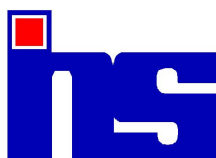


Proceedings of the seminar on Medflor - India  
and Ethnobotanical research in Andhra Pradesh,  
India.

**Working Paper - WP 04/1993 (1-32)**



**THE INSTITUTE OF HEALTH SYSTEMS**

**PROCEEDINGS OF THE SEMINAR ON MEDFLOR-INDIA AND  
ETHNOBOTANICAL RESEARCH IN ANDHRA PRADESH  
DATES: 16TH & 17TH OF DECEMBER, 1993.**

Institute of Health Systems (IHS) organised a two days workshop on MEDFLOR-INDIA an ethno-botanical database on 16th & 17th of December. About twenty delegates from all parts of Andhra Pradesh, and other states participated. List of participants and their address are enclosed in annexure - 1. Sri Smarajit Ray IAS Principal Secretary to Government Of A.P was the chief guest for the inaugural function.

Dr. Prasanta Mahapatra, Hon. President of IHS, welcomed the Chief guest and the participants. He narrated the events leading to setting up of MEDFLOR-INDIA database. IHS did a study of the economic potentiality of herbal and traditional medicine, at the instance of Girijan Cooperative Corporation (GCC). During this study the enormous economic potential of the biologically diverse Indian flora became evident. The need for systematic research into potentiality was realised. There is also the need to document and register the ethnic knowledge about medicinal properties of plants. This will facilitate equitable sharing of the economic benefits for local communities from bio-diversity prospecting. While studying the various aspects of herbal and traditional medicine he came across literature about the NAPRALERT database of the University of Illinois at Chicago. He paid a visit to Dr. Farnsworth of the university of Illinois and spend a week in studying the NAPRALERT database. There he came across Dr. Christopher William Beecher who was then finalising the MEDFLOR data entry programme (DP). Dr. Beecher readily agreed to the suggestion to build up a MEDFLOR-INDIA database. Mr. Vijay Kumar , M.D, G.C.C. has been supportive to this effort. He readily agreed to put forth to the GCC board, proposal for setting up MEDFLOR-INDIA on a pilot scale basis. The GCC finally approved funding for one year to set up the database. The present seminar is culmination of the workshop organised by IHS to establish the MEDFLOR-INDIA database.

Sri. Vijay Kumar in his presidential address informed that GCC mission is to improve the economic condition of tribal by securing better prices for the nonwood forest products collected by them. GCC's approach is to improve quality of the collections and market value added forest produce. GCC has been successful in achieving substantial value additions for eight forest products like Gum-karya, Strychnos nux-vomika etc. Quality of collections is sought to be achieved, by explaining the scientific methods in collecting the forest products. This is being done in collaboration with Sri Krishna Devaraya University (SKD), Anantapur. He felt that MEDFLOR-INDIA has a vital role in focusing attention on development of the nonwood forest products, resultant environmental conservation, and will also help in designing cost effective health interventions.

Chief guest Sri Smarajit Ray, IAS , Principal Secretary to Government of Andhra Pradesh, Forest Department in his inaugural address emphasised on the urgent need to revise the priorities in management of forest resources of our country. The forest department is one of the oldest departments and it has very strong traditions in management of forest resources. Forests have so far been viewed as sources of timber and wood products. So the emphasis of the forest department had been to protect the forests and conserve them for getting maximum advantage in terms of wood based outputs. In the recent years there has been increasing realisation of the environment implications of exploitation of

forests for timber. On the other hand the economic potentiality of non wood forest produce is also being understood. India has a rich heritage of ethnic and systematic scientific work about medicinal properties of its diverse plant resources. Unfortunately, this information is not readily accessible in a manner that will make it possible to design cost effective herbal health intervention programmes. He appreciated the efforts of the Institute of Health Systems in setting up the MEDFLOR-INDIA database. This database will help in developing cost effective herbal based health intervention packages. He urged the Institute of Health Systems to explore the possibility of using the database to collate information about medicinal properties of plants on domestic animals. He drew attention of the participants about the importance of veterinary based economic activities for the poverty alleviation programmes of the country. One of the commonest problems has been non availability of cost effective treatment for common veterinary ailments. As a result agricultural laborers and marginal farmers have to incur heavy economic burden in dealing with the common ailments of their live stock. Some times their whole enterprise suffers a set back due to this. He also appreciated the efforts of the Girijan Go-operative Corporation in trying to increase the value added content of the non wood forest produce collected by the Tribals. He mentioned that funding the MEDFLOR-INDIA is a step in the right direction for realisation of this goal. Sri Ray assured that the Forest department will build into its working plans suitable non wood forest produce plants to bring in greater synergy in the efforts by various departments. He appreciated efforts of the (IHS), and the GCC for developing the MEDFLOR-INDIA database. He also wished for cooperation between IHS and the Forest Department in such types of projects.

The inaugural function ended with a vote of thanks proposed by Dr. G.N.V.Ramana. The seminar then continued with its business sessions. Detailed programme followed by the seminar is enclosed at annexure-2.

**SESSION-1**  
**An Overview of NAPRALERT and MEDFLOR Databases**

Chairperson Dr. G.V.Subbarao

Rapporteurs Mr. Raghu Ramulu and Dhaval M.Shah

**MEDFLOR-INDIA database**

Dr. Ramana gave a brief introduction to the IHS project, MEDFLOR-INDIA database, project of IHS. He outlined the following objectives and the outcome expected from it.

**Objectives Of MEDFLOR-INDIA Project**

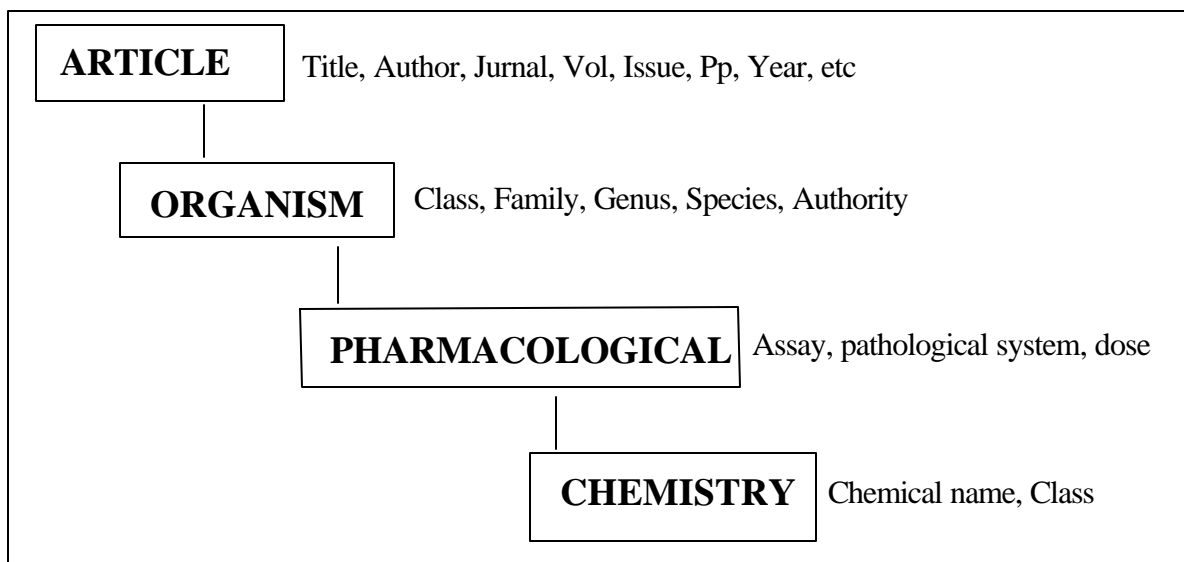
1. To first buildup a computerised database of ethnobotanical information in AP.
2. To build-up of a network of ethnobotanical databases in India.
3. To provide search facility by post, on line and through remote access to scientists, researchers and others.
4. To provide search facility for NAPRALERT database to Indian researchers.
5. To stimulate research and development in medicinal plants.
6. To provide a readily accessible knowledge base for design of herbal medicine oriented health interventions.
7. To provide a medium of documentation and registration of the cumulative intellectual heritage of respective communities about the medicinal properties of plants. There by MEDFLOR-INDIA will be an instrument to secure equitable terms of sharing economic benefits of biodiversity prospecting.

