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ENVIS Newsletter on Medicinal Plants



जहाँ है हरियाली ।
वहाँ है खुशाली ।।



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Credit line

ENVIS team

Mr. D.K Ved	Ms. Suma T.S
Mr. Vijay Srinivas	Mr. Harish K
Ms. Sugandhi Rani	Ms. Surekha Bhat
Mr. M.V. Sumanth	



Full-fledged exclusive Medicinal Plants Nursery at FRLHT, Bangalore

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Mr. D.K. Ved	
Dr. Padma Venkatasubramanian	
Dr. G.S. Goraya	Dr. Boyina Ravi Prasad Rao
Dr. Iyengar M.A.R.	Mr. B.S. Somashekhar
Dr. K. Ravikumar	Dr. Venugopal S.N.
Mr. Vijay Barve	Dr. Shilpa Naveen
Ms. Nandini D.	Ms. Sathya Sangeetha
Dr. Dinesh Kumar	

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FRLHT Image Library, Dr. Ravikumar K.,
Dr. G.S. Goraya, Mr. Ganesh Babu, Ms. Suma T.S.,
Dr. Narasimhan, Dr. Boyina Ravi Prasad Rao,
Mr. B.S. Somashekhar, Mr. M.V. Sumanth
Mr. Umesh Tiwari, Dr. G.S. Rawat

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Next issue

Medicinal Plants Conservation Efforts
across the country ...continued.

Editorial

Dear Friends, Greetings to you!

It's a decade long journey to celebrate and invite you all to our Centre. Our association with MoEF ENVIS scheme began in March 2002 and has seen a gradual and eventful growth. We at FRLHT-ENVIS are really glad to share this fiesta with all the well-wishers, promoters and participants of ENVIS network scheme across the country and the Ministry of Environment and Forests, Government of India for providing financial support all through this venture and to manage and maintain this Centre effectively.

Our Centre's unique focus is to collect, curate and disseminate data on Indian Medicinal Plants which will be of immense use to several research organizations, policy/decision makers, resource managers, academicians, traders, industries, cultivators, households, school and college students and other stakeholders. Keeping our focus aligned, we have tried to reach out to people through various activities such as sharing information through web applications such as www.envis.frlht.org and www.frlhtenvis.nic.in; publishing of newsletters and special booklets, responding to online/ offline and onsite queries on regular basis and popularizing the scheme through organizing and participating in events to sensitize people about medicinal plants and associated traditional knowledge.

At this juncture, we like to share with you that, due to search engine optimization of our website, we have reached a pinnacle of 82.73 lakhs hits per annum. While this is encouraging and challenges lie ahead for us to reach out to many more in an innovative manner using contemporary technologies.

This 6th issue of *Mediplant* newsletter treasures articles related to medicinal plants conservation theme. Articles like Consumption of Botanicals by Rural Households, Conservation Status of *Hildegardia populifolia*, Medicinal Plant Species of Conservation Concern for Andhra Pradesh, Arunachal Pradesh, and Madhya Pradesh & Rajasthan are included along with the selected images, happenings and much more.

We invite your feedback, new ideas regarding our newsletter and websites for constant improvements. We will be glad to receive your popular write-ups along with good quality photographs. Email id: envis@frlht.org

With Season's Greetings
Suma T.S, Editor - Mediplant

ENVIS Centre on Medicinal Plants



Celebrating Completion of 10th year
of long Association with ENVIS network



Environmental Information Systems Centre on Medicinal Plants
Foundation for Revitalisation of Local Health Tradition, Bangalore

Supported by MoEF, Go.I.

www.envis.frlht.org
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We sincerely acknowledge the financial support extended by Ministry of Environment and Forest, Government of India, to establish & manage the ENVIS Centre on Medicinal Plants at FRLHT, Bangalore. We are thankful to all our ENVIS network partners and patrons for their constant encouragement.

Today, we see ourselves as a unique platform to Collect, Curate and Disseminate Authentic Multi-dimensional Information on Indian Medicinal Plants via communication media to revitalize Indian Medical Heritage and Conserve Medicinal Plants.



ENVIS Team



Consumption of Botanicals by Rural Households

D.K.Ved & G.S. Goraya

(Excerpts from "Demand and Supply of Medicinal Plants in India"¹)

The various codified Indian systems of medicine are complemented by an equally strong heritage of non-codified and non-commercial living folk healthcare traditions, based primarily on ecosystem and region-specific plant material. These folk healthcare traditions, carried from generation to generation and practiced by around one million folk practitioners and nearly 140 millions of rural households in the 6,00,000 odd villages in the country, contribute enormously to the health security of the people, especially in the rural areas. However important role the medicinal plants are playing in taking care of healthcare needs of a large segment of the society, no estimates of consumption levels of botanicals by these users are available (Anon., 2003). The current study, through a limited survey of rural households, was primarily taken up with the objective to draw attention towards the possible scale and significance of such consumption and its implications on the management of related natural resources.

Data Collection

As per the census figures of 2001 A.D, India has 13,77,47,384 rural household spread across the length and breadth of the country. Considering that these households rely mainly upon the medicinal plants available in their vicinity, there are bound to be large variations in relation to the use of medicinal plants within and across various phyto-geographic regions of the country that would require extensive sampling of consumption choices (in terms of species) and quantities used to arrive at species-wise consumption estimates for the country by this segment. However, in order to highlight the issue, a limited exercise to estimate the consumption of botanicals by rural households has been conducted under this study as per methodology explained in chapter-2¹.

Data was collected from randomly selected households spread across ten states viz. Andhra Pradesh, Chattisgarh, Assam, Karnataka, Kerala, Madhya Pradesh, Mizoram, Orissa, Rajasthan and Tamil Nadu through the in-house teams of FRLHT and by involving local NGOs and other Resource persons. A semi-structured documentation format was used to record information on consumption of medicinal plants for health care needs of the family. The quantitative estimates of consumption were elicited in the way the family actually uses the material e.g. weight, volume, numbers or other popular measurements like fistfuls, handfults, bundles etc. These local measures of plant use were then converted into uniform weight measures while recording data. Even as a common format to record information was used, a lot of variation was there in the quality of the data received from different areas. In some

cases, names of botanicals used were in local dialect that could not be correlated to their botanical identities in the absence of complete samples, whereas in some other cases the measures of use were not adequately quantified. The data, therefore, needed a lot of cleaning and weeding to reduce the risk of over-estimation of quantities.

After the cleaning and weeding exercise, data in respect of only 1223 households from five states viz. Karnataka, Kerala, Tamil Nadu, Orissa and Andhra Pradesh was found to be of acceptable quality. The state-wise distribution of 1223 sampled households and the state-wise total number of rural households (as per 2001 census) is presented in table 1

Table 1: State-wise number of sampled rural households vs. total rural households

States (Districts)	No. of Rural Households (2001 census)	No. of Sampled Households (Rural)
Karnataka (8)	67,25,882	342
Kerala (3)	50,10,259	300
Tamil Nadu (2)	82,84,383	200
Orissa (2)	66,18,547	125
Andhra Pradesh (4)	1,26,07,167	256
Total	3,92,46,238	1,223

Even though the sample size is very small (0.003%), it has been utilized to arrive at a kind of first level estimate of annual consumption of herbals by the rural households of the country.

Major Source of Botanicals

Most of the botanical material is ordinarily sourced from the natural growth found in the nearby forests, shrub lands, wastelands and field sides. In case of a few species like *Ocimum tenuiflorum* and *Hibiscus rosa-sinensis* the major source of supply invariably is the homegrown plants. Many households were noted to maintain vibrant home herbal gardens having more than ten medicinal plant species. Only in cases of spices, cereals and fruits, etc. used with other botanicals for preparing home remedies the material was found to be procured from market. Even though quantification of the money saved on account of treatment with botanicals sourced from wild was outside the purview of this study, it is apparent that the medicinal plants play a significant role in the economy of these rural households.

