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

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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 an 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