CONTROVERSIAL PLANTS

A large percentage of plants used in herbal industries are a subject of controversy. Non-availability of plants, poor understanding and parallely evolved knowledge systems are some of the reasons attributed to it. The existing practices of polynomial nomenclatural system of Sanskrit, different perceptions in various communities, vernacular equivalents all are cumulative factors. However controversial drugs offer a promising area of plant based research. Here a simple attempt have made to review information about a few of the important controversial drugs commonly used in Ayurvedic medicine.

BRAHMI

According to ayurvedic classic Abhinjanamanjari (Mooss, 1952), four different kinds of brahmi are mentioned. They are satala brahmi, medha brahmi, muni brahmi and mandukaparni. But this differentiation is found neither in the classical literature, nor in practice. Rajanighantu (Narahari, 1933) equated brahmi and mandukaparni as one and the same plant, which is distributed in many parts of North India (Sivarajan and Balachandran, 1994). But the great triads of Ayurveda, Charaka, Susruta, and Vagbhata treated brahmi and mandukaparni as one and the same.

Comparative studies on the phytochemistry and pharmacology clearly proved that brahmi and mandukaparni are distinct drugs. According to Charaka, though both drugs are promoters of general mental ability, brahmi is used in specific mental disorders where as mandukaparni is generally employed as a rasayana drug or rejuvenator (Sivarajan and Balachandran, 1994).
This difference is found in their *rasa* property also. *Tikta rasa* (bitter) is attributed to *brahmi* by Bhavaprakasha (Panday, 1985) but mandukaparni has ‘*kasaya rasa*’ (astringent property).

Exact botanical identity of *brahmi* and *mandookaparni* is contributed by Ali *et al.*, (1981).

Kerala physicians treated these two plants as two distinct drugs. According to them *brahmi* is *Bacopa monnieri* (L.) Pennell. and *mandukaparni* is *Centella asiatica* (Linn.) Urban.

**JIVANTI**

*Jivanti* is included in the regimen of *rasayana* (life promoting) drugs by the great Charaka (Pandya, 1983). It is an important constituent of ayurveda formularies such as *Jivantyadi ghritham, Jivantyadi thailam, Amrutaprasaghritam, Manasamitra vatakam, Balarishtam, Anuthailam* etc. Vagbhatha treats it among the ten vitalising drugs i.e. *Jivaneeyagana*.

According to Bhavmisra, " *Jeevanti Jivani Jivaniya Madhusrava Mangalyanamadheya ca Sakasresta Payasvani " - means it is the plant which is vital to life, protects life, having sweet juice, shower bliss and happiness, apt among vegetables and having milk (Pandey, 1985).

Ayurvedacharya Charaka also considers it as " *Jivanti saak saakanam*” means *Jivanti* is the best vegetable (Pandya, 1983)

The great classic Madanadinighantu (Madanapal, 1902) opines *jivanti* "Netra rogahara, sita pittasrkkaphanasam " i.e. *jivanti* is a choice in ophthalmic conditions, having cooling nature and also corrects the vitiation of pitta, kapha and rakta.
The botanical identity of this drug is highly controversial. In classics *Jivanti* is included in "sakavargam" means it is a vegetable drug (Vagbhata, 1966).

The term *jivanti* is a synonym for a number of drugs. Various drugs are being used in different parts of India under this name (Vaidya, 1982; Vaidya, 1975; Uniyal *et al.* 1979; Gupta and Kapoor, 1971) these include

1. *Desmotrichum fimbriatum* Bl. Bidr = *Dendrobium macraei*
5. *Celtis orientalis* Linn.
8. *Holostemma ada-kodien* Schultes.

Leaves of *jivanti* plant are used as a pot herb in Gujarat and Kathiyavar region against tuberculosis and eye diseases (Sivarjan and Balachandran, 1994; Vaidya, 1982). According to modern version, leaves of *jivanti* is the best source of Vit. A and can be successfully utilised in eye diseases such as night blindness, cataract etc. (Un published data).

By considering these aspects, it can very well be inferred that *jivanti* is a pot herb and a climber of par excellence rather than an orchard plant.

