**A cytotoxic acylphloroglucinol from the leaves of *Triadenum borneoensis* (Hypericaceae)**

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This presentation will cover the isolation, structure elucidation and biological evaluation of a new prenylated acylphloroglucinol natural product (**1**) from *Triadenum borneoensis* (L.) Viljoen. (Hypericaceae). The *Triadenum* genus occurs in North America and Eastern Asia and is characterized by opposite, blunt-tipped leaves and pink flowers with 9 stamens. Originally considered as a section of *Hypericum* (Nürk et al., 2013), recent genetic analysis suggests that this genus is a separate taxon (Robson, 2021).

As part of our continuing search for new phytochemistry and cytotoxic compounds from plants of the order Malpighiales, we made collections of *T. borneoensis* from Kota Kinabalu (Sarawak) (Soepadmo et al., 2002). An EtOAc extract of the air-dried aerial parts of the plant exhibited significant cytotoxicity (ED50 < 0.5 **g/mL) towards the MCF-7 cell line. Bioassay-guided isolation using VLC and HSCCC and structure elucidation employing extensive NMR spectroscopy and HRESIMS, led to the new prenylated acylphloroglucinol **1** (Fig. 1).



**Fig. 1.** Structure of prenylated acylphloroglucinol **1**

Single-crystal X-ray diffraction analysis established the complete absolute stereochemistry of natural product **1** as depicted. Cytotoxicity profiling demonstrated that **1** has noteworthy activity against an extensive panel of multidrug-resistant cancer cell lines with ED50 values in the range of 1.5-6 nM. Preliminary mechanistic studies suggest that **1** is a potent inhibitor of topoisomerase-II (Reece et al., 1991). It is proposed that **1** is biosynthesized from prenylation and geranylation of the acylphloroglucinol core, followed by oxidation and methylation.

*Keywords: Triadenum borneoensis,* Hypericaceae, cytotoxicity, HSCCC, topoisomerase-II

**References**

Nürk, N.M., Madriñán, S., Carine, M.A., Chase, M.W., Blattner, F.R., 2013. Molecular phylogenetics and morphological evolution of St. John’s wort (Hypericum; Hypericaceae). [Mol. Phylogenetics Evol.](https://www.sciencedirect.com/journal/molecular-phylogenetics-and-evolution) [66,](https://www.sciencedirect.com/journal/molecular-phylogenetics-and-evolution/vol/66/issue/1) 1-16.

Reece, R.J., Maxwell, A., 1991. [DNA gyrase: structure and function.](https://pubmed.ncbi.nlm.nih.gov/1657531/) Crit. Rev. Biochem. Mol. Biol. 26, 335-375.

Robson, N.K., 2021. Studies in the genus *Hypericum* L.(Hypericaceae). Phytotaxa. 72, 1-111.

Soepadmo, E., Saw, L.G., Chung, R.C.K. (Eds,). 2002. The Tree Flora of Sabah and Sarawak, Volume 4. Forest Research Institute of Malaysia, Selangor Darul Ehsan.

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