

ABSTRACT

The host-parasite relationship of an isolate of S. mansoni from Saudi Arabia in its local molluscan host, Bi. arabica and in mice was investigated under various physico-chemical conditions. The first series of experiments included the study of the influence of miracidial dose, exposure temperature and salinity on the infection of Bi. arabica by S. mansoni miracidia. Also the daily pattern of cercarial emergence was observed. The second series of experiments included the investigation of the influence of water temperature, salinity, pH, duration of exposure and cercarial concentration on the infection of Swiss albino mice with cercariae of S. mansoni.

The pre-patent period of S. mansoni in Bi. arabica was found to be 30 to 33 days. The infection rate in snails increased from 10.7% to 50% as the miracidial dose was increased from 1 to 8. Cercarial production was higher in snails exposed to 1 miracidium each than those exposed to 2, 4 and 8 miracidia.

Snails were exposed to S. mansoni miracidia at temperatures ranging from 10° C to 40° C at intervals of 6° C. It was found that water temperature during exposure had an effect on the survival, infection rate and cercarial production in Bi. arabica. No infection of Bi. arabica occurred at 10° C. The infection rate in snails increased from 11.1% to 69.9% as the temperature increased from 16° C to 34° C, respectively and then declined to 13.6% at 40° C. Cercarial production was highest at 34° C and lowest at 40° C.

The effect of salinity on the infection of Bi. arabica with S. mansoni miracidia was investigated at salinities ranging from 0.5 mg/l to 6,000 mg/l. The infection rate in snails was highest at a salinity of 0.5 mg/l and decreased as the salinity was increased to 4,500 mg/l, above which no infection occurred.

The daily pattern of cercarial emergence from infected Bi. arabica was found to be rhythmic, with 94.7% of the total daily cercarial output being released within 6 h. The peak cercarial emergence occurred between 11.00 a.m. and 1.00 p.m.

Swiss albino mice were infected with S. mansoni cercariae at temperatures ranging from 4°C to 40°C at intervals of 6°C. The percentage infection rate in mice was highest at temperatures ranging from 10°C to 34°C. However, the worm burden and worm recovery rate were highest in mice infected with cercariae previously exposed to a temperature of 28°C.

The influence of salinity on the infection of mice was studied at salinities ranging from 0.5 mg/l to 12,800 mg/l. The percentage infection rate was highest in mice infected at salinities of 0.5 mg/l to 1,600 mg/l. No infection of mice occurred at the salinity of 12,800 mg/l. The worm burden and worm recovery rate were highest in mice exposed to cercariae at a salinity of 100 mg/l.

The infection of mice with cercariae of S. mansoni was conducted at pH ranging from 4.4 to 9.4 at intervals of 1. Mice exposed at pH 4.4 and 9.4 did not develop an infection. The percentage infection rate was highest in mice infected at pH 6.4, 7.4 and 8.4. However, the worm burden and worm recovery rate were highest in mice

exposed to cercariae at pH 5.4.

The effects of duration of exposure of a host and cercarial concentration on the infection of mice with S. mansoni cercariae were investigated. It was found that the percentage infection rate, worm burden and worm recovery rate increased as the duration of exposure or cercarial concentration increased.