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Prevalence and seasonal variation of monieziosis in sheep in different geographical and climatic zones of Uzbekistan

O'zbekistonning turli geografik-iqlim mintaqalarida qo'ylar monieziyozining tarqalishi va mavsumiy o'zgarishlari**Распространение и сезонная изменчивость мониезиоза овец в различных географо-климатических зонах Узбекистана****SAFAROV Xurshid Abdurajabovich^{1*}, DJABBAROV Shuxrat Abdumajidovich¹, AKRAMOV Komiljon Shuhrat o'g'li¹, ULUQOV Behzod Karamat o'g'li¹, YUSUPOVA Zarifa Musurmon qizi²**¹ Scientific-Research Institute of Veterinary, Samarkand, Uzbekistan² Tashkent Branch of Samarkand State University of Veterinary Medicine, Livestock and Biotechnologies, Tashkent, Uzbekistan* Corresponding author: safarov_xurshid_94@mail.ru**ARTICLE INFO****ARTICLE TYPE**

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AUTHOR, TITLE AND ABSTRACT METADATA (EN / UZ / RU)**ENGLISH****SAFAROV Xurshid Abdurajabovich^{1*}, DJABBAROV Shuxrat Abdumajidovich¹, AKRAMOV Komiljon Shuhrat o'g'li¹, ULUQOV Behzod Karamat o'g'li¹, YUSUPOVA Zarifa Musurmon qizi²**¹ Scientific-Research Institute of Veterinary, Samarkand, Uzbekistan² Tashkent Branch of Samarkand State University of Veterinary Medicine, Livestock and Biotechnologies, Tashkent, Uzbekistan

Abstract. The study aimed to determine the prevalence and seasonal variation of monieziosis in sheep under different geographical and climatic conditions of Uzbekistan. During 2021-2023, 2,465 sheep from the Republic of Karakalpakstan and 12 provinces were examined parasitologically. Fülleborn flotation, sequential washing sedimentation and a modified Berman-Orlov larvoscopic method were used. Monieziosis was detected in 123 animals, corresponding to an overall prevalence of 4.99% among the examined sheep. Prevalence reached 6.89% in foothill-mountain areas, 4.44% in irrigated areas and 3.44% in desert-pasture areas. Seasonal prevalence was highest in summer (35.8%), followed by spring (28.4%), autumn (23.6%) and winter (12.2%). In a separate field trial, a locally produced albendazole formulation, Alsus, showed an estimated extensive efficacy of 77.5% against monieziosis. The findings demonstrate pronounced geographical and seasonal variation in sheep monieziosis and support the use of locally adapted surveillance and control schedules.

Keywords: sheep; monieziosis; Moniezia; anoplocephalid cestodes; helminth infection; prevalence; seasonal dynamics; geographical-climatic zone; albendazole; Uzbekistan

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Annotatsiya. Ushbu tadqiqot O'zbekistonning turli geografik-iqlim sharoitlarida qo'ylar monieziyozining tarqalish darajasi va mavsumiy o'zgarishlarini aniqlashga qaratildi. 2021-2023-yillarda Qoraqalpog'iston Respublikasi hamda Andijon, Buxoro, Jizzax, Qashqadaryo, Navoiy, Namangan, Samarqand, Sirdaryo, Surxondaryo, Toshkent, Farg'ona va Xorazm viloyatlarida jami 2465 bosh qo'y parazitologik tekshiruvdan o'tkazildi. Tekshiruvlarda Fülleborn flotatsion, ketmaket yuvish-sedimentatsion va Berman-Orlovning takomillashtirilgan larvoskopik usullaridan foydalanildi. Tekshirilgan hayvonlarning 123 boshida monieziyoz aniqlanib, zararlanish darajasi 4,99% ni tashkil etdi. Geografik-iqlim mintaqalari bo'yicha ko'rsatkich tog'oldi-tog' hududlarida

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HAC / OAK: On the HAC list of national scientific publications (Academy of Sciences of the Republic of Uzbekistan) for 06.00.00 Agricultural Sciences and 16.00.00 Veterinary Sciences. O'zbekiston Respublikasi FA huzuridagi OAK ro'yxatida: 06.00.00 – Qishloq xo'jaligi fanlari; 16.00.00 – Veterinariya fanlari.

