



PHYTOCHEMISTRY, PHARMACOLOGY, AND TRADITIONAL USES OF VALONEIC ACID: A REVIEW

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ABSTRACT

Valoneic acid dilactone, a mildly acidic chemical, is a potential biomarker for ingestion in cloves, common walnut, and Japanese walnut. It is found in the heartwood of *Shorea laevifolia* and other oak species, with major active chemical constituents and phytoconstituents like corilagin, ellagic acid, kaempferol, luteolin, myricetin, quercetin, quercimetrine, and quercetin-3-o-rutinoside. Reviewing the phytochemistry, pharmacology, and traditional use of valoneic acid is the goal. A by-product of hydroxybenzoic acid is valoneic acid. A carboxylic acid called valoneic acid has unknown pharmacological properties and potential medicinal uses. As a result of its infrequent usage in medicine, research is crucial to comprehending its pharmacological properties.

KEYWORDS: Valoneic acid, Phytochemistry, Pharmacology, Traditional.

INTRODUCTION

Valoneic acid, a naturally occurring phenolic chemical, forms hydrolysable tannins from plant sources by hydrolyzing stronger tannin molecules. It shares structure similarities with gallic acid.^[1] Numerous plant groups, including the Rosaceae, Fabaceae, and Myrtaceae, have produced this chemical in isolation. It is present in leaves, fruits, bark, and other plant components.^[2] Depending on the quantity of lactone rings present, valine can exist in a variety of forms, including valine dilactone and valine trilactone. The potential health advantages of valoneic acid have drawn interest. It demonstrates antioxidant activity, which aids in defending cells against oxidative stress and harm brought on by free radicals. Additionally, it has demonstrated anti-inflammatory effects that may suppress pro-inflammatory mediators and enzymes.^[3] Valoneic acid has also proven to be an effective antibacterial agent against a variety of microbes. Despite the fact that valoneic acid has been researched for its phytochemical properties and possible health advantages, its precise pharmacological effects and therapeutic uses are still not fully understood.^[4]

Eugenia jambolana fruit seeds contain hydrolysable tannins like corilagin, ellagic acid, kaempferol, luteolin, myricetin, quercetin, and quercimetrine, as well as eight known compounds and three novel hydrolysable tannins.^[5] *Juglans regia* L. brown and thin leathery covering of the kernel contains a high concentration of

phenolic compounds and protects the kernel from microbial attack.^[6]

Increasing scientific evidence highlights the crucial role of diet, probiotics and nutraceutical products on biological processes and, consequently, on human health and diseases, including cancer.^[7] walnut fruit septum, it has been used for a long time as a folk remedy in Traditional Chinese Medicine, with the name of *Diaphragma juglans* is fructus.^[8]

OBJECTIVE

Phytochemistry of Valoneic Acid

A naturally occurring phenolic chemical in nature called valoneic acid is commonly found in a wide range of plant sources.^[9] It is classified as a hydrolysable tannin, therefore indicates the larger tannin molecules had been hydrolysed to create it. The structure and chemical properties of valoneic acid are involved in its phytochemistry. It is a derivative of gallic acid, containing a galloyl group attached to a glucose molecule through an ester bond. Depending on the quantity of lactone rings present, valoneic acid can exist in a wide range of forms, including valoneic acid dilactone and valoneic acid trilactone.^[10] The rose family Rosaceae, the legume family Fabaceae, the flowering family Lytharaceae, and the myrtle family are among the plant families most predominantly contains valoneic acid. Various plant sources, such as fruits, leaves, and stems, have been used to isolate it.^[11]

Pharmacology of Valoneic Acid

Valoneic acid has antioxidant and anti-inflammatory properties, potentially aiding in managing inflammatory conditions.^[12] It also exhibits antimicrobial properties against various microorganisms, including bacteria, fungi, and viruses.^[13] Its potential anticancer properties include inhibiting cell proliferation and cell death in certain cancer models, but further research is needed to fully understand its mechanisms and potential applications in cancer therapy.^[14]

Traditional Uses of Valoneic Acid

Tannins, particularly hydrolyzed ones, have been used as astringents, tightening and contracting tissues for skin diseases, wound healing, and bleeding reduction.^[15] They also have antibacterial effects and can promote oral health in dental care procedures.^[16] Hydrolysable tannins are applied topically to treat skin issues like burns, lesions, and ulcers, providing antiseptic and healing benefits.^[17]

DISCUSSION

Tannins, plant polyphenols, are essential secondary metabolites of higher plants with tanning and astringent consequences.^[18] They are found in various plant components and are essential for defense against microbial infection, insects, and herbivory.^[19] These amorphous, white, light yellow, or colorless granules have a high molecular weight of 500 to 30,000 Da and antioxidant effects. Gallotannins and ellagitannins are molecules with a central glucose core and esterified with gallic acid or hexahydroxy diphenic acid. PEG is a fundamental building block for hydrolysable tannin metabolism.^[20] Hydrolyzable tannins (HTs) are responsible for 92% of pomegranate fruit's antioxidant activity. HTs are found in fruit peels, leaves, bark, and piths.^[21]

Valoneic acid, a naturally occurring phenolic chemical, is found in various plant sources, including fruits, leaves, and stems.^[11] It is a hydrolysable tannin and is a derivative of gallic acid.^[1] Valoneic acid can exist in various forms, including dilactone and trilactone, and is predominantly found in the rose family Rosaceae, Fabaceae, Lytharaceae, and myrtle families.^[2] Valoneic acid, found in plant components like leaves, fruits, and bark, has potential health benefits.^[22] It exhibits antioxidant activity, anti-inflammatory effects, and antibacterial properties.^[23] However, its exact pharmacological effects and therapeutic uses remain unexplored. Valoneic acid's potential health advantages are largely unknown.

Lagerstroemia speciosa leaves were extracted with aqueous acetone, causing the isolation of seven ellagitannins, ellagic acid, ellagic acid sulphate and four methyl ellagic acid derivatives, including corosolic acid, gallic acid, 4-hydroxybenzoic acid, 3-O-methyl protocatechuic acid, caffeic acid, p-coumaric acid, kaempferol, quercetin and isoquercitrin.^[24] A

composition derived from *Lagerstroemia speciosa* comprising one or more compounds selected from the group consisting of gallotannins, ellagitannins and valoneic acid dilactone.^[25]

CONCLUSION

Traditional medicine relies on plants as primary components, with secondary metabolites comprising the majority of crude medicines. These active metabolites include steroids, terpenoids, glycosides, phenolic compounds, amino acids, saponins, starch, alkaloids, carbohydrates, organic acids, flavonoids, reducing sugars, tannins, and more. Valoneic acid has numerous biological activities, including anti-inflammation, antibacterial, antioxidant, anti-HIV, anti-diabetic, anti-ageing, anti-wrinkle, and anti-diarrheal activity. We have outlined the phytochemical and pharmacological effects of valoneic acid on numerous disorders in this review of its phytochemical qualities.

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