

# Flavonoids and Alkaloids from *Cuscuta* (Cuscutaceae)

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## Subject and Source

*Cuscuta* L. (Cuscutaceae subgenus *Grammica*) is represented in Central Chile by two species, *C. micrantha* Choisy and *C. chilensis* Kerl-Gawl. They are holoparasites of herbs and shrubs, respectively, and their taxonomy is based on flower and fruit characters (Hunziker, 1950). The plant material was collected from Cajon de Maipo (*C. micrantha*: SQF 16425, *Convolvulus arvensis* L.: SQF 16425.2) and Espinillo de Caleu, Chile (*Sophora macrocarpa* J.E. Sm.: Peña 296.3, and *C. chilensis*: Peña 296) and voucher specimens were deposited in the Herbarium of Chemistry and Pharmacy School (SQF), University of Chile.

Folk use of *Cuscuta* (Cabello de Angel) was as a love elixir by the Mapuche (Gusinde, 1917), in inflammatory tumors and for abortion, when mixed with parsley (*Petroselinum crispum*) (Muñoz *et al.*, 1981).

## Previous Work

Agroclavine from the seed of *C. monogyna* and *C. chinensis* (Chao and Der Marderosian, 1973). Lupanine, and sparteine from shoots of *C. reflexa* and *C. platyloba* (Bäumel *et al.*, 1994). Quercetin and kaempferol derivatives from *C. epithimum* (Pagani and Ciarallo, 1974).

## Present Study

Determination of the major metabolites present in the parasites shows a clear relationship with compounds found in the host plants. *Cuscuta chilensis*, growing on *S. macrocarpa*, showed a high content of quinolizidine alkaloids, matrine being the major compound (78.61%), with smaller amounts of sophoranol (2.98%) and methylcytisine (1.32%). In the host plant, *S. macrocarpa*, there was a quantitatively different pattern, matrine constituting 44.3%, with smaller percentages of sophoranol (0.27%), methylcytisine (16.80%), and cytisine (8.2%). Cytisine, was not detected in the parasitic plant *C. chilensis*. (Capillary gas-liquid chromatography, N/P selective detector, compared with authentic samples.)

*Cuscuta micrantha*, growing on *Convolvulus arvensis*, exhibited a high content of kaempferol (0.1% of dried material) and a low content of kaempferol-3-O- $\beta$ -glucoside. (UV, IR, <sup>1</sup>H NMR, Mass,  $\beta$ -glucosidase, authentic samples).

## Chemotaxonomic and Ecological Significances

Kaempferol and astragalín are well distributed in other sections of *Cuscuta*. The present report is the first in a member of the section *Grammica*. The flavonoid derivatives has anti-inflammatory activity (Nissa *et al.*, 1985). Matrine is nematocidal and various quinolizidine alkaloids including methylcytisine and matrine are toxic against phytophagous insects (Wink, 1986; Matsuda *et al.*, 1991). *Cuscuta* from South America accessions rarely grow on members of Sophoreae, and parasitism and alkaloid transfer, from host plant *S. macrocarpa*, have not previously been reported.

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