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2014

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Ganzorig, Sumiya; Batsaikhan, Nyamsuren; Hagiwara, Katsuro; Gardner, Scott Lyell; Baba, Kenji; and Hoshino, Buho, "On the Helminth Fauna of Small Mammals in Hustai National Park, Mongolia" (2014). *Scott Gardner Publications & Papers*. 30.
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On the Helminth Fauna of Small Mammals in Hustai National Park, Mongolia

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Keywords: Mongolia, Hustai National Park, Mammals, Helminths, Rodents, Cestodes, Nematodes, Acanthocephalans

Introduction

The Hustai National Park is one of the special protected areas in Mongolia. The park is famous by the successful re-introduction of the wild horse (takhi), and its well-managed protection work. The park has a rich and diverse mammal fauna and flora. Of these, the takhi, and other large mammal species are objects of intensive research by the international researchers, but the parasitic helminth fauna in Hustai National Park is remained unknown. Species diversity of wildlife and its abundance, especially high density of both the prey and predators, might allow the presence of various parasitic and symbiotic organisms on the territory of the park.

The material for this paper was collected during small mammal survey in 2005 (Batsaikhan et al., 2006) and in spring and summer of 2013.

Materials and methods

Field surveys: The host sampling was conducted during spring and autumn in 2013 in Hustai National Park. Also, helminths from several host species were collected during field surveys in 2005 by one of authors (N. Batsaikhan) and deposited in Department of Zoology of the National University of Mongolia, were used in this study.

Hosts: The host animals were trapped using standard Sherman traps. In 2013, eight individuals of *Mus musculus*; two *Meriones unguiculatus*; one *Cricetulus barabensis*; two *Cricetulus longicaudatus*; one *Apodemus peninsulae*; one *Allactaga sibirica*; two *Myodes Clethrionomys rutilus* were collected and examined for helminths. Also, carcasses of one individual of *Marmota sibirica* and one *Capreolus pygargus* were provided to us by the administration of Hustai National Park.

In 2005, the helminths were collected from the following hosts: *Apodemus peninsulae*, *Crocidura sibirica*, *Microtus fortis*, and *Allactaga sibirica*.

Helminthological examination: Captured mammals were dissected and studied immediately for helminths or after fixation with 10% formalin. The digestive organs, lungs, body cavity and subcutaneous tissues were checked for helminths. Nematodes were fixed and preserved in 10% formalin or in 70% ethanol. Acanthocephalans and cestodes were fixed in 70% ethanol.

Nematodes and acanthocephalans were cleared in glycerin or lactic acid. Apical sections of the nematode head were prepared by hand using razor blade. Cestodes were fixed in 70% alcohol, stained with Schneider's aceto-carmin, dehydrated in an ethanol series, cleared in cedar oil or in xylene, and mounted in Canada balsam.

Deposition of specimens: The voucher specimens were deposited in the Department of Zoology of the National University of Mongolia (DZNUM) and in the Helminthological Collection of the Graduate School of Veterinary Medicine of the Hokkaido University (HCHU), Japan.

Results and discussion

A total of 9 species of helminths belonging to 8 families were found. In 2005, helminths were found in *Crocidura sibirica*, *Apodemus peninsulae*, *Allactaga sibirica*, and *Microtus fortis*. In 2013, helminths were found in one of two *Cricetulus longicaudatus*; one *Marmota sibirica*; one of two *Clethrionomys rutilus*. None was found in 8 *Mus musculus*; two *Meriones unguiculatus*; one *Cricetulus barabensis*; one *Apodemus peninsulae*, and one *Allactaga sibirica*.

Each finding represents a new locality record. Finding of *P. baicalensis* is a first record for Mongolia. *Cricetulus longicaudatus*, *Crocidura sibirica*, and *Allactaga sibirica* for the first time registered as paratenic hosts for *Macacanthorhynchus catulinus*.

The spring season in 2013 has been characterized by very low density of both the host and internal parasites (except the ectoparasites) in Hustai National Park. Limited number of specimens examined does not allow more detailed analysis of the data found. Further studies are required to understand the helminth fauna of the mammals and other vertebrate hosts in Hustai National Park. The list of the helminths found is as follows:

Family Trichuridae Ransom, 1911

1. *Trichuris muris* Schrank, 1788.

HOST: *Cricetulus longicaudatus*.

SITE OF INFECTION: colon.

LOCALITY: Huh Asgat.

REMARKS: Previously, in Mongolia, *T. muris* have been reported from *Cricetulus longicaudatus* and *Phodopus campbelli* in Gurvanbulag (Bulgan Province), Shaamar (Selenge Province), Bayan Ovoo and Ovoot Counties (Umnugobi Province) (Danzan, 1978a; 1978b), and from *Microtus Lasiopodomys brandti* in Hentii and Suhbaatar Provinces (Ganzorig, 1998). The present finding constitutes a new locality record.

