

Ocimum africanum:

A new distributional record for Uttar Pradesh

During the survey and inventorization of five districts of UP, a lemon scented *Ocimum africanum* Lour. (citral rich) was identified and characterized, which was earlier misidentified by most of the Indian taxonomist as *O. americanum* (Syn. *O. canum*). It is native to Africa and in most of the herbaria of India, it is lodged by this name. One more camphor rich *Ocimum* is also occurring throughout India and is lodged in most of the herbaria of the country as *O. americanum*. Both of the species looks similar but the difference in essential oil and referred as camphor rich chemotype *O. americanum* in India. Approximately all the research/ experimental work done in India on this species is referred as *O. americanum/canum*.



Fig. 1: Lemon scented *Ocimum africanum* Lour. (Left: Field view; Right: Inflorescence close up)

According to Paton (1992), the taxonomy of *Ocimum* in India is itself in confusion, with some Indian literature (Pushpangadan et al., 1975; Sobti and Pushpangadan, 1977; Khosla and Sobti, 1985; Khosla, 1993) providing detailed information on cytology and phytology using a different infrageneric classification from that used in recent taxonomic literature. Due to polymorphism, much confusion has still surrounding the identification of the species of *O. basilicum* and *O. americanum* which have a wide range of distribution in India with enormous diverse ecological settings. The confusion surrounding the name of *O. americanum* also arises because the type specimens of *O. americanum* and *O. canum* do not reveal the characters necessary to decide to which entity they belong. The Type of the former species is a young specimen lacking calyx, whereas the Type of the later species is an illustration (Paton, 1996).

Our long experience of surveys and plant collections across the country showed that there are two chemically distinct types of so called *O. americanum* exist in India, i.e. camphor type (copiously smelling like camphor) and citral type (smelling like lemon). Following dichotomous key can easily distinguish both these species and *O. basilicum* as well:

Taxonomical Key:

- 1a. Fruiting calyx up to 5 mm long; corolla 4-5.5 mm long:
 - 2a. Fruiting calyx 2-3 mm long; stem internodes with short adpressed or retrorse hairs *O. americanum*
 - 2b. Fruiting calyx 4-5.5 mm long; stem internodes with long, spreading and sometimes retrorse hairs *O. africanum*
- 1b. Fruiting calyx 6-8 mm long; corolla 7-8 mm long *O. basilicum*

The populations of *O. americanum* and *O. africanum* are often intermixed and erroneously identified as *O. americanum* in most of the herbaria in India. Chemical profiling worked out at CIMAP also indicates their distinctiveness. Although *O. americanum* is well known in Indian Floras, the following description of *O. africanum* with nomenclature will facilitate to distinguish it from other closely related species. Furthermore, it is hoped the present report will attract other Indian taxonomists for the correct appraisal of *O. africanum* in India.



Fig. 2: *Ocimum africanum* Lour. variety CIM-Jyoti

Ocimum africanum Lour., Fl. Cochinch. 2: 270. 1790; Suddee, S. et al. in Kew Bull. 60: 28-29. 2005. *O. citratum* Rumph. in Herb. Amboin.5: 266, t. 93, f.1. 1747. *O. pilosum* Willd., Enum. Pl. 2: 629. 1809. *O. basilicum* L. var. *anisatum* Benth., Labiat. Gen. Sp. 4. 1832. *O. basilicum* L. var. *pilosum* (Willd.) Benth., Prodr. 12:33. 1848. *Ocimum* × *citriodorum* Vis. in Linnaea 15: Litt. Ber. 102. 1841. *Ocimum americanum* L. var. *pilosum* (Willd.) A. J. Paton in Kew Bull. 47:426. 1992. *O. americanum sensu* Pushpangadan & Sobti non L. in Cytologia 47: 575-583. 1982. 'Lemon basil'.

Ocimum africanum Lour.; Mamiri, Lemon Basil, Nimboo Tulsi; Lamiaceae.

Description: An aromatic, annual or short lived perennial herb, up to 80 cm high; stems densely pubescent with long, spreading and sometimes retrorse hairs. Leaves elliptic-lanceolate or ovate-lanceolate, 0.8-3.5 × 0.6-2 cm, entire or shallowly serrate at margins, apex acute, base cuneate or obtuse, glandular punctuate, glabrescent above, hairy on veins beneath, sometimes pubescent on both surfaces with longer hairs on veins beneath; petioles 0.2-1.8 cm long, pubescent. Verticels up to 1 cm apart; axis densely pubescent with retrorse hairs; bracts ovate, up to 5 mm long; pedicels 1-2 mm long, recurved, finely pubescent. Calyx campanulate, 2-2.5 mm long, 4 – 5.5 mm long in fruit; posterior lip rounded, decurrent on tube; anterior lip with 2 median lanceolate teeth; tube with a ring of dense hairs at throat. Corolla white or light purple, 4-5.5 mm long; posterior lip 4-lobed with oblong obovate villous lobes, anterior lip boat-shaped; tube straight, glabrous. Stamens 4, slightly exserted, posterior 2 shorter. Nutlets oblong, 1-1.5 mm long, black, minutely tuberculate (Fig 1).

Ecology: In waste places, often in association with *O. basilicum*.

Flowering & Fruiting: August- December.

Distribution: Tropical Africa, America and Asia; major parts of India.

Major Chemical Constituents: Essential oil: Citral (71.9%: 31.7% neral and 40.2% geranial), methyl chavicol (3.5%), citronellal (2.8%), geraniol (2.3%), β- ocimene (0.6%), 1, 8-cineole (1.3%), linalool (2.3%).

Biological Activity: Plant- effect on Central Nervous System, hypothermic; leaf extract- antibacterial; essential oil- antifungal.

CSIR-CIMAP, Lucknow has developed one high yielding improved variety CIM-Jyoti in *O. africanum* (Fig. 2). The average herb yield is 200 q/ha and oil yield 150 kg/ha with 68-75% citral content against parental check having herb yield 175 q/ha and oil yield 100 kg/ha with citral content 10-15%, respectively. This variety has produced citral in a short duration of 70-80 days. It also fits in crop rotation/inter-cropping between wheat and paddy and with other vegetables crops of small/marginal farmers.

• For Detail: •

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