

## Hercules of homeopathy: turbulence in mouth

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**Purpose:** Aim of clinical trial was to assess the efficacy of 10 % terminalia chebula as an anti-plaque agent and its effect on Periodontal Health

**Materials and methods:** It was a clinical trial conducted in dept of Periodontology at K.D. dental college and Hospital , Mathura . 25 subjects were enrolled in the study after ruling out the inclusion and exclusion criteria . assessment was carried with help of indices which included ;Gingival index (Loe and Silness),Bleeding Index , Quieglyhein plaque index , Probing Pocket Depth. All the parameters were recorded at baseline (21 days post scaling ) , after a period of 1 month and 2 months . Statistical analysis was done by student's T- test

**Results:**The encouraging results clearly favour promotion of Terminalia chebula as a mouthrinse for communities, particularly those belonging to low socioeconomic strata. However, as this is the first attempt to assess the effect of Terminalia chebula on plaque and gingivitis, clinical trials of longer duration with a larger sample size should play a vital role in the commercialisation of Terminalia chebula mouthwash.

**Conclusion:** The results obtained after 2 months of continuous use of mouthwash proved it is highly effective in improving periodontal health

**Key words:** Terminalichebula.

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### I. Introduction

Good oral health has a great influence on general well being and quality of life . A happy mouth is key to happy life. with increasing amount of oral and specially periodontal diseases urges a need to expand the panorama of medicine , and to include alternative medicines and therapies which will be an adjunct to conventional treatment therapies but with a cheaper cost and better results . The root cause of all the periodontal diseases is interplay of bacteria deposition and action of by products this deposition occurs in a form Of bacterial biofilm called PLAQUE , which further strengthens by mineral deposition resulting in formation of calculus. Dental Plaque is a specific but highly variable structural entity resulting from sequential colonization and growth of microorganisms on the surface of teeth and restorations which consist of microorganisms of various strains and species which are embedded in extracellular matrix. It is composed of bacterial metabolic products and substance from serum, saliva and blood (WHO – 1978)<sup>1</sup>. Its inadequate control is one of the primary causative factors in the development of gingivitis and periodontal disease progression. This led to the concept that strict plaque control is a prerequisite for a stable and healthy periodontal condition.

Homeopathy in dentistry is a less visited avenue in the management of orofacial diseases. It is a safe and natural alternative that is effective in both adults and children. Homeopathy as a part of holistic dentistry is said to provide effective treatment to the patients while minimising side effects. Homeopathy is not a replacement or alternative to clinical dental care but can be used alongside conventional treatments and drug regimens.

One of the magical, power-puffed medicine that is frequently used in homeopathy is Terminalia chebula extract, also known as black myroblans in English , harad in hindi,

the Sanskrit name 'ikatirah' is rich with meaning, referring to the yellowish dye (haritak) that it contains, as well as indicating that it grows in the abode of god siva (Hari, that is the Himalayas) and that it cures (harayet) all diseases. Its other commonly used Sanskrit name, Abhaya, refer to the "fearlessness" it provides in the face of the disease .The fruit of T. chebulais consider as the "king of medicines" by Tibetans and second-to-none by ayurvedic apothecaries, and also held in high regard by other folk medicinal practitioners . It is now considered a valuable source of unique natural products for development of medicines against various diseases and also for the development of industrial products<sup>2</sup>.

### Plant and fruit morphology :

**Kingdom :** Plantae

**Division :** Magnoliophyta

**Class :** Magnoliopsida

**Order :** Myrtales  
**Family :** Combretaceae  
**Genus :** Terminalia  
**Species :** chebula  
**Binomial name :** Terminalia chebula Retz

