

## Diversity of helminths in snow sheep (*Ovis nivicola*) and muskox (*Ovibos moschatus*) in Russia

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### INTRODUCTION & AIM

Snow sheep (*Ovis nivicola*) and muskoxen (*Ovibos moschatus*) are Arctic ungulates. Snow sheep are endemic to Russia, while muskoxen were reintroduced from North America in 1974. Helminth fauna of these ungulates in the northern regions are being transformed under anthropogenic influence and this requires additional research, considering helminth prevalence and pathogenicity.

The aim of this study was to revise helminth fauna of snow sheep and muskoxen in Russia.

### MATERIALS & METHODS

More than 100 faecal samples of the snow sheep were collected during 2016-2024 in the Putorana Plateau (Krasnoyarsk Krai) and Republic of Sakha (Yakutia). More than 150 fecal samples of the muskoxen were collected during 2022 in the Yamalo-Nenets Autonomous Okrug, Wrangel Island, Chukotka Autonomous Okrug, Taymyr Peninsula (Krasnoyarsk Krai), and Zavyalov Island (Magadan Oblast) (Fig. 1).



Figure 1. A map showing fecal sampling points for snow sheep and muskoxen.

Faecal samples were examined for the presence of macrohelminths (visible to the naked eye), and then proceed via larvoscopy, flotation, and sedimentation ovoscopy. Diagnoses were made based on the morphology and morphometrics of the obtained eggs and larvae.

### RESULTS

The following helminths were detected in snow sheep: *Moniezia* sp.; small strongylids; *Marshallagia* sp.; *Nematodirus* sp.; *Protostrongylus* spp., (with a longer and a shorter tail spikes); *Trichuris* sp.; and *Capillaria* sp. (Fig. 2).

The following helminths were discovered in muskoxen: *Moniezia* sp.; small strongylids; *Nematodirus* sp.; *Nematodirella* sp.; Protostrongylidae sp., (with a dorsal spine); and *Trichuris* sp. (Fig. 3).

### CONCLUSION

The diversity of helminths in snow sheep and muskoxen in Russia was studied using a non-invasive method (coproscopy). No trematodes were found in both snow sheep and muskoxen fecal samples yet. Nematode *Capillaria* sp. was found in snow sheep for the first time.

Nematode larvae were sampled for the DNA analyses. This research is to be continued.

