

Review article

REVIEW ON PHARMACOLOGICAL AYURVEDIC
COMPOUND OF TERMINALIA ARJUNA

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ABSTRACT:

The traditional system of medicine contain Terminalia Arjuna is moderate tree used in various disease to cure. It is identified to confirm various compounds present in them. Terminalia Arjuna has been applied to balance the three humors Kapha, Pitta, Vata. Terminalia Arjuna is mankind's widely used herbal medicinal plant through Bangladesh and used in traditional system of Medicine like Ayurveda, Siddha and Unani. Analytical Active Constituent containing Gallic acid and Arjunolic acid, B-sitosterol, Terminic acid, pyrocatechols, Calcium Magnesium Zinc copper. It has been medicinal value on Pharmacological agents as Anticancer, Antimicrobial, Antiacne, Antidiabetic, Antianthelmintic, Anticholinesterase, Antiinflammatory, Antioxidant, Antiasthmatic as well as Wound healing, Cardioprotective and insecticidal activities. It is also applicable for the treating of Cancer, Cardiomyopathy and Hypertension.

Key Word: Terminalia Arjuna, Gallic acid, Arjunolic acid, Antidiabetic, Cardiotonic, B-sitosterol, Terminic acid.

INTRODUCTION

Terminalia Arjuna is a worldwide medicinal tree and native Bangladeshi tree having leaf simple and smooth with thick bark belonging to the family Combretaceae (Lal *et al* 1963). It is mostly used in Unani, Ayurveda and Homeopathy medicine. A Terminalia Arjuna is a traditional system of medicine is used in India and also in other countries like Bangladesh, Asia. Pharmacological active chemical present in this plant of Terminalia Arjuna which is widely used for the treatment of No of Disease like an Cardiomyopathy, Cardioprotective, Antiinflammatory, Anticholinesterase (Bajpeyee.,1995) . Terminalia Arjuna decreases the effect of Stress and Anxiety, Antimutagenic, Hypolipidemic, Antioxidant and Hypocholesterolamic. Terminalia Arjuna have the capability protect liver and kidney tissue again CCl₄ induce oxidative stress, Terminalia Arjuna with its Phytochemical and pharmacological characteristic (Agarwal V and Chauhan BM.,1998).

HABITAT: It is world popular tree famous for medicinal used. The bark Terminalia Arjuna has been used in India for more than 3000 years. Primarily has an heart remedy (Delgado *et al* 1998) the first to used this product heart condition in this 7th century AD

research on the Terminalia Arjuna has been going on since 1930. Terminalia Arjuna also Amandier Indian, Amandier Tropical (Shailaja Chandra *et al* 2001), Argun Badamier Arjuna axjun.

MACROSCOPIC CHARACTER:

TREE: It is moderate tree having thick bark.

LEAVES: Terminalia Arjuna contain simple and smooth leaf.

FRUITS: Fruits are obovoid - oblong dark brown fibrous woody indehiscent drupe.

INFLOURESENCE: Terminalia Arjuna the inflorescences are short axillaries spikes or small terminal panicles.

FLOWER: Flower is small regular, sessile cup shaped polygamous, white creamy or greenish white and robustly honey scented.

POWDER: The powder of Terminalia Arjuna containing yellowish white (Dhiman AK 2006)

PHYTOCHEMISTRY: It was initially identify that containing water extract 16% tannin and 23 degree calcium salt existence. In it bark has been contain 34 % ash contain which found pure calcium carbonate and where as the alcoholic extract contain very little colouring matter and tannin (Nema *et al* 2012). The analysis reported that 12 % of sugar present in tannin colouring matter of glycoside and carbonate of calcium sodium and traces of chloride of alkali (Junior *et al* 2006)

MEDICINAL USE:

Antimicrobial activity : (Mann *et al* 2008) scientifically analysis reported that water extract of Terminalia Arjuna barks shows maximum amount of antimicrobial antimicrobial activities against *Proteus Vulgaris*, *Klebsiella aerogenes*, *Eschrichia coli* and *Pseudomonas aerogenis*. The presence of antibacterial activity in the bark of Terminalia Arjuna exhibiting selectively maximum activity against *S. epidermidis* (Biotechnol., 1996).

Anticancer activity: Reporting that the different type of cancer to treat Terminalia Arjuna extracts are compiled. Herbal extracts of *Terminalia Arjuna* shows to enhance increased percentage of life. Arjuna extract inducing DNA damage in HepG2 cells indicated that Terminalia Arjuna extract induces ROS production in HepG2 cells and consequently causes apoptosis (Kumar *et al* 2009).

