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Molecular detection of *Hemotropic mycoplasma* in stray dogs in Mosul city, Iraq

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Abstract

Hemotropic mycoplasmas (hemoplasmas) are epierythrocytic, and a wall-deficient bacterium within the order Mycoplasmatales can induce temperate or menacing anemia in mammals and be documented as emerging zoonotic disease, throughout the world. It is cause canine hemoplasmosis which is most often symptomless; and risky in immunosuppression dogs. The molecular detection aimed towards defining the status of this microorganism in stray canines in Mosul city. During a period from March 2022 to March 2023, blood specimens from one hundred (50 males, 30 bitches, and 20 puppies) stray dogs were evaluated, conventional polymerase chain reaction (c-PCR) method using 16Sr RNA gene, was employed to detect the presence of *Hemotropic mycoplasma* DNA. *Mycoplasma hemocanis* was detected in 40% (95% CI=32.6-46.9%) of dogs. The positive infection rates were dominant in males (48.3%, 95% CI=32.4-69.4) and adults (43.8%, 95% CI=30.4-60.9) dogs in comparison to bitches and puppies respectively. No significant relationship was found between molecular-positive animals and skin lesions, and among emaciated dogs compared to asymptomatic dogs. In conclusion, the molecular study focused in Mosul city, Iraq, reveals a substantial prevalence of hemotropic mycoplasma in stray dogs, highlighting the need for effective control procedures to decrease the spread of hazards to people and other mammalians.

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Introduction

Worldwide, stray dogs have been the main origin of infectious agents and zoonoses such as cutaneous and hemoparasites (1-5). In recent years, *Hemotropic mycoplasmas*, (canine hemoplasmosis), are unique bacteria that are small uncultivable and lack a cell wall, which differentiates them from other bacteria (6-8), these pleomorphic bacteria afflict erythrocytes, have been increasingly announced in man and various animal classes (9-11) resulting in different level of anorexia, hemolytic anemia, febrile, motor incoordination, splenomegaly, laziness, jaundice, dehydration, emaciation, and unexpected death (12-14). Although the transmission of hemoplasmas is still poorly understood, they are transmitted through fighting, blood transfusion, contaminated fomites and transplacentally, lactation, and ectoparasites (Lice, fleas, and ticks) from apparently healthy carrier dogs to another animal (15,16). Canine hemoplasmosis is most often symptomless; however, hazardous or lethal illness can occur in immunosuppression dogs. Additionally, the incidence of demodectic mange was associated with canine hemoplasmosis (17). The diagnosis of hemoplasmas microorganism and based on typical clinical symptoms of hemolytic anemia and reveals the presence of microorganisms in traditional stained blood smears. However, artifacts like Howell-Jolly bodies and other surrounding ruins, together with cytology efforts unable distinguishing distinct types of hemoplasmas and consequently low diagnostic sensitivity and specificity (18,19). Different molecular techniques are currently widely employed for detecting and differentiating hemoplasma

(20,21). Stray dogs, due to their constant exposure to the environment and potential contact with various pathogens, pose a significant public health risk (23). Epidemiological studies conducted globally have revealed varying prevalence rates of canine hemoplasmosis, ranging from 0.6 to 56.8%.

However, there has been no research conducted in Mosul city to explore the presence of hemotropic mycoplasma in stray dogs, So the purpose of this study is to analyze a molecular detection of this pathogen and some related links to the causative agent in Mosul city, Iraq.

Materials and methods

Ethical approve

The Institutional Animal Care and Use Committee issued IACUC/UM.Vet.2023.026, dated at 15th February 2023 to license this study.

Animal sampling and laboratory tests

The sampling was carried out in Mosul, a significant city in northern Iraq, strategically positioned along the Tigris River. As the capital of Nineveh Governorate, Mosul is not only an urban hub but also a region of considerable historical and cultural relevance. Geospatially, the city is located at coordinates approximately 36°2′N latitude and 43°7′E longitude, offering a unique setting for the study. During the period between March2022 to March 2023, 100 stray dogs (50 male dogs, 30 bitches, and 20 puppies) were randomly selected from different area in Mosul city. However, the majority of animals were apparently clinically normal; some of those animals were emaciated and had pale mucous membranes and /or skin lesions. Blood specimens were obtained from the cephalic vein and placed into an EDTA tube and frozen at -20°C until use (13).

