УДК 576. 893.16

КИШЕЧНЫЕ ПАРАЗИТЫ ТУГАЙНОГО ОЛЕНЯ (CERVUS ELAPHUS BACTRIANUS LYDEKKER, 1900) В ИЛЕ-БАЛХАШСКОМ ГОСУДАРСТВЕННОМ ПРИРОДНОМ РЕЗЕРВАТЕ

О.Беркинбай, Б.Б.Омаров, М.Ж.Сулейменов, Н.М.Джусупбекова, Е.Б.Баймуханбетов, С.М.Нысамбаева

Республиканское государственное предприятие на праве хозяйственного ведения «Институт зоологии» Комитета науки Министерства науки и высшего образования Республики Казахстан, Алматы, Казахстан

INTESTINAL PARASITES OF TUGAI DEER (CERVUS ELAPHUS BACTRIANUS LYDEKKER, 1900) IN THE ILE-BALKHASH STATE NATURE RESERVE

O.Berkinbai, B.B.Omarov, M.Zh.Suleimenov, N.M. Jussupbekova, E.B.Baymukhanbetov, S.M.Nyssambayeva

Republican State Enterprise on the right of economic management "Institute of Zoology" of the Committee of Science of the Ministry of Science and Higher Education of the Republic of Kazakhstan, Almaty, Kazakhstan

ИЛЕ-БАЛХАШ МАМЛЕКЕТТИК ЖАРАТЫЛЫШ РЕЗЕРВИНДЕГИ ТУГАЙ КИЙИКТИН ИЧЕГИ МИТЕЛЕРИ (CERVUS ELAPHUS BACTRIANUS LYDEKKER, 1900)

О. Беркинбай, Б. Оморов, М. Ж. Сулейменов, Н. М. Жусупбекова, Е. Б. Баймуханбетов, С. М. Нысамбаева

Казакстан, Алматы, Казакстан Республикасынын Илим жана жогорку билим берүү министрлигинин Илим комитетинин "Зоология институту" чарба жүргүзүү укугундагы республикалык мамлекеттик ишканасы

berkinbay49@mail.ru; baijan1957@gmail.com; maratbeks@mail.ru; nurgul.dzhusupbekova@mail.ru; erkesh.b@gmail.ru; nysssaya@gmail.com.

Аннотация: *Приведен анализ литературных данных и собственных исследований по распространению и видовому составу кишечных паразитов у тугайных оленей в Иле-Балхашском государственном природном резервате.*

Впервые на территории Иле-Балхашского государственного природного резервата у тугайных оленей зарегистрированы девять видов кишечных паразитов: Eimeria sholpanae, Eimeria kulashae, Eimeria aruzhanae, Dicrocoelium lanceatum, Anoplocephala perfoliata, Moniezia expansa, Nematodirus spathiger, Haemonchus contortus и Cylicocyslus insigne. Простейшие являются специфическими паразитами тугайных оленей, трематода, цестоды и нематоды – паразитами многих видов домашних и диких животных и человека. Выявленные у тугайных оленей гельминты имеют большое медико-социальное и ветеринарное значение, это необходимо учитывать охотникам, любителям активного отдыха на природе и медицинским и ветеринарным специалистам.

Ключевые слова: *тугайный олень, эймерий, дикроцелий, аноплоцефала, диктиокаулы, параскарисы.*

Annotation: *The analysis of literature data and own research on the distribution and species composition of intestinal parasites in tugai deer in the Ile-Balkhash State Natural Reserve is presented.*

For the first time, nine species of intestinal parasites have been registered in Tugai deer on the territory of the Ile-Balkhash State Natural Reserve: Eimeria sholpanae, Eimeria kulashae, Eimeria aruzhanae, Dicrocoelium lanceatum, Anoplocephala perfoliata, Moniezia expansa, Nematodirus spathiger, Haemonchus contortus and Cylicocyslus insigne. Protozoa are specific parasites of tugai deer, trematodes, cestodes and nematodes – parasites of many species of domestic and wild animals and humans. The helminths detected in tugai deer are of great medical, social and veterinary importance, this must be taken into account by hunters, outdoor enthusiasts and medical and veterinary specialists.

Key words: *tugai deer, eimeria, dicrocelium, anoplocephala, dictyocaulae, paraskaris.*

Аннотация: *Иле-Балхаш мамлекеттик жаратылыш резервиндеги Тугай бугулардагы ичеги мителеринин таралышы жана түрлөрүнүн курамы боюнча адабий маалыматтарды жана өздүк изилдөөлөрдү талдоо.*

Биринчи жолу аймагында Иле-Балхашского мамлекеттик жаратылыш резерват уюштуруунун жана анын у тугайных оленей катталышы тогуз түрлөрүн ичеги алматы: Eimeria sholpanae, Eimeria kulashae, Eimeria aruzhanae, Dicrocoelium lanceatum, Anoplocephala perfoliata, Moniezia expansa, Nematodirus spathiger, Haemonchus contortus жана Cylicocyslus insigne. Протозоандар – бугулардын, трематоддордун, цестоддордун жана Нематоддордун өзгөчө мителери-Үй жана жапайы жаныбарлардын жана адамдардын көптөгөн түрлөрүнүн мителери. Бугуларда аныкталган гельминттердин медициналык-социалдык жана ветеринардык мааниси чоң, муну мергенчилер, сыртта эс алууну сүйүүчүлөр жана медициналык жана ветеринардык адистер эске алышы керек.

