International Journal of Scholarly Research in
Biology and Pharmacy
Journal homepage: https://srrjournals.com/ijsrbp/
ISSN: 2961-3310 (Online)

(Review Article)

Check for updates

A review of phytochemical profile and application in functional food and pharmacology of *Schefflera heptaphylla*

Tam B. Tran [1], Nhi Y. Dinh [2] and Phu H. Le [2,*]

[1] *Department of Biotechnology, School of Biotechnology, International University – Vietnam National University of Ho Chi Minh City, Ho Chi Minh City, Vietnam.*
[2] *Department of Food Technology, School of Biotechnology, International University – Vietnam National University of Ho Chi Minh City, Ho Chi Minh City, Vietnam.*

International Journal of Scholarly Research in Biology and Pharmacy, 2026, 07(01), 012-021

Publication history: Received on 05 February 2026; revised on 14 March 2026; accepted on 16 March 2026

Article DOI: https://doi.org/10.56781/ijsrbp.2026.7.1.0021

Abstract

Schefflera heptaphylla contains a wide array of phytochemicals with promising potential for application in both pharmaceuticals and functional foods. This study aimed to comprehensively review the phytochemical profile of *S. heptaphylla* by analyzing relevant scientific literature and assessing its potential bioactivities. A total of 31 studies were screened using the keyword "*Schefflera heptaphylla*" on Google Scholar®, of which 18 focused on the isolation and identification of bioactive compounds. Additional online sources provided supporting information regarding the plant's prospective value in health-related applications. The findings highlight that the species possesses diverse classes of bioactive constituents such as triterpenoids, saponins, lignans, sesquiterpenes, and aromatic compounds which may contribute to various pharmacological effects. These chemical components represent valuable resources for the development of nutraceuticals and therapeutic agents. Overall, the review supports the need for further research to characterize the pharmacological effects of these compounds and explore their incorporation into functional food and pharmaceutical products, ultimately contributing to healthcare innovation and economic growth.

Keywords: Biological Activities; Functional Foods; Pharmacology; *Schefflera heptaphylla*

1. Introduction

Schefflera heptaphylla, also known as "Đáng chân chim" or "Chân chim bảy lá" in Vietnamese, it is a blooming evergreen shrub native to East Asia, Japan, and southern China, Taiwan, and the Ryukyu Islands [1-3]. *Schefflera heptaphylla* is a small to medium-sized, semi-deciduous or evergreen tree that can reach up to 25 meters in height, with a bole that can be up to 80 cm in diameter. The leaves are palmately compound, typically with 6-8 (sometimes 11) leaflets, and the petiole measures 8-35 cm in length. The leaflets are elliptic to ovate-elliptical, measuring 7-20 cm in length and 3-6 cm in width. They have an attenuate base, narrowly pointed apex, entire glabrous margins, and unequal petioles ranging from 1-5 cm long. The inflorescence is a well-developed panicle with hairy branches, and the flowers are arranged in many-flowered umbellules or occasionally solitary at the top of the secondary axes. The flowers are 5-merous, with a 5-8 (sometimes 10)-locular ovary. The flowers bloom from fall to early winter, followed by round, blueish-black berries. The fruit is globular, black, and 3-4 mm in diameter. Historically, this species has been known as *Schefflera octophylla (Lour.)* Harms since the 1890s, but recent taxonomic insight suggests it should be called *S. heptaphylla (L.) Frodin* [1].

* Corresponding author: Phu H. Le

Figure 1 Documented Species Distribution [1]

It grows up to 25 meters tall with a bole diameter of up to 80 cm. *S. heptaphylla* has several traditional medicinal uses. The fresh branchlets are used as a wash to soothe itching of the skin. The leaves have diuretic properties. The root-bark and stem-bark are used in folk medicine for their anti-inflammatory, diuretic, and tonic properties. They are used to treat various conditions, including rheumatism, lumbago, osteodynia. The ashes are sometimes used to treat dropsy. Pharmacological studies have shown that the root-bark and stem-bark contain triterpenoid saponins that yield oleanolic acid on hydrolysis. Harvesting of the medicinal parts usually occurs in autumn, followed by drying in the shade. This plant therefore has potential as a source of biologically active compounds for pharmaceutical applications [2].