**Project Outcomes**

MEDFLOR-INDIA central site at IHS, Hyderabad will be operational and demonstrated capacity to provide following services.

1. Makes available standards of data structure and dictionaries for setting up and maintenance of additional sites in other parts of the country.
2. Provides search services to researchers, scientists, public health officials and planners.
3. Provides archival services for the citations included in the database.

Trained manpower base in IHS and Department of Botany, Sri Krishna Devaranya University (SKD), Anantapur will be built to develop and operate the MEDFLOR-INDIA database. Continued development of the database will, however, depend on availability of funding.



## **NAPRALERT & MEDFLOR DATABASES**

Dr. Beecher described the development of the NAPRALERT database, and the need for implementation of the MEDFLOR Database.

### **NAPRALERT Database**

The concept of the NAPRALERT database (An acronym for Natural Products ALERT) was initiated by Dr. Farnsworth at University of Illinois at Chicago, to provide search information on pharmacological and phytochemical aspects of the plants and organisms. This activity commenced under the Programme for Collaborative Research in Pharmaceutical Sciences (PCRPS) and is the only World Health Organisation (WHO) collaborative site for U.S.A with major emphasis on research. Structure of the NAPRALERT is as follows:

The database - over a period of 15 years - has accumulated 1,10,000 articles, 42,000 organism details, 4,000 biological activity details and 66,000 chemical activity details. On an average, 2400 articles are screened per month and 900 articles are entered.

The editorial staff, headed by Dr. Farnsworth consists of 15 persons, most of them students, comprising botanists, pharmacologists & chemists. Dr.Farnsworth peruses all articles and assigns them priorities for entry into NAPRALERT. The botanist verify the authenticity of the searching in Index

Symmeres. Then bibliographic, botanical, chemical and pharmacological information in the article is coded by the editorial staff.

The database is managed by a Database Manager who is the only authorised person to work on the database, and incorporate changes like inserts, deletes, updates in it. A Systems Manager assists in maintaining the database.

The present NAPRALERT database is ported over Ingress RDBMS, and occupies ½ giga bytes (GB) of disk space and requires at least 1 GB of working space. The database is made available on INTERNET and can be accessed through E-mail, an daemon process running on the machine checks incoming E-mail every 2 seconds and answers the relevant query. The whole database is also available over STN network Plans are afoot to ship a NAPRALERT CD-ROM version (Chaplin & Hall) by 1994.

The UIC NAPRALERT incurs an expenditure of \$ 3,00,000/- per annum, access to it is offered for a price to pharmaceutical industry interested in herbal medicines.

Dr. Beecher, noted that NAPRALERT addressed more of pharmacological & chemical attributes and less of ethno-medical uses. As NAPRALERT grew in size and increasing demands were made on it, the need for ethnobiological information became apparent. Thus, an ethnobiological database with appropriate linkages to NAPRALERT was conceived.

The experience gained for NAPRALERT provided an opportunity for design improvements. For example, it was found that NAPRALERT required a lot of manpower. Substantial part of the Database Manager's time was spent in rectifying data entry errors. The specificity and completeness of searches is affected to a great extent by spelling errors in the database. It was realised that codification of the botanical information will make the database error free and less manpower intensive. In addition, the new database had to be designed to provide distributed data gathering and data entry to capture the diversity and complexity of world's ethnobiological knowledge base.

The new ethnobiological database is called MEDFLOR (Acronym for MEDicianl FLORa) which relied primarily on pre-compiled and codified botanical and other dictionaries. Also a new data structure was developed similar to NAPRALERT, but simplified without any loss of process. The data structure was first encoded into a 3rd normal form. But looking at query overheads generated, it was slightly denormalised. The MEDFLOR data structure now looks as follows.

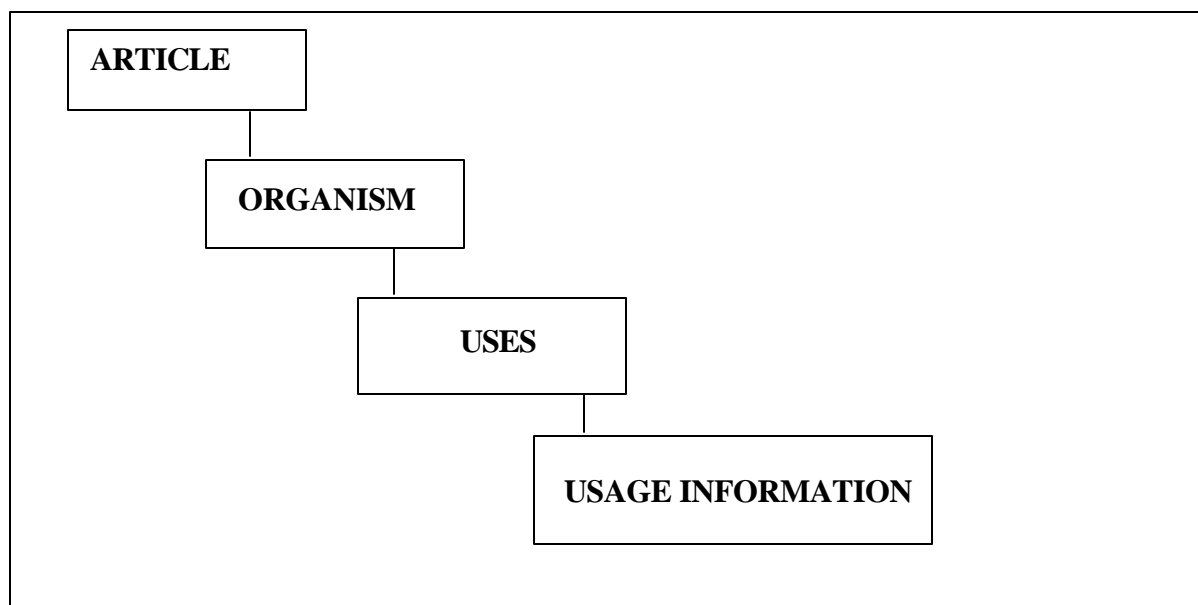
This structure coupled with the extensive character of the dictionaries incorporated into the database gives the database.

