Ethno-medico-botanical studies on cucurbits of Rajshahi division, Bangladesh

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Use of medicinal plants for primary health care by the tribal people of the Rajshahi division, Bangladesh was recorded. In the present ethno-medico-botanical survey, a total of 24 species belonging to 13 genera of the family Cucurbitaceae were collected and recorded for their use in various ailments. Among the medicinal species, *Diplocyclos palmatus* (L.) Jeffrey, *Gymnopetalum cochinchinense* (Lour.) Kurj., *Melothria maderaspatana* (L.) Cogn., *Thladiantha cordifolia* (BL.) Cogn. have been reported as new medicinal species from Bangladesh. For each species botanical name, family name, local name, pick period, chromosome number, ailments to be treated, mode of treatment and part(s) used are provided.

**Keywords:** Ethno-medico-botany, Cucurbitaceae, Folkloric uses, Rajshahi, Bangladesh.

1. Introduction

Rajshahi division is one of the seven administrative divisions of Bangladesh. It has an area of 18,174.4 km² and a population at the 2011 census of 18,329,000 (preliminary figures). Rajshahi division consists of 8 districts (Bogra, Joypurhat, Naogaon, Natore, Nawabganj, Pabna, Rajshahi, Sirajganj), 70 Upazillas and 1092 Unions. This division is characterized by its cheap labour force. It has an excellent rail and road communication infrastructure. The divisional capital of Rajshahi is only four hours road journey away from Dhaka, the capital city (Singh, 2003). Rajshahi was a Divisional headquarter during British period, partition of India in 1947, resulting continuous migration from the Indian side led to sudden population boom in the city. This is the fourth largest city in Bangladesh after Dhaka, Chittagong and Khulna. The city is famous for its high number of educational institutions and situated on the Bank of river Padma. The city is located between 24°21’ north latitudes and between 88°28’ and 88°38’ east longitudes. The city has a sub-tropical monsoon climate, typical of Bangladesh, which falls within a low rainfall zone of the country. 75 percent rainfall occurs during June-September. The annual rainfall is 1350mm. Temperature of the area is low in January varies from 9.0°C to 14.1°C. From February an increasing trend of temperature is found up to April and thereafter temperature start to decline. In
April temperature varies from 22.6°C to 36.9°C. The mean relative humidity is found to be low in March (65%) and high in July-September (88-89%) (BBS, 2009).

Ethnobotany, in its totality, is virtually an old field with new dimension of research. Bangladesh is very rich in ethno-cultural heritage and traditional use of plant materials that may be of special interest in ethno-botanical information. About 80 percent people of the country live in the villages and a considerable proportion is tribal’s living in remote forest areas (Rahman et al. 2012). Even today in most of the rural areas people are depending on herbal drug systems for primary healthcare (Prasanth and Kumar, 2008). So far no systematic ethno-medico-botanical survey has been made in this area. Once, they relied on natural plants and plant products of Rajshahi division for the primary healthcare other than modern medicine (Rahman et al., 2013). Currently, traditional knowledge of primary healthcare system of tribal communities is under great threat because of a number of factors including deforestation, habitat degradation, biodiversity loss and modern civilization (Uddin et al., 2012). For the sake of conservation of tribal knowledge on medicinal cucurbits, ethno-medico-botanical study at Rajshahi division was essential. Studies on ethno-medico-botanical information of ethnic communities in Bangladesh are at initial stage. Several ethno-medicinal studies in Bangladesh have been carried out by Alam (1992); Hassan and Khan (1996); Anisuzzaman et al. (2007); Rahman et al. (2008, 2010, 2012); Rahman (2013, 2013); Uddin et al. (2001, 2004, 2006, 2008, 2012); Khan (1998) and Yusuf et al. (2006, 2007). But none of them was devoted to ethno-medico-botany on cucurbits of Rajshahi division. The aim of the present study was to record medicinal knowledge of cucurbits used by the tribal communities living of Rajshahi division, Bangladesh.

