Preliminary Survey on Medicinal Values of Some Dendrobium Species Occurring in Kutkai Township, Northern Shan State

Myint Myint San
Research Assistant-2
Forest Research Institute

Khin Win Myint
Retired Associate Professor
University of Forestry

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မိုဘာသာစကားမှ စာမေးပိုဒ်တွင် စာသင်္ချာစာလိုင်း၊ စာပေနှင့် အခြားပညာရေးတို့ကို သင်ယူရန် အသေးစိတ်မှာ အဖြစ်သင်ကြား စာလိုင်းနှင့် စာသင်္ချာအတွက် အားများကြည့်ရှုပ်ထားသည်။

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Preliminary Survey on Medicinal Values of Some *Dendrobium* Species Occurring in Kutkai Township, Northern Shan State

Myint Myint San, Research Assistant-2
Forest Research Institute

Khin Win Myint, Retired Associate Professor
University of Forestry

Abstract

Kutkai Township has a unique forest ecosystem harboring a rich flora and vast natural resources. The local people collect the orchids and medicinal plant from the wild and on sale at the market days. They are widely known for their economic importance but less for their medicinal value. The present preliminary survey, some 25 species of Orchids including 22 Epiphytes and 3 terrestrials were collected. Scientific name, local name and the parts of the plant used were described. Among them 10 *Dendrobium* species were presented in detail. This paper also discussed some of the threats to the orchids of this region, as well as some very serious problems regarding their conservation.

Key words: Kutkai Township, *Dendrobium* species, Medicinal uses
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1. Introduction

Orchids are herbaceous plants that are classified in their own family, the orchidaceae. It is the largest and most diverse of the flowering plant (Angiosperm) families, with over 800 described genera and 35,000 species in the world. According to Dr John Kress and his team informed that there are 738 orchid species in their revise “Checklist of the trees, shrubs, herbs and climbers of Myanmar”.

*Dendrobium*, a member of the family Orchidaceae, includes approximately 1100 species distributed in different parts of the world. In Myanmar, the genus is represented by 170 species (Hundley and Chit Ko Ko,). Of which some *Dendrobium* species are increased demand and high price in the trade by other related species. Many *Dendrobium* species are listed under endangered taxa in the Convention on International Trade in Endangered Species of wild Fauna and flora (CITES).

*Dendrobium* Species are either epiphytic or occasionally lithophytic. They have adapted to a wide variety of habitats, from the high altitudes in the Himalayan mountains to lowland tropical forest and even to the dry climate of Australian desert.

Most of the orchids are rich in alkaloids, flavonoids, and glycosides. According to reference from agriculture, there are 23 *Dendrobium* species found to posses medicinal value in Myanmar. Especially in China and some parts of Europe and America, Africa and Australia orchids have been used as traditional drugs for a long time (P.K. Dash, 2008). In India the medicinal properties of orchids have been used since vedic period. *Dendrobium* (Shih-hu) Shih-hu is a term used to describe all *Dendrobium* and some *Flickingeria* species in China. According to one estimation there are 1400 *Dendrobium* species in China, but only some of them, especially the *Eugenanthe*, provide the drug Shih-hu in its various forms. The frequently used Shih-hu includes such orchids as Chin chai Shih-hu (Golden Hairpin *Dendrobium*), Er Huan Shih-hu (Earring *Dendrobium*), Mapoenshih-hu (Horse Whip *Dendrobium*), Huan tsao Shin-hu (Yellow Herb *Dendrobium*), and Yu kue Shin-hu (Melon *Flickingeria*). Among them, the Er Huan Shin-hu (Earring *Dendrobium*), for example, was used as a stomachic in Japan. It was used to treat night sweats in Taiwan, to fortify a person’s baby, to strengthen the kidneys and to cure impotence.

By far the most commonly used species in the preparation of shih-hu is *Dendrobium nobile* Lindl. This variety of Shih-hu has been valued greatly in China since the Han dynasty (200BC to 200AD). It is used as a tonic and a strengthening medicine. It is also reputed to impart longevity and serve as an aphrodisiac. The stems are used to
alleviate thirst, calm restlessness, accelerate convalescence, and reduce dryness of the mouth.

