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PREVALENCE OF PATHOGENIC PARASITES IN RIVER WATER IN DIYALA PROVINCE

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ABSTRACT
The current study was designed to determine the incidence of pathogenic parasites found in the river water in Diyala province. The study was extended from June to September 2017. All samples were subjected to microscopic examination using traditional examination. The results of the present study showed water contamination of the Tigris River in Diyala province with the following parasites: *Rabditae* larve (40%), Strongyloides *stericorailis* (25%), Cryptosporidium (60%), *Acanthamoeba* (50%) and *Entamoeba coli* (40%).

KEYWORDS: Raw Water; *Cryptosporidium*; Tigris River**,** Zeal Nelson stain, *Strongyloides***,** protozoa.

INTRODUCTION

Contamination from waste material discharges and wild or farm animals is important supply for untreated water (Dubey, 2005). Waterborne diseases occur worldwide and outbreaks caused by the contamination of community water systems have the potential to cause malady in large number of shoppers (Barwick *et al*., 2000) a minimum of 325 water associated outbreaks of parasitic protozoan diseases have been reportable worldwide (Kramer *et al*., 2001). Possible sources of water contamination together with each human and animals sources are best-known to be necessary within the introduction of protozoa to a water system (WHO 2004). Some contaminants end in acute effects. There's an on the spot relation between the prevalence of some parasitic diseases and also the prevalence of that etiologic agent in water (Yousefi *et al*., 2009). Parasitic diseases are quite common in aggregation countries. In Iraq, the parasitic infection is wide current with variable distribution in numerous areas. Helminth and Protozoa parasites are found in varied water sources particularly within the water of rural villages of marsh land showed the next prevalence of contamination, this higher prevalence of water supply contamination may be explained by poor sanitation and hygiene, low socio-economic standing and in acceptable health and biological process education, contamination of water with animal and human waste material (Jarallah, 2009) The aim of this study is to watch and confirm the prevalence of water contamination with parasites.

MATERIALS & METHODS

Twenty water samples were collected from Tigris River in Diyala province when sewage discharge expel in Tigris River during the period from June to September 2017. All the samples were collected in special bottle of 250 ml that was tagged with place and date of collected. In the laboratory water examination was performed by centrifuge (about 2300 rpm) for one min (Chatterjee, 1952). Decant the supernatant fluid and take a drop of the deposit by pipette, put it on a clean slid and cover with a cover slip (Al-Joobori, 1952). All samples were examined by low power magnification 10x, high power magnification 40x, 100x, and stain method. The methods used Zeal nelson stain and iodine stain and examined under microscope. Measurements images of oocysts were taken after ocular micrometer calibration (Thienpont *et al*., 1986). This work was conducted at the Center for Research and Natural History Museum, University of Baghdad.

RESULTS

Five genera and species of pathogenic parasites were identified in fresh water in the Tigris River: *Strongyloides* sp (25%), *Cryptosporidium* sp (60%), *Acanthamoeba* sp (50%), *Rabditae* larve (40%) and *Entamoeba coli* (40%) as shown in Table (1). The identification of parasites was illustrated in Figures (1-5).

TABLE 1: The percentages of parasites species in the fresh water samples

Species of parasite	No. of sample Examined	No. of sample positive	Percentage %
Strongyloides sp	20	5	25%
Cryptosporidium sp	20	12	60%
Acanthamoeba sp.	20	10	50%
Rabditae larve	20	8	40%
Entamoeba coli	20	8	40%