2. Materials and Methods
In the present ethno-medico-botanical survey, a total of 24 species belonging to 13 genera of the family Cucurbitaceae were collected and identified. A total of 140 people having an age range 15-75 years were interviewed using semi-structured interviewed method (Alexiades 1996; Martin, 1995). Professionally they were peasant, day labor, farmer, betel leaf cultivators, house wives, medicine men, small shop keepers etc. Among them 60 were female and rest 80 were male. Regular field studies were made in the study area. The information about the plants used for various diseases was gathered through interviews and discussion with the elderly people, Kabiraj, medicine men and traditional medical practitioners were also consulted. Triangulation methods have been followed for data validation in the field (Dean and Whyte, 1959). Plant specimens with flowers and fruits were collected and processed using standard herbarium techniques (Hyland, 1972; Alexiades, 1996). Herbal plants referred by these people were authentically identified with the help of Hooker (1961), Prain (1963), Khan and Huq (1975), Kirtikar and Basu (1987), Rahman et al. (2013) and Ahmed et al. (2008). The voucher specimens are stored at Rajshahi University Herbarium (RUH) for future reference.

3. Results
By applying survey, interview, collection and identification methods, different ethno-medico-botanical information were accumulated. The well analyzed and check listed information about the plant materials collected from the study area are described below.
1. **Botanical Name:** *Benincasa hispida* (Thunb.) Cogn.  
**Family Name:** Cucurbitaceae  
**Local Name:** Chal kumra, sada kumra, chuna kumra  
**Pick Period:** March to October  
**Chromosome Number:** 2n=24 (Simmonds, 1976)  
**Part(s) Used:** Fruits, Seeds  
**Ailments and Treatment Process:** Curry made from fruit is used in tonic, nutritive, diuretic, antiperiodic, constipation, heart disease, tuberculosis, colic pain and aphrodisiac. Fried seeds are used in tapeworm, lumbrici and diuretic.

2. **Botanical Name:** *Citrullus lanatus* (Thunb.) Mart & Nakai.  
**Family Name:** Cucurbitaceae  
**Local Name:** Turmuz  
**Pick Period:** January to May  
**Chromosome Number:** 2n=22 (Simmonds, 1976)  
**Part(s) Used:** Fruit, seeds  
**Ailments and Treatment Process:** Ripe fruits are directly used as cooling, strengthening, diuretic, stomachic, purifies the blood, aphrodisiac, astringent, biliousness, sore eyes, scabies and itching. The juice of the fruit as an antiseptic in typhus fever and purgative. The seeds are tonic to the brain.

3. **Botanical Name:** *Coccinia grandis* (L.) Voigt.  
**Family Name:** Cucurbitaceae  
**Local Name:** Telackucha  
**Pick Period:** March to December  
**Chromosome Number:** 2n=24 (Darlington and Wylie, 1950)  
**Part(s) Used:** Whole plant, fruit, leaves, roots, stem  
**Ailments and Treatment Process:** Curry made from young fruits is used in diabetes, aphrodisiac, biliousness and disease of the blood. Juice of whole plant is used in diabetes, anorexia, asthma, fever, dropsy, catarrh, epilepsy and gonorrhrea. The whole plant has the reputation effect in reducing the amount of sugar in the urine of patients suffering from diabetes mellitus. Fresh juice of leaves, stem and root produces no reduction sugar in the blood or urine of patients suffering from glycosuria. The fruit and leaves are prescribed in the treatment of snake-bite.

4. **Botanical Name:** *Cucumis sativus* L.  
**Family Name:** Cucurbitaceae  
**Local Name:** Sasha, Khira  
**Pick Period:** January to December  
**Chromosome Number:** 2n=14 (Simmonds, 1976)  
**Part(s) Used:** Leaves, fruits, seeds  
**Ailments and Treatment Process:** Fruit is direct used in demulcent. Fried seeds are used in cooling, tonic, diuretic and anthelmintic. Leaves along with cumin seeds administrated in throat affections.

5. **Botanical Name:** *Cucumis melo* L.  
**Family Name:** Cucurbitaceae  
**Local Name:** Phuti, Bangi, Kurbuz  
**Pick Period:** January to May  
**Chromosome Number:** 2n=24 (Simmonds, 1976)  
**Part(s) Used:** Fruits, seeds  
**Ailments and Treatment Process:** The ripe fruit is used in kidney diseases, cooling, flattening, tonic, laxative, aphrodisiac, biliousness and diuretic and acute eczema. The seeds are diuretic, cooling, nutritive, and beneficial to the enlargement to prostate gland.