Негизги сөздөр: *Тугай бугу, эймериум, дикроцелиум, аноплоцефала, диктиокула, параскарис.*

The Tugai red deer (Cervus elaphus bactrianus) is a unique form of red deer, the only one adapted to inhabit the tugai of the arid zone. In the first half of the twentieth century, the tugai deer disappeared from the fauna of the Ile-Balkhash region and across Kazakhstan as a whole as a result of direct extermination, as well as under the influence of habitat degradation. The species is listed in the International Red Book and the Red Book of the Republic of Kazakhstan.

In November 2018, the first adaptation enclosure for Tugai red deer was built in the Ile-Balkhash reserve.

In Kazakhstan, 21 species of parasites have been registered in tugai deer, including 3 species of protozoa: *Eimeria sholpanae, Eimeria kulashae, Eimeria aruzhanae*, 2 species of trematodes: *Fasciola hepatica, D. lanceatum*, 2 species of cestodes: *Moniezia expansa, Echinococcus granulosus* and 14 species of nematodes: *Parabronema skrjabini, Onchocerca skrjabini, Setaria labiato-papillosa, S. cervi, S.digitata, Oesophagostomum columbianum, O.radiatum, O.venulosum, Cooperia sp., Haemonchus contortus, Nematodirus spathiger, N. sp., Dictyocaulus eckerti, Trichocephalus skrjabin* [1].

The collection of the material was carried out in 05.02.2024-02/14/2024 in the Ile-Balkhash State Natural Reserve. 21 tugai deer were examined by the Fulleborn flotation method.

Lifetime parasitological studies of sheep were carried out using the Fulleborn method. Faecal samples (3 g) were taken from tugai deer. The feces were placed in plastic jars and preserved with a 2.5 % solution of potassium bicarbonate for subsequent processing in the

nystitut laboratory. The feces were thoroughly rubbed in a porcelain cup with 15-20 ml of ammonium nitrate solution with a density of 1.3. They were maintained for 45 minutes. Then the upper film was removed from the liquid with a wire loop, applied to a slide, drops of distilled water were added, covered with a cover glass and microscoped.

The species identity of eimeria was established on the basis of morphological features of oocysts (shape, size, color, thickness and structure of the shell, presence of micropyle, polar cap, residual body and refractive bodies), sporocysts (shape, size, presence of residual body and styd bodies), sporozoites (shape, size, presence of refractive bodies) and time sporulation of oocysts. At the same time, the data of S.K.Svanbaev were also taken into account [1].

When determining helminth eggs, the shape, size, color, thickness and structure of the shells were taken into account; the presence of caps on one of the poles, miracidia or eggs with yolk, tubercle or thorn, filaments in trematodes; pear-shaped apparatus with oncosphere in cestodes; plugs at the poles, crushing balls or larvae in the center of nematodes.

The intensity of infection was determined by counting the number of oocysts of eimeria and helminth eggs in 20 fields of view of the microscope.

As a result of the study, eimeria, dicrocelium, anoplocephala, dictyocaulae and paraskaris were recorded in tugai deer (Table 1).

The extent of the eimeric invasion of tugai deer in the Ile-Balkhash State Natural Reserve is 28.6 %, and the intensity of the invasion is 9.1±3.5 oocysts.

The extent of invasion of *Eimeria sholpanae* Berkinbay, Baytursinov et Elyubaeva, 2012 of tugai deer in the Ile-Balkhash State Natural Reserve is 4.8 %, and the intensity of invasion is 10.0 oocysts.

The extent of invasion of *Eimeria kulashae* Berkinbay, Baytursinov et Elyubaeva, 2012 of tugai deer in the Ile-Balkhash State Natural Reserve is 14.3 %, and the intensity of invasion is 9.0±4.0 oocysts.

The extent of invasion of *Eimeria aruzhanae* Berkinbay, Baytursinov et Elyubaeva, 2012 of tugai deer in the Ile-Balkhash State Natural Reserve is 9.5 %, and the intensity of invasion is 8.0±1.0 oocysts.

The extent of invasion of *Dicrocoelium lanceatum* Stiles et Hassal, 1896 tugai deer in the Ile-Balkhash State Natural Reserve is 33.3 %, and the intensity of invasion is 9.2±4.9 eggs. Localization: liver (bile ducts and gallbladder).