Some people use wild orchids for making herbal medicine. Bulbs of *Habenaria* spp. and some terrestrial orchids are used as ingredients in some folk medicines. Paste from the pounded leaves and bulbs of *Cymbidium* spp. is used by traditional orthopaedists. Although there are 170 species of orchid having medicinal value only a few are noted. Other orchid species are used as herbal remedies for diarrhoea and dysentery (Saw Lwin, 2000). Therefore it is a necessity to carried out the medicinal orchids in Myanmar. To fulfill this requirement a collection was made in Kutkai area of Northern Shan State.

The uses of orchids in herbal medicine has a very long history. There is not a single ailment for which therapeutic and curative elements are not found in one or the other orchids species. It is also reported that orchids were held in great reputes as a medicine with strengthening and demulcent qualities in “Ayurveda”.

**Objectives**

The objectives of the research are

1. To identify some orchid species which has medicinal value and its market potential
2. To support effective orchids management in Kutkai area

**2. Literature Review**

As early as 200BC the Chinese Pharmacopoeia “the Sang Nang Pen Tsao Ching” mentions *Dendrobium* as a source of tonic, astringent, analgesic, anti-inflammatory substances (Singh et al. 2007).

Similarly in 1892, E de wildemen had already begun investigation of orchid alkaloids in domesticated. European orchids species as well as *D. nobile* and *Phalaenopsis lueddemanniana*.

According to (Bensky D,1986) orchids, particularly the species, *Dendrobium officinale* have been used as medicinal herbs for centuries. According to some research there are at least 50 orchids species used and especially in traditional Chinese medicine formulas. So, now a day, all *Dendrobium* spp. are used for medicine and medicinal purposes, mainly for strengthening the immune systems.
Brain Morris (2003), has described twelve orchids currently used as medicinal in Malawi. Nine of these are used for stomach complaints and two for fertility problems. Interestingly *Eulophia* spp., as employed to promote friendship, the former being dried and pounded into a powder and the latter prepared as an infusion of the roots.

Hock, Chan CC (2003), Some Chinese orchid preparations that are used in Traditional Chinese herbal medicine. An orchid product called “shi-hu” is currently for sale and made from several *Dendrobium* species. It is recommended for indigestion, rehydration, as an anti-pyretic, to increase white cells in the blood and reduce “fidgets”. Interestingly, the Chinese use it for stomach and lung cancer, derived from *D. loddigesii*, has anti-cancer activity for stomach and lung cancer cell lines and also *Gastrodia elata* is grown commercially. It is used to treat allergies and relieve headache and fatigue.

Similarly, the Indian *vanda* orchid does indeed express anti-proliferative effects against various types of cancers, including those from cancer of germ cells, lung cancers and stomach cancers (Ho and Chen, 2003).

Still other orchids has been used in the treatment of epilepsy, flatulence, rheumatism and sprains. They have also been used for sedative and flavor enhancers and for everything from cramps to increased virility (Kong, 2003).

In China, *Gastrodia elata* tubers were used for food, raw or steamed and roasted in Japan, Tibet. This orchid is an important herbal medicine for the control of the internal movement of wind according to the ancient Chinese medicine theory. Rhizomes, stalks and dried tubers are used to treat headaches, dizziness, epilepsy, rheumatism, fever, lumbago. In Korea, the tubers were used to treat nervous disorders, percent the common cold and serve as a tonic. Dried plants were used in Japan to treat vertigo, and nervous diseases, especially in children (Kong Jm et.al., 2003).

The Chinese medicinal orchids found in Myanmar forest represent 15 genera and 24 species. The medicinal orchids belong to the following genera: *Calanthe*, *Coelogyn*, *Cymbidium*, *Cypripedium*, *Dendrobium*, *Ephemeranta*, *Eria*, *Galeola*, *Gastrodia*, *Gymnadenia*, *Habenaria*, *Ludisia*, *Nervilia*, *Thunia* (Satake, M, Lee Ijung, 2004).

