

**BULLETIN OF NATIONAL ACADEMY OF SCIENCES
OF THE REPUBLIC OF KAZAKHSTAN**

ISSN 1991-3494

Volume 2, Number 378 (2019), 112 – 114

<https://doi.org/10.32014/2019.2518-1467.48>

UDC 619:616.98.578.636

N. P. Ivanov, R. S. Sattarova, F. A. Bakiyeva, K. M. Shynybaev, B. Zh. Issakulova

LLP "Kazakh Scientific research Veterinary Institute", Almaty, Kazakhstan.

E-mail: akademik-vet@mail.ru; ranosaitomarovna@gmail.com; flurachka-78@mail.ru;
k.shynybaev@mail.ru, bahitzhamal_i@mail.ru

**DIAGNOSTIC VALUE OF CFT/LCFT
FOR CATTLE MORAXELLOSIS**

Abstract. In our country, moraxellosis has not previously been registered and immunological tests have not been tested (RSK and RDSK).

Timely diagnosis of morax is a major component of antiepidemic measures. Currently, the diagnosis of moraxcellosis is based on the epidemiological data and the clinical picture. Early signs of the disease can only be detected by immunological tests. In this regard, we have tested the serological reactions, in particular the CFT and LCFT and given a comparative diagnostic value.

Keywords: strain, bacteria, moraxella, infectious keratoconjunctivitis, complement fixation test.

Relevance of the topic. Moraxella was first isolated by ophthalmologists V. Moraks and K. Axenfeld in 1896. The Moraxella genus belongs to the Gammaproteobacteria class, the Proteobacteria type [1] is a group of bacteria that are not fermentative of gram-negative microorganisms that live on the mucous membranes of various organs of humans and animals. In cattle, Moraxella bovis and Moraxella bovoculi species parasitize, which have been isolated from the eyes of animals with infectious keratoconjunctivitis [3, 4].

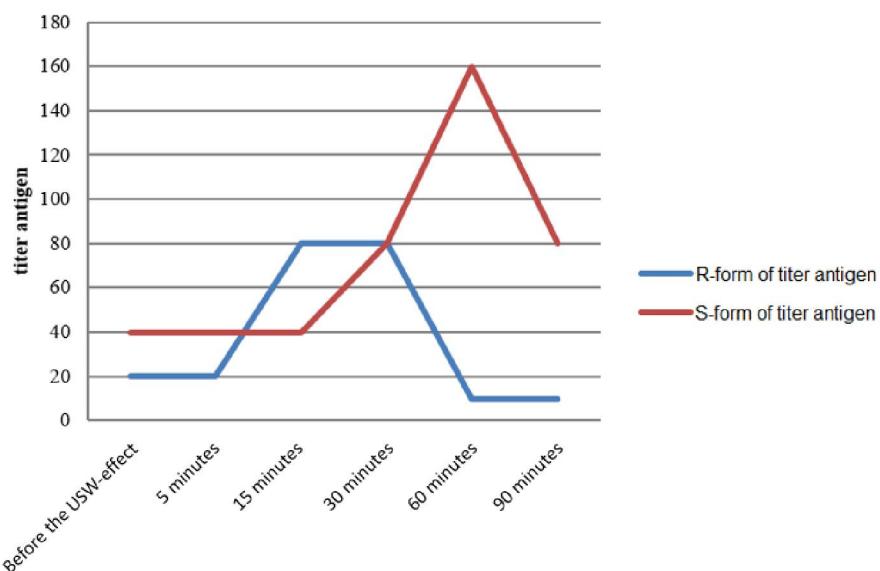
Identification of the pathogen is carried out on the basis of cultural, morphological, tinctorial, hemolytic, proteolytic, enzymatic and pathogenic properties.

The presence of endotoxin and other various waste products of microorganisms should be attributed to the pathogenicity factors of moraxell. With the help of existing fimbria, moraxellae are attached to the mucous membrane of the upper respiratory tract, the conjunctiva and the cornea of the eye [5]. With the defeat of the upper respiratory tract were isolated capsular forms of the pathogen. Conditionally pathogenic forms isolated from the nasopharynx indirectly indicate the presence of a capsular pathogen [6]. There is evidence of the use of monoclonal antibodies to study the proteins of the outer membrane of moracsell [7]. The presence of antibodies in the body is determined by many immunological tests, such as the RDP [8], ELISA Sattarova N.V. [9, 10].

The purpose of the study is a comparative analysis of the indications of CFT and LCFT with cattle morakselleze.

