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## Review Article

### CAMPHOR (*CINNAMOMUM CAMPHORA*) AND ITS MEDICINAL APPLICATIONS: A REVIEW

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#### ABSTRACT

The aim of this review is to have deep intensive knowledge about the general description and medicinal uses of camphor. It is the drug which is obtained from the wood of camphor tree. This has been used for centuries throughout the world to treat number of diseases. The drug has been in use for treatment of infection, inflammation, pain management, skin diseases and wounds. Recent studies have exhibited that this drug contains number of phyto-chemicals which possesses antimutagenic activities in cancer cells. The drug has been also used for the treatment of skin non healing ulcers. This review article has demonstrated the different chemical constituents imparting in healing of wounds/ulcers.

**Keywords:** *Kāfur*; linalool; borneol; Unani medicine; Non healing ulcers

#### INTRODUCTION

*Kāfur*/Camphor (*Cinnamomum camphora*) is a crystalline material having a white color with a strong odor and pungent taste, Figure-1. This drug is derived from the wood of tree; camphor laurel (*Cinnamomum camphora*) and other trees of the laurel family. Camphor tree is largely found in Taiwan, China, Mongolia, Japan, and India.<sup>1</sup> The white crystals are obtained using steam distillation, sublimation, and purification of wood and bark of the laurel family.<sup>2</sup> Camphor is used in many pharmaceutical applications such as antiseptic, antipruritic, anti-infective, anti-spasmodic, contraceptive, expectorant, cough suppressant, rubefacient, anti-inflammatory, topical analgesic, and nasal decongestant.<sup>3</sup> The drug gets easily absorbed through the skin and can also be administered by injection, inhalation and ingestion.<sup>2,4</sup>

**Actions/Af'āl:** It is beneficial for *Tap-i-Diq* (tuberculous fever)<sup>5,6</sup> and possesses properties like *Mufarrih* (exhilarant)<sup>7,8,9</sup> *Daf'i-fasād-i-hawa* (air purifier).<sup>7,9</sup> Camphor oil exhibits analgesic properties if applied topically, it is known to have actions like *Daf'i Ta'affun* (anti-septic), *Muharrrik* (stimulant) and *Khushk kunanda* (desiccant). It exhibits pharmacological activities such as candidicide, fungicide, anti-bacterial, analgesic, Anti-itch, rubefacient,<sup>6</sup> *Muharrrik* (stimulant), *musakkin-i-alam* (pain killer), and *muhammir* (rubefacient).<sup>8</sup> Ethanolic extract of fruits possess antibacterial activity against several Gram-positive and Gram-negative bacteria. Antifungal activity against many fungi has been recorded by the essential oil of the plant.<sup>10</sup>

**Ethnobotanical Descriptions:** The tree is evergreen having a height of about 15 meters, trunk bark thick, and grooved. The leaves are alternate and coriaceous with long petiole having a shiny surface on the upper side and 3 nerved at the base.

Inflorescence in the axillary panicle, shorter than the leaf; flowers small, greenish yellow.<sup>11</sup>

**Habitat:** The tree is cultivated in sub-tropical and tropical countries.<sup>7</sup> This tree is native to China and Japan and frequently grown as a hedge plant.<sup>10</sup>

**Uses/Ista'mal:** *Kāfur* along with decoction of coriander stops hemorrhage from nose.<sup>7</sup> *Kāfur* along with the *Āb-i-kishneez* (decoction of coriander) shows analgesic action for an earache when used as eardrop.<sup>7</sup>

It results in cleaning up and healing up of the wound if sprinkled over it.<sup>7</sup> The fine powder has been known beneficial for skin diseases if used along with other essential drugs. No further extension of a bedsore is estimated if the spirit of camphor is applied on it.<sup>9</sup> It is used in several formulations like ointment or tincture to gain anti-septic and anodyne properties. The camphor obtained from the trunk wood is known to have anodyne, cardiac, anti-bacterial, analeptic, and demulcent properties. In case of cardiac collapse, injection of camphor oil and sodium camphor sulfonate are prescribed. The administration of this drug is efficient for sore throat, colic, impotence and fever.<sup>11</sup> An ointment containing *Kāfur*, when applied locally over the wound, results in the stoppage of bleeding and provides *taskeen* (relief) from *hararat* (warmth) and *sozish* (burning) of the wound.<sup>8</sup> It acts as a rubefacient and mild analgesic especially when used topically.<sup>8</sup>

**Dose/Miqdār-i-khurak:** 5 to 8 grain,<sup>9</sup> 1 to 3 ratti,<sup>8</sup> Topical ointment with 3-11% camphor<sup>6</sup>

**Concentrate:** 125-375 mg<sup>10</sup>

**Reformer/Musleh:** *Mushk* (Musk), *Ambar* (Ambegris), *Jund-bedastar* (Castoreum), *Roghan-i-soosan* (Oil obtained from Orris root) and *Banafsha* (violet herb).<sup>7, 8</sup>

**Substitute/Badal:** *Tabāsheer safed* (Exudate from female bamboo tree), *sandal*(sandal).<sup>7, 8</sup>

**Compound formulation/Murakkabāt:** *Qurs-i-tabasheer kāfuri*, *Tiryāq-i-A'zam*<sup>8</sup>

**Chemical constituents:** Camphor, linalool, borneol, camphene, dipentene, terpineol, safrole and cineole.<sup>12, 13</sup>

**Pharmacological studies:** Camphor contains camphor, linalool, borneol, camphene, dipentene, terpineol, safrole and cineole. But only four of the above i.e. camphor, linalool, borneol, and cineole have been proved to be capable and effective in the wound healing process and relieving the pain through various pathways. Camphor causes activation of some of TRP (transient receptor potential) channels like TRPV1, TRPV3, TRPM8 and inhibits TRPA1, causing warm sensation and desensitization of sensory nerve endings thereby resulting into the relieving in pain, itch, and irritation in the area where it was applied.<sup>12,13</sup>

Linalool has been found to be exhibiting insecticidal activity against various stored insects Linalool has also been found to possess antifungal and antimicrobial activities.<sup>14</sup>

Peana and Moretti, 2002 have revealed that Linalool is efficacious against several micro-organisms like *Candida albicans*, *Escherichia coli*, and *Staphylococcus aureus*, but not against *Pseudomonas aeruginosa*. Linalool also possesses antioxidant and antinociceptive properties.<sup>15</sup>

The borneol has been reported to have wound healing efficacies owing to the potential of exhibiting some properties like Analgesia, putridity elimination and flesh regeneration, and repair of damaged cells.<sup>16</sup> The cineole has been found to exhibit antibacterial, antifungal, insecticidal, anti-inflammatory, anti-parasitic, repellent, antioxidant and analgesic properties. The antibacterial effect was investigated against *Klebsiella* spp., *Proteus* spp., *Pseudomonas* spp., *Escherichia coli*, and *Staphylococcus aureus*.<sup>17</sup>

## CONCLUSION

Camphor has been in use traditionally for many years either singly or in combination with other appropriate drugs for a number of diseases. It can also be very effective in treating and preventing some serious, life-threatening diseases. Considering the growing number of some chronic illnesses like non-healing ulcers, *Cinnamomum camphora* should be investigated further as a viable option for the treatment of wounds.

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