



HITHERTO IGNORED PLANT SPECIES FOR SUSTAINABLE USE AND DEVELOPMENT IN INDIA: A REVIEW

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ABSTRACT There is a growing interest worldwide for tapping the fullest potentiality of biodiversity. India is also a runner in this marathon and hence surveys are going on to find out traditional uses. The present paper focused some potential plant species growing in India but traditionally utilized in other countries or underutilized in India. This is one area of research lagging behind, although it has made headway by Indian researchers. The critical study and analysis of data available from India and other countries yielded some useful information new to India. This will help widen resource base for welfare of Indian societies.

KEYWORDS : Comparative Ethnobotany, New Bioresources, Underutilized Species.

Introduction:

Ethnobotany in India was said to be just six-decade old (Jain, 2001). It started with the opening of section of Economic Botany in Botanical Survey of India by Dr. E.K. Janaki-Ammal. It was geared up by other pioneer Indian ethnobotanists. At the beginning, understanding, definitions, scope and objectives were focused on various fora, besides preparing questionnaires. Further scope was then widened by giving serious thought for inter-disciplines, nature and linkages of ethnobotany, besides dynamism, decision relating to thrust areas and need for more focused, meaningful and result-oriented work on ethnobotany. Jain *et al* (1995) dealt with comparative study of India in east and Amazonic in west based on literary research. They focused similar or common uses of these two regions. Jain *et al.* (1997) later compared Indian ethnobotany and ethnobotany in Latin America. In this attempt, they studied Indian uses which were less known or unknown in Latin America. Jain and Sikarwar (1998) compared ethnomedicine known to the tribals of Latin America of the plants also found in India. The present authors endeavored to compare some traditional uses or applications of different countries or cultures. The plants are found in both regions but the uses/ applications are unknown to Indian folks. This information provides some clues which can be extended in Indian territory. This in-depth examination is being presented in this paper.

Methodology:

The ethnobotanical data from India and other countries are borrowed from literature. A scrutiny of literature of the regions or countries was made and critically analyzed focusing: (i) plant species growing in India and other regions or countries, (ii) uses or applications unknown to India. For Indian information, literary sources are *viz.*, (i) Dictionary of Indian Folk Medicine And Ethnobotany (Jain, 1991), (ii) Ethnobiology In Human Welfare (Jain, 1996) (iii) Cross-Cultural Ethnobotany of North-East India (Saklani and Jain, 1994) (iv) The Wealth of India. Vol.1-11, (Anonymous, 1948-1976) (v) A Dictionary of Economic Products of India., (Watt, 1889-1893), (vi) Ethnobotany of Jalgaon District (Maharashtra) (Pawar and Patil, 2008) and (vii) Ethnobotany of Nasik District (Maharashtra) (Patil and Patil, 2006) and (viii) Ethnobotany of Buldhana District (Maharashtra) (Patil *et al.*, 2011). The literature for other countries is as mentioned in the text itself. In the following account, plant name, family and English common names, if available, are followed separately by the uses or applications from countries other than India. The feasible and beneficial utilities are remarked separately below.

Enumeration:

1) *Adansonia digitata* L. (Bombacaceae) Baobab Tree:

It is used for the following purposes by the people of Northern Ghana (Kranjac-Berisavljevic, 2009):

- Young or new leaves are collected for leaf vegetable. They are also dried and preserved for use in future.
- Fresh fruit pulp is directly consumed.
- Fruit pulp after drying is preserved for future use. Dried pulp is diluted and used in ice-cream.
- Dried seeds are used to prepare soup. Seeds pounded are also

mixed with seasonal leafy vegetable.

Remarks: This tree is planted in garden and public places mostly as a botanical curiosity because of unusual form and size. The aforesaid utilities can be adopted as employed by the said community in Ghana. Its use in ice-cream is commendable. It should be tried in India also.

2) Following species are used as leafy vegetable in the community of Segouena of Northern Burkina Faso (Belem *et al.*, 2009):

(a) *Arachis hypogea* L. (Fabaceae), (b) *Balanites aegyptiaca* L. (Balanitaceae), (c) *Ceibapentandra* (L.) Gaerth. (Bombacaceae), (d) *Corchorus trilocularis* L. (Tiliaceae), (e) *Lycopersicon esculentum* Mill. (Solanaceae), (f) *Moringa oleifera* Lam. (Moringaceae), (g) *Tamarindus indica* L. (Caesalpinaceae), (h) *Vigna unguiculata* (L.) Walp. (Fabaceae)

Remarks: (i) All these species, except *Corchorus trilocularis*, are crop plants or planted in India but their foliage is not used as vegetable. Being available in large quantities in different seasons, these can be brought under use as in Burkina Faso. (ii) *Balanites aegyptiaca*, *Ceiba pentandra*, *Moringa oleifera* and *Tamarindus indica* are perennial arborescent species. They are available for throughout a year. Except *Balanites aegyptiaca*, others are under cultivation for edible fruits and as ornamental. Their potentiality as leafy vegetable will certainly contribute on large scale and solve problem of food security. Their uses as such are, however, ignored or unknown to Indian society.

