

# List of Publications

- Das, A.P.; Ghosh, C.; **Sarkar, A.** & Biswas, R. 2007. Ethnobotanical studies in India with notes on Terai-Duars and hills of Darjiling and Sikkim, *NBU J. Pl. Sci.* 1: 67 – 83.
- Sarkar, A.** & Das, A.P. 2010. Ethnobotanical formulations for the treatment of jaundice by the *Mech* tribe in Duars of West Bengal. *Indian Journal Traditional Knowledge* 9(1): 134 – 136.
- Sarkar, A.**; Biswas, K. & Das, A.P. 2010. Ethnobotany of *Kirat* festival of *Magar* community in Buxa Duar area of West Bengal, India. *Ethnobotany* 22: 82 – 85.
- Das, A.P.; Ghosh, C.; **Sarkar, A.**; Biswas, R.; Biswas, K.; Chowdhury, D.; Lama, A.; Moktan, S. & Chowdhury, A. 2010. Preliminary report on the medicinal plants from three MPCAs in Terai and Duars of West Bengal, India. *Pleione* 4(1): 155 – 157.
- Mitra, P.K.; Mitra, P.; Das, A.P.; Ghosh, C.; **Sarkar, A.** & Chowdhury, D. 2010. Screening the efficacy of some East Himalayan medicinal plants on ethanol induced gastric ulcer in albino rats. *Pleione* 4(1): 69 – 75.
- Sarkar, A.**; Mandal, P.; Ghosh, C. & Das, A.P. 2010. Antioxidant activity of Rice Beer used by tribes of Duars in Sub-Himalayan West Bengal, India. *Indian Journal of Natural Product Radiance* (in press).
- Sarkar, A.** & Das, A.P. 2010. *Mech's* way of treatment of some respiratory diseases in the Northern Districts of West Bengal, India. Proceeding Volume of the International Seminar “*Multidisciplinary Approaches in Angiosperm Systematics*” held on 11<sup>th</sup> – 13<sup>th</sup> October, 2008. Department of Botany, University of Kalyani, West Bengal (in press).

## Ethnobotanical formulations for the treatment of jaundice by the *Mech* tribe in Duars of West Bengal

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Ethnomedicinal survey among the tribe *Mech* in the Duars region of West Bengal recorded 10 plant based formulations from the traditional healers to treat jaundice. While some of these formulations work nicely with high proportion of cure rate, others are of moderate or low efficiency.

**Keywords:** Ethnomedicine, Jaundice, *Mech* tribe, Duars, West Bengal

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Duars is a Sub-Himalayan region of West Bengal situated on the eastern bank of the River Tista and located between 27°-26°16' N latitude and 89°53'-88°4' E longitude. The total area of Duars is approximately 6,227 sq km stretching between the rivers Tista and Sankosh. Duars is bounded by Darjeeling Himalaya and Bhutan in North, Coochbehar district of West Bengal and Bangladesh in South, Assam in the East and the plain region of Darjeeling district and small part of Bangladesh lies to the West. Temperature and precipitation of the area varies in each season. However, the temperature fluctuates between 37.5°C during summer and about 6°C in winter. Rainfall mainly occurs due to South-west monsoon wind and begins from the month of May and continues till the first quarter of October. The annual rainfall of the region is about 374 cm. Most of the sectors of Duars are covered with dense forest and savannah type grasslands and, hence, is very rich in biodiversity. Villages of *Mech* tribes are situated within the vicinity of the forest and they inhabit the land along with other tribes such as *Rabha*, *Toto*, *Munda*, *Oraon*, *Garo*, etc.<sup>1-3</sup> Major part of *Mech* population (very primitive tribe of this region) in Duars (known as *Bodo* in Assam) is still dependent on traditional methods of treatment for recovering from most of their health problems. The study was conducted among these people during 2006 to 2008 to record the methods of treating jaundice, a quite common disease of the tribe.

### Methodology

Information about the medicinal use of several plants was collected through surveys conducted in several villages in Duars located mainly in different parts of the Jalpaiguri district of West Bengal<sup>4-9</sup>. These people are apparently very friendly but maintained a deep secrecy about their traditional knowledge. However, after visiting them for several times after developing confidence, they finally shared their knowledge about the medicinal uses of plants growing around them. A good number of patients suffering from jaundice were also interviewed during the survey, mostly taking them away from the healer (*Ojha*). The voucher specimens of the useful plants were spotted by the healers were collected and processed following conventional techniques<sup>10</sup>. The plant species were identified, verified and deposited in NBU herbarium.

