Goldschmidt 2023 Abstract
https://doi.org/10.7185/gold2023.17003

Dietary differences between reindeer and moose evidenced by trace element, carbon, and nitrogen content in their feces

YANNICK AGNAN[1], MARYSE ROUELLE[2], ROMAIN COURAULT[3], MARIANNE COHEN[4] AND MARIE A. ALEXIS[2]

[1]UCLouvain
[2]Sorbonne Université, CNRS, EPHE, UMR METIS
[3]Université Paris 1 Panthéon-Sorbonne
[4]Sorbonne Université

Presenting Author: yannick.agnan@uclouvain.be

Reindeer (*Rangifer tarandus*) and moose (*Alces alces*) are both Cervidae among the few large herbivorous mammals living in circumpolar regions. Reindeer and moose meat represent a significant proportion of the food resources for both aboriginal and non-aboriginal humans living in northern areas. The reindeer, on one hand, was domesticated centuries ago. Among the five million reindeers distributed in circumpolar regions, the semi-domesticated herds account about two million individuals, including 250,000 individuals in Sweden in 2014. The moose, on the other hand, is only wild species and the largest deer inhabiting boreal forests, including 300,000–400,000 individuals in Sweden. They feed on the typical vegetation of the tundra-taiga transition ecosystem, including forbs, dwarf shrubs, mosses, and lichens. Although their feeding behavior is quite similar in summer, reindeer and moose present different feeding strategies in winter: moose consumes a diet dominated by twigs of woody plants while reindeer mainly feeds on terrestrial and arboreal lichens. Yet, climate change leads to modify both vegetation diversity and composition, including a latitudinal shift to the north of the taiga-tundra boundary. Understanding the diet of these two deer species is therefore essential to assess the food availability in the coming decades. In this study, we aimed to identify the diet sources comparing feces (as a proxy of diet composition and seasonal trend) and plant chemical composition (trace element, carbon, and nitrogen content) in several study sites in Abisko, Sweden. Results showed distinct chemical signatures for plant materials (higher C/N ratio in lichens (*Cladonia stellaris* and *Flavocetraria nivalis*) than shrub leaves (*Betula nana*, *Betula pubescens*, and *Salix* sp.). This difference was also noticed in deer feces (reindeer feces < moose feces). Trace element content followed this trend with distinct chemical signature for micronutrients (e.g., copper, zinc, molybdenum, or selenium) and potentially toxic elements (e.g., cadmium). This approach will thus help in evaluating the deer population dynamics and health.