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STUDIES ON THE BIOLOGY OF *BULINUS TRUNCATUS* UNDER LABORATORY CONDITIONS.*

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ABSTRACT

A two-year laboratory study on the biology (including self-fertilization) of *Bulinus trancatus,* the intermediate host of *Schistosoma haematobium, S. bovis* and *Paramphistomum microbotrium* in Iran, has revealed information on the longivity, reproduction, hatchability rate, hatching time during various months of the year, and growth and mortality rates of this snail.

It was found that the reproduction, hatchability and growth rate of *Bulinus truncatus* increase under condition of self-fertilization.

INTRODUCTION

Information on the biology of *Bulinus truncatus* intermediate-host of *Schistosoma haematobium, S. bovis* and *Paramphistomum microbtrium* in Iran (Arfaa *et al.,* 1962, 1965 and 1967) will certainly be useful in control of this snail and the reduction of the prevalence of the above-mentioned infections.

In the present paper, the results obtained from some biological studies undertaken under laboratory conditions will be discussed.

MATERIAL AND METHODS

Bulinus truncatus collected from schistosomiasis infested area of Khuzestan, south western of Iran, and bred in the laboratory for two years, were used in these studies.

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Twenty snails were placed in each of 20 round glass containers having a diameter of 17.5 cm, a depth of 7.5 cm and a capacity of 2 liters filled with dechlorinated tap water with a PH around 7.

Egg-masses laid on the surface of the glass container and lettuce were checked each day, the number of eggs in each mass were counted and the snail was transfered to a new container.

Information on the number of snails hatched, the time required for hatching, the size of the snails and their changes, mortality rate, the time of the first oviposition among the new generation and the longivity of the snails was collected.

Studies were continued for two years using 400 laboratory bred snails and their offsprings.

Studies on self-fertilization of snails were also conducted by placing each newly hatched Bulinus in a separate container and their offsprings were also isolated in new containers. Data on the number of oviposition, eggs and hatchability rate was collected and recorded. Water temperature during these experiments varied from 17°C in the winter to 31°C in summer.

RESULTS

The longivity of Bulinus depends on the month of its hatching. Snails hatched during the cold months live longer, with a minimum life span of 398 days.

The average number of egg-masses laid by each snail per year, was 44 and the number of eggs 321. The average number of egg-masses per snail during its entire life-span was 50 and, since the average number of eggs per each egg-mass was 7.3 each Bulinus laid about 365 eggs during its life-pan. The hatchability rate of the eggs was found to be 53.7% and thus each Bulinus produced about 169 offsprings during its life-span in the laboratory.

The number of new generation produced each year varied between 3-5 according to the month when the first generation was hatched, being less among snails which hatched their first filials during the winter months.

Temperature had the greatest effect on the activity and productivity of snails (Fig. 1). Maximum time required for the hatching of eggs was found to be 28-30 days in November and December and the minimum was 7 days in June and July (Fig. 1).

The first oviposition takes place when Bulinus reaches a length of 5.5-6mm.

As shown in Fig. 2, the maximum time required for snails to start hatching was 175 days for Bulinus hatched in December and the minimum 48 days for snails hatched in July. Maximum productivity occurred in July and the minimum in January (Fig. 3).

The result of the experiment on self-fertilization for 5 generations are set forth in Table 1. A higher rate of self-fertilization occurs among solitary

Bulinus than among Bulinus kept together in a jar. The average number of egg-masses laid by each solitary snail during its life-span (one year) was 66 and the average number of eggs laid during its life span was 598; the average number of eggs laid during its life span was 598; the average number of eggs per each egg-mass was 9, and the hatchability rate among these snails was 55.2%.

DISCUSSION AND CONCLUSION

The results obtained from these limited studies which are mostly in accordance with findings of other workers (Gaud and Dumpuy, 1955) indicate that the temperature might be the main factor influencing the egg-laying, growth and productivity of *Bulinus truncatus* from Iran bred in the laboratory.

Seasonal variations in the population density of *Bulinus truncatus* in the Bilharziasis endemic area of Khuzestan, southwest Iran reported by Chu *et al.* (1968) which coincid with ourfinding in the laboratory, will cause variations in the transmission of the urinary bilharziasis in the area.

The results obtained from self-fertilization study indicate that the productivity rate is higher among Bulinus kept alone.

This may explain the reason for repopulation of a snail habitat in a short period after mollusciciding.

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Table 1
Egg-laying capacity of self-fertilized
Bulinus truncatus in various generations

Generations	No.of snails	No.of egg-masses	mean eggs/ mass	egg masses /snail (mean)	eggs/ snail (mean)	No.of eggs hatched (mean)	Hatch-ability rate %
2nd	12	86	8	7	695	438	63
3rd	12	111	10	9	1126	538	48
4th	12	78	9	7	716	392	55
5th	12	41	9	3	357	238	67
6th	12	15	7	1	97	47	49
Average	12	66.1	8.5	5.5	598.	330.4	55.2

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