

# Native Phytotherapy for Filariasis from Odisha, India

<sup>1\*</sup>Mokhtar Alam,  
Javed I. Siddiqi, S. A. H. Zaidi,  
S. Singh, <sup>1</sup>Aminuddin,  
<sup>2</sup>R. D. Girach and M. H. Khan

Drug Standardisation Research  
Institute (Unani), PLIM Building,  
Kamla Nehru Nagar,  
Ghaziabad – 201001 (U.P.)

<sup>1</sup>Central Council for Research in  
Unani Medicine,  
61-65 Institutional Area,  
Janakpuri, New Delhi-110058

<sup>2</sup>Regional Research Institute of Unani  
Medicine, Bhadrak-560001 (Odisha)

## Abstract

Filariasis is one of the common health problems in coastal belt of India. The disease is prevalent largely in Balasore, Bhadrak, Puri and Ganjam districts of Odisha lying on the eastern coast. Thus far, there is no satisfactory cure of the disease in modern system of medicine. Diethyl Carbamazine (DEC) is however the only drug of choice. But its side effects and relapse etc eludes complete cure of the disease. The search is, therefore, on at various levels for suitable anti-filarial herbal drugs which may be cost effective, easily available and free from side effects.

In an attempt to search antifilarial drugs from herbal resources, survey of different districts of Odisha was undertaken during last 20 years. The outcome of plants used in the treatment of filariasis by the natives of Odisha is presented in this communication with details of uses. The data presented are supported by chemical and / or pharmacological reports wherever available and may provide clue for further research on some of these folk herbal remedies and discover new antifilarial drugs of natural origin.

**Key Words :** Filariasis, Ethno-botanical studies, Phytotherapy, Odisha

## Introduction

With ideal combination of the vast forest, the rich flora and the large tribal population comprising as many as 60 different tribal communities, Odisha is an important state for the study of ethnobotany. The type of herbal remedies, the way in which they are administered and the disease for which they are used varies from tribe to tribe and place to place. Thus, there is a great scope for ethnobotanical studies in the state.

Among mosquito borne diseases, filariasis is the major health problem in Odisha According to an estimate, out of total population of 26.27 million in the state, 18.24 million rural population is exposed to the risk of filariasis (Mohanty, 1985). Diethyl Carbamazine (DEC) is the only drug widely used, so far, for the prevention and treatment of filariasis in the modern medicine, without much success (Singh and Ram, 1988).

There is, therefore, an urgent need to find out a suitable herbal drug for the treatment of filariasis. However, concerted efforts have been going on at various centers of Unani medicine and other organizations to come-up with suitable remedy.

<sup>1\*</sup> Author for correspondence

In the present study an attempt has been made to bring on record herbal remedies used by native inhabitants of Odisha for prevention and treatment of Filariasis.

## Materials and Methods

The data presented here is based on larger ethnobotanical surveys conducted between 1982 and 2000. First hand information on medicinal uses of plants was collected from native health practitioners and other knowledgeable persons of either sex in different localities of the area surveyed. The data were cross checked from other groups / localities wherever possible. The method for collection of plant samples and obtaining information on medicinal uses followed for the study was that of Jain (1967). Materials collected during medico-ethnobotanical survey from various districts of Odisha were processed, identified and equated with correct botanical names, classical Unani name and local names. Voucher specimens are housed in unit herbarium of Regional Research Institute of Unani Medicine, Bhadrak (Odisha), for future reference and study.

Medicinal species used as antifilarial drugs are enumerated in the following order : botanical name, family in parenthesis, Unani name, local name and locality followed by medicinal uses, voucher specimen number and names of key informants in bracket. Data is supplemented with phyto-chemical and pharmacological reports from published literature, wherever available, to justify or contradict the information provided.

## Antifilarial medicinal plants

1. *Abrus precatorius* L. (Fabaceae); Gungchi; Kaincho; Hatuapada. Crushed leaves with castor oil is applied locally to subside filarial swellings – 4416 (Kol).

Tribals of Sagar district in Madhya Pradesh and lodha of Midnapur district in West Bengal use this plant in swelling (Bhalla *et al.*, 1982; Pal & Jain, 1989). Abruquinones A,B,D and F showed strong anti-inflammatory activity (Kuo *et al.*, 1950). Seeds contain Abrin A which is toxic to cell free protein synthesis (Rastogi & Mehrotra, 1993)

2. *Andrographis paniculata* (Burm.f.) Wall. (Acanthaceae); Bhuineem; Bhuinimbo; Akhuapada. Leaf juice mixed with honey (one teaspoon, three times daily) is advised to drink for about one month to subside oedematous swelling in filariasis – 4819 (Singh).

