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SHORT COMMUNICATION

## **An Ethnomedicinal survey with the Rajbanshi community of Terai and Duars region in West Bengal part of India for the treatment of Primary Dysmenorrhea**

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### **ABSTRACT**

Since time immemorial long before the beginning of human civilization, prehistoric men used plant parts traditionally to take care of various diseases and disorders. Primary Dysmenorrhea is a sort of painful menstrual disorder. By semi-structured questionnaires in the course of scheduled interviews with the local herbal practitioners (commonly known as Mahan, Ojha or Kabiraj), four herbal formulations (coded as DYS1, DYS2, DYS3 and DYS4) were recorded with their dosimetry and method of application. Several plants like *Allium sativum* L., *Areca catechu* L., *Zingiber officinale* Roscoe, *Crinum amoenum* Roxb. ex KerGawl., *Cuscuta reflexa* Roxb., *Nymphaea pubescens* Willd., *Piper nigrum* L., *Citrus limon* (L.) Osbeck are used in different ratio to make herbal formulation to cure primary dysmenorrheal pain by the traditional healers of the Rajbanshi community.

**Keywords:** Primary Dysmenorrhea, Rajbanshi community, Terai & Duars region, West Bengal, India

## **1. INTRODUCTION**

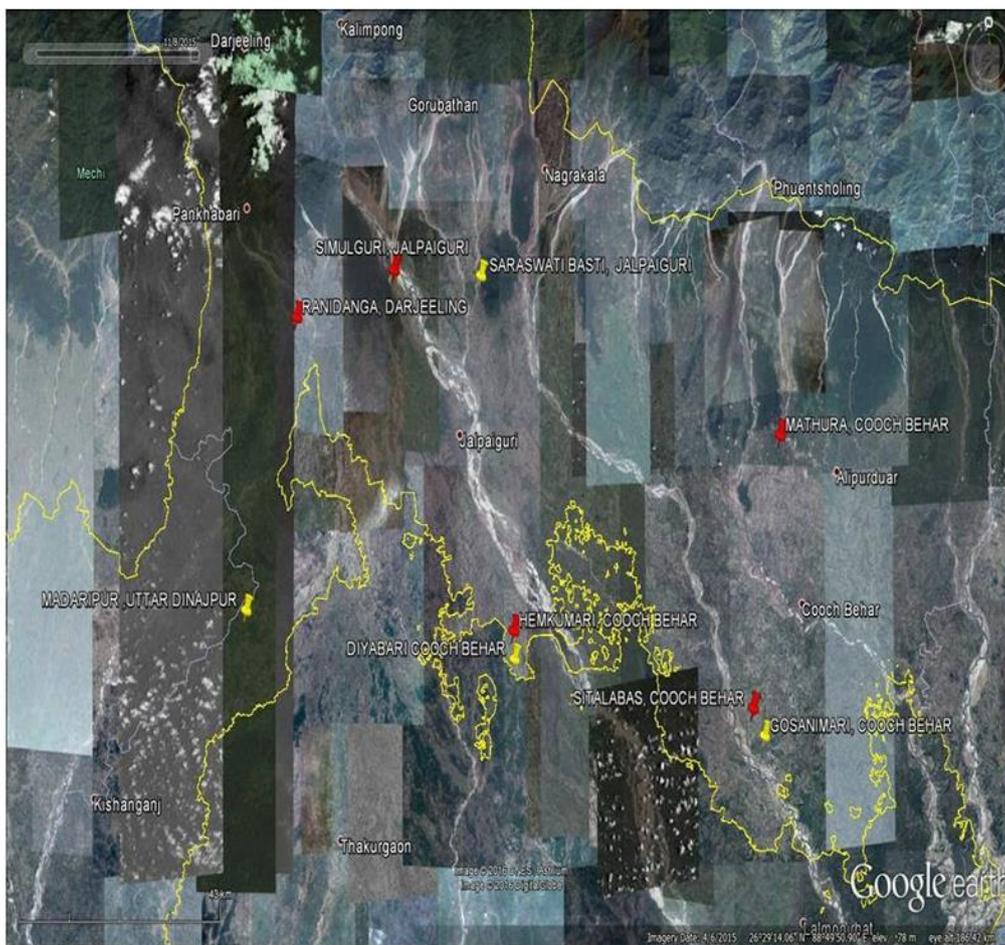
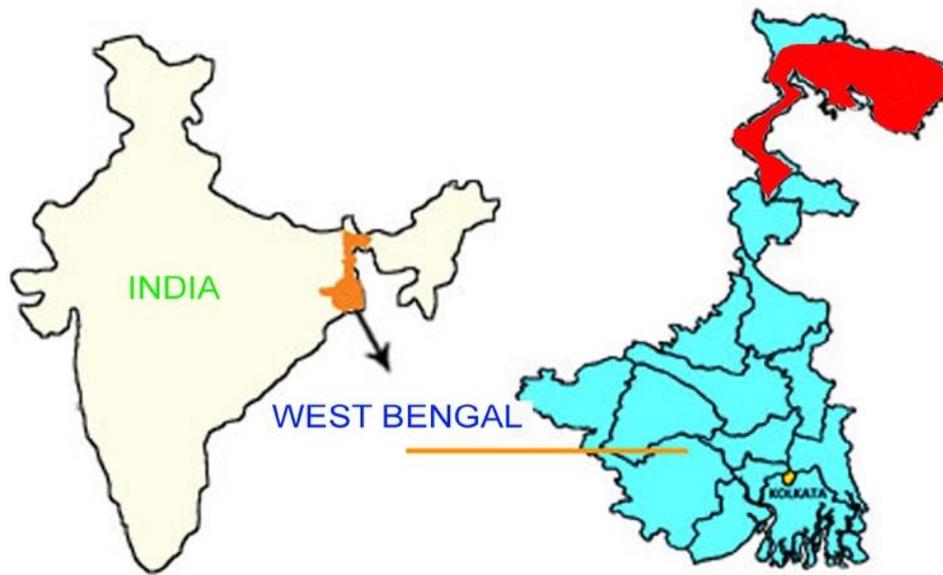
Dysmenorrhea is a Greek word. In Greek, ‘Dys’ means difficult, painful or abnormal, ‘meno’ means month and ‘rrhea’ means flow or discharge. Clinically, it refers to painful period during menstruation. One of the most important gynaecological disorders deserves attention. Dysmenorrhea is characterized by frequent muscle cramping during menstruation and lower abdominal pain but can spread to the lower back and thigh (Kashani *et al.