



COMPARITIVE STUDIES OF DIFFERENT SAMPLES OF MANJISHTHA (*Rubia cordifolia* Linn) W.S.R. TO DESHVICHARA – A REVIEW

More D.B.^{1}, Gajarmal A. A.², Shende M.B.³*

1*. Assistant Professor, Department of Dravyagunavigyana, Government Ayurveda College, Nanded- 431601 Maharashtra, India

2. P.G. Scholar, Department of Dravyagunavigyana, Government Ayurveda College, Nanded- 431601 Maharashtra, India.

3. Guide & Associate Professor, Department of Dravyagunavigyana, Government Ayurveda College, Nanded- 431601 Maharashtra, India.

Address For correspondence

Dr. D.B.More,
Department of Dravyagunavigyana,
Government Ayurveda college,
Wazirabad, Nanded - 431601
Maharashtra, India.
Email: dmore602@gmail.com

ABSTRACT

In the era of modern world, the demand of *Ayurvedic* medicine is increasing day by day. As medicinal plants are rich source of bioactive compound. They serve as important raw material for drug production. But for production of drug, the raw material used should be free from all types of adulterant. All these facts has prime importance in one of the branch of *Ayurveda* called *Dravyagunavigyana*. During ancient time, the preparation of medicine was done by self-physician as a part of the practice, so the preparation of medicine was limited. Selective and personal level only, later on this attitude changed and it turned into profession for the motive of profit. Popularity among the common people increased the used of medicinal plant, herbal adulteration is one of the malpractice in herbal raw material trade. On the same mode, in majority of *Ayurvedic* literature, the drug *Manjishtha* is considered as the *mula* (root) of *Rubia cordifolia* Linn. But it is seen that *Ayurvedic Pharmacopoeia*, Part I, Vol. III, published by the Ministry of Health and Family Welfare, Dept. Of AYUSH, Govt. of India, describes *kaand* (stem) of *R. cordifolia* as *Manjishtha*. Indigenous systems of medicine play a vital role in rural health populations. Complexities in herbal nomenclature system in indigenous systems of medicine lead to misidentification of plants. Identifying the exact plant mentioned in traditional literature and identifying the adulterants or substitutes are major tasks in basic research. Sample collection is one of the most important work. But there are controversies between researchers in identifying the source of plants. In the same way, *Rubia cordifolia* does not appear have been much cultivated but it was still mostly collected form the wild. That's why this review article enumerates about comparative studies of different samples of *Manjishtha* (*Rubia cordifolia* Linn) w.s.r.to *Deshvichara*.

KEY WORDS: *Ayurveda, Manjishtha, Rubia cordifolia* Linn., Root, *Desh*

INTRODUCTION

Rubia cordifolia Linn is common throughout the hilly tracts of India from the North-Western Himalayas, eastward ascending to 2500m. Also reported from Greece, Africa and other Asiatic countries like China, Japan, Afghanistan, Vietnam and Malaysia^{1,2}. *Rubia cordifolia* is a perennial, herbaceous climber, roots long, cylindrical, flexuous, with a thin red bark. The stems are often many yards long, rough, grooved, becoming slightly woody at the base, bark white, petioles quadrangular, sometimes

prickly on the angles, glabrous and shining. Fruits 4-6 mm, didymous or globose, smooth, shining and purplish black when ripe³.

The roots of the plant are sweet, bitter, acrid and used as anti-inflammatory⁴, haemostatic⁵, antidysentric, antipyretic, analgesic, anthelmintic, improves the voice, the complexion and cures the *Kapha*, the inflammation diseases of the uterus, the vagina, eye, ear and the blood. It is also used in the cure of leucoderma, ulcers, urinary discharges, jaundice, and piles⁶.

The *Ruberythric acid* is one of the major constituents of the root and is widely used asphytotherapeutic drug in the treatment of calcium containing stones in the urinary tract⁷. *Rubia cordifolia* is used in *Ayurveda* as an ingredient of popular formulations like *Chandanasaava*, *Ashwagandhadyarishtha*, *Jatyadi Ghrita*, *Jatyadi Taila*, *Phala Ghrita*, *Pinda Taila*⁸.