Plant is used as antifilarial herbal drug (Mukherjee & Singh, 1994). Whole plant is reported in the treatment of filariasis from east Godavari district of Andhra Pradesh (Sudhakar and Rolla, 1985).

Plant contains andrographolide, kalmeghin, sitosterol, glycosides, neo andrographolide, tannins and traces of volatile oil (Jain *et al.*, 1991).

Andrographolide exhibited antipyretic, analgesic and anti ulcerogenic activity (Madav *et al.*, 1995). Plant extract showed antipyretic and anti-inflammatory activities (Vedavathy and Rao, 1991). Three subcutaneous injections of the extract injected into infected dogs at 0.06ml/g weight, reduced the number of microfilaria in blood by more than 85 percent (Mukherjee and Singh, 1994).

Out of 32 cases treated with *Andrographis paniculata*, 24 showed reduction in filarial swelling (Mukherjee and Singh, 1994).

3. *Caesalpinia bonduc* (L.) Roxb. (Caesalpinaceae) ; Karanjwa; Gil ; Paliabindha.

A handful of seeds (without seed coat) boiled in sufficient cow's milk, washed repeatedly to remove its toxic effects, sundried and powdered. Powdered drug (3-5 g two times daily) is given orally for three months to treat symptoms like filarial fever and swelling - 3518 (Panda).

Rural people in Bhadrak district of Odisha use plant extract in filariasis (Girach *et al.*, 1996). Ointment made from the roasted seeds with castor oil forms an excellent application to glandular swellings. Seeds are useful for dispersing swelling (Nadkarni, 1976). Ayush- 64, consisting *Caesalpinia bonduc* as one of the ingredients of composite drug, (2 tablets three times daily) given for 14 days, was found effective in the treatment (Mukherjee and Singh, 1994).

Seeds contain bounducin, Phytosterinins, Phytosterols, caesalpin –F and bonducellin (Chatterjee & Pakrashi, 1992) Fattyacid triglycerides have been identified as the macrofilaricidal principles from the seed kernel of *Caesalpinia bonduc* (Rastogi *et al.*, 1996).

4. *Clerodendrum viscosum* Vent. (Verbenaceae); Angusti; Hantuapada. Leaves (warm) with castor oil is applied locally on filarial swelling - 4440 (Sabaro).

Root is prescribed to subside swellings by paharia tribes of Santal pargana in Bihar (Goel *et al.*, 1984). The leaves are used to alleviate fever in Northeastern states of India (Jain, 1991).

5. *Elephantopus scaber* L. (Asteraceae) ; Morchulia; Jugsai patna Root paste with paste of rasna is applied on oedematous swelling to cure filariasis - 1037 (Bathuries)

Root paste is applied on oedematous swellings by Ho tribe of Singbhum district in Bihar (Girach & Aminuddin, 1994). Root is used in filariasis in Chhatarpur district of Madhya Pradesh (Datt, 1996) and by tharus tribe in Kheri district of Uttar Pradesh (Maheshwari *et al.*, 1990). Asurs of Netarhat Plateau in Bihar practiced the root in swellings (Gupta, 1981). Plant extract contains glycosides (Girach *et al.*, 1994).

6. *Ficus bengalensis* L. (Moraceae); Bargad; Baro; Kaupur. Milky latex is directly applied on glandular swelling of lymphnodes and inflamed veins to subside swelling, 4779 (Barik). Plant extract contains saponin, flavonoid, glycoside and steroids (Karnick, 1981).

7. *Jatropha gossypifolia* L. (Euphorbiaceae) ; Kodajhaji ; Padampur. Leaf paste is applied locally to subside swelling - 4737 (Naik).

Stem bark contains bitter, amorphous, alkaloids, jatrophin which is similar to quinine in properties. The latex is poisonous and contains 2.5% alcohol soluble matter (Anonymous, 1980-81). Plant exhibited antibacterial and anti-inflammatory activities (Anonymous, 1987).

8. *Litsea glutinosa* (Lour.) Robins (Lauraceae); Meda Lakri; Gobindagaradu; Gopinathpur. Stem bark pounded together with three black pepper is made into pills of pea size. Two pills, two times daily are prescribed for one month to treat clinical manifestations of filariasis - 5671 (Kol). Stem bark is used to subside swellings (Maheshwari *et al.*, 1980).

