TRADING OF ETHNOMEDICINAL PLANTS IN THE INDIAN ARID ZONE

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Introduction

Plants as cure for human ailments is a tradition as old as human civilization. Ancient traditions of Indian medicine viz. Ayurveda, Unani and Sidha and now, even, allopathy derive many of their curative tools from plants. All plants do not occur every where. Different geographic regions of the world house specific plants, one of them is the Arid zone, which has come to occupy a prestigious place as a major source of herbal based remedies. Phytochemicals and secondary metabolites produced and stored in plants under harsher ecological conditions, by and large, impart adaptability to these plants for their survival. While these were essential for plant survival, incidentally, these components were found through ages to have therapeutic value for human beings, too. Beginning as household remedy, a particular plant through extensive application became part of traditional system, leading to commercial exploitation. In one such study, Kumar and Parveen (2000) reported 65 Taxa as household remedies, 34 as traditional system of Ayruveda and 17 as commercialized remedies. However, a detailed analysis of ethnomedicinal plants in interior desert areas vis-à-vis their trading was lacking. This paper therefore, reports results of one such investigation.

Materials and Methods

Four districts of arid western Rajasthan i.e. Jodhpur, Bikaner, Jaisalmer and Barmer which are undergoing a real transformation due to various factors were surveyed in detail. Ethnomedicinal uses from 6-8 villages in every tehsil of these districts were recorded. Villages were selected on the basis of population of schedule caste/tribe (SC/ST), total population, total number of households and their location in such a way as to be well distributed across each tehsil of the district. This data has been compiled in respect of all districts to know ethnomedicinally important plants.

Once the plant products from the ethnobotanical survey were confirmed as an instrument of trade, then the traders in the local market were interviewed to know about the procurement price and sale price of local medicinal plants, in order to know their trade worthiness.

Results and Discussion

Ethnomedicinal plants

Indian arid zone has 682 species (Bhandari, 1990). A total of 131 ethnomedicinal plants have been listed in the present work (Table 1). Out of these, 34 taxa have been medicinally useful in

Table 1

Marketing of medicinal plants in the four districts of Western Rajasthan and Delhi.

Plant species	Local name	Delhi	Jaisalmer	Bikaner	Jodhpur	Barmer
		(sale price in Rs. per kg)				
1	2	3	4	5	6	7
Acacia nilotica	Desi babool		Y*	Y*	35	Y
Adhatoda vasica	Adusa	4	Y	Y	20	20
Aloe vera	Guarpatha	30	Y	Y	11	Y
Asparagus racemosus	Satawari	20-25	60-80	45	25-60	50-80
Azadirachta indica	Neem (seed & bark)	20	Y	Y	20	Y
Butea monosperma	Kesula phol/ palash		60	Y	100	100
Capparis decidua	Keri		Y	80-100	15-80	Y
Cassia angustifolia	Sonamukhi	15-20	60-70	Y	20-45	30
Cassia fistula	Amaltas	25	Y	5	Y	20-40
Cassia tora	Puwaliya ka beez		Y	Y	200	35
Citrullus lanatus	Matira		Y	40	40	Y
Clerodendrum indicum	Bharangi/Arni		Y	Y	25	70-80
Commiphora wightii	Guggul	75	100	Y	75	100-120
Corchorus depressus	Chamkas	8	Y	Y	40	Y
Cuscuta reflexa	Amarbel		Y	Y	Y	80
Dicoma tomentosa	Bajradanti				30-35	
Emblica officinalis	Amla	54-60	50	75	75	30
Evovulus alsinoides	Shankhpushpi		Y	Y	30	50-60
Glycyrrhiza glabra	Multhi	40-60	Y	Y	200	50-120
Indigofera cordifolia	Bekariyo					25
Ipomoea digilata	Vidari kand		Y	Y	80	90-200
Jatropha curcas	Ratanjot	30	Y	Y	100	45-120
Lagenaria siceraria	Lauki		Y	Y	Y	175
Lawsonia inermis	Mehendi	30	Y	Y	65	Y
Mimosa pudica	Lajwanti		100	Y	100	70
Moringa oleifera	Saijana		Y	Y	1200	Y
Mucuna pruriens	Kavachbeez	10	80	Y	25	68-80
Nardostachys jatamansi	Balchad	125-250	80	Y	Y	Y
Ocimum canum	Bapchi		Y	Y	24	150

Contd...