A medium-sized, up to 25 m tall, deciduous tree of variable appearance, with a usually short cylindrical bole of 5-10 m length, 60-80 cm in diameter at breast height; crown rounded, with spreading branches; bark dark brown, usually longitudinally cracked with woody scales; branchlets rusty-villous or glabrescent. Leaves alternate or opposite, thin-coriaceous, ovate or elliptic-obovate, 7-12 cm x 4-6.5 cm, rounded at base, obtuse to subacute at apex, entire, pubescent beneath; petiole up to 2 cm long, provided with 2 glands at the base of the leaf blade. Flowers in axillary 5-7 cm long spikes, simple or sometime branched, about 4 mm across, yellowish-white and unpleasantly scented; calyx 5-lobed, corolla absent; stamens 10, exserted; ovary inferior, 1-celled. Fruit an obovoid or oblong-ellipsoid drupe, 2.5-5 cm long, faintly 5-angular, yellow to orange-brown when ripe, glabrous. (Fig1)



**Fig 1**

#### **Chemical Constituents:**

In Terminalia chebula, 33% of the total phytoconstituents are hydrolysable tannins (which may vary from 20-50%) and are responsible for pharmacological activity.<sup>3</sup> Further, tannin content of T. chebulalargely depends on its geographic location.<sup>4</sup> These tannins contain phenolic carboxylic acid like gallic acid, ellagic acid, chebulic acid and gallotannins such as 1,6 di-O-galloyl- $\beta$ -D-glucose, 3,4,6 tri-O-galloyl- $\beta$ -D-glucose, 2,3,4,6 tetra-O-galloyl- $\beta$ -D-glucose, 1,2,3,4,6 penta-Ogalloyl- $\beta$ -D-glucose. Ellagitannin such as punacalagin, casuarinin, corilagin and terchebulin and others such as chebulanin, neochebulinic acid, chebulagic acid and chebulinic acid reported in literature.<sup>3</sup>

#### **Pharmacological properties:**

Terminalia chebula extract has myriad of pharmacological properties,<sup>5</sup>.

##### **1. Antibacterial activity :**

Anti-microbial activity of terminalia chebularetzfruit extract against Microgrnism. Bacillussubstils, staphylococcus aureus, staphylococcus epidermis, escherichia coli, Staphylococcusflexineriaandpseudomonas aeruginosa were studied by disc diffusion method

All the tested extracts of T. ChebulaWere highly effective against two of the Tested dental caries causing bacteria. They suggest as an Alternative antimicrobial agent against dental caries causing microorganisms .

The antibacterial activity of T. Chebula(leaf gall) was evaluated against ten bacterial strains including gram-positive and gram-negative bacteria using the agar-well diffusion method Antibacterial potency of the extracts was tested by standard growth inhibitory Assay methods. All the tested extracts showed to varying degrees of strain specific antibacterial .<sup>3</sup>

##### **1. Wound healing :**

Topical administration of alcoholic extract of the leaves of T. chebulacauused much faster healing of rat dermal wounds in vivo due to improved rates of contraction and a decreased period of epithelialization. Biochemical studies revealed increase in total protein, DNA and collagen contents in the granulation tissues of treated wounds. The levels of hexosamine and uronic acid also increased up to day 8 post-wounding.<sup>5</sup>

## **2. Antioxidant property :**

Antioxidants are very important for human health, and thus antioxidant supplementation is recommended provide cellular protection from the deleterious effects of excessive ROS concentrations. In a study by Chang et al demonstrated and compared for the first time the phytochemical compositions, chemiluminescence antioxidant activities, and neuroprotective effects of water, methanol, and 95% ethanol extracts of the air-dried fruit of *T. chebula* Retzius. The three extracts present various levels of ROS scavenging efficiency due to differences between the mechanisms of the four ROS chemiluminescence systems. The three extracts are new potential sources of natural antioxidants for food and nutraceutical products.<sup>6</sup>

## **3. Anti-inflammatory activity**

Gallic acid (3, 4, 5-trihydroxybenzoic acid) is one of the main endogenous phenolic acids found in *T. chebulaplant*, which possess the anti-inflammatory activity (Feng-Lin et al., 2007).<sup>2</sup>

## **4. Astringent**

The word "astringent" derives from the Latin word "adstringere" meaning "to bind fast". Astringents are the substances that precipitate proteins, but do not penetrate cells, thus affecting the superficial layer of mucosa only. They toughen the surface by making it mechanically stronger and decrease exudation.<sup>7</sup> In allopathy, *T. chebula* extract is used as an astringent (Thomas et al., 2000).<sup>2</sup>