For more information, please refer to:

1.Ved D.K & G. S Goraya (2008), Demand and Supply of Medicinal Plants in India, Bishen Singh, Mahendra Pal Singh, Dehra Dun & FRLHT, Bangalore, India (copy right 2008, National Medicinal Plants Board, New Delhi)

Equating the Green Weight of Botanicals in use to their Dry Weight

A large majority of the surveyed households reported the use of botanicals in fresh green form and the data relating to annual consumption of such plant material was recorded for green weight of the material. Only in a few cases the use of botanicals in dry form was reported. For consolidation of the data obtained from rural households and to make the data compatible with the estimates of consumption by the domestic herbal industry, which consumes the botanicals mainly by dry weight, it was found necessary to convert the green weight into its equivalent dry weight. A conversion ratio of 5:1, i.e. 5 gm of green weight equals 1 gm of dry weight was used for this conversion of green weight of botanicals to its equated dry weight. This conversion ratio is based on the average conversion ratio between the green weight and dry weight as worked out for herbaceous medicinal plants at FRLHT laboratory. Anon. (2006) has also used the same conversion ratio in the report on market survey of minor forest produce.



Rural Households use many Botanicals for Healthcare purposes in Green Form

This conversion of green weight into equated dry weight has enabled the consolidation of consumption data by all consumers at national level.

Plant Species Recorded in Rural Household Consumption

Compilation of the data obtained from 1223 sampled households resulted in a list of 405 plant entities used by them for health care needs. A thorough review of this list was undertaken to exclude those species that are used by the rural households primarily as food items or as spices. As a result, 51 species were found to have major use as food and/or spices and were, therefore, excluded from the list of botanicals consumed by the rural households mainly for healthcare needs. Reported usage of the remaining 354 species is presented state-wise in table 2.

Table-2: Reported use of 354 medicinal plant species by 1223 sampled rural households across five states

States	No. of Rural Households	No. of Medicinal Plants reported to be consumed
Karnataka	342	178
Kerala	300	98
Tamil Nadu	200	104
Orissa	125	130
Andhra Pradesh	256	170

As is evident from table 5, use of many species has been recorded from more than one state. In fact 22 species have been recorded to be consumed, for primary healthcare, by the sampled rural households across all the five states.

A list of 54 medicinal plant species that have been recorded from at least four states during the survey is given in table 3. These 54 species represent very popular plant entities in medicinal use by the rural households of the region.

Table-3: Popular plant entities in medicinal use by the sampled rural households

No. Species	No. Species
1 <i>Abrus precatorius</i>	28 <i>Hibiscus rosa-sinensis</i>
2 <i>Abutilon indicum</i>	29 <i>Hygrophila schulli</i>
3 <i>Acalypha indica</i>	30 <i>Indigofera tinctoria</i>
4 <i>Achyranthes aspera</i>	31 <i>Jatropha curcas</i>
5 <i>Acorus calamus</i>	32 <i>Lawsonia inermis</i>
6 <i>Adhatoda zeylanica</i>	33 <i>Mimosa pudica</i>
7 <i>Aegle marmelos</i>	34 <i>Mimusops elengi</i>
8 <i>Aloe barbadensis</i>	35 <i>Ocimum basilicum</i>
9 <i>Andrographis paniculata</i>	36 <i>Ocimum tenuiflorum</i>
10 <i>Aristolochia indica</i>	37 <i>Phyllanthus amarus</i>
11 <i>Asparagus racemosus</i>	38 <i>Plectranthus amboinicus</i>
12 <i>Azadirachta indica</i>	39 <i>Plumbago zeylanica</i>
13 <i>Butea monosperma</i>	40 <i>Pongamia pinnata</i>
14 <i>Caesalpinia bonduc</i>	41 <i>Punica granatum</i>
15 <i>Calotropis gigantea</i>	42 <i>Ricinus communis</i>
16 <i>Centella asiatica</i>	43 <i>Ruta graveolens</i>
17 <i>Clitoria ternatea</i>	44 <i>Santalum album</i>
18 <i>Cocculus hirsutus</i>	45 <i>Solanum anguivi</i>
19 <i>Cynodon dactylon</i>	46 <i>Solanum xanthocarpum</i>
20 <i>Cyperus rotundus</i>	47 <i>Strychnos nux-vomica</i>
21 <i>Datura metel</i>	48 <i>Syzygium cumini</i>
22 <i>Eclipta prostrata</i>	49 <i>Terminalia bellirica</i>
23 <i>Emblica officinalis</i>	50 <i>Terminalia chebula</i>
24 <i>Erythrina variegata</i>	51 <i>Tinospora cordifolia</i>
25 <i>Ficus benghalensis</i>	52 <i>Tridax procumbens</i>
26 <i>Gymnema sylvestree</i>	53 <i>Vitex negundo</i>
27 <i>Hemidemus indicus</i>	54 <i>Withania somnifera</i>

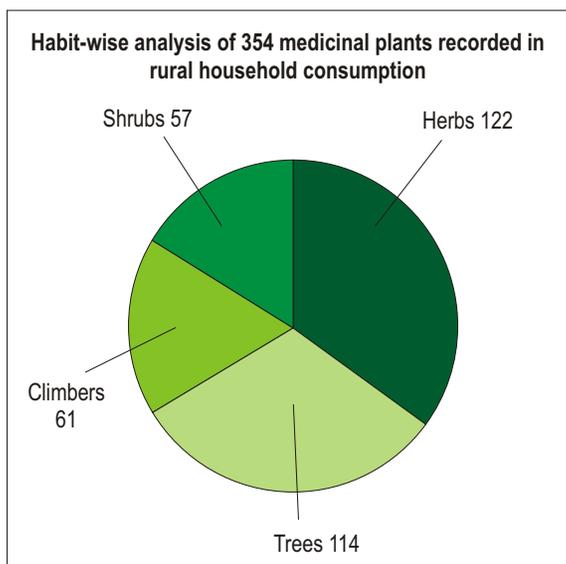
Further analysis of the list of 354 medicinal plant species recorded in rural household use reveals that 257 species (72.5%) form part of the Master List of 960 Traded Medicinal Plants of India. This would mean that there is a competing use in respect of these species between the rural households and the commercial interests. This is a significant finding in as far as it has a bearing on the continuous availability of resource to the rural households. Any indiscriminate harvesting of this resource for commercial trade may deprive the rural households of their major means of primary health care.



A folk healer processing fresh Medicinal Plants for use

It is also interesting to note that the rural households are using almost the entire range of plant life forms for medicinal purposes. Break-up of 354 medicinal plants species being used by the sampled rural households, by life forms, is presented in figure. 1

Fig. 1 Habit-wise analysis of medicinal plants used by rural households



Use of Medicinal Plants by Rural Households in Karnataka: Some Interesting Highlights

The sample survey related to medicinal plant usage by the rural households in Karnataka, in addition to yielding quantifiable data about the consumption of plant material for their healthcare needs, also brought out many interesting facets related to such use.

- ii Use of many botanicals in very specific and quite unusual forms came to notice during survey e.g.
 - A glassful of **watery sap** carefully collected from a hole augured the previous night into the trunk of a well-grown country fig tree
 - A handful of **fibrous peels** scraped from the inside of the bark of a wild *Diospyros* tree
 - A cup of **greenish juice** squeezed from the fibrous mesocarp of a hard-ripe coconut
 - A foot long piece of a **rhizomatous root** of an aromatic grass
 - **Spiny calyces** of a wild species of *Barleria* bush
 - **Sticky droplets** of gum scraped from the root surface of a wild tree
 - **Tender shoot tips** nipped from the branchlets of a bush, and the list goes on

ii. The households also seem to employ innovative methods in prospecting the available plant diversity for the medicinal use, e.g. many plants predominantly known for their food value also find medicinal use in many rural households. Even within these plants the part put to medicinal use is the one that is generally discarded as non-edible. Thus, the root pieces of Coconut, seeds of Papaya, roots of Ash gourd, seeds of Tamarind, Seeds of Gooseberry, and cotyledons of Mango, etc. were reported to be used by these households in many specific primary healthcare recipes.

iii. It was also noticed that generally the plant material used was region-specific and village-specific, being easily available in the nearby areas. However, very interestingly, the use of plants to address same primary health care condition varied even from one household in the village to the other as different set of plants were found to be used by even adjacent houses for the purpose. It indicates that a household level specificity also exists in the health care traditions in the country.

iv. The survey also revealed that households located in the Western Ghats, where fresh plant material is available almost round the year, have a distinct preference for the green herbage in the form of leaves, tender shoots, bark, flowers and fruits for medicinal purposes. On the other hand, households located in the drier eastern plains seem to rely more on the dried plant material viz. dried roots, seeds and dry fruits for their healthcare needs.