1	2	3	4	5	6	7
Pedalium murex	Bada gokhru	25	60-80	20-30	35-55	40
Plantago avata	Isabgol (seed/husk)	30/160	30-40	15-25	30-45	120-130
Punica granatum	Anar	70	Y	Y	Y	360-600
Sisymbrium irio	Khoobkala/Asaliyo		Y	Y	40	50-65
Solanum nigrum	Makoi		Y	40	40	Y
Terminalia arjuna	Arjun chal	15	Y	Y	Y	35-40
Tinospora cordifolia	Neem giloy	8	Y	Y	25	20-50
Trigonella foenum -graecum	Methi		Y	Y	25	Y
Vernonia anthelmintica	Kali-jeeri		Y	Y	Y	60-70
Vitex negundo	Nargundi		Y	Y	Y	60-200
Withania coagulens	Paneer bandh	35	60-80	Y	Y	Y
Withania somnifera	Ashwagandha	40	120	60-100	35-50	70-115
Brought from Delhi :						
Albizia lebbek	Sares		Y	Y	40-50	Y
Acorus calamus	Ghoda vach	20	-	Y	Y	60-10
Alpinia galanga	Kolanjan	28	-	Y	Y	250
Althaea officinalis	Khatmi	35	-	Y	120	350
Anacyclus pyretherum	Akalkhora	650-750	Y	Y	Y	600-700
Apium graveolens	Ajmod	30	Y	Y	Y	100
Berberis lycium	Daru haldi	25	Y	Y	Y	30-50
Bombax malabaricum	Mochras (gum)		Y	Y	Y	160
Cedrus deodara	Dev daru				200	35
Celastrus paniculata	Mal kangni	45-80	Y	Y	Y	150-180
Centella asiatica	Brahmi	40	100	Y	150	50-65
Chlorophytum borivillianum	Safed musli	560	1200	1000	1200	1000-1200
Chrysopogon gryllus	Salam gotta		Y	Y	Y	100
Crocus sativus	Kesar		Y	Y	Y	50000
Curculigo orchioides	Kali musli	22	Y	Y	Y	30-70
Curcuma amada	Amba haldi		50	Y	Y	80-100
Cyperus scariosus	Nagarmotha	15	Y	Y	Y	60
Eulophia compestris	Salan panja	900	1000-1500	Y	Y	70-180
Euryale ferox	Tal makhana	280	Y	Y	Y	150-300
Flacourtia jangomas	Talis patra	30-35	Y	Y	Y	600
Foeniculum vulgare	Saunf	60	Y	Y	Y	20

Contd...