1. Flexibility
2. Compatibility with NAPRALERT and
3. Ease of use with separation between data entry system module and the database management module.

## **MEDFLOR-INDIA DATABASE SYSTEM**

Mr. Dhaval M. Shah presented an overview of the MEDFLOR-INDIA database and pointed out the additions made so far to the MEDFLOR-INDIA data structure, to take care of the Indian need.

MEDFLOR-INDIA implementation primarily consists of two modules, the Data Entry Module and the Data Reporting and Querying Module, based on the MEDFLOR Data Structure and the Dictionaries. The Data Entry Module, presently with Institute of Health Systems was developed at University of Illinois at Chicago (UIC), Chicago and the Data Reporting and Querying Module was developed in Foxpro 2.0 (LAN) at Institute of Health Systems.



Data Entry Module and the Data Query Module rest on a pre-defined Data Structure which is implemented by a set of Dictionaries and both the modules can be logically viewed connected by set of Utility programs. This set of Utility programs convert the Data entered through the Data Entry Module, into a set of delimited ASCII text file. Similarly a set of command line utilities in FOXPRO 2.0 read this

delimited ASCII files, and put them into their respective Database files. The major advantages with this kind of separation are:

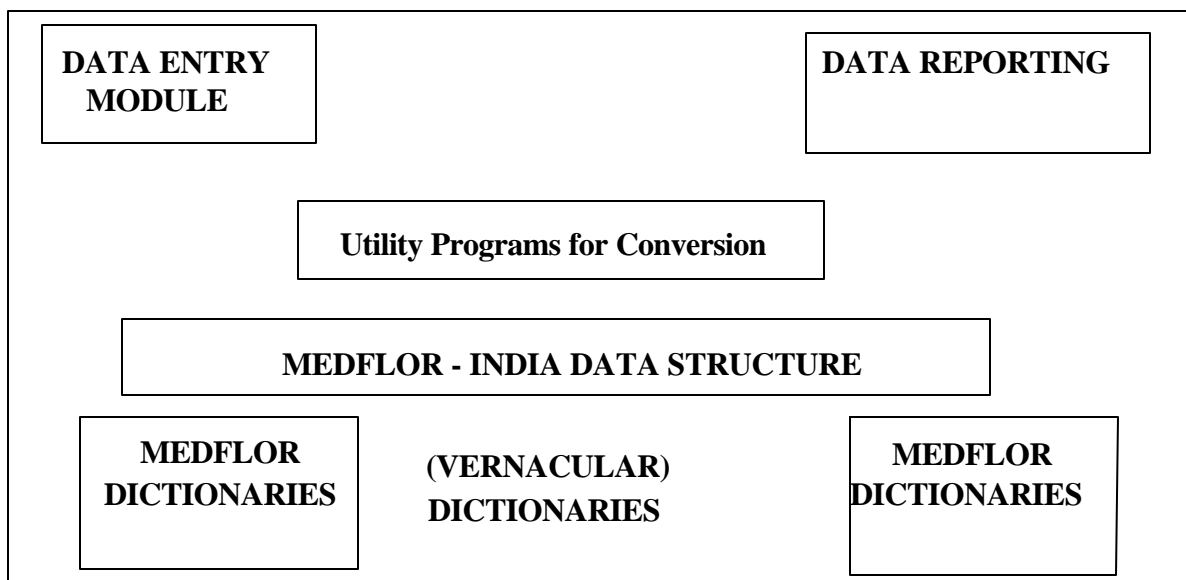
1. The Data Entry Module enforces standards and ensures compatibility with NAPRALERT (NATURAL PRODUCTS ALERT) and other MEDFLOR sites.
2. The Data Entry Module can be customised without loss of compatibility and can be implemented on any type of Software or Hardware Platform.
3. Similarly, the Data Reporting and Query Module being independent of the Data entry Module, can be easily customised to encompass different ranges of queries, and can also be implemented over a wider range of Software Platforms.

Since, the Data Structure is implemented by a set of Dictionaries, another level of abstraction is introduced, that is, the same Data Structure can be implemented by a set of say vernacular Dictionaries which can still be compatible across several database, and will be independent of the Data Entry and the Data Reporting & Query Module.

### **MEDFLOR-INDIA DICTIONARIES**

Mr. Raghu Ramulu narrated the following modifications incorporated in to the MEDFLOR-INDIA dictionary and their correlation to the MEDFLOR core dictionaries.

1. Habitat : MEDFLOR's habitat dictionary is built according to Holdridge (1971). The system of Champion & Seth which is commonly followed in India was, therefore coded according to Holdridge (1971). Slight modifications were made to accommodate especially aquatic and miscellaneous types.
2. Author's citation : The dictionary did not accommodate all the authors connected with botanical nomenclature of Indian flora. This field was converted from a dictionary coding to an open type. A standard code for authors will be made subsequently with reference to KEW literature.





3. Ethnic groups of India according to the listing by the Anthropological Survey of India (ASI). In the ethnic tradition category a new entry “General folklore” - which will cover the medicinal information source from persons other than tribals - was added to the dictionary.
4. An additional field has been created to accommodate information especially with reference to habit, season of occurrence (veg, fl, fr.) . Herbarium specimen number, with collector, and miscellaneous information.

## **SESSION - 2**

### **Panel Discussion on Issues Regarding Editorial Management of Medflor-India.**

**Panelists Prof. : T. Pullaia**

**Dr. Beecher**

**Dr. Nistheswar**

**Rapporteur Dr. Vedavathy**

Prof. Pullaiah drew attention of all participants to the background paper included in the participants package. He went over the background paper and outlined the following issues for discussion:

1. Whether the approach to editorial management outlined in the background paper all right.
2. What are the areas where further elaboration / clarification is necessary?
3. What should be the composition of the editorial management committee?
4. Role of the editorial office.
5. Starting list of journals for surveillance.
6. Starting list of books and texts.

MEDFLOR-INDIA database will contain both published and unpublished parts. All participants appreciated the need for including the available matter having scientific value.

