



TRADITIONAL INDIAN HERBS: A STUDY OF SOME BIO-INORGANIC ASPECTS

Dr. Ravi Shankar

Faculty of Chemistry

Banarsilal Saraf Commerce College, Naugachia, Bhagalpur(Bihar)

Abstract :

Scientific interest in medicinal plants has burgeoned in recent times due to increased efficiency of new plant derived drugs and rising concerns about the side effects of conventional medicine. Medicinal plants have been curing various disorders in human being from the time immemorial. Allopathic drugs sometimes show negative effect or side effects but herbs are safer and easy to access. The herbal treatments are cheap as compared to allopathic drugs too. Vitamins are organic micro nutrients and essential trace elements are considered as inorganic micro nutrients. Trace elements are more important than vitamins, in the sense - they can not be synthesized by living matter, as in the case with vitamins. It has been found that all plants life - including bacterial, fungi, algae and higher plants, require copper, iron, magnesium, manganese and zinc. Green plants and algae need boron and some require cobalt and molybdenum. Higher plant eating insects have low levels of sodium in their blood and high levels of magnesium (Schroeder, 1976). For human system, the committee on Diet, Nutrition and Cancer (1982) noted that the essential function of several trace elements in defense mechanism against microbiological, chemical, viral and oxidative insults become well recognized, linking some trace elements not only with infections but even with neoplastic diseases.

Key Words : Elements, Medicine, Inorganic, Mineral, Concentration, Bio-Chemicalfunction.

Introduction :

A large number medicinal plants have been investigated on modern scientific lines by various workers. It is reasonable that the efficacy of a medicinal plant is dependent on the effect of either its organic or, inorganic constituent or on the combined effect of the both. So far the inorganic aspect is concerned it is found that the work is very limited and specially the inorganic elements, occurring in trace amount(trace elements) are not properly investigated, because for this sophisticated instruments like atomic absorption spectrophotometer, X-ray fluorescence spectrophotometer, inductively coupled plasma(ICP) etc, are absolutely necessary.

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MATERIALS AND METHODS :

The research work Carried out by selecting five well known herbs mostly form Stasang 'Vaisaj' garden as sample materials. I have done all work in the Vashisth Research Laboratory, a unit of VMVS, Deoghar (registered Trust and also in the Satsang Herbal Research and Analytical Laboratories, Deoghar. The selected medicinal plants are Adhatodavasica, Cinnamomumtamala, Clerodendronviscosum, Nyctanthes arbor-trusties and Vincarosea. The Botanical decription is very necessary to indentify the genuine Herbal because in the some genus there may be one or, more varieties of the concerned herb having variation in their medicinal properties. A brief Botanicaldescription with morphological characters are studied.

Any of the types of mills available for the grinding of plant material will contaminate the sample to some extent and the method employed depends on the nature of subsequent analysis. Occasionally hand grinding in a mortar an pastel (non-metallic) was adopted.

Instrumental Techniques :

Atomic absorption spectrometry (AAS) achieved rapid success in 1960 and to-day it is the popular method form determination concentration of metals in general and the most widely used techniques for analysis of trace element Estimations of Cu, Sn, Ni, Co, Mn, Cr, Ca, Fe, Mg, Li including Na, K may be done by AAs. The popularity of AAs arise from its analytical

specificity, good sensitivity and precision. The main drawbacks being the limited linear calibration range and the inability to analyze more than one element at a time.

Discussion :

The present chapter deals with the nutritional and therapeutic properties of the five selected medicinal plants under study. Here an attempt has to been made to corroborate them with their concentration and distribution behavior in different essential mineral along with their bioinorganic aspects.

Adhatodavasica:

It occupies an important place in Ayurvedic texts. Adhatodavasica (Vakas) has been used in traditional Indian medicine for thousands of years to treat respiratory disorders. It is also used in treating bronchitis, tuberculosis and other lung and bronchiole disorders. A decoction of the leaves may be used to help with cough and other symptoms of colds. The soothing action helps irritation in the throat and the expectorant will help loosen phlegm deposits in the airway. A poultice of the leaves may be applied to wounds for their antibacterial and anti-inflammatory properties. The poultice is also helpful in relieving rheumatic symptoms when applied to joints. It has been used to control both internal and external bleeding such as peptic ulcers, piles and bleeding gums. In Ayurvedic medicine, adhatodavasica has been used for a multitude of disorders including; bronchitis, leprosy, blood disorders, heart troubles, thirst, asthma, fever, vomiting, loss of memory, leucoderma, jaundice, tumors, mouth troubles, sore-eye, fever, and gonorrhoea. This herb exhibits antispasmodic, expectorant and blood purifying properties.