3) The following taxa are employed as sources of leaf vegetable in Kenya (Abukusta-Onyango, 2009):

(i) *Cleome gynandra* L. (Capparidaceae), (ii) *Corchorus olitorius* L. (Tiliaceae)

Remarks: Of these, *Cleome gynandra* is a common weed of rainy season on waste places. Its leaves can be profitably employed as source of vegetable. *Corchorus olitorius* is exotic but naturalized in India. It can be adopted similarly. Moreover, it yields better fiber from stems. If it is brought under cultivation, it can serve two purposes *viz.*, leafy vegetable and as a source of fiber.

(4) *Corchorus ridens* L. (Tiliaceae): It is used as leafy vegetable in Buhera district of Zimbabwe (Muchuwatiet *et al.*, 2009)

Remarks: It is common wild plant species in India and hence readily available particularly in rainy season. These authors investigated its nutrient contents. It has comparatively higher protein percentage, fair micro-nutrients and vitamin-C. It truly appears a promising species contributing to household food security.

(5) *Celosia argentea* L. (Amaranthaceae) Lagos: It is consumed as leafy vegetable by people of Cote d' Ivoire (Agboet *et al.*, 2009, Mahayo *et al.*, 2009).

Remarks: The species is a common weed of cultivated fields and

removed manually. Its utility can be also adapted in India. It contains high percentage of β -carotene and vitamin-A, besides minerals. (Agbo *et al.*, 2009). It is also sold in local markets in this country. Indians can also adopt this species similarly.

(6) *Capparis spinosa* L. (Capparidaceae) Capers: The flower buds are used for flavoring foods and such consumed in Italy, France and Spain. Remarks: It is cultivated by the people of these countries. It is collected and marketed to various countries (Hellin and Higman, 2009; Guilianiet *al.*, 2006). In India, it is wild. It should be brought under cultivation. It can fetch better income.

(7) *Portulaca oleracea* L. (Portulacaceae) Purslane: It is called and consumed as leafy vegetable in Kenya (Adekaet *al.*, 2009). It is also sold in local markets.

Remarks: This indicates that it is widely used by the people of Kenya. The present authors are also aware that some tribals use it similarly in India (Patil, 2003). But it is not employed so by the non-tribal section of the society. Even, its allied species *Portulaca quadrifida* L. is also used as vegetable. Both species are weeds of cultivated and barren wet lands. These should be used as vegetable by the non-tribal communities.

(8) *Solanum nigrum* L. (Solanaceae): The people of Philippines used the tender leafy shoots as vegetable (Balangcod and Balangcod, 2009).

Remarks: It is very common weed of cultivated fields throughout India. It is removed manually being a weedy species. It can be tapped on the aforesaid line.

(9) *Sonchus oleraceus* L. (Asteraceae): The leaves and shoots are sautéed and eaten by the people of Philippines (Balangcod and Balangcod, 2009).

Remarks: It is a common weed of cultivated fields and waste lands. It can be used as the people of Philippines.

(10) *Pupalia lappacea* (L.) Juss. (Amaranthaceae): The people of Anambra state in Nigeria consume its foliage as vegetable (Iduet *al.*, 2011).

Remarks: The said species is a wild taxon and has largely remained ignored and hence as food source can be tried in India.

(11) *Pergularia daemia* (Forsk.) Chiov. (Asclepiadaceae): It is used as leafy vegetable by the people of Anambra state in Nigeria (Iduet *al.*, 2011).

Remarks: It is wild climber extending on roadside hedges and wild trees. Its utility stated above can be adapted in India.

(12) *Alternanthera philoxeroides* (Mart.) Griseb. (Amaranthaceae): The plant species is exotic in China but still it is used as forage and green manure (Hu-Yin Huai and Xu-Dong Zhang, 2006).

Remarks: The said species is also an exotic weed in India. It can be similarly adapted.

