A Nearctic parasite in a Palearctic Host: *Parelaphostrongylus andersoni* infecting semi-domesticated reindeer in Alaska

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### Background

*Parelaphostrongylus andersoni*: Nematoda; Protostrongylidae
- Infects skeletal muscles of caribou and white-tailed deer across North America. Causes significant muscular and pulmonary pathology.

**Eurasian reindeer: Rangifer tarandus tarandus**
- Introduction to Alaska began in 1892
- Animals brought from Russia, and later Norway to provide Inupiat people with a source of meat in times of caribou scarcity.
- Semi-domesticated reindeer currently farmed in Alaska using modern management practices.

**Protostrongylidae in North America**
- Knowledge of parasite diversity in native North American ungulates has increased substantially in the last decades.
- Knowledge in free-ranging introduced ungulates is sparse.
- Protostrongylids have not been previously been reported in reindeer in North America.

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### Objective

Determine what protostrongylid species are present in semi-domesticated reindeer from the from Seward Peninsula, Alaska.

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### Methods

Fecal samples (n=44) collected from reindeer of the Kakarak herd. This herd ranges on western Seward Peninsula and historically has had no direct contact with native Grant’s caribou (*Rangifer tarandus granti*) of the Western Arctic herd (WAH).

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### Results

- DSL found in ten reindeer (22.7%), intensities of 0.2-50 larvae per gram of feces.
- 40 DSL sequenced: all *P. andersoni* based on BLAST analysis.
- 10 sequenced deposited in GenBank (JQ 946524 to JQ 946533).

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### Discussion

The presence of *P. andersoni* in this reindeer herd might be due to:

1. **Recent sympathy with caribou**: introduction associated with the enhanced proximity or range overlap with the WAH during the last 12 years.
2. **Natural dispersal**: Sporadic sequential translocation of the parasite to westernmost areas of the Peninsula from the WAH through solitary individuals or other reindeer herds that may have been sympatric with WAH.
3. **Anthropogenic**: Reindeer movement among herds has been documented either by commercialization or herd admixture, and infected reindeer originally from herds with direct contact with WAH may have entered the herd.

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### Conclusion

- The Nearctic nematode *P. andersoni* occurs in semi-domesticated reindeer, a Palearctic host introduced to western Alaska.
- *Parelaphostrongylus andersoni* might also infect other reindeer herds in Alaska and Canada, potentially causing deleterious effects and negatively impacting commercial production.

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### References