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Medicinal Plants in Active Trade at Haridwar City of Uttarakhand State in India

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Abstract

Medicinal plants offer a wide range of services including monetary benefits. In view of the importance of medicinal plants marketing, the present study was conducted in the Uttarakhand state of India. The traders were interviewed for collection of information on the medicinal plants in active trade. Thirty medicinal plants were documented during the survey those were in active trade. Different plant parts of these species such as fruit, root, leaf, stem and bark were sold in the market. The dried leaves of *Allium stracheyi* Baker had the highest cost in the market (Rs 3000 per kg), followed by Pi*crorhiz*a kurrooa Royle ex Benth (Rs 2500 per kg). Of the total 30 traded species, 10 species are categorized as the threatened species. There is an urgent need for conservation of medicinal plant species in order to maintain their sustainability and the business associated with such a precious natural resource.

Keywords: Medicinal plants; Ecosystem service; Marketing; Uttarakhand; Sustainable development

Introduction

Medicinal plants, traditionally established as a major source of curing diseases, at present, not only use in curing various ailments but also offer a wide range of subsistence and monetary benefits to the people across the world [1-3]. The recent past has witnessed the substantial growth in the herbal product's market. According to the World Health Organization, 30% of the drugs sold worldwide contain compounds derived from plant material. The world trade figures suggest that India is next to China as it exports 32,600 ton of medicinal raw material worth US$ 46 million annually [4]. The exponential growth in human population, unemployment, desire to earn more money, and increasing acceptability of herbal medicine are among few stimulating factors for rising trade in medicinal plants [5].

In India, over 270 million people depend on forest produce for their living [6]. Due to several reasons, including vagaries of climate, the agriculture does not yield expected returns on many occasions. The dependency of community on forest produce, which include medicinal plants, may increase on such occasions [7]. Since supply chain of medicinal plants passes through many stages involving primary collectors, local contractors, regional wholesale markets and specialized suppliers, the primary collectors may not be getting the genuine benefits of their produce sold in the market [8]. At the same time, there is a challenge for the sustainability of raw material. In view of the present socio-economic changes due to several reasons and importance of medicinal plants marketing, the present study was conducted in the Uttarakhand state of India.

Survey Methods

The present study was carried out in Uttarakhand state of India. It is mainly a hill state having international boundaries with China (Tibet) in the north and Nepal in the east. On its south lies the Indian state of Uttar Pradesh and on north-west is Himachal Pradesh. It spans over an area of 53,483 square km. Because of the wide altitudinal range, Uttarakhand endows with the sub-tropical, temperate and sub-alpine forests that support a rich biological and cultural diversity.

To gather information on the medicinal plants in trade, the local traders in the city of Haridwar were identified and interviewed, as the medicinal plants collected from the hill districts of Uttarakhand are also brought here for sale being the city located in the foothills of the Himalayas. A checklist of medicinal plants and plant parts in trade were compiled. Information related to the supply chain of medicinal plants was also gathered by approaching village level collectors to middlemen and wholesale traders.

Results and Discussion

A total 30 medicinal plants were documented during the survey those were in active trade (Table 1).

Serial No.	Species	Plant trade name	Part used	Rupees per kg
1	*Acacia concinna DC.*	Shikakai	Fruit	100
2	*Acorus calamus L.*	Buch	Leaf	300
3	*Allium stracheyi Baker*	Faran/jambu	Leaf, stem	3000
4	*Arnebia benthamii (Wall. ex G.Don) Johns*	Balchhadi	Root	600