Cinnamomumtamala:

Cinnamomum Tamala has found its place in Ayurvedic medicine. Commonly it is called Tejpatra. Tejpatra is an Ayurvedic herb that makes a condiment of different medicines. It is effective in regularizing blood circulation and also used in treating obesity. It enhances fat metabolism and reduces bad cholesterol from the blood. Indian Cassia also known as Tejpat (Cinnamomum Tamala) is a small to moderately sized ever green tree. The leaves of this tree is the spice having clove like taste and a faintly pepper like odor. The tree has height up to 7.5 mtr with zigzag branching, trunk up to 95 cm girth, bark rough, dark gray to reddish brown in color. Cinnamomum tamala is mostly occurring in the tropical and sub-

tropical Himalayas extending to North East Indian up to an altitude of 2000 meters MSL. It also grows in Nepal, Bangladesh and Myanmar.

Parts of the plant used are leaf and bark. Leaf is mainly used for flavoring food. It is widely used in pharmaceutical preparations because of its hypoglycemic, stimulant and carminative properties. It is also used in Indian system of traditional medicines, fight Chikungunya and viral fever reversing aging, improving immune system and increasing libido Ayurvedichome remedies for anemia. The following previous works of previous workers are listed below:

Clerodendrum viscosum:

Traditional herbal medicine is predominantly practiced by the rural people of India, especially remote areas such as the Uttara Kannada District in Western Ghats of Karnataka. Local traditional healers play an important role in the management of reproductive health problems of the native population due to socio-economical and geographical factors. Shrubs or small trees, rarely sub shrubs or herbs, erect or rarely climbing, deciduous or evergreen. The capacity of certain plant proteins closely to simulate the action of various human blood group specific agglutinins is well known. Examination of non-leguminous plants has now revealed specific agglutinins in the fruit pulp of *Clerodendrum viscosum* Vent (syn. : *C. petasites* Lour; *C. infortunatum* Cook et al., non-Gaert and non-Linn), of the natural order Verbenaceae, a gregarious shrub commonly found throughout India, Burma, Ceylon and the Andaman Islands (1961). Leaves used as bitter tonic, vermifuge, laxative and cholagogue, fresh leaf juice introduced into the rectum for removal of ascarids. Leaves and roots used in external applications of tumours.

Anti-inflammatory, Antinociceptive, and Neuropharmacological activities of *Clerodendron viscosum* was confirmed by Ahmed, F. et al. (2007). Priyesh P. et al., (2007) reported the antioxidant potential of *Clerodendron viscosum* vent roots. Husain, MM, et al. (2006) studied on the repellent effect of plant Bhat (*Clerodendron viscosum* L.) leaf on *Tribolium castaneum* Herbst. Results indicated that both the adults and larvae were repelled by contact with food medium treated with Bhat leaf dust conditioned with 100, 500, 1000 and 2000 ppm of flour.

Nyctanthes arbor-tristis:

Nyctanthes arbor-tristis Linn. is a large shrub which is widely cultivated throughout India as a garden plant. The bitter leaves are used in traditional system of

medicine for the treatment of rheumatism, sciatica and intestinal worms. The powdered seeds are recommended for the treatment of scurvy (Kirtikar, K.R. and Basu, B.D., 1995).