## **5. Immuno-modulatory activity**

A study by Vaibhav et al confirms the immunomodulatory activity of ripe *T. chebula* fruits as evidenced by increase in the concentration of antioxidant enzymes, GSH, T and B cells, the proliferation of which play important roles in immunity. This phenomenon also enhances the concentration of melatonin in pineal gland as well as the levels of cytokines, such as IL-2, IL-10 and TNF-alpha, which play important roles in immunity.<sup>8</sup>

## **7. Antinociceptive activity**

The ethanolic extract of *T. chebula* fruits showed a potential drug for bioactivity-guided isolation of natural analgesic agents in the management of chronic pain.<sup>4</sup>

## **8. Cytoprotective activity**

The ethanol extract of the fruits of *T. chebula* inhibited oxidative stress and the age-dependent shortening of the telomeric DNA length. In the peroxidation model using butanol, *T. chebula* extract showed a notable cytoprotective effect on HEK-N/F cells.<sup>3</sup>

## **9. Anti-allergic activity**

Hydro-ethanol extract of *T. chebula* exhibit antihistamine and antispasmodic in guinea pig ileum. Oral administration of an aqueous extract of fruit significantly suppressed histamine release from rat peritoneal mast cells.<sup>9,10</sup>

## **8. Anti-anaphylactic activity**

Animal study show that when extract of *T. chebula* was administered following induction of anaphylactic shock, the serum histamine levels were reduced, indicating its strong anti-anaphylactic action.<sup>11,12</sup>

*Terminalia Chebula* is a store house of abundant medicinal properties to add a few more namely antiviral, antimutagenic, antiulcerogenic, antiplasmodial, antioxidant activity, Molluscicidal activity, Antidiabetic and retinoprotective activities, Antianaphylactic and adaptogenic activities, Antiulcerogenic activity, Anti-arthritis activity, Wound healing activity, Radioprotective activity, Cardioprotective activity, Hepatoprotective activity, Chemopreventive activity, Hypolipidemic and hypocholesterolemic activities etc.

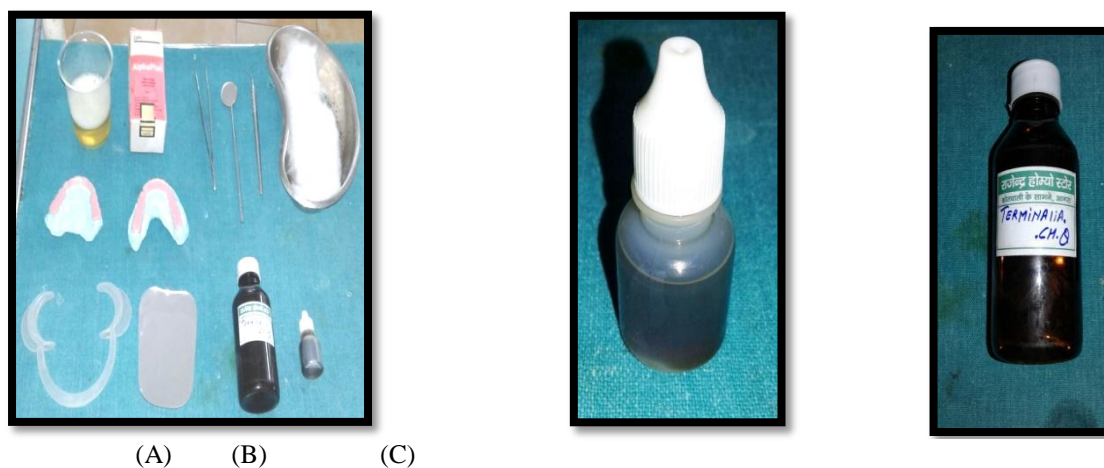
## **II. Materials And Methods**

In a clinical trial 25 subjects with chronic generalised periodontitis were included who were fulfilling the inclusion criteria which stated Both male and female subjects were included of age :20- 40 years, Subjects with at least 20 teeth, Pocket depth of 5 mm ( max), Subjects who were willing to be a part of treatment (clinical Trial), Subjects with no history of any dental treatment, No antibiotic or anti-inflammatory drug therapy for the past 3 months. Any subjects with Subjects with any of history systemic diseases or conditions, fibrotic gingival enlargement were excluded from the study, Pregnant Females and Lactating mothers, Patients with deleterious habits like smoking and drinking were excluded

