



ISSN (E): 2320-3862  
ISSN (P): 2394-0530  
NAAS Rating 2017: 3.53  
JMPS 2017; 5(3): 265-268  
© 2017 JMPS  
Received: 11-03-2017  
Accepted: 12-04-2017

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## Ethnobotanical investigation of some orchids used by five communities of Cox's Bazar and Chittagong hill tracts districts of Bangladesh

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### Abstract

The present study deals with an ethnobotanical investigation of the utilization of orchids as medicine by the ethnic communities (Chakma, Marma, Tanchangya, Rakhain and Bengali) of Cox's Bazar and Chittagong Hill Tracts Districts of Bangladesh. The information has been documented by interviewing the traditional healers and various elderly people from five communities following different ethnobotanical methods. The documented information compiled a total of nine orchid species which have been used individually or in combination with different plant parts of other species to treat 42 diseases. The most frequent diseases found to treat in the current investigation are rheumatism, inflammation, fever, paralysis, earache and epilepsy. The species have been presented along with their scientific and local names, family, short description and their ethnomedicinal uses. The herbal medicines have been found to be prepared in various ways like- juice, decoction, paste, pill and sometimes the plant parts directly used as raw element. From the documented information it is revealed that the most frequently used part of orchid is leaf.

**Keywords:** Ethnobotanical method, ethnic communities, ethnomedicinal use.

### 1. Introduction

Man's dependence on the plant kingdom seems parallel to our evolutionary history. Our basic, domestic, cultural and health needs have all been catered for by plants, and through the ages our dependence has hardly decreased. Orchid is one of the naturally growing common plants in Bangladesh. About 178 orchid species grow in Bangladesh<sup>[1]</sup> of which 26 orchid species (epiphytic and terrestrial) were recorded as ethnobotanically important. 30 types of diseases are considered to be treated with orchid based medicine by different ethnic people<sup>[2]</sup>. The medicinal value of plants realized by early civilizations and the traditional use of plants as medicine is still in practice today<sup>[3]</sup>. Some of the earliest indications of mankind's dependence on medicinal plants and their applications are documented in ancient pharmacopoeias<sup>[4, 5]</sup>. UNESCO<sup>[6]</sup> and WHO<sup>[7]</sup> reported widespread usage of medicinal plants within the practice of traditional medicine in developing countries. Historically, plants were the only source of medication and they continue to demonstrate their therapeutic usefulness by being a part of, possibly the only primary health care system in certain regions<sup>[8]</sup>. Orchids are the largest and most diverse group among the angiosperms. They are cultivated for beautiful flowers. They are widely known for their economic importance but less for their medicinal value. Recently there has been tremendous progress in medicinal plants research, however orchids have not been explored fully for their medicinal application. Phytochemically some orchids have been reported to contain alkaloids, terpenoids, flavonoids and stilbenoids<sup>[9]</sup>. Traditional Chinese medicine widely utilizes orchids in medicines. Some orchid species like *Dendrobium crumenatum*, *Eulophia campestris*, *Orchis latifolia*, *Vanda roxburghii* and *Vanda tessellata* are recognised for their medicinal value. Hence the present study is undertaken to explore the ethnomedicinal uses of orchids by the tribal communities of different parts of south east Bangladesh.

### 2. Materials and Methods

#### Collection of plant materials

Ethnobotany is the study of the interaction between plants and people, with a particular emphasis on traditional tribal cultures.

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Ethnobotanical field work is an art and skill practiced and conceived by the practitioners and researchers. The success of ethnobotanical documentation depends on the cooperative relationship between the researcher and local informants. It is very important to locate knowledgeable informants for the study of Ethnobotany [10, 11].

