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**THE UNIVERSITY**  
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**ETHNOMEDICAL, BOTANICAL AND**  
**PHYTOCHEMICAL ASPECTS OF**  
**NATURAL HALLUCINOGENS** 28 1982

RICHARD EVANS SCHULTES AND NORMAN  
**GENERAL LIBRARIES**

**ABSTRACT**

More than 200 species and/or varieties of higher plants, as well as numerous species of basidiomycetes, are reported in the literature to have been used for their hallucinatory and/or euphoriant effects. Due to a paucity of research, only a few of these have been confirmed as definitely hallucinogenic in man or animals. This article reviews all of those plants now known to have a scientific basis for producing hallucinogenic effects in man or for which reliable ethnobotanical data are available to indicate that they could be hallucinogenic. Those plants alleged to be hallucinatory, but where substantive proof of this effect may be lacking, are summarily included for completeness and in the hope of stimulating investigation.

The hallucinogens of higher plant origin alone are found in 146 genera in more than 50 families. In virtually every instance in which the active constituents are known, their chemical skeletons are unique to a specific genus or to a very closely related genus.

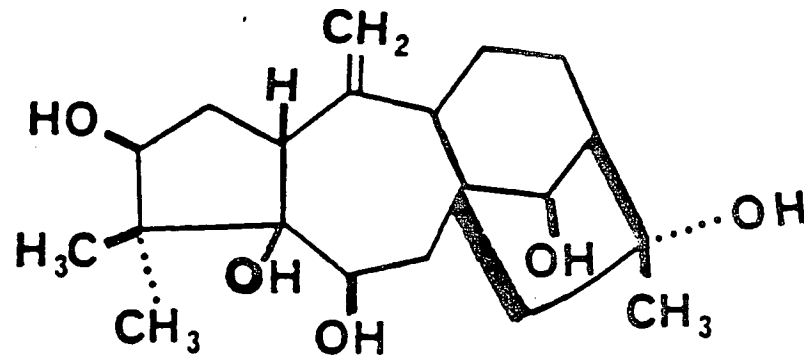
It is interesting to note that of more than 200 species of hallucinogenic plants only two are legally prohibited from use in the United States by Federal law: *Cannabis sativa* and *Tabernanthe iboga*. Two or three others are illegal in a few states.

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Some 25 species of *Pernettya* are known from Tasmania, New Zealand, the highlands from Mexico to Chile, the Galapagos and the Falkland Islands.



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#### Gomortegaceae

*Gomortega* R. & P.

*Gomortega Keule* (Mol.) I. M. Johnst., an endemic of Chile, where it has the Mapuche Indian names *keule* or *hualhual*, may once have been employed as a narcotic (Schultes 1970c). Its fruits are intoxicating, especially when fresh, due possibly to an essential oil. There is only this single species in the whole family Gomortegaceae.

#### Himantandraceae

*Galbulimima* F. M. Bailey

In Papua, the leaves and bark of *agara*, *Galbulimima Belgraveana* (F. Muell.) Sprague, are taken with the leaves of a species of *Homalomena* to induce a violent intoxication that progresses into a sleep in which visions and dreams are experienced (Barrau 1958). Several uncharacterized isoquinoline alkaloids have been isolated from this plant, but the specific pharmacology of the constituents is not clear. (Willaman and Schubert 1961).

Two or three species of *Galbulimima* occur in eastern Malaysia and northeastern Australia.

#### Labiatae

*Coleus* Lour., *Salvia* L.

In southern Mexico, crushed leaves of *Salvia divinorum* Epling & Ját.-M., known in Oaxaca as *hierba de la Virgen* or *hierba de la Pastora*, are valued by the Mazatec in divinatory rites, when other more potent hallucinogens are unavailable (Wasson 1962). Although investigators have experimentally substantiated the psychotomimetic effects, an active principle remains to be isolated from the plant (Schultes and Hofmann 1973 and 1980; Wasson 1962). It has been suggested that *S. divinorum* represents the hallucinogenic *pipiltzintzintli* of the ancient Aztecs (Wasson 1962).

There are some 700 species of *Salvia* in the temperate and tropical parts of both hemispheres, but no other species seems to have been reported as an hallucinogen.

The leaves of two other mints, *Coleus pumilus* Blanco and *C. blumei* Benth., both native to southeast Asia, are similarly employed by the Mazatec (Wasson 1962). Chemical studies of these two species, at least on the basis of material growing in southern Mexico, have not been reported, and a psychoactive principle is not known in this genus of some 150 species of the Old World tropics. An uncharacterized alkane, sterol and triterpene (García et al. 1973), and the flavonoids aromadendrin and cyanidin 3,5-di-O-β-D-glucosyl *p*-coumarate (Lamprecht et al. 1975) have been isolated from *C. blumei*, but they would not be expected to induce marked pharmacological effects. However, diterpene quinones of the coleon Q type have been isolated from other species of *Coleus* and one might expect compounds of this type to give rise to some type of biological effect (Arihara et al. 1975).

#### Leguminosae

*Erythrina* L.

The reddish beans of *Erythrina* may have been valued as hallucinogens in Mexico. Resembling seeds of *Sophora secundiflora*, they are frequently sold in modern Mexican herb markets under the name *colorines* (Schultes 1970c). Several species contain indole or isoquinoline derivatives and could be hallucinogenic.