Molecular technique

Blood specimens were handled and equipped according to g SYNC™ DNA Extraction Kit (Korea). The obtained DNAs were then checked for their concentration (ng/µl) and purity using the NanoDrop spectrophotometer from Thermo Scientific, UK, with an absorbance measurement at A260/280. This extracted DNA served as the template for subsequent PCR amplification. To proceed with the amplification of the *Hemotropic mycoplasmas* species gene, Master Mix tubes with a final volume of 20µl were prepared. The target region for detection was the 16S rRNA gene, and the primers used were Myco-F (5'-ATACGGCCCATATTCCTACG -3') and Myco-R (5'-TGCTCCACCACTTGTTCA -3'), as mentioned in the study by (13). The amplification of DNAs was carried out using a conventional PCR-reaction in the Thermocycler System BIO-RAD, USA. The PCR process began with an initial denaturation step at 95°C for 3 minutes. This was followed by 35 cycles, each consisting of 30 seconds of denaturation at 95°C, 30 seconds of annealing at 60°C, and 30 seconds of extension at 72°C. To wrap up, a final extension step was carried out at 72°C for 5 minutes. To analyze the PCR products, electrophoresis was conducted on a 1.5% agarose gel stained with SYBR Safe DNA Gel Stain Thermo Fisher Scientific, USA. The gel was run at 100V and 80 AM for 1 hour. The identification of positive samples for *Hemotropic mycoplasmas* species. was based on the confirmation of a product size of 618 bp This size indicates the presence of the target gene in the blood samples, and calculated the prevalence of *Mycoplasma haemocanis* among these groups, using the following formulas: Prevalence = (Sum of positive animals/Total number of dogs)*100.

Statistical analyses

Statistical analysis was accomplished by STATA v.14.0 software. Chi-squared test was used to compared the individual factors (sex, age, and clinical symptoms) with hemoplasma infection. The level of significance was set as $P<0.05$. The observed prevalence of the Hemotropic mycoplasmas and the 95% confidence intervals (CI) were calculated.

Results

Hemoplasmic PCR was positive in 40 out of 100 dogs (40 and 95% CI= 32.6-46.9%) (Figure 1 and Table 1). Male gender ($P<0.05$) has a significantly greater prevalence of canine hemoplasmosis (48.3%, 95% CI =32.4-69.4) compared to bitches (27.3 %, 95% CI= 13.4 to 49.2). Also, considerable variance ($P<0.05$) between dogs infected with *Mycoplasma haemocanis* as adults (43.8%, 95% CI =30.4-60.9) and puppies (25.0%, 95% CI= 8.1 to 58.3) (Table 1).

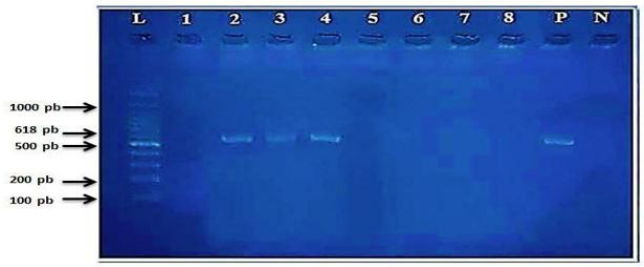

Figure 1. Agarose gel electrophoresis image that showed the PCR product analysis of 16s ribosomal RNA gene in *Mycoplasma haemocanis* from extracted DNA of blood dog's samples. Where M: marker (1000-100bp) and the Lane (2-4) positive *Mycoplasma haemocanis* samples at (618bp) PCR product, P: positive control, N: negative control.

Result of *Mycoplasma haemocanis* according to clinical symptoms show that Significant high infection with *Mycoplasma haemocanis* in asymptomatic dogs (50.9%, 95% CI =33.6 to 74.1) than in animals with symptoms (27.7%, 95% CI =14.7 to 47.3) (Figure 2). A significant

infected rate (P<0.05) in emaciated with pale mucous membrane animals 3(20.0%,95% CI =4.1 to 58.5) compared with asymptomatic dogs (Table 2). No significant relationship was not found between molecular-positive animals and skin lesions, and among emaciated dogs (P< 0.05) compared to asymptomatic dogs which show significant differences in infection without appearing any clinical signs (Table 2).