The above highlights, while bringing out the high diversity in our folk health traditions, also bring out the innate complexities in quantification of household consumption of botanicals. This sample survey is, thus, just a starting point and holds a definite promise for further studies on the subject.

Average annual consumption/ rural household (in gms)	Total number of rural households in five states	Estimated total annual consumption (in MT)
890 gms	39.2 million	24405

As per 2001 census data there are 137.7 million rural households in the country. Assuming that the consumption pattern of botanicals for health care needs by the rural households in other states is by and large similar to the one obtained for five states, the total annual consumption of botanicals by the rural households of the country is estimated at a rounded value of **86,000 MT**. Even though this estimation is based on a small sample size restricted to the five selected states, it is indicative enough to highlight the issue.

Species wise estimated annual consumption by the 39.2 million rural households of the five states has been worked out for 17 topmost species and is presented in Table 5.

Table-5 Comparison of rural household consumption and industrial consumption

Botanical name	Parts used	Source of supply *	Average annual consumption per rural household (dry wt. in gms/year)	Estimated consumption by the 39.2 million rural households (Dry wt. in MT/ year) of 5 surveyed states	Total estimated consumption by domestic herbal industry (Dry wt. in MT/ year)
<i>Ocimum tenuiflorum</i>	Leaf, shoot	C	55	2164	3500
<i>Hibiscus rosainensis</i>	Flower, leaf	C	29	1135	Not recorded
<i>Emblica officinalis</i>	Fruit	W/C	21	842	17000
<i>Azadirachta indica</i>	Bark, leaf, twig, fruit, root, seed	W	18	701	2200
<i>Aloe barbadensis</i>	Leaf	C	16	645	1600
<i>Eclipta prostrata</i>	Leaf, whole plant	W	16	643	3300
<i>Centella asiatica</i>	Leaves, whole plant	W	16	638	980
<i>Lawsonia inermis</i>	Leaf	C	16	601	420
<i>Plectranthus amboinicus</i>	Leaf, whole plant	C	14	557	Not recorded
<i>Andrographis paniculata</i>	Leaf, root, whole plant	W	14	520	3300
<i>Phyllanthus amarus</i>	Leaf, root, whole plant	W	12	456	2800
<i>Adhatoda vasica</i>	Leaf, root, stem, whole plant	C/ W	11	423	2700
<i>Vitex negundo</i>	Leaf, tender shoot	W/ C	8	299	300
<i>Calotropis gigantea</i>	Latex, leaf, flower, root	W	5	203	Not recorded
<i>Gymnema sylvestre</i>	Leaf, shoot	W	4	169	870
<i>Hemidemus indicus</i>	Leaf, root	W	4	166	700
<i>Achyranthes aspera</i>	Leaf, root, whole plant	W	3	131	310
Total			262	10298	39980

*Sources of supply: C = Exclusively obtained from cultivation; W = Exclusively obtained from wild sources

In spite of the limitation of the sample size involved, it provides a first level comparison of these quantities with the national level estimate of industrial consumption of these specific plant entities. It shows that the household level consumption is half of the quantum estimated for industrial consumption.

About the authors:

Mr. D.K.Ved, I.F.S., (Retd.) Advisor, FRLHT, Bangalore
Email: dk.ved@frlht.org
Dr. G.S.Goraya, I.F.S., Additional PCCF, Himachal Pradesh

For more information:

- <http://envis.frlht.org/traded-medicinal-plants-database.php>
- <http://envis.frlht.org/conservation-concern-species-india.php>

FRLHT's Ethno - Medicinal Plants Garden & Nursery

Write to us for more details: garden@frlht.org

Conservation status of *Hildegardia populifolia* (Roxb.) Schott & Endl.

Boyina Ravi Prasad Rao

Hildegardia populifolia is a moderate sized deciduous tree belonging to the family Malvaceae (sub family Sterculioideae, tribe Sterculieae). They are found growing up to 20m and mature plants are recognizable for their pale green coloured bark. Leaves are ovate-cordate, 3-5 lobed and digitately 7-nerved. Flowers are purple, erect with leathery perianth. Follicles are winged, erect, thinly woody, falcately ovate-reniform and inflated; with 1-2 seeds, affixed from base of the follicle and conspicuously wrinkled when dry.

The species is endemic to Eastern part of Southern Peninsular India, currently recorded from southern Andhra Pradesh, small patch in adjoining Karnataka and Salem Hills in Tamil Nadu. This species name was first published by William Roxburgh in 1832. J.S. Gamble collected the species from Nigadi forests (currently in Anantapur-Kadapa district borders) in 1884. The species was located in different parts of Tamil Nadu (by C.A. Barber in 1917 in Dharmapuri; by Mohanan and Venugopal in 1978-80 in Kullukurchi of Kalrayan hills; by Mathews in 1983 from South Arcot Kalrayans). Rangachari in 1991 reported its occurrence in Kalikiri hills of Chittoor district. Interestingly the plants are found in Taiwan as avenue trees.

The species in its native area is known as *Galibuduga*, *Pichipoliki*, *Buddapoliki* in Telugu and *Malaipuvarasu* in Tamil. The species was named as *Poplar leaved ardure* by Lushington. The fiber of the species is used locally to tie firewood collected in the forests. The fibre was found is worked out to be one of the best vegetable fibres. Locally in Anantapur district the bark extract is used for treating malaria fever. There are reports of using seed extracts in curing rabies.

Nair & Sastry (1990), in the Indian Red Data Book reported the species as Endangered. Sarcar and Sarcar (2002) reported that they found only 13 mature trees and 11 young plants of this species in Kallakurichi Forest Division in Tamil Nadu and reassessed the status of the species as Critically Endangered.

Our research teams have made intensive explorations for the past 17 years in all 'known and likely sites' of the species distribution in Andhra Pradesh and Tamil Nadu and found 10 locations for the species in Southern Andhra Pradesh (Anantapur and restricted localities in Kadapa and Chittoor districts), Devikunta area in Karnataka and Salem hills in Tamil Nadu. The species was found in deciduous forests at an elevation of 300-700m, among boulders. We studied the species population through grids of 6.25 × 6.25 km stratified across the hill ranges of South Eastern Ghats (11°52'–14°16' N and 77°45'–78°59'E) and adjoining hills. We found the species only in 29 grids of the study area. In each grid, we laid transects of 1 Km × 5 m for enumerating the species. In



A: Tree; B: Habitat; C & D: Fruit (follicle)

total, 376 matured individuals of *H. populifolia* were listed and interestingly the species was found mostly above 420 m and restricted to top hills and rock boulders and in sandy red soil. Following IUCN criteria (Version 9.0) we calculated EOO (Extent of Occurrence) to about 14,160 km² and the AOO (Area of Occupancy) to about 14.6 Km² (1460ha). The population size of the species was estimated to comprise 23,100 individuals. Although we found that there is no overall estimate of decline, the population is considered to be experiencing ongoing decline because of habitat modification and continuing threats in the form of man-made fire which kills most of the seedlings.

We reassessed and evaluated the status of the species as *Vulnerable*, based on our field observations and application of IUCN criteria as mentioned in the Box 1 (page 11). Interestingly, this coincides with the observations recorded in FRLHT-CAMP workshop held in 2001 at Hyderabad⁴.

Trails on *in-vitro* germination and subsequent transplantation in forested tracts of its distribution range will help in revising the conservation status to 'not threatened' level.

For More Reading:

1. Boyina Ravi Prasad Rao, MadhaVenkata Suresh Babu, Araveeti Madhusudhana Reddy, S. Sunitha, A. Narayanaswamy, G. Lakshminarayana & M. Ahmedullah (2011). Conservation status of *Hildegardia populifolia* (Roxb.) Schott & Endl. (Malvaceae: Sterculioideae: Sterculieae), an endemic of southern peninsular India. *Journal of Threatened Taxa*

2. Rao, Ravi Prasad, B., M.V. Suresh Babu & John Donaldson (2010). A Reassessment of the Conservation Status of *Cycas beddomei* Dyer (Cycadaceae), an Endemic of the Tirupati-Kadapa Hills, Andhra Pradesh, India, and comments on its CITES Status. *Encephalartos* 102: 19-24.