6,89%, sugʻoriladigan hududlarda 4,44% va choʻl-yaylov hududlarida 3,44% boʻldi. Mavsumlar kesimida monieziyozning eng yuqori koʻrsatkichi yozda 35,8%, undan keyin bahorda 28,4%, kuzda 23,6% va qishda 12,2% qayd etildi. Mahalliy albendazol asosidagi Alsus preparati bilan oʻtkazilgan alohida sinovda monieziyozga qarshi ekstensiv samaradorlik 77,5% ni tashkil qilgan. Olingan natijalar monieziyozning tarqalishi hudud va mavsumga qarab sezilarli darajada oʻzgarishini koʻrsatib, parazitga qarshi tadbirlarni epidemiologik vaziyatga mos rejalashtirish zarurligini koʻrsatadi.

Kalit soʻzlar: qoʻy; monieziyoz; Moniezia; anoplotsefalatoz; gelmintoz; zararlanish darajasi; mavsumiy dinamika; geografik-iqlim mintaqasi; albendazol; Oʻzbekiston

РУССКИЙ

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Аннотация. Исследование посвящено определению распространенности и сезонной изменчивости мониезиоза овец в различных географо-климатических условиях Узбекистана. В 2021–2023 гг. паразитологически исследовано 2465 овец из Республики Каракалпакстан и Андижанской, Бухарской, Джизакской, Кашкадарьинской, Навоийской, Наманганской, Самаркандской, Сырдарьинской, Сурхандарьинской, Ташкентской, Ферганской и Хорезмской областей. Применяли флотационный метод Фюллеборна, последовательное промывание с осаждением и усовершенствованный метод ларвоскопии Берман-Орлова. Мониезиоз выявлен у 123 животных, экстенсивность инвазии составила 4,99%. В предгорно-горной зоне показатель составил 6,89%, в орошаемой зоне – 4,44%, в пустынно-пастбищной – 3,44%. Максимальная сезонная зараженность отмечена летом (35,8%), затем весной (28,4%), осенью (23,6%) и зимой (12,2%). При отдельном испытании препарата Алсус на основе альбендазола экстенсивность против мониезиоза составила 77,5%. Полученные данные свидетельствуют о выраженной территориальной и сезонной изменчивости мониезиоза и необходимости дифференцированного планирования профилактических мероприятий.

Ключевые слова: овцы; мониезиоз; Moniezia; аноплотцефалатоз; гельминтоз; экстенсивность инвазии; сезонная динамика; географо-климатическая зона; альбендазол; Узбекистан

1. KIRISH

Introduction

Monieziyoz qoʻylar orasida uchraydigan anoplotsefalid sestodozlardan biri boʻlib, uning tarqalishi yaylovdan foydalanish tizimi, oraliq xoʻjayinlar mavjudligi, iqlim va mavsumiy sharoitlar bilan bogʻliq. Kasallikning epizootologik koʻrinishi hududlar boʻyicha bir xil emas; namlik, harorat, oʻsimlik qoplami va yaylovlardan foydalanish xususiyatlaridagi farqlar parazitning rivojlanish sikliga taʼsir qilishi mumkin [1–3].

Moniezia expansa va Moniezia benedeni qoʻylar va boshqa kavsh qaytaruvchi hayvonlarda uchraydigan asosiy anoplotsefalid sestodalar hisoblanadi. Monieziya siklida oraliq xoʻjayin sifatida tuproq yuzasida yashovchi oribatid kanalar muhim oʻrin tutadi. Shu sababli yaylovning ekologik holati va mavsumiy sharoitlar invazyani shakllanishida muhim omillardan boʻlishi mumkin [3,4].

