



BSP Travel Award 2017 recipient: Sekeleghe Kayuni

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A field study report from Mangochi in Malawi, funded by a BSP International Training and Fieldwork Award.

Discovering Male Genital Schistosomiasis, an ignored neglected tropical disease manifestation on the shorelines of Lake Malawi

Countries such as Malawi in sub-Saharan Africa, possess some of the world's most beautiful natural environments which attract global tourists and local peoples to visit them for pleasure, recreation, sports and nurture. Among such mountains, forests and historic sites, Lake Malawi (Figure 1) stands out as one of the most beautiful freshwater bodies in Malawi, the third largest in Africa, and ninth largest in the world. This African Great Lake flows along the East African Rift valley, across the length of the country Malawi, and is a natural habitat to more fish species than any other lake in the world. In addition to tourism, hydro-electricity generation, agriculture and aquaculture are key contributing economic factors supported by Lake Malawi, as well as serving as a source of water for daily household chores and subsistence income production for local inhabitants in shoreline communities.

However, the lake is known to harbour intermediate host molluscs of the *Schistosoma spp.* parasites, the causative agents of schistosomiasis, a neglected tropical disease (NTD), common in low and middle-income countries affecting over 200 million people with significant morbidity. In sub-Saharan Africa, this snail-borne helminthic disease is predominantly caused by two species of blood vessel-dwelling schistosomes; *Schistosoma haematobium* or *S. mansoni*, responsible for urogenital and intestinal diseases, respectively.



Figure 1: Lake Malawi shoreline showing local inhabitants conducting their daily routine activities involving water contact where risks of infection by *Schistosoma haematobium* are significant.

One of the specific manifestations of urogenital schistosomiasis is Male Genital Schistosomiasis (MGS), associated with various pathologies of the genital organs caused by entrapment of schistosome eggs. Since the first report of MGS in 1911, several studies have described symptoms (pelvic and ejaculatory pain, haemospermia, erection dysfunction, infertility, enlarged genital organs), histopathological and radiological findings associated with MGS. However, this male-specific manifestation of schistosomiasis remains under-diagnosed, under-treated and under-reported, thought to be due in part to the tendency of males to present at clinics less often to receive diagnoses and treatment, and in the difficulties in engaging males in standard community treatment programmes.

To further investigate the prevalence and morbidity of MGS, I conducted a longitudinal cohort study among fishermen along the shoreline of Lake Malawi (Figure 2), Mangochi District in November 2017 to June 2018, with ethical clearance from Liverpool School of Tropical Medicine Research Ethics

Committee (LSTM REC) and National Health Sciences Research Committee of Malawi (NHSRC). A total of 376 fishermen were recruited into the study, interviewed by questionnaire and asked to provide mid-morning urine and semen samples for parasitological diagnosis of egg-patent *S. haematobium* infections by microscopy.



Figure 2: Dr Seke Kayuni interacting with fishermen who came attended for the male genital schistosomiasis (MGS) a follow-up study in Mangochi district, Malawi.

A novel method was developed for examining semen for schistosome eggs, where ejaculate was collected into a transparent, self-sealing plastic bag; heat-sealed after liquefaction, and thereafter examined directly under microscope (Figure 3). Afterwards, semen volume was measured, then centrifuged and wet mounts of sediments had microscopical examination. The supernatant harvested together with plasma collected were stored frozen at -80°C and shipped for further molecular analyses. Transabdominal and scrotal ultrasonography (Figure 4) were also conducted to

investigate presence of genital pathologies. Thereafter praziquantel treatment was offered to participants along with invite to follow-up studies.