Table 1: Molecular prevalence of *Hemoplasma canis* in stray dogs

Factors	Samples (n)	PCR positive n(%)	P value
Sex			
Male	60	29(48.3)	< 0.01
Bitches	40	11(27.3)	
Age			
Adults	80	35(43.8)	< 0.01
Puppies	20	5 (25.0)	

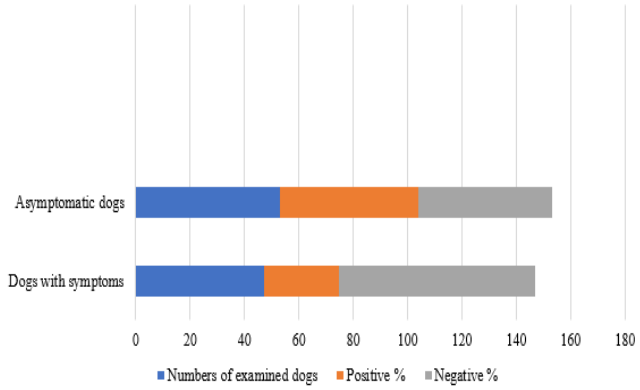

Figure 2: Distribution of Molecular Prevalence of *Hemoplasma canis* infection in stray dogs according to clinical symptoms in Mosul city, Iraq.

Table 2: Molecular prevalences of hemoplasma canis infection in stray dogs based on clinical symptoms in Mosul city, Iraq

Symptoms	Examined dogs (n)	Positive n(%)	x^2	P value
Skin lesions	15	5(33.3)	3.411	0.0648
Emaciated	17	5(29.4)	4.893	0.0270
Emaciated with pale mucous membrane	15	3(20.0)	7.527	0.0061
Asymptomatic dogs	53	27(50.9)	References	
Total	100	40		

Discussion

The outcomes of these study studies revealed a significant prevalence of *Hemotropic mycoplasma* in the sampled stray dogs, with an overall infection rate of 40%. This finding highlights the serious consequences of stray dog populations on public health, as these animals can act as reservoirs and potential sources of transmission for *Hemotropic mycoplasma* to humans and other susceptible species. The higher prevalence of canine hemoplasmosis recorded in this study was identical to data from in Portugal 40% (24) and, in Turkey 38.3% (25). The high frequency of canine hemoplasmosis were was reported in Brazil (26), Turkey (27), Australia (28), Southern Brazil (29) and Sudan (30), respectively. Whereas slighter prevalence rates were documented 23% in Iran (31), 15.7%, in Saudi Arabia (32), 4.5% in Italy (33), 7.7% in Nigeria (34), and 1.3% in the USA (35).

The variances of distribution between areas can be clarified by geographical dissimilarity dissimilarities, such as weather, vector spreading, and analytical procedures (molecular tools versus microscopical detection), or a combination of all of them, resulting in disagreements among scientific researches researchers. Another possible explanation for the higher prevalence could be that the stray dogs are not regularly vaccinated and may not receive regular veterinary care, hemoplasma infections can go undetected and untreated for long periods of time. This can lead to the spread of the bacteria to other animals.

The commonness of *Hemotropic mycoplasma* was significantly larger in males and adults in comparison to bitches and puppies respectively. This result is in agreement with the newly new research, which informed hemoplasmas to be more predominant in adult dogs (22,24,36). This may result from prolonged times of exposure to microorganisms as dogs age, as well as increasing exposure to the outside environment. These factors may have elevated the incidence of *Hemotropic mycoplasma* infection in both male and adult dogs (24). Despite the fact that even though Barbosa *et al.* (37) found that gender did not statistically significantly affect the spread of *Hemotropic mycoplasma* infection to dogs in their study. Yüksel *et al.* (27), recorded *Hemotropic mycoplasma* at rate 25% and 27% in bitches and male dogs respectively.

A high significant infection rate with *Mycoplasma haemocanis* was recorded in asymptomatic dogs than in animals with symptoms and also in emaciated with pale mucous membrane animals compared with asymptomatic dogs. The clinical manifestations of canine hemoplasmosis, vary from asymptomatic to anemia, anorexia, lethargy, dehydration and loss of body weight to sudden death (12,33). *Mycoplasma haemocanis*, plays a significant role in the

development of anemia in dogs through *Mycoplasma haemocanis* attaches to red blood cells, causing immune-mediated destruction and blood hemolysis leading to anorexia, lethargy, emaciation and pale mucous membranes (7,8).

