Phytochemical and Anthelmintic Investigation of Leaves of *Glochidion ellipticum* Linn

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Abstract

Worm infections remain a major constraint to livestock productivity across all agro-ecological Zones. Now, the main mode for control of gastrointestinal parasites is based on the synthetic anthelmintic. However, wide spread increase of anthelmintic resistance, scarcity and high cost especially to farmers of low income in developing countries led to the need of other alternative helmint control methods. Among other alternative methods, there is considerable and expanding interest in traditional herbal de wormers. In present communication methanolic and aqueous extracts of leaves of *Glochidion ellipticum* Linn. Flem were investigated for their anthelmintic activity against *Pheretima posthuma* and *Ascardia galli*. Different concentrations were used in the assay, which involved paralysis and death time of the worms. Both the extracts showed significant anthelmintic activity.

Keywords: *Ascardia galli*; *Pheretima posthuma*; leaves of *Glochidion ellipticum* Linn; Piperazine citrate

Introduction

Nature is best combinatorial logical master and conceivably has answers to all contaminations of humanity [1]. Till now, normal thing blends found from restorative plants have given different clinically supportive solutions [2]. In India itself, there are more than 1100 remedial plants grew all around all through wild woods. Of these, precisely 60 genuses are used hugely as traditional herbal de-wormers. In modern medicine, the complex of several natural biologically active metabolites are obliged from accumulated *Glochidion* species, including tannins, glycosides, lignans, terpenoids [5]. There are more than 250 sorts of plant on planet. In long run, significant piece of creature classes are yet to be gotten some data about or must be continued to light of pros. Couple triterpenoids and triterpenoids glycosides and alkaldoids are known not constituents of plants having spot with game-plan *Glochidion* plants having triterpenoid are most exhaustively used for treatment of disease. In India unmistakable supportive plants and their unassuming areas are for most part used for treatment of coordinated issue [5]. *Glochidion ellipticum* Linn. Fever nut; bonduc nut (Family: Euphorbiaceae) commonly known as Nata Karanja (Hindi), is a prickly shrub found throughout the hotter regions of India, Myanmar and Sri Lanka. By performing chemical tests revealed that extract consist of secondary metabolites like diterpines, resins, flavonoinds, tannins and steroids. The main intention of study is to evaluate anthelmintic potential of leaves of *Glochidion ellipticum* Linn.

Materials and Methods

Plant material

The whole plant *Glochidion ellipticum* Linn were collected from karad-patan hills near Satara district of Maharashtra. Plant was authenticated by Dr. Sanjay S. Sathe, department of Botany, Padmabhushan Dr. Vasantraodada Patil Mahavidyalaya, Tasgaon, Dist-Sangli, Maharashtra.

Preparation of extracts

The leaves were collected in summer session, shade dried, powdered and used for extraction. First chlorophyll was removed by treatment of petroleum ether and cold macerated.

Animals

Indian adult earthworms *Pheretima posthuma* & *Ascardia galli* were collected from freshly slaughtered fowls. Both worms were authenticated from Raja Lakhamagouda Science Institute, Belgaum.

Glochidion was seen as kind of family Euphorbiaceae. Similarly lots of studies have been done on *phylanthus* genera on *Glochidion* species in family Phyllanthaceae. Several right hand metabolites were got from accumulated *Glochidion* species, including tannins, glycosides, lignans, terpenoids [5]. There are more than 250 sorts of plant on planet. In long run, significant piece of creature classes are yet to be gotten some data about or must be continued to light of pros. Couple triterpenoids and triterpenoids glycosides and alkaldoids are known not constituents of plants having spot with game-plan *Glochidion* plants having triterpenoid are most exhaustively used for treatment of disease. In India unmistakable supportive plants and their unassuming areas are for most part used for treatment of coordinated issue [5]. *Glochidion ellipticum* Linn. Fever nut; bonduc nut (Family: Euphorbiaceae) commonly known as Nata Karanja (Hindi), is a prickly shrub found throughout the hotter regions of India, Myanmar and Sri Lanka. By performing chemical tests revealed that extract consist of secondary metabolites like diterpines, resins, flavonoinds, tannins and steroids. The main intention of study is to evaluate anthelmintic potential of leaves of *Glochidion ellipticum* Linn.
Evaluation of anthelmintic activity

Activity was performed as per Ajaiyeoba et al. method [6]. The relative biological activity was evaluated on adult Indian earthworm *Pheretima posthuma* [7] & *Ascardia galli* [8]. From three different concentrations alcoholic and aqueous extract (10,100,200 mg/ml in distilled water) was treated for the study of anthelmintic activity (paralysis & death), six worms (same type) were placed in it. Observations were made for both type of worms and the time taken to cause paralysis and death of the individual worms calculated. Mean time for paralysis & death time was recorded; piperazine citrate (10 mg/ml) was used as reference standard [9-11] (Tables 1 and 2).

