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Traditional Herbal Medicines Used for the Treatment of Diabetes among Two Major Tribal Groups in South Tamil Nadu, India

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Abstract

Medicinal plants used to treat diabetic conditions are of considerable interest and a number of plants have shown varying degrees of hypoglycaemic and antihyperglycaemic activity. An ethno-medico-botanical survey was carried out among the Kani and Paliyar tribals in southern Western Ghats of Tamil Nadu for the exploration of antidiabetic herbal medicines. They frequently use ten species of plants for the treatment of diabetes either in single or in combination with some other plant parts. The wealth of tribal knowledge on medicinal plants points to a great potential for research and the discovery of new drugs to fight diseases including diabetes, obtaining new foods and other new uses.

Keywords: Diabetes, Medicinal Plants, Traditional Medicine, Tamil Nadu, India.

Introduction

In recent years, there has been renewed interest in the treatment against different diseases using herbal drugs as they are generally non-toxic and World Health Organization has also recommended the evaluation of the effectiveness of plants in condition where we lack safe modern drugs. Plant derivatives with hypoglycaemic properties have been used in folk medicine and traditional healing systems around the world (Yeh et al., 2003) from very ancient time. Despite the introduction of hypoglycaemic agents from natural and synthetic sources, diabetes and its secondary complications continue to be a major medical problem to people (Ravi et al., 2005). Medicinal plants used to treat hypoglycemic and hyperglycemic conditions are of considerable interest to ethnobotanical community as they are recognized to contain valuable medicinal properties in different parts of the plant.

In traditional medicine diabetes mellitus is treated with diet, physical exercise and medicinal plants, even though, more than 1200 plants are used around the world in the control of diabetes mellitus and approximately 30% of the traditionally used antidiabetic plants were pharmacologically and chemically investigated (Alarcon-Aguilar et al., 2002). On the other hand, potential hypoglycaemic agents have also

been detected for more than 100 plants used in antidiabetic therapy. Traditional treatments may provide the valuable clues for the development of new oral hypoglycemic agents and simple dietary adjuncts. More than 100 medicinal plants are mentioned in the Indian system of medicines including folk medicines for the management of diabetes, which are effective either separately or in combinations (Kar et al, 2003).

As per the ethnobotanical literature on traditional phytotherapy of Indian medicinal plants, the species like *Asparagus racemosus*, *Butea monosperma*, *Cathanranthus roseus*, *Coccinia indica*, *Gymnema sylvestre*, *Syzygium cumini* and *Momordica charantia* are consistently used by the tribal communities for the treatment of diabetes (Rana *et al*., 1999) as well as in modern medicine. The present study was performed with the aim of producing an inventory of the plants used by traditional healers in southern Western Ghats of Tamil Nadu to treat diabetes.

Study area and ethnic people

Southern Western Ghats of Tamil Nadu occupy the forests of Tirunelveli, Kanyakumari and Virudhunagar districts of Tamil Nadu with rich vegetation and lies between the longitudes 77^0 5' - 77^0 40' E and latitudes 8^0 5' - 8^0 50' N. These hills are characterized by numerous folds and extension engulfing small, narrow valleys and the elevation varies from 50 to 1869m. There are two reserve forests present in the study area such as Kalakad – Mundanthurai Tiger Reserve (Tirunelveli district) and Grizzled Giant Squirrel Sanctuary (Virudhunagar district). The information was gathered from the two distinct indigenous people inhabiting the southern Western Ghats of Tamil Nadu such as *Kani* or *Kanikaran* (Tirunelveli and Kanyakumari districts) and *Paliyars* (Virudhunagar district), oldest group of the branch of ethnic group in Southern India. However, modern way of living conditions of these aboriginal communities at present seems to endanger the transmission of their traditional knowledge, including medicinal plant uses, to future generations (Ayyanar and Ignacimuthu, 2005).

Methodology

Frequent field surveys were carried out in southern Western Ghats of Tamil Nadu during January 2005 to March 2007. Data were collected through general conversations with traditional healers and questionnaires were used to obtain the plants used by them. Details of medicinal plants used, mode of treatment, methods of preparation, types of administration and dosage were documented by interacting with them as well as through direct observations. The information got from the tribals was recorded in field notebooks and the voucher specimens were deposited in the herbarium at Entomology Research Institute (ERIH), Loyola College, Chennai (India).

Results and Discussion

The present study identified that, there are two medicine men in Tirunelveli hills and one man in Giant Squirrel Wildlife Sanctuary are identified as the well-known persons for the preparation of medicine in the treatment of diabetes. Herbal medicines prescribed by tribal healers are either preparation based on single plant part or a combination of several plant parts. Always they prepare medicine to treat diabetes in the combination of more number of plants. They believe that combination of several plant parts cures diseases rapidly. To improve the acceptability of certain remedies that are taken orally some additives are frequently used. Before starting the treatment the condition of the patient is observed deeply and then the

prepared medicines are given to treat diabetes. Most of the plants cited by Kani tribals are widely used by the other tribals in Tamil Nadu (Balu *et al*., 1999). The plants which are used by the tribal people inhabiting southern Western Ghats of Tamil Nadu in the treatment of diabetes is provided given below with the mode of preparation, method of administration and dosage.