Further scientific records informed that there is no significant relation among anemia and hemoplasmosis (33,38). While, Yüksel *et al.* (27), observed that 8 (66.6%) of the samples revealed *Hemotropic mycoplasma* in the anemic dogs, whereas the remaining 4 (33.4%) samples did not. Additionally, *Hemotropic mycoplasmas* were identified in the blood of dogs that appeared to be normal using molecular techniques (25-40).

Conclusion

The molecular survey conducted in Mosul city, Iraq, reveals a substantial prevalence of hemotropic mycoplasma in stray dogs, emphasizing the need for effective control procedures to diminish the spread of risk to humans and other animals. Stray dog populations should be a focus of public health efforts, including regular monitoring, vaccination campaigns, and population control measures. Furthermore, educating the local community about the risks and transmission mechanisms of hemotropic mycoplasma is crucial to ensure a safer environment for both humans and animals alike.

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Conflict of interest

There is no conflict of interest.

References

1. Alseady HH, Al-Dabbagh SM. Isolation and molecular identification of cutaneous leishmaniasis in humans and dogs in middle Euphrates, Iraq. Iraqi J Vet Sci. 2024;38(2):427-435. DOI: 10.33899/ijvs.2023.143821.3259
2. Hassan WS, Abdulrazzaq KM, Al-Obaidi QT, Al-Azow KA. Molecular detection of *Anaplasma platys* in dogs in Nineveh province, Iraq. Iraqi J Vet Sci. 2024;38(3):677-682. DOI: 10.33899/ijvs.2024.148465.3592
3. Albakri HS, Aziz KJ, Ismael SS, Nasrullah OJ. Microscopical and molecular diagnosis of canine babesiosis in stray dogs in Erbil, Iraq. Iraqi J V Sci. 2024;38(4):823-830. DOI: 10.33899/ijvs.2024.150422.3699
4. Fadhil SA, Alkhaled MJ. Molecular identification of *Crithidia sp*. from naturally infected dogs. Iraqi J Vet Sci. 2024;38(4):831-837. DOI: 10.33899/ijvs.2024.150337.3695
5. Al-Malachi HB, Al-Farwachi MI. A comparison between different laboratory methods and stains for detection microfilaremic dogs. Iraqi J Vet Sci. 2024;37(1):171-175. DOI: 10.33899/ijvs.2022.133610.2267
6. Tasker S, Helps CR, Day MJ, Harbour DA, Shaw SE, Harrus S, Belford CR. Phylogenetic analysis of hemoplasma species: An international study. J Clin Microbiol. 2003;41(8):3877-3880. DOI: 10.1128/JCM.41.8. 3877
7. Messick JB. *Hemotrophic mycoplasmas* (hemoplasmas): A review and new insights into pathogenic potential. Vet Clin Pathol. 2004;33(1):2-13. DOI: 10.1111/j.1939-165x.2004.tb00342.x
8. Valle Sde F, Messick JB, Dos Santos AP, Kreutz LC, Duda NC, Machado G, Corbellini LG, Biondo AW, González FH. Identification occurrence and clinical findings of canine hemoplasmas in southern Brazil. Comp Immunol Microbiol Infect Dis. 2014;37(4):259-65. DOI: 10.1016/j.cimid.2014.08.001
9. Maggi RG, Compton SM, Trull CL, Mascarelli PE, Mozayeni BR, Breitschwerdt EB. Infection with hemotropic Mycoplasma species in patients with or without extensive arthropod or animal contact. J Clin Microbiol. 2013;51(10):3237-3241. DOI: 10.1128/JCM.01125-13
