

Morphological and pharmacognostical evaluation of Ginkgo biloba: a living fossil with medicinal potential.

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Description

Ginkgo biloba, commonly known as the maidenhair tree, is one of the oldest living tree species on Earth, dating back to millions of years. Renowned for its unique fan-shaped leaves and impressive resistance to environmental stressors, Ginkgo biloba has also gained significant attention for its potential medicinal properties. Ginkgo biloba extract is obtained from the leaves of the ginkgo tree and contains a variety of active compounds, including flavonoids and terpenoids. These compounds are believed to possess antioxidant and anti-inflammatory properties, which contribute to the potential health effects of Ginkgo biloba.

Ginkgo biloba is a deciduous tree belonging to the Ginkgoaceae family. It is renowned for its distinctive fan-shaped leaves, which have parallel veins radiating outward from a central point. The leaves turn a vibrant yellow in the fall before shedding. The tree has a straight and slender trunk with unique furrowed bark, making it easily recognizable. Ginkgo biloba produces inconspicuous male and female cones that appear on separate trees. The female cones develop into fleshy, plum-like seeds known as "ginkgo nuts" that have been used in traditional Chinese cuisine and herbal medicine for centuries.

Macroscopic evaluation of Ginkgo biloba involves examining the external features of the plant parts with the naked eye or a magnifying lens. The leaves are fan-shaped and have a leathery texture with distinct veins. The bark is light gray and deeply furrowed, providing a unique characteristic for identification. The ginkgo nuts are green when young and turn yellow-orange when mature. The seeds are approximately the size of a cherry and have a distinct odor.

Microscopic evaluation of Ginkgo biloba includes the examination of thin sections of the plant under a microscope. The leaves exhibit anomocytic stomata, which are surrounded by a large number of epidermal cells. The mesophyll contains palisade and spongy parenchyma, along with vascular bundles. The seeds consist of a seed coat with a thick outer layer called the sarcotesta and a hard inner layer called the sclerotesta. The endosperm inside the seed contains aleurone grains and protein bodies.

Ginkgo biloba contains a wide array of chemical constituents that contribute to its medicinal properties. The main active compounds in Ginkgo biloba are flavonoids and terpenoid lactones. Flavonoids, such

as quercetin, kaempferol, and isorhamnetin, exhibit antioxidant and anti-inflammatory effects. Terpenoid lactones, including ginkgolides and bilobalide, are unique to Ginkgo biloba and are believed to support neuroprotective and vasodilatory actions, making them relevant for cognitive and circulatory health.

The leaves of Ginkgo biloba are commonly used to prepare standardized extracts for medicinal purposes. These extracts, which are available in various formulations, have been studied extensively for their potential benefits in enhancing memory, cognitive function, and blood circulation.

The morphological and pharmacognostical evaluation of Ginkgo biloba provides valuable insights into this ancient tree's distinctive features and its potential medicinal properties. The fan-shaped leaves, furrowed bark, and characteristic seeds aid in the plant's identification and authentication. Understanding the chemical constituents, particularly the flavonoids and terpenoid lactones, enables researchers to explore the therapeutic potential of Ginkgo biloba in supporting cognitive health and improving blood circulation. As a living fossil with a rich history and promising pharmacological attributes, Ginkgo biloba continues to captivate researchers and health enthusiasts alike, offering a glimpse into the fascinating world of natural medicine.

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