

Reproductive Ecology of *Ocimum americanum* L. and *O. basilicum* L. (Lamiaceae) in India

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Abstract *Ocimum americanum* and *O. basilicum* bloom once a year. They produce flowers over a long period, a few flowers being produced each day. The flowers of both are short-lived (3–4 hours), bisexual, zygomorphic, and chasmogamic with anthers dehiscing in the bud stage. The open flowers offer nectar and pollen as rewards and are visited and sternotribically pollinated by day-flying animals. The blossoms are flag-shaped, and the reproductive organs are close to the lower corolla lip. The stamens and stigma show movements immediately after anthesis and remain for 20–30 minutes and this may cause self-pollination. Both species reproduce primarily through autogamy. Flowers are open during 5:30–13:30 hr in *O. americanum* and during 7:00–13:00 hr in *O. basilicum*. Certain bee species like *Apis florea*, *A. cerana indica*, *Amegilla* sp., and *Pseudapis oxybeloides*, and the butterfly *Surandra quercetorum* are the most frequent and consistent visitors and can be pollinators for both plant species.

Key words: *Ocimum*, autogamy, sternotriby.

Preliminary observations made on the floral biology of some species of Lamiaceae by Kerner (1904), Knuth (1909), Percival (1965), Proctor and Yeo (1972), Faegri and van der Pijl (1979) and in reviews by Schremmer (1953) and van der Pijl (1972) are complemented by detailed studies of the pollination ecology of *Origanum vulgare* (Lewis and Crowe, 1956), *Trichostema* species (Spira, 1980), *Monarda didyma*, *M. clinopodia* (Whitten, 1981), *Hyptis* species (Bran-tjes and De Vos, 1981) and *Monarda fistulosa* (Cruden et al., 1984). Flower visitors for *Salvia splendens* (Salim Ali, 1932) and *S. apiana* (Grant and Grant, 1964) have also been recorded. Pollen-ovule ratios in relation to breeding systems for some species of Lamiaceae were discussed by Cruden (1976a, b; 1977). Based on such studies, some salient features of the floral biology of Lamiaceae can be drawn.

In majority of species, the flowers are bisexual. They are typically zygomorphic and bilabiate. The upper part of the corolla is drawn out into a helmet shaped hood, formed by the two posterior petals and constituting a roof over the four stamens (two) and bilobed stigma. The anterior part of the corolla forms an alighting platform for the insect visitor. Nectar is secreted by a disc at the base of

types. The gullet type flowers with the essential organs placed adjacent to the upper lip facilitate pollen deposition on the back of insect-visitor, i.e., nototriby. The flag type flowers with essential organs placed adjacent to or lie on the lower lip facilitate pollen deposition on the ventral side of the insect-visitor, i.e., sternotriby. The gullet type blossoms are relatively larger than flag type ones. The small flowers are generally autogamic, while the large ones are xenogamic. The flowers are visited by different insect groups as Diptera, Hymenoptera, Lepidoptera and also by birds. Bees and birds are important in effecting pollination in several of the Lamiaceae.

The *Salvias* are pollinated by flies, bees and birds. *Salvia mellifera* is visited by a variety of insects and by hummingbirds, but only flies, small sized solitary bees, honey bees and bee-flies are effective pollinators. *Salvia apiana* is serviced by carpenter bees and bumble bees, and *S. splendens* by sun-birds. Pollen vectors are: bees in *Hyptis suaveolens*, *H. macrantha*, *H. mutabilis*, *H. fasciculata*, *Aeollanthus njassae*, *A. canescence*, *Eriope* sp., *Marsipanthus* sp., *Peltodon* sp., *Raphiodon* sp., *Plectranthus* sp., and *Coleus* sp.; flies and wasps in *Mentha aquatica*; flies and butterflies in *Aiuea rentans*.

