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Traditional Therapeutic Uses of Some Indigenous Orchids of Bangladesh

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ABSTRACT

The traditional therapeutic uses of some indigenous orchids of Bangladesh are described in this paper. Terrestrial (11) and epiphytic (18) orchids, 29 in total, are used by Bangladeshi rural and tribal people for the treatment of nearly 45 different diseases and ailments. Roots, tubers, pseudobulbs, stems, leaves and even whole plants are used. Some herbal preparations have miraculous curative properties. Unfortunately, these preparations have not typically been subjected to the precise scientific clarification and standardization which are consequently required for clinical implementations. Some of the orchids are endangered due to over-exploitation and habitat destruction. Conservation strategies for orchids and further pharmacological studies on traditional medicines are suggested.

Keywords: astavarga, conservation, ethnomedicine, herbal remedies, rasna

INTRODUCTION

Orchidaceae is the largest and most evolved family of the flowering plants, consisting of 2500 to 35,000 species belonging to 750-800 genera (Dressler 1993). They are found in virtually all regions around the world except the icy Antarctica, but their greatest diversity occurs in tropical and sub-tropical regions. In Bangladesh 177 species including 3 varieties have been recorded and the majority of them are epiphytic orchids (Huda *et al*. 2007). Orchid flowers are the most fascinating and gorgeous of all of nature's flowers and exhibit a wide range of diversity in form, size, color and texture that make them unique among the ornamentals. Evident by recent increases in world floriculture trade, orchids became the second most popular cut flowers as well as potted floriculture crop with wholesale prices estimated $126 million (USDA 2008).

Apart from their ornamental value, many orchids have eminent medicinal and glycosidal importance. However, the fact that orchids could play an important role in herbal medicines is often overlooked. Orchids have been used as a source of herbal remedies in China since 2800 B.C. (Kimura and Migo 1936; Lüning 1974). Since the Vedic period, some orchids have been used by Indians for their curative and aphrodisiac properties and as a symbol of sanctity (Kaushik 1983) and there are several references in this context in the ancient literature like 'Amarkosha' and 'Nighantus' by Vegbhata and Sushruta respectively (250-300 B.C.) (Khasim and Rao 1999). In some parts of Europe, America, Australia and Africa have long been used as a herbal cure. In the Ayurvedic system of medicine, a rejuvenating herbal formulation 'Astavarga' is derived form a group of 8 herbs, some of the herbs i.e. jivak (*Microstylis wallichii*), kakoli (*Habenaria acuminate*), ridhi vridhi (*H. inermedia*) being orchids (Handa 1986). *Flickingeria macraei* is used in Ayurveda with the name of 'jeevanti' which is used as astringent to the bowels, aphrodisiac and to treat asthma and bronchitis (Kartikar and Basu 1975). Other commonly used orchid drugs in the Ayurvedic system are salem (*Orchis latifolia*, *Eulophia latifolia*), jiwanti (*Dendrobium alpestre*), shwethuli and rasna (*Acampe papillosa*, *Vanda tessellata*). In 'Sushruta samhita' it is mentioned that the underground tuber of *Orchis latifolia* is used in the drug 'munjatak' pacifying cough (Khasim and Rao 1999). The leaves of *Vanda roxburghii* have been prescribed in the ancient 'Sanskrit' literature for external application in rheumatism, ear infections, fractures and diseases of nervous system. Besides these, other orchids used in local systems of medicine are *Cleisostoma williamsonii* (for bone fractures), *Cirrhopetalum maculosum* (to enhance longevity), *C. giganteum* (for blood clotting), *Cypripedium elegans* (as nerve tonic, in hysteria, spasms, fits, madness, epilepsy and rheumatism), *Dactylorhiza hatagirea* (as expectorant and astringent), *Dendrobium alpestre* (for treating acne, boils, other skin problems), *D. ovatum* (for treating stomachache, bile secretion, laxatives), *D. loddigesii* (as anti-cancer), *Epipactis helleborine* (to cure insanity, pulmonary and cardiac problems), *E. dabia* (as an appetizer, stomach tonic, aphrodisiac and blood purifier during heart trouble), *Eria spicata* (for curing stomach ailments and headache), *E. epidendroideae* (as vermifuge), *E. nuda* (as aphrodisiac, for treating tumours), *Gymnadenia orchidis* (for gastric, liver and urine disorder), *Habenaria acuminata* (as tonic), *H. intermedia* (as tonic in Chyavanprash), *H. edgeworthii* (as ingredient of Astavarga in Chyavanprash, blood purifier, enhance sperm formation, treatment of tuberculosis and rejuvenator), *Liparis odorata* (to treat burns, cancerous ulcers, gangrene, fever and dropsy), *Malaxis wallichii* (as ingredient of Ashtavarga, used in preparation of Chyavanprash, remedy for tuberculosis and enhance sperm formation), *M. muscifera* (as tonic and rejuvenating drug), *M. cylindrostachya* (as tonic), *Oberonia caulescens* (for liver ailments), *Orchis mascula* (as aphrodisiac and nerve tonic), *Pholidota articulata* (as tonic), *P. pallida* (for rheumatic pains), *Pleione maculata* (for liver complaints), *Satyrium nepalense* (as tonic, to cure malaria, hydrosele and dysentery), *S. autumnalis* (as aphrodisiac), *Tropidia curculigoides* (to treat diarrhoea and malaria), *Vanda cristata* (as expectorant), *V. testacea* (in rheumatism, nervous disorders, asthma, malaria and scorpion stings), *Zeuxine strateumatca* (as salep) (Cornel 1950; Chopra *et al*. 1956; Nadkarni 1964; Chopra *et al*. 1969; Kartikar and Basu 1975; Kaushik 1983; Handa 1986; Chauhan 1990; Arditti 1992; Jana *et al*. 1997; Khasim and Rao 1999; Roy *et al*. 2007; Dash *et al*. 2008).