5	*Asparagus racemosus Willd.*	Satavar – yellow reddish	Root	400
		Satavar – white	Root	300
6	*Azadirachta indica A. Juss.*	Neem patta	Leaf	80
7	*Berberis aristata DC.*	Daru haldi	Root/stem	80
8	*Betula utilis D. Don*	Bhoj patra	Bark	1200
9	*Centella asiatica (L.) Ubr.*	Brahmi buti	Leaf	250
		Brahmi buti	Leaf with stem	200
10	*Chlorophytum borivilianum Santapau & R.R.Fern*	Safed musli – yellowish	Root	1200
		Safed musli – white	Root	800-1000
	Convolvulus pluricaulis Chois.	Shankhpushpi	Whole	100
12	*Cyperus rotundus L.*	Nagarmotha	Root	100
	Eclipta alba Hassk.	Bhringraj	Leaf	100
14	*Ficus religiosa L.*	Peepal	Bark	80
15	*Gendarussa vulgaris Nees.*	Kala bansa	Leaf/root	200
16	*Gymnema sylvestre R.Br.*	Gudmar	Leaf	140
		Gudmar	Leaf and stem	80
17	*Juglans regia L.*	Akhrot	Bark	800
18	*Murraya koenigii Spreng.*	Kadi patta	Leaf	100
	Onosma echioides L.	Ratanjot	Root	500
20	*Picrorhiza kurrooa Royle ex Benth*	Katuki	Root	2500
21	*Pterocarpus marsupium Roxb.*	Vijaya sar	Stem	100
22	*Sphaeranthus indicus L.*	Gorakhmundi	Fruit, whole plant	100
23	*Stevia rebaudiana Bertoni*	Stevia	Shoot	300
24	*Swertia chirayita (Roxb.) H. Karst.*	Chirayata	Whole	400
25	*Terminalia arjuna (Roxb. ex DC.) Wight & Arn.*	Arjun	Bark	100
26	*Terminalia bellerica Roxb.*	Baheda	Fruit	80
27	*Terminalia chebula Retz.*	Haida	Fruit	80-100
28	*Tinospora cordifolia Miers*	Giloi	Stem/Root	100
29	*Vitex negundo L.*	Nirgundi/Samolu		100
30	*Withania somnifera (L.) Dunal*	Ashwagandha	Root	350

Table 1: Medicinal plants traded in the Uttarakhand state of India.

Different plant parts of these species such as fruit, root, leaf, stem and bark were sold in the market (Figure 1). The dried leaves of *Allium stracheyi Baker* had the highest price (Rs 3000 per kg) in the market, followed by *Picrorhiza kurrooa* Royle ex Benth (Rs 2500 per kg). The plant parts of threatened medicinal plants species are also sold in the market, of these *Picrorhiza kurrooa* and *Arnebia benthamii* (Wall. ex G.Don) Johns belong to the critically endangered category and *Swertia chirayita,* (Roxb.) H. Karst. and *Acorus calamus L.* belong to the endangered category. Besides, 4 species such as *Allium stracheyi Baker, Terminalia chebula Retz., Pterocarpus marsupium Roxb.* and *Gymnema sylvestre R.Br.* belong to the vulnerable category and two species such as *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn. and *Asparagus racemosus Willd.* belong to the near threatened categories of threatened species as per the IUCN nomenclature. All the species as sold in the market were not collected from the hills of Uttarakhand only but some species were supplied from the plains of India, as well.

The prices of medicinal plants vary across the states. *Chlorophytum borivilianum Santapau & R.R. Fern,* a high value medicinal plant that grows in the plains of central India, costs Rs 800-1200 in Haridwar and Rs 1200-2000 in Odisha. However, many medicinal plants as sold in the market of Uttarakhand having high medicinal values grow only in the Himalayan region. The cost of such medicinal plants goes up in the market away from Uttarakhand.

Figure 1: Medicinal plants are being traded at Haridwar city of Uttarakhand.

The trade in medicinal plants passes through a long chain of stakeholders from herb collectors, local middlemen, urban traders, wholesale traders, manufacturers and herbal healers. Generally, the marginal farmers and daily wage labors collect medicinal plants which they sell to the local middlemen and sometime to any prospective buyer. The cost of medicinal plants sold in the urban market is higher than the prices paid at the village level collection centre. For instance, *Allium stracheyi's* cost at Tolma, a village in the hills of Chamoli district of Uttarakhand was Rs 350 per kg whereas its cost jumped to Rs 3000 per kg in Haridwar.

There are reports which claim that the medicinal plant marketing is not properly organized. This discourages farmers to take up medicinal plants farming at a large scale. In the hills of Uttarakhand, the small landholding of farmers is not consolidated. If marketing of medicinal plants is organized properly its farming may be useful in terms of financial and economic gains. Wild collection still plays an important role in the trade of medicinal plants not only in India [9], but other countries of the world [10]. For the sustainability of medicinal plants related sector, it is important to prioritize the species under pressure due to overexploitation. Out of 30, ten species being placed under different threat categories indicates the need of their immediate conservation. Encouraging farmers for growing high value medicinal plants, including threatened categories, may help to save their wild populations.

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