According to *Ayurveda*, *Manjishtha* is *Guru-Ruksha* in *Guna*, *Kashaya-Tikta-Madhura* in *Rasa*, *Katu* in *Vipaka* and *Ushna* in *Virya*. In indigenous systems of medicine, *Rubia cordifolia* Linn. Is the accepted source for *Manjishtha*. A recent research found that market samples of *R. cordifolia* from south India were derived from *R. tinctorium*. However, *R. tinctorium* is not a south Indian plant. A plant, which is not found in wild or in cultivation of south India, might not be a source of the adulterant. If we believe that *R. tinctorium* is the source of adulterant in south Indian markets, then it might have originated from the Himalayas. However, it is unbelievable that an adulterant sold in south Indian markets, originated from the Himalayas, was not sold in north Indian markets. Polymorphism and geographical variations were reported in *R. cordifolia*. The market samples sold in south Indian markets may be originated from a different polymorphic plant or a geographical race and never from *R. tinctorium*. A recent research article was published on the authentication of market samples of *R. cordifolia*.

One of the author purchased the samples from 5 different places and compared them with the field-collected, botanically-identified authentic plant. It was found that samples purchased from north Indian markets were authentic and samples purchased from south Indian markets were spurious⁹. Based on the presence of specific flavonoid, they concluded that the spurious samples were derived from *R. tinctorium*¹⁰. It is observed that *R. cordifolia* is found throughout the hilly districts of India from N-W Himalayas eastwards, ascending to 8000 ft. and southwards to Ceylon and *R. tinctorium* is restricted to the Himalayas¹¹. *R. cordifolia* is a common plant in almost all parts of south India. *R. tinctorium* is not reported from south India. The stem pieces are adulterants, and samples derived from Sikkim and North East hills are originated from *R. Sikkimensis* Kurz¹². It is seen that *R. cordifolia* is a complex group, exhibiting a wide range of morphological characters. *This* group consists of several distinct species and in India this group is very polymorphic with several recognizable geographical races¹³. For that all forms, types and sub-species of *R. cordifolia* should be studied for its correct botanical identity and phytochemical constituents¹⁴.

One of the study was carried out to compare the authentic sample from its commercial samples keeping in mind the pharmacopoeial standards of *Ayurveda*. The quantitative phytochemical studies of the drug samples were carried out by studying the percentage of ash, extractive values and qualitative screening was carried out by Thin Layer Chromatography and different biochemical tests. The work was done in forming certain parameters for identification of drug with the help of various phytochemical observations. Thus, due to its high medicinal value, the work was carried out to study the root of authentic sample with the commercial samples from Gwalior, Coimbatore, Thiruvananthapuram, Palampur and Lucknow. Genuine material of *Rubia cordifolia* (root), was studied which was collected from Himachal Pradesh and market samples were procured from the markets of above five different places of India. Thin layer chromatography

technique was used for detection of number of major constituents in the samples. Diethyl ether, acetone, benzene, alcohol and methanol extracts of all the samples were run on the TLC plates pre-coated and manually prepared with silica gel-G. The resolution of plates was tried in different solvent system and best resolving system was chosen for running the plates, which were then exposed to UV, Iodine and Libberman-Buchard reagent¹⁵. Qualitative phytochemical evaluation was also carried out to test the presence of alkaloids, carbohydrates, glycosides, sterols, phenolics, saponins, resins, flavonoids, proteins and volatile oils in the drug and its commercial samples¹⁶. The results of commercial samples of *Manjishtha* particularly from Coimbatore, Thiruvananthapuram and Palampur markets showed a high percentage (%) of variation in their Quantitative analysis. This may be attributed to the presence of high percentage (%) of stem part in the commercial samples. The samples of Coimbatore and Thiruvananthapuram were quite dissimilar as compared to the other samples and were identified to be *Rubia tinctorum* on the basis of morphological, anatomical and bio-chemical analysis. These samples showed the presence of flavonoids which have been reported in *Rubia tinctorum* and found to be absent in *R. cordifolia*. Hence to meet market demand, somewhere *Rubia tinctorum* is sold under the name *Manjishtha*. But it is advised to use *R. cordifolia* Linn as *Manjishtha* because one of the researcher conclude that, there is *genotoxic compounds* found in *R. tinctoria*¹⁷. Although the uniformity in presence of different groups of secondary metabolites was observed in all the extracts spotted on TLC plates but number of spots varied, as Lucknow sample is having higher number of U.V. sensitive compounds. Variability was also observed in I₂ exposed plates as well as in Libberman -Buchard Reagent (LBR) sprayed plates followed by heating at 120⁰ C¹⁸.