The extent of invasion of *Anoplocephala perfoliata* Goeze, 1782 tugai deer in the Ile-Balkhash State Natural Reserve is 38.1%, and the intensity of invasion is 13.0±5.6 eggs. Localization: jejunum.

The extent of invasion of *Moniezia expansa* (Rudolphi, 1810) Blanchard, 1891 tugai deer in the Ile-Balkhash State Natural Reserve is 23.8 %, and the intensity of invasion is 9.6±3.8 eggs. Localization: small intestine.

The extent of invasion of *Nematodirus spathiger* (Railliet, 1896) Ralliet et Henry, 1909 tugai deer in the Ile-Balkhash State Natural Reserve is 52.4 %, and the intensity of invasion is 11.5±4.8 eggs. Localization: rennet and small intestine.

The extent of invasion of *Haemonchus contortus* (Rudolphi, 1803) Cobbold, 1898 tugai deer in the Ile-Balkhash State Natural Reserve is 38.1 %, and the intensity of invasion is 14.4±5.8 eggs. Localization: rennet and intestines.

Table 5. The results of research on the coprology of tugai deer collected on the territory of the Ile-Balkhash State Natural Reserve using the Fulleborn method

Sample number	Parasites						
	Eimeria	D. lanceatum	A. perfoliata	M. expansa	N. spathiger	H. contortus	C. insigne
1		7	11		8	6	
2					9	9	
3	E.sholpanae =10			7			
4		8					7
5	E.kulashae =14			8	7	9	
6					9	12	
7		6	19				
8							9
9	E.aruzhanae =9	5	9	18	8	33	
10			9				
11		9			22		
12							8
13	E.aruzhanae =8		8			8	
14					21		
15			21			29	
16	E.kulashae =5	8		9	7		
17			18				
18					20		
19		21				9	
20				6	8		6
21	E.kulashae =9		9		7		8
Total	EI=28,6 II=9,1±3,5	EI=33,3 II=9,2±4,9	EI=38,1 II=13,0±5,6	EI=23,8 II=9,6±3,8	EI=52,4 II=11,5±4,8	EI=38,1 II=14,4±5,8	EI=23,8 II=7,6±1,4

The extent of *Cylicocyclus insigne* (Boulenger, 1917) invasion of tugai deer in the Ile-Balkhash State Natural Reserve is 23.8 %, and the intensity of invasion is 7.6=1.4 eggs. Localization: caecum and colon.

The infection of tugai deer with parasites in the Ile-Balkhash State Natural Reserve is 100 %. Nematodes are the most common among tugai deer (52.4 %), anoplocephals and hemonchs are less common (38.1 % each). Dicrocelium (33.3 %), eimeria (28.6 %) and cilicocyslus (23.8 %) occupy the next places in terms of prevalence.

Protozoa, trematodes, cestodes and nematodes in the body of tugai deer occur in an associative form (83.3%), in the form of eimeria-moniesia, eimeria-moniesia-hemonchus, eimeria-dicrocelia-anoplocephalic-moniesia-nematolirus-hemonchus, eimeria-anoplocephalic-hemonchus, eimeria-dicrocelium-moniesium-nematodirus, eimeria-anoplocephalid-nematodirus-cilicocyslus, dicrocelium-anoplocephalid-nematodirus-hemonchus, dicrocelium-cilicocyslus, dicrocelium-anoplocephalid, dicrocelium-nematodirus, dicrocelium-hemonchus, anoplocephalid-hemonchus, moniesia-nematolirus-cilicocyslus (4.8 % each) and nematolirus-hemonchus (9.5 %).

As a result of the study, 9 species of parasites belonging to 3 types, 5 classes, 5 orders, 6 families and 7 genera were found in tugai deer, including 3 species of protozoa, 1 – trematodes, 2 – cestodes and 3 – nematodes. Protozoa, trematodes, cestodes and nematodes are found in 14 variants of associations.

As a result of our research, it was found that eimeria, gastrointestinal trematodes, cestodes and nematodes in animals occur both in the form of monoinvasia and in the form of mixed invasions.

The work was carried out within the framework of program-targeted financing on the topic: IRN BR21882199 «Development of an inventory of the fauna of the arid territories of the Balkhash – Alakol basin for the development of measures for the conservation and sustainable use of wildlife resources».

References

1. Baitursinov K. K., Asanov G. N., Berkinbay O. Ecology of parasites of the reacclimatized grouse deer (Cervus elaphus bactrianus Lydekker, 1900) in the Syrdarya // Materials International scientific and practical conference «Problems of biodiversity conservation in Kazakhstan and Neighboring territories in wildlife and collections», dedicated to the 80th anniversary of the Biological Museum of Al- Farabi Kazakh National University. – Almaty «Kazakh University», 2016. – P. 21- 26. (In Kazakh)