Nyctanthes arbor-tristis means 'a night flowering sad tree'. It is an indigenous plant, commonly known as Harsinghar in Hindi, belongs to the family Oleaceae (Nyctaginaceae). It is a small tree with a gray or greenish rough bark with delightfully fragrant flowers in autumn. The fresh leaves are used for the 'preparation of homoeopathic medicines. It has frequently been used by the ancient Indian physicians for the treatment of all kinds of fevers and sciatica. The Council conducted the trial of the medicine during the period 1980 - 2003 in various potencies. The study confirms the symptoms like anxiety, restlessness, different kinds of fevers especially intermittent and bilious fevers, headache, gastritis, hepatitis, abdominal colic, constipation, diarrhea, dry cough, rheumatism & sciatica as mentioned in various homoeopathic literatures. Besides, it was also useful in clinical conditions like vertigo, dysmenorrhea, bronchitis and seasonal fevers etc., which can be inferred as additional clinical symptoms as observed during the trial.

The recent phytochemical analysis of *N. arbor-tristis* revealed the presence of tertiary alkaloids, represented mainly by 7-(alpha-anilinop-nitrobenzyl)-8-quinolinol and quaternary alkaloids, belonging to protoberberines and aporphines (Maleki et al., 2004). These substances may influence the immuno-bioactivities of *N. arbor-tristis*. In this study, plant extracts from *N. arbor-tristis* were prepared, administered to rats and its anti-inflammatory properties investigated, as well as its effect on antibody synthesis, total WBC count and delayed-type hypersensitivity reactions.

Vincarosea :

It is an evergreen sub shrub or herbaceous plant growing to 1 m tall. The leaves are oval to oblong, 2.5-9 cm long and 1-3.5 cm broad, glossy green, hairless, with a pale midrib and a short petiole 1-1.8 cm long; they are arranged in opposite pairs. The flowers are white to dark pink with a darker red center, with a basal tube 2.5-3 cm long and a corolla 2-5 cm diameter with five petal-like lobes. The fruit is a pair of follicles 2-4 cm long and 3 mm broad.

Grows throughout India and found as an escape in waste places and sandy tracts. The plants grow one or two feet high and have a glossy, dark green leaves (1-2 inches long) with flowers throughout the summers. The blooms of the natural wild plants are a pale pink with a purple "eye" in their centers. Its alkaloids are hypotensive, sedative and have tranquilizing

properties and are anti cancerous. It helps in relieving muscle pain, depression of central nervous system and wasps' stings. In the wild, it is an endangered plant; the main cause of decline is habitat destruction by slash and burn agriculture. It is also however widely cultivated and is naturalised in subtropical and tropical areas of the world.

Table And Analytical Data: The experimental data of different elements under study are represented in table below:

Figures in ppm (ug/g).

Element	Adhatoda Vasica	Cinnamomum Tamala	Clerodendrum Viscosum	Nyctenthes Aebortritis	Vinca Rosea.
Cu	5.293	4.25	31.405	13.79	10.9
Zn	53.15	24.17	46.115	51.31	29.94
Mn	19.98	12.6	25.79	34.17	26.44
Co	22.00	8.351	28.01	16.27	14.18
Ni	6.16	8.521	7.638	8.315	8.05
Rr	1.81	1.498	2.72	2.06	1.15
Li	5.506	8.943	17.7	16.59	13.51

Concluding Remarks:

It is clear from the above discussions, the present paper deals with the micro analytical investigations on essential mineral contents of some selected medicinal plants with special reference to their trace elements content. It would be evident that so far the aforesaid medicinal plants are concerned; investigations from the essential trace elements aspects have not been attempted earlier. As the same plant species from different regions may show variations in mineral contents depending upon their availability in the soil, plant samples were collected from one place (Deoghar locality Drily), mostly from Satsang 'Vasaj Garden, Deoghar. The geographical position of Deoghar being 24°29'N; 36°43'E; with an altitude of about 440ft And the approximate annual rainfall is around 200mm. As mentioned in the Hand Book of Agriculture (ICAR,1980), the soils of this region are red in nature and the pH varies from 5 to 6.8. Another distinctive feature is the higher percentage of acid soluble Fe₂O₃ than that of Al₂O₃. The salient features which need special mention are:

- While collecting various parts of the plant sample, only full grown, mature organs were collected during appropriate season (as mentioned in standard Ayurvedic books) – following recent well established techniques
- To avoid gross metallic contamination and deterioration of any kind special precaution taken right from collecting samples up to final preparation of solutions for analysis. Also latest instrumental technique adopted (especially for trace elements) for analytical specificity, good precision and sensitivity.

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