Antifungal activity: *Terminalia* species found five contain of organic extracts like (*T. arjuna*, *T. chebula*, *T. bellerica*, *T. catappa* and *T. alata*) were tested with plant pathogenic fungi i.e. *A. flavus*, *A. alternata*, *A. niger*, *A. brassicicola*, and *H. tetramera*.

The present extract of five plant leaves shows inhibits the plant pathogens (Sharma *et al.*, 1982). The bark extracts were more useful than fungicide beneficial in this antifungal test. Intense strongly antifungal activity against *C. parapsilosis*, *C. krusei* and *C. albicans* was exist by a mixture of arjunolic acid with minimum inhibitory concentration (MIC) values in the range of 50-200 µg/ml (Goun *et al.*, 2003).

Antidiabetic activity: The *Terminalia Arjuna* extracts have ability to action on diabetic. In the scientifically analysis diabetic rats model treated with *Terminalia Arjuna* extracts showed two enzymes (glucose-6-phosphatase, fructose-1, 6- diphosphatase) much reduced in liver and kidney. They have an ability to increase insulin secretion which can react on repression of the gluconeogenic key enzymes (glucokinase and phosphofructokinase) (Banting *et al.*, 1992). *Terminalia arjun bark* extract exposed antidiabetic activity by value the outermost utilization of glucose which has the ability to kidney glycolysis and repairing the impaired liver and by decreasing its gluconeogenic generation as like as insulin. The tannin, saponin, flavonoids and other constituent's presence in the bark this action may be due to ability of its ingrednts, which could act valuable constitution in enhancing the effect of glycolytic and gluconeogenic enzymes (Ribnicky *et al.*, 2006). (Mythili *et al* 2012) have research the prophylactic medium of arjunolic acid against streptozotocin (STZ) treat diabetes in the pancreatic tissue of Swiss albino rats. STZ administration (at a dose of 65mg/kg body wt, injected into the tail vein) causes an increase in the production of both ROS and reactive nitrogen species (RNS) in the pancreas of labortical animals. Formations of these reactive intermediates minimize the intracellular antioxidant defense, maximize the levels of lipid peroxidation, protein carbonylation, serum glucose and TNF- (Tiwari *et al.*, 1989).

Antiacne activity: Topical formation made cream of *Terminalia Arjuna* extract containing flavonoid (FF-I to III) and tannin fraction (TF-I to III) have been developed, which were analysis antimicrobial activity against *Propionibacterium acnes* and *Staphylococcus epidermidis*. The composition of FF-III (cream containing 2% flavonoid fraction) has present maximum antibacterial activity against *P. acnes* (zones of inhibition >17 mm) and *S. epidermidis* (zones of inhibition >20 mm) than other composition and which is similar to that of standard marketed topical herbal preparation (Swanson *et al.*, 2003). Herbal anti-acne cream is non-toxic, safe, and effective and treat patient compliance by the application of herbal extracts from *Terminalia Arjuna* would be highly adoptable (Akiyama *et al.*, 2001).

Anthelmintic activity: Bark crude methanolic extracts of *Terminalia Arjuna* formation anthelmintic activity both *in vitro* (eggs, larvae and adult of *Haemonchus contortus* and *in vivo* research against mixed gastrointestinal trichostrongylid nematodes of sheep (Athanasiadou *et al.*, 2001). *Terminalia Arjuna* bark acts as Anthelmintic activity and may be mainly attributed to its tannin content that binds with a free protein formation in the tubes for larval nutrition and decrease nutrient activity resulting in larval decreased

gastrointestinal metabolism by straightly inhibiting the oxidative phosphorylation thereby causing larval death (Niezen *et al.*, 1995).

Wound healing activity: *Terminalia Arjuna* bark extract contain hydroalcoholic, phytoconstituents was reported to be used in topical application on healing rat dermal wounds. In rat wound created on back it have been treated with topical applied as simple ointment. Results prove that fraction III prepared as 1% simple ointment react complete epithelialization on day 20, whereas fraction I react complete epithelialization on day 9, which necessary consists of tannins (Chopra *et al.*, 1995). The ability shows of *Terminalia Arjuna* to total epithelisation of excision wounds and maximum tensile strength of incision wounds (Brzozowski *et al* 1998).

Cardioprotective activity: *Terminalia Arjuna* has an ability to use different therapeutic ways cardiac disease that origin on empirical showing recorded in different treatment of ancient medicine (Fugh-Berman *et al* 2003) .

