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Anti-malarial plants used by traditional healers in Mayurbhanj district, Orissa

Madhusmita Jena¹, Santilata Sahoo¹, Rajani K.Sahu^{2*}

¹Department of Botany, Utkal University, Vani Vihar, Bhubaneswar, (INDIA)

²Department of Botany, BJB Autonomous College, Bhubaneswar - 751 014, (INDIA)

E-mail: sahurajani@yahoo.co.in

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ABSTRACT

An ethno medicinal study was carried out on the tribals of eight villages of Mayurbhanj district, Orissa. The information was gathered from *Kondha, Kolha, Santal, Bhumij, Bathudi* tribes using an integrated approach of botanical collections, group discussion and interviews with traditional healers during year 2007 – 2008. A total of 15 no. of medicinal plants distributed among 11 families were documented. In most of the cases aerial plant parts were used for the preparation of medicine for treatment of malaria. The tribal people exclusively depend on these medicinal plants for the cure and prevention of malaria as a part of their traditional practice. There is an urgent need to evaluate the pharmaceutical activities of these medicinal plants for the treatment and prevention of malaria in India.

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KEYWORDS

Malaria;
Ethno-medicine;
Healers;
Anti-malarials.

INTRODUCTION

Malaria is the oldest recorded disease in the world^[1]. It has been estimated that 58% of the malarial death occur in poor population^[3] killing 1- 3 million people in a year. The aim of this study was to collate information from an indigenous group of people living in the selected 8 villages of Mayurbhanj district about their current traditional uses of plants for the treatment and preventive practices for malaria.

SUBJECTS AND METHODS

About 40% of the population in the world is at a risk of malaria and this risk is more in tropical & sub tropical countries^[11]. About 60 to 65 % of the infec-

tions are due to *P.vivax* and 35- 40% are due to *P. falciparum*^[7]. The magnitude of problem of Malaria in Orissa is very acute and encountered in almost all parts of the Orissa. In 2002 the planning commission^[7] estimated that 23% of the populations in Orissa are malaria prone. However the disease is more prevalent in the tribal districts of state. Forest, plains, hilly and coastal areas with numerous streams, rivers, mines, ethnic diversity and various socioeconomic conditions pretends a dreadful challenge to malaria control operation in the state.

Malaria is caused by single celled protozoan parasites called *Plasmodium* and transmitted to man through female *Anopheles* mosquito. It is one of the major fatal diseases in the world, especially in the tropics and is endemic in some 102 countries with more

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than half of the world population at risk^[11]. 60 to 65 % of the infections are due to *P. vivax* and 35- 40% are due to *P. falciparum*. In spite of control programmes in many countries there has been very little improvement in control of malaria and infections can reduce the effectiveness of labour and can lead to both economic and human losses. Control of malaria is complex because of the appearance of drugs resistant strains of *Plasmodium* and with the discovery that man may become infested with species of Simian (monkey) malaria^[11]. At the same time the *Anopheles* mosquito have developed resistance to many insecticides^[9]. Thus it is important to search for new anti – malarial compounds, either synthetic or natural compounds that kill either the vector or parasite. The use of plant derived drugs for the treatment of malaria has a long and successful tradition. For example, quinine isolated from *Chincona* and quinghausu from *Artemisia annua* Linn. Illustrate the potential value of investigating plants for anti malarial compounds^[9]

OBJECTIVE OF THE STUDY

The aim of this study was to collate information from an indigenous group of people living in the selected 8 villages of Mayurbhanj district about their current traditional uses of plants for the treatment and preventive practices for malaria.

MATERIALS AND METHOD STUDY AREA

Mayurbhanj is one of the largest district in the state of Orissa and is situated towards the North-eastern region of the state. The district covers a geographical area of about 10418 square kilometers and lies between 85° 40' to 87°11' East Longitude and latitude 21°16' to 22° 34' North. The district is bordered by Jharkhand on the North western, by West Bengal Northeastern side, Keonjhar Southeastern side and it is enclosed by Baleshwar district. The district headquarters is at Baripada, situated at a distance of 270 kilometers from the State Capital, Bhubaneswar. As regard the distribution of land area of Orissa State, Mayurbhanj district occupies the highest i.e. 6.69 % of land area among all the districts. In the district the tribals occupy a big portion of the population constituting 52% with 53 tribal

communities both aboriginals and migrated tribes are found in the district glorifying the rich heritage of tribal culture^[5]. The major tribes of the district area Kondha, Kolha, Santal, Bhumij, Bathudi, Lodha, Gond, Saunti etc. along with some of the primitive tribes like Khadia and Mankedia.