Contd. in page 11

Medicinal Plant Species of Conservation Concern identified for Andhra Pradesh

Conservation Assessment Management Prioritisation (CAMP) workshop was held at Hyderabad (March 2001) to assess the threat status of prioritized Medicinal Plants of Andhra Pradesh. 47 plants were assigned the threat status of Near Threatened (NT) and above.

Of these 47 species, 12 have a global RL status as these are endemic (or nearly so) the state/region for which the assessment was undertaken. 5 species have been assigned Critically Endangered (CR) status, 23 species are Endangered (EN), 11 species are Vulnerable (VU) and 8 species are Near Threatened (NT). 20 of these Red Listed medicinal plant species have been recorded in high volume trade, as per the national level trade study.

Critically Endangered:

1. *Cycas beddomei* Dyer
2. *Embelia ribes* Burm.f.
3. *Litsea glutinosa* (Lour.) C.B. Rob.
4. *Pterocarpus santalinus* L.f.
5. *Rauvolfia serpentina* (L.) Benth. ex Kurz

Endangered

1. *Acorus calamus* L.
2. *Angiopteris evecta* (G. Forst.) Hoffm.
3. *Anodendron paniculatum* A.DC.
4. *Boswellia ovalifoliolata* N.P.Balacr. & A.N.Henry
5. *Butea frondosa* var. *lutea* (Witt.) Maheshw.
6. *Decalepis hamiltonii* Wight & Arn.
7. *Entada pursaetha* DC.
8. *Lasia spinosa* (L.) Thwaites
9. *Nervilia aragoana* Gaudich.
10. *Pimpinella tirupatiensis* N.P.Balacr. & Subram.
11. *Piper nigrum* L.
12. *Plectranthus barbatus* Andrews
13. *Plumbago indica* L.
14. *Rhaphidophora decursiva* (Roxb.) Schott
15. *Santalum album* L.
16. *Saraca asoca* (Roxb.) Willd.
17. *Shorea tumbuggaia* Roxb.
18. *Strychnos colubrina* L.
19. *Syzygium alternifolium* (Wight) Walp.
20. *Terminalia pallida* Brandis
21. *Urginea nagarjunae* Hemadri & Swahari
22. *Zanthoxylum rhetsa* DC.
23. *Zingiber roseum* (Roxb.) Roscoe

Vulnerable:

1. *Aegle marmelos* (L.) Corrêa
2. *Amorphophallus sylvaticus* (Roxb.) Kunth
3. *Euphorbia fusiformis* Buch.-Ham. ex D.Don
4. *Gloriosa superba* L.
5. *Gymnema sylvestre* (Retz.) R. Br.
6. *Hildegardia populifolia* Schott & Endl.
7. *Oroxylum indicum* (L.) Kurz
8. *Phyllanthus indofischeri* Bennet
9. *Rubia cordifolia* L.
10. *Stemona tuberosa* Lour.
11. *Sterculia urens* Roxb.

Near Threatened:

1. *Celastrus paniculatus* Willd.
2. *Costus speciosus* (J.König) Sm.
3. *Holostemma ada-kodien* Schult.
4. *Paederia foetida* L.
5. *Pueraria tuberosa* (Willd.) DC.
6. *Shorea robusta* Gaertn.
7. *Tacca leontopetaloides* (L.) Kuntze
8. *Trichosanthes cucumerina* L.

For more information:

<http://envis.frlht.org/conservation-concern-species-india.php>



Aegle marmelos



Celastrus paniculatus



Decalepis hamiltonii



Gloriosa superba



Holostemma ada-kodien



Saraca asoca



Zanthoxylum rhetsa

Medicinal Plant Species of Conservation Concern identified for Arunachal Pradesh

CAMP workshop was held at Guwahati to assess the threat status of prioritized Medicinal Plants of Arunachal Pradesh (March 2003). During this programme, 44 medicinal plant species were assigned the Red Listed Status of Near Threatened (NT) and above.

Of these 44 species, 7 species have a global RL status, as these are endemic (or nearly so) to the state/region for which the assessment was undertaken, 6 species have been assigned Critically Endangered (CR) status, 12 species are Endangered (EN), 17 species are Vulnerable (VU) and 9 species are Near Threatened (NT).

17 of these Red Listed medicinal plant species have been recorded in high volume trade, as per the national level trade study.

Critically Endangered:

1. *Amentotaxus assamica* D.K.Ferguson
2. *Aquilaria malaccensis* Lam.
3. *Gymnocladus assamicus* P.C.Kanjilal
4. *Malaxis muscifera* (Lindl.) Kuntze
5. *Rauvolfia serpentina* (L.) Benth. ex Kurz
6. *Smilax glabra* Roxb.

Endangered:

1. *Aconitum ferox* Wall. ex Ser.
2. *Aconitum heterophyllum* Wall. ex Royle
3. *Brucea mollis* Wall. ex Kurz
4. *Cephalotaxus griffithii* Hook.f.
5. *Coptis teeta* Wall.
6. *Flickingeria fugax* (Rchb.f.) Seidenf.
7. *Fritillaria cirrhosa* D.Don
8. *Nardostachys grandiflora* DC.
9. *Picrorhiza kurrooa* Royle
10. *Pleione maculata* (Lindl.) Lindl. & Paxton
11. *Taxus wallichiana* Zucc.
12. *Tropidia curculigoides* Lindl.

Vulnerable:

1. *Bergenia ciliata* (Haw.) Sternb.
2. *Cinnamomum tamala* (Buch.-Ham.) T.Nees & Eberm.
3. *Dendrobium nobile* Lindl.
4. *Elaeocarpus sphaericus* (Gaertn.) K.Schum.
5. *Gymnadenia orchidis* Lindl.

6. *Homalomena aromatica* (Spreng.) Schott
7. *Mahonia napaulensis* DC.
8. *Oroxylum indicum* (L.) Kurz
9. *Piper boehmeriifolium* (Miq.) Wall. ex C. DC.
10. *Piper pedicellatum* C. DC.
11. *Piper peepuloides* Wall.
12. *Podophyllum hexandrum* Royle
13. *Polygonatum verticillatum* (L.) All.
14. *Rhododendron anthopogon* D. Don
15. *Swertia chirayita* (Roxb.) H.Karst.
16. *Valeriana hardwickii* Wall.
17. *Valeriana jatamansi* Jones

Near Threatened:

1. *Abies densa* Griff.
2. *Cibotium barometz* (L.) J. Sm.
3. *Drosera peltata* Thunb.
4. *Embelia ribes* Burm.f.
5. *Garcinia pedunculata* Roxb. ex Buch.-Ham.
6. *Hydnocarpus kurzii* (King) Warb.
7. *Illicium griffithii* Hook. f. & Thomson
8. *Piper betleoides* C.DC.
9. *Rheum nobile* Hook. f. & Thomson

For more information: <http://envis.frlht.org/conservation->



Aquilaria malaccensis



Bergenia ciliata



Cinnamomum tamala



Dendrobium nobile



Rheum nobile



Rhododendron anthopogon



Taxus wallichiana

Medicinal Plant Species of Conservation Concern Identified for Madhya Pradesh

CAMP workshops were held at Bhopal to assess the threat status of prioritized Medicinal plants of Madhya Pradesh (July 2003). During this process 50 medicinal plant species were assigned the RL status of Near Threatened (NT) and above.

Of these 49 species, only 1 species has a global RL status as these are endemic (or nearly so) to the state/region for which the assessment was undertaken. 3 species have been assigned Critically Endangered (CR) status, 6 species are Endangered (EN), 31 species are Vulnerable (VU) and 10 species are Near Threatened (NT). 30 of these Red Listed medicinal plant species have been recorded in high volume trade, as per the national level trade study.

Critically Endangered:

1. *Alectra chitrakutensis* (Rau) Prasad & Dixit
2. *Commiphora wightii* (Arn.) Bhandari
3. *Psilotum nudum* (L.) P. Beauv.

Endangered:

1. *Acorus calamus* L.
2. *Angiopteris evecta* (G. Forst.) Hoffm.
3. *Clerodendrum serratum* (L.) Moon
4. *Corollacarpus epigaeus* (Rottler & Willd.) Clarke
5. *Eulophia herbacea* Lindl.
6. *Luffa echinata* Roxb.