10. de Sousa KM, Herrera HM, Secato CT, Oliveira AV, Santos FM, Rocha FL, Barreto WG, Macedo GC, de Andrade Pinto PE, Machado RZ, Costa MT, André MR. Occurrence and molecular characterization of hemoplasmas in domestic dogs and wild mammals in a Brazilian wetland. Acta Trop. 2017;171:172-181. DOI: 10.1016/j.actatropica.2017.03. 030
11. Millán J, Becker DJ. Patterns of Exposure and Infection with Microparasites in Iberian Wild Carnivores: A Review and Meta-Analysis. Animals. 2021;11(9):2708. DOI: 10.3390/ani11092708
12. Tasker S. Hemotropic Mycoplasma. Vet Clin North Am J Small Anim Pract. 2022;52(6):1319-1340. DOI: 10.1016/j.cvsm.2022.06.010
13. Mesquita JR, Oliveira AC, Neves F, Mendoza JR, Luz MF, Crespo I, dos Santos TF, Santos-Silva S, Vilhena H, Barradas PF. Hemotropic Mycoplasma and Bartonella Species Diversity in Free-Roaming Canine and Feline from Luanda, Angola. Pathogens. 2021;10(6):735. DOI: 10.3390/pathogens10060735
14. Radhi AS, Alsaad IA. Clinical, Biochemical and Molecular study of *Mycoplasma haemocanis* in Dogs in Southern Provinces of Iraq. Basrah J Vet Res. 2022;21(1):44-57. DOI: 10.23975/bjvetr.2022.177418
15. Lapsina S, Stirn M, Novacco M, Cueni C, Meli ML, Hofmann-Lehmann R, Riond B. What is your diagnosis? Blood smear of a dog. Vet Clin Pathol. 2023;52(2):93-96. DOI: 10.1111/vcp.13109
16. Huggins LG, Baydoun Z, Mab R. Transmission of haemotropic mycoplasma in the absence of arthropod vectors within a closed population of dogs on ectoparasiticides. Sci Rep. 2023;13(10143):1-8. DOI: 10.1038/s41598-023-37079-z
17. Novacco M, Meli ML, Gentilini F, Marsilio F, Ceci C, Pennisi MG, Lombardo G, Lloret A, Santos L, Carrapiço T, Willi B, Wolf G, Lutz H, Hofmann-Lehmann R. Prevalence and geographical distribution of canine hemotropic mycoplasma infections in Mediterranean countries and analysis of risk factors for infection. Vet Microbiol. 2010;142(3-4):276-284. DOI: 10.1016/j.vetmic.2009.09.069
18. Willi B, Novacco M, Meli M, Wolf-Jäckel G, Boretti F, Wengi N, Lutz H, Hofmann-Lehmann R. Haemotropic mycoplasmas of cats and dogs: Transmission, diagnosis, prevalence and importance in Europe. Schweiz Arch Tierheilkd. 2010;152(5):237-244. DOI: 10.1024/0036-7281/a000055
19. Raimundo JM, Guimarães A, Rodrigues RB, Botelho CM, Peixoto MP, Pires MS, Baldani CD. Hematological changes associated with hemoplasma infection in cats in Rio de Janeiro. Rev Bras Parasitol Vet. 2016;25(4):441-449. DOI: 10.1590/S1984-29612016086
20. Wengi N, Willi B, Boretti FS. Real-time PCR-based prevalence study, infection follow-up and molecular characterization of canine hemotropic mycoplasmas. Vet Microbiol. 2008;126(1-3):132-141. DOI: 10.1016/j.vetmic.2007.06.018
21. Gentilini F, Novacco M, Turba ME, Willi B, Bacci ML, Hofmann-Lehmann R. Use of combined conventional and real-time PCR to determine the epidemiology of feline haemoplasma infections in northern Italy. J Feline Med Surg. 2009;11(4):277-285. DOI: 10.1016/j.jfms.2008.06.008
22. Beus K, Goudarztalejerdi A, Sazmand A. Molecular detection and identification of hemotropic Mycoplasma species in dogs and their ectoparasites in Iran. Sci Rep. 2024;14(1):580. DOI: 10.1038/s41598-024-51173-w

