МАЛ ШАРУАШЫЛЫҒЫ ЖӘНЕ ВЕТЕРИНАРИЯ
ЖИВОТНОВОДСТВО И ВЕТЕРИНАРИЯ
STOCK-RAISING AND VETERINARY

IRSTI 68.41.55 **DOI** https://doi.org/10.37884/4-2025/01

M.Umitzhanov, U.Zh.Omarbekova, N.Akimzhan, G.K.Omarbekova,
A.M.Mussoyev, A.Zh. Zhylkaidar

Kazakh National Agrarian Research University, Almaty, Kazakhstan,
m.umitzhanov@yandex.ru, Urzanoma-58@mail.rum, missnazik@yandex.ru, super.flores@mail.ru,
musoev.a@mail.ru, arman.zhylkaydar@bk.ru

GROWTH, MORPHOLOGICAL PROPERTIES OF CAMEL TRICHOPHYTIS DERMATOPHYTE

Abstract

When studying the epizootic situation in camel farms in the Almaty region from 2006 to 2009, 134 pathological samples (hair, skin flakes, etc.) were collected from camels infected with dermatophytosis. Well-germinated bundles were selected from the separated direct shoots and planted on a nutrient medium of malt agar. As a result of the work carried out, 18 dermatophytes of camel trichophytosis were isolated from 134 pathological samples taken from 7 camel farms.

During this scientific work, the conditions, temperature, and selective selection of the isolated strain were taken into account. These results were obtained using the identifier by Ivanova L.G. and identified with scientific research conducted in 1992 [4, 5]. The original document on the vaccine strain was prepared and deposited in the laboratory “On the study of the gene pool of microorganisms” of KazNIVI LLP, KazAgroInnovation JSC.

The deposited strain of Trichophyton sarkisovii was assigned the deposit collection number F-0319 “KazNIVI” No. 3. An application for an invention was filed for the specified vaccine strain Trichophyton sarkisovii F-0319, and a preliminary patent was obtained from the National Agency of the Republic of Kazakhstan [6].

Key words: *arthrospora; camel; clone; chlamydospore; dermatophytes; rabbit; isolate; strain; trichophytosis.*

Introduction

In Akmola and Kostanay statistics recorded about a hundred heads of camels, and in the North Kazakhstan region did not detect at all. Accordingly, the most significant absolute indicators of camel population growth are in areas with a higher base population, although a good result was shown in the Almaty and Aktobe regions. And, on the contrary, the largest camel-breeding region - Mangystau region increased the number of camels by less than 1 thousand heads during the period. This is due to the drought and the shortage of feed that took place in 2021 [1].

In the past 2022, over the same period of time, the increase in camels was higher and amounted to 19.3 thousand heads from 214.8 to 234 thousand heads, or by 9%, - reports.

In 2023, statistics for 5 months on the number of camels is 250 thousand heads [2].

Herds consisting of breeding camels can be found, most often, in the western and southern regions of Kazakhstan. Peasant farms of the country are engaged in breeding the following camel breeds: Kazakh Bacterian, Bactrian, Arvana, Bacterian, Aruana, dromedary, Turkmen arvana, etc.

Kazakh bactrians are bred in Kazakhstan (92%), as well as in Kyrgyzstan and the Volgograd, Saratov, Astrakhan regions of the Russian Federation (8%). Camels of this breed have a voluminous chest and a stretched torso.

Kazakh bactrians are selected in three main areas of productivity:

Dairy. The milk yield of queens for 1 year of lactation is + /- 1750 kg of milk, with a fat content of +/- 5.6%. Meat is dairy.

The live weight of males of this breed of camels is +/- 670 kg, and the weight of females is +/- 580 kg. The slaughter yield in females is +/- 53%, and in males +/- 55%. The milk yield of queens for 1 year of lactation is + /- 1450 kg of milk, with a fat content of +/- 5.4%.

The meat is woolly. Depending on gender and age, the cut of wool per year is +/- 8-15 kg.

Kazakh aruna are elite camels in Kazakhstan. Most often, camels of this breed are bred in Atyrau, South Kazakhstan, Mangistau and Kyzylorda regions of the Republic of Kazakhstan. It was possible to breed this breed by crossing Kurt camels with Argan camels of the Turkmen breed.