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Research Note

The antiviral and anti-cancerous properties of *Vanda parviflora* (Rastogi and Dhawan 1990) and anti-AIDS properties of *Cymbidium* hybrids, *Liparis ovata* and *Epipactis helleborine* have been positively tested (De Clarcq 1994; Vij *et al*. 1997). The Indian *Vanda* orchid does indeed express anti-proliferative effects against various types of cancers, including those from choriocarcinoma (cancer of germ cells), lung cancers, and stomach cancers (Ho and Chen 2003). Nearly 60 alkaloids from Orchidaceae have already been isolated, but from chemical considerations, the most important ones are dendrobine, nobiline and nobilonine (Chen and Chen 1935; Lawler 1984; Toh 1994). Unfortunately, commercial extraction of alkaloids and glycosides from orchids is still lacking except for 'vanilla'. The pharmacodynamics of dendrobine have been investigated that provoke violent uterine contraction, progressively paralyzed peristalsis, low blood pressure, feeble analgesic action, produces a mild hyperglycemia, and augments the secretion of saliva (Arditti 1992). On the other hand, worthy glycoside 'vanillin' derived from *Vanilla planifolia*, is reported to have aphrodisiac, carminative, anti-spasmodic, tonic and simulative properties (Arditti 1992). It is also the most popular and widely used flavouring compound in the world (Pak *et al*. 2004). Annual demand of vanilla in the international market is around 32,000 tonnes but worldwide production is only 4403 tonnes (Divakaran *et al*. 2006). Vanilla could be produced synthetically but natural vanilla contains about 130 organoleptic compounds while synthetic one contains only vanillic acid. However, ruthless collection by increasing orchid lovers and over-exploitation by so called 'kobiraj', destruction of habitats by reclamation, shifting cultivation and deforestation, and unauthorized trade has led to reduction in natural populations of many orchids. Subsequently, some of the orchid species have been extinct and a large number of species have become rare and endangered. Ironically, orchids are fed to cows in north-eastern India with the belief that dendrobes enhance their milk yield and the cymbidiums improve their health. In the present study an attempt was made to collect information on medicinal importance of indigenous orchids traditionally used by Bangladeshi rural tribes. To find out the reasons for losing orchids diversity and what control measures are required for conservation of orchids was another aim.

Study area

Bangladesh lies between 20°34' N to 26°38' N latitude and 88°01' E to 92°41' E longitude. It is surrounded by the Assam Hills in the east, the Meghalaya Plateau in the north, West Bengal of India in the west and the Bay of Bengal in the south. The hot spots of orchids are located in the evergreen and semi-evergreen forests of Sylhet and Chittagong Hill Tracts. Deciduous and semi-deciduous forests, positioned in Mymenshingh, Tangail and Sherpur (Garo hills) of Dhaka Division are also a reservoir of indigenous orchids and numerous medicinal herbs. A few orchid species are also available in some places of Rajshahi Division and in the Sundarban of Khulna Division. Accordingly the study was conducted in these regions only (**Fig. 1**).