Nine orchid species were collected from Kaptai National Park, Kaptai, Rangamati. They were; *Acampe papillosa* (Lindl.) Lindl. 2. *Aerides odorata* Lour. 3. *Bulbophyllum lilacinum* Ridl. 4. *Cymbidium aloifolium* (L.) Sw. 5. *Dendrobium aphyllum* (Roxb.) C.E.C. Fisch. 6. *Eria tomentosa* (Koen.) Hook. f. 7. *Geodorum densiflorum* (Lam.) Schltr. 8. *Papilionanthe teres* (Roxb.) Schltr. And 9. *Rhynchostylis retusa* (L.) Blume. The voucher specimen of the orchid species were preserved in the herbarium of the Chittagong University.

Data collection by using appropriate methodology or technique is an essential part of any research. There are various techniques recommended for ethnobotanical study, such as- i) Direct or participant observation, ii) checklist interview, iii) Group interview, iv) Field interview, v) Plant interview and vi) Market survey [12-17]. All of these techniques were followed.

### 3. Results

Uses of nine orchids species have been recorded in the present study by contracting different ethnic and Bengali people. Roots, leaves, pseudobulbs, stems as well as whole plants of different orchid species were found to be used as medicine by the tribal and Bengali people who live in the hilly or remote areas of Bangladesh.

**Table 1:** Plant parts used, ethnomedicinal uses, mode of preparation, communities/users according B=Bagali, C=Chakma M=Marma T=Tanchanga R=Rakhaine

Name of species	Plant parts used	Ethnomedicinal uses	Mode of preparation	Communities/Users
<i>Acampe papillosa</i> (Lindl.) Lindl.	Leaves (C), Whole plants (B, M)	Treatment of fever (M), ear ache (C), injury (B) and to solve male and female problem (M)	Dried (M), decoction (C, M) and Juice (B, M)	Marma Chakma Bengali
<i>Aerides odorata</i> Lour.	Leaves (BM), Whole plant (CR)	Treat pneumonia (M), dyspepsia (B), epilepsy (M), paralysis (B), inflammation (C), waist ache (R), and fracture (B)	Decoction (C), Juice (BMR)	Marma Rakhain Bengali Chakma
<i>Bulbophyllum lilacinum</i> Ridl.	Pseudobulbs (B), Leaves (BC), Whole plant (CMR)	Used as aphrodisiac (B), Chyawanprash (B). Treatment of rheumatism (B), eye disease (B), tuberculosis (B), cough (B), asthma (B), jaundice (M), anaemia (M), wounds (C), hypertention (R), diabetes (B), heavy menstruation (R) and leucorrhoea (R) Inflammation (C)	Dried (M) and ground plant (BCMTR), Decoction (B), Juice (BCMTR) and pill (B)	Bengali Marma Chakma Rakhain
<i>Cymbidium aloifolium</i> (L.) Sw.	Leaves (BCMTR), Roots (B), Whole plant (C)	Treatment of ear ache (CM), paralysis (M), inflammation (C), painful menstruation (C), child delivery (C), epilepsy (C), infertility (T), irregular menstruation (R), rheumatism (B), cough (B), dyspepsia (B), asthma (B) and boil (R)	pill (M) is prepared. Juice (BR), Paste (R), hot decoction (CM)	Marma Chakma Tanchangya Bengali
<i>Dendrobium aphyllum</i> (Roxb.) C.E.C. Fisch.	Leaves (C), Whole plant (BCMR)	Treatment of wounds (C), earache (C), epilepsy (C), paralysis (C), abdominal pain (M), bodyache (M), carve-depression (M), eye inflammation (M), blear (M), diabetes (R), heavy menstruation (R), rheumatism (B) and leucorrhoea (R)	Paste (BC), Juice (CM), then pill (M) is prepared	Chakma Marma Rakhain Bengali
<i>Eria tomentosa</i> (Koen.) Hook. f.	Whole plants (BCMTR), Leaves (BCMTR), Pseudobulbs (BCMTR)	Used as aphrodisiac (B), chyawanprash (B), Treat liver and kidney disease (M), constipation (M), boils (C), rheumatism (B), epilepsy (C), hypertension (R), irregular menstruation (B), heavy menstruation (R), leucorrhoea (B) and diabetes (R)	Juice (BM), paste (BCR)	Bengali Marma Chakma Tanchangya Rakhain
<i>Geodorum densiflorum</i> (Lam.) Schltr.	Leaves (BMR), Pseudobulbs (M), Whole plants (BMTR)	Used as tonic (B). Treatment of fever (C), inflammation (BCMTR), bodyache (C), piles (BCMTR), vertiginous (BCMTR), carve-depression (M), eye inflammation (CM), blear (M), blood cancer (M), wound (B), abdominal pain (BCMTR), cough (B), leucorrhoea (R), hypertension (R), heavy menstruation (R) and diabetes (R)	Dried (BCMTR) and powdered plant (M), Decoction (C), Paste (BR), Juice (CM)	Marma Chakma Tanchangya Rakhain Bengali
<i>Papilionanthe teres</i> (Roxb.) Schltr.	Leaves (BMTR), Stems (MTR), Whole plant (BMTR)	Treatment of fever (M), heavy menstruation (B), diabetes (B), fever (BCMTR), vertiginous (M), carve-depression (M), eye inflammation (M), blear (M), abdominal pain (T), leucorrhagia (R) and hypertension (R)	Paste (T), Dried (M) and powdered plant (M), Juice (B), Decoction (BM)	Marma Tanchangya Bengali Rakhain
<i>Rhynchostylis retusa</i> (L.) Blume	Leaves (M), Pseudobulbs (CM), Whole plants (BCMTR)	Treat paralysis (M), rheumatism (M), piles irregular menstruation (T), heavy menstruation (T), painful menstruation (T), fracture (B), fever (B), allergy (B) (due to pollution of blood), inflammation (B)	Juice (BCM)	Marma Tanchangya Bengali