Abrus precatorius



Asparagus racemosus



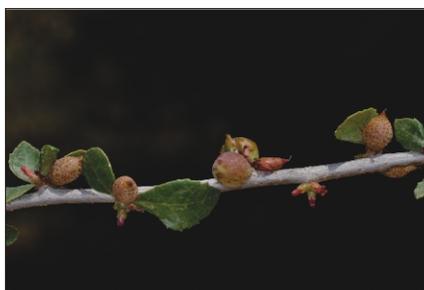
Baliospermum montanum



Buchanania lanzan



Clerodendrum serratum



Commiphora wightii



Uraria picta

Vulnerable:

1. *Andrographis paniculata* (Burm.f.) Nees
2. *Boswellia serrata* Roxb. ex Colebr.
3. *Celastrus paniculatus* Willd.
4. *Ceropegia bulbosa* Roxb.
5. *Chlorophytum tuberosum* (Roxb.) Baker
6. *Citrullus colocynthis* (L.) Schrad.
7. *Cochlospermum religiosum* (L.) Alston
8. *Costus speciosus* (J.König) Sm.
9. *Crateva magna* (Lour.) DC.
10. *Curcuma angustifolia* Roxb.
11. *Curcuma zedoaria* Roxb.
12. *Dioscorea bulbifera* L.
13. *Dioscorea hispida* Dennst.
14. *Embelia tsjeriam-cottam* (Roem. & Schult.) A.DC.
15. *Gloriosa superba* L.
16. *Gymnema sylvestre* (Retz.) R. Br.
17. *Litsea glutinosa* (Lour.) C.B. Rob.
18. *Oroxylum indicum* (L.) Kurz
19. *Peucedanum nagpurensense* Prain
20. *Phyllanthus emblica* L.
21. *Plumbago zeylanica* L.
22. *Pterocarpus marsupium* Roxb.
23. *Rauvolfia serpentina* (L.) Benth. ex Kurz
24. *Rubia cordifolia* L.
25. *Salvadora oleoides* Decne.
26. *Sterculia urens* Roxb.
27. *Terminalia chebula* Retz.
28. *Thalictrum foliolosum* DC.
29. *Tylophora indica* (Burm. f.) Merr.
30. *Uraria picta* (Jacq.) DC.
31. *Urginea indica* (Roxb.) Kunth

Near Threatened:

1. *Abrus precatorius* L.
2. *Aristolochia indica* L.
3. *Asparagus racemosus* Willd.
4. *Baliospermum montanum* (Willd.) Müll.Arg.
5. *Buchanania lanzan* Spreng.
6. *Mucuna pruriens* (L.) DC.
7. *Operculina turpethum* (L.) Silva Manso
8. *Pluchea lanceolata* (DC.) C.B. Clarke
9. *Stereospermum chelonoides* (L.f.) DC.
10. *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.

For more information: <http://envis.frlht.org/conservation-concern-species-india.php>

Medicinal Plant Species of Conservation Concern identified for Rajasthan

CAMP workshop was held at Jaipur to assess the threat status of prioritized Medicinal plants of Rajasthan (September 2007). Based on the CAMP workshop held at Jaipur 38 species were assigned the RL status of Near Threatened (NT) and above.

Of these 38 species, 2 species have a global RL status as these are endemic to the peninsular India. 6 species have been assigned Critically Endangered (CR) status, 12 species are Endangered (EN), 19 species are Vulnerable (VU) and 1 species has Near Threatened (NT) status.

16 of these Red Listed medicinal plant species have been recorded in high volume trade, as per the national level trade study.

Critically Endangered:

1. *Chlorophytum borivilianum* Santapau & R.R.Fern.
2. *Cochlospermum religiosum* (L.) Alston
3. *Commiphora wightii* (Arn.) Bhandari
4. *Eulophia ochreatea* Lindl.
5. *Pterocarpus marsupium* Roxb.
6. *Tribulus rajasthanensis* Bhandari & V.S.Sharma

Endangered:

1. *Boswellia serrata* Roxb. ex Colebr.
2. *Calligonum polygonoides* L.
3. *Ephedra foliata* Boiss. ex C.A.Mey.
4. *Gymnema sylvestre* (Retz.) R. Br.
5. *Leptadenia reticulata* (Retz.) Wight & Arn.
6. *Manilkara hexandra* (Roxb.) Dubard
7. *Neurada procumbens* L.
8. *Oroxylum indicum* (L.) Kurz
9. *Ougeinia oojeinensis* (Roxb.) Hochr.
10. *Sterculia urens* Roxb.
11. *Stereospermum colais* (Buch.-Ham. ex Dillwyn) Mabb.
12. *Tecomella undulata* (Sm.) Seem.

Vulnerable:

1. *Arisaema tortuosum* (Wall.) Schott
2. *Barleria acanthoides* Vahl
3. *Blepharis sindica* Stocks ex T.Anderson
4. *Buchanania lanzan* Spreng.

5. *Butea monosperma* (Lam.) Taub.
6. *Celastrus paniculatus* Willd.
7. *Costus speciosus* (J.König) Sm.
8. *Gloriosa superba* L.
9. *Holostemma ada-kodien* Schult.
10. *Limonia acidissima* L.
11. *Moringa concanensis* Nimmo ex Dalzell & A.Gibson
12. *Naringi crenulata* (Roxb.) Nicolson
13. *Ocimum gratissimum* L.
14. *Peganum harmala* L.
15. *Plumbago zeylanica* L.
16. *Pueraria tuberosa* (Willd.) DC.
17. *Sarcostemma viminalis* (L.) R.Br.
18. *Schrebera swietenoides* Roxb.
19. *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.
20. *Crateva magna* (Lour.) DC.

For more information: <http://envis.frlht.org/conservation-concern-species-india.php>



Arisaema tortuosum



Butea monosperma



Chlorophytum borivilianum



Oroxylum indicum



Schrebera swietenoides



Stereospermum colais



Tecomella undulata

Contd. from page 6

3. IUCN Species Survival Commission (2001). IUCN Red List Categories, Version 3.1. www.iucn.org/themes/ssc/redlists/ssc-rl-c.htm.

4. <http://envis.frlht.org/medicinal-plants-conservation-concern-species.php>

5. Jadhav, S.N., D.K. Ved, U. Ghate, K.N. Reddy & S. Reddy (2001). *Proceedings of the Workshop in Conservation Assessment and management planning for Medicinal plants of Andhra Pradesh (CAMP) MPCC*. Hyderabad.

For more information:

Dr. B. Ravi Prasad Rao, Professor of Botany, Biodiversity Conservation Division, Sri Krishnadevaraya University, Anantapur 515 003, Andhra Pradesh.

Email: biodiversityravi@gmail.com

Box 1: Justification of threat status

Criterion A: The available data does not provide any indicators of change in population size over time and hence this criterion is not applied to *H. populifolia*.

Criterion B:

Criterion B1: The Extent of Occurrence of *H. populifolia* is estimated to be 14,160km² and considered to occur at more than 10 locations (sub-criterion a). Further, there are no extreme fluctuations observed with respect to any of (i) to (iv). It qualifies only under the sub-criterion (b) for continuing decline in terms of (iii) area, extent and quality of habitat. Hence, it does not qualify for any of the threatened categories under B1.

Criterion B2: The Area of Occupancy is 14.6km². However, it does not qualify for either (a) and (c). It qualifies only for the sub-criterion (b) for continuing decline in terms of (iii) area, extent and quality of habitat. Hence, it is not threatened under sub-criterion B2.

Criterion C: Small population size and decline. The total estimated population of *H. populifolia* is >23100 mature individuals. Since the number of mature plants exceed the requirements for Vulnerable status (i.e. <10 000), the species is not considered as threatened under this criterion.

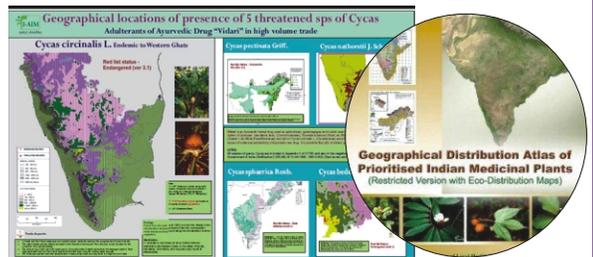
Criterion D: Very small or restricted populations. Although the species population comprises a large number of individuals, it is found restricted to < 20km² and is prone to human activities in terms of fire hence qualifying for vulnerable category under D2.

