



AN UPDATED REVIEW ON ANTHELMINTIC MEDICINAL PLANTS

Raj Kumar*, A. Elumalai, M.Chinna Eswaraiyah

*Department of Pharmacognosy, Anurag Pharmacy College, Ananthagiri (v), Kodad (M), Nalgonda (DT), Andhra Pradesh, India, 508 206. Email: chirra.rajkumar64@gmail.com

Received on: 07/01/12 Revised on: 15/02/12 Accepted on: 23/02/12

ABSTRACT

Medicinal plants are part and parcel of human society to combat diseases, from the dawn of civilization. There exists a plethora of knowledge, information and benefits of herbal drugs in our ancient literature of Ayurvedic (Traditional Indian Medicine), Siddha, Unani and Chinese medicine. According to the World Health Organization, 2003 about 80 % of the population of developing countries being unable to afford pharmaceutical drugs rely on traditional medicines, mainly plant based, to sustain their primary health care needs. Herbal medicines are in great demand in the developed as well as developing countries for primary healthcare because of their wide biological and medicinal activities, higher safety margins and lesser costs. In this review we have enlisted the updated anthelmintic medicinal plants which are used as good alternatives for the traditional allopathic anthelmintic agents.

Key words: Traditional Indian Medicine, primary healthcare, anthelmintic medicinal plants

INTRODUCTION

Helminthic infections are among the most common infections in human beings, affecting a large proportion of the world's population. In developing countries they pose a large threat to public health and contribute to the prevalence of anaemia, malnutrition, eosinophilia and pneumonia¹⁻³. The helminthes which infect the intestine are cestodes e.g. Tape worms (*Taenia solium*), nematodehook worm (*Ancylostoma duodenale*), round worm (*Ascaris lumbricoids*) and trematodes or flukes (*Schistosoma mansoni* and *schistosoma haematobium*). The diseases originated from parasitic infections causing severe morbidity include lymphatic filariasis, onchocerciasis and schistosomiasis. These infections can affect most populations in endemic areas with major social and economic consequences. The traditional medicines hold a great promise as source of easily available effective anthelmintic agents to the people, particularly in tropical developing countries, including India⁴. It is in this context that the people consume several plants or plant derived preparations to cure helminthic infections. Ideally an anthelmintic agent should have broad spectrum of action, high percentage of cure with a single therapeutic dose, free

from toxicity to the host and should be cost effective .none of the synthetic drug meets this requirement. Even the most common drugs like Piperazine salts have been shown to have side effects like nausea, intestinal disturbances and giddiness, resistance of the parasites to existing drugs and their high cost warrants the search for newer anthelmintic molecules⁵⁻⁷. The origin of many effective drugs is found in the traditional medicine practices and in view of this several researchers have under taken studies to evaluate folklore medicinal plants for their proclaimed anthelmintic efficacy. Most of the screenings reported are in vitro studies using some worm samples like Indian earth worm *Pheretima posthuma*, *Ascardia galli*, *Ascaris lumbricoides* etc. Adult Indian earthworm, *Pheretima posthuma* has been used as test worm in most of the anthelmintic screenings, as it shows anatomical and physiological resemblance with the intestinal round worm of parasite of human beings. Because of easy availability, earthworms are used as suitable models for screening anthelmintic drug⁸.

In this present review, we discussed the different anthelmintic plants are scientifically reported by various researchers during jan-dec 2011.