The Turkmen arvana is also a one-humped camel. In addition to Kazakhstan, where there are +/- 15 000 heads of camels of this breed, these camels are also bred in Uzbekistan, where their number is +/- 20 000 heads. The Turkmen breed of single - humped camels has 4 intrabreed types:

1. Iranian meat and dairy;
2. Yerbent dairy;
3. Sakarchaginsky dairy and meat;
4. Kazakh meat and dairy.

The live weight of males of this breed of camels is +/- 750 kg, and the weight of females is +/- 580 kg. The slaughter yield in females is +/- 57%, and in males +/- 60%. The milk yield of queens for 1 year of lactation is + /- 2850 kg of milk, with a fat content of + /- 3.9%. The height at the withers is +/- 1.8 m - 1.9 m. [3].

Materials and Methods

During the study of the epidemic situation in camel farms in the Almaty region from 2006 to 2009, camels with dermatophytia were isolated and 134 damaged samples (wool, skin scales, etc.) were taken from them.

The resulting damaged samples were placed in a 70o ethyl alcohol solution, mixed well and left at room temperature for 2-3 minutes, then rinsed with sterilized distilled water 2-3 times, and then fed to the wort culture medium. When sowing seeds in a thermostat with a temperature of 28 ° C for 10-15 days, it was observed that the first clusters of shoots grew. When we observed these clusters, after 21 days, the clusters grew thicker, increasing in size. When we painted the smear made from this growth using the Romanovsky-Gimza method and examined it under a microscope, a small number of mycelliums and many microconiums of trichophytis dermatophytes were revealed.

As a result of the conducted research, the distribution of straight shoots from samples taken from the following Farms is shown in Table 1.

From the separated straight shoots, we selected well-sprouted bunches and fed them to the re-wort culture medium. As a result of the work carried out, 18 straight dermatophytes were selected from 134 damaged samples taken from 7 camel farms.

Of these 18 straight dermatophytes, 40 rabbits were experimented with to identify dermatophytes with high infestation properties. They were divided into 5 heads, 7 groups, and the 8th group was held as control.

Table 1 - Dermatophytes isolated from sick camels

Shooting of camel farmers	Years of damage sampling	Checked livestock	Number of damage samples	Separated straight isolates
1	2	3	4	5
«Agro Mercur» peasant farm	2006	118	12	1
«Kozhaev»	2006	165	27	3
«Kairat»	2006	188	12	2
Camel farm «Manas»	2006	245	18	2
«Akbota»	2007	205	23	2
«Sarytaukum»	2007	315	22	3

«Nurkeldy»	2008	214	15	4
«Agro Mercur» peasant farm	2009	132	5	1
Total:			134	18

On the backs of rabbits, we cut the fur in the amount of 5x5 cm^2, prepared the place of infection, scratched the skin with the tip of a scalpel without removing blood, and after 1-2 minutes, we formed trichophytia in the same places for 18-21 days, rubbed with a sample containing 1.0 cm3 of liquid-10 million microconidiums. After 7-10 days of observation of experimental animals, clinical signs of trichophytia were clearly observed in the infected areas, and after 15-18 days, the infected surface of the rabbits turned red, scaly and ulcerated. Five rabbits infected with «Manas» (M-1) were 100 percent infected with trichophytia.

The results of the experimental work carried out are shown in Table 2.

Table 2 – Damage properties of formed dermatophytes grown on artificial Culture Media

Brief designation of dermatophyte – forming growths	Practical groups order	Num-ber of rabbits, head	Infection rate, in-festation Size $_{50}$	Sick rabbits, head	Unwell rabbit, head	Sick rabbits, %
1	2	3	4	5	6	7
«Agro Mercur» peasant farm (Mer-1)	1	5	5,0 ±0,1	3	2	60
«Sarytaukum» (S-1)	2	5	5,2 ±0,3	2	3	40
«Nurkeldy» (N-1)	3	5	5,4 ±0,5	3	2	60
Camel farm «Manas» (M-1)	4	5	5,3 ±0,2	5	0	100
«Kozhaev» (Ko-1)	5	5	5,1 ±0,4	3	2	60
«Kairat» (Ka-1)	6	5	5,0 ±0,2	2	3	40
«Akbota» (A-1)	7	5	5,3 ±0,5	2	3	40
Control group	8	5	-	0	5	0

As can be seen from Table 2, among the tested dermatophytes, it was found that the infected rabbits in the experiment had an isolate of the dermatophyte «Manas» (M-1), which caused 100 percent disease and showed high damage. The harmful and toxic properties of the isolates of the sod dermatophyte isolated from the rest of the camel farms were 40-60%.

