GTRP Int. J. Applied BioResearch

Chemical Investigation of Medicinal Plants in Kurumalai Scrub Forest, Tuticorin District

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Published: 15, April, 2013; Vol.No.18:30-34; www.gbtrp.com; All Right Reserved, ©Gayathri Teknological Publication, 2013.

Abstract

Forest supports the multifarious of plants which are variously used by man for their livelihood. Large numbers of medicinal plants are found in the forest. In recent years, the medicinal plants are considered as an important component of ecosystem. Science of plants and healing diseases were intimately linked from the earliest times. These two sciences were actually inseparable. The present investigation was carried out in Kurumalai hillock. It is rich in vegetation. It supports many medicinal plants. The Kurumalai hill is almost 30 meters above the surrounding plains which are situated at an altitude of 40 m above Mean Sea level. The hill forest is a Reserve forest of Tamilnadu forest department. From Kurumalai forest about 144 plant Species were enlisted, among the plant species the active principle and medicinal uses of selected plants have been described. The active principles of the plants have widely divergent actions on human body. Medicinal plants and their isolated active principles act as an emphasis aid to fight against diseases. In this study it was found that many of active principles separated from the plants act as Anti bacterial, Anti oxidant and Anti inflammatory agents.

Key words: Kurumalai Scrub Forest, Medicinal Plants, Chemical Investigation.

Introduction

Herbal medicine represents the oldest system of human health care. Medicinal plants are generally used in traditional medicine for the treatment of many ailments (Njoku and Eziba, 2007). Medicinal Plants are considered to be a chemical factory, comprising varied chemical compounds like alkaloids, glycosides, saponins, resins etc. The various parts of the medicinal plants are utilized for various treatments; these parts produce various substances like alkaloids, terpens, phenolic compounds and basic metabolites (Sofora 1982; Evans and Brighman 1980).

The medicinal value of the plants lies in some chemical substances that produce a definite physiological action on the human body. Medicinal plants are of great importance to the health of individuals and communities (Edeogu *et al.*, 2005). Research needs to be enhanced to identify plants with potential medicinal value in the neighbourhood and to isolate compounds of medicinal importance. The Pharmaceutical Industry first extract the active ingredients before being used in the manufacturing of drugs, hence there is possibility of discovering the evolution of drugs in the medicinal plants (Trease and Evans 1983).

Materials and Methods

Study area

The Kurumalai hillock is located in Tuticorin district. The hillock is situated at 8^0 48' N latitude and 78^0 11' E longitude. The Kurumalai hillock is nearly 30 m above the surrounding plains which are situated at an altitude of 40 m above MSL. The soil supports the rich flora of this area. This scrub forest comes under the Reserve forest of Tamilnadu forest Department.

The present investigation has been undertaken from October 2011 to August 2012, field trips were conducted more frequently during the rainy season to collect the herbaceous vegetation, which appeared only during the rainy season. During field trips, the plants were collected and brought to the laboratory and identified using standard manuals such as Flora of British India (Hooker 1896), Flora of the Presidency of Madras (Gamble 1967), Flora of the Tamilnadu Carnatic (Mathew,1983), Flora of Gulf of Mannar (2001) and Flora of Tamilnadu (Henry *et al.*, 1983).

This paper originated from the *National Conference on* "Biodiversity Conservation and Sustainable Utilization" (11-12th October 2012).

In kurumalai forest about 144 plants species were enlisted. From the available plants uses of sixty medicinal plants were selected for the present study and their active principles and activity were enumerated by using standard books such as Ayurvedic medicinal plants of India (Ramesh Kumar Bhutya, 2011), Medicinal plants of India (Yoganarasimhan, 2000), Medicinal plants (Moshrafuddin Ahmed, 2010), The wealth of India (Anonymous 1999).

Results and Discussion

Medicinal plants from a numerically large group of economically important plants, which provide the basic raw materials for the indigenous system of health care. It is reported that in the developing countries about 80% of the people depend on traditional system of medicine and 95% of the industrial need of this is met through indiscriminate collection from the wild. In the present study about 144 plants have been documented and medicinal uses and active principles of 60 plants were enumerated in table-1.