Among the above mentioned eight plants, the first four plants belong to the family Orchidaceae and show the characteristic features of the family and they cannot be used as a leafy vegetable.
Vaidya (1982) equated *jivanti* to *Celtis orientalis* Linn. This plant is a member of the family Urticaceae and being a medium sized tree, it can not be regarded as *jivanti*.

*Cimicifuga foetida* Linn. (Ranunculaceae) is known as "jiunti" in Punjab. But the pharmacological action of this plant is different, being indicated in dropsy and bronchial diseases, it cannot be considered as *jivanti* (Vaidya, 1982).

*Holostemma ada-kodien* Schultes and *Leptadenia reticulata* Wight and Arn. are members of Asclepiadaceae family. They show the characteristic features of the family such as climbing nature, presence of latex etc. The latter bear light yellow flowers and is regarded as *swarna jivanti* as mentioned in Rajanighantu.

In classical literature Vaidya Jadavji Acharya considers another type of *jivanti* viz, *swarna jivanti* in addition to the ordinary one. The difference is attributed to the difference in colour of the latex obtained by plucking the fruit. *Jivanti* has white latex while *swarna jivanti* has yellow latex. In Bengal and other regions of North Eastern India, *Flickingeria nodosa* is being used as *jivanti*. It may be due to the yellow latex produced (Vaidya, 1982). The exudate of *Leptadenia reticulata* being yellow in colour also fit well and is considered as the genuine source of the drug by many (Singh and Chunekar, 1962; 1979; Anonymous, 1978 a; Gupta and Kapoor, 1971; Kolammal, 1979; Vaidya, 1975; Uniyal et al., 1979). Verma and Agarwal (1962) reported chemical characteristics of *Leptadenia reticulata*.

Another species of *Leptadenia, L.pyrotechnica* Forsk. Decne. is used in Rajasthan and Gujarat as *swarna jivanti* (Sharma, 1983).
In Kerala, the indigenous system make use of *Holostemma ada-kodien* Schultes. (*H. annulare*) as the accepted source of *jivanti* from time immemorial (Nicolson *et al.*, 1988). This plant is known as *adapathian* in Kerala. The name *arkapushpi* in Sanskrit is due to the resemblance of flowers of this plant to *Calotropis* sp. (Kolammal, 1979) On the other hand, *Leptadenia reticulata* is used in other South Indian states especially in Karnataka and Andhra Pradesh as *jivanti*. Market sample obtained from these regions also confirms the use of this drug. It is an accepted galactogogue (Akhtar and Sitaratna, 1972; Gokhalae, 1965; Gupta Nawal Kishore, 1966 and Moulvi, 1963).

In Kerala - dried roots of *Holostemma ada-kodien* is marketed as *jivanti*. It fetches a high price in the market. The dried samples are often adulterated due to scarcity. Besides the tuberous roots, the normal roots are also found admixed in the samples collected from market.

**PATHRA**

In Ayurvedic pharmacopoeia, a collection of four drugs known as *chaturjatam* (chatur - four, jatam - collection) is widely used in *arishtam* and *lehyam*. They are-

a. *Eletteria cardamomum* Maton. - *Ela* (Fruit)
b. *Cinnamomum zeylanicum* Blume - *Twak* (Stem bark)
c. *Cinnamomum tamala* Nees and Eberm - *Pathra* (Leaf)
d. *Mesua ferrea* Linn. - *Nagakesara* (Flower)

Ayurvedic system of medicine describes these plants as being useful as an expectorant, digestive, carminative and above all a flavouring agent in medicinal as well as in dietary preparations. Essential oil from the above is used in various
medicinal preparations and in perfumery. In almost all *arishtam* and *asavam*, dried and powered leaves of *pathra* along with other ingredients are incorporated as *prakeshpana choornam*. *Lehya* preparations also make use of the virtues of these plants in the powder form.

However, the identity of "*pathra*" is still a controversial one. As per ayurvedic treatises (Pandey, 1985), *Cinnamomum tamala* (Family : Lauraceae) is the source plant and it is also referred as *tamala pathra*.

