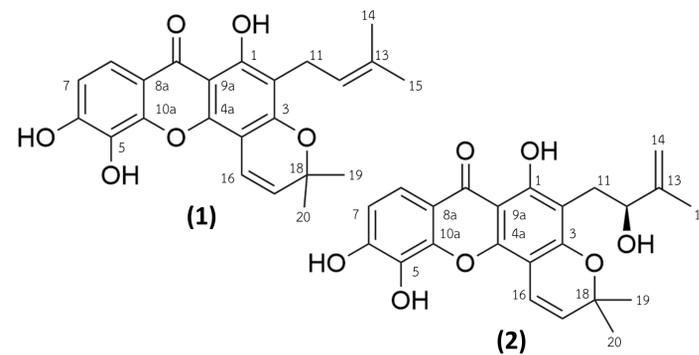


Naruemas Inthano, Kongkiat Trisuwan
Department of Chemistry, Faculty of Science, Chiang Mai University

Garcinia is the largest genus in the Clusiaceae. It possesses a variety of biological activities such as antibacterial, antioxidant, anti-inflammatory, and anticancer activities. These plants have been used in traditional medicine and may have potential for drug development, particularly for treating diseases such as diabetes and malaria. This research study of the chemical constituents of the methanol crude extract from the stems of *G. santisukiana*, a newly discovered plant species that has not been previously studied, using chromatography techniques. Two known xanthenes, 1,5,6-trihydroxy-2-prenyl-6',6'-dimethyl-2H-pyrano(2',3':3,4)xanthone (1) and merguensinone (2) were isolated. Their structures were identified by 1D and 2D NMR techniques.



Introduction

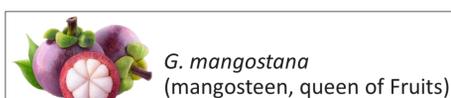


G. santisukiana

Garcinia (Clusiaceae)

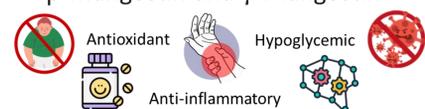
~ 400 species

~ 30 species



G. mangostana
(mangosteen, queen of Fruits)

α-Mangostin
β-Mangostin and γ-Mangostin



For example

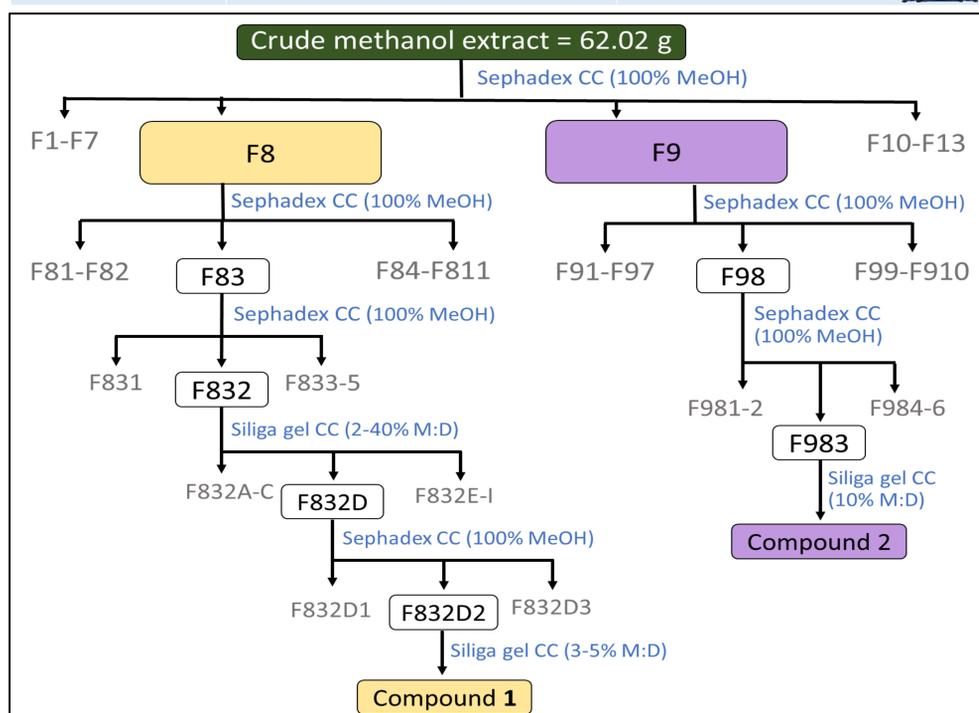
G. santisukiana was discovered in 2022 at Pha Taem National Park, Ubon Ratchathani Province, by Chatchai Ngernsangsrouay and Somran Suddee. Since *G. santisukiana* is a new species in the *Garcinia* genus, which is known for its various bioactive compounds with wide benefits in science, medicine, and other fields. Accordingly, the chemical constituents of *G. santisukiana* is interesting to study.

