Antibacterial Activity of Taxus baccata Extract

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The antibacterial activities of ten different extracts of Taxus Baccata in the solvents, Ethanol, Carbon tetrachloride, Hexane, Diethyl ether, Acetone, Water, Water-Ethanol, Acetone-Ethanol, Carbon tetrachloride-Diethyl ether, and Hexane-Carbon tetrachloride were tested against *B.pumilis, S. aeureus, P. aeruginosa* and *E.Coli* employing agar well diffusion method. The extracts showed significant activity against above said microorganism.

Key words: Taxus baccata, Antibacterial activity, B. pumili, S. aeureus, P. aeruginosa, E. coli.

The health system in India inherited a number of traditional practices system and medicine as a part of its total health care scenario. Traditional systems of medicine whether Indian or others have evolved over thousand of years through transfer of knowledge uses, practices from generations. Such traditional system of medicine still continues through out the world in spite of remarkable achievement of modern medicine and medical research. This feature has also received the attention and active promotion of many organizations including the world health organization primarily due to their safety and cost effectiveness¹. Taxus baccata is mainly found in the Himalayan region. The Taxus includes a single family represented by five genera (Austrotaxus, Amento Taxus, Notho Taxus, Taxus and Torreya) and 15 species. The plants are usually small trees or shrubs. Out of fifteen species nine species are widely distributed in North America, Europe and Asia extending up to Malaysia. Only one species of Taxus baccata occurs in India, which is distributed all along the Himalaya at an elevation of 1,800-3,300. The plant was identified and authenticated as Taxus baccata.

Division		-			Coniferophyta		
Class		-			Taxopsida		
Order		-			Taxales		
Family		-			Taxaceae		
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Taxus baccata has a considerable economic importance. The bark is brewed into concoction like tea in Ladakh (J and K). The aril is edible. The whole plant except aril is poisonous

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due to the presence of poisonous, alkaloid Taxin². *T. baccata* is an evergreen and widespread shrub commonly used for ornamental landscape³. However due to some poisonous properties, only few records document the plant as folk medicine, *i.e.* as an abortifacient, antimalarial and antirheumatic and against bronchitis⁴. It is also used to treat asthama⁵. *Taxus baccata* contains Taxol which is used for the treatment of ovarian and breast cancer⁶.

MATERIAL AND METHODS

Fresh plant leaves (spines) were collected from Gulmarg jungles of Kashmir India in 2007 and were shade dried. The dried leaves were ground into fine powder.

Preparation of Extracts

The plant material were divided into ten parts of 5 gm each and kept in 50 ml of ethanol, chloroform, acetone, diethyl ether, water, hexane, Water-Ethanol, Acetone-Ethanol, Carbon tetrachloride-Diethyl ether and Hexane- Carbon tetrachloride respectively for 24 hrs.

The materials were filtered separately and the extracts were and collected stored at room temperature under aseptic condition for further use. From the photochemical tests it was found that the extracts contain alkaloids, steroids and flavonoids for antibacterial study.

The extracts were concentrated to a dark syrup residue. This syrup was dissolved again in 10 ml in the above solvents. The liquid was used for testing inhibitory activity.

Micro organism used

The experiments were performed using bacteria B. pumilis, S. aureus, P. aureginosa, E.coli, and Candida albicans. Microorganisms were provided by the department of microbiology of Maulana Azad College Aurangabad.

Antimicrobial activity

The Bioassay was performed by agar well diffusion method of extracts in respective solvent keeping same solvents as a blank. The antibacterial activity was performed by agar well diffusion method of extracts of different solvent7. A bacterial lawn was prepared on agar plate by dispensing soft agar containing 100 micro litre cultures. 6 mm diameter wells were made in each plate using a sterile metallic borer. The concentration of the sample was 1mg/ml. 50 micro litre samples were added into the wells using sterile pipettes. The plates were incubated at 37°C for 24 hrs. Streptomycin was antibacterial reference substance at 10 microgram/disc. The antibacterial activity was evaluated by measuring the diameter of the inhibition zones (cm).

RESULTS AND DISCUSSION

The medicinal properties of *T. baccata* have been studied by researches, since taxol extracted from plant has anticancer activity. Extract obtained from the bark of Iranian *T. baccta* showed a comparable cytotoxic effect to doxorubicin against Hela cells⁸. Nugum Exdemoglu *et al.*,⁹ showed that the chloroform soluble portion of the ethanol extract heartwood

Solvent	B. pumilis	S. aureus	P. aeruginosa	E.coli	Candida albicans
Water	0.2	0.4	0.0	0.1	
Ethanol	1.8	1.7	1.7	1.3	1.0
CCl.	2.2	2.2	2.2	1.8 2.0 1.9 1.7	1.2 1.0 1.0 1.1
D.E.E.	1.7	2.4	1.8		
Hexane	1.7	2.1	2.0		
Acetone	1.9	1.8	0.0		
Water-Ethanol	1.6	1.6	1.2	1.4	0.8
Acetone-Ethanol	1.9	1.8	1.2	1.7	1.1
CC1D.E.E.	2.5	2.3	2.3	2.2	1.3
HexanCCl ₄	2.3	2.3	2.2	2.0	1.3

Table 1. Zone of Inhibition in cm

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of *T. baccata* exhibited moderate antibacterial activity against the gram negative bacteria Pseudomonas aeruginosa. Lignan derivatives from *T. baccata* possess significant antiulcerogenic activity¹⁰.

The results of Table (1) of antibacterial zone study revealed that the extracts against the tested strains of microorganism are between the inhibitions zone of 0.0 to 2.5 cm. This study revealed that the extracts posses antibacterial activity against test organism and were almost comparable with standard i.e. streptomycin. All the bacteria were almost equally susceptible to the extracts. Among the tested strains of bacteria Carbon tetrachloride-Diethyl ether extract was most effective against almost all microorganisms while diethyl ether extract was almost equally effective where as water extract was ineffective against almost all species used.

Our results from the presented study indicate the usefulness of *Taxuas baccata* in the treatment of various pathogenic diseases.

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