

Cymbopogon flexosus

Common Name – Lemongrass (Nimbu ghas)

Abstract

Cymbopogon citratus, Stapf (Lemon grass) is a widely used herb in tropical countries, especially in Southeast Asia. The essential oil of the plant is used in aromatherapy. The compounds identified in *Cymbopogon citratus* are mainly terpenes, alcohols, ketones, aldehyde and esters. Some of the reported phytoconstituents are essential oils that contain Citral α , Citral β , Nerol Geraniol, Citronellal, Terpinolene, Geranyl acetate, Myrecene and Terpinol Methylheptenone. The plant also contains reported phytoconstituents such as flavonoids and phenolic compounds, which consist of luteolin, isoorientin 2'-O-rhamnoside, quercetin, kaempferol and apigenin. Studies indicate that *Cymbopogon citratus* possesses various pharmacological activities such as anti-amoebic, antibacterial, antidiarrheal, antifilarial, antifungal and anti-inflammatory properties. Various other effects like antimalarial, antimutagenicity, antimycobacterial, antioxidants, hypoglycemic and neurobehaviorial have also been studied. These results are very encouraging and indicate that this herb should be studied more extensively to confirm these results and reveal other potential therapeutic effects.

Keywords: *Cymbopogon citratus*, essential oil, flavonoids, phytoconstituents

INTRODUCTION

Cymbopogon is a genus of about 55 species, which are indigenous in tropical and semi-tropical areas of Asia and are cultivated in South and Central America, Africa and other tropical countries. These are tufted perennial C₄ grasses with numerous stiff stems arising from a short, rhizomatous rootstock, as with citrus flavor, and can be dried and powdered or used fresh. The name Cymbopogon is derived from the Greek words “kymbe” (boat) and “pogon” (beard), referring to the flower spike arrangement.

Cymbopogon citratus, Stapf (Lemon grass) is commonly used in teas, soups and curries. It is also suitable for poultry, fish and seafood.

Flavonoids and Phenolic Compounds

Lemongrass consists of luteolin and its 6-C and 7-O-glycosides, isoorientin 2'-O-rhamnoside[32] and isolation of the flavonoids quercetin, kaempferol and apigenin from the aerial parts. The phenolic compounds elimicin, catechol, chlorogenic acid, caffeic acid and hydroquinone are also isolated from the plant.

PHARMACOLOGY

Although a lot of pharmacological investigations have been carried out based on the ingredients present, but a lot more can still be explored, exploited and utilized. A summary of the findings of these studies is presented below.

Anti-amebic Effect

The essential oil in broth culture was active on *Entamoeba histolytica*.^[35]

Antibacterial Activity

The chromatographic fraction of the essential oil in agar plate was active on *Bacillus subtilis*, *Escherichia coli*, *Staphylococcus aureus* and *Salmonella paratyphi* and *Shigella flexneri*.^[38] These activities are shown in two of the three main components of the oil identified through chromatographic and mass spectrometric methods. While the α -citral (geranial) and β -citral (neral) components individually elicit an antibacterial action on gram-negative and gram-positive organisms, the third component, myrcene, did not show any observable antibacterial activity on its own. The extract was also active when the volatile oil extract was oxidized via the active oxygen method.

Antidiarrheal Activity

Cymbopogon citratus stalk decoction reduced the fecal output in a dose-dependent manner.

Antifilarial Activity

Fresh leaves were active on *Setaria digitata*.

Antifungal Activity

Lemon grass oil is active against such dermatophytes such as *Trichophyton mentagrophytes*, *T. rubrum*, *Epidermophyton floccosum* and *Microsporum gypseum*, and is among the most active agents against human dermatophytes. Other studies reported that lemon grass oil is active against keratinophilic fungi, 32 ringworm fungi and food storage fungi. Lemongrass oil is also effective as a herbicide and as an insecticide because of these naturally occurring antimicrobial effects.

Anti-inflammatory Activity

The hot water extract of the dried leaves administered intragastrically to rats was active when compared with carrageenin-induced pedal edema.

Antimalarial Activity

The essential oils of *Cymbopogon citratus* were found to produce 86.6% suppression in the growth of *Plasmodium berghei* when compared with chloroquine (taking inhibition by chloroquine as 100%).

Antimutagenicity

The ethanolic extract of lemon grass extract exhibits an antimutagenic activity in various models and retards the growth of fibrosarcoma cells transplanted in mice in association with the prevention of lung metastasis. The plant extract is known to show inhibition on the formation of azoxymethane-induced DNA adducts and aberrant crypt foci in the rat colon. Inhibitory effects of the plant extract on the early phase of hepatocarcinogenesis after initiation with diethylnitrosamine were seen in 344 male Fischer rats.