*, 2015). Dysmenorrhea may be primary, with no associated organic pathology, or secondary, with demonstrable pathology. Primary dysmenorrhea is caused by prostaglandin-induced uterine contractions. Secondary dysmenorrhea means pelvic pain caused by (secondary to) a disorder or disease (Harel, 2006). This gynecological disorder must be treated with considerable seriousness. There are scanty numbers of allopathic medicine to treat this monthly disorder of women but in Indian Ayurvedic systems having numerous herbal treatments for curing this problem (Parvaneh *et al.*, 2014). Current research suggests several mechanisms by which medicinal plants effectively treat dysmenorrhea including modulation of prostaglandins levels, nitric oxide reduction, calcium channel inhibition, endorphin up-regulation and microcirculation regulation. The present paper deals with the information of some medicinal herbs used by the rajbanshi community for the treatment of dysmenorrhea. The plants are used in combination of more than one and are serving the purpose of good medicinal supplement in treating the disorder. This information can be of great importance if rightly used at a particular level and may be used in the preparation of herbal medicines in the long run (Roy *et al.* 2016).

This study also deals with 4 herbal prescriptions used by the ethnic community of Terai and Duars for the treatment of menstrual ailments. For these herbal preparations by the local community, mostly 8 angiosperm plants have been used by them. The present investigation also indicates that the medicaments, which are given for the treatment of dysmenorrhea either prepared from a single plant parts or in combination of other plant parts. It is evident that for the preparation of medicaments that out of different parts, rhizomes and roots are frequently used to prepare the medication for the respective ailments.