2. *Trichuris* sp.

HOST: *Capreolus pygargus*.

SITE OF INFECTION: colon.

LOCALITY: Tariatin davaa.

REMARKS: G. Sharhuu (1976, 1986) reported 11 species of helminthes, including *Trichuris* sp. from *C. pygargus* in Mongolia (Dornod Province). The present finding is a new locality record.

Family Subuluridae Yorke and Maplestone, 1926

3. *Subulura* sp.

HOST: *Allactaga sibirica*.

SITE OF INFECTION: small intestine.

LOCALITY: Ungutiin bel.

REMARKS: Putative new species, detailed description will be reported elsewhere. Previously, *Subulura citelli* Sulimov, 1961 has been recorded from *A. sibirica* and *A. bullata* in Mongolia (Danzan, 1978b). The present species differs by the number of characters, including different number and arrangements of papillae, possessing of caudal alae etc. Also, Meszaros (1975) described a new species named *Kaszabospirura steinmanni* from the same host in Mongolia. However, genus *Kaszabospirura* was lately considered as a synonym of genus *Subulura* by Chabaud (1975).

Family Physalopteridae Leiper, 1908

4. *Physaloptera massino* Schulz, 1926.

HOSTS: *Marmota sibirica* and *Allactaga sibirica*.

SITE OF INFECTION: stomach and large intestines.

LOCALITY: Bayangiin Am, Ungutiin bel.

REMARKS: *P. massino* was first reported in Mongolia, in *Allactaga bullata* by Lobachev and

Jaltsanova (1984), and from *M. sibirica* by Ganzorig and Danzan (1990). Tinnin et al. (2011) found this species in *Spermophilus undulatus* in Uburhangai Province. This finding constitutes a new locality record.

Family Rictulariidae Railliet, 1916

5. *Pterygodermatites baicalensis* Spassky, Ryjikov et Sudarikov, 1952.

HOST: *Apodemus peninsulae*.

SITE OF INFECTION: small intestine.

LOCALITY: Ar Moilt.

REMARKS: This is a first finding in Mongolia, constitutes a new geographic record. Distributed in Kazakhstan, Altai, Tuva, Buryatia, Siberia (Ryjikov et al., 1978).

CLASS ACANTHOCEPHALA RUDOLPHI, 1808

Family Oligacanthorhynchidae Southwell and MacFie, 1925

6. *Macranthorhynchus catulinus* Kostylev, 1927.

HOST: *Cricetulus longicaudatus*, *Crocidura sibirica*, *Allactaga sibirica* (all are paratenic host).

SITE OF INFECTION: subcutaneous.

LOCALITY: Huh Asgat, Moilt, Ungutiin bel.

REMARKS: Findings in *Cricetulus longicaudatus*, *Crocidura sibirica*, *Allactaga sibirica* represents new hosts (paratenic) record. Previously, *Microtus brandti* has been reported as paratenic host (Ganzorig, 1998). As definitive hosts in Mongolia, *Mustela eversmanni*, *Vulpes corsac*, *V. vulpes*, *Nyctereutes procyonoides*, and *Canis familiaris* have been reported (Danzan, 1978a; Daschzeveg et al., 1982; Suhbat and Ganzorig, 1988; Ganzorig et al., 1997).

CLASS CESTOIDEA

Family Anoplocephalidae Cholodkovsky, 1902

Paranoplocephala sp.

HOST: *Myodes Clethrionomys rutilus*.

SITE OF INFECTION: small intestine.

LOCALITY: Shuvuun Davaa forest.

REMARKS: Only one incomplete cestode was found. Additional material is required for the detailed identification.

Family Catenotaeniidae Spasskii, 1950

Catenotaenia sp.

HOSTS: *Cricetulus longicaudatus*.

SITE OF INFECTION: Small intestine.

LOCALITY: Huh Asgat.

REMARKS: Only one cestode was found. Additional material is required for the detailed identification. Previously, five species of *Catenotaenia* Janicki, 1904 have been reported from rodents in Mongolia. Tenora and Murai (1975) described *C. asiatica* and Danzan (1978a) registered *C. dendritica* (Goeze, 1782) and *C. pusilla* (Goeze, 1782). Ganzorig et al. (1999) reported *C. dendritica*, *C. afghana* and *Catenotaenia* sp. in Mongolian rodents.

Family Hymenolepididae Ariola, 1899

Hymenolepis horrida von Linstow, 1901.