In Zambia, Davenport and Bytebier (2004), have described an “orchid rush” whereby the boiled root tubers of terrestrial orchids are used to make a food dish, chikanda or kinaka.

According to Reddy et al. (2005), the different ethnic groups of Andhra Pradesh are known to use some species of orchids for the treatment of ailments that are associated within different diseases.
(Kumar et al, 2005) has described *Vanda tassellate* has had a long history of use by the native population for its anti-inflammatory properties.

In Eastern Ghats, many of the orchids have a medicinal value like *Bletilla striata*, *Cypripedium pubescens*, *Dendrobium*, *Gastrodia elata*, *Acanpe praemorsa*, *Cymbidium aloifolium*, *Geodrum densiflorum*, *Habenaria* spp., *Malaxis acuminate* and *Vanda tesellata*.

Recently, it has been reported that orchids molecules are important is reducing fevers, serving as anti-impotence aids, increasing the white blood cell count, curing eye diseases, treating fatigue and headaches and most importantly, functioning as anti-cancer agents (Bulpitt, 2005).

### 3. Materials and Methods

Preliminary survey on the orchids of Kutkai Township was undertaken in October, 2008. 25 species were collected from natural forest near the two villages namely, Hman yan and Hga ly. The collected specimen were as follow:

**Epiphyte**
1. *Aeride* spp.
2. *Ascocentrum* spp.
8. *Otochilus* spp.

**Terrestrial**
1. *Habenaria* spp.
2. *Thunia* spp.
3. *Arundina* spp.

The specimens were carried by using card box and some were placed in wooden press. Flowers were kept in formalin Acetic acid of 2:1:1. Fresh plants were kept in home garden. Species which possess both vegetative and reproductive parts were
identified through taxonomic descriptions. Confirmation was made by using Myanmar Native Orchids by Saw Lwin Vol.1,2 (2004) and various references.

**Study Area**

Kutkai Township is situated in Northern Shan State it is located between 23°15’ to 24°35’ and 97°35’ E to 98°15’ E. Elevation is about 1500 meters above sea level, occupies an area of 126139 acre. The tribal people are Palaung, Kachin, Shan, Lesu etc. They depend on the forest resources for their livelihood.

Soil type is loamy, higher elevation soil is rocky. Temperature range from 6 °C to 30 °C annual. Rain fall is 68 inches the most conspicuous mountains are Ngam Nge mountain (7443) feet, Lyoin Hpyan Lon mountain (7352) feet, Lyoin Syam Sip mountain (6125) feet. The forest types are hill and grassland forest, green hill forest and dry hill forest.

These species collected from Hman-yam and Hga-ly villages and some were on sale from market day by the local people. Although they represent only a small proportion of Myanmar total, they grow in large quantities and are quite varied.

**4. Results**

**Materia Medica of Medicinally important Orchids**

1. **Scientific Name**: *Dendrobium cariniferum* Rchb.f
   - **Myanmar Name**: Mahar deiwi
   - **Family**: Orchidaceae
   - **Key Characteristics**: Stems cylindrical or sometimes slightly fusiform, 10-28cm long. Leaves several, 8-11cm x 1.5-4cm, abaxial surface and amplexicaul sheaths densely black-hairy. Raceme arising from defoliated stem, often 1-2 flowers, slightly scented, sepals and petals creamy white, mentum conical, lip trumpet -shaped disc, short-fimbriate along adaxial veins.
   - **Flowering time**: February-April
   - **Distribution**: Shan State
   - **Part Use**: Stem/fruit
   - **Uses**: Tonic
2. Scientific Name    : *Dendrobium chrysotoxum* Lindl.

   Myanmar Name     : Shwe tu, Mouk Khan War

   Family           : Orchidaceae

   Key Characteristics  : Stems fusiform, 6 - 13 cm long, with 2 - 5 nodes and many obtuse ridges. Leaves 2 - 5, subterminal, 18 - 20 cm x 2 - 3.5 cm, not sheathing basally. Racemes subterminal, 15-20 cm long, laxly many-flowered, sepals and petals, golden-yellow; mentum subglobose, lip subreniform or oblate, adaxially tomentose-pubescent.