One of the study conducted on stem of *Manjishtha* which was collected in their growing season, which may has all the strength of chemical, so collection was done of fully grown and matured steam. The plant has some chemical genetical changes if collected from different places though it may same plant of same species, so the one of the sample was collected from forest of Bhimashankar, Maharashtra state, 2 samples were collected from cultivated farm of Bhivani, Haryana State which compared with three marketed sample from Ayurvedic medicinal shops of Nagpur, Maharashtra state. After Comparative pharmacognosic and phytochemical study of self-collected and marketed samples of *Manjishtha*, first of all both the samples of *Manjishtha* was differentiated by macroscopy, and pharamacognostic character i.e. leaves, stem, root, color, size, texture, length of stem is differentiating point according to their specific *Desha* and specific *Rutu* (climatic) condition. The percentage (%) of foreign matter was found minimum in self-collected samples within limit of A.P.I. and in marketed out of limit than A.P.I. value. Shapes of stem, mean diameter, transvers axis, width, etc. of self-collected sample were more than marketed sample. T.S. of stem of *Manjishtha* was not found to be any significant value in both types of samples. Powder character was done with the help of microscope, cork cell in both sample were absent. PH value of both samples was nearly same. The mean ash values of self-collected samples was 6.52% and marketed samples was 7.95%. The mean acid insoluble values of self-collected sample was 0.26% and marketed was 2.05%. Mean moisture content value of self-collected was 0.39% and marketed was 0.98%. The mean Extractive values of self-collected sample was 26.4% and marketed sample was 16.22%. The mean Alcoholic value of self-collected sample was 12.17% and marketed sample was 6.92% (Table 1).

Table.1 Phytochemical evaluation of *Manjishtha* samples

	Marketed samples (%)	Self-collected samples (%)
Mean ash value	7.95	6.52
Mean acid insoluble value	2.05	0.26
Mean moisture content value	0.98	0.39
Mean Extractive value	16.22	26.4
Mean Alcoholic value	6.92	12.17

In short it was found that,

1. Microscopy, Histochemistry, powder character, pH, of Aqueous, total Ash, Acid insoluble Ash. Aqueous Extract, Alcoholic Extractives, moisture contain and T.L.C. were differentiating in self-collected and marketed samples.
2. The Aqueous extractive value and Alcoholic extractive value was grater in self-collected samples than marketed samples.
3. Total Ash and Acid insoluble Ash value of self-collected samples was less than marketed samples.
4. The mean value of moisture contain of marketed samples was greater than self-collected samples.
5. T.L.C. of Two self-collected samples from Bhivani visualizes same band on T.L.C. plate. Three marketed samples from Nagpur visualizes same because all three marketed samples were collected in nearly same Desha and climatic condition.
6. Assay for phenolic compound of marketed sample were greater than self-collected samples¹⁹.

RESULTS AND DISCUSSIONS

The results of review article is very encouraging. We found that, the adulterations are all ways there to consume illegal profit. The authentication of medicinal sample is not check by the consumer and one cannot be found desire effect of that medicine as stated in *Ayurvedic sutras* (text). The self-collected samples of *Manjishtha* found to be have great potential values as compared to market samples. Different species of the same plant were found according to *Desh bheda*. That's why *R. cordifolia* is a common plant in south India. *R. tinctorium* is restricted to the Himalayas. The samples derived from Sikkim and North East hills are originated from *R. Sikkimensis* Kurz. In this, mostly the stem part is used as an adulterants in *Manjishtha* root. That's why for the Soule of the *Ayurveda* & for desire effect, proper and authentic material of herbal medicine should be examine with different criteria of assessments. And after that one should aware peoples to use the proper part of the herbal medicine from easily available authentic sources recognized by him. On the same mode, the samples of *Ayurvedic* medicines should be clearly labelled with all authentication criteria fulfil by that packed material instead of buying loose materials only for reason of comparable cheapest cost.

CONCLUSION

We concluded that the south Indian sources of *R. cordifolia* Linn might be derived from a different subspecies or geographical type or plants with different polymorphism and never be from *R. tinctorium*. Although all the samples have similar type of secondary metabolites their quantity differs as evident from quantitative values and TLC spots. This is due to variation in the time of harvesting of sample, location of collection, storage conditions, drying conditions, and adulteration with stem parts and contamination with other species to meet commercial demand. Thus the study shows that there is adulteration in the market sample which requires to be identified and standardized to prove the claims of traditional system of medicine and to rekindle the faith of the masses in this age old Indian system of medicine.

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