Materials and methods. Antigen for immunological tests was prepared by exposure to ultrasonic waves [11], from a daily culture of moraxcell strain Moraxella bovis B-2017/44 [12], SR form grown on Hottinger's solid nutrient medium with the addition of 5% defibrinated ram blood. Moraxell cultures were washed off the nutrient medium and washed with sterile saline with a pH of 8.0 and adjusted to a concentration of 50 billion microbial cells. A bacteriological mixture was voiced by a low-frequency ultrasonic generator UD (Ukraine) for 5, 15, 30, 45, 60 and 90 minutes at an exposure of 22 Hz, power 70-80 kV/cm³. The prepared antigen was preserved with 0.5% formalin solution in a ratio of 1:10. Hyperrimmune serum was obtained by immunization of rabbits [13].

Results and its discussion. It is revealed that ultrasonic waves had a strong disintegrating effect on microbial cells. The bacterial mass after scoring had unequal transparency. As the exposure extended with



Effect of ultrasonic waves on antigen titer

ultrasonic waves, the suspension of moraksell was gradually clarified. So, after 1 and 1.5 hours of exposure to ultrasound, a test tube with a suspension in the concentration of moraxcell in 50 billion microbial cells was transparent compared to the original. The results of the work are shown in figure.

As can be seen from the figure, the titer of antigens with a 5-minute exposure to ultrasonic waves remained the same as before exposure to ultrasound. With a 15 minute exposure, the antigen R titer rose to 80 and remained so when the ultrasonic waves were applied to the antigen for 30 minutes. Further ultrasonic disintegration reduced the titer of the antigen to 10. The titer S of the antigen at 30 and 60 minute exposition with ultrasonic waves rose from 80 to 160, and further exposure to the ultrasonic wave reduced the titer of the antigen.

With the cross-reaction of R, S antigens with a 30-minute exposure with similar hyperimmune sera, their titer was 1:80.

In the reaction of complement binding, S antigen was used with ultrasound waves exposure of 30 minutes, the titer with hyperimmune serum obtained against S antigen was 80, and with R serum the result was negative.

Conclusion. Thus, for CFT and LCFT with morakselleze, the S form antigen is proposed with an exposure in an ultrasonic disintegrator for 30 minutes at an oscillation frequency of 22 Hz, with a capacity of 70-80 kV/cm³, since the antigen is concentrated inside the bacterial cell and for its isolation it is necessary to destroy the microorganism.

Н. П. Иванов, Р. С. Саттарова, Ф. А. Бакиева, К. М. Шыныбаев, Б. Ж. Исакулова

ТОО «Казахский научно-исследовательский ветеринарный институт», Алматы, Казахстан

IPI ҚАРА МАЛ МОРАКСЕЛЛЕЗІ КЕЗІНДЕГІ КБР/КҰБР ДИАГНОСТИКАЛЫҚ ҚҰНДЫЛЫҒЫ

Аннотация. Моракселлез біздің елімізде бұрын тіркелмеген және иммунологиялық тесттер (КБР, КҰБР) зерттелмеген. Ірі кара мал моракселлезін дер кезінде балау - эпизоотияға қарсы іс-шаралардың ең маңызды бөлігі болып саналады. Қазіргі кезде моракселлез ауруының диагностикасы эпизоотиялық деректерге және аурудың клиникалық көрінісіне сүйсніп қойылады. Моракселлез ауруының ерте көріністері иммунологиялық тесттер арқылы анықталады. Осыған байланысты, комплементті байланыстыру және комплементті үзак байланыстыру реакцияларының диагностикалық құндылығы салыстырмалы түрде зерттелді.

Түйін сөздер: штамм, бактерия, моракселла, індепті кератоконъюнктивит, комплементті байланыстыру реакциясы.

Н. П. Иванов, Р. С. Саттарова, Ф. А. Бакиева, К. М. Шыныбаев, Б. Ж. Исакулова

ТОО «Казахский научно-исследовательский ветеринарный институт», Алматы

ДИАГНОСТИЧЕСКАЯ ЦЕННОСТЬ РСК/РДСК ПРИ МОРАКСЕЛЛЁЗЕ КРС

Аннотация. В нашей стране моракселлез ранее не регистрировалось и не испытывались иммунологические тесты (РСК и РДСК). Своевременная диагностика моракселлоза является одним из главных звеньев противоэпизоотических мероприятий (ПЭМ). В настоящее время диагностика моракселлеза осуществляется на эпизоотологических данных и клинической картине. Ранние признаки болезни могут быть выявлены только иммунологическими тестами. В связи с этим, нами испытаны серологические реакции, в частности РСК и РДСК и даны сравнительная диагностическая ценность.

Ключевые слова: штамм, бактерия, моракселла, инфекционный кератоконъюнктивит, реакция связывания комплемента.

