

CONTROL MEASURES AGAINST LYMNAEA CAILLAUDI

BY

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SUMMARY

The moluscicidal effect of some plants and chemicals on the snail intermediate hosts of *Fasciola* sp. in Egypt was tried. It was observed that, the mortality rate have reached its maximum in the concentration of 10 part per million of copper sulphate after 12 hours and at 1.0 ppm of Bayluscide after 24 hs. at room temp. (14 - 23°C). Concerning, the effect of plant extracts it was observed that the leaf infusion of *Amaryllis* at the conc. of 1 : 500 had the mortality rate of 85% after 24 hs., while the bulb infusion was 75%. The infusion of *Ambrosia maritima* (Damsissa) had a lethal effect of 67.5% at a conc. of 1:500 after 24 hs. The molluscicidal effect of *Typha* was 80% after 24 hs., while its rhizomes extracts was 82.5% . In case of *Andropogon citratus* (Lemon grass), the mortality rate was 80% and 47.5% from leaves and rhizomes respectively at a conc. of 1 : 100 after 24 hours.

INTRODUCTION

The snails are the most important group of molluscs which play an important role as intermediate hosts for parasites of man, animals and birds. Therefore, the eradication of these snails is the most important hope nowadays. *Lymnaea* snails are considered one of the most snails which play a role as

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intermediate hosts for *Fasciola gigantica* in Egypt. Ando (1915) pointed out the effect of copper sulphate on different types of snails. Moreover, El-Bahi (1984) summarized the molluscicides tried on different snails in Egypt. So it was very important to try some chemicals and plants in controlling these snails.

MATERIAL AND METHODS

Snails:

The experiments were done on *L. caillaudi* which were collected from the drainage and irrigation channels in Edfina locality, Behera Province. In laboratory, the snails were washed by dechlorinated tap water. Then left for 1/2 - 1 hour in a thin layer of dechlorinated tap water in direct sun light. During that period the active snails measuring 5 - 7 mm in length were used for the experiments. Before the experiments snails were kept for one week in large clay pot containing dechlorinated tap water. Dried lettuceleaves were used for feeding. Every two days the water was recharged.

Chemicals:

Copper sulphate crystals and Bayluscide were used in this investigation. A stock of these chemical was prepared by dissolving 1 gm from the chemical in 1000 ml distilled water. Further dilutions were made as required just prior to the experiment.

Plants:

The tested plants were *Typha angustata* L. (Bardi), *Andropogon citratus* L. (Lemon grass), *Amaryllis vittata* L. and *Ambrosia maritima* L. (Damsissa). The fresh plants were collected, washed well and separated into leaves and rhizomes in case of Bardi and Lemon grass, while the *Amaryllis vittata* separated into leaves and bulbs and the Damsissa used as a whole. They were dried at 50°C in an incubator, and ground into powder.

Infusions from the plants were prepared by soaking 10 gm powder in 100 ml distilled water for 24 hs, then filtered to form a stock solution from which different concentrations were prepared.

Exposure of the snails to molluscicides :

Four replicates of clean cylindrical glass beakers, 150 ml capacity were filled with the test solution for each chemical and plant concentration. 10 snails 5 - 7 mm in length were immersed in each beaker and covered by a wire net to prevent escaping of the snails. The snails were exposed to the tested solutions for 24 hours. The mortality rate in each beaker was recorded after 6, 12 and up to 24 hours and the average of the 4 replicates was taken where the percentage of mortality was calculated. After this, the snails were thoroughly washed in 5 changes of dist. water then in fresh dist. water for a recovery period of 24 hs.

The tested concentrations:

Copper sulphate: 1ppm, 5 ppm, 10ppm, 15 ppm and 20 ppm
Bayluscide: 0.3 ppm, 0.5 ppm and 1.0 ppm. *Bardi*: 1 : 100, 1 : 200 and 1 : 400. *Lemon grass*: 1 : 100, 1 : 200 and 1 : 400. *Damsissa*: 1 : 500, 1 : 1000 and 1 : 1500.

In each experiment similar beakers containing 10 snails in dist. water was used as control.

RESULTS

1- Effect of chemicals on *L. caillaudi*:

a) Copper sulphate

The effect of different concentrations of copper sulphate on *L. caillaudi* were tested under room temp. (14 - 23°C). The mortality rate have reached its maximum in the conc. of 10 ppm after 12 hs. Lower conc. as well as shorter periods gave lower mortality rate.

b) Bayluscide:

The results showed that the lethal effect of Bayluscide have increased with the increase of conc. and exposure period. The mortality rate was 100% in the conc. of 1.0 ppm after 24 hs. Also lower conc. and shorter periods gave lower mortality rate.