Table 1: List of anthelmintic plants

Botanical name	Family	Parts used	Extracts used	Chemical constituents	References
<i>Acacia Suma</i> Roxb	Fabaceae	Bark	Chloroform, pet. ether	Gallo-catechin	Acharya Suman et al ⁹
<i>Acalypha Fructicosa</i>	Euphorbiaceae	Whole Plant	Methanol	Tannins, flavonoids	Lakshmyopathy et al ¹⁰
<i>Acalypha indica</i> Linn	Euphorbiaceae	Leaves	Pet. ether, alcohol	Alkaloids, saponins	Garai Ranju et al ¹¹
<i>Aegle marmelos</i> Linn	Rutaceae	Fruits	Ethanol	Tannins	Bhawana Sati et al ¹²
<i>Ailanthus excelsa</i> Roxb	Simaroubaceae	Bark	Ethanol	Alkaloids, flavonoids	Kasarwala et al ¹³
<i>Anemone vitifolia</i> Var	Ranunculaceae	Root	Ethanol	Glycosides, alkaloids	Bhawana Sati et al ¹⁴
<i>Barringtonia acutangula</i> Gaertn	Lecythydaceae	Leaves	Ethanol	Terpenoids, tannins	Padmavathi et al ¹⁵
<i>Bauhinia purpurea</i> Linn	Fabaceae	Whole Plant	Acetone	Leutin	Kumar et al ¹⁶
<i>Bauhinia racemosa</i> Linn	Fabaceae	Whole Plant	Pet. ether, ethanol, Aqueous	Kaempferol, coumarins, steroids	Tekeshwar kumar et al ¹⁷
<i>Caesalpania pulcherrima</i> Linn	Leguminaceae	Flowers	Ethanol, Pet. Ether	Di-terpenoids	Dhaked et al ¹⁸
<i>Cassia tora</i> Linn	Fabaceae	Leaves	Aqueous, ethanol	Alkaloids, saponins	Bimlesh kumar et al ¹⁹
<i>Cissampelos pareira</i> Linn	Menispermaceae	Leaves	Aqueous	Alkaloids, saponins	Shukla et al ²⁰
<i>Citrus acurantium</i> Linn	Rutaceae	Fruit juice	Water	Alkaloids, steroids	Bidker et al ²¹
<i>Cymbopogon Martinii</i> Roxb	Poaceae	Leaves	Aqueous	Geraniol	Katiki et al ²²
<i>Cymbapogon schoenanthus</i> Linn	Poaceae	Leaves	Aqueous	Geraniol	Katiki et al ²²
<i>Clerodendrum phlomidis</i> Linn	Verbanecaea	Aerial parts	Methanol, Ethyl acetate	Tannins, flavonoids, terpenoids	Vincent et al ²³

<i>Corallocarpus epigaeus</i> Rottl	Cucurbitaceae	Roots, rhizomes	Aqueous, methanol	Ketodiol, carpenoyl ester	Shri Vijaya Kirubha et al ²⁴