## **2. MATERIALS AND METHODS**

### **2. 1. Study area**

Terai and Duars lies in the Northern half of the State of West Bengal and is surrounded by international boundaries of Bangladesh, Nepal and Bhutan. The area is a combination of the wide-ranging landscape from the high mountainous region in the north to the vast Gangetic plains in the farthest south. The study area lies in between 26.7072° N and 88.3558° E. The annual rainfall is recorded to be about 3900 mm and temperature varies between 7 °C to 37 °C. The uniqueness of the area has made it one of the treasures of West Bengal with diversified plant and animal populations. The region not only stands out in the case of scenic beauty, along with flora and fauna but also in social atmosphere. The region is a blend of several exclusive tribal communities which makes it rich in culture as well. Some of the major tribes include Rajbanshi, Rabha, Santal, Munda, Oraon, Polia, Lepcha, Toto etc. (Mitra & Mukherjee, 2010). The mainly Rajbanshi community comprises the major part of the population in this area and they are living here since thousands of years.



**Fig. 1.** Map showing study area (Google map below in detail) highlighted in red colour North Bengal part under India

## 2. 2. Data collection

Surveys were conducted through the semi-structured questionnaires and revealed four herbal formulations (coded as DYS1, DYS2, DYS3 and DYS4), which were recorded with their dosimetry and method of application for the treatment of dysmenorrhea. After these comprehensive discussions, the respective plants were collected properly both in its flowering and fruiting seasons. The collected specimens were deposited at the NBU (North Bengal University Herbarium) for proper identification of the plants and digitalized photographs were also taken.

## 3. RESULTS AND DISCUSSION

### 3. 1. Description of the selected plants used in treating dysmenorrhea

1. *Allium sativum* L. (Liliaceae)---local name: Rasun.

Bulb solitary, globose to applanate-globose. Leaves broadly linear to linear-lanceolate, shorter than scape, to 2.5 cm wide, apex acuminate. Scape 25--50 cm, terete, spathe deciduous; beak 7--20 cm. Umbel with many bulblets and few flowers. Pedicels slender, longer than perianth; bracteoles ovate, rather large, membranous, apex acute. Perianth usually pale red; outer segments ovate-lanceolate; inner ones ovate, ca. 3 × 1.4 mm. Filaments shorter than perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side, teeth with apex filiform and longer than perianth segments. Ovary globose. Style not exerted. Parts used: Rhizome. Local uses: Detailed prescription mentioned under Formula I (DYS 1).

2. *Areca catechu* L. (Arecaceae)---local name: Guya.

Stems solitary, erect. Leaf sheaths closed and forming green, slightly swollen crownshafts to 1 m; petioles not more than 5 cm, rachis recurved, 20-30 per side of rachis regularly and closely arranged. Inflorescences infrafoliar, branched to 3 orders, erect; rachillae many, flexuose, yellowish green, to 25 cm; male flowers solitary, alternate and distichous on rachillae; stamens 6; female flowers at bases of rachillae only, larger than male flowers. Fruits yellow, orange, or red, ovoid, to 8 × 6 cm. Local uses: It is an important cultivated species. The sliced seed (betel nut) is chewed as a mild narcotic. The plant also has great ornamental value and many other minor uses. Parts used: Roots. Local uses: Detailed prescription mentioned under Formula IV (DYS 4).

3. *Citrus limon* (L.) Osbeck (Rutaceae)—local Name: Lebu.

Description: Small trees. Branches ± spiny. Leaf blade ovate to elliptic, margin conspicuously crenulate, apex usually mucronate. Flowers solitary or several in fascicles. Flowers bisexual or male by ± complete abortion of pistil. Calyx cup-shaped; lobes 4 or 5. Petals 1.5-2 cm, outside purplish, inside white. Stamens 20-25 or more. Ovary subcylindric or barrel-shaped; stigma clavate. Fruit yellow, ellipsoid to ovoid, narrowed at both ends, surface usually coarse and lemon scented, apex usually with a mammilla. Seeds ovoid, small, apex acute; seed coat smooth; embryo usually solitary but sometimes numerous; cotyledons milky white. Parts used: Roots. Local uses: Detailed prescription mentioned under Formula III (DYS 3).