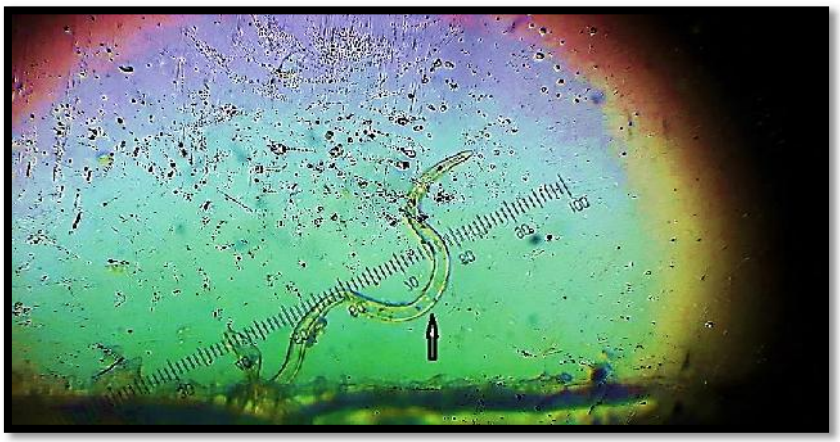

FIGURE 1. *Strongyloides* sp

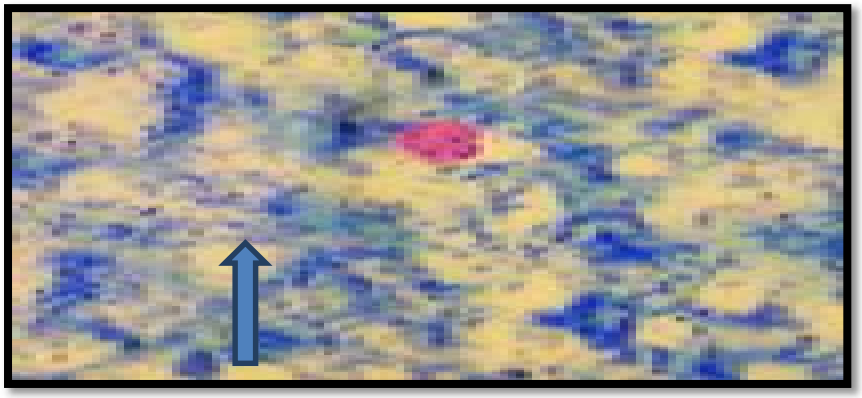

FIGURE 2.*Cryptosporidium* sp with Zeal nelson stain

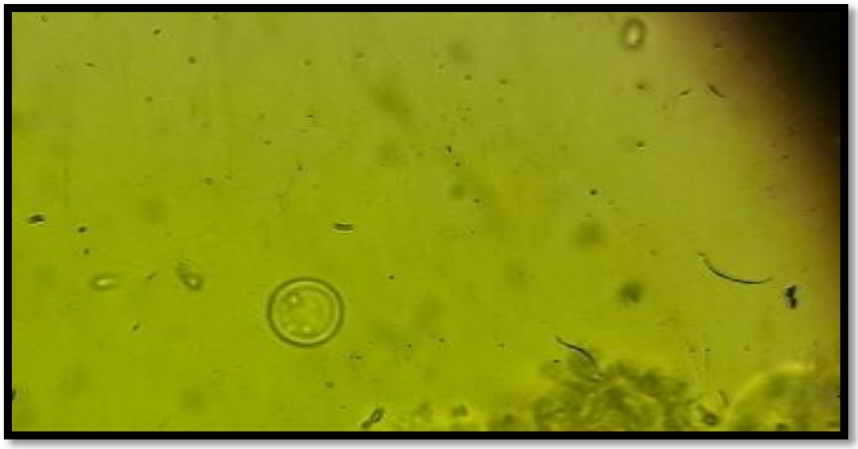

FIGURE 3.*Cryptosporidium* sp

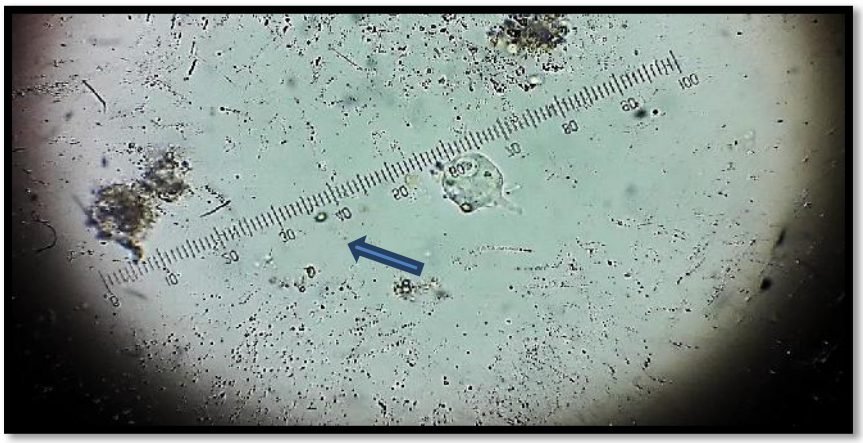

FIGURE 4. *Acanthaeoba* sp

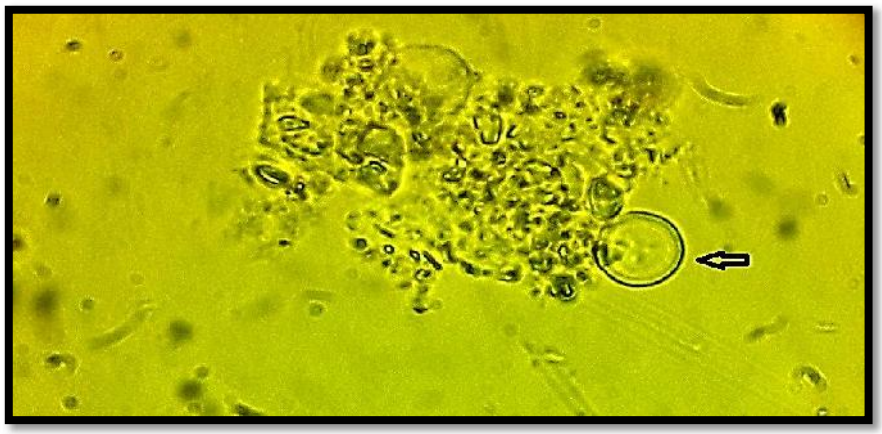

FIGURE 5. *Entamoeba coli*

DISCUSSION

Worldwide, freshwater diseases area unit among the leading killers of kids below 5 years old and a lot of individuals die from unsafe water annually than from all kinds of violence, as well as war (WHO 2002). Several water-related diseases are the results of poor quality water that's used for drinking, washing and other. This research included five of genera and species parasites from fresh water of Tigris River are risk of health particularly for swimmers in these areas of these parasites were recorded in Republic of Iraq previously in their hosts however during this study include infective parasite in the waters of the Tigris River water that might be mentioned with rates of infection in Iraq. Water-based diseases come back from hosts that either live in water or need water for a part of their life cycle. These diseases are passed to humans once they are eaten or acquire contact with skin. This study was recorded infection with *Strongyloides stercoralis* in the rate of (25%), agreed with **(**Hadi & Makawi 2013). There are two vital stages within the life cycle of the worm, the rhabditiform stage and also the filariform stage. The *Strongyloides* life cycle is a lot of complicated than that of most nematodes with its alternation between independent and parasitic cycles and possibility autoinfection and multiplication inside the host (James, 2007), that current study discovered adult and larvae of this worm cause acute diarrhea may be a vital public pathological state in Iraq, drinking raw or municipal water and hot seasons. Free living *amoebae* are nonparasitic protozoans that exist in fresh water .These *amoebae* were found infective to man inflicting a fatal malady touching the central nervous system (Fowler & Carter 1965). The genus *Acanthamoeba* are best known to cause eye infection and inflammation (Jogwuwes *et al*., 2000; Hansen & Kronborg, 2003; Speer *et at*., 2003). These amoebae thrive in enough numbers to cause infection once their environmental temperature is fairly high (Carter 1972), totally different shapes of free *amoebae* were appeared in freshwater of Tigris River. This study showed the water contamination of the river with pathogenic parasite, this study agreed with **(**Al-Fahdawi 2002; Hadi & Makawi 2013; Zahraa, 2013; Makawi, 2016), they showed contamination of Tigris river with different parasites.