Interviews and plant collection

This survey was carried out between the year 2006 and 2007 while an extensive investigation was conducted for estimation of species diversity, distribution, status of conservation and the uses of wild orchids of Bangladesh especially in Chittagong Hill Tract and greater Sylhet district, the hot spots of wild orchids. Some people are engaged to practice herbal remedies who are locally known as 'Kobiraj' or 'Boiddya'. A total of 40 'Kobiraj' were interviewed from different places and at least three people were interviewed on the same orchid species in different locations to confirm the authenticity of the information. During the survey the questions included i) vernacular name of the plant, ii) plant parts used, iii) purpose and properties that used, iv) methods

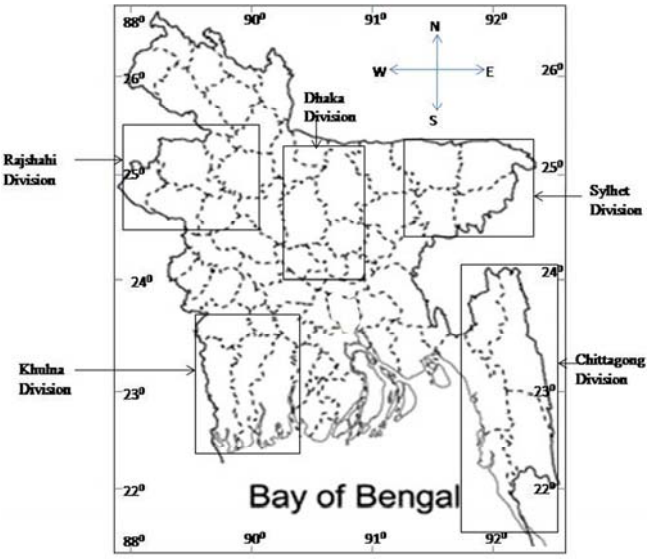

Fig. 1 Map of Bangladesh showing location of study area.

of preparation, v) modes of administration, and vi) approximate doses. People of different community used different vernacular names for the same orchid species. Interestingly, epiphytic orchids are commonly known as 'Pargasa' (= the plants grown on other trees) throughout the country. In the present investigation the word 'pargasa' is used as local or vernacular name for epiphytic orchids where distinct vernacular names were not available. The specimens were temporarily identified on the spot and later on confirmed using available information from the orchid collections of Chittagong University. The nomenclature of the species was based upon International Code of Botanical Nomenclature (ICBN). Collected information was then compared and appraised to the available information on ethnomedicinal uses of herbal preparations in these regions.

Although many tribal people provided information of therapeutic uses of medicinal orchids they did not provide the methods of preparation. The confidentiality of formulations was maintained due to their business or professional interest.

The therapeutic potentials of 29 indigenous orchids of both terrestrial (11) (**Fig. 2**) and epiphytic (18) (**Fig. 3**) for the treatment of different diseases and ailments including

Fig. 2 Some terrestrial medicinal orchids of Bangladesh. (**A**) *Arundina graminifolia* (**B**) *Eulophia nuda*. (**C**) *Eulophia* sp. (**D**) *Geodorum densiflorum*. (**E**) *Phaius tankervilleae.* (**F**) *Peristylus constrictus*.