In order to check the growth and morphological properties of all isolated dermatophytia-forming isolates, they were sown in the wort culture medium at one time. The conclusion of these verified results is presented in Table 3.

Table 3 - Growth-morphological properties of cultivated straight isolates in Culture Media

Split straight shoots in short name	Morphological manifestations of growths	
	Susloagar	Meat peptone glucose Agar
1	2	3
Mer-1	White, yellowish, velvety, up-toed, with a diameter of 6.0-9.0 mm	Whitish, velvety, zhanzha-white pointed, diameter 5.0-7.0 m
(S-1)	Yellowish brown, velvety, smooth, diameter 5.0-7.0 mm	Pale yellow, single smooth, diameter 6.0-7.0 mm
(N-1)	White yellowish, pleated, diameter 6.0-8.0 mm	Brown, one uneven, with a pointed edge, diameter 7.0-8.0 mm
BM-1	Grayish brown, white uniform, diameter 4.0-6.0 mm	Gray, brownish bumpy, velvety, diameter 9.0-10.0 mm
Ka-1	Yellowish or brownish, uplifted smooth, diameter 6.0-9.0 mm	Yellowish brown, velvety, smooth, diameter 5.0-7.0 mm
(Ko-1)	Reddish brown, the surface is floury, one smooth, diameter 5.0-8.0 mm	White yellowish, pleated, diameter 6.0-8.0 mm

A-1	Light brown, velvety, uplifted smooth, diameter 6.0-9.0 mm	Whitish, one uneven Bump, pointed on the sides, diameter 8.0 - 9.0 mm
Mer-1	Mycelium is not one kilogram thick, filamentous, 0.8-5.0 microns wide, microconidium Oval pear-shaped, Rod, 1.5-4.0 x 3.0-9.0 microns in size, not numerous; macronidium is not found at all. Arthrospores are 3.5-9.0 microns in diameter, with a small number.	The mycelium is crossed, 1.0-3.0 microns in size, the microconidium is Oval in size 1.5-3.0 x 2.0-5.0 microns, the macronidium is completely absent, the arthrospores are 4.2 - 8.0 microns in diameter.
(S-1)	The mycelium is branched, filamentous when examined under a microscope with a smear, the width is 0.8-5.0 microns, the microconidium is Oval, the size is 1.5-4.0 x 3.0 - 9.0 microns; The Shape of the macronidium is oblong, the size is 4.2-9.2 x 10-30 microns. The diameter of arthrospores is 5.5-9.0 microns, the volume of chlomidospores is 6.0-10.0 microns.	Mycelium size 2.2-3.5 microns, microconidiums Oval size 1.5-3.0 x 2.0 - 5.0 microns, macronidiums without, arthrospores diameter 4.2-8.0 microns, chlomidospores diameter 5.0-12 microns
(N-1)	The mycelium has an ascending filamentous shape with a width of 0.6-7.0 microns, the microconidium has an Oval pear shape, the size is 1.3-3.0 x 2.0-6.0 microns, The Shape of the macronidium is oblong, the size is 4.2-9.2 x 10 - 30 microns. The diameter of the arthrospores was 3.2-8.0 microns, the volume of the chlomidospores was the same 6.0-10.0 microns.	Mycelium is crossed, 1.0-3.0 microns in size, microconidia Oval size 1.5-3.0 x 2.0-5.0 microns without macronidia, arthrospores are not encountered chlomidospores with a sporadic diameter of 5.0-15 microns
M-1	Mycelium has a single smooth filament with a width of 0.7-6.0 microns, microconidium is pear-shaped, 1.8-3.0 x 2.0-7.0 microns in size; macronidium has a long shape, 4.2-9.2 x 10-30 microns in size, occurs sporadically. There are no arthrospores, chlomidospores are 6.0-10.0 microns in size.	Mycelium is branched, 2.0-3.0 microns in size, micro-conidia are Oval in size 2.5-3.0 x 4.0-5.0 microns sporadically, macronidia are absent, arthro-spore diameter 4.2-8.0 microns, chlomidospores are 5.0-15 microns in diameter
Ka-1	Mycelium is filamentous, with a width of 0.8-5.0 microns, microconidiums are round or pear-shaped, with a size of 1.4-6.0 x 4.0-8.0 microns, sporadic; macronidiums are oblong, with a size of 4.2-9.2 x 10-30 microns. Arthrospores are sporadic with a diameter of 3.5-9.0 microns.	The mycelium is 1.0-3.0 microns in size, microconidiums are almost Oval in size 1.5-3.0 x 2.0-5.0 microns in size, macronidiums are absent, arthrospores are sporadic with a diameter of 4.2-8.0 microns, chlomidospores are 5.0-15 microns in diameter.
(Ko-1)	The mycelium has the shape of a single smooth ascending filament with a width of 0.7-4.0 microns, the microconidium has an Oval pear shape, the size of which is 1.5-4.0 x 3.0-9.0 microns, met sporadically; The Shape of the macronidium occurs with a sequential volume of 4.2-9.2 x 10-30 microns. There are no arthrospores and chlamydospores.	The mycelium is crossed, 1.0-3.0 microns in size, the microconidium is Oval in size 1.5 - 3.0 x 2.0-5.0 microns, the macronidium is absent, the arthrospores are sporadic with a diameter of 4.2-8.0 microns.
A-1	The mycelium has an ascending smooth filamentous shape with a width of 0.8-5.0 microns, the microconidium is Oval-pear-shaped with a volume of 1.5-4.0 x 3.0-9.0 microns, The Shape of the macronidium is oblong, the size is 4.2-9.2 x 10-30 microns, sporadic or completely absent. Arthrospores were absent, chlomidospores were sporadic with a volume of 6.0-10.0 microns.	Mycelium is distributed, 1.0-3.0 microns in size, microconidiums are Oval in size 1.5-3.0 x 2.0-5.0 microns in size, chlomidospores without macronidiums and arthrospores have a diameter of 5.0-15 microns.