“Pathram tamalapathranca tatha syatpathranamakam”

It is a medium sized evergreen tree distributed at an elevation of 900-2, 400 m in the sub-Himalayan region and in parts of northeast. The leaves of the plant are used in cough, flatulence and dyspepsia and also as a carminative (Nadkarni, 1954). This material is not available in the central and southern parts of India and drug manufacturers are using the leaves of patchouli (*Pogostemon patchouli*) instead. The dried leaf of patchouli also is used in cough, flatulence, dyspepsia and also as a carminative (Nadkarni, 1954).

An extensive survey on this drug revealed that in Kerala, different species and varieties of *Pogostemon* (Malayalam – *patchouli*) are being used as *pathra*. The drug is not available in the state and the markets depend on suppliers from other states. Market samples are found adulterated with impurities such as earth, sand and dust. According to Guenther (1949) fine dust is mixed with the leaves or by sprinkling muddy water over the leaves with subsequent drying. It is also made substandard by spraying water inside of the bales or packing the leaves very early in the morning while they are wet with dew. The advantage is that moist leaf can be packed more easily, but the quality deteriorates due to fermentation of the leaves.
Pathra is also found adulterated with leaf material exhausted of essential oil by steam distillation such as leaves of Ocimum basilicum L., Urena lobata L., Hyptis suaveolens and also with leaves of different species of Pogostemon such as P. heynianus Benth. It is also known as Java Patchouli, indigenous to India, often cultivated in Indian gardens. This species is the only flowering patchouli and the Japanese term it as dilem kimbang that means flowering patchouli. In Malaya, it is called as dhalum outan to mean mean forest patchouli.

The word patchouli came from the Hindustani Patcholi referred to by some as Tamil Pacha, pachai - green, ilai - leaf. Pogostemon cablin Benth. (P. patchouli Pellet.), a native of Phillpine Islands, is the true patchouli of commerce. The word cablin is derived from "cablam" - the vernacular name of the plant in the Philippines and it is known to have been cultivated in Pennang since 1834 (Guenther, 1949).

PITABHRINGARAJ

Ayurvedic treatises describe 3 types of bhringaraj viz. seveta, nila and pita. Of these, seveta and nila were formerly identified as two distinct plants. But now they are equated as Eclipta prostrata (Linn.) Linn. = E. alba (Linn.) Hassk. The yellow flowered one (pita bhringarj) is Wedelia chinensis (Osbeck) Merrill (Rheede 1690; Sharma, 1984; Sivarajan and Balachandran, 1994).

Sidhas claim the availability of four different names for bhringaraja. They are: Vellaikurisalanganni – Eclipta. prostrata (L.) L.,

Manjakarisalanganni – Wedelia chinensis (Osbeck) Merrill

Nilakarisalanganni - Caesalia axillaris Roxb
**Sivappu karisalanganni** – Its botanical identity or herbarium is not at all available.

*E. prostrata* when exposed to direct sunlight, produce greater % of anthocyanin pigments which impart black stem colour to the same and this plant is misinterpreted as *kalabhringaraj*. In Ayurveda *Heliotropium brevifolium* is also known as *kala bhringaraj*. Though the same therapeutic property is attributed to *Heliotropium brevifolium* Wall, the botanical identity is different with different cytological characters (Balu, 1991).

Traditionally *pitabhringaraj* is considered as a substitute for *Eclipta prostrata* (Balu 1988). Though same property is attributed to *Eclipta prostrata* and *Wedelia chinensis* (Osbeck) Merrill (Kritikar and Basu, 1991), and wherever the term *bringaraja* is mentioned, *E. prostrata* is used in Ayurvedic formulations such as *Neelibringhadi thailam*, *Narasimharasayanam*, *Bhringarajasavam*, *Kayyunyadi tailam* etc. But *W. chinensis* is widely used in Siddha medicine especially for the calcination of iron (lobha bhasmam) and for the preparation of *Ponkurisalathelineer* – a fermentative preparation used as a haematinic tonic (Govindachari *et al.*, 1969). Sharma (1983) reported that *W. chinensis* is used by Nagarjuna for the processing of iron.

