



British Society for Parasitology

TITLE

- Water contact activities, snail intermediate hosts and cercarial shedding in Yadakunya part of Jakara dam, Kano state, Nigeria.

AUTHOR



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BACKGROUND

- Water contact activities and the presence of snail intermediate hosts are important for the transmission of schistosomiasis. Schistosomiasis is a neglected tropical disease caused by infections with trematodes of the genus *Schistosoma*.
- Snails of the genus *Bulinus*, *Onchomelania* and *Biomphalaria* are the intermediate hosts of this trematode where the asexual stage of the life cycle takes place while the sexual stage takes place in man, the definitive host.
- Cercaria, the larval stage of the schistosome penetrates the skin of man when he comes in contact with the water during fishing, swimming, farming etc.

AIM OF THE RESEARCH

- This work was conducted to investigate the types of water contact activities taking place in this part of the water body, the types of snail intermediate hosts in it and the cercariae they shed.
- In order to confirm the presence of conditions necessary for the transmission of schistosomiasis

MATERIALS AND METHODS

Study area

- Yadakunya part of Jakara dam is located in Ungoggo Local Government area of Kano state.
- This water body is used for irrigation, fishing, transportation and recreational activities. Jakara dam was constructed in 1976 and is situated in Wasai, Minjibir Local Government Area (LGA) in the North Eastern part of Kano metropolis about 41.5Km from the city centre.
- Jakara dam is one of the most grossly polluted dams in West Africa, because during the dry season all the streams that feed it dry up with the exception of the major Jakara river which sustains it.



Fig. 1: Map of Jakara river showing study area

METHODS

Snail collection

➤ Snails were collected by hand picking from water hyacinth and directly from water and transported to the laboratory where they were washed and sorted out into different species morphologically.

Cercarial shedding

➤ Snails were individually placed in compartmented petridishes and exposed to artificial light for 2- 4 hours. Drops of water from the compartments were placed on a clean glass slide with a drop of neutral red and covered with a cover slip.

➤ Observations were made using a compound microscope attached to a Toupview digital camera and a computer through a USB.

RESULTS

- ✘ The types of water contact activities taking place are swimming, fishing, crops farming and transportation by boat.
- ✘ Males have more contact with the water than females. 415 snails were collected, 119 were *Bulinus*, out of which 23 were infected.
- ✘ The different snail intermediate hosts encountered are *Bulinus* and *Lymnea* species. Some of the *Bulinus* species encountered were shedding cercariae of the furcocercus type.
- ✘ Five different types of furcocercus cercaria were shed by the *Bulinus* species which were heavily infected.

FIG.2:BULINUS SPP AND CERCARIAE SHED

Location(dam sites)	Snails	Cercariae	Animals found in snail habitats
Yadakunya (irrigation, fishing)	Bulinus spp	a.Cercaria bulini yadakunya I	Cattle,Dogs, frogs
	Bulinus spp	b.Cercariae bulini yadakunya II	
	Bulinus spp	c.Cercariae bulini yadakunya III	
	Bulinus spp	d.Cercariae bulini yadakunya IV	
	Bulinus spp	e.Cercariae bulini yadakunya V	

BULINUS SPECIES

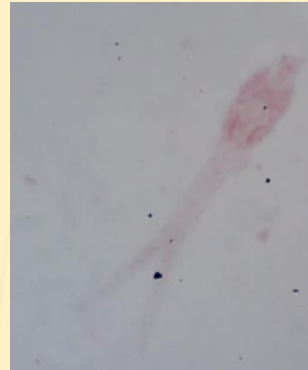
b.



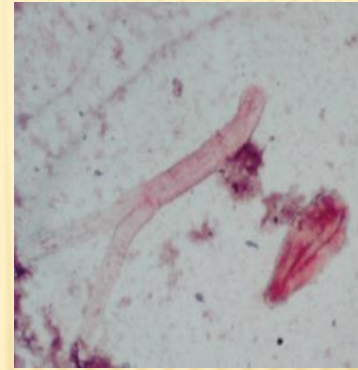
Fig.3: Bulinus species shedding furcocercus cercria



a



b



c



d



e

FIG.4:FURCOCERCUS CERCARIAE

TYPES OF CERCARIA RECOVERED FROM SNAILS

- Five different types of furcocercus cercaria.
- One of them morphologically looks like the *Schistosoma mansoni* cercaria.
- This is the first time these types of furcocercus cercaria were reported in Kano state, Nigeria and were named after the location (Yadakunya).

WATER CONTACT ACTIVITIES



Fig.5: Yadakunya part of Jakara dam: Humans, cattle and dog interact .