6. **Botanical Name:** *Cucumis callosus* L.  
**Family Name:** Cucurbitaceae  
**Local Name:** Bangumak  
**Pick Period:** June to October  
**Chromosome Number:** 2n=24 (Simmonds, 1976)  
**Part(s) Used:** Fruits, seeds  
**Ailments and Treatment Process:** The fruit is used to prevent insanity to strong then memory and remove vertigo. The seeds are cooling and astringent and useful in bilious disorder.

7. **Botanical Name:** *Cucurbita maxima* Duch.  
**Family Name:** Cucurbitaceae  
**Local Name:** Bitati, mistikumra  
**Pick Period:** January to December  
**Chromosome Number:** 2n=40 (Simmonds, 1976)  
**Part(s) Used:** Fruit, seeds  
**Ailments and Treatment Process:** The fruit is used in diuretic, tonic, inflammations and boils. Fried seeds are used in anthelmintic, diuretic and tonic.

8. **Botanical Name:** *Cucurbita pepo* L.  
**Family Name:** Cucurbitaceae  
**Local Name:** Mistikadu, Bilati  
**Pick Period:** November to June  
**Chromosome Number:** 2n=40 (Simmonds, 1976)  
**Part(s) Used:** Fruits, leaves, seeds  
**Ailments and Treatment Process:** The fruit is cooling, astringent to the bowels, laxative, good for teeth, throat, eyes. Paste of leaves are used in biliousness and burning sensation. The seeds are diuretic, tonic, bronchitis, fever, good for the kidney and the brains.

9. **Botanical Name:** *Cucurbita moschata* (Duch. ex Lam.) Duch.  
**Family Name:** Cucurbitaceae  
**Local Name:** Mistikadu, Bilati  
**Pick Period:** November to June
Chromosome Number: 2n=40 (Simmonds, 1976)
Part(s) Used: Leaves, fruits, seeds
Ailments and Treatment Process: Paste of leaves is used in biliousness and burning sensation. The fruit is cooling, astringent to the bowels, laxative, good for teeth, throat, eyes. The seeds are diuretic, tonic, bronchitis, fever, good for the kidney and the brains.

10. Botanical Name: *Diplocyclos palmatus* (L.) Jeffrey
Family Name: Cucurbitaceae
Local Name: Mala
Pick Period: November to April
Chromosome Number: 2n=24 (Darlington and Wylie, 1950)
Part(s) Used: Whole plant
Ailments and Treatment Process: The whole plant juice is used in bitter and tonic.

Family Name: Cucurbitaceae
Local Name: Kaubuti
Pick Period: November to April
Chromosome Number: 2n=22 (Darlington and Wylie, 1950)
Part(s) Used: Leaves, fruit, root, Whole plant
Ailments and Treatment Process: Juice of leaves is given in opthalmia. The fruit is said to be poisonous. The decoction of the root is taken as an antitode to poisoning by ripe fruits and against tetanus after a miscarriage. The whole plant is given to women in labour as composition of special drug. Juice of root is used in body ache and atrophy of limb.

Family Name: Cucurbitaceae
Local Name: Panilau, Lau, Panikadu
Pick Period: January to December
Chromosome Number: 2n=22 (Simmonds, 1976)
Part(s) Used: Leaves, fruits, roots, stem, seeds
Ailments and Treatment Process: White pulp of fruit is cooling, emetic, purgative, diuretic and antibilious. Oil from the seeds is cooling and used to relieve headache. Seeds are nutritive and diuretic. Decoction of leaves mixed with sugar given in jaundice. Warm of tender stem relieves earache. Curry made from fruit is used in cholera.

Family Name: Cucurbitaceae
Local Name: Toroy, Jhinga
Pick Period: June to October
Chromosome Number: 2n=26 (Symmonds, 1976)
Part(s) Used: Leaves, fruits, seeds
Ailments and Treatment Process: The pounded leaves are applied locally to splenetic, hemorrhoids and leprosy. The juice of fresh leaves is dropped into the eyes of children in glandular conjunctivitis, also to prevent the lids adhering at night from excessive meibomian secretion. Fruit is demulcent, diuretic and nutritive.

