



Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

Isolation and elucidation structure of tamarixetin glycoside from bungo perak-perak (*Begonia versicolor* Irmsch) leaves

Ermi Abriyani*, Sanusi Ibrahim and Djaswir Darwis

Department of Chemistry, Andalas University, Padang, West Sumatera, Indonesia

ABSTRACT

The present study were aimed isolation and elucidation structure tamarixetin glycoside from bungo perak-perak (*Begonia versicolor* Irmsch) leaves. The result of this study are the flavonoids quercetin derivatives, tamarixetin 3-O-rhamnoglucoside. This compound were isolated and purified by gel silica and sephadex LH-20. Purification of compound was tested by melting point test and elucidation structure of isolation result by spectrofotometer NMR ($^1\text{H-NMR}$, $^{13}\text{C-NMR}$)

Keywords: *Begonia versicolor* Irmsch, elucidation, tamarixetin 3-O-rhamnoglucoside

INTRODUCTION

Bungo perak-perak (*Begonia versicolor* Irmsch) is belong to begoniaceae family. More than 1600 species spread along tropics and subtropics area [1]. In india, begonia use for increase the resistant of body, the juice fresh leaves to proper development bone and teeth for baby, decrease of body temperature and increase of body weight [2]. Based on genes, the bioactivity of methanol extracts applied to antioxidant [3], anti-bacteria [4], hypoglycemic and anti-hyperglycemic effect [5], and anti microbial [6-7]. Phytochemical result of few species contain alkaloid, terpenoids, flavonoids, steroids, saponin, phenol and tannin [8]. For new knowledge just few chemical constituent was reported from this family like steroids [9-11] and alkaloid [11], but has never found reports of isolated compounds from this *Begonia versicolor* Irmsch plants.

EXPERIMENTAL SECTION

Plant material

Sample or *Begonia versicolor* Irmsch leaves was collected from Padang region. The plants was identified at Herbarium Andalas of Biological Department in Andalas University.

Chemicals

n-hexane, etyl acetat, methanol, filter paper, silica gel 60 (230-400 mesh) obtained from Merck Germany. All other chemicals used in this study were analytical grade.



Figure 1a. *Begonia versicolor* Irmsch plant



Figure1b. *Begonia versicolor* Irmsch leaves

Instrumentation

The equipment used is glassware commonly used for study organic chemistry of natural products, a set of tools solvent distillation, rotary evaporator Heidolp WB 2000, oven, TLC plate (silica gel 60 F₂₅₄, Merck KGaA Darmstadt Germany), melting point apparatus (STUART SMP 10), UV-Vis spectrophotometer (Shimadzu PharmaSpec UV-170), spectrophotometer NMR (¹H-NMR/500MHz), (¹³C-NMR/125 MHz) Agilent 500MHz system consol DD2.

Procedure

Extraction, isolation and purification of tamarixetin 3-O-rhamnoglucoside

Begonia versicolor Irmsch powder (280 grams) extracted by maceration with n-hexane, etyl acetat, and methanol respectively. Weight of each extract are n-hexane (28 g), etyl acetat (24 g) and methanol (34 g). Extracts of

methanol was subjected to column chromatography with gel silica (230-400 mesh). Eluted by system gradient polarity from 100% n-hexane to 100% methanol. Each fraction was monitored by TLC. The same pattern every stain on TLC were combined and then produced fractions F1 (0.2 g), F2 (5 g) and F3 (3 g).

fraction F2 (5 grams) was purified by column chromatography stationary phases sephadex LH-20 with an eluent system was 100% methanol. the results of the re-columns is light yellow powder. purity of isolated compounds melting point test done and structure elucidation using NMR spectrophotometer (^1H and ^{13}C NMR).

RESULTS AND DISCUSSION

The isolated compound from methanol extract of *Begonia versicolor* Irmsch was identified as tamarixetin 3-O-rhamnogluside. Melting point 195-197°C, UV λ_{max} (MeOH) nm : 257, 357. ^1H -NMR (500MHz, CD_3OD): δ 7.61 (dd, $J=8.5$ Hz, 1H, H-6'), 7.66 (d, $J=2.0$ Hz, 1H, H-2'), 6.88 (d, $J=8.5$ Hz, 1H, H-5'), 6.38 (d, $J=2.0$ Hz, 1H, H-8), 6.19 (d, $J=2.5$ Hz, 1H, H-6), 5.10 (d, $J=7.5$ Hz, 1H, H-1/Glu), 4.51 (br s, 1H, H-1/rha), 3.35 (s, 3H, OCH_3), 1.1 (d, $J=6.0$ Hz, 3H, H-6/rha). ^{13}C -NMR (125MHz, CD_3OD): 179.4, 166.0, 163.0, 159.3, 158.5, 149.8, 145.8, 135.6, 132.4, 123.5, 123.1, 117.7, 116.1, 105.6, 104.7, 102.4, 99.9, 94.9, 78.2, 77.2, 75.7, 73.9, 72.2, 72.1, 71.4, 69.7, 68.5, 17.9. NMR data were identical to those reported in the literature [12-16].