Table – 1: Phytochemicals and pharmacological activities of medicinal plants

S.N	Botanical Name	Family	Active Principle	Activity
1.	*Abutilon indicum*	Malvaceae	Sesquiterpenes	Antiinflammatory Antibacterial, Antioxidant
2.	*Acacia nilotica*	Mimosaceae	L rhamnose, L arabinose, Ascorbic acid	Antipyretic, Antifungal
3.	*Acalypha indica*	Euphorbiaceae	Acalfemide, Acalphine	Antibacterial
4.	*Achyranthes aspera*	Amaranthaceae	Achyranthine	Antipyretic, Antiinflammatory, Antiarthritic
5.	*Aloe vera*	Liliaceae	Aloe-emodin	Antifungal
6.	*Anisomeles malabarica*	Lamiaceae	Anisomelic acid, malabaric acid	Antispasmodic, Anticancer, Anticonvulsant, Antibacterial
7.	*Asparagus racemosus*	Liliaceae	Sarsasapogenin	Antiallergic, Antiageing, Antisapamodic, Antioxidant
8.	*Azadiracta indica*	Meliaceae	Azadiractin, Margosen	Antibacterial, Antihistamine, Antifungal
9.	*Boerhavia diffusa*	Nyctaginaceae	Punarnavocide	Antifibrinolytic
10.	*Calotropis gigantea*	Asclepiadaceae	Calotropin	Antibacterial
11.	*Capparis sepiaria*	Capparidaceae	Erythrodiol-3	Antibacterial
12.	*Cardiospermum helicacabum*	Sapindaceae	Apigenin	Antibacterial, Antihyperglycaemic
13.	*Cassia absus*	Caesalpiniaceae	Chaksin	Antibacterial
14.	*Cassia auriculata*	Caesalpiniaceae	Emodin	Antitumour, Antioxidant
15.	*Catharanthus roseus*	Apocynaceae	Vicristin, Vincaleucoblastin	Anticancer
16.	*Centella asiatica*	Apiaceae	Oxyasiaticoside	Antibacterial
17.	*Cissus quadrangularis*	Vitaceae	Coloside-A	Fracture healing
18.	*Citrullus colocynthis*	Cucurbitaceae	Cucurbitacin-E, Kaempferol	Cardiac depressant, Antibacterial

19.	*Cleome gynandra*	Cleomaceae	Cleomin, Hexacosanal	Cardiac stimulant, Vulnerary
20.	*Cleome viscosa*	Cleomaceae	Cloeomiscosin	Immunomodulator, Antiiflammatory
21.	*Clitoria ternatea*	Fabaceae	Taraxerol, Taraxerone	Antibacterial, Antioxidant,
22.	*Commelina benghalensis*	Commelinaceae	Campesterol	Analgesic, Antiinflammatory
23.	*Corchorus aestuans*	Tiliaceae	Corchorusins A,B,C,D	Antibacterial, Antifungal
24.	*Crataeva magna*	Capparidaceae	Lupeol, Friedelin, Diosgenin, Epiofzealachinbata-D-glucoside	Antiurolithitic, Antiiflammatory,
25.	*Cynodon dactylon*	Poaceae	Ergonovine	Antidiarrheal
26.	*Cyperus rotundus*	Cyperaceae	Cyperene 1&2, Cyperotundene	Antibacterial
27.	*Datura metel*	Solanaceae	Tropine, Scopolamine	Anticatarrhal, Antiinflammatory
28.	*Delonix elata*	Caeslpiniaceae	Neohesperidin	Abortifacient
29.	*Dichrostachys cinerea*	Mimosaceae	Quercetin	Antiinflammatory, Antioxidant, Anticancer
30.	*Diospyros montana*	Ebenaceae	Diospyrin	Antibacterial
31.	*Dodonaea viscosa*	Sapindaceae	Dodonin	Anthelmintic
32.	*Eclipta prostrata*	Asteraceae	Phalloidin	Antiheptotoxic
33.	*Euphorbia antiquorum*	Euphorbiaceae	Euphadienol	Insecticidal activity
34.	*Euphorbia hirta*	Euphorbiaceae	L-inositol, quercitin	Antidiarrheal
35.	*Ficus virens*	Moraceae	Caffieic acid	Immunomodulator
36.	*Gloriosa superba*	Liliaceae	Colchicine	Antimitotic
37.	*Grewia tenax*	Tiliaceae	Triterpinoids	Antiartherosclerotic, Antitubercular, Antihypertension, Antioxidant
38.	*Hemidesmus indicus*	Periploacaceae	Hemidesmine	Antibacterial
39.	*Holoptelea integrifolia*	Ulmaceae	Holoptelin A & B	Antidiabetic
40.	*Indigofera linnaei*	Fabaceae	Indigoferin	Antidyslipidemic
41.	*Indigofera tinctoria*	Fabaceae	Indurubin, Indigotin	Antiallergic
42.	*Justicia gossypifolia*	Euphorbiaceae	Jatrophone, Jatropholone-A	Antibacterial
43.	*Melochia corchorifolia*	Sterculiaceae	Melochicorine	Antibacterial, Antiinflammatory
44.	*Merremia emarginata*	Convolvulaceae	Caffeic acid, P-Courmaric acid, Ferulic acid, Snapic acid	Antibacterial
45.	*Merremia tridentata*	Convolvulaceae	Diosmetin, Luteolin	Antiinflammatory, Antiarthritic
46.	*Mimosa pudica*	Mimosaceae	Momosine	Antidepressant, Antispamodic
47.	*Ocimum canum*	Lamiaceae	Ursolic acid	Antihepatotoxic
48.	*Pavonia odorata*	Malvaceae	Pavonenol	Antipyretic, Antiinflammotory
49.	*Pedalium murex*	Pedaliaceae	Pedalin, diometrin	Antihyperlipidemic, Antibacterial