Family Name: Cucurbitaceae
Local Name: Dhundol
Pick Period: June to November
Chromosome Number: 2n=26 (Symmonds, 1976)
Part(s) Used: Fruits, seeds
Ailments and Treatment Process: Young fruits are used in cooling, costive, demulcent, appetite and excitative of mind, bile and phlegm. The seeds are emetic and cathartic.

Family Name: Cucurbitaceae
Local Name: Agmuki
Pick Period: November to April
Chromosome Number: 2n=22 (Darlington and Wylie, 1950)
Part(s) Used: Roots
Ailments and Treatment Process: The juice of the root is considered a remedy for spermatorrhoea, also used in stimulant, invigorating, purgative and gonorrhoea.

16. Botanical Name: *Momordica cochinchinensis* (Lour.) Spreng
Family Name: Cucurbitaceae
Local Name: Kakrol
Pick Period: March to September
Chromosome Number: 2n=22 (Symmonds, 1976)
Part(s) Used: Leaves, fruits, seeds
Ailments and Treatment Process: Both paste of leaves and fruits are used in external application for lumbago, ulceration and fracture of bones. The seeds of plant are used as aperients and in the treatment of ulcers, sores and obstructions of liver and spleen. The roots are given in rheumatism with swelling of the lower limbs.

17. Botanical Name: *Momordica carantia* L.
Family Name: Cucurbitaceae
Local Name: Karala
Pick Period: January to December
Chromosome Number: 2n=22 (Symmonds, 1976)
Part(s) Used: Fruit, root, leaves, seeds, whole plant
Ailments and Treatment Process: The fruit are considered tonic, stomachic, febrifuge, carminative and cooling, they are used in rheumatism, gout and disease of liver and spleen. The seeds are used in anthelmintic. An alcoholic extract of the whole plant is used in stomachic against colic and fever. Juice of the whole plant is used in diabetes. The fruits, leaves and roots have long been as a folk remedy for diabetes mellitus. The fruits and leaves are anthelmintic, useful in piles, leprosy, jaundice and as vermifuge.

18. Botanical Name: Momordica dioica Roxb.  
Family Name: Cucurbitaceae  
Local Name: Gheekorolla  
Pick Period: June to October  
Chromosome Number: 2n=22 (Symmonds, 1976)  
Part(s) Used: Root  
Ailments and Treatment Process: The roots are toasted and used to stop bleeding from piles, used in urinary complaints, ground to paste smeared over body as a sedative in high fever with delirium.

Family Name: Cucurbitaceae  
Local Name: Dabilata  
Pick Period: May to October  
Chromosome Number: 2n=18 (Darlington and Wylie, 1950)  
Part(s) Used: Root, seeds  
Ailments and Treatment Process: The seed is cardiac tonic and an astringent. The root is alterative, cholagogue, diuretic and galactagogue.

Family Name: Cucurbitaceae  
Local Name: Bhuikakra  
Pick Period: May to October  
Chromosome Number: 2n=22 (Symmonds 1976)  
Part(s) Used: Root  
Ailments and Treatment Process: The roots are used as a tonic. The root dried and reduced to powder is given in enlargements of the spleen, liver and abdominal viscera. The fresh root mixed with oil, forms a common application for leprous ulcers.

Family Name: Cucurbitaceae  
Local Name: Potol  
Pick Period: November to April  
Chromosome Number: 2n=22 (Symmonds 1976)  
Part(s) Used: Fruits, leaves  
Ailments and Treatment Process: Fresh juice of unripe fruit is used as cooling and laxative. The fruit is also used in spermatorrhoea. Laeves is aperients, also used to be tonic and febrifuge; used as diet in subacute cases of enlarge liver and spleen. Fruit is febrifuge, laxative, antibilious.

22. Botanical Name: Trichosanthes anguina L.  
Family Name: Cucurbitaceae  
Local Name: Chichinga  
Pick Period: November to April  
Chromosome Number: 2n=22 (Symmonds 1976)  
Part(s) Used: Fruit, root, seed  
Ailments and Treatment Process: The fruit is used as a laxative and tonic. The root and seeds are anthelmintic and antidiarrhoel, used for biliousness and in syphilis.