When this 100 percent damaging dermatophyte isolate «Manas» (M-1) was first purified and sown in the wort culture medium, their growth was slow, and after repeated sowing in the wort culture medium and several generations, the growth rate of dermatophytes increased, and when examined under a microscope, it was also observed that their ability to form spores increased. After 8-10 days of observation of this cultured dermatophyte isolate on specially treated, sliced areas of laboratory animals (rabbits), it was observed that the disease had a mild allergy-like

appearance, after 25 days, rabbits in the experimental group recovered from trichophytia, evidence of a decrease in the disease-causing properties of dermatophytes.

Discussion

The harmfulness, toxicity, immunogenicity of isolated direct dermatophyte isolates was studied by conducting experiments in laboratory rabbits, and a high-immunogenicity, harmful, toxic direct dermatophyte isolate was isolated.

This dermatophyte isolate «Manas» was isolated from private camel breeding. The individual germinated clusters were repeatedly sown in petri dishes filled with susloagar nutrient medium with this form of dermatophyte isolate. At the same time, 11 clones grew from the 1st Petri dish, these grown clones were initially grown at a temperature of 27-37 ºC, 5 clones obtained from the 2nd Petri dish were grown at a temperature of 28-30 ºC, 4 and 6 clones obtained from the 3rd and 4th were grown at a temperature of 28 ºC. After that, these clones were sown for the 2nd time in each petri dish in 5 layers. This cloning was repeated 2 times. It was thoroughly cleaned of other microflora, then repeated 45 times to reduce the damage to dermatophytes, and when they were subjected to 3 generations and tested in the middle of the 4th generation, in test rabbits with a tested sample, it was found that it was not harmful. Each generation was sprayed on susloagar 10 times, that is, in the 1st generation it showed 85% damage, in the 2nd generation-65%, in the 3rd generation - 35%, and in the middle of the 4th generation, infected rabbits showed no clinical signs of trichophytis. As a result of such research, a vaccine strain was isolated, which has a high spore-forming ability and immunogenicity, does not have the ability to cause diseases. The M-1 vaccine strain isolated from «Manas» camel breeding has a large number of microconidiums, macroconidiums and arthrospores are sparse, there are no chlamydospores, and in the Mer-1 vaccine strain isolated from «Agro Mercur» camel breeding (Mer-1), These results showed the following indicators: microconidiums are medium, macroconidiums and arthrospores are sparse, and chlamydomores are absent.

The conditions taken into account during these scientific works, the temperature and the selection step-by-step selection work on the selected strain. These obtained results were identified with the scientific work of Ivanova L.G. conducted in 1992 [4, 5]. The original document for the vaccine strain was prepared and deposited in the laboratory «Research of the microbial lineage fund» of the «Kazakh scientific research veterinary institute» LLP of the Joint-Stock Company «KazAgroInnovation».