The study conducted in the villages namely Thakurmunda, Dhatikidiha, Dubapala, Chichirpali, Satkosia, Ektali, Dhalabani and Gudugudia. The location of these villages has been demarcated in figure 1.

LOCAL TRADITIONAL HEALERS

Local traditional healers having practical knowledge in the use of medicinal plants for treatment and prevention of malaria were interviewed in 8 villages of Mayurbhanj district. During the course of study during the period of 2007 – 2008 several trips have been made to the study areas. Method of selecting the informants depends upon the distribution of local people having folk knowledge. The informants were requested to collect the specimen of the plants they know to be used for malaria. The wealth of the medicinal plant knowledge among the people of the district is based on hundreds of years of belief and observations. The knowledge has been transmitted orally from generation to generation, however it seems that it is vanishing from modern society since younger people are no more interested in this tradition.

INTERVIEW WITH THE TRADITIONAL HEALERS

The data on the traditional practices for treatment and prevention of malaria has been collected through general conversation with the informants. Questionnaires were used to obtain information on medicinal plants with their local names, parts used, mode of administration, contraindications etc.

PRESERVATION OF PLANT SPECIMENS

Standard method was followed with regard to collect the plant materials, drying, mounting, preparation and preservation of the plant specimen. Voucher specimens of medicinal plants were collected in trip-