9. *Mimosa pudica* L. (Mimosaceae); Lajjalu; Lajkoli; Deoil. Root of Lajkoli together with stembark of semel (*Bombax ceiba*) in equal quantity made into paste with hukka water is applied locally on odematous swelling and tied with Banana leaves, 745 (Bathuries).

Tribals of Jalpaiguri district in West Bengal use this plant in swellings (Chaudhri *et al.*, 1982).

10. *Pedilanthus tithymaloides* (L.) Poit. (Euphorbiaceae); Hemsagar; Kolai. Root bark mixed together with sindhaluno (black salt) is made into paste with starch water. The paste is uniformly applied on filarial oedema to subside swelling - 5015 (Ojha).

Plant latex exhibited anti-inflammatory activity (Dhar *et al.*, 1988).

11. *Streblus asper* Lour. (Moraceae) ; Sahada ; Sahada; Chingdipur. Powdered stem bark (5-10 g two times daily) is given for 15-20 days to control recurrent attacks, alleviate fever and subside glandular swelling of Lymphnodes - 4963 (Kar).

Powdered stem bark is used in Ayurveda for treatment of filariasis (Anonymous, 1991). Powdered stem bark is also popularly used in filarial belts of several eastern districts of U.P. (Singh & Ram, 1988). Plant is used for glandular swelling and elephantiasis. (Hussain, *et al.*, 1992).

Plant contains anti filarial cardinolides such as strebloside, asperoside and unidentified cardinolate K 030B (Pal *et al.*, 1995). Screening of plant extract showed Potential antifilarial activity using *Setaria cervi* as test organism (Parveen *et al.*, 1992). Alcoholic and aqueous extract has found to exhibit ant-filarial activity (Singh *et al.*, 1991). The crude extract killed microfilaria as well as adult worms. The filaricidal activity was due to two glycosides reported from the plant (Anonymous, 1991). Therapeutic efficacy of the drug has been clinically established (Singh & Ram, 1988).

12. *Vernonia cinerea* (L.) Less. (Asteraceae) ; Sahadevi ; Harsingpur. Powdered plant (10-20 g) is advised to be taken with 125 ml milk (mixed with 5-7 cardamom and 10 g sugar candy) once every morning, empty stomach for about three months – 5613.

Whole plant contains alkaloids and saponin (Joshi & Sabnis, 1989). Plant exhibited antipyretic activity (Varghese, 1996).

## Discussion

In the present communication 12 plant species used by the native inhabitants in the treatment of filariasis have been reported. Scrutiny of published literature reveals that only three species viz., *Andrographis paniculata*, *Elephantopus scaber* and *Streblus asper* have been reported for the treatment of filariasis (Jain, 1991; Singh & Ram, 1988). *Caesalpinia bonduc* (Karanjwa) seeds are reportedly used for filariasis in Unani system of medicine (Anonymous, 1992). Rest of the plant species are little known for their use in filariasis, treatment.

Fatty triglycerides from *Caesalpinia bonduc* (Rastogi *et al.*, 1996) and *Streblus asper* contain anti-filarial cardinolides such as strebloside and unidentified

cardinolide KO30B (Pal *et al.*,1995). Phytochemical screening for other plant species reported as regards antifilarial agent is suggested.

*Abrus precatorius* (Kuo *et al.*, 1995), *Andrographis paniculata* (Anonymous, 1987) and *Pedilanthus tithymaloides*, (Dhar *et al.*, 1988) exhibited antiinflammatory activity. While *Andrographis paniculata*, (Vedavathy & Rao, 1991) and *Vernonia cinerea* (Varghese, 1996) exhibited antipyretic activity. *Caesalpinia bonduc* and *Streblus asper* both are popular for their use in filariasis. The former is commonly used in Unani medicine while the later is frequently used in Ayurvedic system of medicine as well as in several eastern districts of Uttar Pradesh. The work on *Streblus asper* as an anti-filarial drug has been undertaken at CDRI, Lucknow with encouraging results (Anonymous, 1991).

## Conclusion

The data presented in the paper provides clue for further research. Based on the present findings it may be suggested that *Streblus asper* may be taken up for preliminary clinical trials. The other species may be screened for their phyto-chemical and / or pharmacological activity, so as to assess suitable criteria for their use in the treatment of filariasis.

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