



STUDY ON BIOCHEMICAL CONSTITUENTS AND ITS ANTIBACTERIAL ACTIVITY OF ARJUN (*TERMINALIA ARJUNA*) BARKS

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ABSTRACT: The present study is carried out to identify the bio-chemical properties of *Terminalia arjuna* bark and also to test their antimicrobial effects at FCRI, Mettupalayam. Barks are collected from twenty years old *Terminalia arjuna* in Government Horticulture Garden, Kallar. These were chopped, shade dried, powdered and extracted solvent using soxhlet apparatus. It was analysed for its biochemical constituents through GC-MS. It revealed that seven major compounds of which *Methyl palmitate* was having highest peak area (21.31%) and this compound can be used as a solvent in perfumes. Also, *Methyl palmitate* can be used as component in pesticide against the treatment of head lice. Apart from this, the second highest peak area of 18.08% was *Di-isobutyl phthalate*. This compound can be used as a component in nitro cellulose plastic, explosive material and lacquer manufacturing. The compound identified with least peak area of 0.75% was *Cathinone* and this compound can be used in pharmaceuticals as an anti-depressant agent. It also attempts to test the anti-bacterial efficacy of *Terminalia arjuna* bark. It results that 0.4±0.1mm inhibition zone around the *Bacillus subtilis* cultures.

Keywords: Medicinal plants, *Terminalia arjuna* bark, biochemical constituents, methyl palmitate, *Bacillus subtilis*, antibacterial activity

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Nowadays, synthetic drugs are widely used but their excessive use may cause severe side effects

in body. Also control of the multi drugs resistant infectious agents is a serious issue in the field of pharmaceutical industries (Rath and Padhy, 2015). It resulted in spending lot of time and money to development of new cost effective affordable herbal drugs. Naturally the plants have a number of secondary metabolites which could help in development of above drugs. Because secondary metabolites of plants have various biochemical compounds which will varies with species, climate and other ecological factors (Gupta and Kumar, 2017). These were inhibiting the growth of microorganisms and insects. *Terminalia arjuna* bark is one of the widely used medicinal plants in Indian system of medicines since time immemorial (Chaudhari and Mahajan, 2015).

Terminalia arjuna Roxb. also, known as *arjun* tree belonged to the family Combretaceae. It is a large sized buttressed tree widely grown in river banks and streams along the deciduous forests of Indian subcontinent. It had a shallow root system which spreads radially along stream banks. Barks are thick, smooth, surface pinkish-grey in colour when became older exfoliating in thin

irregular sheets (Harborne *et al.*, 1984). Branches are spreads as horizontally and drooping. Leaves are simple, glabrous, opposite or sub-opposite, oblong or obtuse, dull green in upper part and pale green in lower. The bark is used in the indigenous system of medicine. Also, it is used for the treatment of cancer, blood pressure, ulcers, dermatological, gynaecological problems, heart diseases and urinary disorders. Even though barks are used to cure more number of diseases, there are only few studies are about biochemical constituents of Arjun bark and their efficacy against diseases. The present was aimed to analyse the biochemical constituents and their antibacterial efficacy *Terminalia arjuna* barks.

MATERIALS AND METHODS

The healthy bark of *Terminalia arjuna* (around twenty years old) were selected from Government Horticulture Garden- Kallar in November 2016. From this the bark is peeled using the knife and then chopped. Chopped barks were shade dried and coarsely powdered by using electrical blender. The powdered bark extracted through soxhlet apparatus with methanol as a solvent for two hours at 55°C. The extract suspensions were filtered through Whatman filter paper No. 1. Filtrates were then concentrated under reduced pressure at 40°C using a rotary evaporator (Buchi Rotavapor R-