(13) *Eichhornia crassipes* Solms. (Potentillaceae) Water-Hyacinth: It is exotic plant species in China. It is used as vegetable, forage and ornamental (Hu-Yin Huai and Xu-Dong Zhang, 2006). In Nepal, it is used as food for pigs and sheep, besides as green manure (Joshi, 2009). Remarks: In India, it is also exotic weed and grows as troublesome weed in rivers, rivulets and aquatic bodies. It can be adapted as in China. It will be rendered as a useful species instead of trouble some weed. Uses in Nepal are very promising. It can be directly employed similarly.

(14) *Cassia mimosoides* Linn. (Mimosaceae): Its leaves are used in China as tea and for green manure (Hu-Yin Huai and Xu-Dong Zhang, 2006).

Remarks: It is wild plant in India and can be similarly employed.

(15) *Hibiscus trionum* L. (Malvaceae): It is exotic in China and extracted for fibers (Hu-Yin Huai and Xu-

Dong Zhang, 2006). Its fibers will be also useful for domestic purposes.

Remarks: It is weed in India. Thus its utility for fibers will render it a useful plant species.

(16) *Hydrilla verticillata* (L.f.) Royle (Hydrophyllaceae): In Nepal, the whole plants are used as fodder and for green manure. It is also employed as food for fish and ducks (Joshi, 2009).

Remarks: It is very common plant species in every aquatic body throughout India. Its utility for domestic animals, fishes and as manure is directly applicable.

(17) *Lemna minor* L. (Lemnaceae): It is used as food for fish and ducks, besides green manure in Nepal (Joshi, 2009).

Remarks: It is also a common plant species floating especially in polluted water bodies everywhere. It can be similarly adapted in India as in Nepal.

(18) *Spirodella polyrhiza* (L.) Schleider (Lemnaceae): In Nepal, it is used as food for fish and ducks (Joshi, 2009). Remarks: Commonly grows in polluted water bodies. It can be similarly exploited in India.

(19) *Cajanus cajan* (L.) Millsp. (Fabaceae) Pigeon Pea: It is cultivated generally for pulse (seeds) in all tropical and subtropical region of the Old and New Worlds, including India. In Ethiopia, its young shoots are consumed as vegetable (ZemedeAsfaw, 1995).

Remarks: Utility of foliage and tender shoots can be adapted as additional source of food.

Discussion:

Jain *et al.* (1995, 1997, and 1998) critically studied ethnobotany of India and Latin America comparatively. Their studies considered especially plants growing in both distant areas and ethnobotanically wisdom developed in distant and culturally different communities. Thus they endeavored to point out first their similar wisdom and then wisdom unknown or less known to each other. The present authors also studied ethnobotany of India and various nearby countries and distant ones. The plant species considered are similar but for India the uses are unknown. It is aimed at benefiting Indian people by exposing the wisdom developed in other cultures.

In recent times, we are debating and interacting for value-addition of our plant-wealth whenever we put them in use. But, at the same time, we are not realizing the hidden value of our biodiversity. The comparative ethnobotanical study will help realize valuable potentials of the plant species growing in our vicinity. The present authors earmarked certain utilities and applications feasible to Indian scenario and folks. Some feasible uses which can be directly adopted in Indian environment are enumerated in this paper. They belong to: (i) food addition and flavoring food, (ii) miscellaneous use like fiber, (iii) food sources adding rich nutrients and micro-nutrients, (iv) making use of common crop weed, weeds of waste land and obtaining fodder sources from troublesome weeds, (v) source of non-alcoholic beverages e.g. tea, (vi) production of green manure, (vii) feed for pigs, ducks, fishes etc., (viii) use of ignored potential of Indian crop species, etc. Many more potential species can be added if more extensive literary survey of common plant species growing in India and other countries is given a serious thought. Thus traditional uses developed in one culture can be picked up and may benefit for human welfare in other countries. Further study on this line may reveal hidden potentiality for medicine, dyes, gums, tannin, etc.

The adaptation of plantlore of other countries relating to Indian plant species will enhance sustainability and even income of the local communities, if the habitats and potential species are properly managed in an integrated manner with the involvement of local people in planning and management of the resources.

Some taxa are notorious exotic weed. For example *Eichhornia crassipes* and *Alternanthera philoxeroides*. The former involved into many aquatic systems and propagates asexually. Native plants have failed in competition with it. The latter also causes serious damage in

aquiculture and agriculture. Their usage as noted will be helpful in finding new and effective ways to check them. Other weeds found in agriculture lands if used in the manner stated, we can reduce damage caused by them to agriculture.

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