### **Recommended Format for Collection of Ethnobotanical Data in India.**

Majority of the participants came to the consensus regarding the model format. However Dr. Rajaiah felt that the form of administration should also included along with mode of administrator and time of collection. Dr. Nitheswar felt that collection time is not necessary since it is not needed for the database. Dr. Beecher informed that all the above information can be included in the description text and it is not necessary to be given separately. Dr. Subba Rao suggested inclusion of the name and locality of tribal or rural person that is being interviewed. Prof. K.N.Rao suggested, duration and number of patients treated, age group and case reports should also be included in the model format. Dr. Nishteswar felt that there no need to be too rigid since the data that is to be collected is from published journals and there should be flexibility in including the information. Dr. Beecher is of the opinion that the data generation for this is from published data but not from field collection. Hence, only relevant information should be included in the descriptive text.

### **Editorial Management Committee**

The need for having an editorial management committee for the MEDFLOR-INIDA was discussed in detail. All members agreed to limit of the committee of 3 to 5 members. The committee should include persons at least from any three of the following four faculties.

1. Botany (Preferably ethnobotany)
2. Ayurveda (Preferably with interests in Dravyaguna)
3. Modern medicine (Preferably with interests in study of natural products)
4. Anthropology (Preferably with interests in health related practiced, local health traditions etc.)

All participants agreed to the above composition. Dr. Beecher suggested that there should be a Chief editor, who should be available to all easily. Dr. Nishteswar felt that the chief editor should be a composite personality. All agreed that the editorial board should generally meet quarterly to start with and its frequency may be revised based on work load and quality of manpower available in the editorial office.

The detailed guidelines for editorial management of the MEDFLOR-INIDA database, as agreed by the participants, including the format for collection of ethnobotanical information is furnished at annexure 3a-c. The starting lists of journals, books and texts as agreed upon is enclosed in annexure - 3b.

## SECTION - 3

### Panel Discussion on Networking and Linkages for Realisation of India's Potentiality of Herbal Resources

Panelists Sri. Darshan Shankar  
Dr. Christopher W. Beecher  
Dr. Prasanta Mahapatra  
Rapporteur Dr. G.N.V.Ramana

Dr. Mahapatra initiating the discussions stated that India is a vast country with wide ethnic diversity. He felt that diversity within one state of the country is so vast India is akin to a continent rather than just a country. Due to this diversity, he felt that, appropriate networking and coordination between different agencies involved in ethnobotanical research is crucial for developing a database of medicinal plants. He drew attention to the following points brought out by Mr. Raghu Ramulu in the short background paper.

1. **Diversity in Indian Vegetation :** Due to wide variation in climatic conditions across the country it is not surprising that the vegetation types in India also vary from place to place. For example, Rajasthan has large desert stretch having arid climatic conditions which are favourable to xerophytic and scrub jungle forests. While the western Ghats have tropical evergreen forests, the high altitude Himalayan region is favourable to alpine vegetation.
2. **Diversity in Ethnic Group :** Similar to vegetation, there is vast diversity in ethnic groups of India. Different ethnic groups may use the same plant for different purpose and different plants for the same purposes.

With such large and diverse variation in ethnic groups as well as flora in the country it is not possible for a single site, to collect the data from all parts of India. Therefore there is need for setting up multiple sites of MEDFLOR-INDIA database. The structure of the database and the dictionaries to be used by them have, however, to be common. So there is need for a mechanism of coordinated effort to maintain integrity of data structure and also the dictionary and simultaneously provide for their development according to the Indian needs.

Sri. Darshan Shankar in his comments stressed that there are several agencies involved in conservation of bio-diversity of the country. He mentioned that LSPSS at Coimbatore has about 850 highly committed members propagating traditional medicine and community health in different parts of the country. Foundation for Revitalisation of Local Health Traditions (FRLHT), Bangalore, another association he is closely associated with, has been working in the area of conservation and revitalisation of resource base of Indian medicinal plants in the states of Karnataka, Tamilnadu and Kerala. He then detailed about INMEDPLAN (an acronym for Indian MEDicinal PLAnt Network) recently established in the country. Nine institutions across the country have formed a network after signing a formal memorandum of understanding in June 1993 (For details see annexure - 4). These agencies function with the concept of one nodal agency and several satellite agencies in each area of specialisation and

substantial data is already available with each agency. He then stressed the need to avoid unnecessary duplication of work.

Commenting on the MEDFLOR-INDIA, he stated that very impressive work has been done and it is one of the best organised data structure he had ever come across in ethnobotany. He stated that FRLHT is going to organise a work shop for the ethnobotanists soon and it is highly desirable to have MEDFLOR in the agenda. He felt that additional directory for correlating vernacular and Ayurvedic / Sanskrit names is highly desirable.

Tropical Botanical Garden Research Institute (TBRI), Trivandrum is INMEDPLAN centre for medicinal plants database. The TBRI currently has ethnobotanical data on about 7000 plants. This is the result of an all India survey conducted by Dr. Pushpangadhan for the Ministry of Environment, GOI. The data moved to TBRI as Dr. Pushpangadhan became its director. He, however, added that due to wide diversity in the country, the names and uses of the plant are likely to change from place to place. Therefore, the data available at TBRI may not actually reflect the total picture. Regarding computerisation of Ayurvedic scriptures he stated that the Centre for Indian Medical Heritage has undertaken this task and this could be an important source of information if Ayurvedic texts are proposed to be added to the database. He felt that most of the available folk literature on medicinal plants is from south India and stressed the need for closer look into the earlier European works undertaken in India.

He concluded stating that networking is vital for developing of databases and it avoids unnecessary duplication of work that has already been done. Since TBRI is going to computerise the unpublished field data, he suggested that the site at IHS can focus on published literature. He also stressed the need to explore the scope of establishing linkages with Ayurvedic, Unani and Siddha texts. In this context he felt that Hyderabad could be a vital link for Unani.

Dr. Beecher said that MEDFLOR structure and dictionaries are made available at IHS and networking is the key for information dissemination. He stated that adequate standardisation exercise has been undertaken in developing the MEDFLOR structure so that are not duplicated. He felt that synonyms are very vital in establishing such data bases and diffusion of information from field to the published data will be quite interesting. With such linkages they can be considered as single large source of knowledge. He concluded, stating that global networking is very crucial in propagating the database and he will extend all his support in this context.

Dr. Narayana Rao expressed the difficulties associated with description of species. Dr. Beecher in response, stated that while describing any names which are not common, an expert taxonomist need to be consulted to find out whether it is a synonym or a new species. Dr. Venkata Raju said that, due to wide variation in plant species in north and south, the chemical contents also vary widely. He therefore, felt that species concept is not appropriate.

Sri. Darshan Shankar stated that considerable data is available with Publication and Information Directorate (PID) of CSIR which also maintains a bibliographic database and archives. Dr. P. V. Raj said that INSDOC also provides information on medicinal plants.

Dr. Rajaiah felt that more detailed information on the use(s) of the plant should be provided in the database for the use of researchers and to avoid bias. Reacting to this Dr. Beecher said that to avoid such issues a statement would be given at the beginning indicating that the data is from published literature and care has been taken to present all the information provided in the article. If somebody wants more information they should check with the original author. At this juncture Dr. Mahapatra added that the nodal agency would maintain an archive of the articles entered in the database.