While research on *Schefflera heptaphylla* remains limited, its traditional medicinal uses indicate potential. This article emphasizes the value of bioactive compounds found in *S. heptaphylla* and highlights their potential applications in functional foods and pharmaceuticals. With further characterization of its bioactivities, *S. heptaphylla* may become a promising candidate for nutraceutical development. Overall, the study provides a rationale for continued research to unlock the full economic potential of this underutilized natural resource.

1.1. Phytochemicals in Schefflera heptaphylla

Based on the diversity of chemical compounds found in this plant species and referring to the list of compounds and their sources provided earlier, this paper aims to more clearly describe the locations and extraction methods employed for different groups of compounds.

The largest groups represented are triterpenoid and saponins, with over 50 compounds of types Oleanane, Ursane, Lupane, and Dammarane, and over 20 other phytochemical compounds isolated from 1989 to present described in Table 1 [4].

Table 1 Phytochemicals from *Schefflera heptaphylla*

Phytochemistry	Types	Group	No	Compounds	References
Triterpenoid and saponins	Oleanane		1	28-Norolean-12-en-3α,17β-diol	[5]
		3β-OH	2	Oleanolic acid	[6]
					[7]
		3 =O	3	Oleanonic acid	[8]
					[5]
			4	3-Oxo-11α-methoxy-olean-12-en-28-oic acid	[6]
		3α-OH; 23-COOH; R = -glc4 -rha	5	Heptoleoside D	[9]
			6	Heptoleoside C	[9]

		2α,3β-OH; R = -glc6 -glc4 -rha 23-CH2OH; R = -glc6 -glc4 -rha; 2α,3β-OH	7	Scheffoleoside A	[6] [10]
		2α,3β-OH; 23-CHO; R = -glc6 -glc4 -rha	8	Scheffoleoside B	[9] [10]
		3β-O-ara; 23-CH2OH; R = -glc6 -glc4 -rha	9	Cauloside D	[10]
		3α-OH; 23-COOH; R = -glc6 -glc4 -rha	10	Scheffoleoside D	[6] [10]
		3β-O-gluA2 -gal2 -gl c; R = -glc6 -glc4 -rha	11	Scheffoleoside E	[10]
		2α,3β-OH; 24-CH2OH; R = -glc6 -glc4 -rha	12	Scheffoleoside F	[10]
		3α-OH; 23-COOH R = -glc6 -glc4 -rha	13	Heptoleoside A	[9]
		3α-OH; 23-CHO R = -glc6 -glc4 -rha	14	Heptoleoside B	[9]
	Ursane	R = H	15	3-Oxo-urs-12-en-28-oic acid	[6]
		2α,3β-OH; 23-CH2OH; R = H	16	Asiatic acid	[11]
		R = H	17	3α-Hydroxy-urs-12-ene-23,28-dioic acid	[11]
			18	3α,13-Dihydroxy-urs-11-en-23,28-dioic acid-13,28-1act one	[6]
			19	3-Oxo-urs-12-en-24-nor-oic acid 28-O-α-L-rhamnopyra nosyl-(1→4)-β-D-glucopyranosyl-(1→6)-β-D-glucopyra noside	[12]
		2α, 3β-OH R = -glc6 -glc4 -rha	20	Asiaticoside D	[9]
		2α, 3β-OH; 23-CH2OH R = -glc6 -glc4 -rha	21	Asiaticoside	[10] [11]
		3α-OH; 23-CHO R = -glc6 -glc4 -rha	22	Heptursoside A	[9]
		3α-OH; 23-COOH R = -glc6 -glc	23	Heptursoside D	[9]
		3α-OH; 23-COOH R = -glc6 -glc4 -rha	24	Scheffuroside D	[6] [11] [10]