Criterion E: No demographic modeling has been undertaken for the species and hence this criterion does not apply for the species.

For more information:

www.iucn.org/themes/ssc/redlists/ssc-rl-c.htm.

Mapping Geographical distribution of Wild Indian Medicinal Plants using GIS



The Geographical Information System (GIS) based digital Maps for Wild Indian Medicinal Plants Species depict the natural distribution of selected species within India. These maps can be used as a reference material to undertake botanical explorations, research studies such as conservation biology, population studies, trade study and plan suitable resource augmentation and conservation research programs.

So far, for 1920 species, the Geographical Distribution Maps have been prepared and shared through ENVIS website (www.envis.frlht.org). For selected 220 species of Conservation Concern Eco-Distribution Maps have been prepared depicting correlations of natural occurrence with various ecological parameters like rainfall range, altitude range, vegetation type etc.

The Geographical Distribution Maps show the wild occurrence of a species in a particular state /district/taluka level. Those species recorded in high volume trade (> 100 MT/Annum as per Demand and Supply of Medicinal Plants Trade in India, 2008) as well as the species of Conservation Concern are the priority species for distribution mapping efforts. The Eco-Distribution Maps include precise geographical location and occurrence of a particular species (as per the latitude and longitude co-ordinates of specimen related records accessed from different herbaria and scientific publications). Interpreting the correlation between such precise location and the related ecological parameters such as altitude range, rainfall range, and vegetation type, provides an understanding of the pattern of natural distribution of a species which in turn can help the resource managers to undertake conservation action and resource augmentation programs strategically.

Another dimension of GIS mapping is to depict backward linkages with regions of occurrence for selected high priority botanicals in trade. For example: as per the current taxonomic understanding five species of the genus *Cycas* occurs wild in India and some of these have been recorded in trade as adulterants of plant raw drugs like "Vidari".

Digital Maps on Indian Medicinal Plants
<http://envis.frlht.org/digital-atlas-main.php>

These species are *Cycas circinalis*, *C. pectinata*, *C. beddomei*, *C. nathorstii* and *C. sphaerica*. For developing map/s depicting identified regions of occurrence and possible sources of supply the data relating to specific sites of presence (herbarium and field study records) has been compiled and converted into precise latitude-longitude coordinates leading to generation of maps using QGIS and MAPWINDOW. Similar Maps have been prepared for the traded plant drugs names such as "Manjistha" (*Rubia sikkimensis* and *Rubia cordifolia*) and "Anantmool" (*Hemidesmus indicus* and *Decalepis hamiltonii*). This work is supported by Centre of Excellence on Medicinal Plants and Traditional Knowledge project, Mo.E.F, Go.I.

These maps are certainly useful for State Forest Departments to establish *in-situ* conservation sites such as Medicinal Plants Conservation Areas and also in planning resource augmentation efforts. Based on these maps, ground truthing exercises can be taken up to confirm the presence of species in Wild. Maps generated to track trade route are another useful to show backward linkages with regions of occurrence for selected high priority botanicals in trade.

For more information: Mr. D.K.Ved, I.F.S. (Retd.), Advisor, FRLHT, Bangalore Email: dk.ved@frlht.org; Ms. Sathya Sangeetha, Research Officer, FRLHT, Bangalore. Email: sathya.sangeetha@frlht.org



असतो मा सद्गमय ॥
सर्वो भूयते ॥



Medicinal Plants in CoP 11, Hyderabad

<http://www.cbd.int/cop11>



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XI Conference of Parties
BANGALORE, INDIA 2012

The Eleventh Meeting of the Conference of the Parties to the Convention on Biological Diversity was held in Hyderabad, India, from 1st to 18th October 2012. The convention was well represented by Parties to The Convention, Ministry, Private Organisations and Local Governing Bodies. Under the GoI-GEF-UNDP project "Mainstreaming Conservation and Sustainable use of Medicinal Plants Diversity in Indian States". IAIM-FRLHT, Bengaluru got an opportunity to showcase India's medicinal plant heritage.

Exhibition: Need for Medicinal Plants Conservation, market value, importance of Sustainable Harvest, Scientific Validation, Phytochemistry aspects, Bio-informatics and database use was presented to the visitors. More than 1000 visitors visited the stalls and interacted with the staff to get more information.

Communitypalli: In this forum, discussion involving participants on the use of certification schemes for processing of natural products, and issues involved in persuading local communities to adopt cultivation of medicinal plants as livelihood options was carried out. During this session, Chattisgarh presented rich cultural heritage of medicinal plant conservation through the stage play "Jaddu Baddu". During this forum meet, wall paintings, and healers interactions were also organized. More information on COP II, write to: Mrs. Nandini D, Research Associate email: nandinid@frlht.org

Base Line Studies for Establishing New Medicinal Plant Conservation Areas (MPCA) in Karnataka: An initiative of Karnataka Forest Department

In the process of making new MPCAs in Karnataka, Karnataka Forest Department had commissioned FRLHT to undertake botanisation of 4 prioritised forest areas. The botanical study is complete and report submitted to forest department for further processing and notification of the sites. For more information: Dr. C.R. Jawahar, P.O., FRLHT, Bengaluru.

E-mail: cr.jawahar@frlht.org and Karnataka Forest Department, Bengaluru. www.kfd.gov.in; www.karnatakaforest.gov.in

International Training Workshop on Conservation and Sustainable Use of Medicinal Plants, 1-5 October 2012

International training workshop was organised by Foundation for Revitalisation of Local Health Traditions, Bengaluru, India in collaboration with MoEF, CoP II Secretariat, GEF-UNDP from 1st -5th October 2012, at FRLHT Campus, Bangalore.

Learning objectives of the course:

1. To instill sense of appreciation towards medicinal plants, its cultural linkages, contemporary relevance of Indian Medical Heritage
2. To inculcate better understanding of conservation and Sustainable Use of Medicinal Plants

21 participants from 7 countries India, Srilanka, Nigeria, Brazil, Kenya, China and Benin attended the International course. Participants were from varied fields of conservation. They represented NGOs, State Forest Departments, Resource managers, NGOs, Cultivators, Botanists, and Conservation Biologists.

Self-study Material on Medicinal Plants and Vegetation Monitoring activities for the Front Line Staff of Forest Department

The training team at FRLHT designed and brought out 2 volumes of selfstudy material in Kannada covering select topics on Medicinal Plants conservation for the use of the frontline staff of the Forest Department. These volumes are expected to serve as reference- cum-post-training learning material amongst the frontline staff. Following are the volumes:

Kaadu emba kanaja & Sasya parisara Adhyayana

For more information on conservation training: Shri B.S.

Somashekhar, Asst. Director, FRLHT, Bangalore.

Email: bs.somashekar@frlht.org



Amlavetasa

Shilpa Naveen

The word *Amlavetasa* (*Amla*) means a plant that has predominant sour taste. There are around 130 references from classical texts of Ayurveda on *Amlavetasa* and 30 distinct synonyms mentioned across various Nighantus (Classical lexicons). *Amlavetasa* is also called *Valyamla*, *Chukra*, *Satavedhi*. There is another variety of *Amlavetasa* according to *Dhanwantari niganthu*, which is named as *Amla-Maheeruha*. The word meaning of *Amla-Maheeruha* is sour tree. In *Gadanigraha* there is a story on the origin of *Vetasa* tree, which mentions about the acidic nature/property of the fruit.

Many species are correlated to *Amlavetasa*. The following species are considered as *Amlavetasa* by traditional practitioners of Ayurveda and Botanist across the country.

1. *Garcinia indica*
2. *Garcinia pedunculata* (in some commentaries of the ancient texts this is the plant equated with *Amlavetasa*; it is a tree)
3. *Rumex vesicarius* (perhaps this is the genuine drug plant)
4. *Rheum emodi* (this plant is recommended as a substitute in Ayurvedic Formulary of India)

Properties of *Amlavetasa* as mentioned in classical texts of Ayurveda:

Rasa (taste): *Amla* (sour), *Kashaya* (astringent)

Guna (quality): *Laghu* (light), *Ruksa* (dry), *Tiksna* (penetrating)

Veerya (potency): *Ushna* (hot)

This plant is known as 'Kokam butter tree' or 'Mangosteen oil tree' in English, 'Kokan' in Gujarati, 'Kokam' in Hindi, and 'Dhupadamara' in Kannada; 'Birondi' in Goan Konkani, 'Amsol' or 'Bhirand' in Marathi and 'Murgal' in Tamil.