It was finally agreed that most of the information provided in the article would be entered on to the database. However, for a more detailed reference by researchers, an archive of all articles entered in the database would be maintained at the nodal agency.

After a detailed discussion the group agreed that the access to the unpublished data should be restricted according to the wish of the, scientists, institution or authority making it available. The group agreed that all efforts are needed to ensure intellectual property rights and to protect the bio-diversity of the plant species in addition to safe guarding the rights of the tribals. After discussing this issue, the group felt the data base should be primarily of use to Indian researchers. The group expressed its concern regarding non availability of adequate capacity for establishing such databases. It was agreed that all efforts are needed to develop a set of well trained people.

## **SESSION - 4**

### **The State of Ethno - Botanical Research in India with Particular Reference to A.P. and Directions for the Future**

**Panelists Prof : K.N.Rao**  
**Dr. R. R. V. Raju**  
**Mr. Mathew. Don**  
**Rapporteur N. Nagaraju**

Participants took note of the background paper prepared by Dr. G. N. V. Ramana and broadly concurred with it. Hence the points covered by the paper are reproduced below.

#### **ETHNOBOTANY**

The term ethno-botany was first used by Harshberger (1896), who has defined it as a study of “plants used by primitive and aboriginal people”. Later this term was broadened by Robbins et al (1916), who suggested that the science of ethnobotany should include the investigation and evaluation of the knowledge of all phases of life amongst the primitive societies and of the effects of the plant environment upon the life customs, beliefs and history of these tribal peoples. The most concise definition of the term ethnobotany was forwarded by Jones (1941) who called it as a study of interrelationships of primitive men and plants. Ethnobotany can be considered as a subset of botany which emphasizes the uses of plants, their potential for incorporation into another culture and have indirect contact with the plants through their by products (Ford, 1980).

Indigenous knowledge is essential to know the use, identification and cataloging of the tropical plants. As tribal groups gradually disappear, their knowledge vanishes with them. It is therefore, necessary to document these claims in a systematic way by undertaking ethnobotanical studies.

#### **ETHNOBOTANY AND MEDICINE**

Plants have been serving mankind as most important weapon against disease. It is estimated that almost half of the prescriptions in USA contain substances of natural origin. The plants that are used by tribals can be useful to the modern medicine in four basic ways.

1. Plants can be used as direct sources of therapeutic agents e.g. Alkaloid D-Tubocurarine Reserpine.
2. Plant sources can be used as starting points for elaboration of more complex semi-synthetic substances e.g. Saponin extracts in synthesis of steroids.
3. Plant sources can be used as models for developing new synthetic medicines e.g. Cocaine in the synthesis of many local anaesthetics.
4. Plant can also be used as taxonomic markers for the discovery of new compound e.g. Phytochemical studies.

## **INDIAN FOLK MEDICINE**

This is an age old system practiced by primitive people, particularly, the tribals residing in remote villages and forests. The knowledge gained over the years - through trial and error methods - about the medicinal uses of local flora are transmitted from one generation to another. It is an outcome of bold experimentation and useful observations made over several hundreds of years and is in fact considered as mother of all other traditional systems of medicine

Folk medicine may broadly be divided into two major categories the Herbal folk medicine and Magico-religio folk medicine. Unfortunately, the common feeling is that these herbal flock medicine is with in the access of every one and there is no need to undertake any systematic study. There is an immediate need to document these claims which provides a basis for further research. Ethnobotanical documentation, therefore, constitutes the most logical step towards achieving this objective.

## **MEDICINAL PLANTS IN INDIA**

Medicinal plants are being widely used in India either directly as folk remedies or medicaments of different indigenous systems of medicine like Ayurveda, Unani and Siddha. Out of about 40,000 plant species so far described in India, different medicinal uses have been described for more than 7000 species.

India has a vast reservoir of nearly 400,000 practitioners of Ayurveda, Siddha, Unani etc., whose services could not be adequately utilized in the health care delivery systems. About 80% of the raw materials for drugs used in the Indian systems of medicine and homeopathy are based on plant products. The credibility of these systems of medicine, therefore, depends on availability of authentic



raw material in sufficient quantities. At present, there are about 46,000 licensed pharmacies manufacturing medicines for these systems.

As early as 190 Nadkarni published the Indian Materia Medica. This was followed by a detailed scrutiny of literature in Indian Medicinal plants by Majumadar (1927), Kirtikar and Basu (1933) and Chopra et al (1956, 1969). Surprisingly the ethnobotanical research in the country is far too little and mostly confined to the regions where botanical research institutions or universities are located.

Several premier institutions such as Council for Scientific and Industrial Research (CSIR), Central Institute of Medicinal and Aromatic Plants (CIMAP), Tropical Botanical Garden and Research Institute (TBRI), Trivandrum and Botanical gardens located in different parts of the country have put in considerable effort to put together information on medicinal use of plants in different parts of the country. Some of these institutions are even screening the plants, identified by ethnobotanical studies, for their biological and phytochemical properties. Unfortunately, even these institutions, so far, could not bring out all the potentialities of the local claims made for most of the plants. The CIMAP is concentrating its attention on *Mentha arvensis* L. (Japanese Mint), *Cymbopogon Winterianus* Jowit (Citranella), etc. The same Institute is also involved in developing appropriate agro-technology for growing the medicinal plants. The TBRI has recently concluded a project on listing the medicinal plants in India and is currently in the process of developing a data base. The Foundation for Revitalisation of Local Health Traditions, a non governmental organisation, has recently initiated the task of networking different institutions currently undertaking studies on medicinal plants.

## **ETHNOBOTANICAL RESEARCH IN ANDHRA PRADESH**

In the state of Andhra Pradesh, it was reported that there are about 700 plants of medicinal importance (Seshagiri Rao 1984). However, most of the ethnobotanical research in the state was restricted to some regions and a detailed systematic ethnobotanical research in the entire state has not been undertaken so far. The state of Andhra Pradesh, according to the data available, with the Social Welfare department, has around 33 main tribes and another 60 other smaller tribes. Out of these tribes not more than 15 tribes have been covered by ethnobotanical studies. A significant part of the ethnobotanical research in the state has been undertaken in the regions surrounding the Universities ie. Andhra University (Visakapatnam, Srikakulam), Sri. Krishna devaraya University (Anantapur, Cudappah, Karnool), Sri. S.V.University (Chittor and parts of Rayalaseema region).

A survey undertaken for Council for Scientific and Industrial Research (C S I R) by Seshagiri Rao and Hemadri (1984) revealed that, even among the medicinal plants identified by ethnobotanical studies in different parts of the state, only a few are commonly used by the pharmaceutical industries. The most commonly used herbal medicines include roots of *Hemidesmus Inducus* and fruits of *Embolia officinalis*, *Terminalia chebula*, *Strychnos noxvomica*.