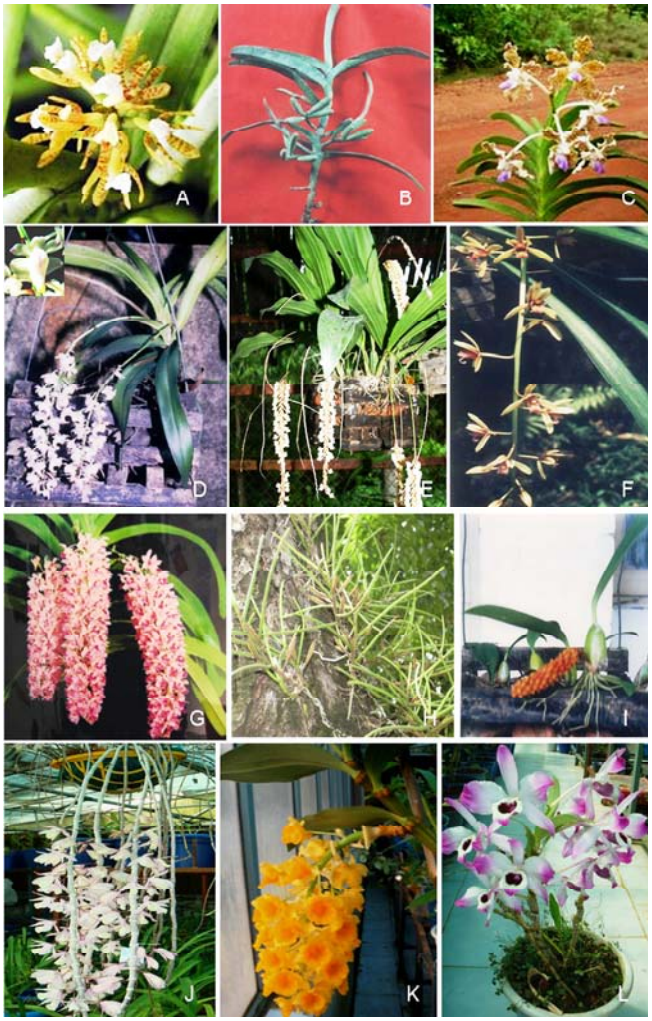

Fig. 3 Some epiphytic medicinal orchids of Bangladesh. (**A**) *Acampe papillosa.* (**B**) *Acampe praemorsa*. (**C**) *Vanda tessellata*. (**D**) *Aerides odorata*. (**E**) *Pholidota imbricata*. (**F**) *Cymbidium aloifolium.* (**G**) *Rhynchostylis retusa.* (**H**) *Luisia zeylanica*. (**I**) *Bulbophyllum lilacinum*. (**J**) *Dendrobium aphyllum.* (**K**) *Dendrobium densiflorum*. (**L**) *Dendrobium nobile*.

tuberculosis, paralysis, stomach disorders, chest pains, arthritis, syphilis, jaundice, cholera, acidity, eczema, tumor, piles, boils, inflammations, menstrual disorder, spermatorrhea, leucoderma, wounds and sores, diahorrhea, muscular pain, blood dysentery, hepatitis, dyspepsia, bone fractures, rheumatism, asthma, malaria, earache and sexually transmitted diseases were screened out. Besides noteworthy physiological utility of orchidaceous preparations as emetic, purgative, aphrodisiac, vermifuge, bronchodilator, ointments, anti-tumor agent, sex stimulator, contraceptive, cooling agent and remedies of scorpion and snake bites were also demonstrated (**Table 1**). However, the mode of administration could not be documented for all species due to a lack of sufficient information. Even though it is believed that some of the preparations have incredible curative properties, but these have no precise scientific proof. The impression of the scientific community that folklore medicines rarely follow scientific methods and hardly beneficial for the patients, although majority of the people throughout the world are using these preparations from many centuries. Scientific clarification and standardization of these preparations is utmost required for clinical implementations.

Recommendations for conservation of orchid diversity

The natural orchid gene pool is depleting at an alarming rate due to over-exploitation for medicinal and ornamental purposes, onslaught habitat destruction by urbanization and shifting cultivation, loss of pollinators, destructive diseases, climate changes and unauthorized trade (Gopinath 1994; Suseela and Thomas 2000). Conservation of important orchids is, therefore a major challenge now a day. Recent advances in conservation biology with biotechnological approaches have paved the safeguard for plant biodiversity. Unfortunately, the progress of biodiversity conservation in Bangladesh is not praiseworthy due to lack of adequate attention of government, industrialists, conservation based research institutes/organizations and orchid clubs/societies. Therefore, the following measures are to be suggested for conservation of orchids and their sustainable uses.

