

## Specific Identification of a Taeniid Cestode from Snow Leopard, *Uncia uncia* Schreber, 1776 (Felidae) in Mongolia

Sumiya Ganzorig<sup>\*,\*\*</sup>, Yuzaburo Oku<sup>\*\*</sup>, Munehiro Okamoto<sup>\*\*\*</sup>, and Masao Kamiya<sup>\*\*</sup>

<sup>\*</sup>Department of Zoology, Faculty of Biology, National University of Mongolia, Ulaanbaatar 210646, Mongolia

<sup>\*\*</sup>Laboratory of Parasitology, Graduate School of Veterinary Medicine, Hokkaido University, Sapporo 060-0818, Japan e-mail: sganzorig@yahoo.com

<sup>\*\*\*</sup>Department of Laboratory Animal Sciences, Tottori University, Tottori 680-8533, Japan

### Abstract

An unknown taeniid cestode, resembling *Taenia hydatigena*, was recovered from a snow leopard, *Uncia uncia* in Mongolia. Morphology and nucleotide sequence of the mitochondrial cytochrome *c* oxidase subunit I gene (mt DNA COI) of the cestode found was examined. The cestode is differed from *T. hydatigena* both morphologically and genetically. The differences between two species were in the gross length, different number of testes, presence of vaginal sphincter and in egg size. The nucleotide sequence of this cestode differed from that of *T. hydatigena* at 34 of the 384 (8.6%) nucleotide positions examined. The present cestode is very close to *T. kotlani* in morphology and size of rostellar hooks. However, the adult stages of the latter species are unknown, and further comparison was unfeasible.

**Key words:** Mongolia, snow leopard, *Taenia*, taxonomy, mt DNA, cestode, Taeniidae

### Introduction

The snow leopard, *Uncia uncia* Schreber, 1776 (Felidae) is an endangered species within Mongolia and throughout its range. It is listed in the IUCN Red Data Book, Mongolian Red Book and included in CITES (Convention on International Trade in Endangered Species of Fauna and Flora) on Appendix I. The helminth fauna of this carnivore is almost unknown. Only two species of nematode, namely *Toxascaris leonina* and *Toxocara cati* were reported from this host in Russia (Mozgovoi, 1953) and India (Maity *et al.*, 1994), respectively.

In 1986, we were able to obtain a digestive tract from one snow leopard that was shot under special permission to the Academy of Sciences of Mongolia. During dissection, the cestodes resembling *Taenia hydatigena* Pallas, 1766 in terms of rostellar hook lengths, hook shape and number were recovered from the small intestine of a snow leopard (Ganzorig & Amarsanaa, unpublished). However, a more recent examination has revealed that the specimens are differing from *T. hydatigena* in the number of morphological traits.

The specific identification of taeniid cestodes based on morphological characters only is often inadequate. Because of the characters of *Taenia* species are subject to variations which necessitate

the use of more than one character for specific identification (Edwards & Herbert, 1981). Identification based on hook morphology and measurements are difficult because of overlap in the hook lengths between different species. That based on the gross morphology of the strobila and segments are invalid because of distortion due to poor fixation (Verster, 1969; Beveridge & Gregory, 1976; Edwards & Herbert, 1981). Beveridge & Gregory (1976) found that gross strobilar morphology and anatomy of the mature proglottid were reliable methods of differentiating 4 species of *Taenia* in suitably relaxed, fixed and stained specimens. Identification of taeniid cestodes requires well-relaxed and subsequently fixed complete cestodes with mature segments and scoleces.

To date, the nucleotide sequences of the mitochondrial DNA cytochrome *c* oxidase subunit I (mt DNA COI) gene were used to distinguish and resolve phylogenetic relationships in the strain variation of *Echinococcus granulosus* and *E. multilocularis* (Bowles *et al.*, 1995); between species of Taeniidae (Okamoto *et al.*, 1995). Using this approach, it has been indicated that the Asian *Taenia* recently described as *Taenia asiatica*, is closely related to *T. saginata* and taxonomic classification as a subspecies or strain of *T. saginata*