Turli mamlakatlarda olib borilgan tadqiqotlar monieziyozning tarqalish darajasi sezilarli oʻzgarishini koʻrsatadi. Shimoliy Kavkaz sharoitida invaziya asosan bahor-kuz davrida qayd etilib, yoz va kuz oylarida yuqoriroq koʻrsatkichlar kuzatilgan [4]. Senegal sharoitida kichik kavsh qaytaruvchilarda anoplotsefalid sestodalar ham qayd etilgan boʻlib, ularning tarqalishida mavsumiy oʻzgarishlar aniqlangan [5]. Oʻzbekistonda ham qoʻylarning ichak sestodozlari boʻyicha hududiy va ekologik farqlar qayd etilgan [6,7].

Oʻzbekiston hududining tabiiy sharoitlari sugʻoriladigan vohalar, togʻoldi-togʻ hududlari va choʻl-yaylov tizimlarining birligida mavjudligi bilan ajralib turadi. Bunday xilma-xillik qoʻylarning boqilish sharoitlari va parazitlarning rivojlanishiga taʼsir etuvchi omillarni hududlar boʻyicha farqlashi mumkin. Shu

nuqtayi nazardan, monieziyozning turli mintaqalardagi tarqalish darajasini va mavsumiy oʻzgarishini aniqlash amaliy veterinariya parazitologiyasi uchun muhimdir.

Tadqiqotning maqsadi Oʻzbekistonning turli geografik-iqlim mintaqalarida qoʻylar monieziyozining tarqalish darajasini aniqlash, uning mavsumiy oʻzgarishlarini baholash hamda aniqlangan epizootologik xususiyatlar asosida profilaktik tadbirlarni rejalashtirish uchun ilmiy asos yaratishdan iborat.

2. MATERIALLAR VA USULLAR

Materials and methods

Tadqiqotlar 2021–2023-yillarda Qoraqalpogʻiston Respublikasi hamda Andijon, Buxoro, Jizzax, Qashqadaryo, Navoiy, Namangan, Samarqand, Sirdaryo, Surxondaryo, Toshkent, Fargʻona va Xorazm viloyatlarida olib borildi. Tadqiqot materiallari fermer xoʻjaliklari, dehqon xoʻjaliklari va aholi xonadonlarida boqilayotgan qoʻylardan olindi. Jami 2465 bosh qoʻy tekshirildi.

Parazitologik tekshiruvlar najas namunalari gelmint tuxumlari va lichinkalarini aniqlash asosida amalga oshirildi. Gelmint tuxumlarini aniqlash uchun Fyulleborn flotatsion va ketma-ket yuvish-sedimentatsion usullaridan, lichinkalarni aniqlash uchun Veterinariya ilmiy-tadqiqot institutida takomillashtirilgan Berman-Orlov larvoskopik usulidan foydalanildi. Mikroskopik tekshiruvlar Motich B1 yorugʻlik mikroskopida 10×4, 10×40 va 10×100 kattalashtirishlarda bajarildi.

Tadqiqot hududlari ekologik sharoitlariga koʻra sugʻoriladigan, togʻoldi-togʻ va choʻl-yaylov mintaqalariga ajratildi. Mavsumiy tahlilda bahor, yoz, kuz va qish davrlari alohida baholandi. Har bir mintaq va mavsum uchun monieziyoz bilan zararlangan hayvonlar soni tekshirilgan hayvonlar soniga nisbatan foizlarda ifodalandi.

Moniyeziozning ekstensiv zararlanishi (EZ) quyidagi formula asosida hisoblandi: $EZ = (\text{zararlangan hayvonlar soni} / \text{tekshirilgan hayvonlar soni}) \times 100$. Aralash invazyalar mavjud bo'lishi mumkinligi sababli alohida gelmintozlar bo'yicha ko'rsatkichlar bir-biriga qo'shib yuborilmadi.