- Orchid sanctuaries (for *in situ* conservation) should be established in the hot spots of orchid diversity in different part of the country. Stringent measures should be adapted for conservation of natural orchid habitats.
- Orchid societies and clubs are to be established to draw the attention of general people concerning the importance of orchids and their conservation. General awareness is to be created through public media (radio, television, cinema, and newspapers), arranging workshops, seminars and symposia.
- Orchidaria are to be developed for *ex situ* conservation, if possible, only for medicinal orchids for multiplication and maintenance. Rare, endangered, threatened and endemic orchid species should be conserved on priority basis. Seed gene bank or cryo-gene bank is to be developed for long term preservation.
- Cost effective, efficient and reproducible mass propagation techniques are to be established either through tissue culture or conventional methods.
- Habitat destruction, over-exploitation and illegal trade of orchids and their products are to be prevented by conferring laws.
- Modern laboratory facilities are to be developed for scientific evaluation of therapeutic phytoconstituents of orchids. Financial support is to be achieved through stimulating the interest of government and industrialists.

CONCLUSIONS

This inventory of medicinal orchids will be helpful to future investigators for conducting further research and rich orchid gene pool could be developed by practicing the recommendations of conservation. Proper utilization and management of medicinal orchids might be a better alternative of synthetic medicines, because herbal preparations are generally safe for health and have least side effects. The formulations used by the ethnic people would undoubtedly help in precise investigation of phytoconstituents.

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Table 1 Orchid species used for treatment of various human diseases and ailments in Bangladesh and their present status.

Name of the species	Vernacular name	Place of collection	Habit and present status	Plant part use	Therapeutic use	Mode of administration
***Acampe praemorsa* (Roxb.) Blatt. & McCann**	Pargasa, Rasna	Jamalpur, Mymansingh	Epiphytic Sporadic	Roots	For treatment of rheumatism, as tonic	Crusted roots are used as tonic; pasted roots are used externally for treatment of rheumatism and pains. Half spoon of *Acampe praemorsa* fresh root paste, 1 g of *Asparagus racemosus* root paste are mixed together, of which one spoonful is taken orally on an empty stomach twice a day for 15 days to cure arthritis (Dash *et al*. 2008).
***Acampe papillosa* (Lindl.) Lindl.**	Pargasa, Rasna, Mar (Chakmas)*	Cox's Bazar, Bandarban, Rangamati, Jamalpur and Sylhet	Epiphytic Common	Roots	For treatment of rheumatism, syphilis, uterine diseases and as tonic	Roots are used as substitute of 'Rasna'. It is used as cooling agent, astringent to boils, expectorant, burning sensations, biliousness. Useful in asthma, bronchitis, diseases of eyes and blood, poisonous infections, tuberculosis, throat troubles and fever. Crusted roots are used as tonic; pasted roots are used for rheumatic pains, sciatica and neuralgia. It is considered to be beneficial in curing secondary syphilis and uterine diseases (Yusuf *et al*. 1994).
***Aerides odorata* Lour.**	Pargasa	Dhaka, Chittagong Cox's Bazar, Sylhet	Epiphytic Common	Fruits, Roots and leaves	Treatment of joint pain, swelling, wounds, tuberculosis, healing boils in nose and ear	Leaf juice is employed as medicine for healing boils, nose and ear diseases. The ground fruits are used for treatment of wounds. One g of fresh root, 1 g common salt, 1 g root powder of *Saraca asoca* and 2 g *Azadirachta indica* bark powder are mixed thoroughly and made into a paste. Half spoon of this paste is taken orally twice a day with a cup of water for one month to reduce joint pain and swellings. The leaf juice is taken orally twice a day for 20 days against tuberculosis.