Сведения об авторах:

Иванов Николай Петрович – главный научный сотрудник, доктор ветеринарных наук, профессор, академик НАН РК, ТОО «Казахский научно-исследовательский ветеринарный институт», Алматы, Казахстан; akademik-vet@mail.ru; <https://orcid.org/0000-0003-1964-241X>

Саттарова Рано Сайтомаровна – старший научный сотрудник, кандидат ветеринарных наук, ТОО «Казахский научно-исследовательский ветеринарный институт», Алматы, Казахстан; rano_mail.ru@mail.ru; <https://orcid.org/0000-0001-9105-4415>

Бакиева Флора Альбертовна – старший научный сотрудник, кандидат ветеринарных наук, ТОО «Казахский научно-исследовательский ветеринарный институт», Алматы, Казахстан; flurachka-78@mail.ru; <https://orcid.org/0000-0003-0627-2608>

Шыныбаев Куандык Мухаметкалиевич – старший научный сотрудник, кандидат ветеринарных наук, ТОО «Казахский научно-исследовательский ветеринарный институт», Алматы, Казахстан; shynybaev.k@mail.ru; <https://orcid.org/0000-0002-7702-1390>

Исакулова Бақытжамал Жақсығалиқызы – младший научный сотрудник, ТОО «Казахский научно-исследовательский ветеринарный институт», Алматы, Казахстан; bahitzhamal_i@mail.ru; <https://orcid.org/0000-0001-6560-5607>

REFERENCES

- [1] Bergey's Manual of Systematic Bacteriology / Department of Microbiology and Molecular Genetics: Michigan State University: USA, 2005. Vol. 1, part B. P. 411-417.
- [2] Shenderov B.A. Nefermentirujushchie gramotricatelnye bakterii / B.A. Shkenderov, G.P. Serkova // Zhurn. mikrobiol., jepid. i immunol. 1979. N 3. P. 14-20.
- [3] Kalina G.P. Bakterii roda Moraxella. Jekolojija / G.P. Kalina, G.M. Truhina // Zhurn. mikrobiol., jepid. i immunol. 1987. N 2. P. 93-102.
- [4] Galvão K.N. Ulcerative blepharitis and conjunctivitis in adult dairy cows and association with Moraxella bovoculi / K.N. Galvão, J.A. Angelos // Can. Vet. J. 2010. Vol. 51, N 4. P. 400-402.
- [5] Moraxella bovoculi sp. nov., isolated from calves with infectious bovine keratoconjunctivitis / J. A. Angelos, P. Q. Spinks, L. M. Ball [et al.] // Int. J. Syst. Evol. Microbiol. 2007. Vol. 57, N 4. P. 789-795.
- [6] CEACAM1 recognition by bacterial pathogens is species-specific / M. Voges, V. Bachmann, R. Kammerer [et al.] // BMC Microbiol. 2010. N 10. P. 117.
- [7] Obshchie jepitopy u belkovyh antigenov menengokokkov i moraksell / A. V. Goncharenko, T. N. Filatova, L. N. Padjukov [i dr.] // Zhurn. mikrobiol. 2000. N 5. P. 15-19.
- [8] Pugh G.W., Hughes D.E., et all. Bovine infectious keretokonjunktivitis serological aspects of Moraxella bovis infection // Canadian journal of comparative medicine. April, 1971. Vol. 35.
- [9] Sattarova N.V. Razrabotka test-sistemy dlja vyjavlenija antitel k bakterijam Moraxella bovis metodom immunofermentnogo analiza (ИК-SEROTEST): Avtorefererat na soiskanie kand. vet. nauk. Kazan', 2013. P. 19.
- [10] Mahabetov K., Ivanov N.P., Studencov K.M. Poluchenie antigaena dlja reakcii dilitel'nogo svjazyvanija komplementa pri diagnostike infekcionnogo jepididimita barana // Vestnik sel'skohozjajstvennoj nauki. 1972, 1. P. 71-76.
- [11] Ivanov N.P., Sultanov A.A., Sattarova R.S., Bakieva F.A., Shynybaev K.M. Shtamm bakterij Moraxella bovis V-2017/44, ispol'zuemyj dlja poluchenija diagnostikumov, immunogennych preparatov i vydelenija faga. Patent.
- [12] Ivanov N.P., Sultanov A.A., Bakieva F.A., Sattarova R.S., Egorova N.N. Moraksellez u KRS v Kazahstane // Izvestija Nacional'noj akademii nauk Respublik Kazahstan. Serija agrarnyh nauk. 2016. 5(35). ISSN 2224-526X. P. 20-29.
- [13] Sattarova R.S., Dupleva L.Sh., Bakieva F.A., Husainov A.S. Diagnostika infekcionnogo keratokonjunktivita krupnogo rogatogo skota // Mezhdunarodnaja nauchno-prakticheskaja konferencija, posvjashchennaja 90-letiju so dnja rozhdenija professora K. A. Kirshina «Aktual'nye problemy veterinarnoj mediciny» 5-6 aprelja 2018 g. Kazan'. P. 261-265.