Antigelmintik samaradorlikni baholash uchun alohida 52 bosh tabiiy zararlangan qo'y ishtirokidagi tajriba natijalari tahlil qilindi. Hayvonlarga albendazol ekvivalentida 10 mg/kg dozada 10% li mahalliy Alsus suspenziyasi peroral berilgan. Davolashdan oldin va keyin parazitologik tekshiruvlar o'tkazilgan. Moniyeziozga qarshi ekstensiv samaradorlik 77,5% deb baholangan.

3. TADQIQOT NATIJALARI

Results

2021–2023-yillarda tekshirilgan 2465 bosh qo'yning 123 boshida moniyezioz aniqlanib, umumiy ekstensiv zararlanish 4,99% ni tashkil etdi. Bu ko'rsatkich tekshiruvga jalb qilingan hayvonlar orasida moniyezioz mavjudligini va invazyani mamlakatning turli hududlarida uchrashini ko'rsatadi.

1-jadval

Qo'yalar moniyeziozining umumiy tarqalishi / **Table 1.** Overall prevalence of monieziosis in sheep

Ko'rsatkich	Qiyamat
Tekshirilgan qo'ylar soni, bosh	2465
Moniyezioz aniqlangan qo'ylar soni, bosh	123
Ekstensiv zararlanish, %	4,99

Tadqiqot davomida moniyezioz boshqa gelmintozlar bilan birgalikda ham uchragan. Umumiy gelmintologik tekshiruvlarda nematodiroz 26,29%, marshallagiyoz 25,80%, boshqa oshqozon-ichak strongilyatozlari 19,88%, fassioloz 13,35% va moniyezioz 4,99% darajasida qayd etilgan. Mazkur ko'rsatkichlar moniyezioz qo'ylarning gelmintozlari tarkibida alohida o'rin egallashini ko'rsatadi.

2-jadval

Geografik-iqlim mintaqalari bo'yicha tarqalishi / **Table 2.** Distribution by geographical and climatic zones

Geografik-iqlim mintaqasi	Tekshirilgan, bosh	Moniyezioz aniqlangan, bosh	EZ, %
Sug'oriladigan	1216	54	4,44
Tog'oldi-tog'	755	52	6,89
Cho'l-yaylov	494	17	3,44

Moniyeziozning eng yuqori ko'rsatkichi tog'oldi-tog' mintaqasida qayd etilib, 755 bosh qo'yning 52 boshida invaziya aniqlangan va ekstensiv zararlanish 6,89% ni tashkil qilgan. Sug'oriladigan hududlarda 1216 boshdan 54 boshida moniyezioz aniqlanib, ko'rsatkich 4,44% bo'lgan. Cho'l-yaylov mintaqasida esa 494 bosh qo'yning 17 boshida invaziya qayd etilib, 3,44% ni tashkil qilgan.

Tog'oldi-tog' mintaqasidagi ko'rsatkich sug'oriladigan hududlarga nisbatan 2,45 foiz punktga, cho'l-yaylov hududlariga nisbatan esa 3,45 foiz punktga yuqori bo'ldi. Natijalar moniyeziozning tarqalishida ekologik sharoitlar bilan bog'liq hududiy tafovut mavjudligini ko'rsatadi.

3-jadval

Mavsumiy dinamika / **Table 3.** Seasonal dynamics

Fasl	Moniyezioz bilan zararlanish, %
Bahor	28,4
Yoz	35,8
Kuz	23,6
Qish	12,2

Mavsumlar bo'yicha moniyeziozning eng yuqori ko'rsatkichi yozda – 35,8% qayd etildi. Bahorda zararlanish 28,4%, kuzda 23,6% va qishda 12,2% ni tashkil etdi. Yozgi ko'rsatkich qishki ko'rsatkichdan 23,6 foiz punktga yuqori bo'ldi.

