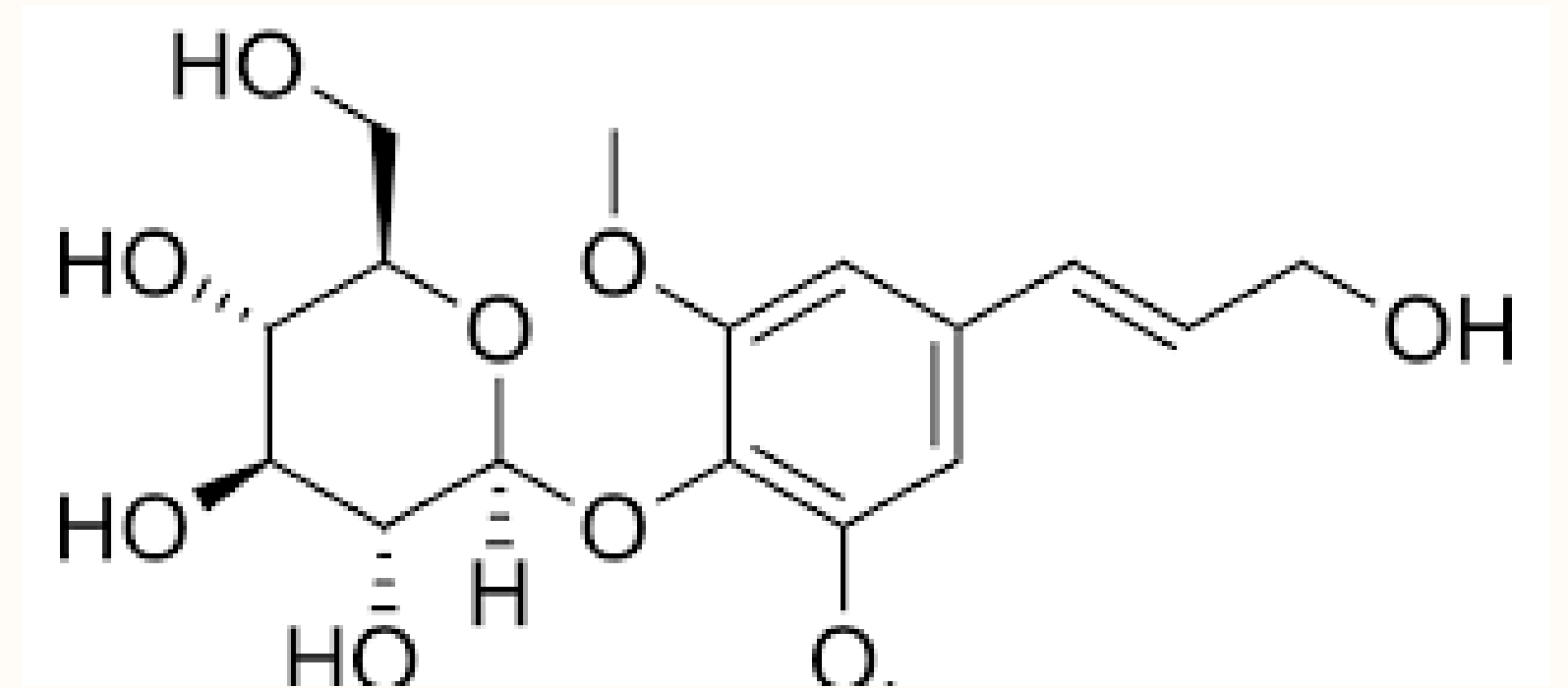


Alcoholic and phenolic glycosides

SYRINGIN

Syringin

- A PHENYLPROPANOID GLYCOSIDE
- was identified in several plants including *Musa paradisiaca*, *Jasminum mesnyi*, *Edgeworthia chrysantha*, *Acanthopanax senticosus*



pharmacological action

01

Protection against
neuronal cell damage

02

Syringin inhibits apoptosis

03

anti-inflammatory and
anti-nociceptive agent

Ultrasound-assisted extraction (UAE) of syringin

01

STEP 1

A rapid extraction method based on UAE of syringin from the bark of *I. rotunda* thumb using a response surface methodology (RSM) is described.

02

STEP 2

The syringin was analyzed and quantified by HPLC coupled with ultraviolet (UV) detection