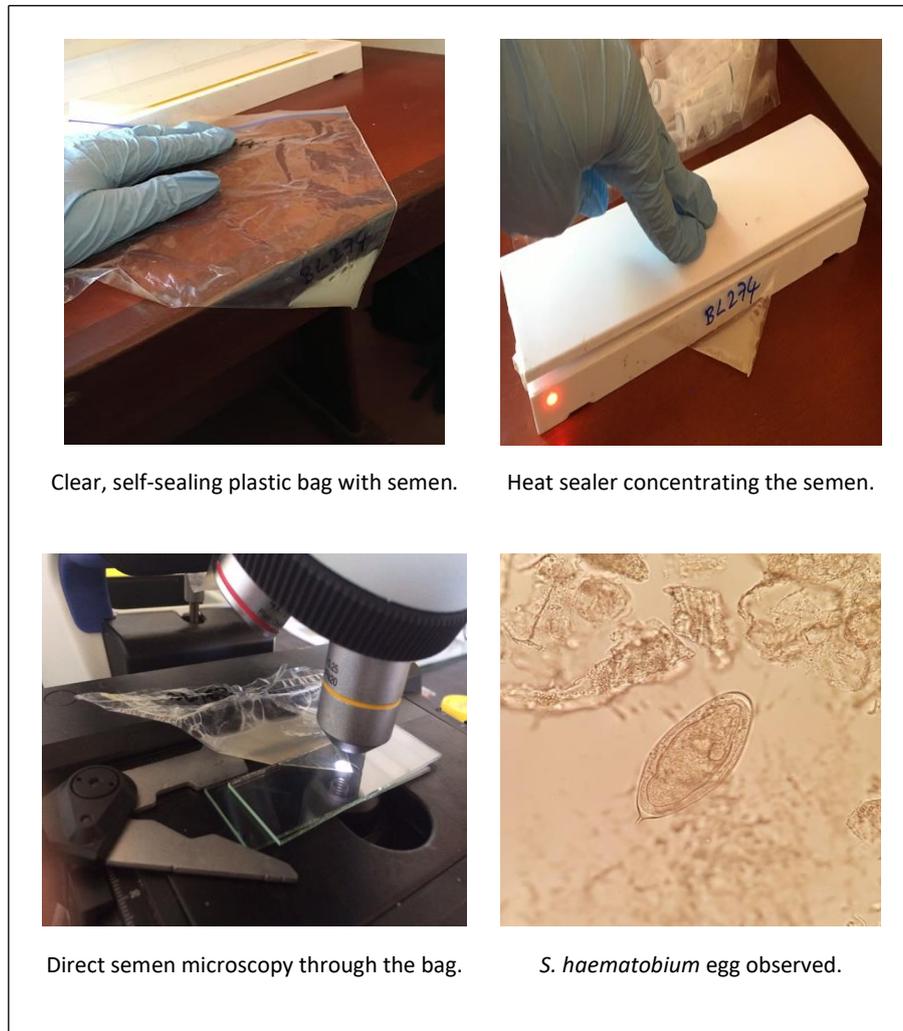


Figure 3: A novel, low-cost clear plastic bag method for semen examination of schistosome eggs.

The prevalence of urine egg-patent infection was 17.1% (n = 210) while MGS, defined by schistosome eggs in semen, was confirmed in 10.7% of the participants (n = 112) who submitted semen, with two-thirds having no eggs in urine. A fifth of the participants who underwent transabdominal and scrotal ultrasonography, had genital pathologies in their prostates, seminal vesicles and testes. At 1-month follow-up study after praziquantel therapy, prevalence of urine egg-patent infection reduced to 11.1%, and no eggs were seen in the submitted semen. Further

molecular analyses are being conducted to describe parameters of MGS and the full results will be widely disseminated at the end of the study.

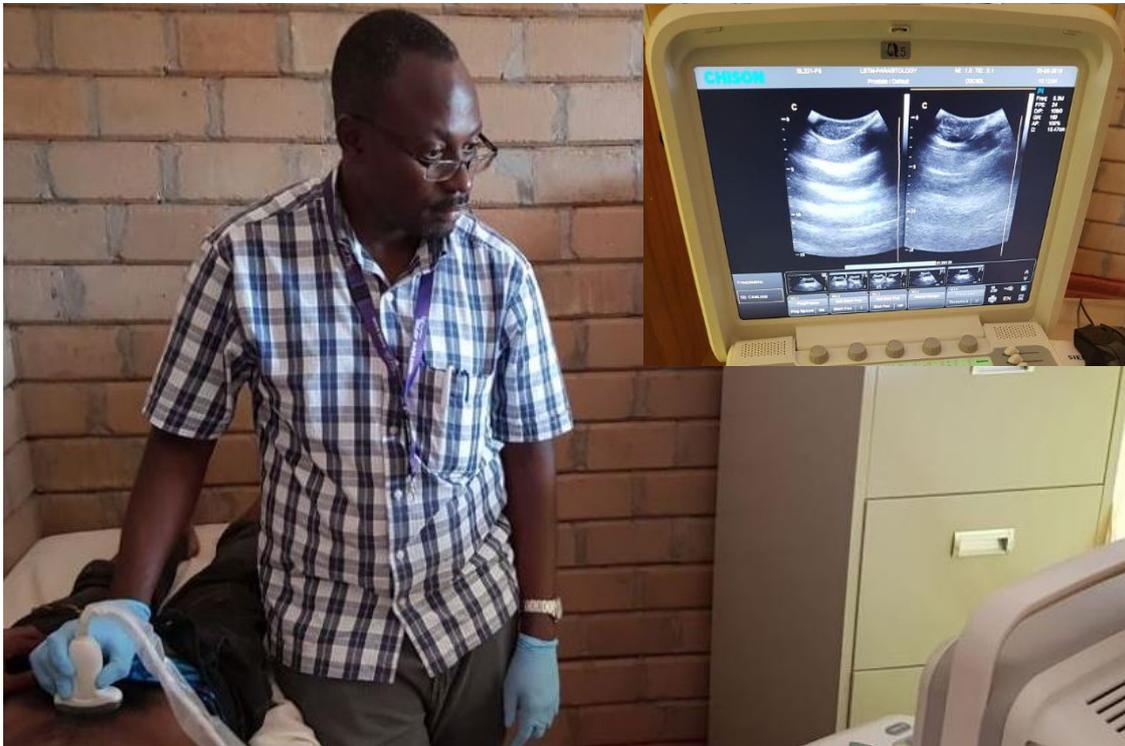


Figure 4: Dr Seke Kayuni performing transabdominal and scrotal ultrasonography on the genital organs of a study participant, insert showing a small hydrocele observed.

In summary, this initial study shows MGS is prevalent among fishermen along Lake Malawi, an area known to be endemic for schistosomiasis, and that the current treatment can clear the infection. These initial findings are encouraging and raise the need for availability and accessibility to appropriate diagnostics and treatment for all people in endemic areas, together with other control interventions.

I wish to thank and acknowledge the British Society for Parasitology (BSP) for the ITFA award which greatly assisted in conducting these essential follow-up studies of this unique longitudinal cohort research of MGS. I would also like to thank my supervisors – Professor J.R. Stothard and Dr. E.J. LaCourse, international and local collaborators, Programme Manager of National Schistosomiasis and STH Control in the Malawi Ministry of Health, the District Health Management Team (DHMT) of

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