   Flowering time    : May – June

   Distribution      : Kayin State, Shan State, Bago Division, Mandalay Division

   Part Use          : Stem/flower

   Uses              : Tonic

3. Scientific Name    : *Dendrobium crepidatum* Lindl.

   Myanmar Name     : Ganaing Na Bay Pauk

   Family           : Orchidaceae

   Key Characteristics  : Stems pendulous, cylindrical, 30 - 40 cm long. Leaves many, 5 - 10 cm x 1 - 1.3 cm, base amplexicaul-sheathing; sheaths green and white-striped. Racemes arising from defoliated stem, very short, with 1 - 4 flowers, sepals and petals white tipped with pink, mentum subglobose, lip orbicular or broadly obovate

   Flowering time    : April - May

   Distribution      : Chin State, Shan State, Kachin State, Mandalay Division, Kayah State

   Part Use          : Stem

   Uses              : Arthritic, Tonic, rheumatism
4. Scientific Name: *Dendrobium dixanthum* Rehb.f.

Myanmar Name: Shwe War Ga Lay

Family: Orchidaceae

Key Characteristic: Stems long slender, 30-40cm, smooth. Leaves many 10-15cm x 0.7 x 1.1 cm, linear-lanceolate. Racemes arising from leafless stem, 2-4cm long, with 3-5 flowers, sepals and petals bright yellow, mentum subglobose, lip pale yellow.

Flowering time: February –March

Distribution: Shan State, Mon State

Part Use: Stem

Uses: Tonic

5. Scientific Name: *Dendrobium falconeri* Hook.

Myanmar Name: Myet Thit Khwa

Family: Orchidaceae

Key Characteristics: Stems pendulous, 30-40 cm long, much branched, the nodes of branches often swollen. Leaves many, 5-7 cm x 0.3-0.7 cm, base with pink tubular sheaths. Racemes often arising from branches, mostly 1-flowered, sepals and petals rose purple or white; mentum subglobose, lip ovate-rhombic.

Flowering time: December-February

Distribution: Chin State, Shan State, Kachin State

Part Use: Stem

Uses: Lung cancer, Tonic
6. **Scientific Name**: *Dendrobium findlayanum* Par & Rchb.f
   **Myanmar Name**: Cho Chin Thitkhwa, Shwe Sit Kyoo
   **Family**: Orchidaceae
   **Key Characteristics**: Stems 2 cm long, internodes swollen, obconical or compressed conical, 3-3.5 cm long. Leaves several, 5.5-8 cm x 1.3-2 cm, base amplexicaul sheathing. Racemes arising from defoliated or sometimes leafy stem, with 2 flowers. pale lavender sepals and petals, mentum subcylindrical, lip suborbicular.
   **Flowering time**: February-March
   **Distribution**: Bago Division, Mon State, Shan State
   **Part Use**: Stem
   **Uses**: Injection, Pain

7. **Scientific Name**: *Dendrobium fimbriatum* Hook.
   **Myanmar Name**: Arme Let Tan To
   **Family**: Orchidaceae
   **Key Characteristics**: Stems cylindrical or sometimes slightly swollen towards the base, 50-100 cm long. Leaves many 8-16 cm x 2-3.6 cm, base amplexicaul-sheathing. Racemes arising from defoliated stem, 5-15 cm long, laxly 6-12 flowers, sepals and petals bright yellow, mentum subglobose, lip sub orbicular, margins compound-fimbriate.
   **Flowering time**: May-June
   **Distribution**: Mandalay Division, Chin State, Shan State, Kachin State, Kayah State
   **Part Use**: Stem
   **Uses**: Fever, Tonic
8. Scientific Name: *Dendrobium moschatum* (Buch-Ham.) Sw.

   Myanmar Name: Waso Pan

   Family: Orchidaceae

   Key Characteristics: Stems suberect, up to 1 m long. Leaves many, 10-15 cm x 1.5-3 cm, base amplexicaul-sheathing. Racemes subterminal, pendulous, up to 20 cm long, with several to more than 10 flowers, sepals and petals white or yellow, mentum conical, lip cuculate, semi-globose.