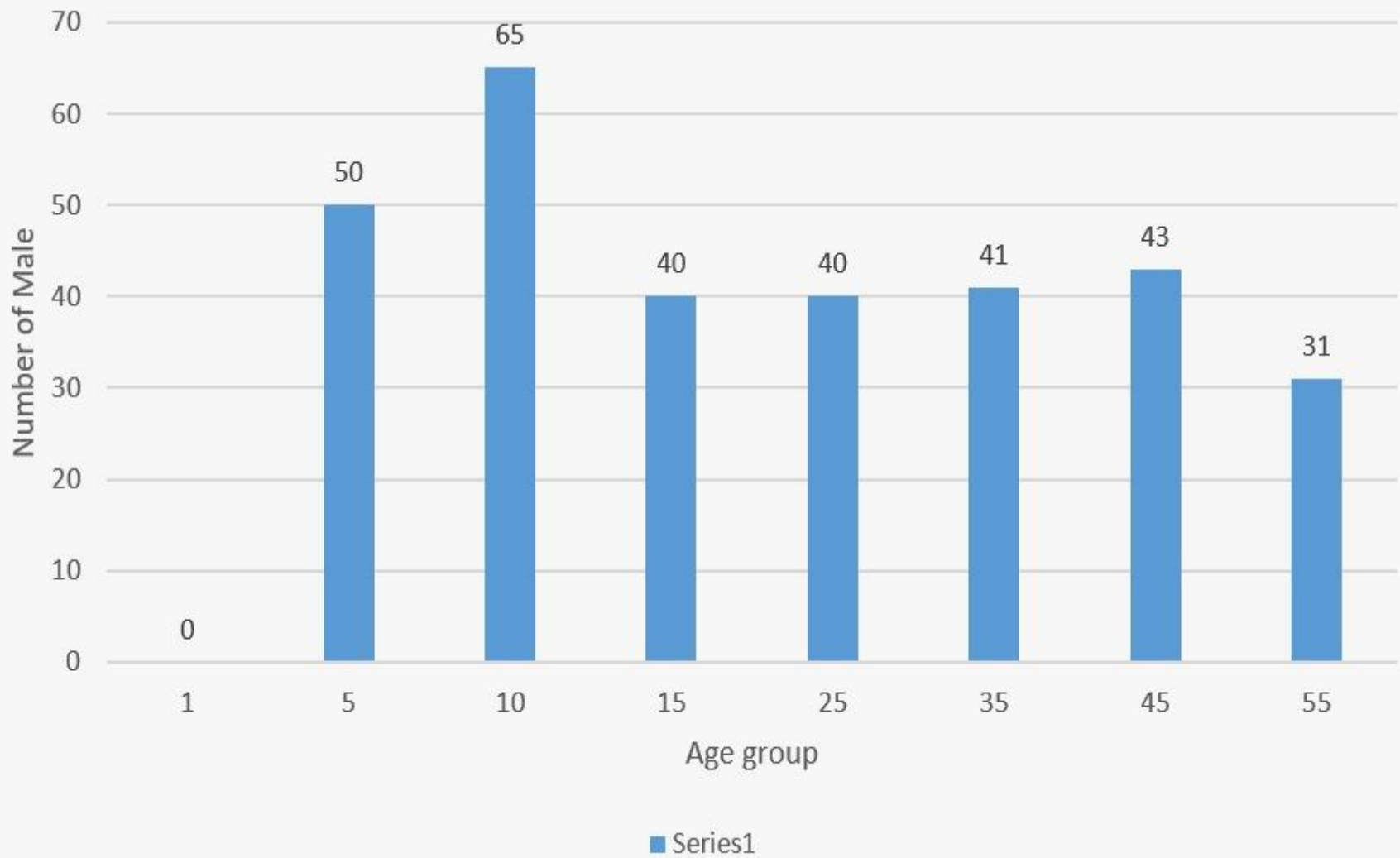


Fig.6: AGE RELATED PATTERN OF HUMAN WATER CONTACT ACTIVITY

DISCUSSION AND CONCLUSION

- All conditions necessary for the transmission of Schistosomiasis were observed in the water body.
- Some cercariae obtained has characteristics similar to *Schistosoma mansoni* but there were no Biomphalaria species which is the intermediate host of *Schistosoma mansoni* in this waterbody.
- The backwardly curvation of the tail furcae which is only rarely observed in preserved cercariae or in living cercariae under pressure of the cover slip on the slide was observed in this study (d. above). With four swimming behavior
- Humans , cattle and dogs share the same transmission sites in this parts of Jakara dam.
- Since cattle were found here there is the likely hood of hybridization and humans getting infected with the cercariae that infects cattle.

➤ According to Webster *et al* (2013) there is the likelihood of novel zoonotic hybrid schistosomes evolving with subsequent changes in the parasites' life history traits, transmission potential and virulence when humans and their livestock start to frequent the same water bodies.

➤ There is need for health education, investigation and treatment of infected individuals in the neighboring communities around the water body.

REFERENCES

- Webster BL, Diaw OT, Seye MM, Webster JP, Rollinson D (2013) Introgressive Hybridization of *Schistosoma haematobium* Group Species in Senegal: Species Barrier Break Down between Ruminant and Human Schistosomes. PLoS Negl Trop Dis 7(4): e2110.
doi:10.1371/journal.pntd.0002110