CHIRAITO

Swertia chirayita

Chiraito occupies one of the major positions in the trade of medicinal and aromatic plants. Total of 7,110kg of dried Chiraito was estimated to be traded from Dolakha district (DFO, Dolakha), and 3500kg of dried Chiraito was traded from Basantapur, Tehrathum district (Federation of Commerce and Trade, Basantapur) in 2001. The Chiraito is a biennial herb and whole part of this plant is traded. Chiraito is one of the major valuable Ayurvedic medicinal plants in Nepal and India.

1. BIOLOGY

A. Taxonomy

Swertia comprises 100 species (Airy Shaw, 1973) of which 27 species are reported from Nepal (Hara *et.al*, 1982). Around nine species of *Swertia* are reported to be in trade in different trading centres of Nepal. Among them *Swertia chirayita* is considered superior in quality.

Family - Gentianaceae
Local Name - Chiraito, Chiraita, Tite, Tikta
English name - Chiretta

Chiraito is an erect, biennial herb, 50-125 cm tall. Stem is robust, branching, cylindrical below, 4- angled upwards, containing large pith. Leaves are broadly lanceolate, 5-nerved, and sub-sessile. Flowers are lurid greenish yellow, tinged with purple in large panicles. Capsules are egg-shaped, seeds are minute, smooth, and many angled.

B. Habitat and Range

Chiraito grows in temperate Himalayas from Kashmir to Bhutan and in Khasia hills of Meghlaya (Chanda, 1976). In Nepal Chiraito is found to be reported from forty districts (Bhattarai & Acharya, 1996). In Koshi and Janakpur area, Chiraito is found from 1500m to 3000m altitude in open forest and on the margin of cultivated land.

Chiraito is predominantly found in the following VDCs of Dolakha District: Bocha, Gaurishankar, Lamabhagar, Orang, Chilankha, Khapachagu, Bhighu, Jiri, Shayama, Mali, Thulopatal, Laduk, Bulung, Lapilang, Lamidada, Sailungeshowr, Dhudhapokhari,

Katakuti, Magapouwa, Bhusapheda, Dadakharka, Lakuridada, Khare, Junghu, Suri, Chankhu, Kalenchowk, Jhakhu, Marbhu, and Kshamawoti VDCs.

Chiraito is predominantly found in the following VDCs of Tehrathum: Singnam, Basantapur, Dagapa, Solma, Jirikhimti, Phule, Angbung, Marahang, Pauthak, Khamlalung, Santhu, Yuba, Chatedhungha, Jhaku etc. In case of Sankhuwasabha district, Chiraito is predominantly found in the following upper altitude VDCs namely; Madimulkharkha, Taphu, Mawodin, Nundhaki, Sidhakali, Sidhapokhari, Jaljala, Pathibhara, Barhabesai, Num, Tamkhu, Hatiya, Makalu, Chepuwa (Chenten) etc.

C. Ecology

Chiraito is a biennial herb, which shows a rosette form in the first year whereas two years old plant has elongated stem with yellow flower.

Distribution of Chiraito is not uniform; it depends upon the altitude and slope. It prefers to grow on north facing slopes. It grows in south facing slope between 1500m and 3000m. While on the north facing slope, it descends below 1500m. In general, 2000m altitude is most preferable range (Bhattarai, 1996).

Chiraito prefers to grow in acidic soil condition with pH of 4.7 to 5.5 (Bhattarai & Shrestha, 1996). Chiraito is found being mixed with other species. The most common associate are: Bhuin Kaphal (*Fragaria indica*), Bukephool (*Anaphilis triplinervis*), Chari Amilo (*Oxalis corniculata*), Dubo (*Cynodon dactylon*), Ghans (*Digitaria adecendens*), *(Desmodium oxyphyllum)*, (*Elsholtzia strobilifera*), Titepati (*Artemesia vulgaris*).

D. Regeneration

The natural regeneration of plant takes place by seeds, when the seeds become biologically mature having high potentiality of viability during November (Bhattarai, 1996). The viability of seeds is very low if seeds are collected before November. The seeds stored in bad condition have no viability at all. The viability decreases after next October. If seeds are collected after November and cleaned properly, the percentage of germination is reported to be up to 90% (Bhattarai, 1991).

To start a Chiraito Nursery in November it is possible collect Chiraito seeds from the forest. The seeds collected should be sown within a year of collection. Before February, the soil is too cold to sow the seeds. It is better to sow between February and April, into moist, fertile nursery beds. The seeds are covered with a thin layer of soil (depth twice the size of the seeds). Mulching is necessary for better germination. Frequent water

spraying is done to maintain the moisture content of soil. When the seeds start to germinate, the mulching materials should be removed. After the seedlings attained the height of 6-8 cm, then they are ready for transplantation in field. Generally 15cm spacing between seedlings is needed for optimum production.

Chiraito should be harvested after three years of growth when the plant is well developed, after the plant has flowered and produced fruit. If harvesting is done after the seeds mature, then the plant can naturally regenerate. Harvesting Chiraito without considering the age of the plant and seed maturity reduces regeneration significantly.

2. RESOURCE MANAGEMENT

A. Management System

Chiraito is mostly collected from government forest, which has no control over collection. Who comes to collect first, will collect more and earns more money. Thus, there is always competition for collection and collectors collect before seed dispersal. Seeds are only the medium for the propagation of this plant, so if the plant is collected before the maturation of seeds, there will be no future germination. Unhealthy competition between the collectors has led to the over-harvesting of Chiraito without the consideration of sustainable regeneration. Not only does premature harvesting have a negative impact on regeneration, immature plants decrease the active ingredient quality of the final product.

