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Antifungal activity of *Butea monosperma* plant in Burharpur distract of Madhya Pradesh

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Abstract
Butea monosperma having a long history in traditional healthcare applications represents an understandable choice for scientific investigation. It is fascinating to determine whether the traditional uses are supported by actual biological effects or merely based on folklore. In the present study *Butea monosperma* plants currently used as Ethnobotany in Burhanpur District of Madhya Pradesh were investigated for their antifungal activity against a dermatophyte, *Trichophyton mentagrophytes*. Leaves of the selected plants were extracted with methanol at room temperature. The methanolic extracts obtained were subjected to antifungal assays using *Trichophyton mentagrophytes* as a test fungus. In the agar diffusion antifungal assays, *Butea monosperma* showed more activity inhibitory activity in comparison to that of a commercial antifungal agent, miconazole.

Keywords: Antifungal activity, bioassays, dermatophyte, Burhanpur

Introduction

The Burhanpur district did not remain unaffected by the Great Uprising of 1857, which swept the country, against British rule. In connection with the so-called Riots of 1857, Tatya Tope had gone through the region of Nimar and before marching out of the region, burnt the police stations and Govt. buildings at Khandwa, Piplod and several other places and escaped again to central India by way of Khargone.

In 1536 A.D., the Mughal Emperor Humayun, after his conquest of Gujarat, visited Burhanpur and Asirgarh via Baroda, Broach (Bharuch) & Surat. Raja Ali Khan (1576-1596 A.D.), also known as Adil Shah, was asked to submit to Akbar, when the latter had sent an expedition to Khandesh, in the summer of 1577 A.D. The former, to avoid the unequal contest with the mighty Akbar, dropped his royal title of Shah and accepted the Suzerainty of Akbar. This marked an epoch in the Deccan policy of the Mughals, for Khandesh was used as a base for the future Conquest of Deccan. Raja Ali Khan constructed many buildings like Jama Masjid in the upper portion of the fort of Asir in 1588 A.D., Jama Masjid at Burhanpur in 1590 A.D., Idgah at Asir, mausoleums & Serai at Burhanpur and Serai & Mosque at Zainabad.

Madhya Pradesh means “Central Province” and is one of the richest repositories in terms of biodiversity. It is located in the geographic heart of India, between latitude 21.2°N - 26.87°N and longitude 74°02' - 82°49' E. The state straddles the Narmada River, which runs east and west between the Vindhya and Satpura ranges; these ranges and the Narmada are the traditional boundaries between the north and south of India. Among different types of forests, the tropical dry deciduous forest occupies the largest area in Central India. The Indigenous way of life in the state is nurtured by rich traditional knowledge, woven around 1000 medicinal plants that contributed significantly to health security in rural areas.

Since time immemorial, plants are the basis of life on earth and are the center of people's livelihood. Medicinal plants have been crucial in sustaining the health and well-being of mankind for millennia. ‘Ethno medicine’ implies the study of traditional knowledge of plant classification, cultivation, and use as food, medicine and shelter. They have been used in virtually all cultures as a valuable and safe natural source of medicines of nearly 24 lakh known species; more than 5 thousand plants are being exclusively used in the Chinese, Indian, Arabian and other traditional systems of medicine (Sharma, *et al.,* 2000) [6]. Ethno medicine, a branch of ethnobotany, mainly focuses on the knowledge, experience and belief of thousands of years of ancient people or tribal people living in remote areas (Patel *et al.,* 2010) [8]. Tribal people are the ecosystem people who live in harmony with nature and maintain a close link between man and the environment. These tribal communities of particular cultures and regions make use of indigenous plants to cure the ailment. The knowledge accumulated by them through a long series of observations from one generation to another is transmitted by oral communication.