<i>Clitoria ternatea</i> Linn	Fabaceae	Leaves	Aqueous, Ethanol	Alkaloids, aminoacids	Bimlesh Kumar et al ²⁵
<i>Ficus bengalensis</i> Linn	Moraceae	Fruits	Aqueous extract	Alkaloids, flavonoids	Mukesh kumar singh et al ²⁶
<i>Gymnema Sylvestre</i> R.Br	Asclepiadaceae	Leaves	Methanol	Triterpenoids,	Lakshmipathi raj et al ²⁷
<i>Jalans regia</i> Linn	Juglandaceae	Leaves	Pet. ether, methanol, Aqueous	Tannins, saponins	Das et al ²⁸
<i>Lawsonia inermis</i> Linn	Lythraceae	Leaves	Pet. ether	Lawson	Bairagi et al ²⁹
<i>Leptadenia pyrotechnica</i> Forssk	Asclepiadaceae	Stem	Methanol	Flavonoids, glycosides	Sunil kumar et al ³⁰
<i>Maduca Indica</i> Linn	Sapotaceae	Flowers	Methanol Ethanol	Alkaloids	Kativar et al ³¹
<i>Manihot esculenta</i> Linn	Euphorbiaceae	Leaves	Pet. ether, methanol, aqueous	Glycosides	Jayasri et al ³²
<i>Murraya koengil</i> Spreng	Rutaceae	Leaves	Alcohol, Pet. ether	Girinimbine	Khuntia et al ³³
<i>Neolamarckia cadamba</i> Linn	Rubiaceae	Bark	Methanol, chloroform, Pet. ether	Indole alkaloids	Mondal et al ³⁴
<i>Pandanus fascicularis</i> Linn	Pandanaceae	Leaves	Ethyl acetate, ethanol	Tannins, saponins	Nayak bhabani shankar, Jena prabhat kumar ³⁵
<i>Parkia Biglobosa</i>	Fabaceae	Leaves	Aqueous	Alkaloids, saponins	Soetan and lasisi ³⁶
<i>Prosopis cineraria</i> Linn	Mimosaceae	Bark	Pet. ether, methanol	Fixed oils	Velmurugan et al ³⁷
<i>Sapindus trifoliatus</i> Linn	Sapindaceae	Seeds	Methanol	Saponins, flavonoids	Chaitanya Sravanthi et al ³⁸
<i>Saraca indica</i> Linn	Caesalpinaceae	Leaves	Ethanol, methanol	Tannins, glycosides	Sarojini nayak et al ³⁹
<i>Sesbania grandiflora</i> Linn	Fabaceae	Bark	Methanol Pet. ether	Alkaloids, tannins	P Karbuike et al ⁴⁰
<i>Spondias pinnata</i> Linn	Anacardiaceae	Bark	Ethanol Acetone	Glycosides	Panda B.K et al ⁴¹
<i>Symplocos racemosa</i>	Symplocaceae	Bark	Ethanol	Colloturine , Glycosides	Narasimha Rao et al ⁴²