HOSTS: *Microtus fortis*.

SITE OF INFECTION: small intestines.

LOCALITY: Moilt.

REMARKS: In Mongolia was first reported from *Alticola semicanus* in Huvsgul Province by

Ganzorig et al. (1988), and from number of rodent species, including *Microtus brandti*, *Microtus gregalis*, *Microtus oeconomus*, *Microtus fortis*, *Myodes Clethrionomys rutilus*, *Myodes Clethrionomys rufocanus* and *Apodemus peninsulae* (Ganzorig, 1998).

Acknowledgments

We thank the administrators and staff of the Hustai National Park, Prof. N. Bandi, Mr. T. Munhbat, for their help during the study.

References

- Batsaikhan, N., Battulga, S., and Samiya, R. (2006) Small mammal communities in Hustai National Park. Takhi Research Papers, 83–98.
- Chabaud, A. G. (1975) Keys to genera of the order Spirurida. Part 2. Spiruroidea, habronematidae and Acuarioidea. In: Anderson, R. C., Chabaud, A. G., Willmott, S. (eds.). CIH keys to the nematode parasites of vertebrates. Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, U. K.
- Danzan, G. (1978a) [Helminths of wild mammals in Mongolia.] D. Sc. Thesis, Moscow, VIGIS (in Russian).
- Danzan, G. (1978b) [On nematode fauna of lagomorphs and rodents in Mongolian People's Republic.] Trudy Gelmintologicheskoi Laboratorii AN SSSR, 28: 9–16 (in Russian).
- Daschzeveg, G., Dambii, N., and Sugar, D. (1982) [On study of helminths in dog.] Journal Hodoo Aj Ahui, 4: 42–43 (in Mongolian).
- Ganzorig, S. (1998) Biodiversity of helminth parasites in Mongolia. Ph. D. Thesis, Hokkaido University, Sapporo, Japan.
- Ganzorig, S., and Danzan, G. (1990) [Helminths of Mongolian marmot, *Marmota sibirica*.] In: Proceedings of 1st meeting Workshop on Mongolian marmot. Tsendjav, D., and Batbold, J. (eds.). Mongolian Academy Press, Ulaanbaatar, Mongolia, 54–58 (In Mongolian).

- Ganzorig, S., Danzan, G., Burmaa, J., and Enhtuya, B. (1988) [New findings of helminths from mammals in Huvsgul area.] Abstracts, International meeting of the Mongolian-Soviet Huvsgul Expedition, "Natural condition and resources of some regions of Mongolia." Irkutsk State University Press, Irkutsk, USSR, 111–112 (In Russian).
- Ganzorig, S., Sumiya, D., Batsaikhan, N., Oku, Y., and Kamiya, M. (1997) Helminth parasites of lynx and corsak fox in Mongolia. Abstracts, 123rd meeting of the Japanese Society of Veterinary Science, Fijisawa, Nihondaigaku, Japan, p. 121.
- Ganzorig, S., Tenora, F., Oku, Y., and Kamiya, M. (1999) New records of catenotaeniid cestodes from rodents in Mongolia, with notes on the taxonomy of the *Catenotaenia* Janicki, 1904 and *Hemicatenotaenia* (Tenora, 1977) (Cestoda: Catenotaeniidae). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis* (Brno), XLVII (3): 33–38.
- Lobachev, V. C., Jaltsanova, D.-S. D. (1984) [Materials on helminth fauna of jerboa in Mongolian People's Republic.] Abstracts, International meeting, "Natural condition and resources of some regions of Mongolia." Bratislava, Slovakia, p. 152 (In Russian).
- Meszaros, F. (1975) Two spirurids (Nematoda) from *Allactaga sibirica* (Mammalia) in Mongolia. *Acta Zoologica Academiae Scientiarum Hungaricae*, 21 (1–2): 97–100.
- Ryjikov, K. M., Gvozdev, E. V., Tokobaev, M. M., Schaldyryn, L. S., Matsaberidze, G. V., Merkusheva, I. V., Nadtochii, E. V., Hohlova, I. G., and Sharpilo, L. D. (1979) [Key to the helminths of rodents in USSR. Nematoda and Acanthocephala.] Nauka, Moscow, USSR, 279 pp. (in Russian).
- Sharhuu, G. (1976). [On helminth fauna of roe deer.] *Mal aj ahuin erdem shinjilgeeniii buteel*, 22: 142–143 (in Mongolian).
- Sharhuu, G. (1986) [The helminths of the wild and domestic ruminants and control measures on the main helminthiasis in Mongolia.] D. Sc. Thesis, Moscow, VIGIS (in Russian).