50.	*Phyllanthus amarus*	Euphorbiaceae	Phyllanthine, Hypophyllanthine	Antimutagenic, Antitumour
51.	*Pongamia pinnata*	Fabaceae	Pongapin, Pongamol	Antispasmodic, Antipyretic
52.	*Permna latifolia*	Verbenaceae	Diterpene	Antiarthritic
53.	*Sesamum indicum*	Pedaliaceae	Sesamol, Seasamin, Sesamolin	Antioxidant
54.	*Sida cordifolia*	Malvaceae	Vasicinin, Vasicimol	Anticonvulsant, Antipyretic
55.	*Tribulus terrestris*	Zygophyllaceae	Tribuloside	Aphrodisiac activity
56.	*Tridax procumbens*	Asteraceae	Lupeol, Oleanolic acid	Anticancer
57.	*Vitex negundo*	Verbenaceae	Vitextriterpene	Analgesic, Antiinflammatory
58.	*Waltheria indica*	Sterculiaceae	Adouetin X,Y,Z	Antisplasmodial, Antifungal
59.	*Ziziphus nummularia*	Rhamnaceae	Numularine R & S	Antibacterial
60.	*Ziziphus xylopyrus*	Rhamnaceae	Amphibine-H	Anti *Mycobacterium pheli*, Antidepressant

About 21 plants possess antibacterial activity and 11 plants have antiinflammatory activity. Antioxidant property was reported in 7 plants. Antifungal, Antipyretic and Antispasmodic activities were reported in 5 plants. Anticancer activity was present in 4 plants. Antiarthritic activity was reported from 3 plants. Other properties like anticonvulsant, antiallergic, antitumour, antidiarrrheal, analgesic, immunomodulator, antihepatotoxic and antidepressant activities were found in two plant species each. Medicinal plants are potential renewable natural resources. Therefore the conservation and sustainable utilization of medicinal plants must necessarily involve a long term, oriented action programme. The biodiversity of Kurumalai hills is now under anthropogenic threat. There are six villages adjoining the hillock. The cattle maintained by them are sending to the forest area for grazing. Thus uncontrolled grazing is a serious

threat to the ground flora, which contains majority of medicinal plants. Sand mining is also seen in some places. Another major threat in the pilgrims visiting the sacred grooves in the hillock. They visit the temples in large numbers in vehicles and spent a whole day there with scarifying animals and cooking food. This pollutes the surrounding environment and is a serious threat to the medicinal plants.

Conclusion

Several policies and strategies have been formulated for the conservation of medicinal plants. The world conservation strategy (1980) stresses the need for the conservation of medicinal plants as it supports millions of rural communities. The rural community should make aware of the value of medicinal plant conservation. The grazing should be controlled with the help of villagers. They should be involved in the conservation programmes. Effective water and soil conservation programmes should be organized with the help of NGO's and government departments.

Acknowledgements

The authors are grateful to University Grants Commission, New Delhi (40-149/2011 -SR), for financial support. Thanks are also due to Management of St. John's College, Palayamkottai.

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