



CHEMICAL COMPOSITION OF THE RHIZOME ESSENTIAL OIL OF *ZINGIBER CERNUUM* FROM SOUTHERN INDIA

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Abstract: The chemical investigation on volatile oil obtained by hydrodistillation of air dried rhizome of *Zingiber cernuum* Dalzell. (Zingiberaceae) from Southern India done by GC and GC-MS. The major constituents of the above oils were Caryophyllene (20.52%), 3-Carene (12.26%), Caryophyllene oxide (11.64%), beta-Phellandrene (5.10%), Benzoic acid (3.37%), 4-tert- Butylcyclohexylacetate (3.05%), alpha-Phellandrene (2.57%). This is the first report on the chemical compounds of the essential oil of this species.

Keywords: *Zingiber cernuum*; Zingiberaceae; Essential oil composition; GC-MS; Caryophyllene; 3-Carene; Beta-Phellandrene; Benzoic acid.

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The family Zingiberaceae is the largest of the eight families in the order, with 53 genera and over 1377 species (Kong et al., 2010). They are mainly distributed in tropics and subtropics with the centre of distribution in the Indo-Malayan region, but extending through tropical Africa to central and South America (Tomlinson 1969, Kress et al., 2002, Kong et al., 2010). Zingiberaceae are one among the largest monocotyledonous families in India, and are represented by 21 genera and about 180 species (Jain and Prakash, 1995). The family consists of rhizomatous perennial herbs with well-developed aerial shoots. Inflorescence is terminal on a leafy shoot or on a short, separate leafless shoot arising directly from the rhizome. Flower is zygomorphic, epigynous and bisexual. The family is characterized by the fusion of the lateral staminodes of the inner staminal whorl into labellum, presence of two epigynous glands and occurrence of cells containing essential or ethereal oils are unique features which distinguish this family from other families of Zingiberales. The genus *Zingiber*, the type genus of the family Zingiberaceae, represented by 141 species (Theilade and Mood 1999) distributed mainly in tropical Asia. Baker (1892) reported 24 species from British India. *Zingiber* species are perennial rhizomatous herbs with tuberous sympodial rhizomes. Aerial shoot is often covered by sheathing leaf bases. The inflorescence is usually a spike or raceme. *Zingiber* is distinct from other genera of the family by the presence of a single anther with a beak or

horn-like appendage, which embraces the upper part of the style. The inflorescence usually arises at the base of the leafy stem on a short or long, aerial or subterranean peduncle. The bracts are overlapping; each subtends a non tubular bracteole and a single flower. In many species the bracts are green when young, turning to red in the fruiting stage. The flowers are very delicate and fragile and last only for a few hours. The genus can be recognized in the vegetative stage by the presence of a pulvinous between the base of the petiole and ligule.

***Zingiber cernuum* Dalzell.**

Plant a herb with perennial rhizome. Rhizome fleshy, subterranean, purplish-lilac inside, aromatic, roots many bearing ovoid tubers. Leafy shoot 65-90 cm tall, ensheathed by green bracts. Leaves shortly petiolate, pulvinate. Lamina 20-28 x 7-10 cm, oblong-lanceolate, glabrous above, densely pubescent beneath. Inflorescence emerges directly from the rhizome, peduncle short, green, ensheathed by reddish green sheaths, outer surface pubescent. Spike subglobose, 5-6.8 x 2-2.7 cm, reddish green, base submerged in soil. Flowers 5.5-5.8 cm long, fragile, dark yellow with red spotted labellum, one or two opens at a time. Capsule ellipsoid, fleshy, green when young and turns to red at maturity. Seeds 6-8 x 2-4 mm, dark brown, striate, arillate.

Volatile oil containing drugs and essential oils have been used for a long time both in folk medicines and in therapeutics, both traditional and alternative. Essential oils, the volatile secondary metabolites responsible for