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Short Report

Natural infection of *Bulinus senegalensis* by *Schistosoma haematobium* in a temporary pool focus in Niger: characterization by cercarial emergence patterns

C. Vera, F. Mouchet, P. Bremond, A. Sidiki, E. Sellin and **B. Sellin** *Laboratoire des Schistosomiases, CERMES, OCCGE-ORSTOM, B.P. 10887, Niamey, Niger*

The transmission in West Africa of *Schistosoma haematobium* by *Bulinus truncatus* and *B. globosus* is well known (BROWN, 1980). On the contrary, *B. senegalensis*, widely distributed in the sub-desert and sahelian zone and associated principally with a temporary environment (BETTERTON *et al.*, 1983), has been found naturally infected in Senegal and The Gambia only (VERCRUYSSE *et al.*, 1985). In Niger, snail–schistosome infection experiments have proved that *B. senegalensis* is an excellent potential vector of *S. haematobium* originating from the sahelian zone (VERA *et al.*, 1990).

The purpose of this study was to establish and determine the natural role of *B. senegalensis* in the transmission of urinary schistosomiasis. The survey was carried out in 1988 in temporary rain-fed pools near the village of Bomberi, in the western part of Niger, 120 km north-east of Niamey in the south sahelian zone. A parasitological survey of schoolchildren in that village showed a prevalence of urinary schistosomiasis of 83% (77/92).

A fortnightly hand collection of snails (lasting 20 min) was conducted from the time when the ponds filled until their drying up. The schistosomes were characterized by determining the emergence rhythms of cercariae under standardized laboratory conditions by means of a chronocercariometric apparatus (PAGÈS & THÉRON, 1990).

The survey showed that *B. senegalensis* was the only snail species present in the ponds near the village which were used by human populations. That species was also the only one present in ponds located within a range of 10 km around the village. The populations of *B. senegalensis* developed after the filling of the ponds, in late June, and survived until their drying up between October and December.

Only 3 of 600 snails (0·5%) collected in October 1988 released cercariae, characterized by peak emergence between 1200 h and 1400 h.

Studies in our laboratory on several strains from different localities in Niger have shown that the mean shedding time (MST) was between 1200 h and 1400 h for *S. haematobium* and between 0800 h and 1000 h for *S. bovis* and *S. curassoni* (MOUCHET *et al.*, 1990). Our results agree with those obtained by previous workers. For *S. haematobium*, the MST was between 1200 h and 1400 h, whether under natural outdoor conditions in South Africa (PITCHFORD & DU TOIT, 1976) or under experimental conditions identical to ours in Niger (PAGÈS & THÉRON, 1990). Different African strains of *S. bovis* were characterized by an MST between 0800 h and 1000 h under similar experimental conditions (MOUAHID *et al.*, 1987; PAGÈS & THÉRON, 1990).

These results indicate that the chronobiology of cercarial emergence can be used as a reliable character for distinguishing between *S. haematobium* on one hand and *S. bovis* and *S. curassoni* on the other hand. Furthermore, in Niger, *S. curassoni* is present only in the eastern part of the country (MOUCHET *et al.*, 1989). These results consequently allow us to affirm the natural infection of *B. senegalensis* by *S. haematobium* in the focus of Bomberi.

The importance of this temporary rain-fed pool focus, which represents the predominant focus within the sahelian zone and harbours principally *B. senegalensis*, cannot be underestimated in a schistosomiasis control programme because the pools are numerous and can result in a high level of endemicity, as shown in our study. Complementary studies are under way in Niger in order to determine the effective importance of *B. senegalensis* in the transmission of *S. haematobium* within the sahelian region.

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