		2α,3β-OH; 23-CHO R = -glc6 -glc4 -rha	25	Scheffuroside B	[10]
		3β-O-ara; 23-CH2OH R = -glc6 -glc4 -rha	26	Scheffuroside C	[10]
		3β-O--gluA2 -gal2 -g lc R = -glc6 -glc4 -rha	27	Scheffuroside E	[10]
		2α,3β-OH; 24-CH2OH R = -glc6 -glc4 -rha	28	Scheffuroside F	[6]
					[10]
			29	3 3α-Hydroxy-urs-20-en-23,28-dioic acid 28-O-β-D-gluc opyranosyl-(1→6)-β-D-glucopyranoside	[12]
		3α-OH; 23-CHO; R = -glc6 -glc4 -rha	30	Heptursoside B	[9]
		3α-OH; 23-COOH; R = -glc6 -glc4 -rha	31	Heptursoside C	[9]
			32	3-Oxo-urs-20-en-23,28-dioic acid 28-O-α-L-rhamnopyr anosyl-(1→4)-β-D-glucopyranosyl-(1→6)-β-D-glucopyr anoside.	[12]
			33	3α-Hydroxy-urs-20-en-23,28-dioic acid 23-O-β-D-gluc opyranosyl,28-O-α-L-rhamnopyranosyl-(1→4)-β-D-gluc opyranosyl-(1→6)-β-D-glucopyranoside	[12]
			34	3α-Hydroxy-20β-hydroxyursan-23,28-dioic acid δ-lacto ne 23-O-β-D-glucopyranoside	[12]
	Lupane	3β-OH	35	Betulinic acid	[13]
		3α-OH	36	3-Epi-betulinic acid	[14]
		3α-OSO3H	37	3-Epi-betulinic acid 3-O-sulfate	[15]
		3β-OSO3H	38	Betulinic acid 3-O-sulfate	[13]
					[15]
			39	3β-Hydroxy-lup-20(29)-ene-23,28-dioic acid	[13]
			40	3α-Hydroxylup-20(29)-ene-23,28-dioic acid	[6]
					[16]
			41	3α,11α-Dihydroxylup-20(29)-ene-23,28-dioic acid	[17]
			42	3α-Hydroxylup-20(29)-ene-23,28-dioic acid fatty acid este	[18]

		3β-O-glc	43	Betulinic acid glucoside	[13]
			44	3-Epi-betulinic acid 3α-O-β-D-glucopyranoside	[19]
			45	rhamnopyranosyl-(1→4)-O-β-D-glucopyranosyl-(1→6)]-β-D-glucopyranoside	[6]
					[19]
					[14]
			46	-[α-L-Rhamnopyranosyl-(1→4)-O-β-D-glucopyranosyl-(1→6)]-β-D-glucopyranoside	[14]
			47	3-Epi-betulinic acid 28-O-[α-L-rhamnopyranosyl-(1→ 4)-O-β-D-glucopyranosyl-(1→6)]-β-D-glucopyranoside	[14]
		3α-OSO3H	48	nosyl-(1→4)-O-β-D-glucopyranosyl-(1→6)]-β-D-glucop yranoside	[8]
			49	3-Epi-betulinic acid 3-O-β-D-glucopyranoside 28-O-[α -L-rhamnopyranosyl-(1→4)-O-β-D-glucopyranosyl-(1→ 6)]-β-D-glucopyranoside	[20]
			50	3-Epi-betulinic acid 3-O-β-D-6'acetylglucopyranoside 28-O-[α-L-rhamnopyranosyl-(1→4)-O-β-D-glucopyrano syl-(1→6)]-β-D-glucopyranoside	[11]
			51	12(13)-Ene betulinic acid	[13]
			52	7α,11β-Dihydroxy-2,3-seco-lup-12(13),20(29)-diene-2,3, 28-trioic acid	[13]
	Dammara-ne	R = -glc2 -xyl	53	Heptdamoside A	[8]
Sesquiterpenes and nor-sesquiterpenes			54	Dysodensiol D	[6]
			55	15-Nor-10-hydroxy-oplopan-4-oic-acid	[6]
			56	Dysodensiol E	[6]
			57	(3S,4S,5R,6R,7E,9R)-3,6,9-Trihydroxy-megastigm-7-en-4-O-β-Dglucopyranoside	[5]
			58	(3S,4S,5R,6R,7E,9S)-3,6,9-Trihydroxy-megastigm-7-en-4-O-β-Dglucopyranoside (5)	[5]
			59	2,6-Dimethoxy-p-hydroquinone-1-O-β-D-[6′-O-(1″S,2″R,4″S,6″R,7″E,9″Z)-	[5]