CONCLUSION

Traditional systems of medicine are popular in developing countries and upto 80% of population relies on traditional medicines or folk remedies for their primary health care needs. Herbal medicines are in great demand in the developed as well as developing countries for primary health care because of their wide biological and medicinal activities, higher safety margins and lesser costs. The present review study give evidential explore mechanism of action of medicinal plants against experimentally induced helminthiasis. Hence the review study is concluded that the herbal drug possesses anthelmintic activity and it has been proved by earth worm model gives many links to develop the future trials.

REFERENCES

- Satyavati GV, Use of plant drugs in Indian traditional system of medicine and their relevance to primary health care in economic and medicinal plant research by Farn Worth NR and Wagner H. Academic press Ltd, Ltd, 1990, 190-210.
- Liu LX and Weller PF, An update on anti-parasitic drugs, N Engl J Med 3, 34, 1996, 1178.
- Walter PJ and Prichard KK, Chemotherapy of parasitic infections, In: W.C.Campbell and L.S Rew (Eds), Plenum, New York, 1985, 278-539.
- Temjenmongla and Yadav A, Anti-cestodal efficacy of folklore medicinal plants of naga tribes in North –East India, Afr J Trad cam, 2, 2, 2005, 129-133.
- Vidtyardhi RD, A Textbook of Zoology, S. Chand and Co, New Delhi, 14th edition, 1967, 329-370.
- Vigar Z, Atlas of Medical Parasitology, P.G. Publishing House, Singapore, 2nd Edition, 1984, 216.
- Thorn GW, Adams RD, Braunwald E, Isselbacher KJ and Petersdorf RG, Harrison's Principals of Internal medicine, McGraw Hill co, New York, 1977, 1088.
- Chaterjee KD, Parasitology, Protozoology and Helminthology, Glutha Ray Sree Saraswathy Press ltd, Calcutta, 1967, 168-169.
- Das Guari Kumar, Brahma Dillip Kumar, Chhetree Rishi Raj, Matushree V. B. Preliminary phyto chemical investigation and anthelmintic activity of *Acacia suma* (Roxb.) barks, International Journal of Pharmacy, 2, 1, 2011, 136-141.
- Subbarayan Gopalakrishnan, Krishna Sami Saroja, Jeyaseelan Dulcy Elizabeth, Chemical investigation of aerial parts of *Acalypha fruticosa* Forssk, Der pharma Chemica, 2, 5, 2010, 383-389.
- Guari Ranju, Sutar Niranjana, Patro Saroj kumar, *In-vitro* anthelmintic activity of *Acalypha indica* leaves extracts, IJRAP, 2, 1, 2011, 247-249.
- Sandeep Dhankhar, S Rahul, M Balhara, Seema Dhankar, Chhillar AK, Aegle marmelos (Linn.) Correa, A potential source of Phytomedicine, Journal of Medicinal Plants Research, 5, 9, 2011, 1497-1507.
- Megha Kasarwala, Saurabh Parmar, Dipen Patel, Marmik Bhavsar, Parth Thakkar, Anthelmintic activity of leaf and stem bark extracts of *Ailanthus excelsa* Roxb. Asian Journal of Pharmaceutical Sciences and Researches, 1, 4, 2011, 18-21.
- Bhawan Sati, Hemalata Sati, Sarla Saklani, Prakash Chandra Bhatt, Somesh Thapliyal, Anthelmintic potential of certain ethano medicinal plants of Uttarakhand State, India, J. Chem Pharm. Res, 3, 5, 2011, 465-467.
- Padmavathi D, Vijaya Bharathi, Sarala A, *In-vitro* anthelmintic activity of ethanolic extract of *Barringtonia acutangula* (Linn.). International Journal of Pharma Tech Research, 3, 2, 2011, 784-786.
- Tekeshwar Kumar, Amit Alexander, Dhansay Dewangan, Kushangra Nagri, Anthelmintic activity of the whole plant of *Bauhinia purpurea* (Linn.). Asian Journal of Pharmaceutical and Clinical Research, 4, 3, 2011, 110-111.
- Tekeshwar Kumar, Amit Alexander, Ajazuddin, Dhansay Dewangan, Junoid khan and Mukesh Sharma; Investigation of *in-vitro* anthelmintic activity of *Bauhinia racemosa* Linn. Journal of applied Pharmaceutical Science, 1, 2, 2011, 73-75.
- Daked PS, Ponigrahy RN, Kshirsagar Smn, In-vitro evaluation of anthelmintic activity of *Caesalpinia pulcherima* (Linn.) flowers extracts in Indian Earth worms, International Journal of Pharmaceutical Sciences Review and Research, 7, 1, 2011, 89-91.
- Deore SL, Khadabadi SS, Kamdi KS, Ingle V P, Kawalkar NG, Sawarkar PS, Patil UA, Vyas A, In vitro Anthelmintic activity of Cassia tora, J. International Journal of ChemTech Research, 1, 2, 2011, 177-179.
- Padmini Shaukla, Prabodh Shukla, Gopalakrishna B, Investigation of In-vitro Anthelmintic activity of *Ciampelos pareira* Linn., Against Pheritima posthuma, Research article shukla, IJPSR, 3, 1, 2012, 265-267.

