SAHYOG Conference and Brokerage Event on Bio-economy
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Some “Waste” Statistics from India

- About 0.1 million tonnes of municipal solid waste is generated in India every day. That is approximately 36.5 million tonnes annually.
- Per capita waste generation in major Indian cities ranges from 0.2 Kg to 0.6 Kg.
- Difference in per capita waste generation between lower and higher income groups range between 180 to 800 gm per day.
- Calorific value of Indian solid waste is between 600 and 800 Kcal/Kg and the density of waste is between 330 and 560 Kg/m3.
- Out of the total municipal waste collected, on an average 94% is dumped on land and 5% is composted.

Between 2000 and 2025 the waste composition of Indian garbage will undergo the following changes:

- *Organic* Waste will go up from 40 percent to 60 percent
- *Plastic* will rise from 4% to 6%
- *Metal* will escalate from 1% to 4%
- *Glass* will increase from 2% to 3%
- *Paper* will climb from 5% to 15%
- *Others* (ash, sand, grit) will decrease from 47% to 12%

Unmapped waste resources Forest, Agriculture Fields etc.

Waste or Resource

Waste can be a valuable resource

Recycle, reuse and RECOVER

DBT HAS INITIATED PROGRAMMES WHICH PROVIDE A PLATFORM FOR A BIO ECONOMY VENTURE

National Bioresource Development Board

Set up in 1999 with

Vision:

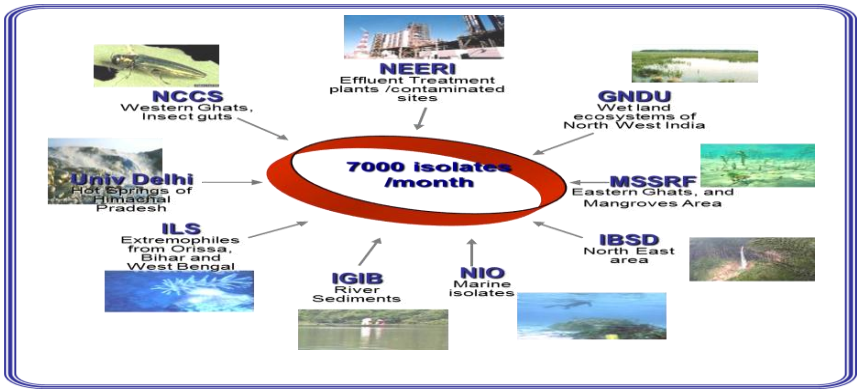
- Development and sustainable utilization of Bioresources for economic prosperity of the nation.

Mission:

- To evolve a broad policy framework and an effective action plan for accelerated R&D for development of new products and processes sustainably utilizing the rich biodiversity of our country.

Mission Programme on Microbial Prospecting: Drugs from Microbes

Phase-I: Screening for Bio-Molecules from Microbial Diversity Collected from Different Ecological Niches



No. of Microbes collected- ~ 2,50,000	
No of 3* hits- 16,123	
Anti-infective	5286
Anti-cancer	518
Anti-diabetes	6676
Anti-inflammation	3643

Phase – II: Chemical characterization of selected hits for bio-actives

Present Status:

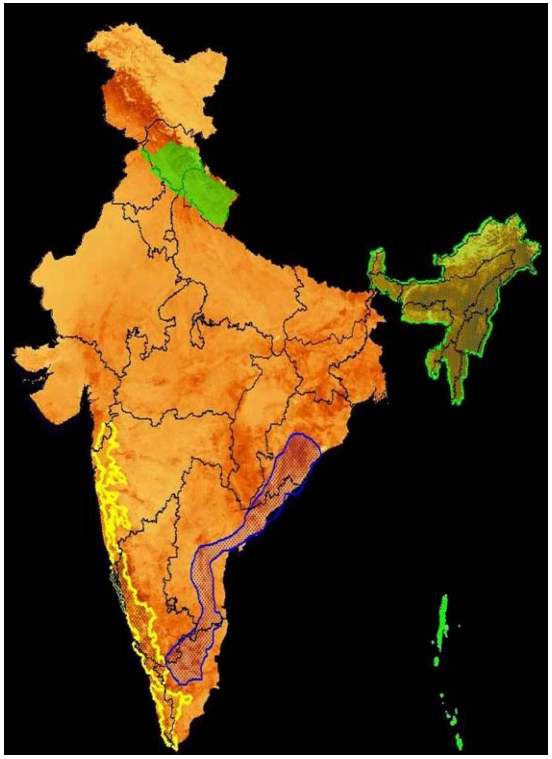
- 1875 extracts have been prepared and analyzed for activity
- 6626 isolates sequenced for 16S rDNA data
- Confirmed structures of 7 compounds by NMR and Mass spec data
- Identified 1 NCE with anti-cancer and anti-inflammatory activity 12 probable NCA which was under novelty search
- Isolated 23 compounds and structural elucidation is underway