CONCLUSION

The study concluded contamination of river water (Tigris River) by pathogenic parasite and it considered source of human and animal infection.

REFERENCES

Dubey, J.P. (2005) Toxoplasmosis-a waterborne zoonosis. Veterinary Parasitology. 126; 57 -72.

Barwick, R., Levy, D., Craun, G., Beach, M. & Calderon, R. (2000) Surveillance for waterborne-disease outbreaks. Morbidity and Mortality. Weekly Report Surveillance Summary, 49:1-21.

Kramer, M., Quade, G., Hartemann, P. & Exner, M. (2001) Waterborne diseases in Europe 1986- 96. Journal of the American Water Works Association 93: 48-53.

WHO (2004) Guidelines for drinking water quality. 3rd edition, Geneva. 121-144.

Yousefi, Z., hezarjaribi, H.,Enayati, A.& Mohammad poor, R. (2009) Parasiticcontamination of wells drinking water in Mazandaran province. Iran Journal of Environmental Health Science and Engineering 6 (4): 241-246.

Jarallah, H. (2009) The Role of risk factors in the increase of leishmaniasis (Black fever) in marshlands of southern Iraq: A review. Proceeding of the 3td Marsh Rehabilitation Symposium. 243-248. .

Chatterjee (1952) Human parasites and parasitic disease. Physician R.G. Kar Medical. College Belgachia, Calcutta. 537-547.

Al- Joobori, T. (1952) Medical parasitology laboratory manual medical helminthology. Department of medical microbiology. Medical College Al-Nahreen Univ. 159.

Thienpont, E., Rochette, F. & Vanparijs, O. (1986) Diagnosing helminthiasis by coprological examination. Turnhoutsebaan 30, 2340 Beerse, Belgium). Available from Vetenary lab Services, UNIT 11. Station Road South water, Sussex. 137.

World Health Organization (WHO) (2002) World Health Report: Reducing Risks, Promoting Healthy Life. France.

Hadi, A. & Makawi, Z. (2013) Pathogenic intestinal parasites found in fresh water of the Tigris River. Journal of Veterinary Research, 17(11): 608-619.

James, B. (2007) *Strongyloides stercoralis*: a model for translational research on parasitic nematode biology. WormBook Organization.

Fowler, M. & Carter, R. (1965) Acute pyogenic meningitis probably due to Acanthamoeba sp a preliminary report. Brit Medical journal, 2: 740-742.

Jogwuwes, S., Pariyakanok, L., Charoenkorn, M., Yagita, K. & Endo, T. (2000) Heterogeneity in cyst morphology within isolates of *Acanthamoeba* from keratitis patients in Thialand Tropical Medical International Health. 5(5): 335-340.

Hansen, B. & Kronborg, G. (2003) Acanthamoeba Keratitis in a non-contact lens wearer with human immunodeficiency virus. Scand Journal Infection Disease. 35(3): 207-209.

Speer, E., Hofmeister, E. & Cohen, E. (2003) An atypical presentation of *Acanthamoeba* keratitis in a non-contact lens wearer. Eye and Contact Lens 29(1): 21-22.

Carter, R. (1972) Primary amoebic meningoen cephalitis. Transactions of the *Royal Society* of *Tropical*Medicine and *Hygiene*, 66: 193-208

Al-Fahdawi, H. (2002) Study on the contamination of different water sources with pathogenic parasites in Ramadi city. M.Sc. Thesis. College of Science- University of Al-Anbar. 93.

Zahraa, Y. (2013) Ecological and Taxonomic Study of Protozoa Community in the East Bank of River Tigris within Baghdad City. A Thesis Baghdad, College of Science, Biology Department in Partial Fulfilment of the Requirements for the Degree of Master of Science in Zoology. 146

Makawi, Z. (2016) Survey of intestinal protozoa in sheep, handlers and drinking water in Wasit province Iraq .M.Sc. Thesis. College of Science - University of Baghdad.