The *Butea monosperma* Native to India, Flame of the Forest is a medium sized tree, growing 20-40 feet high, and the trunk is usually crooked and twisted with irregular branches and rough, grey bark. The leaves are pinnate, with an 8-16 cm petiole and three leaflets, each leaflet 10-20 cm long (Fig-1). The Hindi phrase (Dhaak Ke Teen Paat) comes from the prominent three leaflets of this tree. It is seen in all its ugliness in December and January when most of the leaves fall: but from January to March it truly becomes a tree of flame, a riot of orange and vermilion flowers covering the entire crown. These flowers, which are scentless, are massed along the ends of the stalks--dark velvety green like the cup-shaped calices--and the brilliance of the stiff, bright flowers is shown off to perfection by this deep, contrasting colour. Each flower consists of five petals comprising one standard, two smaller wings and a much curved beak-shaped keel. It is this keel which gives it the name of Parrot Tree. In olden days, the flowers of Tesu were used to make color for the festival of Holi. In Manipur, there is an interesting cultural use of the wood of this tree with beautiful flowers - when a member of the Meitei community dies and, for some reasons, his body cannot be found, the wood of this tree is cremated in place of the body.

Fig 1: *Butea monosperma*

It is used for timber, resin, fodder, medicine, and dye. The wood is dirty white and soft. Being durable under water, it is used for well-curbs and water scoops. Spoons and ladles made of this tree are used in various Hindu rituals to pour ghee into the fire. Good charcoal can be obtained from it. Farmers typically utilise trees on field bunds and use them to reduce soil erosion. The young shoots are mostly used by buffaloes as fodder. The leaves were used by earlier generations of people to serve foods where plates (Dona and Pattal) would be used today.

Materials and methods

Plants samples

The plants were collected from Burhanpur based on their ethnobotanical information the plants were identified with the flora of Madhya Pradesh and other taxonomist literature. The voucher specimens were deposited in RNTU, Bhopal Botany laboratory.

Fungal culture

Trichophyton mentagrophytes was used as a test fungus. The isolates were subcultured onto potato dextrose agar (PDA) plates at 28°C. Stock inoculum suspensions of each isolate were prepared for each experiment from 7 to 14-day-old cultures grown on PDA. The fungal colonies were covered with ca. 5 ml of distilled water, and suspensions were made by gently probing the surface with the tip of a Pasteur pipette. The resulting mixture of conidia and hyphal fragments was filtered and transferred to a sterile tube. The densities of these suspensions were adjusted with a spectrophotometer at a transmittance of 75%.

Extraction

Plant powders (ca. 100 g) were extracted with methanol for 48 hours at room temperature. The extraction was performed three times. The extract solution was filtered with a What Man no 2 (What Man International Ltd., England). The solvent was removed with a rotary evaporator at 40oC under reduced pressure. The extract was kept in a vacuum oven to dry to give solid extracts. Each respective soluble fraction was subjected to an antidermatophyte activity assay against *T. mentagrophytes*.

Antidermatophyte assay

Antidermatophyte assay was conducted with agar diffusion on a paper disc. Twenty-milliliter aliquots of sterile molten PDA were transferred to Petri dishes and allowed to solidify. The PDA plates were inoculated with 100 mL of inocula suspension spread uniformly on the surface of the plates. A sterile paper disc (6 mm i.d) containing 10 mL of extract (equals to 2 mg extract) was applied to the surface of each inoculated plate. The plates were incubated in the dark at 25oC for 48 hours. Zones of inhibition around the discs were measured in mm. The control plate contained acetone and medium only. Miconazole (10 mg/disc) was used as a positive control. Incubation was conducted for 5 days.

Results and discussion

Antidermatophyte assay of *Butea monosperma* plants was conducted against *T. mentagrophytes* and the result was presented in Table-1. The result showed that the plants possess potential activity against *T. mentagrophytes*

Table 1: Antifungal activity of *Butea monosperma* plants against *Tricophyton mentagrophytes*

No	Plant samples	Part used	Antifungal activity (%) vs Miconazole*
1.	*Butea monosperma*	Leaves	0

***** Extract amount was 2 mg /paper disc. Miconazole was used as a positive control.

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