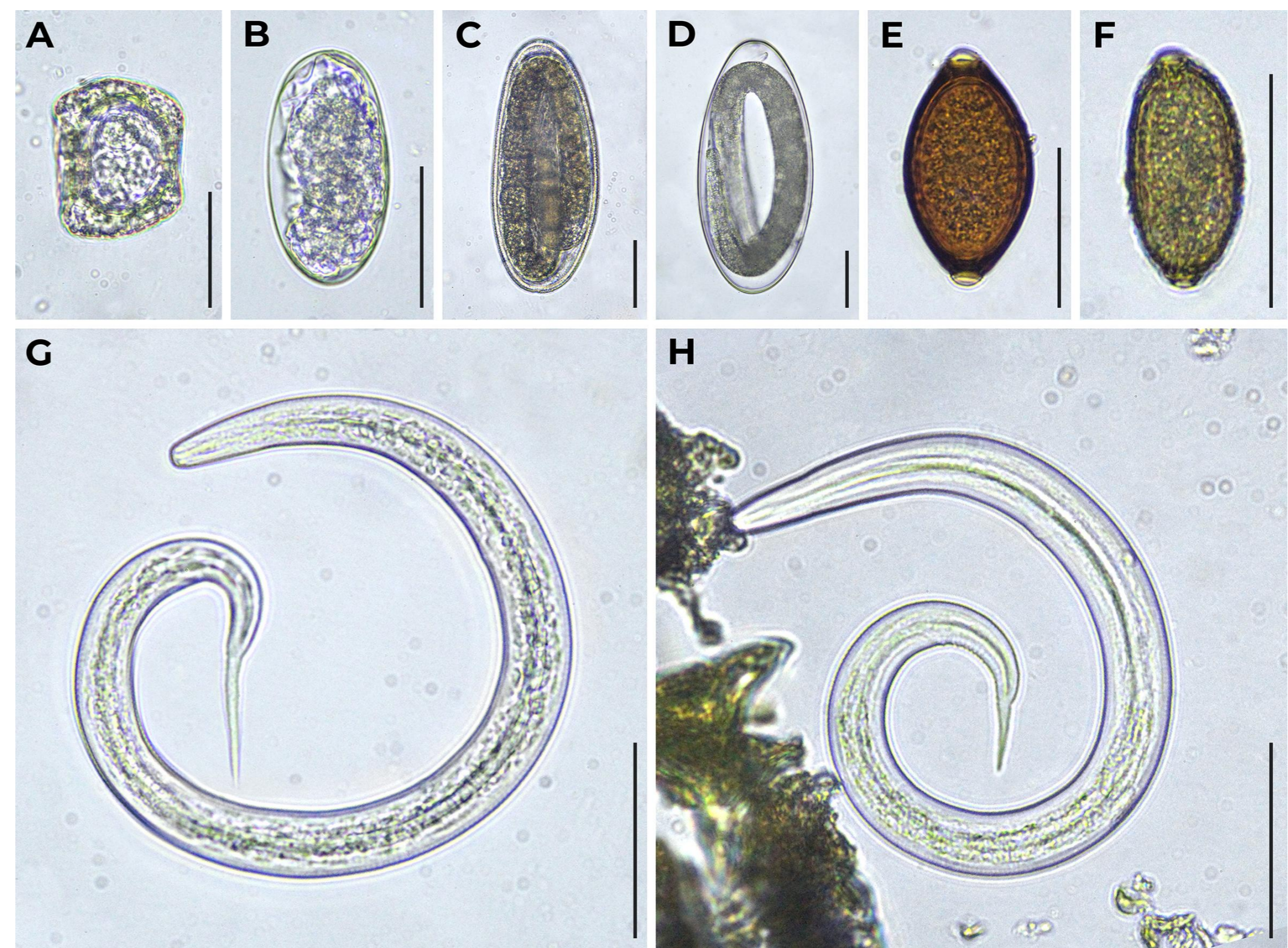


Figure 2. Diagnostic stages of helminths obtained from feces of snow sheep. A *Moniezia* sp. egg; B Strongyle-type egg; C *Marshallagia* sp. egg; D *Nematodirus* sp. egg; E *Trichuris* sp. egg; F Capillaria-type egg; G *Protostrongylus* sp. first stage larva (L1) with a longer tail spike; H *Protostrongylus* sp. L1 with a shorter tail spike. Bright field microscopy, 400× magnification. Scale bar = 50 µm.

