

Synergistic Anthelmintic Activity of Leaf Extract of *Andrographis Paniculata* with other Plant Extracts

Rajamanickam.V, Sivakumar.V

Arulmigu Kalasalingam College of Pharmacy, Krishnankoil, India

Abstract- The prevalence of worm infestation is high in underdeveloped and developing countries because of poor sanitation and lack of health education. Our study was aimed to search out the individual and synergistic result of *andrographis paniculata* (Family: Acanthaceae), *coriandrum sativum* (Family:Apiaceae), *curcuma longa*(Family: Zingiberaceae), *ocimum sanctum*(Family: Lamiaceae), *phyllanthus emblica*(Family: Phyllanthaceae) and *trigonellafoenum-graecum*(Family: Fabaceae) extract as a result of they need been used historically for the treatment of worm infestation. Additional exploring the phytoconstituents gift within the herbs of the polyherbal formulation can aid us within the bioactivity gift.

Various concentration of ethanolic extracts of varied herbs and therefore the polyherbal formulation were subjected for assessment of anthelmintic activity in *Pheritima posthuma*. Time of dysfunction associated time of death was used as an analysis parameter. helminthic change state (10 mg/ml) was used as a customary drug. Phytochemical take a look at discovered the presence of alkaloids, flavanoids, glycosides, carbohydrates, phenolic compounds and tannins. Concentration dependent anthelmintic result was discovered with the extract. once one hundred mg/ml concentration of ethanolic extracts of the polyherbal formulation was more it showed dysfunction of take a look at worm (earthworm) at eight minutes and death at fifteen minutes. The combination of two plant extracts has shown substantial anthelmintic activity exploitation in vitro model on earthworms which can be attributed to the polyphenols gift within the extract.

I. INTRODUCTION

India is one of the world's leading biodiversity with the presence of over 45000 different plant species. India is perhaps the largest producer of medicinal herbs & is rightly called the botanical garden of the world. Medicinal herbs have been for thousands of years is one form or another under the indigenous systems of medicine like Ayurveda, siddha, unani since independence in 1947. India had made tremendous progress in agro technology standardization, quality control & research development etc.¹⁻⁴

The world has received greater attention in recent time because of its diversity of curing diseases, safety & well

tolerated remedies compared to the conventional medicines. The herbs natural combination of constituents as a whole or naturally occurring remedies which has proved to be more effective & safer than conventional medicines.⁵⁻⁷

The ability of herbal medicine to affect the body systems depends on the chemical constituents that it contains. Research on isolated plant constituents are of greater importance.

The study of diseases & their treatment must also have been contemporaneous with the dawn of the human intellect.

It is well known plant generally own their virtues as medical agents to certain characteristic alkaloid & principles present in them because a complete & full chemical analysis of the medicinal plants of India have not yet been performed.⁸⁻¹⁰

In the present study, we investigate the anthelmintic activity of ethanolic extracts of *andrographis paniculata*, combined with *coriandrum sativum*, *curcuma longa*, *ocimum sanctum*, *phyllanthus emblica* and *trigonellafoenum-graecum*.

II. MATERIALS AND STRATEGIES

The leaves powdery material was extracted by continuous hot extraction methodology exploitation Soxhlet equipment. Powdery leaves were taken in a very white textile and through the flask containing 500ml of boiling volatile solvent fermentation alcohol and maintain temperature at 70°C. The vapour arising within the flask passes by the aspect tube into the condenser. The soluble matter dissolved from the drug within the extractor remaining within the flask. Finally, the soluble matter was distillates then evaporate to xerotes in china dish exploitation heating mantle at temperature 70°C.

The preliminary photochemical analysis of leaves of *andrographis paniculata*, *coriandrum sativum*, *curcuma longa*, *ocimum sanctum*, *phyllanthus emblica* and *trigonellafoenum-graecum* showed the presence of alkaloids, flavonoids, glycosides, carbohydrates, polyphenol compounds and tannins.¹¹⁻¹⁵

Preliminary Phytochemical Studies

S.no	Extracts	Alkaloids	Carbohydrate	Tannins	Volatile oils	Glycoside	Phyosterols	Triterpene	Flavonoids	Phenolic Compounds
1.	AP	+	+	-	-	-	+	+	+	+
2.	APO	+	+	-	+	+	+	+	+	+
3.	APC	+	+	+	+	-	+	+	+	+
4.	APE	+	+	-	+	+	+	+	+	+
5.	APL	+	+	+	+	+	+	+	+	+
6.	APF	+	+	+	-	+	+	-	+	+

