

Article

A Simple and Reliable Method for the Determination of Isorhapontigenin in Murine Biological Matrices: Application in a Tissue Distribution Study

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Abstract

Isorhapontigenin (*trans*-3,5,4'-trihydroxy-3'-methoxystilbene; ISO), a dietary derivative of resveratrol (*trans*-3,5,4'-trihydroxystilbene; RES), exhibits diverse health-promoting properties. To facilitate its potential development as a nutraceutical, a simple and reliable high-performance liquid chromatography (HPLC) method was developed and validated for the quantification of ISO in various murine biological matrices. Chromatographic separation was achieved with a reversed-phase HPLC column through a 17 min gradient delivery of a mixture of acetonitrile and formic acid (0.1% *v/v*) at a flow rate of 1.5 mL/min at 50 °C. Quantification was performed using ultraviolet (UV) detection at 325 nm, with a lower limit of quantification (LLOQ) of 15 ng/mL in both plasma and tissue homogenate samples. The method demonstrated excellent selectivity, accuracy, and precision, and ISO remained stable under the tested conditions. This method was subsequently employed to investigate the tissue distribution of ISO in mice following oral administration at a dose of 200 µmol/kg (equivalent to 51.7 mg/kg). ISO was rapidly absorbed and extensively distributed across major pharmacologically relevant organs. Despite its limited aqueous solubility, its oral absorption was not significantly compromised. Given its oral bioavailability and broad tissue distribution, ISO represents a promising candidate for further nutraceutical development.

Keywords: isorhapontigenin; resveratrol; nutraceutical; bioavailability; biodistribution



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1. Introduction

Resveratrol (*trans*-3,5,4'-trihydroxystilbene; RES; Figure 1), one of the most well-known nutraceuticals, occurs naturally in dietary sources such as grapevine, red wine, cranberry, blueberry, bilberry, peanut, and various herbs [1–3]. Since the turn of the millennium, RES has attracted considerable attention in the biomedical research community due to its reported potential benefits in managing a wide range of medical conditions, including Alzheimer's disease, cancer, cardiovascular diseases, chronic kidney disease, diabetes, nonalcoholic fatty liver disease, obesity, and metabolic syndrome. Increasing interest is also being directed toward its naturally occurring dietary derivatives [4].

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Lunge and Keane's Technical Methods of Chemical Analysis. 2d Ed., Edited by Charles A. Keane ...and P.C.L. Thorne Georg Lunge,1928 **The Mathematics Teacher** ,1929 The American Journal of Science ,1905 The American journal of science and arts **Merck's Report** Theodore Weicker,1914 *Journal of the Institution of Electrical Engineers* ,1926 Proceedings of the Institution of Electrical Engineers Institution of Electrical Engineers,1922 Vols for 1970 79 include an annual special issue called IEE reviews The Journal of the American Leather Chemists Association American Leather Chemists Association,1914 *Handbook of Performability Engineering* Krishna B. Misra,2008-08-24 Dependability and cost effectiveness are primarily seen as instruments for conducting international trade in the free market environment These factors cannot be considered in isolation of each other This handbook considers all aspects of performability engineering The book provides a holistic view of the entire life cycle of activities of the product along with the associated cost of environmental preservation at each stage while maximizing the performance

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