Research Objectives

To study the chemical constituents of the stems of *G. santisukiana* using chromatography techniques and identified by 1D and 2D NMR techniques

Methodology

Extraction	Isolation and purification	Structural elucidation
- MeOH	- Sephadex LH-20 - Siliga gel CC - TLC	- ¹ H-NMR, ¹ H- ¹ H COSY - ¹³ C-NMR, DEPT - HSQC, HMBC



Notes : CC = chromatography, M = MeOH = methanol, D = dichloromethane

Results and Discussion

Table 1 ¹H-NMR and ¹³C-NMR data of 1 and 2
(400 MHz in CDCl₃)

Position	1		2	
	δ _H multiplet (J in Hz)	δ _C (C-type)	δ _H multiplet (J in Hz)	δ _C (C-type)
1-OH	13.21, s	157.5 (C)	13.23, s	157.0 (C)
2	-	107.0 (C)	-	104.1 (C)
3	-	159.1 (C)	-	156.5 (C)
4	-	103.0 (C)	-	104.3 (C)
4a	-	157.5 (C)	-	158.0 (C)
5	-	131.5 (C)	-	130.9 (C)
6	-	148.1 (C)	-	148.0 (C)
7	6.89, d (8.3)	112.5 (CH)	6.92, d (8.4)	112.4 (CH)
8	7.67, d (8.3)	118.2 (CH)	7.66, d (8.4)	117.8 (CH)
8a	-	114.2 (C)	-	114.2 (C)
9	-	181.3 (C)	-	180.7 (C)
9a	-	104.7 (C)	-	103.0 (C)
10a	-	146.0 (C)	-	145.5 (C)
11	3.43, d (6.8)	21.7 (CH ₂)	3.08, d (5.5)	29.0 (CH ₂)
12	5.16, br t (6.8)	121.9 (CH)	4.42, t (4.8)	77.3 (CH)
13	-	131.5 (C)	-	148.0 (C)
14	1.81, s	18.0 (CH ₃)	5.02, s	110.2 (CH ₂)
15	1.66, s	25.6 (CH ₃)	1.88, s	18.7 (CH ₃)
16	6.68, d (10.0)	116.7 (CH)	6.72, d (10.0)	115.7 (CH)
17	5.54, d (10.0)	127.4 (CH)	5.58, d (10.0)	129.3 (CH)
18	-	78.5 (C)	-	78.4 (C)
19	1.41, s	28.3 (CH ₃)	1.52, s	28.5 (CH ₃)
20	1.41, s	28.3 (CH ₃)	1.49, s	28.4 (CH ₃)

