



EFFICACY OF TERMINALIA BELLIRICA (*Balela*): A REVIEW

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ABSTRACT

Terminalia bellirica, commonly referred to as *Balela*, is a plant belonging to the Combretaceae family, which has been extensively employed in both preventative and therapeutic medicine. In Unani medicine, it is a widely used herbal drug for the treatment of several ailments, including obesity, atherosclerosis, gastrointestinal disorders, memory loss, premature greying of hair, weakened immune system, loss of eyesight, general weakness, and ageing. The present review article aims to provide a comprehensive account of *Terminalia bellirica*, describing its medicinal uses, pharmacological actions, therapeutic properties, and chemical constituents. Furthermore, the article provides an overview of the plant's properties. The study highlights the potential of *Terminalia bellirica* as a valuable source of medicinal compounds, which can be harnessed for the development of novel therapeutic agents.

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INTRODUCTION

The Unani system of medicine is one of the oldest healthcare systems that has been used to prevent and treat diseases through various methods. Among these methods, treatment with drugs, known as "*ilaj-bil-dawa*," is a widely used approach. This mode of treatment utilizes drugs made from herbal, mineral, and animal sources, with a focus on herbal drugs. *Balela* is an herbal medicine that has been widely used in Unani medicine for both preventive and therapeutic purposes. It is made from dried ripe fruits of *Terminalia bellirica* Roxb, which belongs to the Combretaceae family. The drug *Bellirica* consists of the pericarp of these fruits. The drug-yielding plant is a large deciduous tree that can grow up to 10-12 m or higher. It is commonly found in plains and forests. The fruits of this plant usually ripen in November. Together with *amla* (*Emblica officinalis*) and *halela* (*Terminalia chebula*), it forms a group known as

'*Triphala*'. This trio is the base of an important Unani formulation named '*Itrifal*' (Alam & Ansari, 2019).

SCIENTIFIC CLASSIFICATION

(Khope et al., 2022; Kumari, J, et al., 2017)

Kingdom : Plantae
Division : Angiosperm
Class : Magnoliopsida
Order : Myrtales
Family : Combretaceae
Genus : Terminalia
Species : Terminalia bellirica

VERNACULAR NAMES AND ETYMOLOGY (Motamarri et al., 2012)

Arabic : Balela
Assam : Bhomora, Bhomra, and Bhaira
Persian : Balelaj
English : Beleric Myrobalan

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Fig 1: Terminalia bellirica



Fig 2.: Terminalia bellirica

Gujarat	:	Bahedan, Baheda manjhad, Bahedo and Bahi
Hindi	:	Bahera, Baheda
Kannada	:	Shanti, Shantikayi, Tare, and Tarekayi
Malayalam	:	Tanni, Tannikai, Thani and Tusham
Marathi	:	Bahera, Behera, Balra and Beda
Tamil	:	Thanakkai, Tanri, tanrikkai and Tani
Oriya	:	Baheda, Bhara
Sanskrit	:	Vibhita, Aksa, Aksaka and Bibhitaki
Telegu	:	Tani, Tandi and Vibhitakami.

DESCRIPTION

This tree is a member of the Combretaceae family and is characterized by its large, deciduous nature. The tree's leaves are extensively elliptic and are typically found clustered at the terminal of its branches (Meena *et al.*, 2010). The axillary spikes bear pale greenish-yellow flowers with an offensive odour, which are smaller than the leaves but longer than the petioles. The fruits are ovoid drupes and initially spherical and pink-coloured and become 5-ridged and greyish when they are dry. Each fruit contains an ellipsoid seed. The bark is grey or pale brown with longitudinal fissures and shallow cracks (Gupta *et al.*, 2020). It is widely distributed throughout the world, particularly in the Indian subcontinent, Sri Lanka, Pakistan, Nepal, and Southeast Asia (Gupta *et al.*, 2017). The Terminalia bellirica tree grows up to 30 m and thrives in diverse ecological conditions, reaching elevations of up to 1200 m (Warrier *et al.*, 1994). Due to its numerous healing properties, it is commonly used in traditional medicine (Gupta *et al.*, 2017). Gallic acid, ellagic acid, ethyl gallate, galloylglucose, and chebuinic acid are believed to be primarily responsible for their extensive healing effects (N. Kumar & Khurana, 2018).

