

SHORT COMMUNICATION

***Tinospora cordifolia* (Willd.) Miers. (Menispermaceae): A new herbal source for the treatment of diabetic foot ailments**

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ABSTRACT

Diabetic foot problems, such as ulcerations, infections and gangrene, are the most common causes of hospitalization among diabetic patients. Routine ulcer care, treatment of repeated infections, amputations, and high hospital-care cost, put a tremendous financial burden on the diabetic patients. Modern medicines do not have any definitive cure of these diseases, except surgery. However, traditional herbal remedies can offer a cure. The stem of *Tinospora cordifolia* (Willd.) Miers. (Menispermaceae) cures such diabetic foot ailments. This species is excellent remedy for diabetic foot ulcers.

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INTRODUCTION

Diabetes mellitus is a condition where the body is unable to control the blood sugar. In diabetic patients, the immune system of a person is adversely affected. In addition, the blood vessels are also damaged due to the excessive sugar load in the veins. This leads to lack or decreased pain sensation in toes (Neuropathy). Pain usually alerts a normal person to take care for an affected area in order to prevent infections. In diabetic patients this is absent and the wound often gets severely infected without notice. Further, the weak immune system is unable to fight the invading organisms at the site of wound. High blood sugar makes the blood more favourable for bacterial and microorganisms to grow. Diabetic patients commonly get foot infections. This is because the feet are commonly exposed to injury and bumps and bruises in the activities of daily living. Foot infections may begin as small ulcers and may invade deeper tissues,

lead to gangrene or affect the bones and invade the blood stream as well. Diabetic foot ailments, such as ulcerations, infections, and gangrene, are the most common cause of hospitalization among diabetic patients (Ingrid-Kruse and Steven Edelman, 2006). Modern medicines do not have any cure of these problems, except the surgery. However, traditional herbal remedies can have a cure. Recently, the stem of *Tinospora cordifolia* has been found to cure such diabetic foot problems and can serve as an excellent remedy for diabetic foot ulcers.

MATERIALS AND METHODS

The information regarding the use of *Tinospora cordifolia* in the treatment of diabetic foot problems was collected during an ethno-botanical survey by the author in the tribal belt of Ratlam district of Madhya Pradesh (India).

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The data was collected through interviews and field observations with the help of local guides, villagers, medicine men and tribal people who had the traditional knowledge of local flora. During the survey these person were contacted and were taken to the field for collecting information about medicinal plant, local names and, method of preparation of the drug and approximate dosage of administration. Voucher specimen [VSN: DJ-50] was collected for authentication of information and future reference. Herbarium specimens prepared following the standard method (Jain and Rao, 1978) were deposited in the herbarium of Botany department, Govt Arts & Science PG College, Ratlam (Madhya Pradesh).

Ratlam district lies in the western part of the Malwa Plateau in Madhya Pradesh. The geographical limits of the district extend from 23° 05' North to 23° 55' North and from 74° 30' East to 75° 42' East. The elevation varies from 434 to 549 m above mean sea level. The forests, which occupy a total area of 499.92 sq km are of the dry deciduous Vb type (Champion & Seth, 1968). The forests are dominated by Teak (*Tectona grandis* L.f.), Sajad [*Terminalia tomentosa* (DC.) Wt. & Arn.], Mahua (*Madhuca indica* Gmel.), Tendu (*Diospyros melanoxylon* Roxb.), Palas [*Butea monosperma* (Lam.) Taub.], Kalam [*Mitragyna parviflora* (Roxb.) Korth.], Dhaora [*Anogeissus latifolia* (Roxb.) Wall. ex Bedd.], Bel [*Aegle marmelos* (L.) Corr.], Bija (*Pterocarpus marsupium* Roxb.) and Bamboo (*Dendrocalamus strictus* Nees.). The climate of the State is generally sub-humid with an annual rainfall ranging from 700-1200 mm. The minimum and maximum temperatures range between 6° C and 43° C in the months of January and May, respectively. The black cotton soil predominates this region.