Mavsumiy o'zgarishlar moniyezioz invazyasining yil davomida bir xil darajada saqlanmasligini ko'rsatadi. Ayniqsa, bahor-yoz davrida zararlanishning yuqoriligi yaylovlarda parazitning rivojlanishi va qo'ylarning invazion bosqichlar bilan uchrashish ehtimoli ortishi bilan bog'liq bo'lishi mumkin. Biroq ushbu tadqiqotda oraliq xo'jayinlar soni, yaylov namligi va boshqa mikroiklim ko'rsatkichlari alohida o'lchanmaganligi sababli mavsumiy farqlarni muayyan ekologik omil bilan bevosita sababiy bog'lash ehtiyotkorlikni talab qiladi.

4. OLINGAN NATIJALAR TAHLILI

Discussion

Olingan natijalar O'zbekiston sharoitida qo'ylar moniyeziozining tarqalishi hudud va mavsumga qarab o'zgarishini ko'rsatdi. Tekshirilgan hayvonlarning 4,99% ida moniyezioz aniqlangan bo'lsa-da, ekologik mintaqalar bo'yicha ko'rsatkichlarning 3,44-6,89% oralig'ida farqlanishi invazyaning hududiy xususiyatga ega ekanligini ko'rsatadi.

Tog'oldi-tog' mintaqasida qayd etilgan 6,89% ko'rsatkich sug'oriladigan va cho'l-yaylov hududlariga nisbatan yuqori bo'ldi. Bu farq yaylovlarning o'simlik qoplami, namlik rejimi, qo'ylarning boqilish zichligi va parazitning oraliq xo'jayinlari uchun qulay mikrobiotoplar mavjudligi bilan bog'liq bo'lishi mumkin. Biroq mazkur omillarning har biri ushbu tadqiqotda alohida miqdoriy baholanmaganligi sababli ular faqat ehtimoliy tushuntirish sifatida qaraladi.

Mavsumiy tahlilda yozgi davrda 35,8% lik eng yuqori ko'rsatkich qayd etilgani moniyeziozga qarshi profilaktik tadbirlarni faqat qishki yoki kuzgi davr bilan cheklamaslik zarurligini ko'rsatadi. Shimoliy Kavkazdagi tadqiqotlarda ham moniyeziozning mavsumiy dinamikasi qayd etilib, yoz va kuz oylarida yuqori ko'rsatkichlar kuzatilgan [4]. Biroq mavsumiy cho'qqining aniq vaqti hududning iqlimi va chorvachilik tizimiga qarab farq qilishi mumkin.

O'zbekistonda ichak sestodozlari bo'yicha olib borilgan tadqiqotlar ham moniyeziozning hududiy va ekologik sharoitlarga bog'liq holda o'zgarishini ko'rsatadi [6,7]. Buxoro hududida olib borilgan zamonaviy tadqiqotlarda qo'ylarda Moniezia expansa qayd etilgani ham ushbu sestodaning mamlakat hududida saqlanib qolayotganini ko'rsatadi [8]. Shu bilan birga, mazkur tadqiqotda Moniezia turlari molekulyar yoki morfometrik tur darajasida alohida identifikatsiya qilinmaganligi sababli 4,99% ko'rsatkichni muayyan Moniezia turi uchun emas, moniyezioz invazyasi uchun qo'llash to'g'ri bo'ladi.

Antigelmintik sinovda Alsus preparatining moniyeziozga qarshi 77,5% ekstensiv samaradorligi qayd etildi. Moniyeziozga qarshi preparat samaradorligini baholashda faqat davolashdan oldingi va keyingi parazitologik aniqlash bilan cheklanmasdan, miqdoriy najas tekshiruvlari, nazorat guruhi va standartlashtirilgan fecal egg count reduction test kabi yondashuvlardan foydalanish maqsadga muvofiq. Bu ayniqsa albendazolga chidamlilik xavfini monitoring qilish uchun muhimdir [9-11].