Amlavetasa is mainly recommended in cases of metabolic disorders and is considered among mass breaking, appetizers, carminatives, and cardio-tonic, alleviate colic, anorexia, constipation, alcoholic complications, hiccup, dyspnoea, cough and vomiting.

This drug finds its way in important Ayurvedic formulations such as *Hingwadi coorna* (alleviates pain in anus and vaginal tract, anemia, anorexia etc.); *gutika*, *Lasunadya grita*, *Yavaanisadava*, *Maricadya coorna*, *Kantakaaree ghrita* (alleviates diseases arising from kapha like cough, dyspnoea and hiccup); *Padmakadi leha* (alleviates the 5 types of cough) *Mahagandhahastadi agada* are some of the important formulations in *Charaka Samhita*. Mostly sour tasting fruits are being used as *Amlavetasa*. Hence, similar tasting, highly acidic fruits are being taken as substitute. Thus warranting us to do further study on the various species that are actually used as *Amlavetasa*.

Simple home remedies:

1. ***Amlavetasa churna*** (*Astanga Hridaya*, *Chikitsa sthana*, 6/30)
Mix fine powder of fruit of *amlavetasa* (*Garcinia pedunculata*) & fruit rind of pomegranate, Add powder of dried ginger to this. Sprinkle little *asafetida* & black salt to this mixture. Mix 5gm of this powder with honey & consume. This recipe relives the difficulty in breathing as in bronchial asthma.
2. ***Amlavetasa Mantha*** (*Charaka samhita*, *sutrasthana*, 23/38)
Pound equal parts of grapes, gooseberry, pomegranate with *Kokum/amalavetasa* (*Garcinia pedunculata*) fruit. Filter to separate the seeds. The add 200 ml of water and mix evenly. This preparation is called as 'Mantha'. Consume this juice in dose of 100 ml twice a day. This acts as good nourishment & provides firmness, lusture & strength to the person.

Parts used: Fruit

Additional inputs: Dr. Dinesh Kumar, Research Fellow, FRLHT, Bangalore.

Amlavetasa properties and action as mentioned in one of the classical literature:

अम्लवैतसन्त्यन्तं पायोऽत्र वातजित् ।
कार्शंश्चमूलं चानरो व हरे परम् ॥ (Raja Niganthu)

Amlavetasa is *atyamla* (extremely sour tasting), *kashaya* in *rasa* (astringent in taste), *usna* (hot) in potency, *vata hara* (alleviates vitiation of *vata*), cures *kapha* (diseases caused due to aggravation of *kapha*), *arsa* (piles), *srama* (exertion), *gulma* (tumors), *adhmana* (distention of the abdomen) and *arocaka* (anorexia)



Garcinia indica

For more information:

Author: Dr. Shilpa Naveen, Research Officer, FRLHT, Bangalore. Email: shilpa.naveen@frlht.org

For the report on Indian Biodiversity Congress, 2012
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Whats in news?

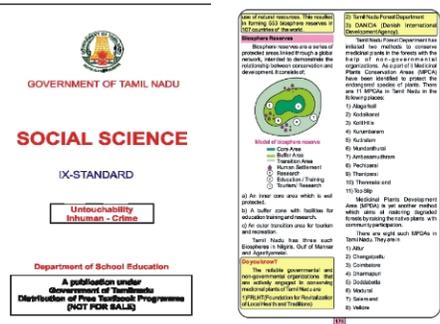
ENVIS Centre Reaching Out to People:

- **5th Feb 2013:** An interactive workshop was organized for 12 primary school students from Poorna Learning Centre, Bangalore
- **18th to 21st Jan 2013:** Participants of the Joint Indo-US Workshop on Biodiversity Informatics organized at ATREE, Bangalore were oriented on Indian Medicinal Plants Scenario and special visits were organized to FRLHT Bangalore.
- **10th Dec 2012:** In Indian Biodiversity Congress, 2012, Children Biodiversity Conclave, 120 school students and teachers were oriented towards neighborhood medicinal plants of Bangalore city and usefulness of the information on the website www.envis.frlht.org
- **7th Dec 2012:** 20 members from National Institute of Rural Development, Guwahati were given a perspective on "Medicinal Plants Trade in India".
- **7th Dec 2012:** A special invited talk on "Medicinal Plants of Morocco", by Prof. Gary Martin, Ethnobotanist and Fellow at the Rachael Carson Center for Environment and Society in Munich, Germany and Director of the Global Diversity Foundation (GDF), Morocco at FRLHT, Bangalore.
- **2nd Oct 2012:** Participants of COP 11 International Training Workshop on Conservation and Sustainable Use of Medicinal Plants were oriented towards Encyclopedia on Indian Medicinal Plants Database through demonstration of the website <www.envis.frlht.org>
- **28th Sep 2012:** ENVIS team organized a special invited talk on "Trade in Some Botanicals in Ancient India (C 3000 Bce – 500 Ce)", by a well-known anatomist and botanist, Prof. Dr. K.V. Krishnamurthy, Adjunct Fellow, FRLHT, Bangalore.
- **27th Sep 2012:** 50 second year Pre-University students from Gyanajyothi College, Yelahanka were oriented towards Indian Medical Heritage & natural resources.
- **31st Aug 2012:** ENVIS activities were shared to select teaching faculty members of Indian Institute of Forest Management, Bhopal and Minor Forest Produce Processing and Research Centre (MFP-PARC), Madhya Pradesh Forest Department, Madhya Pradesh during the visit of ENVIS personnel.
- **29th-30th Aug 2012:** Actively participated in National Interaction-cum-Evaluation workshop organized in Bhopal by Disaster Management Institute and shared ENVIS activities to all the ENVIS Centres country wide.
- **9th Jul 2012:** Twelve primary students from Heggadae Halli Government School, Doddaballapura Taluk were oriented towards neighbourhood medicinal plants and ENVIS website and activities.
- **4th Jul 2012:** Institutional day: Demonstrated database and other CD's for various visitors which includes Forest Department Officials from Karnataka, pharmacy sector, students and other general public as well as Post Graduate students from Unani medical college.
- **5th Jun 2012:** On the occasion of World Environment Day, 50 students from class 5-6th standard, Poorna Pragna Primary School, Bangalore and 50 college students from Maharani Pre-University College Bangalore were oriented towards medicinal plants and traditional knowledge through an interactive session.

www.greenhealer.net

Visit for more information on educational products related to medicinal plants, email: medplan@frlht.org

School Curriculum and Medicinal Plant Conservation



Social Science text books for 9th standard included medicinal plants conservation areas and development areas. This is published by Tamil Nadu Text Corporation. Click on this link to find more information.

<http://www.textbooksonline.tn.nic.in/Std9.htm> /
<http://www.textbooksonline.tn.nic.in/Books/Std09/Std09-SocSci-EM-2.pdf>

Neighbourhood Medicinal Plants of Bangalore CDROM for High School Students



Now, Bangalore city students can use the new CDROM, to explore your fascinating plant world. Experience the richness of plant diversity in your traditions, life style and environ. Share with us your interesting and enriching learnings in a creative way (such as poems, essays, paintings etc. Best expressions will be published in our website : www.envis.frlht.org. Email: envis@frlht.org or send your entries by post.



Herbarium Technique Training Programme

The goal of FRLH is to make significant contribution towards creating awareness about the diversity of medicinal plants and their conservation status. Thus act as a vehicle to promote medicinal plant conservation and go a long way to help revive our health care traditions. Several training programs and workshop have been conducted for high school students, teachers, lecturers, students of pre-university, graduation and post graduation, ISM practitioners on need

basis. Usually a 15 member team is given training and interested institutions or groups may write to:

Assistant Director

FRLH (Bio-Cultural Herbarium & Repository of Raw Drugs)

Foundation for Revitalisation of Local Health Traditions

No. 74/2, Jarakbande Kaval, Post Attur, Via Yelahanka Bangalore.

