



EFFECT OF *ARDISEA SOLANACEA* BARK ON ANTHELMINTIC ACTIVITY

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ABSTRACT

This study was aimed to investigate the anthelmintic activity of *Ardisia Solanacea* bark, using Indian earthworm *Pheretima posthuman*. Tribals are traditionally used *Ardisia solanacea* plant for different disease. The hydroalcoholic extraction of *ardisia solanacea* was subjected to preliminary phytochemical screening to find out the major phytoconstituents present in the extraction. Various concentration of extraction (50 mg/dl and 100 mg/dl) were tested which involved determination of paralysis time and death time of the worm. Albendazole (100 mg/ml) was used as standard. Preliminary phytochemical test showed that the extraction contains various phytoconstituents such as alkaloids, tannins, flavonoids, saponins, carbohydrates. The result of the study reveals the dose dependent anthelmintic activity of hydroalcoholic extract of *Ardisia solanacea* bark. Further investigation is needed to find out the specific constituent which is responsible for anthelmintic activity.

KEYWORDS; *Ardisia solanacea*, *pheretima posthuma*, phytoconstituents, anthelmintic activity, Albendazole, hydroalcoholic extract.

INTRODUCTION

Helminth infections are among the most widespread infections in human, distressing a huge population of the world. The GIT Helminthes becomes resistant to currently available anthelmintic drugs therefore there is foremost problem in Helminthes disease. Hence nowadays the demand of natural anthelmintics increases.^[1]

Anthelmintics are a group of antiparasitic drug that expel parasitic worms (helminths) and other internal parasites from the body by either expel or killing them, without causing significant damage to host. They may also be called vermifuges (expel) or vermicides (kill). Anthelmintics are used to treat people who are infected by helminths a condition called helminthiasis.^[2]

Ardisia solanacea is a large evergreen shrub. It is a native of moist ravines and forests almost throughout India. It is also found in the Himalayas, at altitudes of 200 – 1100m. Traditionally it is used for wound healing, GI disorder, antimicrobial activity, diarrhoea, rheumatism, cancer, ulcer.^[3-5]

MATERIALS AND METHODS

Preparation of plant extract

The fresh bark of *Ardisia solanacea* was collected from Wayanad, Kerala. The authenticated plant was cleaned

and dried under shade condition the dried bark material. The grinded powder was subjected to hydroalcoholic Soxhlet extraction using ethanol and water in the ratio of 7:3. The extract was dried and percentage yield was checked.^[6]

Preliminary phytochemical analysis

Hydroalcoholic extract of *Ardisia solanacea* bark were subjected to qualitative chemical test for the detection of various plant constituents.^[7-8]

Experimental worm

Due to its anatomical resemblance with the intestinal roundworm parasites of human beings Indian adult earthworm (*pheretima posthuma*) was used in this anthelmintic assay.

Anthelmintic assay

In anthelmintic assay, all formulation and standard drug preparations were freshly prepared before starting the experiment. For the present study equal sized earthworm were used as two earth worms in each group. *Pheretima posthuma* was placed in petri dish containing two different concentrations (50 & 100 mg/dl) of hydroalcoholic extract of *Ardisia solanacea* bark and standard (100 mg/ml).

Group 1: control (normal saline)

Group 2: standard (albendazole 100 mg/ml)

Group 3: hydroalcoholic extract of *Ardisia solanacea* bark (low dose 50 mg/ml)

Group 4: hydroalcoholic extract *Ardisia solanacea* bark (high dose 100 mg/ml)

Observations were made for the time taken for paralysis and death of individual worm. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that the worms neither moved when shaken vigorously nor when dipped in warm water at 50°C followed with fading of their body colour.^[9-10]

Statistical analysis

All the data were expressed as the mean \pm standard error of the mean (SEM). The statistical significance of the difference between the groups was analysed by using Graphpad 5.0 software (GraphPad, SanDiego, USA) by applying one way Analysis of Variance (ANOVA) followed by Tukey's multiple comparison test as post hoc. The values of $P < 0.05$ was considered to be statistically significant.^[11]

RESULTS

Extraction

The percentage yield of hydroalcoholic extract of *Ardisia solanacea* was found to be 20% w/w.

Preliminary phytochemical screening

Preliminary phytochemical analysis of the hydroalcoholic extract of *Ardisia solanacea* showed the presence of different phytoconstituents and is depicted in Table-1

Table – 1 observation table for phytochemical test of hydroalcoholic extract of *Ardisia solanacea*.

Sl.no	Phytoconstituents	Presence
1	Alkaloids	+
2	Flavanoid	+
3	Tannins	+
4	Saponins	+
5	Carbohydrates	+

Anthelmintic activity assay

The time taken for paralysis and death of earthworm after treating with control, test, standard is depicted in table -2.