***Arundina graminifolia* (D. Don) Hochr.**	Ghas phol (Chakma)*	Cox's Bazar, Bandarban and Khagrachari	Terrestrial Common	Bulbous stem, Root	For rheumatism, snake bites, body-ache, bones crack	Juice of bulbous stems used to treat cracks of hand and feet. Fine paste of the roots is applied to place of snake bite of the patient. Root decoction is useful for joint pain and rheumatism (Roy *et al*. 2007).
***Bulbophyllum lilacinum* Ridl.**	Pargasa; Gota parchallow (Rakhain)*	Cox's Bazar	Epiphytic Common	Pseudo-bulbs	For cooling body from restiveness	Fluid from cleaned pseudobulbs are extracted by pressing and kept in a sealed jar for over night then mixed with water and taken as a cool drink. It removes fatigue, restlessness and keeps the body fresh.
***Bulbophyllum neilgherrense* Wight**	Purusharantha	Cox's Bazar	Epiphytic Rare	Pseudo-bulbs	As tonic	The extracted juice from the pseudobulbs is used for restoration of adolescence and as tonic (Deorani and Naithani 1995; Chowdhery 1998).
***Coelogyne cristata* Lindl.**	-	Bandarban, Cox's Bazar and Sylhet	Epiphytic Rare	Pseudo-bulbs	As refreshment	The extracts of pseudobulbs are taken for cooling and soothing (Anonymous 1970).
***Corymborkis veratrifolia* (Reinw.) Bl.**	Pargasa	Bandarban, Cox's Bazar and Sylhet	Epiphytic Rare	Leaves	To treat fever	The juice of the fresh leaves is given as an emetic to reduce fever, especially in children.
***Cymbidium aloifolium* (L.) Sw.**	Pargasa, Suri mach (Tanchinga)* Manu ranam (Rao and Henry 1995)	Bandarban, Cox's Bazar and Sylhet	Epiphytic Common	Leaves, roots, whole plant	For treatment of paralysis, emetic and purgative	Dried root powder with equal volume of dried ginger and half volume of black pepper are mixed thoroughly. Half spoon of this mixed powder with a cup of cow milk is given twice a day for two months to cure paralysis (Dash *et al*. 2008). Tribal people of Chittagong hill tracts use leaf extract for treating boils and fever. Pasted aerial roots are used for joining fractured bones. Whole plant is used as purgative, emetic, tonic and in treating ear-ache, burns and sores (Chowdhery 1998). Plant is pounded with ginger; and the water extract given to cure chronic illness, weakness of eyes, vertigo and paralysis.
***Dendrobium aphyllum* (Roxb.) G.E.C. Fischer**	Fasia mach (Chakma)*	Chittagong, Bandarban, Cox's Bazar, Sylhet	Epiphytic Common	Leaves	For getting normal shape of deformed head structure in newly born baby	Fine leaf paste is applied on the abnormal or deformed parts of the head of the infant. The treatment continues for long time to get effective remedy.
***Dendrobium nobile* Lindl.**	Orchid	Dhaka	Epiphytic Rare	Stem, Whole plant	For treatment of eye infection, healing wounds, soothe burns and as stimulant	Stem is useful in thrust and dryness of tongue and also given in fever during convalescence. Fresh and dried stems used for longevity, as aphrodisiac, stomachic and analgesic. Leaf extract is very effective for freshly cut wounds. Seed powder is used to cure cuts and wounds. Extracted juice from whole plant is taken as drug. Pseudo-stem extract is used to cure eye infections and to soothe burns (Roy *et al*. 2007). The plant has been regarded as a source of precious drug in Chinese *materia medica* for containing some important alkaloids as dendrobine, nobiline etc. (cf. Onaka *et al*. 1964).
***Dendrobium densiflorum* Wall. ex Lindl.**	Orchid	Bandarban	Epiphytic Rare	Leaves	Bone fractures	Tribal people use leaf paste to plaster fractured bones.