4. *Crinum amoenum* Ker Gawl. ex Roxb. (Amaryllidaceae)---local name: Gorasun

Herbaceous and bulbous plant. Flowers are large, white in a dense umbel of 6-12, with slender spreading petals and a long green flower-tube. Stamens are strongly reddish. The flower cluster is borne atop a slender leafless stem 1-3 ft tall. Petals are linear-lanceolate, 6-8 cm long, with the flower-tube very narrow, 7-9 cm long. Style is long, purple. Leaves are 9-14 cm long, spear shaped, 2 - 4 cm broad. Bulb is large, 5-7 cm in diameter. Parts used: Rhizome. Local uses: Detailed prescription mentioned under Formula I (DYS 1).

5. *Cuscuta reflexa* Roxb. (Convolvulaceae)—Local name: Alokelata.

Stems yellow or yellowish green, stout, 2-3 mm in diam., with brown spots. Inflorescences lateral, few to many flowered, in racemes or panicles 1.5-3 cm, branched; bracts and bractoles scalelike. Pedicel 2-4 mm, together with peduncle, brown spotted or tuberculate. Calyx cupular; sepals 5, broadly ovate. Corolla white or creamy, fragrant, tubular, 5-9 mm. Stamens inserted at throat; filaments shorter than anthers or absent; anthers elliptic-ovate; scales oblong, reaching middle of tube, short and densely fimbriate. Ovary ovate-conical. Style 1, very short or absent; stigma divergent or erect, elongated, ligulate, longer than style. Capsule conical-globose, subquadrate when mature, 5-10 mm in diam., circumscissile. Seeds 1-4, dark brown, oblong, ca. 4 mm. Parts used: Leaves. Local uses: Detailed prescription mentioned under Formula IV (DYS 4).

6. *Nymphaea rubra* Roxb. ex Andrews (Nymphaeaceae)—local name: Lal Hola.

Aquatic perennial rhizomatous herb. Leaves long petioled, orbicular, entire, 15–25 × 22–30 cm, first dark red both above and beneath, turning greenish above with age. Flowers crimson red. Petals 16–25; stamens 25–75. Berry 2.5–9 cm. Seeds ellipsoid. Parts used: Rhizome. Local uses: Detailed prescription mentioned under Formula II (DYS 2).

7. *Piper nigrum* L. (Piperaceae)—local name: Golmorich.

Climbers woody. Petiole 1-2 cm, glabrous; leaf blade ovate to ovate-oblong, rarely suborbicular, 10-15 × 5-9 cm, leathery, glabrous, base rounded, usually slightly oblique, apex acute; veins 5-7(-9). Flowers polygamous, usually monoecious. Spikes leaf-opposed, to as long as leaves; peduncle nearly as long as petioles, glabrous; bracts spatulate-oblong, 3-3.5 × ca. 0.8 mm. Stamens 2, 1 on each side of ovary; filaments thick, short; anthers reniform. Ovary globose; stigmas 3 or 4, rarely 5. Drupe red when ripe, drying black when unripe, globose, 3-4 mm in diam., sessile. Parts used: Fruits. Local uses: Detailed prescription mentioned under Formula I (DYS I).

8. *Zingiber officinale* Roscoe (Zingiberaceae)---local name: Ada.

Rhizomes branched, yellowish inside, thickened, fleshy, strongly aromatic. Pseudostems 50--100 cm. Leaves sessile; ligule slightly 2-lobed, leaf blade lanceolate or linear-lanceolate, 15--30 × 2--2.5 cm, glabrescent. Inflorescences arising from rhizomes, ovoid, 4--5 × ca. 1.5 cm; peduncle to 25 cm; bracts pale green, sometimes yellowish at margin, ovate, ca. 2.5 cm, apex mucronate; bracteoles equaling bracts. Calyx ca. 1 cm. Corolla yellowish green; tube 2--2.5 cm. Central lobe of labellum with purple stripe and cream blotches, oblong-obovate, shorter than corolla lobes; lateral lobes ovate, ca. 6 mm, free nearly to base. Stamen dark purple; anther ca. 9 mm; connective appendage curved, ca. 7 mm. Parts used: Rhizome. Local uses: Detailed prescription mentioned under Formula III (DYS 3).