				dihydrophaseyl]-glucopyranoside	
			60	4-(3′-Hydroxypropenyl)-2-methoxyphenyl-1-O-β-D-{6″-O-[(1‴S,2‴R,4‴S, 6‴R,7‴E,9‴Z)-dihydrophaseic acyl]}-glucopyranoside	[5]
			61	2-Methoxy-4-[(1′S,2′S)-1′,2′,3′-trihydroxypropyl]-phenyl-1-O-β-D- {6″-O-[(1‴S,2‴R,4‴S,6‴R,7‴E,9‴Z)-dihydrophaseic acyl]}-glucopyranoside	[5]
Lignans			62	(7S,8R)-7′,8′-threo-4-O-1″,3″-dihydroxy-2″-propyl bennettin	[21]
			63	(7S,8R)-7′,8′-threo-meliasendanin D 7′-O-β-D-glucopyranoside	[21]
			64	(7R,8S)-9′-O-butyl-5-methoxydehydrodiconiferyl alcohol 4-O-β-D-glucopyranoside	[21]
			65	(7R,8S)-9′-O-butyl-dehydrodiconiferyl alcohol 4-O-β-D-apiofuranosyl-(1→2)-β-D-glucopyranoside	[21]
			66	(7S,8R)-9′-O-ethyl-dehydrodiconiferyl alcohol 4-O-β-D-{6″-O-[(1‴S,2‴R,4‴S,6‴R,7‴E,9‴Z)-dihydrophaseic acyl]}-glucopyranoside	[21]
			67	(+)-Balanophonin	[6]
Phenylpropanoids			68	3,5-Di-O-caffeoylquinic acid methy ester	[6]
			69	3,5-Di-O-caffeoylquinic acid	[22]
			70	3,4-Di-O-caffeoylquinic acid	[22]
			71	3-O-Caffeoylquinic acid	[22]
Aromatic compounds			72	Methyl benzoate 2-O-β-D-apiofuranosyl-(1→2)-β-D-glucopyranoside	[21]
Diterpenes			73	12-Oxo-GA14-3-O-β-D-glucopyranoside	[5]
Lactones			74	4-(3-Hydroxypropyl)-2-oxo-2H-pyran-6- carboxylic acid	[21]
			75	Butyl 3-(3-hydroxypropyl)-2-oxo-2H-pyran-6- carboxylate	[21]

Oligosaccharides			76	α-L-Rhamnopyranosyl-(1→4)-β-D-glucopyranosyl-(1→6)-β-D-glucopyranose	[20]
			77	α-L-Rhamnopyranosyl-(1→4)-β-D-glucopyranosyl-(1→6)-α-D-glucopyranose	[20]

Table 1 summarizes the groups of compounds and the corresponding compounds found in the plant. Through research studies, this plant was found to contain many important bioactive compound groups, such as triterpenoids, saponins, sesquiterpenes, lignans, phenylpropanoids, aromatic compounds, and oligosaccharides.Some of the triterpenoids found in the plant have strong anti-inflammatory, antioxidant, and antimicrobial activities. This shows the potential of *S. heptaphylla* to become a source of raw materials for medicinal drugs. The saponins in the plant can also be applied to drug manufacturing, functional foods, and herbicides.With its rich chemical properties, *S. heptaphylla* promises to become an important traditional herbal medicine and a source of raw materials serving the pharmaceutical and cosmetic industries in the future. Research and application of the compounds in the plant will be significantly meaningful.