Table -2: Anthelmintic activity of hydroalcoholic extract of *Ardisia solanacea* bark.

Group	Treatment	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
I	Control	-	-	-
II	Standard	100	16.41 \pm 0.0750 ^a	24.44 \pm 0.0900 ^a
III	Formulation (Low Conc.)	50	39.10 \pm 0.0350 ^{adg}	51.84 \pm 0.4900 ^{adg}
IV	Formulation (High Conc.)	100	21.36 \pm 0.1850 ^{adg}	30.42 \pm 0.1700 ^{adg}

Results expressed as Mean \pm SEM; (n=2)

^a $P < 0.001$, ^b $P < 0.01$, ^c $P < 0.05$, when all groups were compared with control;

^d $P < 0.001$, ^e $P < 0.01$, ^f $P < 0.05$, when all groups were compared with standard;

^g $P < 0.001$, ^h $P < 0.01$, ⁱ $P < 0.05$, when formulations were compared with each other.

Results expressed as Mean \pm SEM

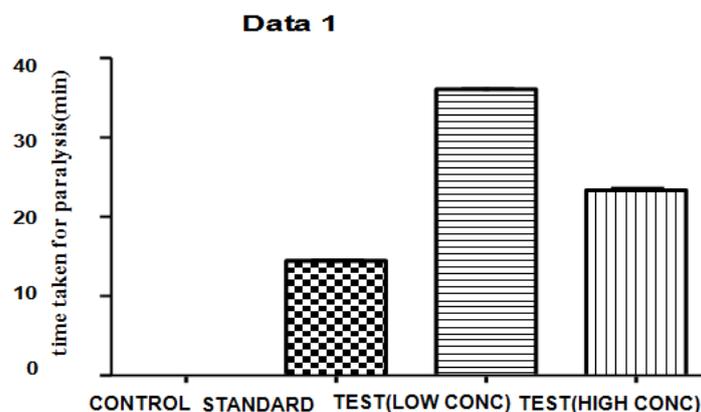


Figure 1: Graphical representation for the anthelmintic activity of different treatment groups (Paralysis)

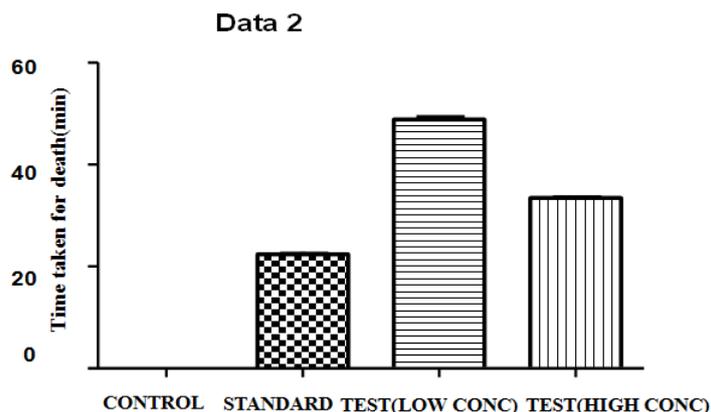


Figure 2; Graphical representation for the anthelmintic activity of different treatmentgroup (death)

DISCUSSION

The helminths are worm like parasites. Today large portions of the world's population are affecting helminthic infections. In developing countries, they pose a major threat to public health and contribute to the prevalence of malnutrition, anaemia, eosinophilia and pneumonia. Anthelmintics are drugs that either kill or expel infesting helminths.

The aim of the present study was to carry out the preliminary phytochemical screening of hydroalcoholic extract of *Ardisia solanacea* bark and to evaluate the anthelmintic activity of the same. Phytochemical analysis of the extract was carried out in order to find out the various phytochemical constituents present in *Ardisia solanacea* bark and to evaluate the anthelmintic activity of the same.

Phytochemical analysis showed that *Ardisia solanacea* bark contain tannins, flavonoids, carbohydrates, alkaloids, saponins. These constituents were shown to possess anthelmintic activity. Tannins are found to bind to glycoproteins on the cuticle of the parasite and cause death and this might be the reason for the anthelmintic activity of the hydro alcoholic extract of *Ardisia solanacea* bark.

The anthelmintic activity showed that the hydroalcoholic extract of *Ardisia solanacea* bark possessed a dose dependent anthelmintic activity which was comparable to that of the standard drug. From this study, it can be concluded that hydroalcoholic extract of *Ardisia solanacea* bark have potent anthelmintic activity. Further research is required for finding the exact phytoconstituent which is responsible for the anthelmintic activity.

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