**Fig. 2.** During oral interview with local Rajbanshi people at Hemkumari Dangapara Village, Kochbehar.  
[first author was writing ITK]

**Fig. 3.** During Rhizome & Bulb collection with local People by the first author at Bhitarkamta village, Kochbehar

### **Formulation of drugs used for the treatment of Dysmenorrhea**

#### **FORMULA 1: (DYS1) [DYS = DYSMENORRHEA]**

**Ingredients:** (i) *Crinum amoenum* Roxb. [Priyankar 09780], (ii) *Allium sativum* L. [Priyankar 09782], (iii) *Piper nigrum* L. [Priyankar 09785—this number denotes the dried plant including its part is deposited in the herbarium of studied institute]

#### **Rajbanshi**

**Names:** (i) Gorasun (ii) Rasun (iii) Golmorich

**Preparation:** Rhizome of *Crinum amoenum*, bulb of *Allium sativum* and powder of fruit of *Piper nigrum* crushed together and made into 7 pills.

**Dosage:** One pill given per day for 7 days from the starting day of menstrual cycle.

#### **FORMULA 2: (DYS2)**

**Ingredients:** (i) *Nymphaea rubra* Roxb. ex Andrews [Priyankar 09781].

#### **Rajbanshi**

**Names:** (i) Lalhola

**Preparation:** Rhizome of *Nymphaea rubra* Roxb. ex Andrews crushed and given orally for.

**Dosage:** Extract given for 3 days

#### **FORMULA 3: (DYS3)**

**Ingredients:** (i) *Citrus limon* (L.) Osbeck [Priyankar 09787], (ii) *Piper nigrum* L. [Priyankar 09785] and (iii) *Zingiber officinale* Rosc. [Priyankar 09786]

#### **Rajbanshi**

**Names:** (i) Lebu, (ii) Golmorich and (iii) Ada

**Preparation:** Roots of *Citrus limon* crushed and soaked in water overnight & the suspension taken. Dried fruit of *Piper nigrum* crushed & made into powder, 10-20 gm rhizome of *Zingiber officinale* and a little bit of salt mixed together with the suspension.

**Dosage:** One cup of mixture given for 3 days.

**FORMULA 4: (DYS4)**

**Ingredients:** (i) *Cuscuta reflexa* Roxb. [Priyankar 09787], (ii) *Areca catechu* L. [Priyankar 09784]

**Rajbanshi**

**Names:** (i) Alok lata, (ii) Guya

**Preparation:** Whole plant part of *Cuscuta reflexa* and equal quantities of roots of *Areca catechu* crushed and mixed with sufficient cold water and filtered.

**Dosage:** One cup of extract given per day for 21 days in empty stomach.  
(Should not consume non veg items like meat, fish, egg)

Local people of the Rajbanshi community, especially in the remote areas, are exclusively dependent on these plant parts for the treatment of dysmenorrheal pain since time immemorial. These plants are readily available in this locality and thus the said community is being benefitted by these herbal resources.

#### 4. CONCLUSIONS

There are many reports regarding the use of these plants in treating Dysmenorrhea (Roy et al., 2016) by different ethnic community of North Bengal but the present study reveals that rhizomes of *Crinum* have been used for the ailment of dysmenorrhea very effectively by the local apothecary for the first time. The above mentioned medications are not well known to the general people of this area because the ethnic practitioners not willing to disclose their Indigenous Traditional Knowledge (ITKs) of preparation of medicine to the general public. The tribal population residing far away from the light of modern medicines sometimes do not want to use synthetic medicine for the treatment of their ailments and is depending completely upon their methods of alternative herbal systems of medicine. The field of ethnobotany has ample opportunity to unwrap new horizons in the field of modern drug development programme especially for the females. More detailed and minute observational study of these plants in respect of menstrual cycles of females is required to find out some more effective potential plants from which some unique herbal medicines can be prepared for human welfare in the near future.

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