1.2. Analgesic and anti-inflammatory effects

Several studies have demonstrated the significant anti-inflammatory effects of *Schefflera heptaphylla* based on in vitro and in vivo experiments found in literature. As reviewed by Wang et al. (2020), *S. heptaphylla* displayed dose-dependent anti-inflammatory and analgesic activities in animal models, though not as strongly as the standard drug indomethacin. The ethanolic extract at a dose of 600 mg/kg and chloroform fraction at 300 mg/kg considerably reduced the expression levels of the pro-inflammatory cytokines TNF-α, IL-1β, and IL-6 compared to the control arthritis group [4].

Various phytochemicals isolated from *S. heptaphylla* have exhibited anti-inflammatory properties. Wu et al. (2013, 2014) reported that certain saponins of oleanane and ursane classes lessened inflammation [9, 12]. Li et al. (2020) found that specific lignans listed in table 2 along with a pyran derivative known as 350 inhibited IL-6 expression induced by LPS in RAW 264.7 macrophage cells [21].

1.3. Anticancer effects

Man (2007) was the first to report on the anticancer activity of compounds from *Schefflera heptaphylla*. A lupane-type triterpenoid called 3α-hydroxy-lup-20(29)-ene-23,28-dioic acid (HLDA) isolated from *S. heptaphylla* potently inhibited the proliferation of various cancer cell lines from different origins after 72 hours. HLDA showed strong anti-proliferative effects, with IC50 values ranging from 23-90 µg/ml. Additionally, an ethyl acetate fraction containing HLDA suppressed cancer cell growth, exhibiting slightly higher IC50 values of 46-110 µg/ml. This study provided novel evidence of broad-spectrum anticancer activity for HLDA from *S. heptaphylla*, indicating its potential as a lead for further anti-tumor drug development [23].

1.4. Antimicrobic effects

Early studies have reported on the anti-viral activity of compounds from *Schefflera heptaphylla.* Li et al. (2004) first demonstrated that *S. heptaphylla* extract exhibited inhibitory effects against respiratory syncytial virus (RSV) [24]. Subsequently, Li et al. (2005) identified specific caffeoylquinic acid derivatives, compounds 3,5-Di-O-caffeoylquinic acid and 3,4-Di-O-caffeoylquinic acid purified from *S. heptaphyll*a that were responsible for the extract's anti-RSV activity. Both the crude extract and purified compounds potently suppressed RSV replication based on in vitro assays, establishing *S. heptaphylla* as a potential source of anti-RSV agents. These early findings provided novel evidence of S. heptaphylla's antiviral properties and introduced caffeoylquinic acid derivatives as lead anti-RSV components warranting further investigation [22].

1.5. Coagulant effects

According Liu et al, 2019, this study evaluated the pro-coagulant effects of *Schefflera heptaphylla* extracts and compounds. In vitro, the ethanol extract, ethyl acetate and n-butanol fractions prolonged clotting times. Bioassay-guided isolation yielded three lupane triterpenes, with compound Betulinic acid 3-O-sulfate exhibiting significant coagulant activity. In vivo, the extracts and Compound B decreased clotting times and increased fibrinogen. Betulinic acid was confirmed as the main pro-coagulant constituent. In a heparin rat model, Betulinic acid 3-O-sulfate doses of 160 and 80 mg/kg enhanced coagulation. Mechanistically, effects involved regulating thromboxane, prostacyclin, eNOS and endothelin-1. Decreased bleeding time evidenced hemostatic activity. Collectively, results support S. heptaphylla's traditional use for bleeding by demonstrating a pro-coagulant mode of action via vascular and hemorheological modulation. This validates further study of its bioactive constituents [25].

