

Limitation of Mitragynine Biosynthesis in *Mitragyna speciosa* (Roxb.) Korth. through Tryptamine Availability

Tossaton Charoonratana^a, Juraithip Wungsintaweeikul^{a,*}, Pathamaporn Pathompak^a, Milen I. Georgiev^b, Young Hae Choi^b, and Robert Verpoorte^b

^a Department of Pharmacognosy and Pharmaceutical Botany, Faculty of Pharmaceutical Sciences, Prince of Songkla University, Hat Yai, Songkhla 90112, Thailand.

Fax: +6674428220. E-mail: juraithip.w@psu.ac.th

^b Natural Products Laboratory, Institute of Biology, Leiden University, Leiden, 55 Einsteinweg, 2300 RA Leiden, The Netherlands

* Author for correspondence and reprint requests

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Metabolite profiles of *Mitragyna speciosa* were determined by means of ¹H NMR-based and HPLC-based analyses. The results indicated that high contents of secologanin, caffeic acid, gallic acid, epigallocatechin, and mitragynine were accumulated in leaves. In *M. speciosa*, feedings of tryptamine, tryptophan, phenylalanine or tyrosine significantly increased the mitragynine contents. Feedings of tryptamine and loganin also enhanced the mitragynine accumulation, but feeding of loganin only did not affect the mitragynine level. The mRNA levels of anthranilate synthase alpha subunit (*ASA*), tryptophan decarboxylase (*TDC*), and strictosidine synthase (*STR*) were measured by quantitative real-time polymerase chain reaction (RT-qPCR) in control plants and those exposed to methyl jasmonate (MJ; 10 μM). All genes responded to MJ after a 24-h treatment. The mitragynine contents were also enhanced and corresponded to the transcript levels. From the present results we conclude that a high content of secologanin together with a undetectable level of tryptamine in *M. speciosa* feature the limitation of mitragynine biosynthesis. Additionally, expression of all the genes limits production of an essential precursor for mitragynine production.

Key words: *Mitragyna speciosa*, Mitragynine, Tryptamine