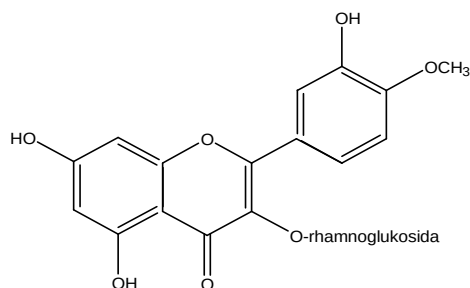


Figure 2. Structure of the isolated compound from *Begonia versicolor* Irmsch (tamarixetin 3-O-rhamnogluside)

CONCLUSION

Based on the analysis of spectroscopy UV, ^1H -NMR and ^{13}C -NMR, the isolated compound is quercetin derivatives from *Begonia versicolor* Irmsch methanol extract, the compound is tamarixetin 3-O-rhamnogluside.

Acknowledgement

The authors express a greatest thank to Dr. Mai Efdi for helpfull discussion on laboratory research and completion of this work.

REFERENCES

- [1]Hartutiningsih dan Siregar, M., Mengenal dan merawat begonia, PT. Agromedia Pustaka Jakarta, Indonesia, **2008**.
- [2]Ariharan, VN., Meena Devi, VN., Rajakokhila, M., Prasad, PN., *International journal of Plant, Animal - and Environmental Sciences*, **2012**, Vol. 2(3): 92-94.
- [3]Kalpanadev, V., Mohan, VR., *Asian pacific Journal of tropical biomedicine*, **2012**: S1572-S1577.
- [4]Jeeva, S., Marimuthu, J., *Asian pacific journal of tropical biomedicine*, **2012**: S151-S154.
- [5]Pandikumar, P., Babu, NP., Ignacimuthu, S., *J. Ethnopharmacol*, **2009**, 124(1): 111-115.
- [6]Ramesh, N., Visnawathan, M.B., Saraswathy, A., Balaskrishna, K., Brindha, P., *J.Ethnopharmacol*, **2001**, 79(1): 129-132.
- [7]Dan-ping, L., Zhu Le, Yu Zhuo-Er, Pan Si-yi, *Food science*, **2012**, Vol. 33(11): 70-74.
- [8]Maridass M., *Ethnobotanical leaflets*, **2010**, 14: 616-625.
- [9]Zhang J., Chen Y., Li B., Wang M., *Zhongguo zhong yao Za Zhi*, **1997**, 22(5): 295-296.
- [10]Frei B., Heinrich M., Hermann D., Oriala JE., Schmitt J., Sticher O., *Planta Med*, **1998**, 64(4): 385-386.
- [11]Wu, P.-L., Lin, F.-W., Wu, T.-S., Kuoh, C.-S., Lee K.-H., Lee, S.-J., *Chem. Pharm. Bull.*, **2004**, 52(3): 345-349.

- [12]Mabry TJ., Markham KR., Thomas MB., The systematic identification of flavonoids, Springer-Verlag, New York, **1970**: 41-56.
- [13]Saewan, N., Koyomboon, S., Chantrapromma, K., *J. Med. Plant. Res*, **2011**, Vol. 5(6): 1018-1025.
- [14]El-Sayed, MM., Mahmoud MA.-A., El-Nahas, HA.-K., El-Toumy, SA.-H., El-Wakil, EA., Ghareeb, MA., *Pharmacologyonline*, **2010**, 3: 317-332.
- [15]Gohari AR., Saeidnia S., Malmir M., Yazdanpanah, Ajani Y., *Journal of Medicinal Plants*, **2011**, Vol. 10, No. 39.
- [16] Peng, W., Li, Y., Zhu, C., Han, X., Yu, B., *Carbohydrate Research*, **2005**, 340: 1682-1688.