2. Application of *Schefflera heptaphylla* in functional food and pharmacology

2.1. In functional food

Currently, there is little evidence for using *Schefflera heptaphylla* in functional foods. Despite its phytochemicals, health roles remain understudied. Usage in immunity formulations is nascent due to inconsistent sourcing and unknown bioactives. While chemically rich, commercializing benefits poses challenges without clinical validation of extraction methods and efficacy claims. Further research aims to characterize health-supporting properties, facilitating mainstream adoption in nutraceuticals.

Schefflera heptaphylla, a member of the *Araliaceae* family, possesses medicinal properties attributed to its rich phytochemical content. Studies have shown that it contains several lignans, sesquiterpenes, nor sesquiterpenes, phenylpropanoids, aromatic compounds, diterpenes, lactones, oligosaccharides, triterpenes, and saponins [4]. These phytochemicals indicate the following potential benefits. Lignans and sesquiterpenes exhibit anti-inflammatory and antioxidant effects [5]. They may protect the body against oxidative stress-related chronic diseases. Phenylpropanoids are anti-inflammatory and anticancer due to inhibiting tumor cell development [26]. Aromatic compounds demonstrate antimicrobial, antifungal and antiviral properties [27]. They could aid in treating and preventing infectious diseases. Saponins and triterpenes effectively combat harmful agents like viruses, bacteria, and fungi [28]. Oligosaccharides improve gut health and immunity [29].

Overall, *S. heptaphylla* shows promise as a functional food source for general wellness by supporting treatment and prevention of various ailments through its diverse phytochemical composition. Further biological and clinical studies are warranted to fully realize this potential. The plant warrants consideration for utilization in nutraceuticals and functional foods given its valued pharmacological activities.

2.2. In pharmacology

S. heptaphylla contains numerous beneficial secondary metabolites like lignans, sesquiterpenes, phenylpropanoids, terpenes and polysaccharides. Studies have shown that these phytochemicals confer anti-inflammatory, anticancer, antimicrobial and antioxidant properties to the plant. Lignans and sesquiterpenes present in *S. heptaphylla* effectively suppress inflammatory mediators and inhibit enzymes linked to inflammation. Their anti-inflammatory action holds promise for treating conditions with chronic inflammation [5].

Furthermore, aromatic compounds and certain terpenes isolated from *S. heptaphylla* display antibacterial, antifungal and antiviral activities against several pathogenic strains [27]. This antimicrobial potential can be harnessed for developing phytotherapeutic agents against infectious diseases. In addition, the plant demonstrates considerable antioxidant capacity due to the redox properties and free radical scavenging actions of its constituent terpenes. The synergistic antioxidant activities may protect against oxidative stress-linked diseases [29].

2.3. Toxicology

As found by Wang et al. in their 2020 study, toxicity data on *Schefflera* plants in general and the species *Schefflera heptaphylla* specifically is still limited. However, some recent research has shown that this species displays only minimal toxicity indicators [4].

Specifically, in an acute toxicity test on rats, Chen et al. (2015) extracted *S. heptaphylla* and found that a dose of 62.5g/kg of the extract was deemed safe for rats [30]. This indicates the species has low toxicity scores in acute testing.

However, data on chronic toxicity remains under-researched, particularly regarding the safe dose according to World Health Organization standards. More in-depth studies are still needed to comprehensively evaluate the safety of *S. heptaphylla*. While initial findings show low toxicity, further research is warranted before confirming its safe use long-term for humans or animals. Establishing an accepted daily intake amount requires additional investigation.

3. Conclusion and trend in future research

Schefflera heptaphylla, a plant with numerous bioactive compounds, has potential for functional foods and pharmacology. Phytochemical screening reveals phenolic compounds, including triterpenoid, saponin, lignan, sesquiterpenes, and aromatic compounds. Further research is needed to characterize these compounds and evaluate their pharmacological activities. Further exploration could lead to evidence-based functional food items or drugs. Clinical trials will be important next steps to validate the health benefits suggested by preliminary findings and provide human evidence for the bioactivity and efficacy of *Schefflera heptaphylla* compounds. Identifying the active ingredients responsible for observed effects through bioassay-guided fractionation can support new drug discovery. Cultivation and sustainable sourcing methods may also need development to meet potential commercial demand. Ultimately, establishing *Schefflera heptaphylla* as a clinically proven functional plant may support new opportunities in agriculture, pharmaceuticals, and consumer healthcare industries based on its promising phytochemical profile.