The Clinical parameters which were recorded included :

1. Gingival index (Loe and Silness),
2. Bleeding Index ,(Carter and Barns )
3. Quigleyheine plaque index .
4. Probing Pocket Depth

A single examiner trained and calibrated and recorded all the above mentioned indices were recorded at baseline (21 days after scaling ) , after 1 week , 1 month and 2 months. After completion of phase 1 therapy which included ultrasonic scaling and root-planning the patients were asked to swish with 10ml of 10% terminalia chebula mouthwash after the procedure at the clinic and thereafter for twice daily for two month .



**Fig 2:** (A) armamentarium for study , (B) 10% mouthwash of terminalia chebula , (C) mother tincture of terminalia chebula

Preparation of mouthwash :

To compound a solution, 30 ml of Drug “Terminalia chebula”(mother tincture 100% pure extract ) is added to 250 milli Liters of water.

Drug “Q” = 30m

Water = 250m

Total Volume = 280

Next, take the volume of Drug “Q” and divide it by the total volume.

$30/280 = .10$

Lastly, you can either move the decimal two places or multiply by 100.

$.10 \times 100 = 10$  that yields a concentration of .10% V/V

#### Statistical analysis

Data was entered and analysed using SPSS version 17 (SPSS Inc.) Descriptive data was expressed in Percentage , students t-test was used to analyse the results . Significance was set at  $P < 0.05$ .

### III. Results

All the participants completed the study and results are described in following tables and graphs

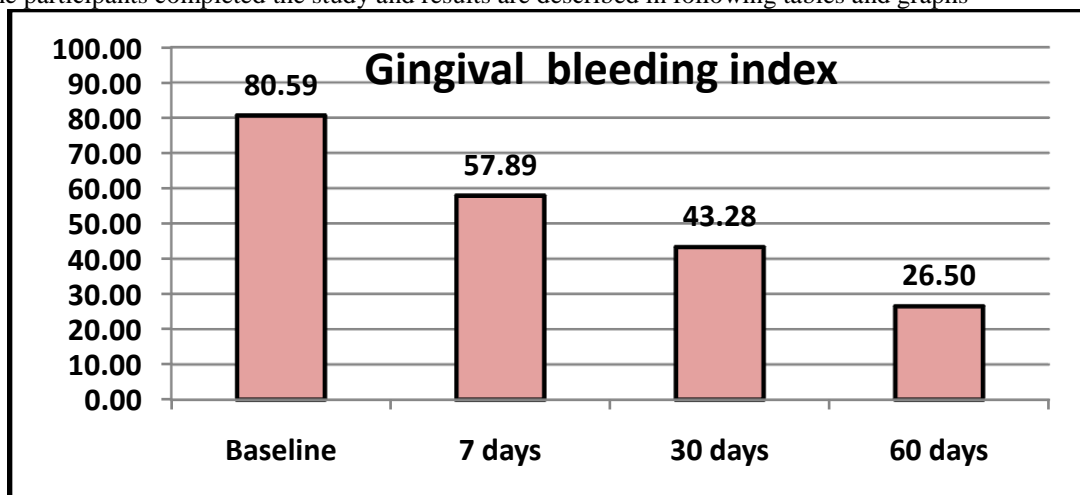
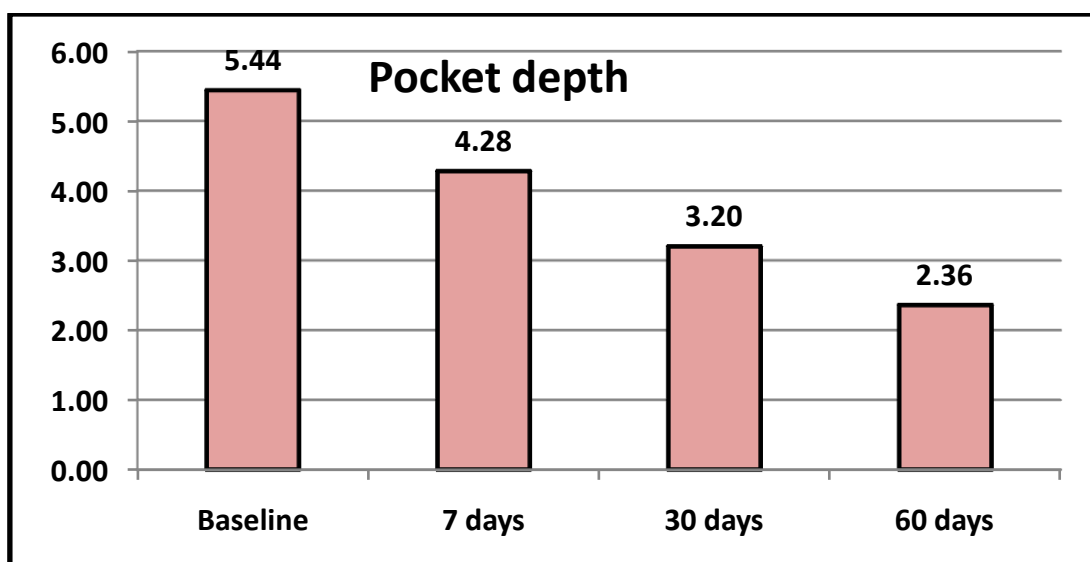