1	2	3	4	5	6	7
Grewia flavescens	Gengsi		Y	Y	30-35	Y
Gymnema sylvestris	Gudmar patti	30	Y	Y	Y	120
Helicteres isora	Marod-phali	8	400	Y	Y	110-160
Hemideymus indicus	Anantmul	50	Y	Y	Y	180
Inula racemosa	Pushkarmul				Y	200
Lallemantia royleana	Tukvilanga	65	Y	Y	60	250
Litsea glutinosa	Maida lakdi		40		50	45
Meusua ferrea	Nagkesar	300	Y	Y	100	150-170
Moringa concanensis	Sirguda		Y	Y	65-100	Y
Myrica nagi	Kaiphal	22	Y	Y	Y	55-60
Myrstica fragrans	Jaiphal	220-240	Y	Y	Y	600
Nelumbo nucifera	Kamal gatta	35	Y	Y	Y	100
Onosma bracteatum	Gazba	65	Y	Y	Y	250
Orchis mascula	Shlin mihri		1800-3500	Y	*80	135-350
Papover somniferum	Tijaro (khas-khas)		Y	Y	Y	110-120
Picrorrhiza kurroa	Kutak	180	Y	Y	Y	180-260
Piper longum	Pipli	70-110	500-800	Y	Y	65-160
Plumbago zeylanica	Chitrak	150	Y	Y	Y	110-250
Psorelia corylifolia	Bapchi		Y	Y	50	
Pueraria tuberosa	Vidari kand	11-30	Y	Y	Y	75-80
Raphanus sativus	Muli beez	25	Y	Y	Y	60
Ricinus communis	Arandi		Y	Y	Y	Y
Rhus succedanea	Kankagoda singi		Y	Y	100	40
Rumex maritimus	Beez bandh	65	80-120	Y	80	90-300
Santalum album	Chendan	75-800	Y	Y	50	200-300
Saussarea lappa	Kut		Y	Y	200	38
Smilax lanceifolia	Chop chini Red/white	160/300	250	Y	Y	190-40
Sphaeranthius indicus	Gorakh mundi	10	150	Y	Y	85-100
Spilanthes acmella	Pokar mool		1200	Y	Y	Y
Swertia chirata	Chirayta		Y	Y	Y	50
Syzygium cumini	Jamun		Y	Y	125	60-80
Terminalia bellirica	Baheda	3-5	25	Y	45	Y
Terminalia chebula	Harad chhoti	50	350	Y	42	150-180
Vetiveria zizyanoides	Khasghas	40-45	Y	Y	Y	20-50
Viola odorata	Gulbarafsapatti	600	Y	Y	Y	600

* Y indicates prevalence of its trading in the area but prices were not revealed by traders or these were not in their stocks at the time of survey.

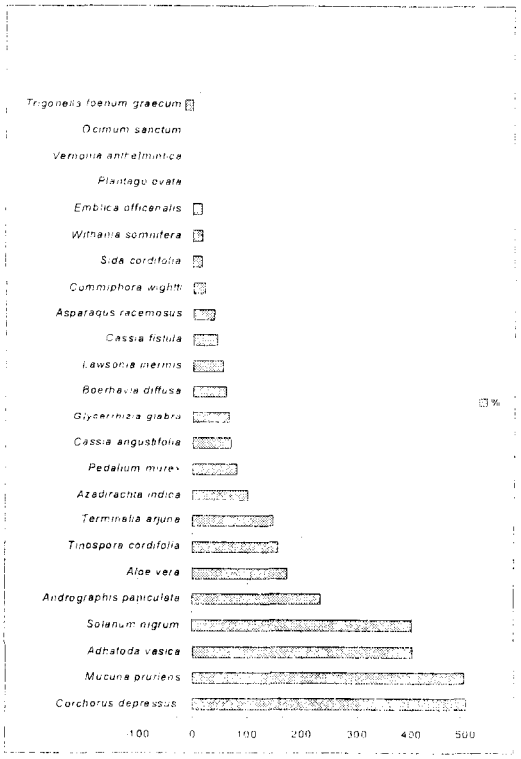
all the four districts. Of the remaining taxa, 25, 21 and 51 taxa were useful in any of the three, two or one district, respectively. Thus, nearly one fourth of total reported taxa were consistently being used across all the four districts. Nearly 19% were being used in three out of the four districts and 16% in two out of the four districts; indicating specific uses of these taxa in two or three districts rather than in all districts. Interestingly 38.93% of taxa were being used in only one out of the four districts. It could be either Jodhpur, or Barmer or Jaisalmer or Bikaner. Such a specialization in using a single taxa only in one district points towards the enormity of traditional wisdom that has locally evolved in such a way to meet the specific needs.