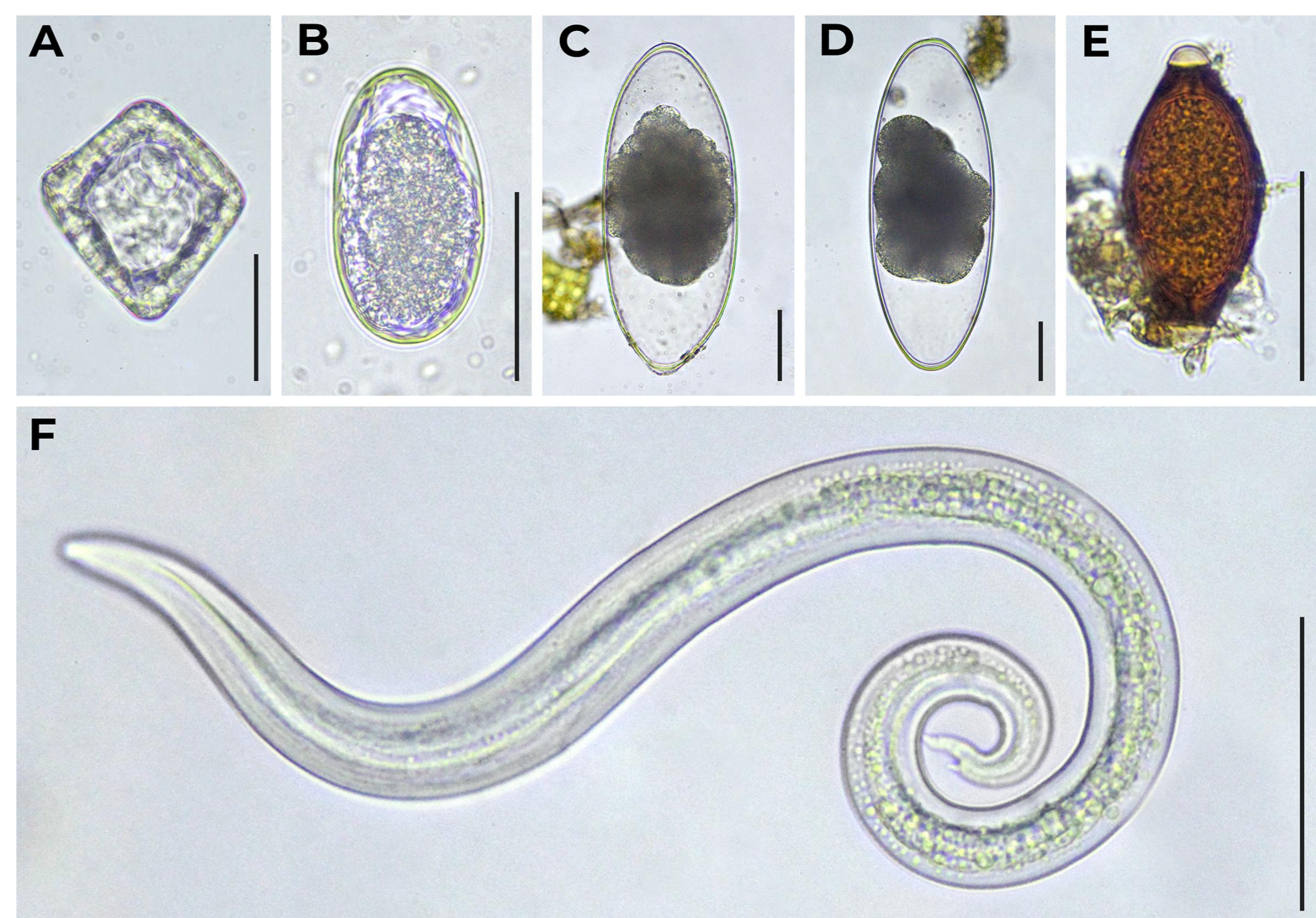


Figure 3. Diagnostic stages of helminths obtained from feces of muskoxen. A *Moniezia* sp. egg; B Strongyle-type egg; C *Nematodirus* sp. egg; D *Nematodirella* sp. egg; E *Trichuris* sp. egg; F first stage larva (L1) of the family Protostrongylidae. Bright field microscopy, 400x magnification. Scale bar = 50 µm.

### FUTURE WORK / REFERENCES

This poster highlights a big research, one part of which is available:

Loginova, O., Rozenfeld, S.; Sipko, T.; Mizin, I.; Panchenko, D.; Laishev, K.; Bondar, M. Kolpashchikov, L.; Gruzdev, A.; Kulemeev, P.; Litovka, D.; Semerikova, M.; Mamontov, V.; Mamaev, E.; Spiridonov, S. (2023) Diversity and Distribution of Helminths in Wild Ruminants of the Russian Arctic: Reindeer (*Rangifer tarandus*), Muskoxen (*Ovibos moschatus*), and Snow Sheep (*Ovis nivicola*). *Diversity* 15, 672.

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