Bio-resource Inventory and Biodiversity Characterization

Characterization at Landscape Level using Satellite Remote Sensing

Mapping and database preparation

- North-eastern India,
- Western Himalayas,
- Western Ghats region and
- Andaman and Nicobar Islands
- Central India, Eastern Ghats
- Deccan Peninsula
- Northern Plains
- NCR Delhi, Uttar Pradesh, Bihar
- North-West India, Jammu & Kashmir state



Quantitative Assessment and Mapping of Biodiversity at ground level

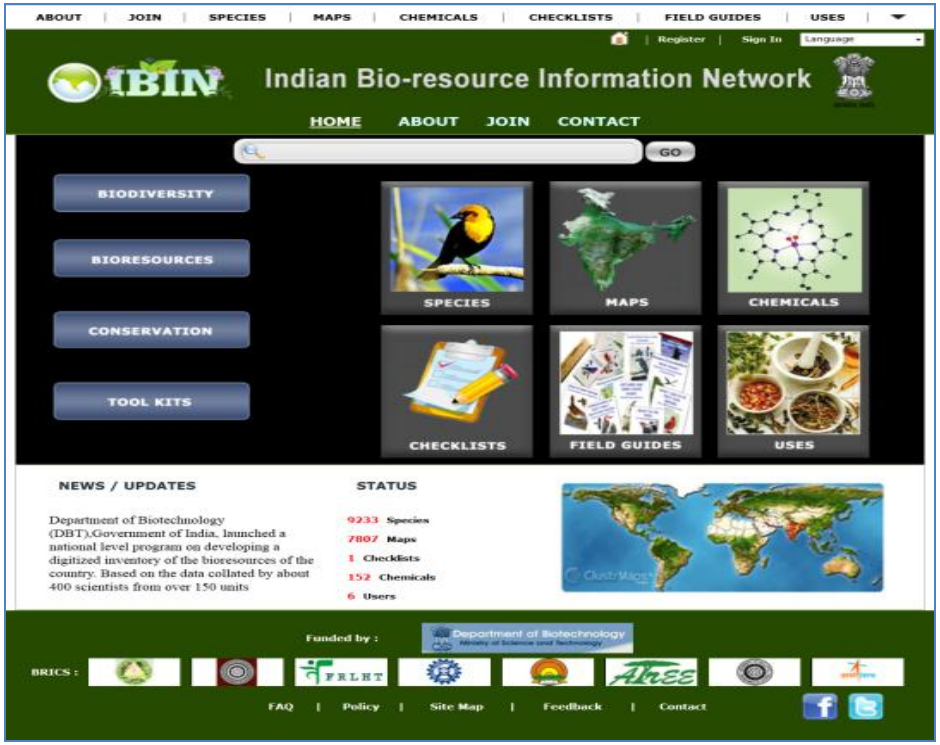
- **Western Ghats – 100%, 3230 grids completed; Data on 2600 species**
- **Eastern Ghats – 100%, 2652 grids completed; Data on 2273 species**
- **North-East – 50%, 1200 grids completed; data on 2600 species**
- **A&NB Islands- 52%, 527 grids completed; data on 2352 species**

Total Geographical Area - 328.0 M ha;

Forest cover – 6.78 M ha (100% of the country's forest cover)

Indian Bioresource Information Network (IBIN)

The IBIN portal developed as a single window gateway to access distributed bioresource database available in the country



Jeeva Sampada:

- The largest Interactive database
- Data on 39,000 species
  - **Plants, animals, marine organisms and microbes**
- More than 54,00,000 records
- Images, distribution maps uses

Coordinating Centers of the IBIN Portal

- University of Agricultural Sciences, Bangalore,
- Indian Institute of Remote Sensing, Dehradun