Table 1 (Cont.)

Name of the species	Vernacular name	Place of collection	Habit and present status	Plant part use	Therapeutic use	Mode of administration
Eria pubescens Lindl.	Iswar mul (Tanchinga)*	Cox's Bazar and Sylhet	Epiphytic Rare	Pseudo-bulbs	For enhancing sexual competency	Clean pseudobulbs are robustly pressed to soften. Three-four soften pseudobulbs are then submerged in a glass of water for overnight to exude fluid materials and taken as drink. This fluid mixed water hold up ejaculation and prolong sexual intercourse.
***Eulophia dabia* (D. Don) Hochr.**	Salab misri, Amrita	Chittagong	Terrestrial Rare	Tubers/ rhizomes	As aphrodisiac, tonic, heart troubles and discharge cough	Extracted juice from tubers is used as appetizer, stomachic, tonic, aphrodisiac, remedies of heart troubles and purulent cough. In Ayurveda, it is considered as cooling, fattening, expectorant and a good remedy for heart problems. In the Yuanani system of medicine, the extracted juice from tubers is used as an astringent tonic. It is also useful for bowels, release cough. It yields 'salep' which is useful as a tonic and an aphrodisiac (Chauhan 1990).
***Eulophia nuda* Lindl.**	Amrita	Madhupur (Tangail) and Khasi hills of Sylhet	Terrestrial Scarce	Tubers	Exorcise intestinal worms, bronchitis, tonic, antidote for poisoning	Tuber paste is used as appetizer, hot, useful in tuberculous glands in the neck, tumours, and bronchitis and very effective to expel intestinal worms in children. A glass of extracted juice of crushed tubers is given in empty stomach to patients suffering from bronchitis. Tuber extract is used as blood purifier and vermifuge (Chowdhery 1998). Powdered tuber is an antidote for poisoning and the pounded fresh plant is applied to alleviate boils and abscesses (Roy *et al*. 2007).
***Eulophia graminea* Lindl.**	-	Chittagong	Terrestrial Scarce	Tubers	As vermifuge	Crushed tubers and the extracted juice are used as vermifuge (Chowdhery 1998).
***Geodorum densiflorum* (Lam.) Schltr.**	Kukurmuria (Garo)*	Madhupur (Tangail)	Terrestrial Rare	Tubers, roots	For female diseases, tumours and skin inflammation	One gram of fresh root paste, 2 drops of ghee and 5 ml of honey taken orally twice a day for 15 days on an empty stomach to regularize menstrual cycle in women (Dash *et al*. 2008). In western India an ointment, prepared from pasted bulbs in rice-boiled water, is used for skin inflammation, tumours, and abscesses (Dalgado 1898)
***Habenaria plantaginea* Lindl.**	Kusuma gadda	Madhupur (Tangail)	Terrestrial Rare	Tubers	For treatment of chest pain and stomach-ache	Pasted tubers mixed with black pepper and garlic, and prepared tablets. One-two tablets twice in a day are prescribed to alleviate continual chest pain and stomach-ache (Rao and Henry 1995)
***Habenaria marginata* Coleb.**	Humari	Sylhet	Terrestrial Rare	Tubers	For treatment of malignant ulcer	Approximately 250 g of tuber are boiled in one liter water until the volume is reduced to 250 ml. The decoction is then mixed with 5 ml of honey and taken daily on an empty stomach for two weeks for treatment of malignant ulcer (Dash *et al*. 2008).
***Luisia trichorhiza* (Hook.) Bl.**	Koira	Chittagong, Bandarban, Cox's Bazar, Sylhet	Epiphytic Sporadic	Roots	For treatment of jaundice, muscular pains and diarrhoea	A paste is prepared from the dried plant with turmeric and ginger. A half spoon of the paste is taken orally with a cup of water thrice a day for 10 days to cure jaundice. The root extract is used as an anti-diarrhoea (for cattle) and to reduce muscular pains in humans (Dash *et el*. 2008).
***Luisia zeylanica* Lindl.**	Pargasa	Chittagong, Cox's Bazar	Epiphytic Sporadic	Stems	For treating boils, burns and fractures	The stem is used as an emollient for boils, abscess and burns (Rao 1998). Oily preparation is used to treat fractures (Cooray 1940)
***Malaxis acuminata* D. Don**	-	Sylhet	Terrestrial Rare	Pseudo-bulbs	For treating tuberculosis, as tonic	Extracted juice from underground portions is used as tonic and for treating tuberculosis (Chowdhery 1998). Tonic enhances formation of sperms (Khasim and Rao 1999). Preparations from pseudobulbs are useful in burning and fever. It is aphrodisiac, tonic and cures splitting of blood; useful in seminal weakness, thrust, emaciation and general body weakness and increase body freshness and vitality.
***Peristylus constrictus* (Lindl.) Lindl.**	Bhuinora (Tanchinga)*	Chittagong	Terrestrial Common	Roots	For treatment of boils	Extract is collected from clean fresh roots through crushing and applied on the surface of boiled places.
***Phaius tankervilleae* (Ait.) Bl.**	-	Sherpur, Sylhet	Terrestrial Rare	Whole plant	For treating boils, dysentery and bone fractures	Paste of whole plant along with wild zinger is used as medicine in dysentery and to heal bone fractures (Roy *et al*. 2007). Crushed pseudobulbs, roots and leaves are used as poultices for boils, infected wounds and abscesses (Chowdhery 1998). Paste of pseudobulbs used to heal swelling of hands and legs and poultice of pseudobulbs applied on abscess to relieve pain. Women of Papua New Guinea take the smoked flowers with their food as an aid to conception (Powell 1976).
***Pholidota imbricata* Hook.**	Pargasa	Chittagong, Cox's Bazar, Bandarban, Sylhet	Epiphytic Common	Pseudo-bulbs, Whole plant	To treat bone fractures	Pseudobulb extract is used to cure abdominal pain and rheumatism (Roy *et al*. 2007). Pasted leaves and roots are applied externally for healing bone fractures (Deorani and Naithani 1995)

Table 1 (Cont.)