AP: *Andrographis paniculata*

O: *Ocimum sanctum*

C: *Coriandrum sativum*

E: *Phyllanthus emblica*

L: *Curcuma longa*

F: *Trigonella foenum-graecum*

Anthelmintic activity¹⁶

Worm: *Pheritima posthuma* Control: solution

Cluster I: AP extract Cluster II: APO extract Cluster III: APC extract Cluster IV: APE extract Cluster V: APL extract Cluster VI: APF extract

Procedure:

The methodology delineated by Dashetal was used for evaluating anthelmintic activity. *Pheritima posthuma* (obtained from gardening department, Madurai, Tamilnadu, India) of roughly equal size (15 cm) was divided into nineteen teams. Every cluster consists of six earth worms of same kind and treated with any of the subsequent.

Fifty ml of take a look at resolution containing twenty, fifty and one hundred mg /ml of take a look at extracts and helminthic change state (10mg/kg).

The mean solar time of dysfunction and death was recorded in minutes. The dysfunction time was recorded once no movement of any kind might be discovered except once the worms were agitated smartly. Time for death of worms was recorded, once worms were neither moved whereas agitated smartly, nor once lordotic in heat water (50°C).

Anthelmintic activity of extracts

Category	Dose	Time of paralysis Mean ± S.E.M (min)	Time of death Mean ± S.E.M (min)
Piperazine citrate	20 mg/ml	15±0.74	31±0.28
AP	20 mg/ml	28±0.74	49±0.28
	50 mg/ml	24±0.36*	45±0.87*
	100 mg/ml	17±0.55*	35±0.70*
APO	20 mg/ml	15±0.65	31±1.76
	50 mg/ml	11±1.40*	23±1.63
	100 mg/ml	08±0.56*	15±0.56*
APC	20 mg/ml	28±0.48	55±0.45
	50 mg/ml	25±1.63	47±0.54*
	100 mg/ml	22±0.52*	42±0.32*
APE	20 mg/ml	39±1.86	55±0.75
	50 mg/ml	33±1.42	49±0.61*
	100 mg/ml	28±0.62*	45±0.72*

APL	20 mg/ml	17±0.49	33±1.25
	50 mg/ml	12±0.60*	24±1.93
	100 mg/ml	08±0.56*	17±0.72*
APF	20 mg/ml	16±1.71	32±0.65
	50 mg/ml	12±1.63	24±0.54*
	100 mg/ml	08±0.54*	16±0.32*

Student 't' test take a look at, *P< 0.001 (Compared to standard) was thought of important.

III. RESULTS & DISCUSSION

The preliminary phytochemical analysis of leaves of *andrographis paniculata*, *coriandrum sativum*, *curcuma longa*, *ocimum sanctum*, *phyllanthus emblica* and *trigonellafoenum-graecum* showed the presence of alkaloids, flavonoids, glycosides, carbohydrates, phenolic compounds and tannins.

The APO, APL and APF extracts showed significant anthelmintic activity. *Andrographis paniculata* extract at the concentration of 20 mg/ml showed the time of paralysis and death at 28 min. and 49 min. respectively. For concentration of 50mg/ml, the paralysis and the death time was found 24 min. and 45 min. respectively. At the concentration of 100 mg/ml, time was 17 min. for paralysis and 35 min. for death. The observations with piperazine citrate showed that time of paralysis and death was 15 min. and 31 min. respectively for concentration at 20 mg/ml). In case of combination of plant extracts (*andrographis paniculata* and *ocimum sanctum*), the time of paralysis and death was 15 min. and 31 min. respectively at concentration of 20 mg/ml. At concentration of 50 mg/ml, the time of paralysis and death was 11 min. and 23 min. respectively and at 1000 mg/ml concentration, the time of paralysis and death was 8 min. and 15 min. respectively.

Amongst the extracts, *Andrographis paniculata* showed better activity in combination with *Ocimum sanctum*. Anthelmintic activity of *Andrographis paniculata* was enhanced in the presence of *Ocimum sanctum*. The anthelmintic activity of *Andrographis paniculata* and *Ocimum sanctum* may be due to the synergetic effect of active phyto-constituents i.e. polyphenols, alkaloids, saponins, flavonoids, terpenes, steroids, etc. present in the extracts.

Although altogether experimental concentrations there's variation within the time to paralyze the worms, however once it gets paralytic, it took terribly short time for the parasites to die. this might be prompt that combination of plant extracts possesses vermifugal activity in nature and will exert a reversible action on the contractor system of the worms and therefore the inactiveness caused would lead the parasite to be swept back out of the host's body

Dose-dependent effectiveness was additionally discovered with exposure to numerous concentrations of every combination, as a rise in concentration, shortens the dysfunction amount.