   Flowering time: April - May

   Distribution: Tanintharyi Division, Shan State, Mon State

   Part Use: Leaves

   Uses: Bone fractured, Tonic


   Myanmar Name: Dawn Mee Thitkhwa

   Family: Orchidaceae

   Key Characteristics: Stems erect, cylindrical, slightly compressed, 10-60 cm long, narrowed towards the base, internodes often somewhat obconical. Leaves many, 6-11 cm x 1-3 cm, base, amplexicaul-sheathing. Racemes arising from leafy or leafless stem, 2-4 cm long, with 1-4 flowers, sepals and petals pale rosy-pink, mentum conical, lip broadly ovate.

   Flowering time: February – April

   Distribution: Chin State, Shan State, Kachin State

   Part Use: Stem, fresh/dried

   Uses: Immune, aphrodisiac, stomachic, analgesic, tonic, pulmonary tuberculosis, fevers, lumbago
10. Scientific Name : *Dendrobium pendulum* Roxb.fl.

Myanmar Name : Mya-sit-kyoe

Family : Orchidaceae

Key Characteristics : Stems cylindrical, with many strongly swollen nodes and moniliform, 22-40cm long, internodes 2-2.5 cm long. Leaves many, 9-12 cm x 1.7-2.7 cm, base amplexicaul sheathing. Racemes arising from defoliated stem, with 1-3 flowers; sepals and petals white, mentum purplish-red, conical, lip suborbicular.

Flowering time : May-June

Distribution: : Shan State

Part Use : Stem

Uses : Liver tonic

5. Discussion

This research work covers along the fringe of forest and the camp was made at the two villages Hman-yam and Hga-ly. Collection was made at the end of rainy season, October 2008. Although it was said to be the end of rainy season. Occasional rainfall and landslide occur often, thus makes the path ways more slippery. In some places tall trees were cut down by the local dwellers in order to collect the orchid from high tree trunks mostly such as *Prunus cerasoides*, *Quercus glauca*, *Syzygium diospyrifolium*, *Quercus serrata*. As Kutkai is a high elevated about 1500 meter above sea level. The merchant from the neighboring countries buy all types of orchids and put all into large plastic bag and the mixture was weighed. 35 species of orchid collected in the first field trip. Among them 25 species possess both vegetative and reproduction organ. 10 species were only vegetative parts. Moreover, orchids and medicinal plants are Non Wood Forest Products. Therefore, both are very important for rural people. According to information there were many other orchids are still left in the forest and it is difficult to collect them. Due to the slippery soil landslide, the field trip were adjourned to the open season. A number of dead host trees fully loaded with epiphytic orchid can fall any time which lead to the loss of these precious orchid. The community living in study area use host trees for fuel wood. Orchid species attached to the dead log are mostly ignored without realizing their importance. There are threats to orchids through lopping of the host species which mostly
occurs to meet the needs of construction timber. Due to these activities, a number of epiphytic orchid species are facing greater and unexpected threats day by day.

6. Conclusion

Hence, understanding the gravity of the situation, it is an urgent and timely need to collect these orchids and replanting them in a suitable habitat. Looking at the kind of degradation and destruction that such orchid colonies face, a strong approach is required not only for the restoration but also for long term benefit of natural environment. Therefore, the conservation of orchids and their host trees are important and necessary more than marketing value and medicinal value.

Acknowledgements

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Plate (1) Dendrobium cariniferum Rchb.f

Plate (2) Dendrobium chrysotoxum Lindl.
Plate (3) Dendrobium crepidatum Lindl.

Plate (4) Dendrobium dixanthum Rchb.f
Plate (5) Dendrobium falconeri Hook.

Plate (6) Dendrobium fimbriatum Hook.
Plate (7)  Dendrobium findlayanum Par & Rchb.f

Plate (8)  Dendrobium moschatum (Buch. Ham)sw.
Plate(9) Dendrobium nobile Lindl.

Plate(10) Dendrobium pendulum Roxb.