Molluscicidal Effect of Cassia Occidentalis and Physalis Anguilata Leaf Extract in the Elimination of Water Snail

Haruna Karamba

Abstract—Study describe action of leaf extract of two sub-aquatic plants; cassia occidentalis and physalis anquilata tested against two snails; Bulinus Glabusus and Lymnea natansia, intermediate host of Bilharziasis.

Bilharziasis is a disease prevalent and endemic to tropical Africa. Easiest way to eradicate the disease is to eliminate secondary host. Molluscicidal effect from the plant used investigated. 150 Juveniles snails collected from Jakara Dam. The snails were put inside container and transported to laboratory and kept for 48 hours. Twelve water baths filled with pond water prepared. Leaf extract of the plants obtained by blending and prepared in 10, 20, 30, 40, 50 and 0ppm, as control. Ten snails placed in each of twelve water baths. Treatment maintained for 2 days after the number of living snails counted. Result indicated all plants were lethal to snails.

Conclusively the toxicity of the extract from these plants proved to be lethal to snails.

Keywords— molluscicide, Bilharziasis, Extract, Lethal.

I. INTRODUCTION

Bilharziasis is a parasite infection by a trematode worm acquired from infected water. Also known as schistosomiasis. Species which live in man can produce liver, bladder and gastro intestinal problems. Species of the schistosomiasis parasite which cannot live in man causes swimmer’s itch.

Bilhaziasis is a disease caused by schistosomiasis species which complete. Its life cycle using snails as secondary host and man as primary host, the pathogen is easily spread through body contact with snail infected water. Snail therefore is cardinal in the spread of the disease.

Tropical environment like in Nigeria is a suitable place for the survival of both the pathogen and the secondary host, thus the disease has been endemic to Nigeria. An easy and cheaper way of eliminating the disease is through the eradication of the secondary host. Schistosomiasis is a disease of poverty that leads to chronic ill-health.

Molluscicides are agents toxic to snails (molluscs), which could be used in controlling snail population, although generally harmless to human, some snails, most notably of the general biophalteria or cornelaria are directly implicated in the transmission of schistosomiasis. (Masrton and Hostettman, 1985), which is one of the most widespread disease in tropical and sub-tropical countries. The normal method of controlling the disease is through chemotherapy with orally administered schistosomal drugs.

Molluscicides of plant origin are also biodegradable and has proved to be less harmful to non-target organisms than niclosamide (a synthetic drug) commonly used molluscicides drug. Laboratory tests have demonstrated that the molluscicidal activity of natural latex remain unchanged after storage for 124 days in a close essay tube at room temperature and after 736 days in a close bottle in a refrigerated at 10oC - 12oC. Field test with natural latex in lactic and lotic environment showed 100% mortality on B. globarata and B. tenagophila at concentration of 5 and 12 ppm respectively. (lopez et, al 1994).

An appealing aspect of using natural plants products as molluscicides is that, while they may be highly toxic, they degrade very rapidly when released into the environment (WHO, 1983). The use of plant with molluscicidal properties is a simple inexpensive and appropriate of plant species showing molluscicidal activity is in the family leguminosae, followed by Euphorbiaceaeae, Rubiaceaeae, Polygonaceaeae and composite. A large proportion of the phytolaccaaceae is also highly active, (WHO, 1983). Moreover, the use of indigenous rather than the imported materials is desirable, especially as strategies for Schistosomiasis control programmer should be based on long term operation.

Some herbicides are also molluscicides, and usually kill snail at concentration below the herbicidal level. In some endemic situation (Africa and South – West Asia) weeds are undesirable; one compound can be used to control both weed and snails. The removal of weeds results in a less favorable habitat for the snails which use the vegetation for food, for deposition of eggs and for protection (WHO 1965).

II. METHODOLOGY

One hundred and fifty juvenile snails of similar size and age were collected using flat net from Jakara Dam in Northeastern part of Kano State, Nigeria. The snails were put inside a plastic container containing some pond water transported to the laboratory immediately, where they were transferred into reservoir tank and kept for 48 hours to get acclimatized with the laboratory environment. Twelve water baths 2/3 filled with pond water were prepared and kept in the laboratory. Leaf extract of the plant were obtained by blending and

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homogenizing the 68obtained and prepared in 10, 20, 30, 40 and 50 ppm, in addition to oppm which served as control. Ten snails were placed in each of the twelve water baths. Six water baths for the species of cassia occidentals leaf extract and other six for physalis angulated extract, the treatment combination were maintained for 2days after which the number of living snails present in each water baths were subsequently counted at 2days intervals the result is indicated below:

III. RESULT AND DISCUSSION

The molluscicidal activity of aqueous extract obtained from the natural latex of these plants (cassia occidentals and physalis anguilata) showed the highest percentage of mortality rate at 40 – 50 ppm in both two types of snails respectively. See the table below for each plant.

IV. THE EFFECT OF PHYSALIS ANGUILATA LEAF EXTRACT ON THE SURVIVAL OF SNAIL

The result in Table 1 indicates that both snails were affect by the leaf extract of the (p. anguilata) used. As the concentration of the leaf extract increases, number of death snails also increases with 50ppm having highest number of dead, and therefore mortality rate of 100% in Bulinus spp. However, the effect of the leaf extract on Lymnea was seen to be less intense. Though as the concentration increases so also mortality rate, but the rates was higher (100%) in Bulinus spp compared to the mortality rate of 90% in Lymnea.

V. EFFECT OF CASSIA OCCIDENTAL LEAF EXTRACTION ON SURVIVAL OF SNAILS

The result in table 2 indicated that both species of snails were inhibited by the leaf extract of the plant (C. occidental). As leaf extract concentrations increases so also dead mortality rate increases with 50 ppm having the highest death rate. The effect of the extract on death rate in Lymnea was lower (80%) absolutely compared with (100%) mortality in Bulinus. This was observed also in the effect of P. angulata leaf extract, as indicates in table 1.

### TABLE 1: EFFECTS OF PHYSALIS ANGUILATA LEAF EXTRACT ON MORTALITY RATE OF BULLINUS AND LYMNEA SNAILS SPP.

<table>
<thead>
<tr>
<th>SNAIL SPECIES</th>
<th>EXTRACT CONC. (PPM)</th>
<th>NO. OF DEAD SNAIL</th>
<th>MORTALITY RATE (%)</th>
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<tr>
<td>Bullinus spp</td>
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<td>Lymnea spp</td>
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VI. CONCLUSION

As a result of the health risk possessed by the high rate of Schistosomiasis and the high cost of chemotherapy treatment, the research was carried out to find an easy way of eliminating the disease. Leaf extracts of P. Anguilata, C. Occidentalist were used to eliminate snails & 50PPM were observed to give to 100% mortality rate & therefore can be used to eliminate the snails.

VII. RECOMMENDATION

In the control Schistosomiasis disease, it is important to identify the vector and method of eliminating it, in addition to treatment of clinical cases through chemotheraphy. Particularly in areas endemic to the disease where coincidentally suffers from poverty which is a factor militating agents controlling the disease through conventional chemotheraphy method.

It is therefore suggests that communities can be advised to use the leaf extract in controlling the disease.

### REFERENCES