Botany

Tinospora cordifolia (Willd.) Miers. (Menispermaceae) is a synonym of *Tinospora sinensis* (Lour.) Merr.; *T. glabra* (N. Burm.) Merr.; *Cocculus cordifolius* DC.; *Menispermum cordifolium* Willd. Its a succulent, glabrous, deciduous climber, with corky and lenticelled bark. Leaves are ovate-cordate. Flowers are yellow, in

axillary racemes. Fruits globose, red when ripe. Flowering and fruiting occurs during December-June.

Tinospora cordifolia is widely distributed in and around Ratlam where it is, known as 'Limbel', 'Neem giloe' in rural and tribal community. The species is known as 'Giloe' in Hindi, as "Golancha" in Bengali, as "Gado" in Gujarati, as "Amrutaballi" in Kannada, as "Amrytu" in Malayalam, as "Gulvel" in Marathi, as "Amudam" in Tamil, as "Tippateege" in Telugu, as "Heart leaved moonseed" in English and as "Amrita" in Sanskrit.

Chemical constituents : Starch, glycoside (Giloin), tinosporic acid, vasa alcohol, essential oil, vasa acid, proteins, Calcium, Phosphorus, Berberine, gilosterol are the major bioactive constituents of Giloy (Jadhav,2008).

Biological activity: The stem is diuretic, stimulant, stomachic (Jadhav,2008) and is frequently used by local community for treating burning sensation, constipation, diabetes, fevers, Jaundice, skin diseases, spleen diseases tonic, vaginal discharges, vomiting (Jadhav,2008).

Ethnomedicinal uses: Some ethnobotanical reports are available from Tamil Nadu region about its being useful in joint pain (Ganesan et al., 2006). The root is useful in Diarrhoea, dysentery (Bhatt and Sabnis, 1987). The leaves are useful in fever, headache, piles (Lakshamanan and Sankaranarayanan, 1988). Stem is useful in skin diseases, jaundice (Sharma et al., 1979), stomachic, asthma (Shah and Joshi, 1971), diphtheria (Roy and Chaturvedi, 1987), Cough (Malhotra and Moorthy, 1973), joint diseases (Dwivedi et al., 2005), fever (Kumar and Chauhan, 2005).

RESULTS AND DISCUSSION

The herbal therapy plays a vital role in the primary healthcare of tribal and rural population, and has tremendous potential for the discovery of new drugs of herbal origin, which are metabolized in the human body with no or very little side effects. The author observed during field investigation that *Tinospora cordifolia* is being frequently used by the local tribal people of Ratlam district to treat various problems associated with diabetic foot ailments.

The method of application is very simple and involves the following SOP: 10 cm or 3 inch long piece of mature branch of *Tinospora cordifolia* is cut in the morning. It is peeled and ground in half a cup of water to form a semi-liquid mixture. The mixture is strained and the pulp is separated from the juice. Three glasses of water is added in the extract. This freshly prepared juice is taken thrice in a day in same quantity i.e. one glass of juice at one time in the morning, afternoon and evening. The juice should be prepared daily in the morning and should be taken fresh. For complete recovery this juice should be taken for a period of one to two month thrice daily, this period may be extended depending upon the condition of the patient and seriousness of the disease. Prescribed medicines of diabetes should also be taken along with this juice.

Foot problems are a common complication in people with diabetes. *Tinospora cordifolia* (Willd.) Miers. (Menispermaceae) exhibits highly potent medicinal properties to cure diabetic foot problems. The plant has been in use for years by the tribal and rural communities of Ratlam. The transmission of such information on use of medicinal herbs through oral communication in tribal people is utmost secrecy. Therefore, this traditional knowledge system of the tribal and rural community needs to be, documented, preserved and used for the benefit of mankind. These medicinal and ethnomedicinal data also need verifications on chemical & pharmacological languages. The information gathered during the course of this survey falls in this category and deserves more scientific prospection.

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