Enumeration of Antidiabetic plants

1. ***Abrus precatorius*** L. (Fabaceae). Local Name: Kundumani. The plant is a climber commonly known as Wild Liquorice and found through the plains of India. Leaf of this plant is mixed with the leaves of *Andrographis paniculata*, *Gymnema sylvestre* and seeds of *Syzygium cumini*. The mixture is shade dried and ground into powder and taken orally along with cow's milk. Dosage: About 50 ml of mixture is taken twice a day before food for 120 days.

2. ***Andrographis lineata*** Wallich ex Nees (Acanthaceae). Local Name: Siriya nangai. The plant is annual herb found in the hedgerows throughout the plains in India and commonly cultivated in gardens. Leaf is shade dried, powdered and taken orally along with cow's or goat's milk. Dosage: 2 teaspoon of powder is taken twice a day after food for 2-3 months.

3. ***Andrographis paniculata*** (Burm.f.) Wall. ex Nees (Acanthaceae). Local Name: Periya nangai. The plant is annual herb (Commonly known as King of Bitters) found in the hedgerows throughout the plains in India and cultivated in gardens. Leaf is shade dried, powdered and mixed with boiled rice and cow's milk and taken orally. Dosage: 50 ml of mixture is taken thrice a day after food for 120 days.

4. ***Canthium parviflorum*** Lam. (Rubiaceae). Local Name: Sakkarai kovaimaram. A shrubby and woody plant found throughout the Western Ghats. Shade dried leaf powder is mixed with cup of water or goat's or cow's milk or boiled rice and taken orally. Dosage: One or two teaspoon is taken early in the morning regularly until cure

5. ***Costus speciosus*** (Koenig.) J. E. Smith (Costaceae). Local Name: Kostak-kilangu. A tuberous fleshy herb, plentifully found in north India and in the Western Ghats the plant is seen in hilly areas. Fresh rhizome is ground into a paste and taken orally. Dosage: 20-25 gm is taken thrice a day after food for 2 months.

6. ***Gymnema sylvestre*** (Retz.) R. Br. ex Schultes (Asclepiadaceae). Local Name: Siru kurinjan. A climbing shrub commonly found in the plains of central and southern India. Dried leaves are pounded and the fine powder thus obtained is taken orally along with milk. Dosage: About 50 ml is taken twice a day after food for 120 days to treat diabetes.

7. ***Memecylon umbellatum*** Burm. f. (Melastomataceae). Local Name: Sakkarai vaembu. A bushy small tree found in the hilly areas of Western Ghats. Shade dried leaf powder is mixed with cup of water and boiled rice and kept overnight and taken orally. Dosage: One teaspoon is taken early in the morning for forty days or until cure.

8. ***Momordica charantia*** L. (Cucurbitaceae). Local Name: Kaattu pagar-kai. The plant is commonly known as Bitter guard and has many varieties. The plant is climbing shrub and generally cultivated everywhere in India. Unripe fruits are taken orally along with food. Dosage: 2-3 fresh unripe fruits are taken at any time per day for 3 months.

9. ***Syzygium cumini*** (L.) Skeels. (Myrtaceae). Local Name: Naaval maram. The plant is large tree and commonly known as Jambolan or Black Plum found throughout the plains. Juice extracted from the leaf

is mixed with honey or cow's milk and fresh fruits are taken orally. Dosage: 2 teaspoon of juice is taken twice a day after food for 3 months. It is one of the significant antidiabetic plant and it has long been reported for its use in many pharmacological activities mainly diabetes. During the last four decades, numerous folk medicine and scientific reports on the antidiabetic effects of this plant have been cited in the literature. Clinical and experimental studies suggest that, different parts of the plant especially fruits, seeds and stem bark possess promising activity against diabetes mellitus (Mukherjee et al., 2006). *S. cumini* exerts a dual effect namely a combination of mechanism of action of sulfonylurea and biguanids and may bring about its hypoglycaemic action through stimulation of surviving ß cells of islets of langerhans to release more insulin (Sagrawat et al., 2006).

10. *Wattakaka volubilis* (L.f.) Stapf. (Asclepiadaceae). Local Name: Perun-kurinjan. The plant is a fleshy and very large climber found throughout the plains with papery leaves. Leaf powder is taken orally along with cow's milk. Dosage: 50-75 ml of mixture is taken twice a day after food for 90 days

Conclusion

The study of ethnomedical systems and plants as therapeutic agents is of importance in addressing health problems of traditional communities. Among the plants used by traditional healers (Kanis and Paliyars), most of the plants have been used in folk medicine and traditional healing systems around the world from very ancient time. The wealth of tribal's knowledge on medicinal plants points to a great potential for research and the discovery of new drugs to fight diseases including diabetes, obtaining new foods and other new uses. Instead of trying to identify the active components of herbs through massive collection of plants from natural sources, it is better to start investigating the efficacy of the medicinal plant based on the traditional healthcare practices by indigenous people.

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