23. Botanical Name: Trichosanthes bracteata (Lamk.) Voigt.  
Family Name: Cucurbitaceae  
Local Name: Makal, Makalphal  
Pick Period: July to December  
Chromosome Number: 2n=22 (Symmonds, 1976)  
Part(s) Used: Fruit, seed, root  
Ailments and Treatment Process: The fruit is used as a cure for asthma, also used in earache, carminative, bitter, purgative, abortifacient, lessens inflammations. The seeds are emetic and purgative. The fruit punded and well mixed with warm coconut oil, forms a valuable application to sores under the ears and nostrils. The juice of the fruit or the root-bark, boiled with gingelly oil, is used with good effect as a bath oil, for the relief of long-standing or recurrent attacks of headache.

24. Botanical Name: Trichosanthes cucumerina L.  
Family Name: Cucurbitaceae  
Local Name: Banchichinga  
Pick Period: June to November  
Chromosome Number: 2n=22 (Symmonds, 1976)  
Part(s) Used: Root, seed, fruit, leaves  
Ailments and Treatment Process: Root is used as a cure for bronchitis, headache and boils. The seeds are cooling and haemagglutinating. The juice of the leaves and fruits is useful in congesting of the liver and bilious headache. Fruits when ripe is purgative, believed to improve appetite, emetic, anthelmintic and cure biliousness. Roots and seeds for expulsion of worms and for the treatment to diarrhea and syphilis.

4. Discussion  
In the present ethno-medico-botanical survey, a total of 24 plant species under 13 genera of the family Cucurbitaceae were collected and recorded for their use in
various ailments. For each species local name, scientific name, ailments to be
treated, mode of treatment and part(s) used
are provided. From the available information
it is revealed that this ethnic community
used plant species, which are not generally
used by other population. Data have been
gathered on the traditional uses of plant
species, especially for abscess, anthilmintic,
astringent, burning sensation, constipation,
conjunctivitis, diarrhoea, diabetes, eczema,
earache, fever, fracture, gonorrhea,
headache, heart disease, itches, jaundice,
kidney disease, leprosy, piles, scabies,
snake-bite, spermatorrhoea, syphilis, throat
affection, ulcers, vertigo, worm and others.
The survey has also recorded 87 categories
of uses of 24 medicinal plants. This is the
indication of rich knowledge of medicinal
uses of plants by the tribal people in the
study area. Use of species in different
ailments showed also variations. *Momordica
carantia* L. has been used for treatment of
19 ailments; *Trichosanthes cucumerina* L.
and *Coccinia grandis* (L.) Voigt. has been
used for treatment of 15 ailments in each.
*Citullus lanatus* (Thunb.) Mart & Nakai.,
*Cucurbita pepo* L. and *Cucurbita moschata*
(Duch. ex Lam.) Duch. has been used for
treatment of 14 ailments in each. *Cucumis
melo* L. has been used for treatment of 13
and *Trichosanthes bracteata* (Lamk.) Voigt.
has been used for treatment of 12 ailments in
each. *Lagenaria siceraria* (Molina) Standl.,
*Momordica cochinchenis* (Lour.) Spreng.
and *Trichosanthes dioica* Roxb. has been
used for treatment of 11 ailments in each.
For treating two to nine ailments 12 species
were used. Among the medicinal use of
plants, the survey reported a good number of
new uses those were not mentioned in the
previous literatures (Yusuf et al., 2009;
Ghani, 1998).
The present findings are probably the first
record of ethno-medico-botanical
knowledge for Rajshahi division using
standard research protocols. The present
study may be a preliminary contribution to
the ethno-medico-botany of this area using
standard research methods, focusing on
medicinal plants and their local uses for the
healthcare. This healthcare knowledge
transmitted orally from one generation to
generation. The study also suggested that the
present information on medicinal use of
plants by tribal people may be used for
botanical and pharmacological research in
future for the discovery of new sources of
drugs (Rahman et. al., 2013).

5. Conclusion
Most of the tribal people in the study area
are poor and illiterate. In one hand, these
Santhals are out of the reach of modern
medicines and on other hand, the market
price of most available medicines are very
expensive. As a result, these medicinal
plants are used by them to cure all of the
diseases. The wide use of local flora by the
tribal people suggests that cultivation and
conservation of indigenous useful plants
should be encouraged. There is a need of
intensive work in this direction which may
help tribal development.

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