560 106, Karnataka, INDIA. Phone: + 91 80 2856

8005/8000/8001 Fax: + 91 802856 5873

Email: herbarium@frlht.org, k.ravikumar@frlht.org

<http://www.iam.edu.in>

Just double click: www.envis.frlht.org / www.frlhtenvis.nic.in



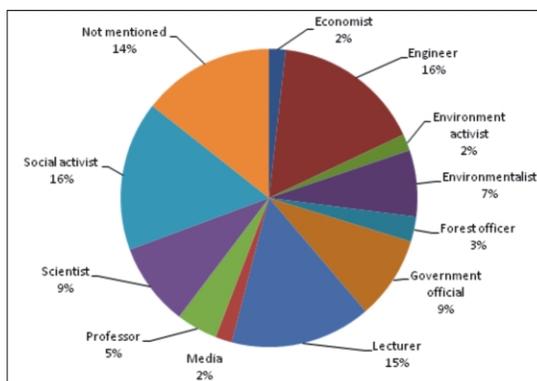
Explore a well referenced, unique one-stop-information house on medicinal plants of India. This exclusively website gives information on conservation concern species, traded species, latest reports/publications/ directories. User friendly search, enables us to access range of information related to botanical and local names correlations, view digital atlas and digital herbarium!



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[Http://pib.nic.in/newsite/PrintRelease.aspx?relid=92888](http://pib.nic.in/newsite/PrintRelease.aspx?relid=92888)

Website Users Profile (2012-13)



Press Information Bureau
Government of India - Ministry of Environment and Forests
Centre of Excellence on Medicinal Plants

04-March-2013 16:00 IST

The Ministry of Environment and Forests (MoEF), Government of India, has set up a Centre of Excellence on Medicinal Plants and Traditional Knowledge at the Foundation for Revitalisation of Local Health Traditions (FRLHT), Bengaluru in September 2002. The objectives of the Centre, which works in project mode, are as under:

- Herbarium of Medicinal Plants and Raw Drugs Repository
- Pharmacognosy studies
- Mapping of natural distribution of medicinal plants for prioritization of species, habitats and zones for conservation
- Ethno-medicinal garden
- Biology of Medicinal Plants
- Training, Capacity building and Outreach.

Glance at our
WEBSTATS – www.envis.frlht.org
82.73 lakh hits/annum

Month	Daily Avg					Monthly Totals						
	Hits	Pages	Visits	Sites	URLs	URL In	URL Out	Visits	Pages	Hits		
Apr 2013	39509	30467	32233	4144	11412	9263043	0	0	37299	290097	274208	355582
Mar 2013	35514	26663	28032	2977	27766	30407343	0	0	92317	869020	826582	1100940
Feb 2013	30854	23912	21518	2213	26274	30159953	0	0	61983	602516	669554	863936
Jan 2013	32310	25428	21653	2159	28244	36953934	0	0	66945	671261	788271	1001638
Dec 2012	28908	23556	19178	1662	23026	34801960	0	0	51534	594525	730257	896178
Nov 2012	23477	19799	12759	1266	23361	35559726	0	0	38006	382777	593980	704310
Oct 2012	20156	16396	9324	1053	24112	31812927	0	0	32669	289053	308279	624837
Sep 2012	19847	17051	10113	950	19936	32239312	0	0	28528	303416	511546	595436
Aug 2012	18940	15721	8606	908	21118	29854804	0	0	28148	266787	487381	587161
Jul 2012	18438	15439	8284	895	21220	27383595	0	0	27688	256830	478639	571591
Jun 2012	15162	12483	5785	861	20515	40344747	0	0	25840	173578	374516	454872
May 2012	16664	13537	6493	899	21460	31819436	0	0	27894	201294	419647	516588
Totals						371300165	0	0	518851	4901154	6662868	8273069

The Ministry released Rs.296.77 lakh during the last three years i.e. 2009-10, 2010-11 and 2011-12 to the Centre and has allocated a sum of Rs 115/- lakh for 2012-13. This was stated by Shrimati Jayanthi Natarajan Minister of State (Independent Charge) for Environment and Forests, in the Lok Sabha today, in a written reply to a question by Shri B.Y. Raghavendra, Shri Shivarama Gouda & Shri Nalin Kumar Kateel.

The Minister further stated that the Ministry of Environment and Forests constituted an Expert Group in January 2012, to review the performance of the Centre from 2007 to 2012. The Group found the progress of the Centre to be satisfactory and suggested the Work Plan for the Centre for the 12th Plan period. The Group also recommended additional objectives and corresponding budget for the Centre, subject to availability of funds and other necessary approvals during the 12th Plan. The recommendations of the Group have been endorsed by the Ministry.

Number of Queries in 2012-13

info@frlht.org, envis@frlht.org, social networking sites, personal com or associations, phone, visits, ...
www.envis.frlht.org / www.frlhtenvis.nic.in



RM/RS- USQ956 - LS

Centre of Excellence on Medicinal Plants
FRLHT-MOEF,Go.I.
Annual Report 2011- 12
Email: info@frlht.org

Awards and Recognitions

- 2013: Legislated into the University by the Karnataka Legislative Assembly on 14th Feb. 12013 (L.C.Bill No. 06 of 2013) awaiting publication in gazette.
- 2012: The 7th Nutra India summit conferred its Nutra Excellence Award 2012 to the Founder Director of FRLHT.
- 2011: The Rajagopal Rama Varier Memorial AVP Excellence award to the Founder, Shri Darshan Shankar
- 2011: Padma Shri awarded to the Founder, Shri. Darshan Shankar
- 2011: Designated as Bio-Resource Information Centre on Indian Medicinal Plants Database, D.B.T., Go.I
- 2010: Recognized as National R&D facility (Rasayana) by : Department of Science and Technology, GOI
- 2010: Indian Innovation Award, Indian Express (EMPI Group of Institutions)
- 2009: Recognized as a Center of Excellence in Indian Systems of Medicine by Dept. of AYUSH, Ministry of Health and Family Welfare
- 2009: Award for Proficiency in Clinical Application of Ayurveda Shastra from Vaidyraj Datar Panchaboutik Chikitsa and Samshodhan Kendra, Sangli, Maharashtra
- 2008: Global Propagation of Ayurveda Award from the AVR Foundation, Coimbatore
- 2007: "The Green Institution Award", Better Interiors, Mumbai
- 2007: "Citizen Extra Ordinaire", Rotary Club, Bangalore
- 2003: Recognized as an organization engaged in Scientific and Industrial Research by the Dept. of Scientific and Industrial Research
- 2003: International Award for Leadership in Complementary & Alternative Medicine, Columbia University, New York
- 2002: Designated as Environmental Systems Centre on Medicinal Plants, Mo.E.F., Go.I.
- 2002: Recognized as National Centre of Excellence, Ministry of Environment and Forests, Go.I. Ministry of Health and Family Welfare, Go.I.
- 2002: Equator Initiative Prize of United Nations for Linking Conservation to Livelihood Needs of Rural Communities
- 1998: Norman Borlaug Award

International Day for Biological Diversity 2013 Water and Biodiversity



Water is essential for life. No living being on planet Earth can survive without it. It is a prerequisite for human health and well-being as well as for the preservation of the environment. The theme **Water and Biodiversity** was chosen to coincide with the United Nations designation of

2013 as the International Year of Water Cooperation. World Water Day is held annually on 22 March as a means of focusing attention on the importance of freshwater and advocating for the sustainable management of freshwater resources.

An international day to "celebrate freshwater" was recommended at the 1992 United Nations Conference on Environment and Development (UNCED). The United Nations General Assembly responded by designating 22 March 1993 as the first World Water Day. World Water Day is also dedicated to the theme of cooperation around water and is coordinated by UNESCO in collaboration with UNECE and UNDESA on behalf of UN-Water.

<http://www.unwater.org/water-cooperation-2013/events/world-water-day/en/>

How to reach FRLHT's IAIM-Health Care Centre, Yelahanka, Bangalore

Contact us: Land line phone number:+91-80-28567000



We invite readers to send their responses/views/features of interest etc. through e-mail: envis@frlht.org (Please note: Articles for subsequent issues should not exceed more than 1500 words. It can be accompanied with images in .jpg format)



For more information contact:

The Co-ordinator, ENVIS Centre on Medicinal Plants

Foundation for Revitalisation of Local Health Traditions

74/2, Jarakabande Kaval Post Attur, Via Yelahanka, Bangalore-560 106, Karnataka, INDIA

Ph: +91-80 - 28565 847, 28568000 Fax: +91-80-28567926; Email:envis@frlht.org / suma.tagadur@frlht.org