Table 1 Phytochemical investigation of leaves of *Glochidion ellipticum* Linn.

| S. No | Test        | Present(A)/Absent(P) |
|-------|-------------|----------------------|
| 1.    | Carbohydrates | A                    |
| 2.    | Alkaloids    | A                    |
| 3.    | Glycosides   | A                    |
| 4.    | Diterpenoids | P                    |
| 5.    | Flavonoids   | P                    |
| 6.    | Resins       | P                    |
| 7.    | Tannins      | P                    |
| 8.    | Steroids     | P                    |

Table 2 Anthelmintic investigation of leaves of *Glochidion ellipticum* Linn.

| Sr. No | Compounds          | Conc. (mg/ml) | Time for respective activity |             |             |
|--------|--------------------|---------------|------------------------------|-------------|-------------|
|        |                    |               | Paralysis (P)                | Death (D)   | Paralysis (P) | Death (D)   |
| 1.     | Control            | -             | -                            | -           | -           |
| 2.     | Alcoholic extract LGE | 10           | 26.5 ± 0.56                  | 65.0 ± 0.36  | 29.67 ± 0.42 | 48.22 ± 0.54 |
|        |                    | 100           | 17.0 ± 0.56                  | 45.5 ± 0.42  | 18.92 ± 0.50 | 35.40 ± 0.41 |
|        |                    | 200           | 8.66 ± 0.49                  | 29.5 ± 0.45  | 9.45 ± 0.45  | 29.75 ± 0.55 |
| 3.     | Aqueous extract LGE | 10           | 29.17 ± 0.47                 | 67.83 ± 0.60 | 20.81 ± 0.46 | 51.06 ± 0.58 |
|        |                    | 100           | 19.37 ± 0.71                 | 50.67 ± 0.66 | 12.35 ± 0.45 | 38.25 ± 0.54 |
|        |                    | 200           | 07.66 ± 0.33                 | 32.33 ± 0.65 | 08.10 ± 0.64 | 29.25 ± 0.58 |
| 4.     | Piperazine citrate | 10           | 18.83 ± 0.85                 | 60.33 ± 0.58 | 15.71 ± 0.46 | 41.64 ± 0.75 |

Results and Discussion

Phytochemical screening of leaves of *Glochidion ellipticum* Linn showed the presence of diterpenoids, flavonoids, steroids, tannins and resins. As shown in Table 1, alcoholic and aqueous extract exhibited anthelmintic activity in dose-dependent manner giving shortest time of paralysis (P) and death (D) with 200 mg/ml concentration. The alcoholic extract of leaves of *Glochidion ellipticum* Linn caused paralysis of 8.66 min. and time of death of 29.5 min. while aqueous revealed paralysis of 7.66 and 32.33 min. respectively against the earthworm *Pheretima posthuma*. The reference drug Piperazine citrate showed the same at 18.83 and 60.33 minutes, respectively. *Ascardia galli* worms also showed sensitivity to the methanolic and aqueous extract of leaves of Glochidion ellipticum Linn. The methanolic extract caused paralysis in 09.42 min, death in 29.75 min and the aqueous extract displayed P and D in 08.10 and 29.22 min, respectively at higher concentration of 200 mg/ml. Piperazine citrate did the same at 15.17 and 41.67 min. Piperazine citrate act with its own mechanism of action by increasing chloride ion conductance of worm muscle membrane produces hyper polarization and reduced excitability that leads to muscle relaxation and paralysis.

Discussion

The leaf extract of *Glochidion ellipticum* Linn not only demonstrated paralysis, but also caused death of worms especially at higher concentration of 200 mg/ml in shorter time as compared to reference drug Piperazine citrate. Tannins were shown to produce anthelmintic activities chemically tannins are polyphenolic compounds. The present work was carried out on the *Glochidion ellipticum* Linn which contains tannins. Further
studies are in process to identify the possible phytoconstituents responsible for anthelmintic activity.

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