

MEDDB: A medicinal plant database developed with the information gathered from tribal people in and around Madurai, Tamil Nadu

John Asnet Mary, Karuppiah Chandran Priyadharshini, Gurusamy Prabakaran Rubia Amal, Gunasekaran Ramya, Radhakrishnan Nithya, Morkondam Balasubramanian Ambika & Rajaiah Shenbagarathai *

PG & Research Department of Zoology and Biotechnology, Lady Doak College, Madurai; Rajaiah Shenbagarathai - E-mail: ldcmadurai.btisnet@nic.in, Phone: 0452-2535575, Fax: 0452-2535575; *Corresponding author

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Abstract:

Tribal peoples are endowed with enriched traditional wisdom to use available nature resources around them. They are well versed in the usage of plant for treating various diseases. They have used powder or extract or paste form of the plant parts such as root, shoot, whole plant, fruits and leaves etc. The recipe known by the tribal people was passed on only to their family members and community through mouth to mouth practice. Hence, the knowledge is confined to particular people alone. It is always expedient to store information in the database, so that it will be accessible by everyone from everywhere. To achieve this, MEDDB has been developed, which stores the details of 110 plant species that are commonly used by tribes for fever, asthma, cold, cough, diabetes, diarrhea, dysentery, eye infections, stomach ache, wounds and snake bite. The details of each plant were collected from the literature and through web search to give comprehensive and exhaustive information. Each plant entry is compiled under the sub-headings viz., common name, classification, physical characteristics, medicinal uses, active constituents, and references.

Availability: <http://www.ladydoakcollege.edu.in/meddb/home.html>

Keywords: Traditional medicine, Active constituents, Ethnomedicine, HTML, database, JPEG.

Background:

Traditional medicines are an invaluable resource for mankind. It is used to refer both traditional medicine system and various forms of indigenous medicine [1]. They followed their own health practices, believes, spiritual therapies and exercises. It is reported that over 6000 plants in India are in use of traditional medicine systems such as Ayurveda, Unanai, and Siddha [2]. Each tribe has explored the medicinal property of herbs in their area by observation and trial and error method.

India is rich in medicinal and aromatic plants and it is one of the twelve mega-biodiversity countries in the world and treasured with well practiced knowledge of traditional herbal medicine. It has been reported that 20,000 plants in India are rich in medicinal value from which 800 plant species are explored by 500 tribal communities for curing different diseases [3, 4]. India possesses a total of 427 tribal communities, of which, 37 tribal communities belongs to Tamil Nadu such as Irular, Kanikaran, Kattunayakan, Kota, Kurimbas, Palliyan, Paniyan, Sholaga and Toda [5, 6]. As herbal medicines have been used to treat many infectious

diseases and save lives of developing countries, about 70% of the Indian population is dependent on herbal medicine [7, 8].

Recently, efforts have been made to gather information from the tribal people. The medicinal plants with wound healing properties are commonly used by the Malayali tribes at Vattal hills near Dharmapuri, Tamilnadu [9]. A survey conducted in remote villages of Madurai, Theni and Dindigul districts of Tamil Nadu identified 62 species of medicinally important plants belonging to 55 genera from 30 families with their uses [10]. *Paliyar* tribes of Madurai district, Tamil Nadu, have been using 60 ethnomedicinal plant species in Southern Western Ghats of India for the treatment of various ailments [11]. In a survey study carried out in tribals in Chitteri hills located in Dharmapuri district, has documented 65 ethno medicinal plant species distributed across 38 families [12]. An ethnobotanical survey conducted at Kottur Hills in Dharmapuri District, Tamil Nadu recorded 48 ethno medicinal plants used by tribal inhabitants for diseases like asthma, body ache, diabetics, digestive disorders, dry cough, dysentery, ear pain, edema, erysipelas, eye infection, fertility, gastrointestinal problems, microbial infections, headache, insect/snake poison, jaundice, joint pain, laxative, menstrual problem, mouth ulcer, nail infection, nerve disorders, piles, pimples, skin disease, throat infection, toothache ulcer, cuts and wounds [13]. A study at Malligainatham village, Kandarvakottai Taluk, Pudukottai district, Tamil Nadu recorded a total of 60 medicinal plant species belonging to 37 families and the usage of medicine. The plant parts are taken as raw or cooked. For instance, *Aloe vera* leaf pulp is taken daily for stomach ulcer. Certain crushed plants are applied externally in case of bone fracture, body pain, head ache and diversion of nerves [14]. An ethnobotanical study carried out at Kollihills, Nammakkal district, Tamil Nadu with Malayali tribals who are Tamil speaking, believed to be migrated from Conjeeveram documented 108 species of medicinal plants belonging to 59 families [15]. The data collected from the tribal people at Valaiyan community of Piranmalai Hills showed the usage of herbal plants for various diseases [16]. Kurumba tribal people in Pennagaram region, Dharmapuri District of Tamil Nadu are utilizing plants for common diseases like ulcer, skin diseases, headache, cold, cough and fits and aware of the antidotes for scorpion sting, insect bites and snake bites [17]. The traditional healers in Kancheepuram District of Tamil Nadu, India are using 85 species of plants distributed in 76 genera belonging to 41 families to treat various diseases. The different plants are prepared as a paste, decoction, powder, juice extracted from either fresh or dried plant parts [18].