Tadqiqotning muhim jihati – namunalar geografik jihatdan keng qamrovda olingani va ekologik hamda mavsumiy kesimlarning birgalikda baholanganidir. Shu bilan birga, hayvonlarning yoshi, jinsi, zoti, yaylovdan foydalanish tarixi, oziqlantirish tizimi va avvalgi degelmintizatsiya ishlari kabi omillar bo'yicha individual ma'lumotlarning yetarli emasligi sababli monieziyozning xavf omillarini statistik jihatdan chuqur tahlil qilish imkoniyati cheklangan. Keyingi tadqiqotlarda ushbu omillarni standart epidemiologik dizayn asosida kiritish maqsadga muvofiq.

5. XULOSALAR

Conclusions

1. 2021–2023-yillarda O'zbekistonning turli geografik-iqlim mintaqalarida tekshirilgan 2465 bosh qo'yning 123 boshida monieziyoz aniqlanib, umumiy ekstensiv zararlanish 4,99% ni tashkil etdi. Eng yuqori ko'rsatkich tog'oldi-tog' mintaqasida (6,89%), keyin sug'oriladigan (4,44%) va cho'l-yaylov (3,44%) hududlarida qayd etildi. Mavsumiy dinamika bo'yicha maksimal ko'rsatkich yozda (35,8%), minimal ko'rsatkich qishda (12,2%) kuzatildi.

2. Natijalar monieziyozga qarshi veterinariya tadbirlarini hudud va mavsum xususiyatlarini hisobga olgan holda tashkil etish zarurligini ko'rsatadi. Ayniqsa, bahor-yoz davrida parazitologik monitoringni kuchaytirish, tog'oldi-tog' mintaqalarida muntazam tekshiruvlar olib borish va davolash samaradorligini nazorat qilish maqsadga muvofiq.

DECLARATIONS

Declarations

Author contributions CRedit

Conceptualization; Methodology; Investigation; Data curation; Writing – original draft; Writing – review & editing. All authors have read and agreed to the published version of the manuscript.

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Ethics approval

The work with animals was carried out within routine veterinary diagnostic, treatment and preventive practice in accordance with the veterinary-sanitary requirements in force in the Republic of Uzbekistan.

Informed consent

All authors have read and approved the final version of the manuscript and have given their consent to its submission and publication. The study involved no human participants and no personal data.

Data availability statement

The data obtained in the study are presented in the tables of this article; the primary records are available from the authors on reasonable request.

Conflict of interest

The authors declare no conflict of interest.

Generative AI disclosure

Generative AI (Claude, Anthropic) was used in the editorial preparation of this article: for language editing, translation of the title, abstract and keywords between Uzbek, Russian and English, preparation of the extended English summary from the authors' text, and formatting of the reference list. No data, results or conclusions were generated by AI. The authors are responsible for the content of the publication.

EXTENDED SUMMARY IN ENGLISH

Kengaytirilgan inglizcha xulosa / Расширенный реферат на английском языке

Purpose and research problem

Monieziosis is one of the anoplocephalid cestodosis of sheep, and its distribution depends on the grazing system, the presence of

intermediate hosts, climate and seasonal conditions. Moniezia expansa and Moniezia benedeni are the main anoplocephalid cestodes of sheep and other ruminants, and oribatid mites living on the soil surface play an important role as intermediate hosts, so the ecological state of pastures and seasonal conditions may be important factors in the formation of invasion. Studies in different countries, such as the North Caucasus and Senegal, show that the prevalence of monieziosis varies considerably and has seasonal features, and regional and ecological differences in intestinal cestodosis of sheep have also been recorded in Uzbekistan. The natural conditions of Uzbekistan combine irrigated oases, foothill-mountain areas and desert-pasture systems, which may differentiate the conditions of sheep keeping and parasite development. The aim of the study was to determine the prevalence of monieziosis in sheep in different geographical and climatic zones of Uzbekistan, to assess its seasonal variation and to create a scientific basis for planning preventive measures.