IV. CONCLUSION

Thus, these plants besides having vermifugal/vermicidal activity additionally showed a synergistic result once treated together.

The polyherbal formulation has shown substantial anthelmintic activity exploitation in vitro model on earthworms which can be attributed to the polyphenols gift within the extract.

REFERENCE

- [1] Gazi Shaikh (2012) International journal of ayurvedic & herbal medicine 2(3) June.
- [2] American Family Physician (2013) www.aafp.org/afp Volume 87, Number 9 May 1,
- [3] Menter A, Gottlieb A, Feldman SR.(2008) Guidelines of care for the management of psoriasis and psoriatic arthritis: Section 1. Overview of psoriasis and guidelines of care for the treatment of psoriasis with biologics. J Am Acad Dermatol. 58(5):826-850.4. Dung NX, Truong PX, Ky PT, Leclercq PA. Constituents of the leaf oil of *Curcuma domestica* L. from Vietnam. J. Essential oil Res; 1997. p. 677
- [4] Mathan C Nisha, Sevanan Rajeshkumar. (2010) Survey of crude drugs from Coimbatore city. Indian Journal of Natural Products and Resources, 1(3): 376-383.5.
- [5] Nambiar, V., Seshadri, S.(2001) Retention of total and beta carotene from fresh radish leaves in steamed, sautéed and baked products of Western India. J Food Science Techn. 38 (5): 458-461.
- [6] Nambiar, V., Bhadalkar, K., Daxini, M.: Drumstick leaves in the ICDS-SFP. Ind J Peadiat.(1997) 70 (5):11-15 (2003). Richmond R, Pombo-Villar E Chromatogr. A. Gas Chromatography-Mass Spectrometry coupled with Pseudo-Sadtler retention indices for the identic cation of components in the Essential Oil of *Curcuma longa* Chromatogr. A. p. 303.
- [7] Colombo AL, Nucci M, Park BJ, Nouér SA, Arthington-Skaggs B, (2006) Epidemiology of candidemia in Brazil: a nationwide sentinel surveillance of candidemia in eleven medical centers. J Clin Microbiol 44: 2816–2823.
- [8] Pfaller M, Neofytos D, Diekema D, Azie N, Meier-Kriesche H, et al. Epidemiology and outcomes of candidemia in 3648 patients: data from the Prospective Antifungal Therapy (PATH Alliance) registry, 2004–2008. Diag Microbiol Infect Dis 74: 323–331. (2012)
- [9] Messer SA, Moet GJ, Kirby JT, Jones RN (2009) Activity of contemporary antifungal agents, including the novel echinocandin Anidulafungin, tested against *Candida* spp., *Cryptococcus* spp., and *Aspergillus* spp.: Report from the SENTRY Antimicrobial Surveillance Program (2006 to 2007). Clin Microbiol J 47: 1942–1946. doi: 10.1128/jcm.02434-08
- [10] Garg SN, Bansal RP, Gupta MM, Kumar S. (1999) Variation in the Rhizome Essential Oil and Curcumin contents and oil quality in the land races of turmeric, *Curcuma longa* of North Indian Plains. Flavour Fragr. J.; p.315-8.

- [11] Joglekar GV, Chaudhary NY & Aiman R. (1959) Effect of indigenous plant extracts on glucose-absorption in mice. *Indian Journal of Physiology and Pharmacology*, 3: 76
- [12] Zachariah TJ, Baby KN. (1992) Effect of Storage of fresh turmeric Rhizome on Oleoresin and Curcumin contents. *J. Spice Arom. Crops*; p. 55-58.
- [13] Shah NC.(1997) Traditional use of Turmeric (*Curcuma longa*) in India *J Med Arom Plant Sci.*; p. 948-95.
- [14] Kumar V. *The Pharma Review Clinical Trials in India: Balancing Economic Opportunity with the Public Health Context*. Kongposh Publication Pvt. Ltd. New Delhi.
- [15] Swiggarm AA, Silverstein RM. (1987) *Monoterpenes*, Aldrich Chemicals Co. Inc.: Milwaukee, WI,
- [16] Dwivedi S., Dwivedi A., Kapadia R. and Kaul S.(2008) Anthelmintic activity of alcoholic and queous extract of fruits of *Terminalia chebula*Retz., *Ethno. Leaflets*,12:741-743.