Orris

BOTANY

Iris florentina L. (=*Iris x germanica* L. nothovar. *florentina* Dykes). Common name: *orris*. Iridaceae family. The plants of the genus *Iris* are perennial herbs of 30 to 100 cm high. The rhizome is thick and short. The strong flower-bearing stem is branched from the middle. The leaves are broad, sword-shaped, usually curved and grey-green. The inflorescences of the genus *Iris* are fan-shaped and contain one or more symmetrical six-lobed, slightly fragrant flowers. These grow on a pedicel or lack a footstalk. The three sepals are spreading or droop downwards. They expand from their narrow base into a broader limb (=expanded portion), often adorned with lines or dots. The three, sometimes reduced, petals stand upright, partly behind the sepal bases. The sepals and the petals differ from each other. They are united at their base into a floral tube that lies above the ovary. The styles divide towards the apex into petaloid branches. The fruit is a large capsule with a number of sections in which the brown seeds are lined up like rolls of coins. This specie is a common source of the dried orris root, which was used in cosmetics and perfume in pre-modern times. The genus is widely distributed throughout the North Temperate Zone. Their habitats are considerably varied, ranging from cold regions into the grassy slopes, meadowlands, stream banks and deserts of Europe, the Middle East and northern Africa, Asia and across North America.

Iris florentina is a naturally occurring hybrid native to Italy and southern France.

Orris extract is produced from the roots of *Iris florentina*.

CHEMISTRY

Essential oil

0.2% Chief constituents irone (10-20%) which smells like violets; the principal compounds are α-, β-, and γ-irone, and other stereoisomers (neo-α-, iso-α-, neo-iso-α-, neo-β-, neo-γ-,iso-γ-n and neo-iso-γ-irone) are also present. In addition, the essential oil contains myristic acid, aromatic aldehydes and ketones, sesquiterpenes, and naphtalene.

Flavonoids

There are also flavonoids and more especially isoflavones (irilone, irisolone, irigenin, tectoridin, homotectoridin, etc.).

Iridale (mono-, bi- and spirocyclic compounds, precursors of the irones), including among others irigermanal.

Triterpenes

The first bicyclic and monocyclic triterpenes to be found in nature were isolated from orris root, viz α- and δ- and iridogermanal.

Other active principles

Xanthones (C-glucosylxanthones) and starch.

TRADITIONAL USES

The dried root of Orris was eaten to fresh the breath, and put in potpourri as a room freshener. Orris root was used as a flavouring in candies, and as a base for dry shampoos, toothpowders, face masks, and perfume. Orris root tea was used to treat bronchitis, colds, coughs, diarrhea, and dropsy.

Today orris root is used more in cosmetics, perfumes, and potpourris rather than for its medicinal qualities; however, it is still an excellent way to brush your teeth, strengthen your gums, and freshen your breath. The fresh root has diuretic, emetic, and cathartic properties. Dried orris root can be used as snuff to bring on sneezing when having headache congestion. It can also be used for colic and liver congestion (http://www.herbalremedies.com/orris-root-information.html#1).

COSMETIC PROPERTIES

Antioxidant activity

This activity is mainly due to the flavonoids content of orris.

The chemical criteria to establish the antioxidant ability of flavonoids are:

- Presence of an O-hydroxyl structure in the B ring, which confers higher stability to the radical form and participates in electron delocalization.
- A double bond, in conjugation with the 4-oxo functional group in the C ring
- 3- and 5-OH groups with 4-oxo function in the A and C rings necessary to reach the maximum antioxidant power

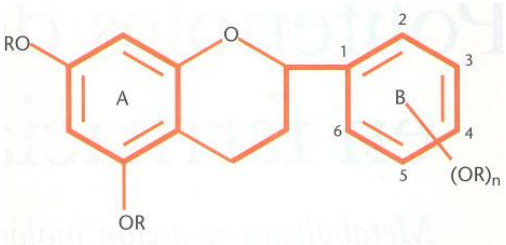

Fig.1. General structure of flavonoids.

The antioxidant activity of flavonoids results from the combination of their iron chelating activity and their ability to scavenge aging-inducing free radicals (FR). Flavonoids can inhibit oxidases such as lipooxygenase (LO), cyclooxygenase (CO), myeloperoxidase (MPO), NADPH oxidase and xanthine oxidase (XO), thus preventing the *in vivo* formation of reactive oxygen species (ROS) and organic hydroperoxide. Additionally, it has been found that flavonoids inhibit enzymes indirectly involved in oxidative processes, such as phospholipase A2 (PLA2), and stimulate other enzymes with well-known antioxidant properties, such as catalase (CAT) and superoxide dismutase (SOD). Through these mechanisms, flavonoids interfere the propagation reactions of free radicals and affect their very formation (Pérez Trueba G., 2003).

Besides scavenging free radicals, chelating metal ions and inhibiting oxidase enzymes, flavonoids may increase the availability of endogenous antioxidants and the activity of antioxidant enzymes. Additionally, they inhibit enzymes involved in the formation of ROS (Pérez Trueba G., 2003).

Therefore, orris extract is recommendable to formulate cosmetic products for the protection of skin and hair integrity against oxidative processes.

Antimicrobial activity

Orhan I et al (2003) made a study to evaluate the antimicrobial activity of *Iris germanica* rhizomes. *In vitro* biological activities including bactericidal, fungicidal and insecticidal activities of the petroleum ether, chloroform and ethyl acetate extracts of *I.germanica* L. were determined. The bactericidal activity of the extracts was assayed by the agar well diffusion test. In the fungicidal test, the agar tube dilution method was used. The insecticidal activity was determined by the exposure method. The chloroform extract of the rhizomes of *I.germanica* exhibited bactericidal activity against *Staphylococcus aureus* with an IC_{50} of 1411.76 µg/mL and *Pseudomonas aeruginosa* with an IC_{50} of 1599.9 µg/mL. The ethyl acetate extract was also found to be active against *Streptococcus pyogenes* with an IC_{50} of 1263.1 µg/mL and *S.aureus* with an IC_{50} of 1500 µg/mL.

Bioactivity-guided fractionation, according to the bactericidal activity results, led to the isolation of two known isoflavones.

For all of these, it can be concluded that chloroform and ethyl acetate extracts of *I.germanica* contain some bactericidal components which might be developed as new bactericidal agents.

COSMETIC APPLICATIONS

Action	Active	Cosmetic Application
Antioxidant	Flavonoids	Anti-ageing Photo-protection Hair colour protection
Antimicrobial	Flavonoids	Purifying Antiseptic

RECOMMENDED DOSE

The recommended dose is between 0.5% and 5.0%.

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