Compliance with ethical standards

Acknowledgments

We would like to express our special thanks to all co-authors for their helpful comments and guidance during preparation of this manuscript. We also appreciate everyone who is involved directly and indirectly in this study.

Disclosure of conflict of interest

The authors have no conflict of interest to report.

References

[1] Orwa C, Mutua A, Kindt R, Jamnadass R, Simons A. Agroforestree Database: a tree reference and selection guide version 4.0. World Agroforestry, 2009. Available from: http://www.worldagroforestry.org/af/treedb/.

[2] Fern K. Tropical Plants Database. tropical.theferns.info, 2024. Available from: http://tropical.theferns.info/viewtropical.php?id=Schefflera+heptaphylla.

[3] GBIF Secretariat. Schefflera octophylla (Lour.) Harms. GBIF Backbone Taxonomy, Checklist dataset, 2023. Available from: https://doi.org/10.15468/39omei.

[4] Wang Y, Khan FA, Siddiqui M, Aamer M, Lu C, Atta-Ur-Rahman, Atia-Tul-Wahab, Choudhary MI. The genus Schefflera: a review of traditional uses, phytochemistry and pharmacology. Journal of Ethnopharmacology, 279, 2021, 113675.

[5] Li FH, Zhang J, Lin MB, Su XM, Li CK, Wang HQ, Li BM, Chen RY, Kang J. Anti-inflammatory terpenes from Schefflera rubriflora C. J. Tseng & G. Hoo with their TNF-α and IL-6 inhibitory activities. Phytochemistry, 163, 2019, 23–32.

[6] Wu C, Wang L, Yang XX, Duan YH, Dai Y, Jiang RW, Ye WC, Li YL. A new ursane-type triterpenoid from Schefflera heptaphylla (L.) Frodin. Journal of Asian Natural Products Research, 13, 2011, 434–439.

[7] Schmidt J, Nam VV, Lischewski M, van Phiet H, Kuhnt C, Adam G. Long-chain fatty acid esters of 3α-hydroxy-lup-20(29)-ene-23,28-dioic acid and other triterpenoid constituents from the bark of Schefflera octophylla. Phytochemistry, 23, 1984, 2081–2082.

[8] Sung TV, Adam G. A sulphated triterpenoid saponin from Schefflera octophylla. Phytochemistry, 30, 1991, 2717–2720.

[9] Wu C, Duan YH, Li MM, Tang W, Wu X, Wang GC, Ye WC, Zhou GX, Li YL. Triterpenoid saponins from the stem barks of Schefflera heptaphylla. Planta Medica, 79, 2013, 1348–1355.

[10] Maeda C, Ohtani K, Kasai R, Yamasaki K, Duc NM, Nham NT, Cu NKQ. Oleanane and ursane glycosides from Schefflera octophylla. Phytochemistry, 37, 1994, 1131–1137.

[11] Adam G, Lischewski M, Phiet HV, Preiss A, Schmidt J, Sung TV. 3α-Hydroxy-lup-20(29)-ene-23,28-dioic acid from Schefflera octophylla. Phytochemistry. 1982;21:1385–1387.

[12] Lischewski M, Ty PD, Schmidt J, Preiss A, Phiet HV, Adam G. 3α,11α-Dihydroxylup-20(29)-ene-23,28-dioic acid from Schefflera octophylla. Phytochemistry. 1984;23:1695–1697.

[13] Schmidt J, Nam VV, Lischewski M, van Phiet H, Kuhnt C, Adam G. Long-chain fatty acid esters of 3α-hydroxy-lup-20(29)-ene-23,28-dioic acid and other triterpenoid constituents from the bark of Schefflera octophylla. Phytochemistry. 1984;23:2081–2082. https://doi.org/10.1016/S0031-9422(00)84983-3.

