

250. *PAPAVER BRACTEATUM* Lindl. (PAPAVERACEAE) — Great Scarlet Poppy, Thebaine Poppy

A handsome ornamental perennial now of greater interest as a source of thebaine, a medicinally important alkaloid. Thebaine can be rather readily converted to codeine, a widely used analgesic and antitussive, but it is not so readily converted into the drug of abuse, heroin. Naloxone, an important narcotic antagonist derived from thebaine, is administered to infants borne of heroin addicts, lest the children experience withdrawal.¹⁷ Watson et al.²³⁶ showed that naloxone produced decreases in auditory hallucinations in some schizophrenic patients. Faden and Holaday report the use of naloxone to treat shock following acute blood loss in conscious rats.²³⁷ Perhaps even more interesting is the report of the induction of copulatory behavior in sexually inactive rats by naloxone.²³⁸ My Bihai driver in Iran told me that his grandfather, like many other shepherds, would smoke the “bracteam” (congealed latex) when he could not get opium (now a capital offense in Iran)! Whole seeds are used in the Kurdistan for baked goods and confectionary. Seeds can be used in lieu of opium poppyseed for food and as a source of oil. But in 1977, the *Chemical Marketing Reporter*²³⁹ stated that the Drug Enforcement Agency Administrator announced that the agency would not authorize domestic commercial production.

Lack of citation in Hartwell⁴ and Duke and Wain³² might suggest that the great scarlet poppy is not used in folk remedies. However, Hartwell did report that the closely related, *P. orientale* was used for tumors of the heart.⁴

The seed contains 45 to 48% oil, rich in unsaturated fatty acids, 7.7 to 7.9% palmitic-, 2.2 to 2.5% stearic-, 8.6 to 9.2% oleic-, and 79.7 to 79.9% linoleic-acids.²⁴⁰ Per 100 g, the seed meal is reported to contain 4.9 to 5.3 g H₂O, 32.7 to 42.0 g protein, 6.3 to 20.7 g fat, 14.3 to 14.7 g fiber, 7.5 to 8.2 g ash. Aspartic acid ran 9.2 to 9.5 g/16 g N; threonine, 3.4 to 3.6; serine, 4.0 to 4.1; glutamic acid, 20.1 to 20.4; proline, 3.7 to 3.9; glycine, 4.2 to 4.4; alanine, 3.8 to 4.0; valine, 4.6 to 5.0; isoleucine, 3.75 to 3.85; leucine, 6.2 to 6.3; tyrosine, 3.8 to 4.0; phenylalanine, 3.6 to 3.8; lysine, 3.9 to 4.0; histidine, 2.2 to 2.4; arginine, 9.9 to 10.1; methionine, 2.35 to 2.45; and cystine, 2.2 to 2.3 g/16 g N.²⁴¹ Duke⁹¹ summarizes the reported alkaloids: acetylornithine, alpinigenine, bractamine, bractavine, bracteine, bracteoline, codeine, coptisine, isothebaine, morphine, nuciferine, oreophiline, orientalinone, oripavine, oxysanguinarine, papaverrubines B, D, and E, protopine, salutaradine, and thebaine, the most important alkaloid. Kettenes et al.²⁴² review the biological activities of thebaine, isothebaine, (–)-nuciferine, protopine, tetrahydropalmatine, coptisine, and alpinigenine. According to Morton,¹⁷ the major alkaloids are thebaine (C₁₉H₂₁NO₃) and alpinigenine (C₂₂H₂₇NO₆). Fresh capsule latex may contain 0.125% thebaine; dried, 0.25 to 0.26%. Thebaine in dried roots ranges from 0.50 to 1.3%; in stems, 0.09 to 0.22%. None or only a little occurs in the leaves. In some strains, shoot concentration in young plants ranges from 233 to 808 ppm; in older plants, 437 to 1606 ppm. Alpinigenine occurs in all above-ground parts and may constitute 18% of the total alkaloids in the capsule latex.

Toxicity — Etorphine, or M99, one of the “Bentley Compounds” derived from thebaine, is much used to sedate large wild animals for scientific purposes.¹⁷ Toxic activities of some of the alkaloids are discussed by Duke.²⁴³ The dependence potential of thebaine is partially attributed to oripavine, one of the principal metabolites of thebaine. The analgesic potency of oripavine in mice is higher than that of thebaine and comparable to morphine.²⁴⁴ At doses of 4 mg/kg rats show preconvulsive disorders, hyperirritability, tremor, muscle rigidity, motor impairment, and transient muscle contraction. At 5 mg/kg the rats died immediately in a persistent tonic seizure. Thebaine has an LD₅₀ of 20 mg/kg in mice. In chicken embryos, thebaine is reported to induce pseudohyperfeminization.²⁴⁵