



Case Report

Schistosomiasis: The Detection of the Eggs of *Schistosoma mansoni* in Urine While Investigating *Schistosoma haematobium* Infection, Is Dutsin-Ma Local Government Area, Katsina State, a Hybrid Zone?

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ABSTRACT

Schistosomiasis is an age-long neglected tropical disease of poverty, which ranks second to malaria in public health significance. Cases of schistosome hybridization are unknown in Dutsin-Ma Local Government Area. Therefore, this short communication was aimed at reporting the detection of *S. mansoni* egg morphotype in the study area. Terminal urine samples were centrifuged, microscopically examined, and schistosome eggs identified using standard protocols. The result showed an overall prevalence of 0.36% and a mean intensity of 0.04 ± 1.03 eggs /10 ml of urine. The detection of *S. mansoni* eggs in the urine samples of study participants was an indication of a possible hybridization between *S. mansoni* and male *S. haematobium* worms. This underscores the need for molecular diagnostic tools for effective diagnosis in endemic resource-constrained settings.

Keywords: Dutsin-Ma; Hybridization; Katsina State; Public Health; Schistosomiasis

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INTRODUCTION

Schistosomiasis is an age-long neglected tropical disease of poverty which ranks second to malaria in public health significance. It is transmitted by planorbid freshwater snails in the genera *Bulinus*, *Biomphalaria*, and *Oncomelania*. *Bulinus* transmits its urogenital form caused by *Schistosoma haematobium* while *Biomphalaria*, and *Oncomelania* transmit *S. mansoni* and *S. japonicum* respectively, the causative agents of its intestinal form. However, *S. japonicum* is only endemic in China (Pennance and Rollinson, 2024). Humans become infected with these schistosomes when they visit cercaria-infested freshwater bodies for water sourcing, swimming, and other recreational activities. Adult *S. haematobium* and *S. mansoni* live in the venules of the bladder and small intestines respectively (Chatterji *et al.*, 2024).

Schistosomiasis is endemic in 78 countries of the world where about 250 million people are infected yearly (Ponzo *et al.*, 2024). Sub-Saharan Africa accounted for 93% of the global cases of schistosomiasis with Nigeria recording 20 million cases, the highest in the continent (Saidu *et al.*, 2023). Reports have shown that pairing does exist among closely related human and animal schistosome species, leading to the production of hybrids with broader host spectrum. Such pairing may involve *Schistosoma haematobium* and *Schistosoma guineensis* or *Schistosoma haematobium* and *Schistosoma mansoni*. Researchers speculated that such hybridization was evidenced in the morphotypes of schistosome eggs recovered from urine samples (Onyekwere *et al.*, 2022).

Cases of hybridization among schistosomes is alien to Dutsin-Ma Local Government Area in Katsina State.

Therefore, this short communication was aimed at contributing to existing knowledge by reporting the detection of *S. mansoni* egg morphotype in urine samples of school-aged children during epidemiological profiling of urogenital schistosomiasis in the study area.

MATERIALS AND METHODS

Ethical clearance and consent

Ethical clearance was obtained from Katsina State Ministry of Health (MDH/ADM/SUB/ 1152/1/537) while written consent was obtained from study participants.

Urine samples collection and processing

Terminal urine samples were collected with 30 mL plastic bottles labelled with unique codes for proper identification. Centrifugation was carried out following standard protocols. Urine samples were examined under a compound binocular microscope

using x10 objective. The eggs of *S. mansoni* were identified by their conspicuous lateral spines which distinguished them from *S. haematobium* morphotypes (Marie and Petri, 2025).

Data analysis

Epi Info 7 (version 2) software was used to analyse data at 95% Confidence Level.