### Results and discussion

As much as ten formulations of traditional medicine are used by the *Ojhas* of the *Mech* community in Duars for the treatment of jaundice. All these formulations have been enumerated along with the methods of preparation, doses and modes of administration. A total of 10 plant species are used in these ten formulations (Table 1). Apart from plants, hen's egg, milk, curd and sugar candy are used in some formulations. There is also variation in the method of administration, decoction for massage, tying to different parts of the body and using like a

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Table 1- Formulations used by *Mech* tribe for the treatment of jaundice

Formulations	Ingredients	<i>Mech</i> name	Methods
Formulation 1	<i>Stephania glabra</i> (Roxb.) Miers <i>Argyreia roxburghii</i> Arnott ex Choisy	<i>Dibauli bidat</i> <i>Dudhali bindong/ Chhaolia</i>	Pills prepared from paste of 10-15 gm tuber of <i>Dibauli bidat</i> and five leaves of <i>Dudhali</i> are dried and taken three times daily.
Formulation 2	<i>Oroxylum indicum</i> (L.) Kurz. Hen's egg	<i>Khara Khandai</i>	Two tablespoons juice of stem bark, one hen's egg and common salt are blended and fried; divided into three equal pieces, given orally thrice daily for 3 days. During the treatment, patients are advised not to take fish and meat.
Formulation 3	<i>Nastium hypericum</i> <i>Stephania glabra</i> (Roxb.) Miers <i>Argyreia roxburghii</i> Arnott ex Choisy	<i>Dokha khamflai</i> <i>Dibauli bidat</i> <i>Dudhali bindong</i>	One branch each of <i>N. hypericum</i> and <i>A. roxburghii</i> and one branch with tuber of <i>S. glabra</i> twisted together like a garland is hung round the patient's neck; used for seven days by changing regularly till recovery.
Formulation 4	<i>Stephania japonica</i> (Thunb.) Miers	<i>Chhantala</i>	Legs are massaged with leaf decoction of <i>Stephania japonica</i> at night.
Formulation 5	<i>Mangifera indica</i> L. Milk	<i>Khaizou</i>	Bark juice (4-5 spoons) of <i>Mangifera indica</i> mixed with one-cup milk is given in the morning on empty stomach.
Formulation 6	<i>Morus australis</i> Poiret	<i>Thaikhong chhef</i>	Root piece tied with a string is hung round the neck.
Formulation 7	<i>Ipomoea aquatica</i> Forsk	<i>Khalmi</i>	Necklace prepared from small pieces of stem is stuck round the head of the patient.
Formulation 8	<i>Morus australis</i> Poiret Curd	<i>Thaikhong Chhef</i>	Leaf juice mixed with one cup of curd is given once in a day till cured.
Formulation 9	<i>Sida cordifolia</i> Wight & Arnott Sugar candy	<i>Bamonmara</i>	Half-cup root juice and half-tablespoon sugar candy mixed together is given once daily till cured.
Formulation 10	<i>Plumbago zeylanica</i> L. Potato ( <i>Solanum tuberosum</i> L.)	<i>Emao</i>	Making a hole in a potato, $\pm 1.2$ cm <i>Emao</i> root is inserted, roasted, peeled off the potato and given orally once a day for three days.

Table 2- Traditional *Mech* healers and the efficacy status of their formulations

Formula No	Name of healer	Total No of patients	Fully cured	Partly cured	Not cured
Formula 1	Dhanabir Champramari	7	5	2	0
Formula 2	Satish Narjeenary	10	7	3	0
Formula 3	Bhaben Champramari	6	3	2	1
Formula 4	Brajendra Basumata	5	0	3	2
Formula 5	Satish Narjeenary	8	4	3	1
Formula 6	Surendra Basumata	4	1	2	1
Formula 7	Surendra Basumata	5	2	1	2
Formula 8	Bolen Boro	3	1	0	2
Formula 9	Anita Bramha	4	2	1	0
Formula 10	Nomili Narjinary	6	2	3	1
Total		58	27	20	10

necklace. These formulations have been collected from eight *Ojhas* and 6 of them use just one formulation; 2 of them, Satish Narjeenary and Surendra Basumata use 2 formulations (Table 2). It is important to know the efficacy of the methods of treatment. For this, at different times, a total of 58 jaundice patients were consulted, who were under treatment for at least 2 months (Table 2). With 2 formulations (2 & 5), Satish Narjeenary treats a good number of patients and 18 of them (10+8) were interviewed and 11 patients (7+4) were fully cured

and six (3+3) were partly cured. The record of successful treatment (50% or more) was also quite high with the formulations 1, 3 and 9. Not a single patient was cured with formulation 4 and the result is not satisfactory for formulations 6, 7, 8 and 10. However, none of these patients were tested for their blood sugar level prior or after the treatment and the general feelings or few symptoms were used for disease recognition and to understand the recovery status.

Documentation of these medicinal plants used by the *Mech* tribe is the firsthand report which shows that

these people are still so much dependent on local vegetation for their healthcare. Unless such reports are documented, the knowledge will be lost along with the old people of the tribes. However, the rapid loss of natural vegetation in the country is posing threat about the availability of these ethnically useful plants<sup>11</sup>. Not only the conservation of different types of natural vegetation of Duars needs to be implemented seriously, the Forest Department should educate the tribal people about the sustainable use of area's plant resources.

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