

Hovenia dulcis Thunberg: Phytochemistry, Pharmacology, Toxicology and Regulatory Framework for Its Use in the European Union

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Keywords: *Hovenia dulcis*; traditional medicine; phytochemistry; pharmacology; toxicology; regulatory science

Parole chiave: *Hovenia dulcis*; medicina tradizionale; fitochimica; farmacologia; tossicologia; scienze regolatorie

ABSTRACT

Hovenia dulcis Thunberg is an herbal plant, belonging to the Rhamnaceae family, widespread in west Asia, USA, Australia and New Zealand, but still almost unknown in Western countries. *H. dulcis* has been described to possess several pharmacological properties, such as antidiabetic, anticancer, antioxidant, anti-inflammatory and hepatoprotective, especially in the hangover treatment, validating its use as an herbal remedy in the Chinese Traditional Medicine. These biological properties are related to a variety of secondary metabolites synthesized by the different plant parts. Root, bark and leaves are rich of dammarane-type triterpene saponins; dihydrokaempferol, quercetin, 3,3',5',5,7-pentahydroflavone and dihydromyricetin are flavonoids isolated from the seeds; fruits contain mainly dihydroflavonols, such as dihydromyricetin (or ampelopsin) and hovenodulinol, and flavonols such as myricetin and gallicocatechin; alkaloids were found in root, barks (frangulanin) and seeds (perlolysin), and organic acids (vanillic and ferulic) in hot water extract from seeds. Finally, peduncles have plenty of polysaccharides which justify the use as a food supplement. The aim of this work is to review the whole scientific production, with special focus on the last decade, in order to update phytochemistry, biological activities, nutritional properties, toxicological aspect and regulatory classification of *H. dulcis* extracts for its use in the European Union.