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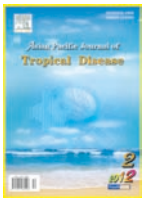

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Traditional use of medicinal plants as febrifuge by the tribals of Purulia district, West Bengal, India

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ABSTRACT

Objective: Ethnobotanical excursions were carried out among the tribals of Purulia district, West Bengal, India to explore the traditional use of medicinal plants against fever. **Methods:** With the help of a semi structured questionnaire, informants were interviewed and their indigenous knowledge regarding antipyretic use of plants was documented. **Results:** A total number of 22 plants used as febrifuge were recorded along with their vernacular names, part(s) used, method of preparation and route of administration. **Conclusions:** Different tribal communities residing in the area were found to possess traditional knowledge of using phytotherapy in the treatment of fevers.

1. Introduction

For the last few decades, plants have served as an important source of several novel biomolecules with medicinal potential[1]. Therapeutic efficacy of plant crude extracts and isolated compounds have been evolved in course of time and generated a number of popular modern day medicines[2]. Novel drug delivery systems have been utilized in the modern herbal formulations[3]. In several instances, safety and efficacy of herbal medicines have been investigated [4] and the World Health Organization (WHO) has estimated more than 4000 million people of the world is dependent on traditional medicine[5].

Plants have been pharmacologically investigated for antibacterial[6,7], antifungal[8], cytotoxic[9], anti-ophidian[10,11], anti-hypertensive[12], anti-ulcerogenic[13], anti-diabetic[14] and other efficacies. Most of the experiments were carried out *in vitro* and *in vivo*, positive results in which have led into clinical trials culminating into herbal drug discovery. The authors have found a few reports of using indigenous phytotherapy having antipyretic potential[15-17]. Some of these traditional uses have been verified scientifically by pharmacological investigations[18,19]. In the present study, ethnobotanical surveys were conducted in the remote tribal villages of Purulia district, West Bengal, India to explore the ethnic use of botanicals as antipyretic agents.

Earlier a few experiments have been conducted in this tribal inhabited district of West Bengal state[20-22]. Ethnic use of medicinal plants in this area in child and mother care[23], livestock treatment[24] and against snakebite[25] have been reported. A few medicinal plants have been mentioned to possess antipyretic activity in these previous investigations. The present study exclusively includes traditional phytotherapy practiced by various tribal communities to reduce the body temperature.

2. Materials and Methods

Purulia, one of the district of West Bengal is situated between 23° 11′ 24″ N and 86° 13′ 12″ E, with an area of 6529 sq km. The district is known for its tropical location,

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extreme climate and undulated topography. It is an extension of the Chhotanagpur plateau and is inhabited by a number of tribal communities namely Santhali, Bhumijs, Mundas, Oraon, Birhor, Mal Pahariya, Kharia and Ho representing a rich heritage of ethnic culture and practice. The temperature reaches up to 45℃ during the scorching summer and falls down to as low as 7℃ in the winter. Average annual rainfall is 1300mm. Due to adverse climate and topography, the tribals residing in the rural villages mostly depend on field and forest products for food, fodder, fuel and primary healthcare of human and livestock. Different ethnic groups were found to practice and inherit their own traditional healing systems. A total number of 85 informants were chosen and interviewed by using a previously prepared semi-structured questionnaire. Traditional knowledge of the tribal people regarding medicinal plants used as febrifuge has been documented in an interview data sheet. Several field visits were conducted to collect the plants from their actual habitat. Abundant plants were collected for herbarium preparation whereas reported endangered and rare plants were only photographed. The herbarium samples were identified by using specific keys mentioned in several books enumerating the flora of the state.

The plants with antipyretic or febrifuge potential have been documented alphabetically with their scientific and vernacular names, families, part(s) used, method of preparation and route of administration. A note on ethnobotanical and pharmacological relevance was added in the end in order to find the correlation of ethnic use of the same plant against fever at different parts of the globe and their scientific significance.

3. Results

The present investigation has reported the use of medicinal plant species as febrifuge belonging to 22 species, 22 genera and 17 plant families by the 9 tribal communities of rural Purulia district (Table 1). Fabaceae (3 species) was found to be the most predominant family followed by Gentianaceae, Rubiaceae and Malvaceae (2 species each). Among the plant parts used, roots (52%) have been the most popular followed by stem-bark (16%), leaves (12%), whole plant (8%), seeds (8%) and rhizomes (4%) (Figure 1). Traditional medicines were prepared in the forms of decoction (45.4%), paste (40.9%), infusion (4.5%), powder (4.5%) or taken as fresh (4.5%) (Figure 2). Oral route was reported as the only administration mode among the traditional healers in the treatment of fevers.

Table 1

Traditional use of medicinal plants as febrifuge by the tribals of Purulia district