Name of the species	Vernacular name	Place of collection	Habit and present status	Plant part use	Therapeutic use	Mode of administration
***Rhynchostylis retusa* (L.) Bl.**	Sita pushpa, Pumam, Perada mura	Chittagong, Mymansingh Cox's Bazar and Sylhet	Epiphytic Common	Whole plant	For healing wounds, dysentery, rheumatic diseases, epilepsy, cramps, kidney stone, palpitation, tuberculosis, vertigo and as emollient	The plant is a substitute of 'Rasna'. A paste is prepared from about 3 to 4 g of roots with 2 g of fresh leaf buds of *Pisum sativum*. One gram of the paste is taken orally with water on an empty stomach twice a day for seven days to cure blood dysentery (Dash *et al*. 2008). The plant is also used as emollient. Pasted leaf is applied externally to cure wounds and skin diseases (Roy *et al*. 2007). A preparation of indigenous system of medicine is used in rheumatic diseases. In Various preparations of this plant have been used as cure for asthma, tuberculosis, nervous twitching, cramps, infantile epilepsy, vertigo, palpitation, kidney stone, and menstrual disorders (Dalgado 1898).
***Tropidia curculigoides* Lindl.**	-	Cox's Bazar and Sylhet	Epiphytic Sporadic	Whole plant	For treating diarrhoea and malaria	A decoction prepared from roots is used for diarrhea (Khasim and Rao 1999). Boiled extract of whole plant is used for treating malaria (Chopra *et al*. 1969).
***Vanda tessellata* (Roxb.) Hook. ex G. Don**	Rasna	Jamalpur, Jassore, Rajshahi	Epiphytic Common	Roots and leaves	To cure hepatitis, dyspepsia, bronchitis, piles, rheumatism, diseases of nervous system, secondary syphilis, scorpion sting, boils and fever	Root is an ingredient of Ayurvedic medicine 'Rasna' is bitter, hot, alexiteric, antipyretic and useful in dyspepsia, bronchitis, rheumatic pains, diseases of abdomen, hiccough and tremors. In Unani system of medicine it is laxative and tonic to liver and brain and beneficial in bronchitis, piles, lumbago, toothache, boils on the scalp, inflammations and bone fractures. Fifty g of the root is boiled in 250 ml of water until it is reduced to 100 ml. and filtered and cooled. Five ml of the decoction is mixed with 3 to 5 ml of honey and taken orally on an empty stomach twice a day for one month for treatment of sexually transmitted diseases (Dash *et al*. 2008). Plant pasted with ginger (3:2) is used for bone fractures. Pasted leaf is used for dyspepsia. A root decoction prepared with kurchi (*Holarrhena pubescens*) stem bark and common salt (3:2:1) used for hepatitis (Pal and Jain 1998). The pasted roots are used as remedies of secondary syphilis, scorpion bite, rheumatism and nervous disorders (Deorani and Naithani 1995; Khasim and Rao 1999). The leaf paste is used for bring down fever (Yusuf *et al*. 1994). A paste prepared from aerial roots with tender bud of *Phoenix loureirii* is used for plastering bone fractures. Leaf juice is used in ear infection and skin diseases. Powdered roots, leaves and flowers are used in scorpion sting; diseases of nervous system, rheumatism, bronchitis, piles, boils and inflammations (Chowdhery 1998; Kumar *et al*. 2005).
***Zeuxine strateumatica* (L.) Schltr.**	Swet huli	Chittagong hill tracts	Terrestrial Scarce	Tubers, Stems	As tonic, salep	The tubers of this orchid are used as a source of tonic in combination with roots of *Cymbidium aloifolium* (Rao 1998). The stem is used as 'salep' (Chowdhery 1998; Khasim and Rao 1999).

* Name of Tribal community

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