Trading of Ethnomedicnal plants

A survey of the purchase and sale price of different herbals was made by visiting traders (Table 1). Knowing sale price could be possible but its purchase price was never revealed. Discussion with various traders revealed that the difference between procurement and sale price of herbals could range from 15-25%. Thus, the sale price of 41 species of herbals in all the four district revealed large inter- and intra district variation in their sale price. The intra district variation ranged as high as 300 per cent, for example in *Jatropha curcas* in Barmer district Rs. 45-120 per kg. Likewise differences in the sale prices of herbals in two districts was again very high in some species, nearly three times e.g., *Plantago ovata* in Jaisalmer was Rs. 30-40/- per kg while in Barmer it was Rs. 120-130/- per kg. While these 41 plants were arranged from markets within Rajasthan, the other 56 being sold in these areas were brought from Delhi. Their sale prices again showed the similar behavior. Analysis of this data indicated that plants brought from Delhi are those which neither occur in this area nor these could be grown in the desertic environment.

A comparison of selling rates in Delhi (Anon., 2003) and Indian arid zone revealed enormous differences that is mostly higher prevailed here than at Delhi. Out of the 20 most exported herbals (Maiti, 2003), 12 are from this area and these have been selected to see their differences in sale price in Delhi vis-à-vis Indian arid zone. It emerged that three species (*Ocimum sanctum, Vernonia anthelmintica, Plantago ovata*) had same selling rates as in Delhi and arid zone (Fig. 1).

Fig. 1



Per cent increase in sale price of herbals in India Arid Zone compared to that in Delhi

One species, *Trigonella foenum-graecum* had in fact lesser rate than that in Delhi. The per cent increase in sale price in arid zone was upto 100% in respect of 12 species, 200% in respect of three species, 300-500% in respect of remaining 5 species. It is interesting to mention that these 12 species occurs in arid zone, but these are also routed via Delhi market.

Dominantly traded and exported herbals included 12 species (Table 2) of

Table 2

Dominantly traded and exported herbals of arid zone and their source of supply.

Name	Qty. in trade (tonnes)	Abundance in nature			Being cultivated	Needs cultivation
		Abundant	Adequate	Insufficient		
Exported herbals :						
Emblica officanalis	13661.1	-	-	Y	Y	Y
Asparagus racemosus	7963.2	-	Y	-	-	Y
Withania somnifera	5702.4	-	-	Y	Y	Y
Cassia angustifolia	4206.7	-	-	Y	Y	Y
Adhatoda vasica	4067.3	-	-	Y	-	Y
Boerhavia diffusa	3073.1	Y	-	-	-	-
Solanum nigrum	2901.9	-	-	Y	-	Y
Sida cordifolia	2585.9	-	Y	-	-	Y
Andrographis paniculata	2304.3	-	-	Y	-	Y
Ocimum sanctum	2290.3	-	-	Y	-	Y
Azadirachta indica	1969.6	Y	-	-	Y	Y
Tinospora cordifolia	1832.2	-	-	Y	Y	Y
Herbals in domestic trade :						
Aloe vera	?	-	Y	-	Y	Y
Cassia fistula	?	-	-	Y	Y	Y
Commiphora wightti	?	-	-	Y	-	Y
Corchorus depressus	?	Y	-	-	-	-
Glycerrhizia glabra	?	-	-	Y	-	Y
Lawsonia inermis	?	-	-	Y	Y	Y
Mucuna pruriens	?	-	-	Y	-	Y
Pedalium murex	?	-	-	Y	-	Y
Plantago ovata	?	-	-	Y	Y	Y
Terminalia arjuna	?	-	-	Y	-	Y
Trigonella foenum graecum	?	-	-	Y	Y	Y

? = Not known
Y = Affirmative

which *Boerhavia diffusa* is abundant. *Asparagus racemosus* and *Sida cordifolia* are adequate while remaining nine species are insufficient in nature. If these, three are being cultivated. In view of immense export potential of these 12 species, 11 of these could be promoted as regular crop while one, 'Punarnava' could be collected from wild.