Suhbat, H., and Ganzorig, S. (1988) [The biology of *Mustela eversmanni* in Mongolia.]

Scientific Notes of the Mongolian State University, 99: 229–238 (in Russian).

Tenora, F., and Murai, E. (1975) Cestodes recovered from rodents (Rodentia) in Mongolia.

Annales Historico-Naturales Musei Nationalis Hungarici, 67: 65–70.

Tinnin, D. S., Ganzorig, S., and Gardner, S. L. (2011) Helminths of squirrels (Sciuridae) from

Mongolia. Occasional Papers, Museum of Texas Tech University, 303: 1–9.

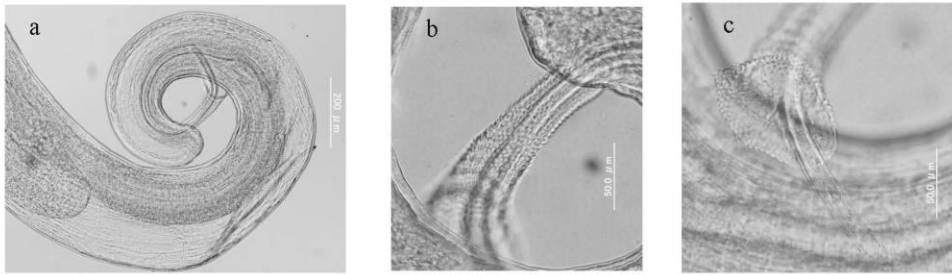


Figure 1. *Trichuris muris* (a. mail tail; b. spicular sheath; c. spicula)

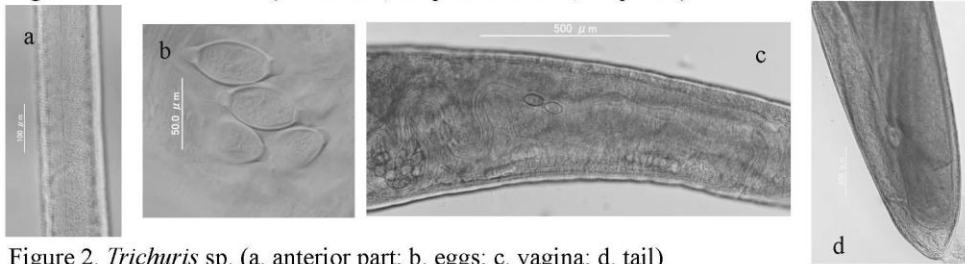


Figure 2. *Trichuris* sp. (a. anterior part; b. eggs; c. vagina; d. tail)



Figure 3. *Physaloptera massino* (a. mail anterior end; b. male tail).

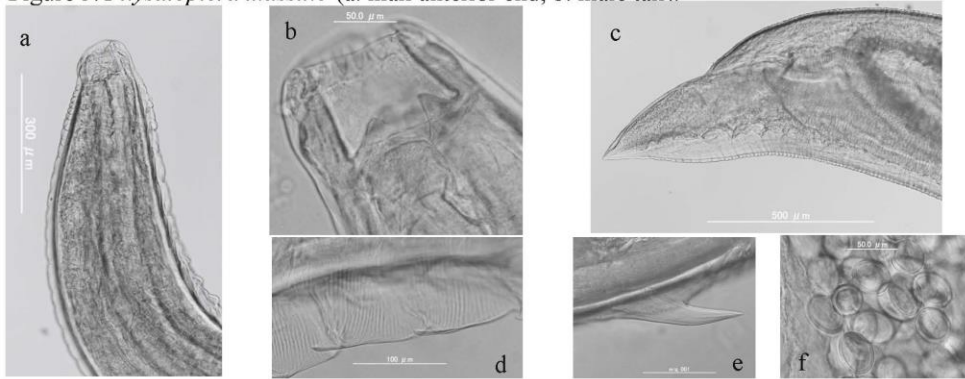


Figure 4. *Pterygodermatites baicalensis* (a-b. anterior end; c. tail; d-e. comb and spine; f. eggs)

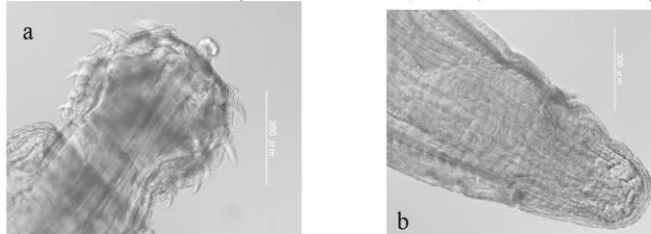


Figure 5. *Macracanthorhynchus catulimus* (a. anterior end; b. tail)