Current study has been conducted into five communities: Bengali, Chakma, Marma, Rakhain and Tanchangya. The

percentage informants of participant of different communities has shown in Figure-1

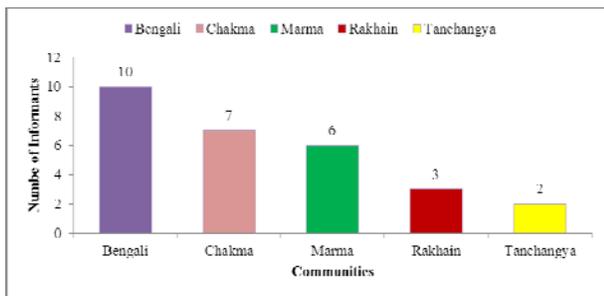


Fig 1: Informants participated from each community

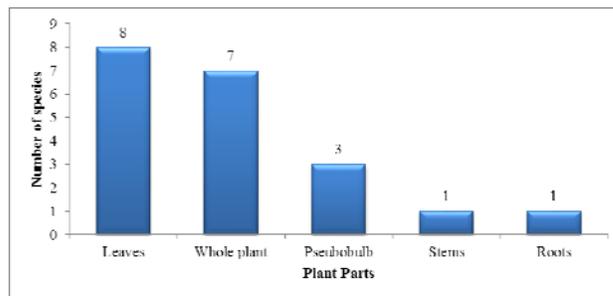


Fig. 2: Number of plant parts used

From the documented data, it has been found that the five communities used leaves, whole plant, pseudobulbs, stems and roots from the orchid species as their source of medicine. Of them leaves are used most frequently followed by whole plant, pseudobulbs, stems and roots (Figure 2.)

**Analysis of diseases/illness with number of species**

The communities have knowledge of herbal treatments for wide range of diseases/illness. In the present study about 42 diseases/illness have been recorded which have been treated by 9 orchid species. The most widely treated rheumatism, inflammation, fever, paralysis, earache and epilepsy. The frequently treated diseases by different orchid species are shown in Figure-3.

