 1887-1900.