**RASNA**

*Rasna* is an effective anti rheumatic and anti arthritic drug, which has wide application as single drug in our indigenous system of medicine. Apart from this, it is used in gastro intestinal complications like flatulance, dyspepsia and upper respiratory diseases like bronchitis and asthma (Sharma, 1983).
This drug is known from vedic period as a major ingredient in compound formulations. Rather than formulation in classical literature, it has wide application in traditional and tribal medicines. In most of these preparations rasna is used as the apt choice in rheumatic complaints. Due to this superior efficacy of rasna, Charaka includes it in the “vayasthapana varga” the group of drugs that can maintain vigour and strength. He commends that “rasna vataharanam” - means the right choice for rheumatic complications (Pandya, 1983).

Besides, rasna is digestive and can eliminate kapha. As per Ayurvedic concept ‘ama’ matter is the causative factor for most of the ailments. Since rasna bears "amapachanam" property it can basically act against diseases connected with indigestion. Because of these properties rasna is mentioned as regulator of rheumatic ailments (Pandey, 1985). Besides rasna is capable of regulating kapha function too, there by suppressing pain or oedema. The synergetic action of the drug make it a panacea that is why it is one of the major ingredient in so many anti rheumatic formulations indicated for rheumatoid arthritis, myalgia, sciatica and other allied conditions.

The important formulations based on these properties of rasna are Rasnerandadi kwath, Ashtavargam kwath and Rasnasapthakam kwath. The Sanskrit synonyms rasna (tongue like leaf), rashna (tongue like leaf), rasana (tongue like leaf), rasya (with higher degree of pungency), sugantha moola (root is fragrant), suvatha (anti rheumatic), elaparni (leaf resemble Eletteria), surpagandha (snake like odour), atirasa (with high pungency) and rasadhya (high pungency).
The botanical identity of *rasna* is still a controversial one. This controversy exists in various angles, language, availability etc. A number of different plants are equated with *rasna* by different workers. It includes *Pleueha lanceolata* C.B Clarke (Compositae), *Vanda tessellata* Loud and Loud (*V. roxburghii* R.Br.) (Orchidaceae), *Alpinia galanga* (L.) Willd (Zingiberaceae) etc. (Anonymous, 1978; Sharma, 1983 and Warrier *et al*., 1995). Other plants substituted as *rasna* are *Acampe papillosa* Lindl., *Saccolobium papillosum* Lindl., *Viscum album* L., *Withania coagulans* Dunal., *Inula racemosa,* *Tylophora asthmatica* and *Aristolochia indica* (Regunathan,1982 and Satyavati *et al*., 1987). The Vaidyas of greater part of Northern India consider *Pleueha lanceolata* as the genuine source of *rasna* (Anonymous, 1978 and Satyavati *et al*., 1987)

The synonyms used for *rasna* such as *sugandhamoola* (root is fragrant), *ela parni* (leaves resembles those of ela) etc. have certain cannotations appropriate to *Alpinia galanga* Linn. than *Pleueha lanceolata* or *Vanda tessellata*. Sharma and Sharma (1977) reported that the water soluble fraction of the alcoholic extract of *Pleueha lanceolata* is significantly effective in inflammatory conditions., but less effective than *Alpinia galanga* and more active than *Vanda tessellata, Tylophora asthmatica* and *Aristolochia indica*. The sun dried rhizomes of *Alpinia* sp. are the useful part. The aerial and climbing roots, stem and leaves of *Vanda* sp. are cut and dried and sold in the drug market of U.P., M.P., Bihar and Bengal. Whole plant mainly, leaf is used as *rasna* in the case of *Pleueha lanceolata* C.B.Clarke.

**TRIVRIT**

*Trivrit* is an effective purgative or laxative drug used in ayurvedic formulations from time immemorial for rheumatic and paralytic affections
(Nadkarni, 1954). It has proven efficacy in skin diseases, consumption, dropsy, oedema and haemophilic diseases (Sivarajan and Balachandran, 1994). Traditionally, this plant has various applications in heart, kidney and liver diseases (Kurup et al., 1979; Nesamony, 1985). Classically, trivrit is indicated as a laxative (Warrier, 1955). The word trivrit means twining or twisted. Sanskrit writers think that it is twining so as to form 3 turns (Vaidya, 1982).