2- Effect of plant extracts on *L. caillaudi*:

a. *Amaryllis vittata*:

The molluscicidal effect of the leaf infusion of *A. vittata* at the conc. of 1 : 500 is recognized by the mortality rate of 85% after 24 hs at room temp. (14 - 23°C). While the bulb infusion of the same conc. led to 75% mortality. Lower conc. of both leaf and bulb infusion yield much lower efficacy after 24 hs.

b. *Ambrosia maritima* (Damsissa) :

The infusions of Damsissa had a lethal effect of 67.5% at the conc. of 1 : 500 after 24 hs. at room temp. (14 - 23°C). At the lower conc. of 1 : 1500 the mortality rate was 10% after 24 hs. and no mortality was noted in less than 14 hs. exposure.

c. *Typha angustata* (Bardi) :

The molluscicidal effect of Bardi at a conc. of 1 : 100 leaves infusion for 24 hs. was 80% while its rhizome extracts were 82.5% . At the conc. of 1 : 200 leaves infusion, the mortality rate was 47.5 and 27.5% at the same concentration from the rhizomes infusion. No efficacy was noted at a conc. of 1 : 400.

d. *Andropogon citratus* (Lemon grass):

At a conc. of 1 : 100 from leaves and rhizomes, the mortality rate was 80% and 47.5% respectively after 24 hs at room temp. (14 - 23°C). No efficiency was noted before 12 hs. exposure with the previous tested concentrations. Besides, no efficiency was noticed at a conc. of 1 : 400 after 24 hs. exposure.

DISCUSSION

In the present study it was observed that *Lymnaea caillaudi* snails needed a higher concentration of copper sulphate, Bayluscide, *Amaryllis vittata*, Damsissa, Bardi and Lemon grass as molluscicide in comparison with levels reported against *Biomphalaria* and *Bulinus* spp. The latter appeared to be highly sensitive and died at lower concentrations as noticed by Galal

et al. (1976) . This may be related to the amphiphian nature of Lymnaea snails. Naturally the snails accumulate at the border of water on the mud and when they feel any alterations in the water contents, they were noticed to move faraway of water and probably surround themselves with mucoid material to lessen the effect of such alterations. However Sherif et al. (1962) mentioned that the Lymnaea snails seemed to be more quickly affected by the molluscicides than Biomphalaria and Bulinus snails. Such statment was not observed in the present study.

In the present data the mortality rate have reached its maximum in the concentration of 10 ppm of Cu So₄ after 12 hs. and at 1.0 ppm of Bayluscide after 24 hs. While Fayek and Hassan (1980) reported 100% mortality for *B. alexandarina* at a conc. of 15 ppm after 24 hs. exposur. El-Bahi (1984) recorded 100% mortality at conc. of 10 ppm CuSo₄ and 100% mortality at conc. of 0.5 ppm Bayluscide.

Regarding the use of some plant extracts as molluscicides it was observed that the *Typha angustata* (Bardi) and *Andropogon citratus* (Lemon grass) have a lethal effect on Lymnaea caillaudi snails. The mortality rate was 80% at the conc. of 1 : 100 leaves infusion, it was also noticed that the leaves and rhizomes of Bardi had nearly equal effect on the snails while the rhizomes inncase of lemon grass has less effect than its leaves (47.5%), To the best of out knowledge, this seems to be first time record.

Concerning the effect of *Amaryllis vittata* in the *Lymnaea caillaudi*, it was found that the mortality percent was 85% at 1 : 500 conc. after 24 hs. exposure. Galal et al. (1976) recorded 70% - 90% mortality rate at a conc. of 1:1000 for the *Biomphalaria alex.* and *Bulinus truncatus* snails.

From the present data, *Ambrosia maritima* (Damsissa) showed 67.5% mortality at a conc. of 1 : 500 for 24 hs. Mean-while Sherif et al. (1962) mentioned 100% mortality in less than 10 hs. at a conc. of 1 : 1000 for Lymnaea snails.

The results showed that the tested plants had molluscicidal effects on Lymnaea snails. Among the plants, the *Amaryllis vittata* and the Damsissa had the greatest effect. So we suggest to grow Damsissa and Bardi along the shores of the cannals and drains by this we introduce volovntearily these biological molluscicides to share the snail habitat at the shore water.

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