## **DIRECTIONS FOR FUTURE**

Through considerable information on medical plants in Andhra Pradesh - consisting of nearly 700 plants - is available, little effort has been made to systematically present this data in an easily retrievable form. Most of this information is fragmented and region specific and it is not uncommon to notice that the same plant has different medicinal uses in different tribes. A closer look at the published literature indicates that the available information in many articles is necessary to standardise the data collection format. There is need for networking of the existing ethnobotanists in the state to undertake systematic coverage of entire state rather than duplicating the work already done. It would be appropriate to explore the support of the GCC for this kind of activity.

Prof. K. N. Rao then explained the traditional system of medicine with relation to human anatomy. He explained his personal experience in curing the diseases by means of herbs and herbal products. Ethnobotanical information can be scientifically validated by means of phytochemistry and pharmacognosy. Collecting the information from tribal should be clear and systematic, he said. He listed various medicinal plants studied by him and narrated their properties.

Dr. R. R. V. Raju expressed his concern about quality of Ethno-botanical research in Andhra Pradesh. Some researchers are publishing papers without doing field work. Hence adequate care screening should be taken by the editorial board in selecting the citations for entry into the database.

Mr. Matahew Don suggested that availability of plants, i.e. Whether cosmopolitan or localised, should be incorporated into the database. Usages requiring two or more plants the information included in two or more records respectively.

**SESSION - 5**  
**Utilisation of MEDFLOR-INDIA and NAPRALERT Databases**

Panellists Dr. G. V. Subba Rao  
Dr. Sripati Rao  
Dr. Nishteswar  
Rapporteur Mr. Mathew Don

Dhaval. M. Shaw and Pradeep Reddy demonstrated the MEDFLOR-INDIA Query system. The database can be queried by sending requests to IHS by post. Result of queries will be mailed to the concerned. In addition scientists can query the database at IHS by using IHS terminals. Remote access to the database through telephone will be provided in future.

### **VALEDICTORY**

Dr. Mahapatra thanked UIC and PCRPS for having spared the services of Dr. Beecher to train the local team. He thanked Dr. Beecher for the contributions he has made by spending time and effectively training up the local team.

**ANNEXURE - 1**  
**LIST OF PARTICIPANTS**

1. Dr. B. Ravi Prasad Rao, Lecturer in Botany, S.K.University, Anantapur.
2. Dr. G. V. Subba Rao, Consultant, Girijan Co-operative Corporation (GCC),Vishakapatnam.  
Phone : 51964.
3. Dr. N. Nagaraju, F Block, Room No. 23A, S.V.University Hostel, Tirupati. Phone:24102.

4. DR. Nishteswar, Lecture (Dravyaguna), Govt. Ayurvedic College & Hospital, Vijayawada.
5. Dr. P. V. Raj , Research Officer, Govt. Research Dept., (AY), Charminar, Hyderabad. Phone:524421 (Ext..40).
6. Dr. Prasanta Mahapatra, Hon. President, the Institute of Health Systems, DMS Complex, Sultanbazar, Hyderabad, AP 500195, INDIA.
7. Dr. R. R. V. Raju, Reader, Dept. of Botany, S.K.University, Anantapur. Phnoe:20923, 24,25 (ext..240).
8. Dr. Rajaiah, Prof. & Head of the Dept.of D.G., R.S., D.K., S.V.Ayurvedic Medical College, Tirupati. Phone: 22123
9. Dr. S. Vedavathy, Lecturer in botany, S.V.Arts College, Tirupati. Phone :21605.
10. Dr. T. Sripati Rao, Prof. & Project Officer, Clinical Research Division, Govt. Res. Dept. Hyderabad. Phone: 524421.
11. Dr. G. N. V. Ramana, Director, The Institute of Health Systems, DMS Complex, Sultanbazar, Hyderabad, AP 500195, INDIA.
12. Mr. Dhaval M. Shaw , Systems Manager, the Institute of Health Systems, DMS Complex, Sultanbazar, Hyderabad, AP 500195, INDIA.
13. Mr. Mathew Dan, JSA, Tropical Botanic Garden & Research Institute, Palode 695562, Thiruvananthapuram. Kerala . Phone:047284 - 236.
14. Mr. Ravi Chander, FRLHT, #50, MSH Layout, 2nd Cross, III main, Anand Nagar, Bangalore. Phone:3336909.
15. Mr. D. Raghu ramulu, Ethnobotanist, the Institute of Health Systems, DMS Complex. Sultanbazar, Hyderabad, AP 500195, INDIA.
16. Mr. T. Pradeep Reddy, Systems Manager, the Institute of Health Systems, DMS Complex, Sultanbazar, Hyderabad, AP 500195, INDIA.
17. Prof. K. Narayan Rao, Door No. 578, Ist Lane, Balaji colony, Tirupati.
18. Prof. Pullaiah, Professor, Dept. of Botany, S.K.University, Anantapur.
19. Sri. Darshan Shankar, Director, Foundations for Revitalisation of Local Health Traditions (FRLHT), #50, MSH Layout, 2nd Cross, III main, Anand Nagar, Bangalore. Phone:3336909.
20. Sri. Vijay Kumar, Managing Director, Girijan Co.operative Corporation(GCC), Visakapatnam.

## **ANNEXURE - 2**

**Institute of Health Systems, Hyderabad**  
**Seminar on**  
**MEDFLOR-INDIA and Ethnobotanical Research in Andhra Pradesh**  
**Date: Dec 16-17, 1993**

Date & Tame	Programme Description	Chair person /Panelists/ Lead Speaker	Rapporteur
Dec. 16, 1993 (First day)			
11.00 am-11.00 am	Inauguration	Sri.S.Ray, IAS, Prl.Secy to Government of AP, Forest Department, Mr.Vijay Kumar MD GCC, Dr.Prasanta Mahapatra Hon.President IHS.	
11.00 am - 11.30 am <i>Tea Break</i>			
11.30 am-1.00 pm	Ssn-1: An overview of NAPRALERT and MEDFLOR Databases	Vijay Kumar/ Dr.Subbarao	Mr.Raghuramulu & Dhaval Shah
	An Introduction to MEDFLOR-INDIA project of the IHS	Dr. GNV Ramana	
	An overview of NAPRALERT and MEDFLOR Databases	Dr.Chris Beedher	
	Implementation of MEDFLOR-INDIA	Mr.Raghuramulu & Dhaval M.Shah	
1.00 pm - 2.00 pm <i>Lunch</i>			
2.00 pm - 3.30 pm	Ssn-2:Panel discussion on issues regard- ing editorial managements of MEDFLOR-INDIA	Prof.Pulliah, Dr.Beecher, Dr.Kopula Hemadri	Ms.Vedavathi
3.30 pm - 4.00 pm <i>Tea Break</i>			
4.00 pm - 5.30 pm	Ssn-3:Panel discussion on Networking and Linkages for Realisation of Indias potentiality of herbal resources	Darshan Shankar, Dr.Beecher, Dr.Prasanta Mahapatra	Dr.GNV Ramana
Dec.17, 1993 (Second Day)			
9.30 am - 11.00 am	Ssn-4:Panel discussion on The state of ethnobotanical research in India with particular reference to AP and directions for the future	Prof.Narayan Rao, Dr.Venkat Raju, Mr.Mathew Don	Dr.Nagaraju
11.00 am - 11.30 am <i>Tea Break</i>			
11.30 am-1.00 pm	Utilisation of MEDFLOR-INDIA and NAPRALERT Databases	Dr.Beecher, Dr.PV Raj, Dr.Subba Rao	Mr.Mathew Don
1.00 pm - 2.00 pm <i>Valedictory</i>			
2.00 pm - 3.00 pm	<i>Lunch</i>		