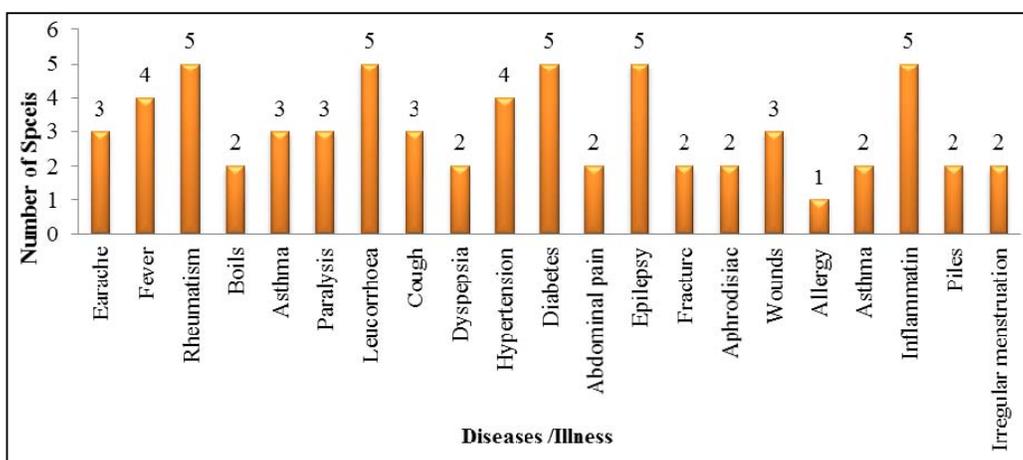


Fig 3: Number of plant species used for various diseases

**Analysis of mode of preparation of medicine**

The present study has revealed five methods of preparation of herbal medicine. The maximum number of mode of preparations of herbal medicines is juice. There were many other mode of preparation of medicine such as paste, powder, pill and decoction (Figure-4.)

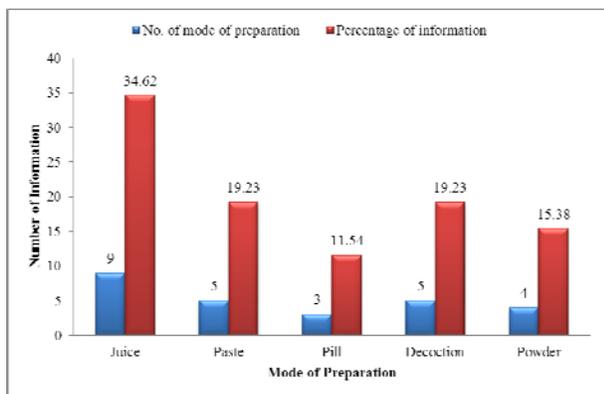


Fig 4: Number and percentage of mode of preparation of medicine

**4. Discussion**

The traditional plants use knowledge lies in the tribal communities as well as Bengali though they live closer to the

nature. They have vast knowledge passes through generation to generation. Lack of proper documentation of this knowledge may be disappeared.

For the documentation of medicinal uses orchid of Chakma, Marma, Rakhain, Tanchangya and Bengali from Cox’s Bazar and Hill Tracts Districts conducted in this study. The men/women over 40 years old have great knowledge of medicinal orchids. Percentage of information collected from the male informants was more than female. This indicates that the male of these five communities are engaged in this profession. On the other hand the elderly people possess more indigenous knowledge of the orchid use than younger.

In a total of 84 individual information are documented along with nine orchid species in nine genera under Orchidaceae family. It is revealed that the maximum used plant part is leaf because of its availability and easy preparation method. Root, stem, pseudo bulb and whole plant are also used. Aerial, underground parts and whole plants are used in 47.05%, 11.76% and 41.18% respectively.