Macroscopic description: The fruit is almost spherical to ovoid and has a diameter of 2.5–4 cm. When mature, the fruit's rind is grey or greyish-brown and has a slightly wrinkled appearance. The thickness of the mature fruit's rind varies from 3 to 5 millimetres, and it has an astringent flavour. Ripe fruits have a somewhat silvery or whitish pubescent surface (CCRUM, 1997; Commission, 2007).

Microscopic description: In a transverse section of the fruit, the outer layer, or epicarp, is made up of epidermal cells. Most of these cells elongate to form hair-like protuberances with a swollen base. The epicarp also contains a zone of parenchymatous cells that are slightly tangentially elongated and irregularly arranged. These cells are intermingled with stone cells of varying shape and size, with elongated stone cells found towards the periphery and spherical stone cells in the inner zone. Calcium oxalate rosettes and stone cells can be found in the parenchymatous cells. The endosperm is composed of stone cells that run longitudinally and transversely. (Commission, 2007).

CHEMICAL CONSTITUENTS:

Fruit of Terminalia bellirica contains termilignan, thannilignan 7-hydroxy-3', 4'(methylenedioxy) flavones, anolignan B, Gallic acid, ellagic acid, β -sitosterol, arjungenin, belleric acid, bellericoside, cannogenol 3-O-D-galactopyranosyl and phospholipids. The plant body of Terminalia bellirica contains Tannins, ellagic acid, ethyl gallate, galloyl glucose and chebulaginic acid, beta-sitosterol, Coloring matter, resins, and a greenish-yellow oilphenyllembelin, β -sitosterol, mannitol, glucose, fructose, and rhamnase. The seed contained 12.28% oil on a dry basis; Moisture, epigallocatechin gallate, ash and crude fibre contents of the seed kernel were found to be 8.43, 2.54, and 8.78% respectively cardenolide, cannogenol 3-O-D galactopyranosyl 14-O-L-rhamnopyranoside and phospholipids (Ayoob

et al., 2014; Gangadhar et al., 2011; Molla et al., 1970; Shukla et al., 2006; Singh & Kumar, 1946; V & Mohit, 2010; Yadava & Rathore, 2001)(R. Kumar et al., 2022).

TRADITIONAL USES

Fruits are diuretic, astringent, anthelmintic, and antipyretic; they are also helpful for treating eye disorders, scorpion stings, dyspepsia, piles, diarrhoea, cough, and hoarseness of voice. They can be used as a tonic for the hair. The green fruit's decoction is used as a cough remedy. Fruit pulp can help with leprosy, dropsy, piles, and dysentery. Fruit that is just partially ripe is employed as a purgative. The fruit's kernel contains a narcotic. In Khagrachari, fruit is used to treat menstruation irregularities. Rheumatism can be treated using seed oil. The bark's gum is demulcent and purgative. The triterpenoid found in the fruits has potent antibacterial properties. Kernel oil has a purgative effect, and mice were able to tolerate it when used for extended periods(Deb et al., 2016).

PHARMACOLOGICAL ACTIONS (*Afaal-o-khawas*)

Muqawwi-e-meda, *qabiz*, *munaffis-e-balgham*, *muqawwi-e-qalb*, *muqawwi-e-dimagh* and *muqawwi-e-basar*(Ghani, n.d.; Kabiruddin, n.d.)(Shakib, 2010).

