**Wild Ruminants Variably Possess a Rumen Microbial Metabolism that Degrades the Toxic Alkaloid Methyllycaconitine

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Tall Larkspur (Delphinium spp.) grows abundantly in the North-western United States, where it presents a serious toxicity danger to rangeland cattle. Consumption of the toxic alkaloid, methyllycaconitine (MLA) found in Tall Larkspur causes an estimated loss of 5-15% of rangeland cattle annually. While detrimental to the agriculture community, cattle mortality due to larkspur poisoning is also of concern for wildlife and land managers, as livestock carcasses attract predatory animals to public lands creating unsafe conditions for recreationists. Due to the wide distribution of Larkspur, wild ruminants in the western US must also be exposed to larkspur while foraging, however, there is no evidence to suggest these species are affected by their toxic alkaloids suggesting they may be less sensitive to MLA. We hypothesized that wild ruminants possess a gut microbial metabolism capable of degrading MLA. Foregut samples were collected from each of Montana's wild ruminant species by volunteer hunters and assayed for total alkaloid- and MLA-degradation activities over 48 hours in in vitro incubations. Separate incubations were performed to assess the relative influence of gut bacterial, fungal, and abiotic activities. Prior to and following incubations total alkaloid was extracted and measured spectrophotometrically and MLA was measured by High-Performance Liquid Chromatography Mass Spectrometry (HPLC), respectively. Preliminary analysis has demonstrated alkaloid degradation occurs in the majority of wild ruminant species at varying levels. Based on these findings, we believe wild ruminant species may provide novel microbial metabolisms that may be developed to benefit both the livestock industry and minimize human:carnivore conflicts on overlapping public lands.