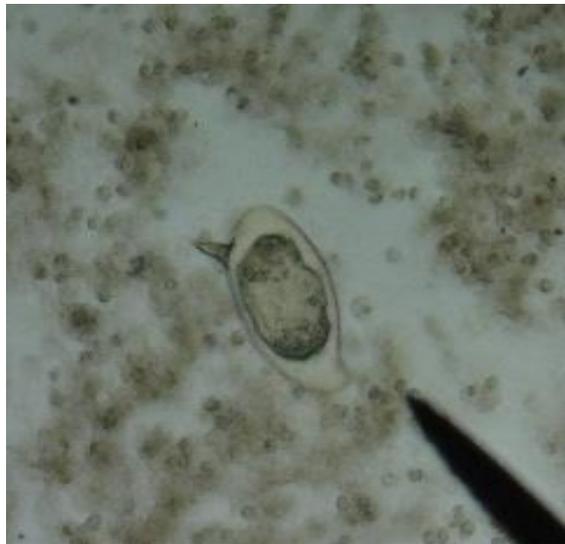
RESULTS

Table 1 presents the overall prevalence (0.36%) and intensity of the morphotypes of *S. mansoni* eggs (0.04±1.03 eggs /10 ml of urine). It shows that a higher prevalence (0.55%) and mean intensity of the *S. mansoni* egg morphotypes (0.07±1.35 eggs/ 10 ml of urine) were obtained from male participants in the age group 11-15 years. Plate 1 presents the pictures of the *S. mansoni* egg morphotypes (with typical lateral spines) in their separate and mixed (with *S. haematobium*) forms.

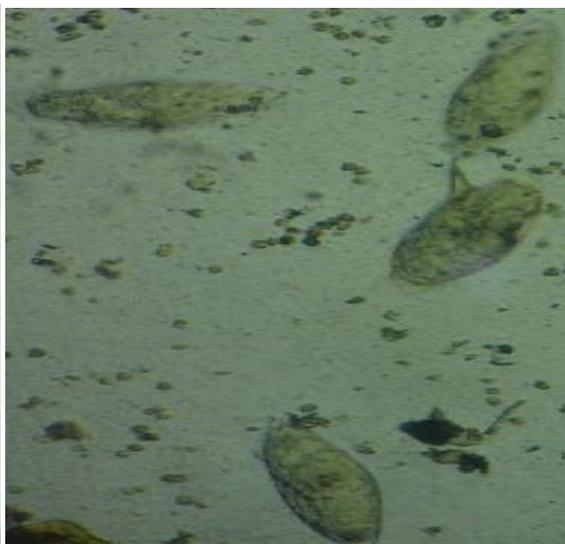
Table 1: Prevalence and intensity of *S. mansoni* egg morphotype

Variable	Examined (n)	Infected (n)	Prevalence (%)	95% CI	Intensity (eggs/10mL)	MI±SD (eggs/10mL)
Age (Years)						
≤ 10	846	0	0	-	0	0
11-15	1146	6	0.52	0.19-1.14	77	0.07±1.35
16-20	541	3	0.55	0.11-1.61	32	0.06±1.06
TOTAL	2533	9	0.36	0.16–0.67	109	0.04±1.03
Gender						
Females	1263	0	0	-	0	0
Males	1270	9	0.71	0.32-1.34	109	0.09±1.45
TOTAL	2533	9	0.36	0.16–0.67	109	0.04±1.03

n, Number of study participants



a. *S. mansoni*



b. *S. mansoni* and *S. haematobium*

Plate 1: Single and mixed *S. mansoni* egg morphotype

DISCUSSION

This short communication presents unusual detection of the eggs of *S. mansoni* in urine samples. Report has shown that just like *S. haematobium* adult, *S. mansoni* sometimes undergoes ectopic migration to the vesicle venous plexus of the bladder to lay eggs instead of its usual anorectal plexus of the large intestine, leading to the excretion of its eggs via urine. This scenario is peculiar to cases of co-infection with urogenital and intestinal schistosomiasis leading to heavy intensity of parasites (Nation *et al.*, 2020). This explanation might apply to the result obtained in this study.

Female schistosomes determine the sex of offsprings by contributing either Z or W chromosome while males contribute only Z chromosome. So, through genomic and transcriptomic data, sex determination in schistosomes has been confirmed (Stroehlein *et al.*, 2022). Consequently, the result presented in this short communication could be explained the premise that the lateral-spined eggs detected in this study were likely the product of a mating between female *S. mansoni* and male *S. haematobium* worms. Conversely, report has shown that lateral egg morphotype does not necessarily connote hybridization because some hybrids can inherit mitochondrial DNA from one parent and nuclear DNA group from another (De Elías-Escribano *et al.*, 2025).