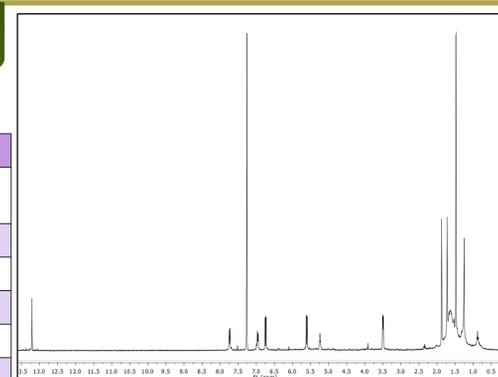


Fig.3 ¹H-NMR (400 MHz, CDCl₃) spectrum of 1

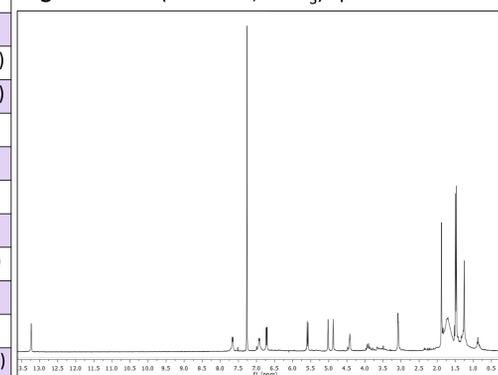


Fig.4 ¹H-NMR (400 MHz, CDCl₃) spectrum of 2

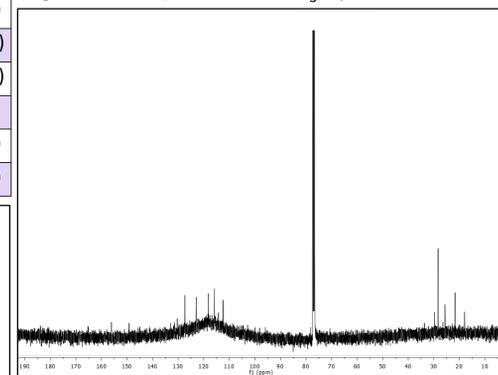


Fig.5 ¹³C-NMR (100 MHz, CDCl₃) spectrum of 1

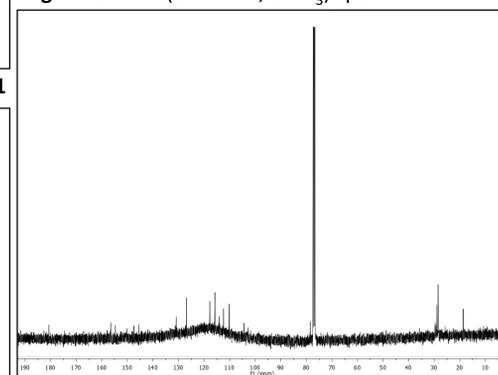


Fig.6 ¹³C-NMR (100 MHz, CDCl₃) spectrum of 2

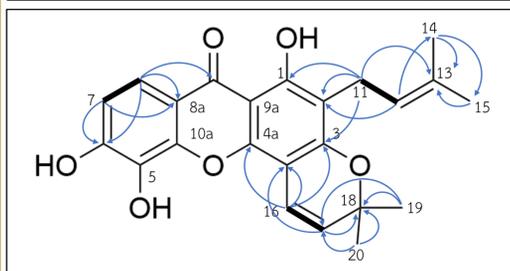


Fig.1 ¹H-¹H COSY (→) and HMBC (→) correlations of 1

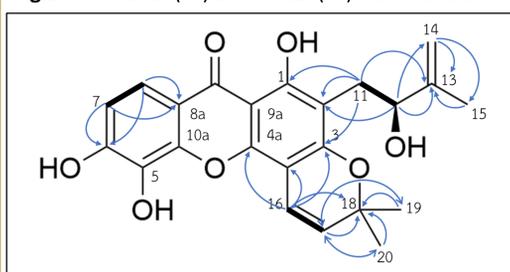


Fig.2 ¹H-¹H COSY (→) and HMBC (→) correlations of 2

Conclusions

In this study, two known xanthenes, 1,5,6-trihydroxy-2-prenyl-6',6'-dimethyl-2H-pyrano(2',3':3,4)xanthone (1) and merguensinone (2) were isolated from methanol crude extract from the stems of *G. santisukiana*. Their structures were compared with similar known compound.

Acknowledgement

I would like to thanks to Associate Professor Dr. Kongkiat Trisuwan for his guidance and advice and to the Department of Chemistry, Faculty of Science, Chiang Mai University for providing equipment, instruments, and laboratory facilities.