## ANNEXURE - 3A

### Guidelines for Editorial Management of the MEDFLOR-INDIA Database

The MEDFLOR-INDIA data base will have two parts as follows:

1. **Part-1: Published part.** This will contain information collected from published sources. It will be readily available to all who want to search MEDFLOR-INDIA. Any general reference to MEDFLOR-INDIA in the context of search and retrieval without specific qualification as to which part it pertains to shall mean that it pertains to the published part.
2. **Part-2: Unpublished part.** This will consist of ethnobotanical information collected and validated in a scientific manner either by individual scientists or by special surveys but not published in literature. Accessibility to data from unpublished sources will be regulated according to specific instructions of the scientist or agency which makes it available to MEDFLOR-INDIA.

All data for MEDFLOR-INDIA (part-1) will originate in one of the following ways.

1. **Articles from journals under surveillance:** For this purpose MEDFLOR-INDIA will identify, from time to time, a list of journals it will keep under surveillance for articles with ethnobotanical information. Only journals that have a regular mechanism of peer review of articles published in them will be considered for inclusion in this list. Another criteria for inclusion will be the regularity with which the journal carries articles with ethnobotanical information. The editorial will check these journals regularly for this purpose.
2. **Retrospective literature search :** A retrospective survey of articles already published will be made to identify and bring in the large amount of published literature on medicinal plants in India. This search will be directed first to the back issues of journals identified for surveillance and then will be extended to other journals.
3. **Books:** For example Ayurvedic texts, etc.
4. **Articles from journals not under surveillance:** Any article in any journal with ethnobotanical information, that comes to the notice of the editorial office of MEDFLOR-INDIA shall also be considered for inclusion. For this purpose MEDFLOR-INDIA may also benefit from the suggestions and information given by scientists in various parts of the country. The possibility of establishing a network of scientists designated as MEDFLOR-INDIA correspondents will be explored. These scientists will be provided regular feedback about MEDFLOR-INDIA activities and in return will be requested to look for articles with ethnobotanical information in journals not regularly surveyed by the editorial office. In this category the editorial review office may receive articles from journals which do not have a regular system of peer review of articles published in it. In such a case the



editorial office shall arrange for peer review of the article before it can be considered for inclusion in MEDFLOR-INDIA.

All editorial decisions shall be made under the general guidance and supervision of an editorial board consisting of between 3 to 5 members. The committee should include persons at least from any three of the following four faculties.

1. Botany (Preferably ethnobotany)
2. Ayurveda (Preferably with interests in Dravyaguna)
3. Modern medicine (Preferably with interests in study of natural products, pharmacognosy, clinical pharmacology or community medicine)
4. Anthropology (Preferably with interests in health related practices, local health traditions etc)

The editorial board should generally meet quarterly to start with and its frequency may be revised based on work load and quality of manpower available in the editorial office. The database will contain information about the composition of the editorial board from time to time. The editorial board will be assisted by an editorial office to be maintained by the Institute of Health Systems.

It has been seen during the preparatory phase of MEDFLOR-INDIA that most journal articles do not contain the full range of information which MEDFLOR is designed to store. This is understandable, in the absence of any methodological specification for collection of ethnobotanical information. In order to encourage researchers to report more complete ethnobotanical information in their articles a model format for collection data for the MEDFLOR-INDIA database has been developed. The model format is enclosed in Annexure-1. It is not necessary that all articles report data to cover all points in the format, particularly if this would dilute the primary focus of the article or if collection of such data would require time that may not be available to the researcher. The intention behind the format is to inform researchers about the kind of data items covered by MEDFLOR, so that they may consider including the relevant ones in their research. For the unpublished part (part-2) of the database, as far as possible data will be collected in the model format.

The editorial office will maintain an archive of articles, books and all materials from which data for the MEDFLOR-INDIA is collected. The archival service will provide copies of such articles to researchers and scientists upon request.

**ANNEXURE - 3B**  
**Model Format for Collection of Data for**  
**MEDFLOR-INDIA Data Base**

[Answer to questions / items in italics should be selected from out of the respective dictionaries. In case it found that none of the dictionary entry is appropriate the miscellaneous category is to be selected and a special remark about it should be written in a separate sheet. Copy of the model format with the respective dictionaries can be had from the IHS on request.]

<b>ETHNOBOTANICAL</b>		
1	Informant & related details	
2	Local name of the plant	
3	Language of Local Name	
4	Locality (Village/Forest Block)	
5	Ethnic Group	
6	Ethnic Tradition	
7	Use	
8	User	
9	Plant part used	
10	Method of preparation	
11	Mode of administration	
12	Miscellaneous	
<b>BOTANICAL</b>		
13	Genus	
14	Species	
15	Infraspecific group	
16	Synonyms	
17	Family	
18	Habit	
19	Habitat type	
20	Season of Occurrence (Vegetative/ flowering / fruiting	
21	Locality / Local Abundance	
22	Miscellaneous	
<b>PHYTOCHEMICAL</b>		
23	Chemical Analysis	

## **ANNEXURE - 3C**

### **STARTING LIST OF JOURNALS FOR SURVEILLANCE**

1. Journal of Ethno-botany
2. International Journal of Crude Drug Research
3. Ancient Science of Life. ISSN 0257-7941 (Published by D. Suresh Kumar for AVR Educational Foundations of Ayurveda, 366, Trych Road, Coimbatore 641018, India)
4. Bulletin of Ethnobotany.
5. Journal of Economic, Taxonomical Botany.
6. Journal of applied & Pure Biology
7. Journal of Research in Ayurveda and Siddha (Published by Council for Research in Ayurveda and Siddha Editorial & Business office: Publishers Division, D-5, Green Park, New Delhi. 110016.)
8. Journal of Ethnopharmacology. Elsevier Scientific Publishers, Ireland Ltd.
9. Journal of Medicinal Herbas and Spices.
10. Indian Medicinal and Aromatic Plant Abstract. (Publishers & Information Directorate, CSIR, Hillside Road, New Delhi 110012)
11. Journal of Medico-Ethnobotany.
12. Indian journal of Medical Research, (ISSN 0019-5340, Published by Indian Council of Medical Research, (ICMR), New Delhi)
13. Planta Medica
14. Indian medical journal