Conclusions

The deposited Trichophyton sarkisovii strain was assigned depositary and collectible numbers F-0319 «Kazakh research veterinary institute» No. 3. The invention of this vaccine strain Trichophyton sarkisovii F-0319 was ordered and a preliminary patent of the National Department of the Republic of Kazakhstan was obtained [6, 7].

A 21 - day view of the Trichophyton sarkisovii F-0319 strain is shown in Figure 1.

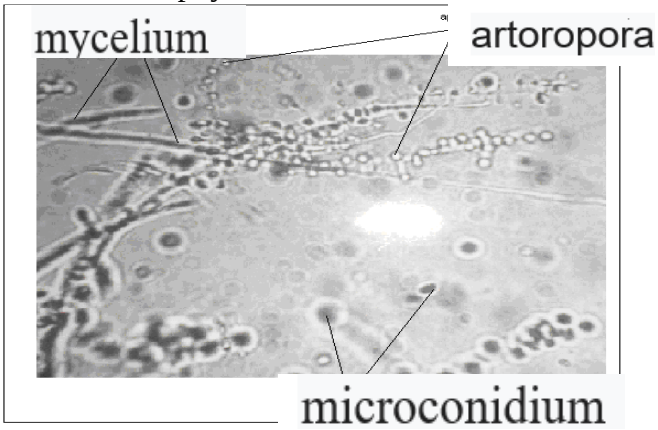

Figure 1. Microconidiums of strain No. 3 «Kazakh scientific research veterinary institute» Trichophyton sarkisovii F-0319.

References

1 S.Bukatov KazakhZerno. ans@gmail.com [Text] from 29.10.2021 ttps://www.bing.com/search?q=S.Bukatov%20KazakhZerno.%2029.10.2021%20%20&qs=n&form=QBRE&sp=-1&lq=0&pq=s.bukatov%20kazakhzerno.%2029.10.2021%20%20&sc=9-5&sk=&cvid=71405228F7EE4D6EADB13E295A936E42

2 Internet resources Statistical data for 2023 [Text] «КазахЗерно.kz». Internet resources Statistical data for 2023 - Поиск

3 Internet resources [Text] https://agroexpert.kz/articles/zhivotnovodstvo/ verbludovodstvo., 2023.

4 Ivanova L.G. Systematics, morphological characteristics and biological properties of dermatomycosis pathogens common to humans and animals: [Text] abstract. ...doct. biol. nauk: 16.00.03.- M.- 1992.-35 p. Larissa IVANOVA | Head of Department | Dr. | University of Tyumen, Tyumen | Laboratory of Plant Ecophysiology and Experimental Phytoecology | Research profile 5 Ivanova L.G. Cultural-morphological and biological properties of the causative agent of camel trichophytia [Text]/ Veterinary mycology and microbiology. - Moscow.-Proceedings of RES.-1987.-Vol. 65.-p.54. Cultural, morphological and biological properties of bacteria from the... | Download Scientific Diagram

6 Kashkin P.N., Khokryakov M.K., Kashkin A.P. Identifier of pathogenic, toxigenic and harmful fungi for humans. - Leningrad: Meditsina, 1979.- P. 5-262.

7 Golovina N.P., Sarkisov K.A. Method of differentiation of dermatophytes - causative agents of dermatomycosis of farm animals. Author's certificate No. 4018262. - 1988.

8 Sutton D. Identifier of pathogenic and opportunistic fungi. - M.: Mir, 2001- 486 p.

9 Umitzhanov M., Bizhanov B.R., Boranbayeva R.S., Arysbekova A.T. Strain of the fungus Tr. Sarkisovii F-0319, used for the manufacture of vaccines against camel trichophytosis [Text]. Pre-patent of the Republic of Kazakhstan No. 19585.-Byul.No. 12.- 2006.