*Acampe papillosa* (Lindl.) Lindl. is used to treat fever, earache, injury and to solve male and female problem. Evidence from different literature shows that *Acampe papillosa* is used to treat rheumatism, sciatica, neuralgia, syphilis, uterine diseases, scorpion sting, snake bites, chest pain, stomach disorder [18] and to treat rheumatism, sciatica, neuralgia, syphilis, uterine disease and as tonic [2].

*Aerides odorata* Lour. is used to treat epilepsy, pneumonia, dyspepsia, paralysis, inflammation, waistache and fracture. Evidence from literature shows that *Aerides odorata* is used to treat joint pain, swelling, tuberculosis <sup>[18]</sup> and to treat wound <sup>[2]</sup>.

*Cymbidium aloifolium* (L.) Sw. is used to treat earache, paralysis, inflammation, painful menstruation, child delivery, epilepsy, infertility, irregular menstruation, rheumatism, cough, dyspepsia, asthma and boil. Evidence from literature shows that *Cymbidium aloifolium* is used to treat paralysis, earache, boils, fever, fracture, burns and sores, weakness of eyes, chronic illness and it is used as emetic, purgative and tonic <sup>[18]</sup> and to treat boils and fever <sup>[2]</sup>.

*Dendrobium aphyllum* (Roxb.) C.E.C. Fisch. is used to treat wounds, earache, epilepsy, paralysis, abdominal pain, bodyache, carve-depression, eye inflammation, blear, diabetes, heavy menstruation, rheumatism and leucorrhoea. Evidence from literature shows that fine leaf paste is applied on the abnormal or deformed parts of the head of newly born baby to get normal shape <sup>[18]</sup> and used in deformed head structure in newly born children <sup>[2]</sup>.

*Eria tomentosa* (Koen.) Hook. f. is used as aphrodisiac, chyawanprash and to treat liver and kidney disease, constipation, bodyache, rheumatism, epilepsy, hypertension, leucorrhoea, diabetes and irregular menstruation.

*Geodorum densiflorum* (Lam.) Schltr. is used as tonic and to treat fever, inflammation, bodyache, epilepsy, piles, vertiginous, carve-depression, eye inflammation, blear, blood cancer, wound, cough, abdominal pain, leucorrhoea, hypertension, heavy menstruation and diabetes. Evidence from literature shows that this plant is used to regularize menstrual cycle in women, applied for insect bite, wounds and to treat fever in cattle, diarrhoeal symptoms <sup>[18]</sup> and to treat tumours and skin inflammation <sup>[2]</sup>.

*Papilionanthe teres* (Roxb.) Schltr. is used to treat diabetes, fever, heavy menstruation, vertiginous, bodyache, carve-depression, eye inflammation, blear, abdominal pain, heavy menstruation, leucorrhoea and hypertension.

*Rhynchosyilis retusa* (L.) Blume is used to treat paralysis, rheumatism, piles, irregular menstruation, heavy menstruation, painful menstruation, fracture, fever, allergy (due to pollution of blood), inflammation. Evidence from literature shows that this plant used as emollient and to treat rheumatic disease, blood dysentery, wounds, skin diseases, asthma, tuberculosis, epilepsy, kidney stone, menstrual disorders <sup>[18]</sup> and used as emollient and to cure rheumatism diseases <sup>[2]</sup>.

Analyzing the result about 42 diseases/illness has been recorded and most frequently treated disease/illness are rheumatism, inflammation, fever, paralysis, earache and epilepsy. Most drugs are administrated in the form of juice, paste, decoction, powder and pill. The dose and duration of application of these herbal medicines are varied from informant to informant. Most of the cases two or three teaspoonfuls dose is used twice daily and most applicable duration is between three and four days. The duration is longer in case of some complicated diseases/illness.

## 5. Acknowledgement

The authors gratefully acknowledge the Ministry (MoE) of Education Government of the People's Republic of Bangladesh for the financial support under Grants for Advanced research in High Education project to conduct the research.

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