Cardiotonic activities: In ayurvedic medicine arjunolic acid is used as a cardiac tonic for centuries and it has been first identify from *Terminalia Arjuna*. The bark extracts have wide component triterpenoid saponin is an arjunolic acid (Sindambiwe *et al.*, 1998). Physico reported carried on the experimental rabbit and frog heart exposed that *Terminalia Arjuna* bark had cardiotonic (Ajees, 2002). It was consequently reported that intravenous administration of the glycoside, formation from the bark of *Terminalia Arjuna*, resulted in rise in blood pressure (Colabawalla, 1951). It was showed that the bark powder has a cardiotonic property and diuretic. The analytical reported to isolated frog heart exposed that the water base extract of the bark had chronotropic and inotropic activities. The aqueous extract of the bark is identified from rat atria that resulted positive inotropic activity (Gupta *et al.*, 2001). Water base extract of the bark was identify from rat atria that was again resulted in consequent work where produced inotropic action which was showing by propranolol and cocaine (. Malhotra *et al.*, 1981). The new element 16, 17-Dihydroneridienone, 3-*O*- -D-glucopyranosyl-(1-6)-*O*- -D-galactopyranoside is identify from arjuna root and applicable as a cardiotonic (Jayant *et al.*, 2000).

Coronary flow: (Rajak *et al.* 2001) analysis form bark to inject aqueous extract into isolated rabbit heart to maximum in coronary flow. The dose was 1024 µg/ml that causes highest increase in coronary flow.

Hypotensive effects: The analysis of injection of alcoholic and aqueous extract into intravertebral and intracerebro-ventricular extract of bark that was dose-dependent persistent bradycardia and hypoten- sion. Although the alcoholic extract show the hypotensive effect in dogs was obtain by pre-treatment with atropine. In another way tested in dogs where intravenous induce of aqueous extract of *Terminalia Arjuna* resulted in dose-addict falls in blood pressure (Sharma *et al.*, 2001).

Effect on aortic prostaglandins: Those rabbits Aortic prostaglandin E₂ like activity was enhanced that were administered *Terminalia Arjuna* compared to those who were on

placebo. The finding of raised PGE₂ like activity was significant because PGE₂ is known to produce coronary vasodilation. This may possibly show the pharmacological basis of the increased coronary flow following *Terminalia Arjuna* infusion (Dwivedi *et al.*, 1987). This may also be participating to the important role of *Terminalia Arjuna* in coronary artery disease (CAD) patients.

Anti-inflammatory: To take two crude herbal ethanolic extract of *Datura stramonium* (leaves) *Terminalia arjuna* (bark) and *Withania somnifera* (root) that analyze polyherbal preparation have anti inflammatory ability to resist the enzyme cyclooxygenase (COX) leading to resist of prostaglandin synthesis vausing inflammation at the 3rd stage. From the analysis of this study, it can be accomplished that polyherbal preparation resulted significant anti inflammatory and analgesic activities (Golan *et al.*, 2008).

Insecticidal property: In the stem *Terminalia Arjuna* isolated from Arjunolic acid exhibits significant resist activity towards 4th instar larvae of *Spilarctia obliqua*. More concentration to less amount of feeding and growth of the larvae has been found to be 666.9 and 617.8 ppm, respectively (Bhakuni *et al.*, 2002).

Antioxidant activity: In *Terminalia Arjuna* bark contain antioxidant activity test that exhibited significant antioxidant activities with the IC₅₀ value of 7.05 µg/ml. Because of Methanol extract of *Terminalia Arjuna* has intense antioxidant activity and may have ability use in medicine (Brand *et al.*, 1995).

Antiasthmatic activity: *Terminalia Arjuna* contain Arjunolic acid and alcoholic extract have significant mast cell stabilization activity and arjunolic acid exhibits well better stabilization reactor than alcoholic extract of TA (Prasad *et al.*, 2004). The antiasthmatic and antianaphylactic activity may be due to the mast cell stabilizing ability and inhibition of antigen induced histamine and acetylcholine release (Prasad *et al.*, 2004).

Gastro protective effect: *Terminalia Arjuna* play important role as a gastroprotective agent probably because its cytoprotective nature and free radical scavenging activity (Gupta *et al.*, 2001).

Decrease arsenic-induced toxicity: In its presents Arjunolic acid that play important role against arsenic-induced cellular oxidative expose (Manna *et al.*, 2007).

COCLUSION: The present analyze research which expose its references that *Terminalia Arjuna* is very beneficial plant. The huge number of phytochemical and pharmacological properties also medicinally and chemicals important. The most exciting aspects of the plant were diagnosis of cardiac diseases, diabetics and cancer. It's reported components wide range as favor of mankind to cure disease like antimutagenic, anti-inflammatory, antibacterial, antiviral, and wound healing activities. Thus this research can review be made for human beneficial source for the researchers to carry out systematic knowledge of herbal and poly-herbal drugs from *Terminalia Arjuna*.

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