EVALUATION OF ANTHELMINTIC ACTIVITIES OF AERIAL PARTS OF *Celsia coromandeliane* Vahl AND *Mollugo pentaphylla* Linn.

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ABSTRACT

The anthelmintic activities of different extracts of aerial parts of *Celsia coromandeliane* Vahl and *Mollugo pentaphylla* Linn were evaluated separately on adult Indian earthworm (*Pheritima posthuma*). It was found that petroleum ether (PECC), chloroform (CCC), ethanol (ECC) extract of *C. coromandeliane* and petroleum ether (PEMP), benzene (BMP), ethyl acetate (EAMP), ethanol (EMP) extract of *M. pentaphylla* showed anthelmintic activities at the concentration of 5 mg/ml of each. The anthelmintic effects of CCC, PEMP, BMP and EAMP at 5 mg/ml and PECC at 10-mg/ml concentrations are comparable with that of the effects produced by the reference standards albendazole (10 mg/ml) and piperazine citrate (10 mg/ml).

INTRODUCTION

Helminthic infections are now being recognized as cause of much chronic ill health and sluggishness amongst the tropical people. More than half of the population in the world suffers from worm infection of one or other. Helminthic also affect the domestic animals and livestock causing considerable economic losses. Traditional system of medicine reports the efficacy of several natural products eliminating Helminthic. Keeping this in mind, the present communication deals with the evaluation of anthelmintic activities of aerial parts of *Celsia coromandeliane* Vahl and *Mollugo pentaphylla* Linn.

*Celsia coromandeliane* Vahl (Family: Scrophulariaceae, kuckshima in Bengali, gadar tambaku in Hindi) is common throughout India, found widely in plains of West Bengal, growing as shrubs (1). Various parts of this plant were used in tribal medicine for diseases like insomnia, fever, diarrhoea, dysentery and syphilitic eruptions(2). The plant has been found to possess CNS depressant (3), astringent (2) and antifertility activity (1, 4).

*Mollugo pentaphylla* Linn (Family: Molluginaceae, jalpapra in Bengali, pitagohun in Oriya) is distributed throughout India, Ceylon, Malaysia, China, Japan and Fiji. It is a bitter vegetable, having stomachic, aperients, antiseptic, and antiperiodic properties. An infusion of the plant is given to women to promote the
menstrual discharges (5, 6, 7). On literature survey, it was found that no detailed study has yet been done regarding the anthelmintic property of aerial parts of *C. coromandeliane* and *M. pentaphylla*. On preliminary testing, it was found that petroleum ether, chloroform, ethyl acetate extract of aerial parts of *C. coromandeliane* (PECC, CCC, EACC respectively) and petroleum ether, benzene, ethyl acetate, ethanol extract of aerial parts of *M. pentaphylla* (PEMP, BMP, EAMP, EMP respectively) showed significant anthelmintic activity compared to other extracts of these plants. Hence, in the present study, we have evaluated the anthelmintic activities of PECC, CCC, EACC, PEMP, BMP, EAMP, and EMP to substantiate the folklore claims.

**MATERIALS AND METHOD**

**Plant material**

The aerial parts of *C. coromandeliane* and *M. pentaphylla* were collected during the months of February and August respectively from the Bankura district of West Bengal and were authenticated by Dr H. J. Chowdhury, Joint Director, Central National Herbarium, Botanical Survey of India, Howrah, West Bengal. The voucher specimen has been preserved in our laboratory for further references (DM 1 and DPP 1 respectively). After collection, plant parts were washed properly and fungal infected parts were discarded.

**Preparation of plant extract**

Shade-dried, powdered, sieved (40 mesh size) plant materials were extracted in succession with petroleum ether (60-80°C), benzene, chloroform, ethyl acetate, ethanol and water. The extracts were evaporated to dryness. The trace amount of solvents, which may be present within the solid mass of respective extracts, was removed under vacuum. On preliminary phytochemical analysis, PECC, CCC, EACC showed positive tests for steroid; steroid, alkaloid; steroid respectively. On the other hand, PEMP, BMP, CMP, EAMP gave positive results for the presence of steroid; steroid; steroid, saponin, triterpenoids; triterpenoids respectively (8, 9, 10, 11, 12).

**Evaluation of anthelmintic activity**

Anthelmintic activities were evaluated for each extract separately. The activities were tested according to method described in detail by Ghosh et al. (13). *Pheretima posthuma* (earth worm obtained from Horticulture department) of nearly equal size (8±1 cm) were selected for present study due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings (14, 15, 16).

Each group was treated with one of the following: vehicle (3% Tween 80 in normal saline), Piperazine citrate (15 mg/ml), albendazole (10 mg/ml) and extracts (5 and 10 mg/ml) in normal saline containing 3% Tween 80. Observations were made for the time taken to paralyze and / or death of individual worm up to four hours of test period. Paralysis was said to occur when the worms did not revive even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body color (17, 18).

**RESULTS AND DISCUSSION**

The anthelmintic activities (19, 20) of the title compounds on *Pheretima posthuma* is exhibited in Table 1. The perusal of the data reveals that PECC, CCC, ECC, PEMP, BMP, EAMP and EMP showed anthelmintic activities at 5-mg/ml concentration of each. The activities were found in a dose dependent manner. The anthelmintic effects of CCC, PEMP, BMP
and EAMP at 5-mg/ml concentrations are comparable with that of the effects produced by the reference standards albendazole (10 mg/ml) and Piperazine citrate (10 mg/ml). However, the PECC showed the effect at 10-mg/ml concentrations that is comparable with reference standards.

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Table 1: Anthelmintic activities of *Celsia coromandeliana* Vahl and *Mollugo pentaphylla* Linn.

| Compound          | Concentration (mg/ml) | Time (min) |
|-------------------|-----------------------|------------|
|                   |                       | For paralysis | For death     |
| Control (Normal saline) | 9                     | -          | -             |
| Albendazole       | 10                    | 36.44±0.72   | 63.82±0.76    |
| Piperazine citrate| 10                    | 21.58±0.32   | 138.51±3.10   |
| PECC              | 5                     | 70.21±1.02   | 138.20±2.30   |
|                   | 10                    | 37.14±0.48   | 101.20±1.00   |
| CCC               | 5                     | 41.35±0.50   | 82.37±0.60    |
|                   | 10                    | 7.30±0.23    | 15.25±0.27    |
| ECC               | 5                     | 140.5±2.02   | 201.2±2.50    |
|                   | 10                    | 66.7±0.96    | 105.7±1.05    |
| PEMP              | 5                     | 32.36±0.55   | 46.81±0.61    |
|                   | 10                    | 19.24±0.36   | 45.54±0.31    |
| BMP               | 5                     | 21.45±0.25   | 69.77±0.49    |
|                   | 10                    | 17.05±0.19   | 25.36±0.30    |
| EAMP              | 5                     | 40.17±0.54   | 75.30±0.97    |
|                   | 10                    | 8.13±0.08    | 13.41±0.20    |
| EMP               | 5                     | 120.54±1.95  | 127.31±2.50   |
|                   | 10                    | 60.80±0.75   | 88.5±0.85     |

Results are expressed as mean ± SEM from six observations. PECC, CCC, ECC: petroleum ether, chloroform and ethanol extract of *C. coromandeliana* respectively. PEMP, BMP, EAMP and EMP: petroleum ether, benzene, ethyl acetate and ethanol extract of *M. pentaphylla* respectively.
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