Materials and methods

The studies were carried out in 2021–2023 in the Republic of Karakalpakstan and the Andijan, Bukhara, Jizzakh, Kashkadarya, Navoi, Namangan, Samarkand, Syrdarya, Surkhandarya, Tashkent, Fergana and Khorezm regions on sheep kept on farms, peasant farms and households; a total of 2465 sheep were examined. Faecal samples were examined for helminth eggs by the Fülleborn flotation and sequential washing-sedimentation methods and for larvae by the Berman–Orlov larvoscopy method as modified at the Scientific-Research Institute of Veterinary, using a Motic B1 light microscope at 10×4, 10×40 and 10×100 magnification. The study areas were divided into irrigated, foothill-mountain and desert-pasture zones, and spring, summer, autumn and winter were assessed separately. The extensity of invasion (EI) was calculated as the number of infected animals divided by the number of examined animals × 100, and indicators for different helminthoses were not summed because of possible mixed infections. To assess anthelmintic efficacy, the results of a separate trial in 52 naturally infected sheep given a 10% suspension of the local albendazole preparation Alsus orally at 10 mg/kg (albendazole equivalent) were analysed, with parasitological examinations before and after treatment.

Results and discussion

Monieziosis was found in 123 of the 2465 sheep examined in 2021–2023, giving an overall extensity of invasion of 4.99%. In general helminthological examinations, nematodiosis was recorded in 26.29% of animals, marshallagiosis in 25.80%, other gastrointestinal strongylatosis in 19.88%, fasciolosis in 13.35% and monieziosis in 4.99%, and monieziosis also occurred together with other helminthoses. The highest rate was recorded in the foothill-mountain zone, where 52 of 755 sheep were infected (6.89%); in irrigated areas 54 of 1216 sheep (4.44%) and in the desert-pasture zone 17 of 494 sheep (3.44%) were infected, so the foothill-mountain rate was 2.45 and 3.45 percentage points higher, respectively. By season, the highest value was recorded in summer (35.8%), followed by spring (28.4%), autumn (23.6%) and winter (12.2%), the summer value exceeding the winter one by 23.6 percentage points. The authors note that the number of intermediate hosts, pasture moisture and other microclimatic indicators were not measured, so the seasonal and zonal differences can only be explained tentatively by vegetation cover, moisture regime, grazing density and microhabitats favourable for oribatid mites. In the anthelmintic trial, the extensive efficacy of Alsus against monieziosis was 77.5%; the authors recommend that future efficacy studies include quantitative faecal examination, a control group and a standardised faecal egg count reduction test to monitor the risk of albendazole resistance. Moniezia species were not identified at the species level, so the 4.99% rate refers to monieziosis as a whole.

Conclusion and contribution

In 2021–2023, monieziosis was detected in 123 of 2465 sheep examined in different geographical and climatic zones of Uzbekistan, with an overall extensity of invasion of 4.99%. The highest rate was found in the foothill-mountain zone (6.89%), followed by irrigated (4.44%) and desert-pasture (3.44%) areas, and in seasonal dynamics the maximum was observed in summer (35.8%) and the minimum in winter (12.2%). The results show that veterinary measures against monieziosis should take into account regional and seasonal features; in particular,

parasitological monitoring should be intensified in spring and summer, regular examinations should be carried out in foothill-mountain zones and the efficacy of treatment should be controlled. Individual data on age, sex, breed, grazing history, feeding and previous deworming were insufficient for a statistical analysis of risk factors, which should be included in future studies with a standard epidemiological design.

ADABIYOTLAR RO'YXATI

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