23. Gado DA, Ehizibolo DO, Meseko CA, Anderson NE, Lurz PW. Review of Emerging and Re-Emerging Zoonotic Pathogens of Dogs in Nigeria: Missing Link in One Health Approach. Zoonotic Dis. 2023;3(2):134-161. DOI: 10.3390/zoonoticdis3020012
24. Di Cataldo S, Cevidanes A, Ulloa-Contreras C, Sacristán I, Peñaloza-Madrid D, Vianna J, González-Acuña D, Sallaberry PN, Cabello J, Napolitano C. Widespread Infection with Hemotropic Mycoplasmas in Free-Ranging Dogs and Wild Foxes Across Six Bioclimatic Regions of Chile. Microorganisms. 2021;99(2):919-924. DOI: 10.3390/microorganisms9050919
25. Aktas M, Ozubek S. Molecular survey of haemoplasmas in shelter dogs and associations with *Rhipicephalus sanguineus* sensu lato. Med Vet Entomol. 2017;31(4):457-461. DOI: 10.1111/mve.12244
26. Fernandes AJ, Elshafie NO, Kmetiuk LB, Ullmann LS, Brandao AD, Haisi A, van Wilpe Bach R, de Barros-Filho IR, Araújo Junior JP, Barbosa DS, Biondo AW, Dos Santos AP. Hemotropic mycoplasmas (hemoplasmas) in wild boars, hunting dogs, and hunters from two Brazilian regions. Transbound Emerg Dis. 2022;69(2):908-912. DOI: 10.1111/tbed.14038
27. Yüksel D, Hafize T, Kirkan Ş. The molecular detection of hemotropic Mycoplasma species in dogs. Thai J Vet Med. 2024;53(2):257-263. DOI: 10.56808/2985-1130.3541
28. Barker EN, Langton DA, Helps CR. Haemoparasites of free-roaming dogs associated with several remote Aboriginal communities in Australia. BMC Vet Res. 2012;8(55):1-7. DOI: 10.1186/1746-6148-8-55
29. Vieira RF, Vidotto O, Vieira TS, Guimaraes AM, Santos AP, Nascimento NC, Santos NJ, Martins TF, Labruna MB, Marcondes M, Biondo AW, Messick JB. Molecular investigation of hemotropic mycoplasmas in human beings, dogs and horses in a rural settlement in southern Brazil. Rev Inst Med Trop Sao Paulo. 2015;57(4):353-357. DOI: 10.1590/S0036-46652015000400014
30. Inokuma H, Oyamada M, Davoust B, Boni M, Dereure J, Bucheton B, Hammad A, Watanabe M, Itamoto K, Okuda M, Brouqui P. Epidemiological survey of *Ehrlichia canis* and related species infection in dogs in eastern Sudan. Ann N Y Acad Sci. 2006;1078(1):461-463. DOI: 10.1196/annals.1374.085
31. Hasiri MA, Sharifiyazdi H, Moradi T. Molecular detection and differentiation of canine hemoplasma infections using RFLP-PCR in dogs in southern Iran. Vet Arh. 2016;86 (4):529-540. [available at]
32. Alanazi AD, Alouffi AS, Alyousif MS, Alshahrani MY, Abdullah H, Abdel-Shafy S, Calvani NE, Ansari-Lari M, Sazmand A, Otranto D. Molecular Survey of Vector-Borne Pathogens of Dogs and Cats in Two Regions of Saudi Arabia. Pathogens. 2012;10(1):25. DOI: 10.3390/pathogens10010025
33. Ravagnan S, Carli E, Piseddu E, Da Rold G, Porcellato E, Zanardello C, Carminato A, Vascellari, M, Capelli G. Prevalence and molecular characterization of canine and feline hemotropic mycoplasmas (hemoplasmas) in northern Italy. Parasit Vectors. 2017;10(1):132. DOI: 10.1186/s13071-017-2069-9
34. Aquino LC, Kamani J, Haruna AM, Paludo GR, Hicks CA, Helps CR, Tasker S. Analysis of risk factors and prevalence of haemoplasma infection in dogs. Vet Parasitol. 2016;15(221):111-117. DOI: 10.1016/j.vetpar.2016.03.014
35. Compton SM, Maggi RG, Breitschwerdt EB. Candidatus *Mycoplasma haematoparvum* and Mycoplasma haemocanis infections in dogs from the United States. Comp Immunol Microbiol Infect Dis. 2012;35(6):557-562. DOI: 10.1016/j.cimid.2012.06.004
36. Antognoni MT, Vascellari M, Da Rold G, Toniolo F, Sgubin S, Zanardello C, Carminato A, Miglio A. Looking for Dog Blood Donors in an Endemic Area for Vector-Borne Infections of Central Italy. Animals. 2022;12(7):817. DOI: 10.3390/ani12070817
37. Barbosa MV, Paulino PG, Camilo TA, Martins D, Paulis L, Senne NA, Santos HA. Spatial distribution and molecular epidemiology of hemotropic *Mycoplasma spp*. and *Mycoplasma haemocanis* infection in dogs from Rio de Janeiro, Brazil. Infect Genet Evol. 2021;87:104660. DOI: 10.1016/j.meegid.2020.104660
38. Mshelbwala FM, Oladipo TM, Olasoju MI, Rahman SA, Adebiyi AA, Olatunji BO, Balami PU. Prevalence, Risk Factors, Haematological and Biochemical Changes Associated with Haemotropic Mycoplasma Infection of Dogs in Abeokuta, Ogun State, Nigeria. Niger J Parasitol. 2024;45(2):316. DOI: 10.4314/njpar.v45i2.8
39. Hosseini SR, Sekhavatmandi A, Khamesipour F. PCR based analysis of Haemobartonellosis (Candidatus *Mycoplasma haematoparvum* and *Mycoplacma haemocanis*) and its prevalence in dogs in Isfahan, Iran. Biosci Biotechnol Res Commun. 2017;10(2):187-191. DOI: 10.21786/bbrc/10.2/32
40. Altay K, Aydin MF, Aytmirzakizi A, Jumakanova Z, Cunusova A, Dumanli N. First molecular evidence for *Mycoplasma haemocanis* and Candidatus *Mycoplasma haematoparvum* in Asymptomatic shelter dogs in Kyrgyzstan. Kafkas Univ Vet Fak Derg. 2020;26(1):143-146. DOI: 10.9775/kvfd.2019.22196