CONCLUSION

The detection of *S. mansoni* eggs in the urine samples of study participants was an indication of a possible hybridization between *S. mansoni* and male *S. haematobium* worms, or uncharacteristic form of egg excretion. This underscores the need for molecular diagnostic tools for effective diagnosis in endemic resource-constrained settings.

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Conflict of interest

None declared.

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REFERENCES

Chatterji, T., Khanna, N., Alghamdi, S., Bhagat, T., Gupta, N., Alkurbi, M. O., Sen, M., Alghamdi, S. M., Bamagous, G. A., Sahoo, D. K., Patel, A., Kumar, P., & Yadav, V. K. (2024). A Recent Advance in the

Diagnosis, Treatment, and Vaccine Development for Human Schistosomiasis. *Tropical Medicine and Infectious Disease*, 9(10), 243.

<https://doi.org/10.3390/tropicalmed9100243>

De Elías-Escribano, A., Artigas, P., Salas-Coronas, J., Luzon-García, M. P., Reguera-Gómez, M., Cabeza-Barrera, M. I., Vázquez-Villegas, J., Boissier, J., Mas-Coma, S., & Bargues, M. D. (2025). Schistosoma mansoni x S. haematobium hybrids frequently infecting sub-Saharan migrants in southeastern Europe: Egg DNA genotyping assessed by RD-PCR, sequencing and cloning. *PLoS neglected tropical diseases*, 19(3), e0012942.

<https://doi.org/10.1371/journal.pntd.0012942>

Marie, C., and Petri, W.A. (2025). Schistosomiasis Bilharziasis). Available at: <https://www.msmanuals.com/professional/infectious-diseases/trematodes-flukes/schistosomiasis>.

Accessed: February 18, 2026.

Nation, C. S., Da'dara, A. A., Marchant, J. K., & Skelly, P. J. (2020). Schistosome migration in the definitive host. *PLoS neglected tropical diseases*, 14(4), e0007951.

<https://doi.org/10.1371/journal.pntd.0007951>

Onyekwere, A.M.; De Elias-Escribano, A.; Kincaid-Smith, J.; Dametto, S.; Allienne, J.-F.; Rognon, A.; Bargues, M.D.; Boissier, J. Mating Interactions between *Schistosoma bovis* and *S. mansoni* and Compatibility of Their F1 Progeny with *Biomphalaria glabrata* and *Bulinus truncatus*. *Microorganisms* 2022, 10,1251.

<https://doi.org/10.3390/microorganisms10061251>

Pennance, T., & Rollinson, D. (2024). Accelerating snail vector genomics. *Infectious diseases of poverty*, 13(1), 32. <https://doi.org/10.1186/s40249-024-01199-z>

Ponzo, E., Midiri, A., Manno, A., Pastorello, M., Biondo, C., & Mancuso, G. (2024). Insights into the epidemiology, pathogenesis, and differential diagnosis of schistosomiasis. *European journal of microbiology & immunology*, 14(2), 86–96. <https://doi.org/10.1556/1886.2024.00013>

Saidu, U., Ibrahim, M. A., de Koning, H. P., McKerrow, J. H., Caffrey, C. R., & Balogun, E. O. (2023). Human schistosomiasis in Nigeria: present status, diagnosis, chemotherapy, and herbal medicines. *Parasitology research*, 122(12), 2751–2772. <https://doi.org/10.1007/s00436-023-07993-2>

Stroehlein, A. J., Korhonen, P. K., Lee, V. V., Ralph, S. A., Mentink-Kane, M., You, H., McManus, D. P., Tchuenté, L. T., Stothard, J. R., Kaur, P., Dudchenko, O., Aiden, E. L., Yang, B., Yang, H., Emery, A. M., Webster, B. L., Brindley, P. J., Rollinson, D., Chang, B.

C. H., Gasser, R. B., ... Young, N. D. (2022). Chromosome-level genome of *Schistosoma haematobium* underpins genome-wide explorations

of molecular variation. *PLoS pathogens*, 18(2), e1010288.

<https://doi.org/10.1371/journal.ppat.1010288>