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SEED DORMANCY IN RELATION TO PREDATION AND PATHOGENICITY WITH SPECIAL REFERENCE TO SEED PHYSICAL DORMANCY

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Seed defense theory which explains the survival of seeds in soil has not been tested experimentally. Thus, the objective of this study was to test the applicability of some selected hypotheses in the seed defense theory.

Four Fabaceae species; *Bauhinia variegata*, *Pterocarpus indicus*, *Cassia spectabilis* and *Cassia bacillaris* which produce seeds with no dormancy (ND) and two seed dormancy classes; physiological dormancy (PD) and physical dormancy (PY) were used to study the relationship between seed dormancy classes and seed predation and seed pathogenicity. Seeds were collected from numerous randomly selected trees in the premises of the University of Peradeniya and experiments were conducted in the Department of Botany, University of Peradeniya. Experiments were initiated within two weeks from collection. Imbibition and germination of manually scarified and untreated seeds were tested to confirm the seed dormancy classes of the collected seeds. Untreated seeds from each species and manually scarified seeds of *C. spectabilis* and *C. bacillaris* were placed separately on moistened filter papers in Petri dishes. These samples were kept in man-made woodland and in grassland and observations were made for a month to determine the number of predators attracted. Another set of samples as explained above were buried and observed to determine the pathogenicity. Nutrient content and availability of volatile compounds in seeds of each species were determined.

Significantly high rate of imbibition and germination of manually scarified seeds confirmed that seeds of the two *Cassia* species have PY seed dormancy class and the results of the germination experiment confirmed that seeds of *B. variegata* have ND while the seeds of *P. indicus* have PD. Seeds collected from the woodland were predated and attacked by pathogens in a higher rate than those from the grassland. The lowest predation and pathogenic attack were recorded in *P. indicus* seeds and the highest in *B. variegata*. Manually scarified seeds of two *Cassia* species were predated and attacked by pathogens in a higher rate than the untreated seeds of the same species. There was no direct correlation between the nutrition content of the seed with rate of pathogenic attacks or with the rate of predation. Manually scarified seeds released more volatile compounds than intact seeds when they were exposed to a moist environment.

Results of the experiments revealed that the rate of pathogenic attack and rate of predation depend on the dormancy state of the seeds supporting the existence of a relationship between the seed dormancy classes and seed predation and seed pathogenicity.