Terminalia bellirica

TAXONOMICAL CLASSIFICATION:[1]

***Kingdom** : Plantae*

Division : Magnoliophyta

Class : Mangoliopsida

Order : Myrtales

Family : Combretaceae

Genus : Terminalia

Species : Terminalia bellerica

INTRODUCTION:[2,3]

Terminalia bellerica commonly known as bibhitaki belongs to the family Combretaceae. It is called vibheetaki in Sanskrit which means “fearless”, the fruit that takes away the fear of disease. In Indian history, it is said that, T. bellerica is inhabited by demons and those who sat under its shade were vulnerable to an attack by the same. It grows wild at an elevation of upto 2000m in wide variety of ecologies. It is native to Sri Lanka, India, Bangladesh, Bhutan, Thailand, China, Indonesia, Pakistan, Malaysia, Nepal, Cambodia and Vietnam. In India, it is commonly found in Madhya Pradesh, Uttar Pradesh, Punjab and Maharashtra. It is mostly found in monsoon forests, mixed deciduous forests or dry deciduous dipterocarp forests, associated with teak. It is large deciduous tree with the height of 50m and diameter of 30m with a rounded crown. It is branchless upto 20m. It is perennial and requires cold climate. Its principle phytoconstituents are beta-sitosterol, gallic acid, ellagic acid, ethyl gallate, galloyl glucose, chebulagic acid. Four lignans including termilignan, thannilignan, hydroxy-3', 4'-(methylenedioxy) flavan, and anolignan-B have been found. Fruit contains terpenoids (belleric acid and chebulagic acid), saponin

(bellericoside and bellericanin) and tannins (23.60%-37.36%), which are composed of chebulinic acid, chebulagic acid, 1, 3, 6-trigalloylglucose and 1,2,3,4, 6- pentagalloylglucose, corilagin, andglucogallin etc. Seed contains alkaloids, coumarin, flavone, glycosides (D-glucose, fructose, sucrose, galactose and mannose). Bark contains beta-sitosterol, tannins, ellagic acid, gallic acid and catechol.

PROPERTIES AND USES: [4,5]

- Anticancer
- Angiogenesis activity
- Antidepressant and antipsychotic activity Anti urolithiatic effect
- Nephroprotective activity Laxative
- Astringent
- Anthelmintic
- Antipyretic
- in eye diseases and scorpion-sting
- a hair tonic
- Antioxidant activity
- Anti-inflammatory activity
- Antibacterial activity
- Antiviral activity
- Antifungal activity
- Immunomodulatory activity
- Antithrombotic and thrombolytic activities

- Antispasmodic and bronchodialatory activities
- Antidiarrheal activity
- Antihypertensive activity
- Hepatoprotective activity
- Antidiabetic activity
- Wound-healing activity
- Diuretic activity
- Antifertility activity
- Antiulcerogenic activity
- **SIDE EFFECTS OF EXCESS CONSUMPTION:**[6]
- Nausea
- Vomiting
- Gastric problems
- Diarrhea

DOSAGE: [7]

- Baheda Oil- 2-5 drops or as per your requirement
- Baheda Powder- ½ to 1 teaspoon or as per your requirement

RESEARCH:

1. The present study established a connecting link between the TB extract induced apoptosis and autophagy in relation to reactive oxygen species (ROS). Our study revealed, that gallic acid in the TB extract possess a strong free radical scavenging capacity contributing towards the selective anti-proliferative activity. Furthermore, TB extract markedly enhanced the accumulation of ROS that facilitated mitochondrial apoptosis through DNA damage, indicating ROS as the vital component in regulation of apoptosis. This effect was effectively reversed by the use of a ROS scavenger, N-acetyl cysteine (NAC). Moreover, it was observed to induce autophagy; however, it attenuated the autophagosome-lysosome fusion in Cal33 cells without altering the lysosomal activity. Pharmacological inhibitors of autophagy, namely, 3-methyladenine and chloroquine, were demonstarated to regulate the stage-specific progression of autophagy post treatment with the TB extract, favouring subsequent activation of apoptosis. These findings revealed, presence of gallic

acid in TB extract below NOAEL value causes oxidative upset in oral cancer cells and promote programmed cell death which has a potential therapeutic value against oral squamous cell carcinoma. [8]

2. The *in vitro* antioxidant activities of *T. bellirica* fruit ethyl acetate and aqueous extracts were measured by metal ion chelation and nitric oxide radical scavenging assays. The *in vivo* antioxidant and hepatoprotective effects of *T. bellirica* extracts (200 mg/kg) and EA (40 mg/kg) in ACF-induced hepatotoxic rats were assessed in serum and liver tissue after oral administration for 21 d. Silymarin (40 mg/kg) was used as a standard control. Oxidative stress markers in the blood (ferric reducing ability of plasma and lipid peroxidation inhibition) and liver tissues (superoxide dismutase, catalase and malondialdehyde) were analyzed using standard protocols. Liver function markers such as alkaline phosphatase, glutamic pyruvic transaminase, glutamic oxaloacetic transaminase, lactate dehydrogenase, γ-glutamyl transferase, creatinine, total protein, and uric acid were evaluated in rat serum. Ellagic acid and *T. bellirica* fruit extracts exhibited considerable hepatoprotective and antioxidant activities in long-term ACF-treated rats. [9]

PRECAUTIONS & WARNINGS: [7]

1. Consult any doctor before applying the paste of Baheda fruit on eyelids in case of eye disease due to its hot potency.
2. Use a paste of Baheda fruit with coconut oil or rose water as it may cause hypersensitivity due to its hot potency.
3. Consult your doctor while taking Baheda if you have diarrhea or loose motion.
4. Consult your doctor while taking Baheda if you have hyperacidity or gastritis due to its hot potency.
5. Consult your doctor before taking Baheda during Breastfeeding.
6. Baheda may lower blood sugar level, so it is generally advised to monitor your blood sugar level while using Baheda along with antidiabetic medicines.

REFERENCES:

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