Chiraito is not included in the Management Plan of the Community Forests of Janakpur and Koshi Zones. There is some awareness about its cultivation in the communities interviewed of the Janakpur and Koshi zones.

B. Harvesting

November-December is the appropriate time for harvesting but it is not practised in Dolakha, Tehrathum and Sankhuwasabha districts. Collection starts September onwards. Collection is done manually without using any instruments. Whole plant is pulled out and sun-dried for few days and then wrapped by '*choya*'. '*Choya*' is the bamboo slip used to tie up bundles of Chiraito. Then small dried bundles of Chiraito is collected into big bundles and sold to the local traders.

C. Sustainability issues

The whole plant is collected for the trade. November - December is the trading season of this product. Due to its high price, collectors have high competition for collection and it is collected before maturation. Thus, unmanaged exploitation of Chiraito has resulted in the decrease in natural production. According to the traders in the central and eastern parts of Nepal, production of Chiraito is declining every year.

3. UTILIZATION

A. Subsistence

Chiraito is an important medicinal herb used for curing various diseases. Locally this plant is given for malarial fever. The plant is dipped in water overnight and the bitter juice is taken the next morning. It is also used in common ailments like cough, cold, and fever. This plant is bitter with a sharp taste; it is used as an astringent tonic and stomachic. It relieves inflammations and improves eyesight. It is given as a sedative during pregnancy. Chiraito is considered good for pain of the joints, scabies, leucoderma, skin disease, asthma, ulcer and chronic fever.

B. Commercial

The main active principle is 'Chiretin'. Nine oxygenated xanthone has been isolated from the whole plant (Gnosal *et.al*, 1973). The bitter principles are the main constituents of the plant. They are included in the Secoirodoid glucoside group. They are Amarogentin and Amaroswerin.

Recently an increased demand for *S. chirayita* has been noticed. The product has been discovered by the beverage industry as an alternative bitter product (i.e. used in the liquor industries to impart bitter flavour to mouth). Swertia extract contains Oleanolic acid and Swertiamarin which is used as hair growth tonic (Suzuki et. al., 1989). Chiraito is also used as one of the ingredients in “Chandra Prabati” which is an Ayurvedic drug for cancer.

4. MARKETING

A. Production and Volume Trade

This plant is collected from Dolakha district from the Central development region and Tehrathum, Sankhuwasabha, Taplegunj districts from the Eastern development region. This species can be cultivated in Pachathar, Dhankuta, Taplegunj, Tehrathum, Solukhumbhu, Sankhuwasabha, Tanahu, Lamgunj, Kaski, Shangjha, Palpa, Baglung, Mustang, Gorkha, Gulmi, Baitadhi, Bajhang, Dadeldhura, Dailekh, Rukum, Kathmandu, Makawanpur, Dolakha districts.

According to DFO information, 7,110 kg of Chiraito is produced annually in Dolakha district. In Basantapur VDC, 3500 kg of Chiraito is traded annually according to Federation of Commerce and Trade, Basantapur.

B. Current Market Channel

Collector - > Village Trader -> Regional Trader - > Exporter
Collector - > Village Trader - > Exporter

Collector - > Village Trader - > Regional Trader - >Wholesaler - >Exporter

C. Current Processing

After drying (solar or smoke) and cleaning, the Chiraito is prepared for transportation. For transportation, bundles of Chiraito are made either using *choya* or by using a manually operated packaging machines. When binding with a *choya,* a bamboo slip is used as a rope to tie up the bundles. If *choya* binding is followed, then voluminous bundles result. The voluminous bundles take up more room during transportation, and result in higher transportation costs. Also when using *choya* binding a 2kg bundle will have 1/2kg of *choya* binding. Chiraito is finally packed in the jute sacks for marketing.

Then small dried bundles of Chiraito is collected into big bundles and sold to the local traders. Chiraito is then mainly exported to India in the crude form. The distillation of Chiraito has not been done in Nepal.

D. Variability and risk

The fluctuation of market price is one of the risky factors for the traders. In 1999, the market price of Chiraito was NRs.350/kg but this year (2002) the price came down to NRs. 200/kg. During storage, 10-12 percent of the weight is lost as the dry Chiraito loses its weight when leaves brake away from the bundles.

Adulteration of Chiraito with other low quality species of *Swertia* is very common in the trade of Chiraito.

5. SOCIO-ECONOMIC AND POLICY ISSUES

A. Socio-economic Factors of Existing Activities

Chiraito is one of the important sources of income for rural people. Mostly poor people and farmers with low land holdings are involved in collection and trade of Chiraito. Mostly children, women and shepherds collect it in their leisure time. In general, each household collected 40kg/season in Chaite CFUGs of Tehrathum district, 2.5kg/season in Okhare CFUGs and 1.40 kg/season in Kalika CFUGs of Sankhuwasabha district, but in Lakuridada CFUGs of Dolakha district each household collect 500-750 kg of Chiraito per season. The cash generated by selling of Chiraito is used to buy food, clothes, salt etc.

B. HMG Policy on collection, processing, and trade

1. Current policy

Before Collection, permit is required from the DFO but it does not exist in practice. Only the traders take collection permission before transporting to Terai market. To release Chiraito from the district of origin to Terai market, trader must pay royalty of NRs. 3/ kg

and get permit from DFO. If illegal Chiraito is found, DFO is empowered to arrest, conduct search and initiate file case.

2. Policy constraints

Several unnecessary checkpoints from district up to the border are the main constraints, which are responsible for harassing the traders.

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8. ADDITIONAL SOURCES OF INFORMATION

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