10 Umitzhanov M. Tuye trichofitiyasy [Text] / Monograph.- Almaty, 2022.-156 p.

М.Умитжанов, У.Ж.Омарбекова, Н.А.Акимжан, Г.К.Омарбекова, А.М. Мусоев, А.Жылқайдар

Қазақ ұлттық аграрлық зерттеу университеті, Алматы, Қазақстан

m.umitzhanov@mail.ru, Urzanoma-58@mail.rum, missnazik@yandex.ru, super.flores@mail.ru, musoev.a@mail.ru, arman.zhylkaydar@bk.ru

ТҮЙЕ ТРИХОФИТТЕРІ ДЕРМАТОФИТТЕРІНІҢ МОРФОЛОГИЯЛЫҚ ҚАСИЕТТЕРІ

Аңдатпа

2006-2009 жылдар аралығында Алматы облысының түйе шаруашылықтарындағы эпизоотиялық жағдайды зерттеу барысында дерматофитозбен ауырған түйелерден 134 патологиялық үлгілер (жүн, тері үлбірлері және т.б.) бөлініп алынды. Бөлінген түзу өркендерден жақсы өнген шоқтар таңдалып, сусло агарының қоректік ортаға отырғызылды. Жүргізілген жұмыстардың нәтижесінде 7 түйе шаруашылығынан алынған 134 патологиялық сынамадан түйе трихофитозының 18 дерматофиті бөлініп алынды.

Бұл ғылыми жұмыстарды жүргізу кезінде жағдай, температура және оқшауланған штаммның таңдамалы таңдауы ескеріледі. Бұл нәтижелер Л.Г.Иванованың және 1992 жылы жүргізілген ғылыми зерттеушілермен ажыратып балау арқылы сәйкестендірілді [4, 5, 6, 7, 8]. Вакцина штаммына құжаттың түпнұсқасы дайындалып, «ҚазАгроИнновация» АҚ «КазНИВИ» ЖШС «Микроорганизмдердің гендік қорын зерттеу» зертханасында сақтауға тапсырылды.

Депозитарийленген Trichophyton sarkisovii штаммына F-0319 «KazSRVI» №3 депозитарий-коллекциялық нөмірі берілді. Көрсетілген Trichophyton sarkisovii F-0319 вакцина штаммына өнертабысқа өтінім беріліп, Қазақстан Республикасының Ұлттық агенттігінде алдын ала патент алынды [9, 10].

Кілт сөздер: артроспора, түйе, клон, хламидоспора, дерматофит, қоян, оқшау, штамм,трихофити.

М.Умитжанов, У.Ж.Омарбекова, Н.А.Акимжан, Г.К.Омарбекова, А.М. Мусоев, А.Жылкайдар

Казахский национальный аграрный исследовательский университет, Алматы,
m.umitzhanov@yandex.ru, Urzanoma-58@mail.rum, missnazik@yandex.ru, super.flores@mail.ru, musoev.a@mail.ru, arman.zhylkaydar@bk.ru

МОРФОЛОГИЧЕСКИЕ СВОЙСТВА ДЕРМАТОФИТА ТРИХОФИТИИ ВЕРБЛЮДОВ

Аннотация

При изучении эпизоотической ситуации в верблюжьих хозяйствах Алматинской области с 2006 по 2009 год были выделены от больных дерматофитией верблюдов, от которых было отобрано 134 патологических образцов (шерсть, чешуйки кожи и т.д.). Из отделенных прямых побегов отбирали хорошо проросшие пучки и высаживали их на питательную среду суслоагар. В результате проведенной работы из 134 патологических образцов, взятых с 7 верблюжьих ферм, было выделено 18 дерматофитов трихофитии верблюдов.

При проведении этих научных работ учитываются условия, температура и селективный отбор выделенного штамма. Данные результаты были получены с использованиям определителя Ивановой Л.Г. и идентифицированы с научными исследователями, выполненными в 1992 году [4, 5]. Оригинал документа на вакцинный штамм был подготовлен и депонирован в лаборатории «По изучению генофонда микроорганизмов» ТОО «КазНИВИ» АО «КазАгроИнновация».

Депонированному штамму Trichophyton sarkisovii присвоен депозитарно-коллекционный номер F-0319 «КазНИВИ» № 3. На указанный вакцинный штамм Trichophyton sarkisovii F-0319 была подана заявка на изобретение и получен предварительный патент в Национальном ведомстве Республики Казахстан [6].

Ключевые слова: артроспора; верблюд; клон; хламидоспоры; дерматофиты; кролик; изолят; штамм; трихофития.

Вклад авторов

Умитжанов Мынбай – администрирование проекта
Омарбекова Уржан Жакатаевна – курирование данных
Акимжан Назым Алтынбеккызы – обзор, редактирование
Омарбекова Гульжан Кабылжановна – курирование данных, формальный анализ
Мусоев Асылбек Майлыбаевич – курирование данных
Жылқайдар Арман - методология, проверка