Amongst those dominantly traded in domestic market, only one species *Corchorus depressus* occurs abundantly and need not be cultivated. Remaining all 10 species need to be promoted for cultivation.

Conclusions and Recommendations

Thus it can be concluded on the basis of market potential of herbals that regular cultivation of 23 species will be most desirable while three can be safely extracted from the wild. Although agro-technique of all may not be standardized, yet growing these by small fine tuning will ensure the success of any herbal in the present marketing scenario.

There is however no organized collection, grading and procurement of these herbals in these districts except for *Cassia angustifolia*, which has now picked up in Jodhpur and Bikaner district headquarters. Their marketing is highly opportunistic, exploitative (of both plants and people), informal and monetarily ineffective and hence unattractive for farmers in this area. Consequently nearly 10,000 pharmacies in India are constantly facing a shaky, un-sustainable and low quality supply of herbals for manufacturing the herbal drugs. This whole trade suffers from the unethical practices by middlemen who exploit these pharmacies and other users by creating artificial scarcities on one hand, while on the other hand, they also exploit herbal collectors and growers by offering them a meager price and by creating artificial situations of glut in the market. Besides, adulteration and substitutions are common maladies of this trade. Hence, it will be most appropriate to develop nodal herbal collection points at tehsil level. Standards for these herbals need to be defined by way of some easily recognizable markers. Packing, storage and transport for each herbal product also need to be defined. The support prices for these herbals need to be worked out by the State Medicinal Plant Board. All these actions will make herbal trade transparent and lucrative.

Acknowledgements

The authors thank DST, Jaipur and DST, New Delhi for financial support of this study. Facilities and encouragement by Dr. P. Narain, Director and Dr. Amal Kar, HD-I are gratefully acknowledged. We appreciate the assistance by staff of Plant Ecology section in both field work and data analysis.

SUMMARY

Trading of ethno-medicinal plants in the Indian arid zone has been studied in the districts of Jaisalmer, Barmer, Bikaner and Jodhpur. Of 682 species reported in the Indian arid zone, 131 have been found to be of ethno-medicinal value. Of these, 41 species are collected and sold within Indian arid zone market. Large inter- and intra-district variation in

sale prices was found. Of the top 20 species in domestic trade, 12 are from this area. Variation upto five times in their rate vis-a-vis western Rajasthan has been found. It has been concluded that 23 species can be prioritised for cultivation on large scale. Standardisation of product and price support are urgently required to promote herbal cultivation in western Rajasthan.

भारतीय शुष्क क्षेत्र में जातिगत औषध पादपों का व्यापार

सुरेश कुमार, एफ० प्रवीन, एस० गोयल व ए० चौहान

सारांश

जातिगत औषध पादपों के व्यापार का अध्ययन भारतीय शुष्क क्षेत्र के जैसलमेर, बाड़मेर, बीकानेर और जोधपुर जिलों में किया गया । भारतीय शुष्क क्षेत्र में मिलती सूचित 682 पादपजातियों में से 131 जातियां जातिगत औषधीय महत्व की पाई गई । इनमें से 41 जातियों का भारतीय शुष्क क्षेत्र बाजारों में संग्रह और विक्रय किया जाता है । बिक्री मूल्य में काफी ज्यादा अन्तर विभिन्न जिलों में तथा जिले के अन्दर भी रहता देखा गया । घरेलू व्यापार की प्रमुख 20 जातियों में से 12 इसी क्षेत्र की हैं । पश्चिमी राजस्थान में रहती कीमतों के मुकाबले में दिल्ली में इनके भाव पांच गुने तक रहते देखे गए । निष्कर्ष यह रहा कि इनमें से 23 पादपजातियां बड़े परिमाण पर खेती करने के लिए पूर्वता आधार पर ली जा सकती हैं । पश्चिमी राजस्थान में जड़ी बूटियों की खेती प्रोत्साहित करने के लिए उत्पादों का मानिकीकरण और कीमतों में सहायता पहुंचाने की तत्काल आवश्यकता है ।

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