Public domain link: www.ibin.gov.in

Bioresource Information Centres

- Ashoka Trust for Reasearch in Ecology and the Environment, Bangalore,
- North Eastern Hill University, Shillong,
- Foundation for Revitalisation of Local Health Traditions , Bangalore,
- Calcutta University
- Institute of Himalayan Bioresource Biotechnology, Palamapur

Bioprospecting of Plants and Other Natural Resources

High value metabolites from plant resources

Secondary compounds production in lichen species- *Dirinaria applanata*

Calophyllum apetalum
(~ 2% dw of leaf)

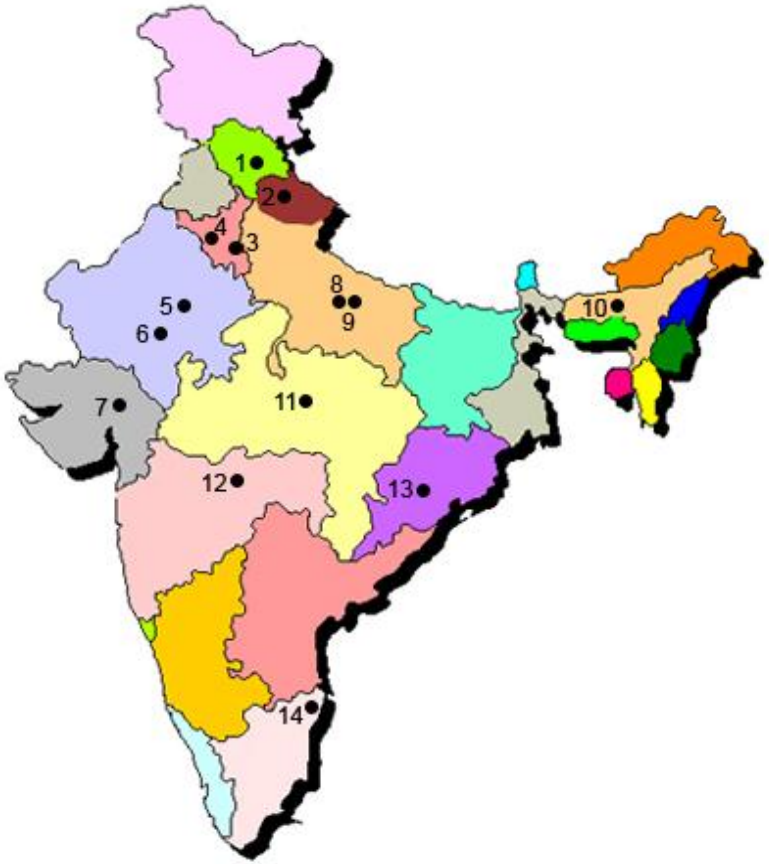
Gymnosperm
(~ 5% dw of leaf)

Alternate sources of Shikimic acid

Some Significant R&D highlights-

- **Four novel compounds isolated from Lichens. One compound showed promising activity for their anti-tuberculosis**
- **Promising species from *Icacinaceae* family screened for the anti-cancer alkaloid, Camptothecin. Two species were found to contain the highest content of camptothecin (1 to 1.2 %).**
- **Alternate sources of shikimic acid from plants were identified.**
- **Antimicrobial Peptides from wasp and bees identified and characterised.**

Multi-location trials of Jatropha across the country



- First systematic study for morphological, chemical and molelcular characterization of germplasm
- 400 accessions bulked to raise 17 lakh quality plants

Collections made by institutes	Collections accessioned	Accessions used for trials	Institutions involved	Area under plantation	Number of plants in trials
1236	1118	253	13	283 ha	693696

DBT-EU PROJECTS

- **SAHYOG**
- **Water4Crops**

Setting the theme for the event

- **Bio-economy: a thematic area of priority for scientific collaboration between Europe and India.**

- **Highlight the developments on Bio-economy in Europe and India and**

- **facilitate linkages between Academia and Industry of India with EU counterpart**

Objective of the brokerage event

The outcome of the event will be to finalise the Strategic Research Agenda and a R&D road map to facilitate concerted planning of future joint EU-India research initiatives

It aims at identifying pathways to promote new technologies that will drive Europe and India to an increased exploitation of biotechnology for biomass production and biowaste conversion.