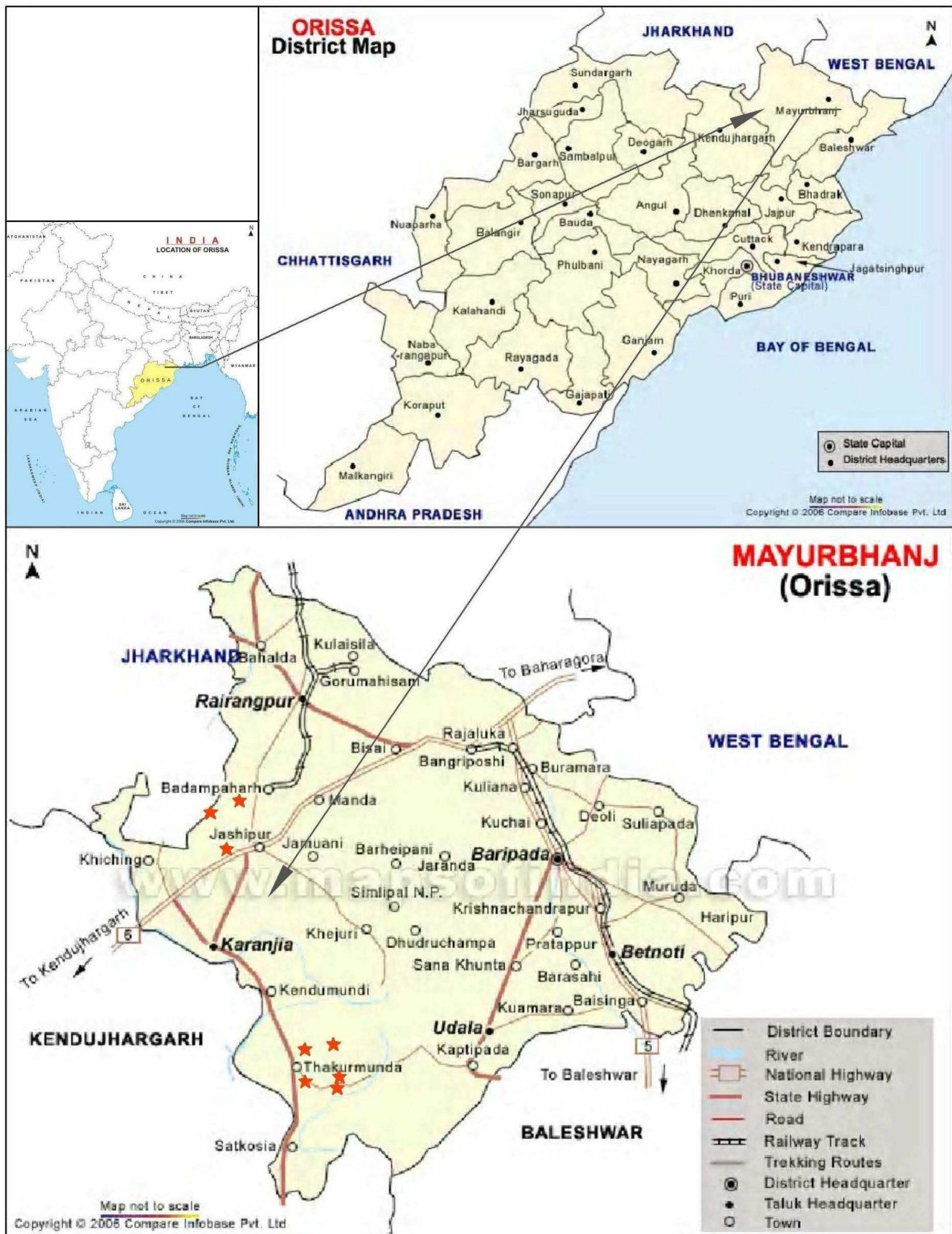


Figure 1 : Location of study villages in Mayurbhanj district, Orissa, India

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licates, prepared and identified. The identification and nomenclature of the listed plants were based on the Flora of Orissa^[7].

RESULTS

Ethno-medicinal study on malaria from Mayurbhanj district reveals use of 15 medicinal plant species distributed across 11 families used for treatment and prevention of malaria. Among these plants 7 are herbs, 2 are trees, 4 are shrub and other 2 are climbers. The uses of above ground parts were found to be higher (62.5%) than the underground parts (37.5%). Leaves was the most widely used plant part accounting for 7

reported plant species followed by roots (6 spp.) and bark (2 spp.). The whole plants of *Andrographis paniculata* and *Desmodium gangeticum* used for the treatment of malaria. The most widely used form of medicine is decoction (7 formulations) followed by paste (3 formulations) and juice (2 formulations). The other formulation used are tablet and powder. It is also observed that formulations with several plant parts in combination are used for the prevention of malaria. The data on medicinal plants used for the curative and preventive measures of malaria was collected from the knowledgeable person of the Mayurbhanj district and analyzed. The detail enumeration and utilization of these plants are described in the TABLE 1.

TABLE 1 : Plants used for treatment and prevention of malaria:

Sl. No	Name of the Plant	Local Name	Family	Habit	Parts used	Mode of Administration
Treatment Practice						
1.	<i>Nyctanthes arbor-tristris</i> L.	Gangasiuli, Gotikharika	Oleaceae	Large Shrub	Leaves	A handful leaf juice of <i>Nyctanthes arbor-tristris</i> (Gangaseiuli) with honey thrice daily for 5 days
2.	<i>Andrographis paniculata</i> (Burm. F.) Wall. ex. Nees	Bhuin Nimba, Kalmegh	Acanthaceae	Herb	Whole plant	The whole plant extract of <i>Andrographis paniculata</i> along with leaf juice of <i>Nyctanthes arbor-tristris</i> and stem decoction* of <i>Tinospora cordifolia</i> taken together to make the pill (5 gm of each ingredient). These pills taken thrice daily for 3 to 7 days
3.	<i>Tinospora cordifolia</i> (Willd.) Hook.F. & Thoms	Guluchi	Menispermaceae	Climber	Stem	The decoction* of stem of <i>Tinospora cordifolia</i> (15gm) with whole plant of <i>Andrographis paniculata</i> (15gm) along with black pepper twice daily for 5 days.
4.	<i>Azadirachta indica</i> A. Juss.,	Nimba	Meliaceae	Tree	Stem bark and Leaves	The bark and leaf decoction* (15gm) taken with honey thrice daily found to be effective for the treatment of malaria.
5.	<i>Ocimum sanctum</i> L.	Tulasi	Lamiaceae	Herb	Leaves	A paste is prepared with a hand full leaves of <i>Ocimum sanctum</i> along with 5 to 7 leaves of <i>Nyctanthes arbor-tristris</i> . This paste taken twice daily for 5 to 7 days with honey
6.	<i>Alstonia scholaris</i> (L.) R.Br	Chatiana	Apocyanaceae	Tree	Stem bark	The stem bark decoction* (30gms) taken twice daily for 3 to 5 days
7.	<i>Clerodendrum serratum</i> (L.) Moon.	Samarkana	Verbenaceae	Shrub	Root	The juice of 5gm root along with 5 gm neem leaf, 5 gm Gangasiuli leaf and Bhuin neem leaf taken twice daily for 5 days

