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# EXPLORING A PLANT-DIVERSITY HYPOTHESIS TO EXPLAIN HELMINTH PREVALENCE IN NORTHERN BOBWHITE IN TEXAS

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## ABSTRACT

Helminths, in particular eyeworms (*Oxyspirura petrowi*), may be a factor influencing northern bobwhite (*Colinus virginianus*; hereafter, bobwhite) populations in Texas, USA. Mean eyeworm prevalence in Texas appears to be greater in the Rolling Plains (55.1%) than the Rio Grande Plains (16.4%), a pattern generally attributed to possible differences in the occurrence of insects, the intermediate hosts of eyeworms. We explored an alternative hypothesis centered on plant diversity. Many plants possess phytochemicals with anthelmintic properties. Because wild animals suffering from parasitic infestations are capable of self-medicating via diet selection, organisms foraging in diverse communities may be expected to possess lower parasite levels. We predicted that plant diversity would be greater and bobwhite diet more diverse in the Rio Grande Plains than the Rolling Plains, which in turn would potentially expose bobwhites to more plants with anthelmintic properties and therefore result in lower parasite prevalence. We conducted a literature review of plant diversity, anthelmintic plants, and bobwhite diet in Texas to explore this hypothesis. Our results indicated that 1) plant diversity was higher (24–96%), 2) the number of anthelmintic plants greater (33%), and 3) bobwhite diet more diverse (120%) in the Rio Grande Plains compared to the Rolling Plains. We documented a mean ( $\pm$  standard error) eyeworm prevalence of  $16.4 \pm 7.27\%$  in the Rio Grande Plains ( $n = 4$  sites) and  $55.05 \pm 2.93\%$  in the Rolling Plains ( $n = 20$  sites). The mean cecal-worm prevalence was documented at  $74.8 \pm 18.21\%$  in the Rio Grande Plains ( $n = 5$  sites) and  $79.79 \pm 2.12\%$  in the Rolling Plains ( $n = 19$  sites). Regarding plant diversity, the Rio Grande Plains contained more potential anthelmintic plants ( $n = 96$  species) than the Rolling Plains ( $n = 72$  species). In cross-referencing these plants with the bobwhite diet, we found that 23 plants with possible anthelmintic properties had been documented in the bobwhite diet in the Rio Grande Plains, whereas only 17 such plants were documented in the bobwhite diet in the Rolling Plains. Our study provides circumstantial evidence for the plant-diversity hypothesis and warrants experimental testing.

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**Key words:** anthelmintic plants, cecal worms, *Colinus virginianus*, eyeworms, northern bobwhite, nutritional wisdom, plant diversity, self-medication

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