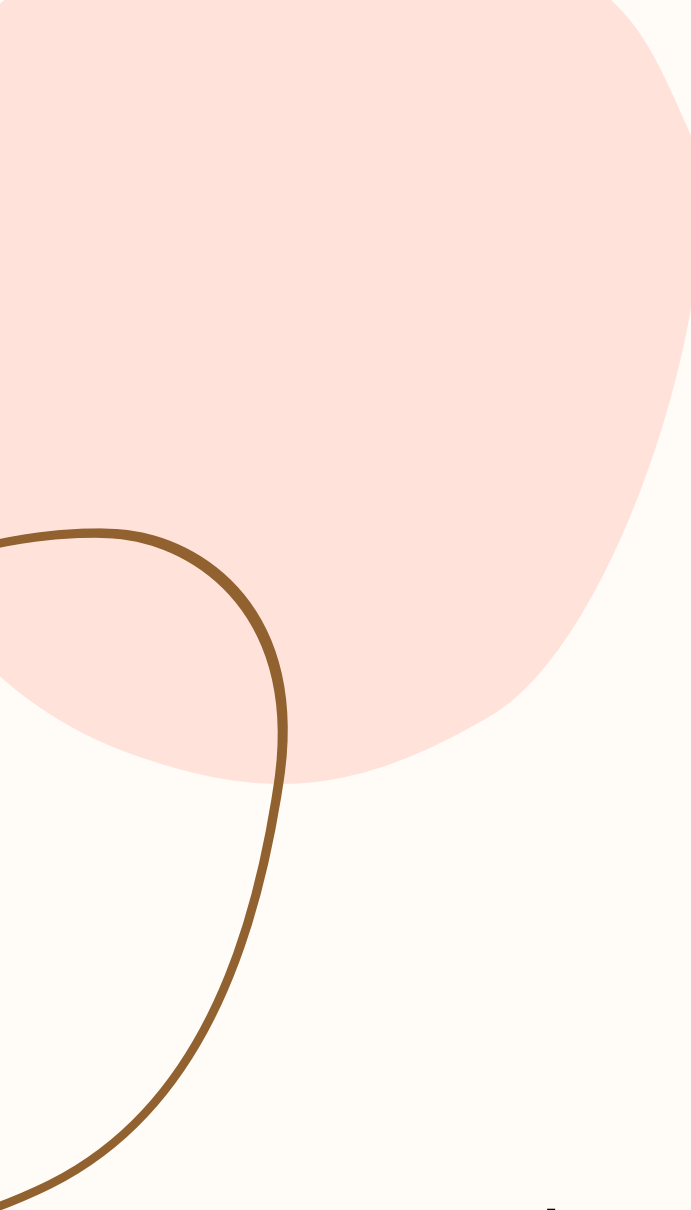
03

STEP 3

The extraction solvent, extraction temperature, and extraction time, the three main factors for UAE, were optimized with Box-Behnken design to obtain the highest extraction efficiency then we analyse the result


The optimal conditions

- **sonication frequency 40 kHz**
- **65% methanol as the solvent**
- **an extraction time of 30 minutes**
- **an extraction temperature of 40°C**



The analysis of variance indicates high goodness of model fit and the success of the RSM method for optimizing syringin extraction from the bark of *I. rotunda*.

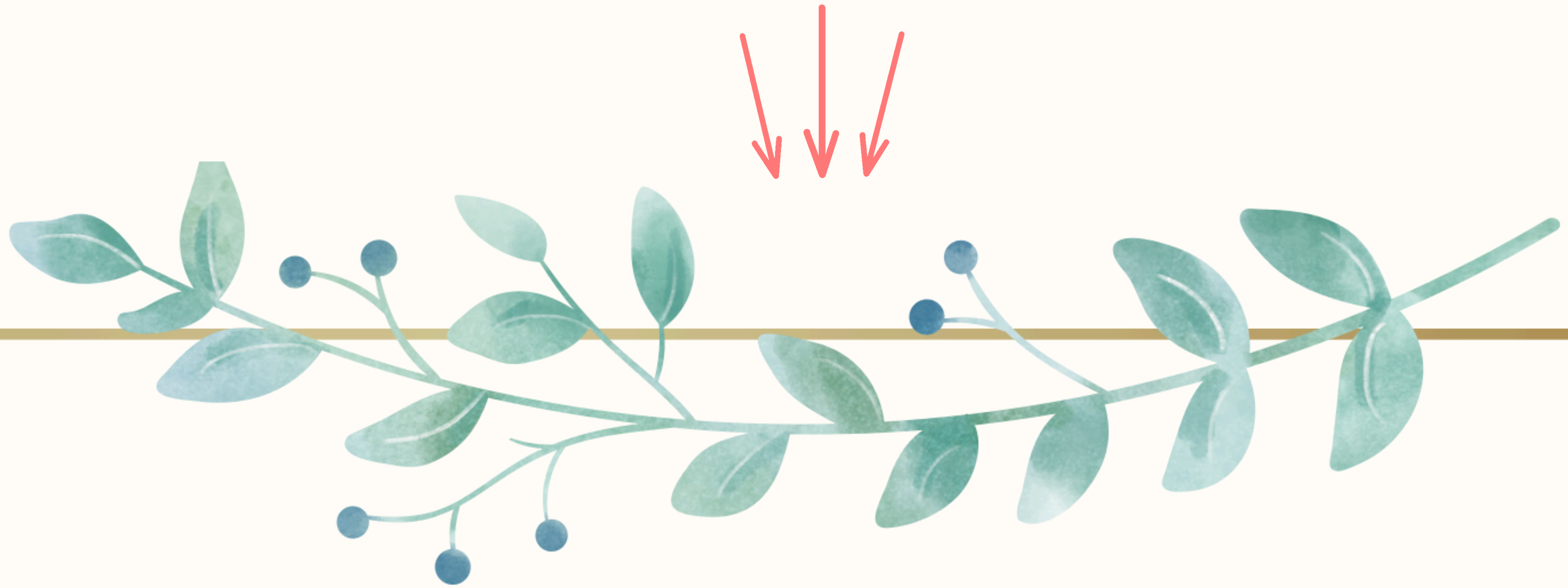
The analysis is performed with a HPLC instrument equipped with a quaternary solvent delivery system, a column oven and UV detector.



separation

- Separation was achieved on a Hypersil ODS2 column (4.6 mm × 250 mm, 5 μm) from Dalian Elite Analytical Instruments CO.
- the column temperature at 25°C
- the detection wavelength at 265 nm.