الكشف الجزيئي للميكوبلازما الدم في الكلاب الضالة في مدينة الموصل، العراق

إيفا أيسر عجاج، ماب إبراهيم الفروه جي و باسمة عبد الفتاح البدراني

فرع الطب الباطني والوقائي كلية الطب البيطري، جامعة الموصل، الموصل، العراق

الخلاصة

الميكوبلازما الهيموتروبية (الهيموبلازما) هي بكتيريا خالية من الجدار الخلوي وتعيش على سطح خلايا الدم الحمراء، تنتمي إلى رتبة المفطورات، إذ أنها يمكن أن تسبب فقر دم معتدل أو خطير وارتفاع طفيف جدا في درجات في الثدييات، كما تعتبر من الأمراض المشتركة بين الإنسان والحيوان وقد تم توثيق ذلك عالميا. وتسبب داء الهيموبلازما في الكلاب والذي لا يكون له أعراض في أغلب الأحيان؛ وهو خطير في الكلاب التي تعاني من تثبيط المناعة. يهدف الكشف الجزيئي في هذه الدراسة إلى تحديد إصابة الكلاب الضالة بهذه البكتريا في مدينة الموصل. خلال الفترة من مارس ٢٠٢٢ إلى مارس ٢٠٢٣، تم تقييم عينات الدم لمائة كلب ضال (٥٠ ذكرا و٣٠ أنثى و٢٠ جروا)، وتم استخدام طريقة تفاعل البوليميرات المتسلسل التقليدية باستخدام جين Sr RNA16 للكشف عن وجود الميكوبلازما الهيموتروبية. تم الكشف عن الميكوبلازما الهيموكانيس في (٤٠%، مع فترة ثقة ٩٥% تتراوح بين ٣٢,٦-٤٦,٩%) من الكلاب الضالة. كانت نسبة الإصابة أعلى لدى الذكور (٤٨,٣%، مع فترة ثقة ٩٥% تتراوح بين ٣٢,٤-٦٩,٤%) وأيضا في الكلاب البالغة (٤٣,٨%، مع فترة ثقة ٩٥% تتراوح بين٣٠,٤-٦٠,٩) مقارنة بالإناث والجراء على التوالي. لم يتم العثور على علاقة مهمة بين الحيوانات الموجبة للفحص الجزيئي وآفات الجلد، وبين الكلاب الهزيلة مقارنة بالحيوانات التي لم تظهر عليها أعراض سريرية. ختاما، تكشف الدراسة الجزيئية التي ركزت على مدينة الموصل بالعراق عن انتشار كبير الميكوبلازما الهيموتروبية في الكلاب السائبة، مما يسلط الضوء على الحاجة إلى إجراءات مكافحة فعالة لتقليل انتشار المخاطر على الناس والثدييات الأخرى.