Trivrit is known in English as turpeth root or Indian jalap. It is considered as a well known substitute for the imported drug - jalap obtained from Ipomoea purga and Ipomoea orizabensis (Wahi and Bhattacharya, 1960).

Ipomoea purga, a large twining plant of Convolvulaceae is indigenous to Mexico. It is the source of the drug - jalap with the trade name Mexican or Vera Cruz jalap. Ipomoea orizabensis, belonging to the same family is used as a substitute or adulterant to jalap or its resin, jalapin. But this resin is more soluble in ether (65%) than jalap resin (10 %) (Treas and Evans, 1983).

The main constituents of Ipomoea orizabensis resin are methyl pentosides and other glycosides of jalapinolic acid and its methyl ester, sitosterol and phytosterol glycosides (Treuse and Evans, 1983). Ether soluble portion of Ipomoea purga resin is known as jalapin and the ether insoluble part comprises convulvin. Convulvin on hydrolysis yields about 74% rhamno convulvic acid, 9% tiglic acid and 7% exogenic acid. Jalapin is the main active constituent of jalap. In addition to all the above constituents, resin also contains ipurganol, β methyl aesculetin, palmitic and stearic acids. (Kokate et al., 1990). Therapeutic value of these two plants are the same; being used as a powerful hydrogogue and cathartic. (Treas and Evans, 1983). Trivrit is a controversial drug as per ayurvedic treatises.
According to Charaka, *trivrit* consists of two types of plants which can be distinguished on the basis of colour of roots, viz., *aruna* and *syama* (Pandya, 1983). Susruta included a third variety to the list, namely *mahatrivrit* or *mahasyama* (Singh and Chunekar, 1972). But Bhavamisra referred it as *Svet* and *Syama* (Panday, 1985). According to Sivarajan and Balachandran (1994), *mahatrivrit* or *mahasyama* described by Susrutha (Singh and Chunekar, 1972) does not exist in Kerala. This has created a lot of confusion in the drug market regarding the genuinity of this drug. Dalhana and Chakrapani, the learned commentators of Charaka and Susruta Samhitas included this in the group of purgative drugs irrespective of the colour. Following this, the Ayurveda Nighantus also classified *trivrit* in to two; white and black.

According to Dymock et al., (1891), white variety of turpeth consists of the dried roots of *Ipomoea turpethum* R.Br = (*Operculina turpethum* Silva Manso) and the black variety is the root of *Lettosomia atropurpurea* Clarke and he attributed the same morphological and histological structure to both.

In South Indian markets, two types of materials are sold as *trivrit* (nisoth). One is the stem and root of *Marsdenia tenacissima* W and A of the family Asclepiadaceae and the other is the stem and root of *Operculina turpethum* (Linn.) Silva Manso. (Wahi and Bhattacharya, 1960; Shah et al., 1960, 1961 and Sivaraj and Balachandran, 1994). Raghunathan and Mitra (1982) opined that roots of *Marsdenia tenacissima* W and A and *Ipomoea turpethum* has the same anatomical structure except that the cork portion is absent in *Ipomoea turpethum* R.Br. They observed that the drug collectors sold *Marsdenia tenacissima* W. & A. after scraping the cork with a special knife. Since these two plants belong to two
different species and families, their pharmacological action will also be different. Vaidya (1982) also opined that white turpethum sold in market is the stem of *Marsdenia tenacissima* W. and A. with an entirely different therapeutic value. Though some medicinal property is attributed to *Marsdenia tenacissima* W. & A., it is basically a fiber yielding plant. *Operculina turpethum* belong to the family Convolvulaceae and it provides drastic purgative action. According to Bhattacharya (1961), $\alpha$ turpethin and $\beta$ turpethin, responsible for purgative activity are found only in *Ipomea turpethum*. Singh *et al.* (1967) confirmed that there are no two *trivrit*, where as, *Operculina turpethum* (Linn.) Silva Manso is the genuine source and *Marsdenia tenacissima* W. & A., is the adulterant.
MATERIALS AND METHODS