The mobile phase was 10% CH₃ CN with a flow rate of 1.0 mL/minutes.
The isocratic elution was employed with 20 μL of injection sample.



Dalian Elite Analytical Instruments Co., Ltd. (DEAIC) is a high-tech company, specializing in HPLC instruments, chromatographic columns and other accessories.

separation

syringin along with **Edgeworoside C** were separated from the n-butanol extract of the stems and barks of **E. chrysantha Lindl** (*E. papyrifera*) by **high-speed counter-current chromatography (HSCCC)**



It was difficult to purify each compound by silica gel column chromatography

Syringin was isolated from this plant for the first time.

The two-phase solvent system used was composed of **ethyl acetate-ethanol-water** at an optimized volume ratio of **15:1:15** (v/v/v).

Preparative HSCCC yielded, from 110 mg of the partially purified extract, 28 mg of syringin, and 45 mg edgeworoside C each at over 96% purity by HPLC analysis.

Their structures were identified by electron impact ionization (EI) MS, ¹H NMR, and ¹³C.

The partially purified extract of *E. chrysantha* Lindl and each peak fraction from HSCCC were analyzed by HPLC.

The analyses were performed with a Shim-Pack CLC-ODS C18 column (250 mm × 6 mm i.d.).

The mobile phase composed of *methanol-water (50:50, v/v)* was eluted at a flow rate of 0.5 ml/minutes, and the effluent monitored by a Shimadzu SPD10Avp UV detector at 254 nm. Identification of HSCCC peak fractions was carried out by EI MS, ¹H NMR, and ¹³C NMR spectra.

NMR spectra were recorded on a Bruker Avance 400MHz spectrometer with TMS (tetramethylsilane) as internal standard.

EI-MS was obtained on a HP5989B mass spectrometer



HPCC



Shimadzu SPD 10 Avp
UV detector

Siberian ginseng

has a lot of herbal plants in it including eleutherococcus root that contain a glycoside fraction that includes various eleutherosides (isofraxidin, sesamin, syringin)



Siberian ginseng

Siberian ginseng is often called an "adaptogen." This is a non-medical term used to describe substances that can supposedly strengthen the body and increase general resistance to daily stress.

In addition to being used as an adaptogen, Siberian ginseng is used for conditions of the heart and blood vessels such as **high blood pressure, low blood pressure, hardening of the arteries (atherosclerosis), and rheumatic heart disease.**

CHEMISTRY AND PHARMACOLOGY OF SYRINGIN, A NOVEL BIOGLYCOSIDE: A REVIEW**MAHADEVA RAO US*, THANT ZIN, MUHAMMAD ABDURRAZAK, BASHIR ADO AHMAD**

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*Received: 21 February 2015, Revised and Accepted: 23 March 2015***ABSTRACT**

Syringin, a phenylpropanoid glycoside belongs to eleutheroside derivative. This bioactive compound was identified in several plants including *Musa paradisiaca*, *Jasminum mesnyi*, *Edgeworthia chrysantha*, *Acanthopanax senticosus*, etc. According to Nair *et al.*, syringin is synthesized from the precursor phenylalanine by a series of reactions. Zhao has described a rapid extraction method based on the ultrasound-assisted extraction of syringin from the bark of *Ilex rotunda* thumb using response surface methodology. Based on the findings made by Jizhong *et al.*, the bioactive compound syringin was separated from the n-butanol extract of the stems and barks of *E. chrysantha* Lindl by high-speed counter-current chromatography. According to Choi *et al.*, the enrichment and purification of syringin from *A. senticosus* was performed based on the adsorption and desorption properties of commercial macroporous resins. The pharmacological properties of syringin includes scavenging the free radicals, protection against neuronal cell damage, inhibition of apoptosis, anti-diabetic effect, anti-inflammatory potential, anti-nociceptive action, anti-allergic effect, etc.

Keywords: Phenylpropanoid glycoside, Eleutheroside, Apoptosis, Nociceptive.

INTRODUCTION**Eleutherosides**

Eleutherosides are a diverse group of chemical compounds that were isolated from the roots of the herb *Eleutherococcus senticosus*

syringin [17]. Syringin was purified from the rhizome and root parts of *Eleutherococcus senticosus* (Araliaceae) [18]. It was also isolated from *Linum olympicum* (The genus *Linum* belongs to the family Linaceae and comprises about 200 species mainly distributed in the Mediterranean region) and its structure elucidated by ¹H-NMR analysis [19]. The

*Thank
you!*