Sl. No	Name of the Plant	Local Name	Family	Habit	Parts used	Mode of Administration
Treatment Practice						
8.	<i>Mimosa pudica</i> L.	Lajkuli	Mimoceae	Herb	Root	Equal quantity of leaf of <i>Andrographis paniculata</i> , leaf of <i>Azadirachta indica</i> , leaf of <i>Nyctanthes arbor – tristris</i> , Bark of <i>Oroxylum indicum</i> and root of <i>Mimosa pudica</i> made to decoction* and taken twice daily for 3 days
9.	<i>Cissampelos pareira</i> L. var. <i>hirsuta</i> (DC.)Forman	Akanabindhi	Menispermaceae	Climber	Root	Root (8g) of <i>Cissampelos pareira</i> made to powder and mixed with the powder of 10-12 black pepper. It is given thrice a day as full dose for 5 days to
10.	<i>Grewia hirsuta</i> Vahl.	Farshakoli	Tiliaceae	Shrub	Root	Roots (100g) of <i>Grewia hirsuta</i> made to paste along with 10-12 black pepper. From this decoction* is prepared and given as full dose 3 times a day for a week. Treatment is repeated twice at an interval of one week
11.	<i>Cryptolepis buchananii</i> Roem. & Schult.	Gopakanhu	Asclepiadaceae	Climber	Root	Roots (50g) of <i>Cryptolepis buchananii</i> made to paste along with 10 – 15 no. of black pepper. It is given as full dose thrice daily for 7 days
12.	<i>Hemidesmus indicus</i> (L.) R.Br.	Anantamool / Sugandhi	Asclepiadaceae	Climber	Root	Dry roots (50g) of <i>Hemidesmus indicus</i> powdered along with 10-12 black pepper. This powder given thrice daily for 5 days
13.	<i>Desmodium gangeticum</i> (L.) DC.	Salaparni	Fabaceae	Herb	Whole Plant	Whole plant of <i>Desmodium gangeticum</i> is ground and decoction is prepared in water. It is given in the dose of 5ml three times a day for 5 days
Preventive Practice						
14.	<i>Nyctanthes arbor-tristris</i> + <i>Andrographis paniculata</i> + <i>Tinospora cordifolia</i>	Gangaseuli + Bhuin nimba + Guluchi	Oleaceae Acanthaceae Menispermaceae	Shrub Herb Climber	Leaf + + Whole Plant Stem	15 gm of all three along with 3 – 5 black pepper taken at a time to make a decoction*. This decoction taken once in a week prevents malaria.
15.	<i>Andrographis paniculata</i>	<i>Bhuin nimba</i>	Acanthaceae	Herb	Leaves	Leaf paste of a handful of taken every day in empty stomach.
16.	<i>Azadirachta indica</i> + <i>Vitex nigundo</i> + <i>Ocimum sanctum</i> + <i>Ocimum bacilicum</i>	<i>Nimba</i> + <i>Nirgundi</i> + <i>Tulasi</i> + <i>Durlava</i>	Meliaceae Verbenaceae Lamiaceae Lamiaceae	Tree Shrub Herb Herb	Leaves	The extract applied all over the body has found to be the mosquito larvicidal effect and these plants are effective against mosquito bite.

* Decoction: 1 part raw drugs + 4 part water boiled till it becomes 1/4th of the total volume.

DISCUSSION

There are several malaria eradication programme

going on in the country with the substantial investment by the govt. of India. Still malaria remains as the most endemic health problem in the tropical part of the country. The traditional system of medicine can be act as an

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alternative towards providing eco system specific curative and preventive practice for malaria as this practice is easily accessible and available to the community. In Ayurveda several plants have been mentioned for the treatment of *Vishamajwara* (Interpreted to be malaria). The decoction of leaves and roots of *Adhatoda zeylanica* taken orally for curing malaria^[2], *Clerodendrum phlomidis* L.f. is one of the components of Ayurvedic preparations Amritarista and Agasta Haritaki rasayan (The Ayurvedic formulary of India, 2003), Dried fruit of *Embelia ribes* Burm.f. are used for fever^[5], *Erythrina indica* Lam. is used as febrifuge^[5], Decoction of *Tinospora cordifolia* is used for malarial fever^[8]. The plants like *Andrographis paniculata*, *Ocimum sanctum*, *Nyctanthes arbor-tristis*, *Tinospora cordifolia* etc. has been reported to be used in traditional phytotherapy in the treatment of malaria by rural people of Bhopal in Madhyapradesh^[4]. Some of the newly reported anti-malarials in the present study are *Clerodendrum serratum*, *Mimosa pudica*, *Cissampelos pareira*, *Grewia hirsute*, *Cryptolepis buchananii* etc. There is an urgent need for the more research on the pharmacological validation and clinical study on traditional anti malarial practice to provide easy accessible, cost effective and culturally compatible treatment against malaria.

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