### **STARTING LIST OF BOOKS AND TEXTS**

1. Medicinal Plants of India. Vol.1, 1976, Editors: Dr.G.V.Satyavati, Dr.M.K.Raina, Dr.Sharma Published by ICMR, New Delhi.
2. Medicinal Plants of India Vol.II, 1987, Editors: Dr.G.V.Satyavati, Dr. Asok K.Gupta, Smt.Neerari Tandon, Published by I.C.M.R.New Delhi.
3. The Wealth of India, series, The dictionary of Indian Raw materials Industrial Products, 1985 (ISBN 81-85038-00-781-85038-01-5, Published by Publication & Information Directorate, C.S.I.R, Hillside Road, New Delhi.110012)

4. Indian Medicinal Plants. 4 Volumes. Kirtikar and Basu.
5. Materia Medica. Vol.I &II, 1976. Nandkarni.
6. Medicinal Plants and Folklore. V. K. Singh & A.M.Khan.
7. Glossary of Medicinal Plants. Chopra et all. C.S.I.R, New Delhi.
8. Indian Ethno-botany. S.K.Jain
9. Modern Plants in Ethno-botany. Sharma & Gupta
10. Vasthugunadeepika
11. Vasthugunachandrika
12. Charaka Samhitha
13. Sushrutha Samhitha
14. Medicinal Plants of Tirumala. K.N.Rao & Thammanna, 1990, (Published by the Tirumala Tirupati Devasthanams, Tirupati).
15. Andhra Pradesh lo Mandumokkalu. K. Hemadri & R. Seshagiri Rao, C.C.R.S. Publications on Medicinal Plants. (4th & 5th Vol.)
16. Medicinal plnats from Andhra Prahesh (Andhra Pradesh lo Vanamoolikalu), Koppula Hemadri, Chemiloid Publications, Vijayawada.
17. Dravyaguna Prayoga Vignanam. Dr. Nishteswar
18. Indian Medicine Industries, Karlmark Road. Vijayawada
19. Medicinal Plants of Eastern Ghats of A.P, N.Rama Rao
20. Bhavaprakasha
21. Dhanvantari Nigantu
22. Amarakosh

## **ANNEXURE - 4**

### **INMEDPLAN**

#### **WHAT IS INMEDPLAN**

The Indian Medicinal Plants National Network of Distributed Databases (INMEDPLAN) an initiative being developed in consultation and collaboration with a number of specialised national nodal agencies involved in plant related work.

#### **OBJECTIVES OF INMEDPLAN**

1. Generate 'Reliable' multi-disciplinary information on Indian Medicinal plants.
2. Adapt databases to serve information needs of Agriculture, Community Health.
3. Contribute, by way of useful data to a popular level of education about medicinal plants.
4. Evolve and grow into an exhaustive national information resource, in the area of plants and plant based natural products.

#### **WHO ARE THE NODAL AGENCIES?**

Nodal agencies are agencies specialised in a particular head of data. The agencies and the information being managed by them is as shown under.

Head of Information	Centre	Contact Person	Information Available
AGRO TECHNOLOGY	Central Institute of Medicinal and Aromatic Plants (CIMAPs), PB No.1, P.O.Ram Sagar Misra Nagar, Lucknow 226016	Dr.R.K.Singh	Propagation, manure & fertilisers, harvesting yield, pests & diseases, cultivation economics, sources of planting material supplies and other relevant information.
BIBLIOGRAPHY & ABSTRACTS	Publication & information Directorate (PID) Dr.K.S. Krishnan Marg, New Delhi 110012	Mr.H.C.Jain	Plant references, source, title, author, institution and abstract of the article. The journal and the year in which published
BOTANY	Botanical Survey of India, Tamil Nadu Agricultural University Campus, Lawley Road, Coimbatore 641002	Tech.Officer (Computers)	Plant reference, source of record, Taxonomic and morphological details synonyms and other information
ECOLOGY	Dept. of Ecology, French Institute, 11, St.Louis St., PB 33, Pondicherry 605 001.	Dr.B.R.Ramesh	Natural conditions in which Medicinal plants occur viz. Topography, climatic factors, edaphic factors, distribution pattern etc.
ETHNOMEDICINE	Tropical Botanical Garden and Research Institute (TBGRI), Karimancode, Pacha-Palode P.O. Thiruvananthapuram, Kerala 695562	Dr.P.Pushpangadhan	Location and ethnic source, disease for which plant used, plant part condition (fresh/dry), medicine form, administration mode etc.
PHARMACOGNOSY	Ayurveda Research Institute, Poojappara, Thiruvananthapuram, Kerala 695562	Dr.N.Lakshmi	Macroscopic and Microscopic description of plant, official part, histology, taste, odour and other distinguishing features.
PHARMACOLOGY	Central Drug Research Instt (CDRI) Chattar Manzil, PB No.173, Lucknow 226001	Dr.R.K.Sharma	Screening data (x115) type of test, results etc.
PHYTOCHEMISTRY	Regional Research Laboratory (RRL) Canal Road, Jammu 180001	Dr.R.S.Kapil	Isolation technique, constituent/compounds, chemical class structure, part containing constituent, percentage yield, analytical techniques, bioactivity evidence (invivi/invitro), biosynthetic studies etc.
TRADITIONAL (INDIGENOUS) SYSTEMS	Centre for Indian Medical Heritage (CIMH) PB No.7102, Ramanathapuram, Coimbatore 641045	Dr.S.N.Venugopal	System of Medicine (Ayurveda), scripture references, indigenous classification, properties, processing, clinical usage, formula- ries in which used etc.
THE NETWORK	Foundations for Revitalisation of	Mr.Ravi Chander	Network secretariat

SECRETARIAT (NS)	Local Health Traditions (FRLHT) No.50, 2nd Stage, 3rd Main, MSH Layout, Anand nagar, Bangalore 560024		
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INMEDPLAN will be serviced by a network secretariat, the responsibility of which has been accepted by the Foundation for Revitalisation of Local Health Traditions (FRLHT). The responsibilities of NS are:

1. Publish INMEDPLAN data standards which will contain common standards for nomenclature and standard data structure for each specialising head of data.
2. Publish a consolidated multi-disciplinary index of the data on this network.
3. Enhance user awareness by a periodic newsletter.
4. Liaise with international databases to strengthen the database building activity of the network.
5. Clearing house for requests and queries, passing them on to the appropriate nodal agencies. The Network secretariat will not be acquiring the database from the Nodal Agencies.

Distribution of data will be directly by the Nodal Agency. NETWORK GRAPHIC CENTER C/o, Centre for Indian Medical Heritage. The Network Secretariat will establish a Network Graphic Centre to be managed by FRLHT. The centre will handle graphic elements of the database. Certain important elements of data in this network are graphic in nature, such as colour photographs, line drawings and those related to pharmacognostic data. The graphic centre will be equipped with suitable hardware and software to scan/digitise drawings, process them into approved formats. Outputs from the Network Graphic Centre will typically be made available in two formats: one low resolution version with adequate details for reviewing on computer screens and obtaining representative hard copies and the other, high resolution version will be made available on demand for print/ publishing quality images.