Table 1



Tab 2

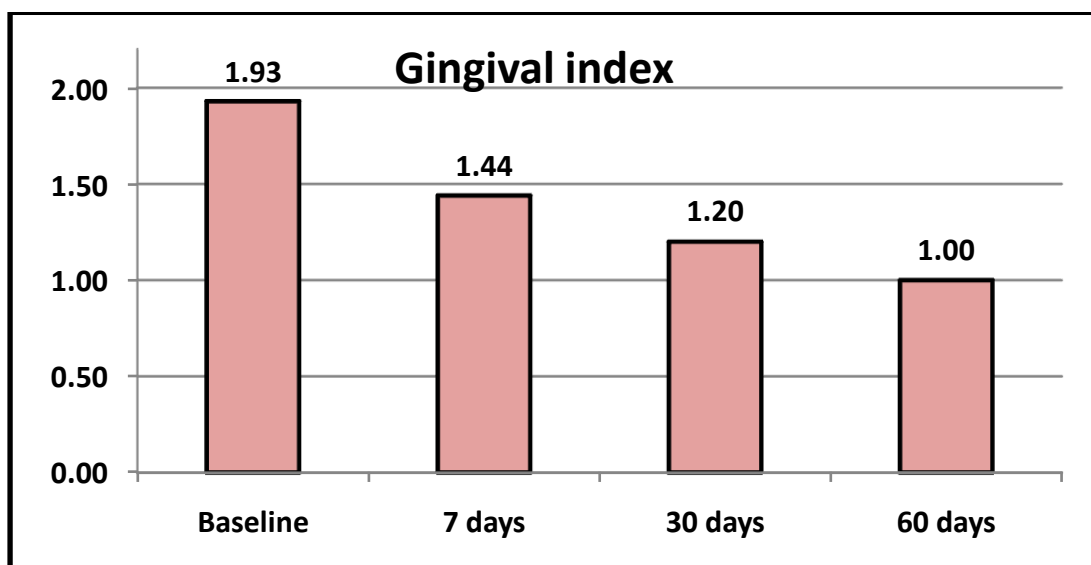


Table 3

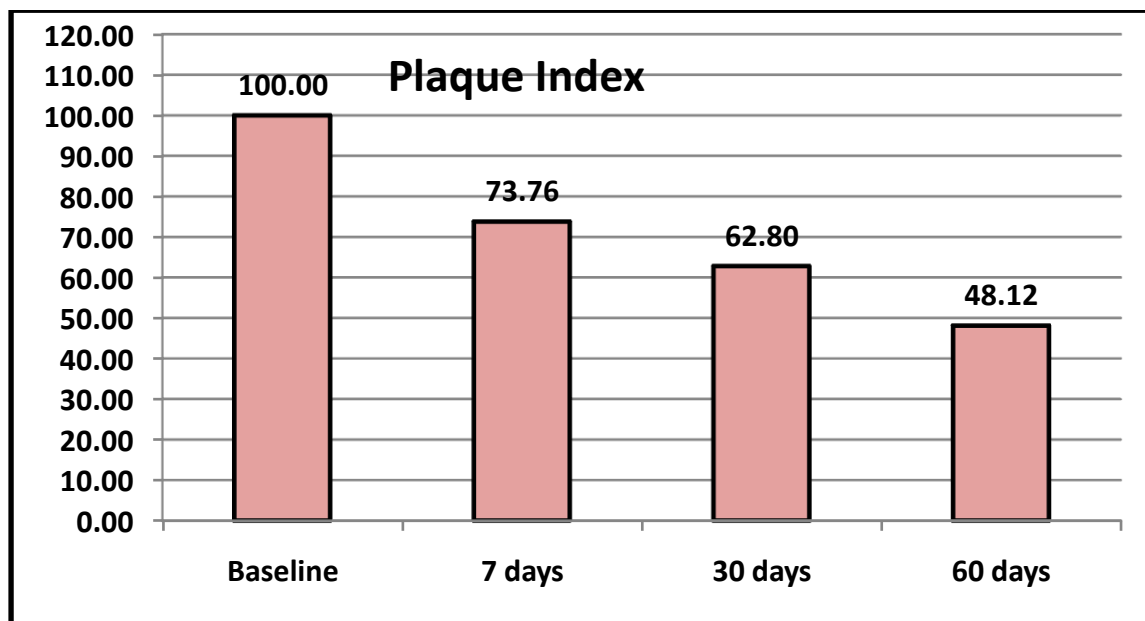


Table 4

The statistical analysis revealed the results were highly significant for all indices also it proves that 10% terminalia chebula extract as a mouth wash was highly effective in reducing inflammation and improving periodontal health.

#### IV. Discussion

An intensive research on use of terminalia chebula as a mouthwash revealed that 10% terminalia chebula mouthwash is as effective as chlorhexidine .02% chlorhexidine mouthwash in reducing Dmft scores , plaque index , gingival index as shown by study by Gupta et al (2013)<sup>13</sup> , Another study Nayak SS et al (2012) In a study showed that , *Terminalia chebulam* mouthrinse showed reduction in *Streptococcus mutans* counts up to 6 hours post-rinsing among 80% of the subjects. Our study clearly proved not only its efficacy and efficiency in reducing Gingival inflammation but also reducing periodontal inflammation as significant improvement was seen in pocket depth. Another property which benefitted the patients was analgesic effect hence patients also reported of reduced pain after use of mouthwash . Use of homeopathy is less visited avenue in dentistry the confounding results in use of homeopathic agents has compelled the further research and study to be done to clinically validate its use and efficacy as adjunctive therapy .

#### V. Conclusion

- ❖ *Terminalia chebula* is one of the most versatile medicinal plants, having a wide spectrum of pharmacological activity. This study showed that *Terminalia chebula* reduced plaque and gingivitis to an extent equivalent to that of the benchmark control chlorhexidine.
- ❖ It is much less expensive than the commercially available chlorhexidine mouthwash, is easily accessible .
- ❖ It has no known side-effects and hence is safe for use over a long period of time

Several conventional anti-plaque agents are available on the market, but with the rise in resistance to antibiotics, there is considerable interest in the development of alternatives for the control of infection.

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