THERAPEUTIC USE (*Mawaq-e-istemaal*)

Dyslipidemia, obesity (*saman-e-mufrat*), weakness of the stomach (*zof-e-meda*), weakness of the intestine (*zof-e-ama*), weakness of the gastrointestinal tract (*zof-e-ama*), diarrhea (*ishal*), weakness of vision (*zof-e-basarat*), weakness of memory and brain (*zof-e-dimagh*), and dry cough (*sual*) ' (Ali, 1979; Commission, 2007).

THERAPEUTIC PROPERTIES

Analgesic activity

By reducing acetic acid secretion, it acts as an analgesic. In the abdominal cavity, acetic acid induces an inflammatory reaction that is followed by the activation of nociceptors (Khan & Gilani, 2010; Khan AU, 2010; Shankar Sharma et al., 2010).

Antispasmodic and Broncho dilatory activity

Studies in vivo and in vitro were carried out to ascertain the mode of action for the therapeutic application of *Terminalia bellirica* fruit in hyperactive gastrointestinal and respiratory illnesses (Kumari, J, et al., 2017).

Dyspepsia and Diarrhoea

The herb *Terminalia bellirica* is used to cure diarrhoea and dyspepsia because of its astringent qualities (Sabnis, 2014)(Sidh & Sarswat, 2018)(B. Kumar et al., 2010).

Purgative property

The half-ripe fruit's purgative quality is caused by the

presence of Fixed oil. An annoying formula is produced by the hydrolysis of the oil. Making soap involves the use of oil. Gum acts as a demulcent and purgative(Sabnis, 2014).

Antimicrobial

Tannins in the fruit extract of *Terminalia bellirica* may prevent the growth of germs by precipitating microbial protein and making nutritive proteins unavailable to them (Sabnis, 2014) (Badrul et al., 2011).

Antihypertensive

Lowering blood pressure By acting as a Ca++ antagonist, *Terminalia bellirica* lowers blood pressure, giving a sound mechanism underpinning its use as a hypertension medication (Khan & Gilani, 2008)(Kumari, Krishna, et al., 2017).

Immunological activity

According to Aurasorn Saraphan choti withthaya et al., PHA and *Terminalia bellirica* extract both have an impact on T cell proliferation. Through T cell-dependent and T cell-independent methods, respectively, the extract with LPS and PWM also had an impact on B cell proliferation. According to the findings, the extract had an impact on cellular-mediated immunity (CMI) as opposed to humoral-mediated immunity (HMI) (Saraphanchotiwitthaya et al., 2008).

Antioxidant

The fruits of *T. belerica* contain a large number of naturally occurring antioxidants, including ellagic acid and gallic acid, which give them antioxidant characteristics (Awad et al., 2015; Guleria et al., 2010; Tanaka et al., 2016).

Antipyretic Activity

The antipyretic effect of ethanolic and aqueous extracts of *Terminalia bellirica* fruits was investigated in brewer's yeast-induced fever models in mice and rats. When compared to the matching control, both extracts inhibited raised body temperature significantly(Shankar Sharma et al., 2010).

DOSE: 5 to 7 g(Ghani, n.d.)(Kabiruddin, n.d.).

COMPOUND FORMULATIONS:

Itrifal-e-sagheer, *Itrifal-e-muqili*, *Itrifal-e-ustukhuddus*, *Majoon-e-jograj gugal*, *Majoon-e-fanjnosh*(Mehmood, 1996; Said, 1997).

CONCLUSION

Balela is an herbal drug that has been used in Unani medicine for generations to cure problems such as obesity, atherosclerosis, gastrointestinal disorders,

memory loss, greying hair, immune weakness, loss of eyesight, general weakness, ageing, and so on. Experimental research has shown that it has analgesic, anti-diarrheal, anti-microbial, antioxidant, antihypertensive, antipyretic, immunomodulator, and hepatoprotective properties. Using the vast resources of traditional medicines, which have a long and proven history of treating a wide range of ailments, has recently become a focus of research. More research should be done on this plant to identify the undiscovered element of it that could benefit mankind.

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