21. Bidkar JS, Bhujbal MD, Ghanwa DD, Dama GY, Anti-helmintic activity of *Citrus aurantium* Linn. International Journal of Pharmaceutical Research and Development, 3, 3, 2011, 69-72.
22. Katikia LM, Chagasb ACS, Bizzoc HR, J F S Ferreirad, Amarantee AFT, Anthelmintic activity of *Cymbopogon martini*, *Cymbopogon schoenanthus* and *Mentha piperita* essential oils evaluated in four different in vitro tests, Veterinary Parasitology, 183, 2011, 103-108.
23. Vincent S, Vijayamirharaj R, Wilson P, Saravanan B, Jeevanatham R, Ramesh R, Anthelmintic potential of aerial part of *Clerodendrum phlomidis* Linn, Research Journal of Pharmaceutical, Biological and Chemical Sciences, 2, 2, 2011, 329-333.
24. Manoj Salhan, Bimlesh Kumar, Prashant Tiwari, Pardeep Sharma1, Harleen Kaur Sandhar, Mayur Gautam, Comparative anthelmintic activity of aqueous and ethanolic leaf extracts of *Clitoria Ternatea*, International Journal of Drug Development & Research, 3, 1, 2011, 68-69.
25. T Shri Vijaya Kirubha, R Senthamarai, K Vasuki, A Venkateswara Rao, S Selvadurai; Anthelmintic activity of roots and rhizomes of *Corallocarpus epigaeus*, J Nat Prod Plant Resour, 1, 1, 2011, 81-84.
26. Sawarkar HA, Mukesh Kumar Singh, Ajit Kumar Pandey, Devendra Bharadwaj, Pranita Kashyap, Comparative in vitro Anthelmintic activity of *Ficus benghalensis*, International Journal of Pharm Tech Research, 3, 1, 2011, 157-159.
27. Lakshmpathy Raj, Ganesh Gadamssetty NC, Sarada, Comparative studies on *in-vitro* anthelmintic activity of *Gymnema sylvestre*, International Journal of Pharmacy and Pharmaceutical Sciences, 4, 1, 2012, 107-109.
28. Das R, Mehta DK, Gupta A, *In vitro* anthelmintic activity of leaves of *Juglans regia* Linn against *Pheretima posthuma*, Sci.Revs.Chem.Comm, 1, 1, 2011, 78-82.
29. Bairagi GB, Kabra AO, Mandade RJ, Anthelmintic activity of *Lawsonia inermis* L. Leaves in Indian Adult Earthworm, International Journal of Research in Pharmaceutical and Biomedical Sciences, 2, 1, 2011, 239-241.
30. Sunil Kumar, Sudhir Chaudhary, Jha KK, Anthelmintic activity on the *Leptadenia pyrotechnica* (forsk.), J Nat Prod Plant Resour, 1, 4, 2011, 56-59.
31. Swati Katiyar Manisha Tandon, Amol, Pharmacognostic standardization, phytochemical investigation and anthelmintic evaluation of the extract of *Madhuca indica* flowers, Pharmacology online, 3, 2011, 892-903.
32. Jayasri P, Narendra naik DL, A. Elumalai, Evaluation of anthelmintic activity of *Manihot esculenta* leaves; International Journal of Current Pharmaceutical Research, 3, 4, 2011, 115-116.
33. Khuntia Tapas Kumar, Panda Dibya Sundar, Evaluation of antibacterial, antifungal and anthelmintic activity of *Murraya koengii* leaves, International Journal of Pharmaceutical Sciences, 2, 2, 2011, 105-110.
34. Mondal S, Ramana H, Suresh P, Anthelmintic activity of *Neolamarckia cadamba* barks, Hygeia J D Med, 3, 2, 2011, 16-18.
35. Nayak Bhabani Shankar, Phytochemical screening and evaluation of anthelmintic activity of *Pandanus fascicularis* leafy extract, International Journal of Universal Pharmacy and Life Sciences 1, 1, 2011, 105-109.
36. Soetan KO, Lasisi O T, Agboluaje AK, Comparative assessment of *in-vitro* anthelmintic effects of the aqueous extracts of the seeds and leaves of the African locust bean (*Parkia biglobosa*) on bovine nematode eggs, Journal of Cell and Animal Biology, 5, 6, 2011, 109-112.
37. Velmurugan V, Arunachalam G, Ravichan V, Anthelmintic potential of *Prosopis cineraria* (Linn.) druce stem barks, Asian Journal of Plant Science and Research, 1,2, 2011, 88-91.
38. Kota Chaitanya Sravanthi, Manthri Sarvani, Sidagonde Srilakshmi, Anthelmintic activity of *Sapindus trifoliatus* seed extract, International Journal of Pharmacy & Technology, 3, 1, 2011, 1603-1608.
39. Sarojini Nayak, Anjulata Manjari Sahoo, Chandra Kanti Chakrabort, Anthelmintic activity study of *Saraca indica* leaves extracts, International Journal of Applied Biology and Pharmaceutical Technology, 2, 2, 2011, 337-339.
40. Karthikeyan P, Suresh V, Arunachalam G, *In-vitro* anthelmintic activity of *Sesbania grandiflora* (L.) poir. Bark, International Journal of Pharmacy and Technology, 134, 2011, 984-987.
41. Panda B K, Patro V J, Mishra U S, Panigrahi B K,; Comparative study of Anthelmintic activity between acetone and ethanolic stem extracts of *Spondias pinnata* (Linn.) kurz, IJPAP, 2, 4, 2011, 1383-1385.
42. Narasimha rao R L, Bhavya B, Pavani K, Swapna A, Prasoon C H; Anthelmintic activity of *Symplocos racemosa*; International Journal of Pharmacy and Biological Sciences, 1, 3, 2011, 198-230.