[14] Kitajima J, Tanaka Y. Two new triterpenoid glycosides from the leaves of Schefflera octophylla. Chemical & Pharmaceutical Bulletin. 1989;37:2727–2730.

[15] Kitajima J, Shindo M, Tanaka Y. Two new triterpenoid sulfates from the leaves of Schefflera octophylla. Chemical & Pharmaceutical Bulletin. 1990;38:714–716.

[16] Sung TV, Steglich W, Adam G. Triterpene glycosides from Schefflera octophylla. Phytochemistry. 1991b;30:2349–2356.

[17] Sung TV, Peter-Katalinic J, Adam G. A bidesmosidic triterpenoid saponin from Schefflera octophylla. Phytochemistry. 1991a;30:3717–3720. https://doi.org/10.1016/0031-9422(91)80097-K.

[18] Sung TV. An acetylated bidesmosidic saponin from Schefflera octophylla. Journal of Natural Products. 1992;55:503–505.

[19] Wu C, Duan YH, Tang W, Li MM, Wu X, Wang GC, Ye WC, Zhou GX, Li YL. New ursane-type triterpenoid saponins from the stem bark of Schefflera heptaphylla. Fitoterapia. 2014;92:127–132.

[20] Pang SQ, Sun AJ, Wang GQ, Xu XX, Xu RA. Lupane-type triterpenoids from Schefflera octophylla. Chemistry of Natural Compounds. 2016;52:432–435.

[21] Li FH, Cao ZY, Wang HQ, Li CK, Fu J, Xie J, Li BM, Chen RY, Kang J. Inhibition of IL-6 expression by lignans and other constituents isolated from Schefflera rubriflora C. J. Tseng & G. Hoo. Fitoterapia, 140, 2020, 104417.

[22] Li YL, But PPH, Ooi VEC. Antiviral activity and mode of action of caffeoylquinic acids from Schefflera heptaphylla (L.) Frodin. Antiviral Research, 68, 2005, 1–9. https://doi.org/10.1016/j.antiviral.2005.06.004.

[23] Man YC. Anticancer effects of the phytochemicals from Schefflera heptaphylla. Doctoral dissertation, The Chinese University of Hong Kong, 2007.

[24] Li YL, Ooi LSM, Wang H, But PPH, Ooi VEC. Antiviral activities of medicinal herbs traditionally used in southern mainland China. Phytotherapy Research, 18, 2004, 718–722.

[25] Liu X, Dong J, Liang Q, Wang HMD, Liu Z, Xu R, Kang W. Coagulant effects and mechanism of Schefflera heptaphylla (L.) Frodin. Molecules, 24(24), 2019, 4547.

[26] Andrade MA, Braga MA, Cesar PH, Trento MVC, Espósito MA, Silva LF, Marcussi S. Anticancer properties of essential oils: an overview. Current Cancer Drug Targets, 18(10), 2018, 957–966.

[27] Solorzano-Santos F, Miranda-Novales MG. Essential oils from aromatic herbs as antimicrobial agents. Current Opinion in Biotechnology, 23(2), 2012, 136–141.

[28] Zaynab M, Sharif Y, Abbas S, Afzal MZ, Qasim M, Khalofah A, Li S. Saponin toxicity as key player in plant defense against pathogens. Toxicon, 193, 2021, 21–27.

[29] Jeurink PV, van Esch BC, Rijnierse A, Garssen J, Knippels LM. Mechanisms underlying immune effects of dietary oligosaccharides. American Journal of Clinical Nutrition, 98(2), 2013, 572S–577S.

[30] Chen, Y., Tao, S., Zeng, F., Xie, L., & Shen, Z. (2015). Antinociceptive and anti-inflammatory activities of Schefflera octophylla extracts. Journal of ethnopharmacology, 171, 42-50.