Due to its accessibility, availability, low cost with less side effects and reliable therapeutic efficacy, traditional Indian medicine drew the attention of global market and many pharmaceutical companies in discovering natural bioactive compounds. Therefore, it is important to collect, document the traditional knowledge of tribal people on traditional medicine and conserving information on indigenous medicinal plants for exploiting as a novel bioactive compounds for treating infectious diseases. Digitalization of all this information is possible because of the development of database system. Anti-diabetic plants used in ethno medicine is digitalized and made available in online. It consists of 238 plants with information like name of the plant, geographical distribution, and part of

the plant investigated, dosage, active constituents with anti-diabetic property with their structures, physical and chemical properties and its action [19]. In order to bring out the knowledge of traditional medicine to the modern world and to make it accessible from everywhere, MEDDB, a database of medicinal plants, was developed with the objective of exploring the ethnomedicine used by tribal people of Madurai, Tamil Nadu. The database has been developed based on the published data collected from tribal people in and around Madurai, Tamil Nadu.

Methodology:

Data collection and database design

The study is based on secondary sources, which include books, thesis, papers in technical journals available from PubMed, Science Direct, and Biomed Central, newspapers and government reports. The database was developed using PHP/MySQL. The images of the plants are given in JPEG file format. The information on each species were collected and arranged in plant profile files which contain the detailed features like scientific name, vernacular name in Tamil, Malayalam, Telugu, Kannada, and Hindi, Odissy in few cases, family name, classification, physical characteristics, medicinal uses, parts used and ethnomedicinal preparation, active constituents, references and the image of the plant. The references are hyperlinked.

Software and Hardware

Microsoft Windows 95/98/2000/2003/XP operating system was used in the development. PHP, HTML and java script used as front end. The database was developed using MySQL as back end. A High-end server- IBM 3.0 GHz Intel Xeon/Itanium/AMD Opetron was used for databases.

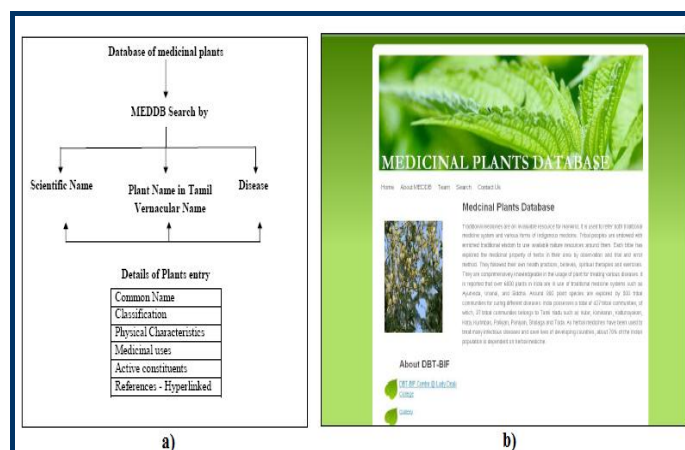


Figure 1: a) The overall structure of MEDDB Database. Data can be searched using scientific name, vernacular name (Tamil) and by diseases; b) A snap shot of the home page of MEDDB.

Utility:

There are many databases on medicinal plants. MEDDB provides the comprehensive information on the usage of plants against various illnesses based on the traditional wisdom of the tribal people. Currently, MEDDB contains data of 110 species, belonging to 50 families, reported to be commonly used by tribal people in and around Madurai. The data can be searched through the search page available in the

top panel. Basically, the user can search the database by three names such as the scientific name of the plant, Tamil vernacular name if you know and finally by the disease name. The left panel contains title like plant name, Tamil vernacular name and disease which are hyperlinked. The search results appear in the new page with the details of the plants. Detailed information about the plants is being displayed in a separate web page containing common name, scientific name, family, classification, physical characteristics, medicinal uses, active constituents and references which is hyperlinked. The photograph of each plant is also displayed in the same page. In the disease search option, all the plants used for the particular disease will be displayed. Each one is hyperlinked with its plant profile file. The overall database design and the screen shot of home page are given in (Figure 1a & 1b) respectively.

Future development:

It will be further refined and updated periodically. The database will also be modified to include the structure of active constituents as .mol files which can be used for docking in the near future.

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References:

- [1] WHO Traditional Medicine Strategy 2002-2005, WHO, Geneva 2002.
- [2] Rajshekharan PE, *World of Science, Employment News*. 2002 **21**: 27
- [3] Dev S, *Curr Sci*.1997 **73**: 11.
- [4] Kamboj VP, *Curr Sci*. 2000 **78**: 1.
- [5] Kala CP, *J Ethnobiol Ethnomed*. 2005 **1**: 11 [PMID: 16288657].
- [6] Solavan A *et al*. *Indian J Tradit know*. 2004 **3**: 2.
- [7] Patrick OE, *Trop J Pharm Res*. 2002 **1**: 2.
- [8] Narayana DBA *et al*. *IDMA Bulletin*. 1998
- [9] Subramaniyan R *et al*. *International research Journal of Pharmacy*. 2011 **2**: 5
- [10] Rajendran K *et al*. *Indian J Tradit know*. 2008 **7**: 3.
- [11] Ignacimuthu S *et al*. *J Ethnobiol Ethnomed*. 2006 **2**: 25 [PMID: 16689985].
- [12] Kadhivel K *et al*. *Environ We Int J Sci Tech*. 2010.
- [13] Sivaperumal R *et al*. *J Environ Sci. Technol*. 2010.
- [14] Natarajan D *et al*. *Indian J Tradit know*. 2010 **9**: 4.
- [15] Suresh K *et al*. *International Journal of Research in Ayurveda & Pharmacy* 2011 **2**: 2.
- [16] Sandhya B *et al*. *Afr J Tradit Complement Altern. Med*. 2006 **3**: 1.
- [17] Alagesaboopathi C, *Asian J Exp Biol Sci*. 2011 **2**: 1.
- [18] Muthu C *et al*. *J Ethnobiol Ethnomed*. 2006 **2**: 43 [PMID: 17026769].
- [19] Singh S *et al*. *Bioinformation*. 2009 **4**: 6 [PMID: 2097592].

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