

## Mahuangchiside, a New Flavone Glycoside from *Chirita fimbrisepala*

Li Dong ZHOU, Jing Guang YU\*, Jia GUO

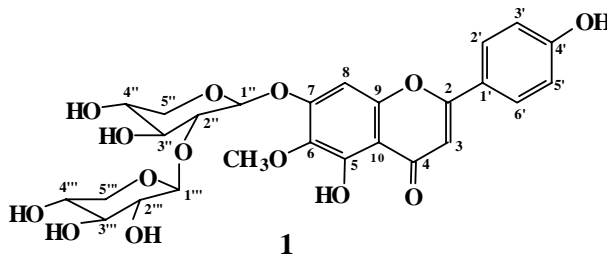
Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing 100094

**Abstract:** A new flavone glycoside, named mahuangchiside, was isolated from the root of *Chirita fimbrisepala* Hand.-Mazz. The structure was elucidated as 5,4'-dihydroxy-6-methoxy-flavone-7-*O*- $\beta$ -D-xylopyranosyl(1 $\rightarrow$ 2)- $\beta$ -D-xylopyranoside on the basis of spectral analysis ( $^1\text{H}$ - $^1\text{H}$  COSY,  $^{13}\text{C}$ - $^1\text{H}$  HETCOR and HMBC) and chemical evidence.

**Keywords:** *Chirita fimbrisepala*, Gesneriaceae, mahuangchiside, flavone, flavonoid.

*Chirita fimbrisepala* Hand.-Mazz. (Gesneriaceae), commonly called "Mahuangchi" in China, is distributed mainly in Southern China. As an anti-inflammatory Chinese folk medicine, the root is used for the treatment of inflammations, such as hepatitis and gastroenteritis. The characteristic constituents of the family are flavonoids.

Mahuangchiside **1** was obtained as yellow granular crystals (MeOH) from the extract of 90%EtOH, mp. 212-213°C. It is positive to Mg-HCl and Molish tests. The UV absorption bands at 273 (3.24) and 326 (3.36) nm (log  $\epsilon$ ). The IR absorption bands ( $\nu$ ,  $\text{cm}^{-1}$ ) at 3400, 2920, 1655, 1605, 1585, 1505, 1485, 1455, 1350, 1280, 1250, 1180, 1075, 990 and 835. The EIMS gave the molecular ion peak of the aglycone of **1** at  $m/z$  300 (100) and fragments 285 (62), 282 (51), 257 (63), 254 (14), 167 (18), 139 (24), 132 (20), 119 (25), 73 (63), and 69 (81). The main peak of the negative MALDI-TOF at  $m/z$  563 indicated that **1** had a molecular weight of 564. The  $^{13}\text{C}$  NMR,  $^1\text{H}$  NMR (according to  $^{13}\text{C}$ - $^1\text{H}$  HETCOR), HMBC and  $^1\text{H}$ - $^1\text{H}$  COSY data of **1** are shown in **Table I**.



Acid hydrolysis of **1** afforded D-xylose and the aglycone (identified by authentic samples on TLC). According to the spectral references<sup>1, 2, 3</sup>, **1** was elucidated as a new flavone glycoside, 4H-1-benzopyran-4-one-5-hydroxy-2-(4-hydroxyphenyl)-6-methoxy-7-[(2-*O*- $\beta$ -D-xylopyranosyl)- $\beta$ -D-xylopyranosyl]oxy], and named as mahuangchiside.

**Table I**  $^{13}\text{C}$ NMR,  $^1\text{H}$ NMR, HMBC and  $^1\text{H}$ - $^1\text{H}$  COSY of mahuangchiside (100 MHz for  $^{13}\text{C}$  and 400 MHz for  $^1\text{H}$  in DMSO- $d_6$ , ppm)

C/H	$\delta$ C	$\delta$ H (J in Hz)	HMBC(observed)	$^1\text{H}$ - $^1\text{H}$ COSY
2	164.3	-	3-H, 2'6'-H	-
3	102.6	6.86 s	-	-
4	182.3	-	-	-
5	152.6	OH, 12.95 s	5-OH	-
6	132.5	-	6-OCH <sub>3</sub> , 8-H, 5-OH	-
7	155.7	-	1''-H, 8-H	-
8	93.8	7.00 s	-	-
9	152.1	-	8-H	-
10	105.7	-	3-H, 8-H, 5-OH	-
1'	121.1	-	3-H, 3'5'-H	-
2'	128.6	7.98 d ( 8.8 )	6'-H	3'-H
3'	116.0	6.94 d ( 8.8 )	5'-H, 4'-OH	2'-H
4'	161.3	OH, 10.40 s	2'6'-H, 4'-OH	-
5'	116.0	6.94 d ( 8.8 )	3'-H, 4'-OH	6'-H
6'	128.6	7.98 d ( 8.8 )	2'-H	5'-H
1''	98.3	5.34 d ( 7.0 )	2''-H	2''-H
2''	80.8	3.65dd(7.0, 8.2 )	1'''-H	1''-H, 3''-H
3''	75.6	3.54*	5''-H, 2''-H	2''-H, 4''-H
4''	68.8	3.50*	3''-H	3''-H, 5''-H
5''	65.6	3.82 brd(ca 7.0) 3.47*	-	4''-H, 5''-H 5''-H
1'''	104.6	4.52 d ( 7.5 )	2''-H, 2'''-H	2'''-H
2'''	74.2	3.00dd (7.5, 8.9 )	3'''-H	1'''-H, 3'''-H
3'''	76.1	3.14dd (8.9, 8.4 )	2'''-H	2'''-H, 4'''-H
4'''	69.5	3.24 m	3'''-H	3'''-H, 5'''-H
5'''	65.7	3.58dd (5.2, 11.3) 3.04 d (11.3 )	-	4'''-H, 5'''-H 5'''-H
OCH <sub>3</sub>	60.2	3.77 s	-	-

\*Peaks overlapped.

### Acknowledgment

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### References

1. K.R. Markham, V.M. Chari and T.J. Marbry. Carbon-13 NMR spectroscopy of flavonoids. In *The Flavonoids: Advances in Research since 1980*. Chapman and Hall. **1988**: 69.
2. P.Z. Cong. *Applications of MS in Natural Organic Chemistry*. Science Press. **1987**, 468.
3. R.S. Xu. *Natural Products Chemistry*. Science Press. **1993**, 425.

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