Scientific name	Family	Vernacular name(s)	PP	MP	RA	REC	RPC
Aegle marmelos (L.) Corrêa	Rutaceae	Bel, Sinju daru	L	D	O	26	27
Ailanthus excelsa Roxb.	Simaroubaceae	Ghorkaram, Ghranim	SB	D	O	28	–
Aristolochia indica L.	Aristolochiaceae	Isher mul	R	D	O	29	30
Asparagus racemosus Willd.	Asparagaceae	Ghora chabuk, Kaisago	R	D	O	31	–
Canscora alata (Roth ex Roem. & Schult.) Wall.	Gentianaceae	Ara bhui nim, Dankuni	WP	I	O	32	–
Catunaregam spinosa (Thunb.) Tirveng.	Rubiaceae	Kantal ara, Saro	SB	D	O	33	–
Croton oblongifolius Roxb.	Euphorbiaceae	Putol, Gote	SB, R	P	O	34	–
Cyanotis tuberosa Schult. f.	Commelinaceae	Merom chunchi, Huring upanda ara	R	F	O	–	–
Exacum tetragonum Roxb.	Gentianaceae	Tiakhana, Marang losod kesari ba	R	P	O	35	–
Ficus benghalensis L.	Moraceae	Bat, Bor	R	P	O	36	37
Grewia hirsuta Vahl	Malvaceae	Seta kata, Seta andir	L	D	O	–	–
Guilandina bonduc L.	Fabaceae	Nata, Bagni	S	D	O	38	39
Holostemma ada-kodien Schult.	Apocynaceae	Moron ara	R	D	O	40	–
Hymenodictyon orixense (Roxb.) Mabb.	Rubiaceae	Borkunda, Bhurkunda	SB, R	P	O	41	–
Lindernia oppositifolia (Retzius) Mukherjee	Scrophulariaceae	Hendegel ba, Garandi	R	P	O	42	–
Mimosa rubicaulis Lam.	Fabaceae	Kundru	R	Pw	O	43	–
Mucuna pruriens (L.) DC.	Fabaceae	Alkushi, Alkusa	R, S	P	O	44	45
Rotheca serrata (L.) Steane & Mabb.	Lamiaceae	Barangi, Gar khumbi	R	D	O	46	–
Rungia pectinata (L.) Nees	Acanthaceae	Jatani ba, Pindi	R	P	O	47	–
Shorea robusta Gaertn.	Dipterocarpaceae	Sal, Makka	L	D	O	–	–
Sida cordata (Burm. f.) Borss. Waalk.	Malvaceae	Junka, Bariar	WP	P	O	–	–
Zingiber officinale Roscoe	Zingiberaceae	Adi	Rh	P	O	48	49

PP: Plant parts used; L: Leaves; SB: Stem-bark; R: Roots; WP: Whole plant; S: Seeds; Rh: Rhizome

MP: Method of preparation; D: Decoction; I: Infusion; P: Paste; F: Fresh; Pw: Powder

RA: Route of administration; O: Oral

REC: Relevant ethnobotanical citations; RPC: Relevant pharmacological citations

– indicates no report from the literature

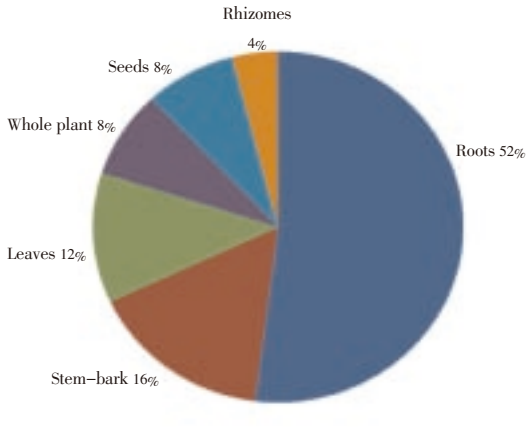

Figure 1: Percentage distribution of plant parts utilized

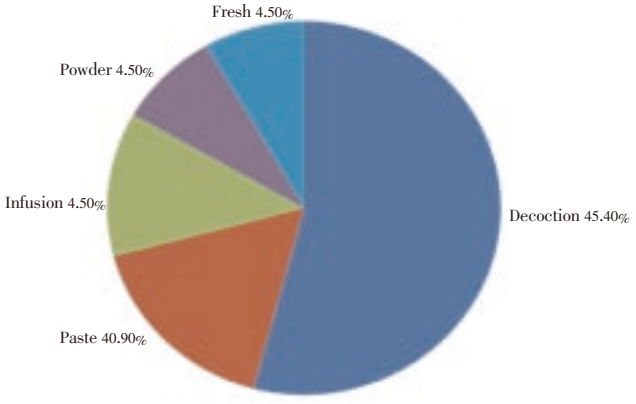

Figure 2: Percentage distribution of method of ethnomedicinal preparations.

4. Discussion

Several previously performed investigations support the tribal use of medicinal plants as febrifuge. A large proportion of the plants (18 out of 22) were reported to be used by the traditional healers in the treatment of fever in the other parts of the world (Table 1). Interestingly, some of these medicinal plants have been investigated pharmacologically for antipyretic properties. Table 1 also demonstrates the pharmacological relevance of tribal usage of medicinal botanicals against fever. Out of the 22 plants, 6 were reported as having antipyretic potential supported by laboratory experiments. Since, a huge percentage of people residing in the third world countries depend on traditional phyto-remedy for their primary healthcare, this kind of correlation is always encouraging. Ethnobotany, in this way, serves as the starting point which may lead to the novel herbal drug discovery passing through several pharmacological and clinical investigations.

Purulia, with its typical topography, climate and location, is known to house a number of tribal communities with diverse socio-cultural backgrounds. The ethnic groups are known to practice and inherit a rich knowledge of medicinal botanicals. Rapid urbanization and loss of biodiversity are responsible for gradual vanishing of this folkloric heritage. Use of synthetic drugs for quick relief, access to modern medicine, reluctance of younger generations to continue ancestral profession as traditional healers are among the other factors responsible for the decline. It is the high time to conserve and propagate the indigenous knowledge not only to alleviate human mortality and morbidity but to use an alternative system of medicine which is cost effective and said to have lesser side effects.

Conflict of interest statement

We declare that we have no conflict of interest.

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