Deltatonin®
Longan Flower Extract

Improve Circadian Rhythm
Help Insomnia & Anxiety & Depression

The world-exclusive innovation: Deltatonin®

- Natural sleep support
- Fall asleep easily & deep sleep
- The unique mechanism to promote sleep - Regulate Melatonin biosynthesis
- Help Insomnia, Anxiety & Depression
- *In-vitro*, animal and clinical studies proven

International Awards

2022 Silver Medal
Geneva International Exhibition of Inventions

2022 Bronze Medal Award
Seoul International Invention Fair (SIIF)

International Publications

WORLD SLEEP October 20-25 2023 Rio de Janeiro BRAZIL

Sleep Medicine

Volume 115, Supplement 1, February 2024, Page 182

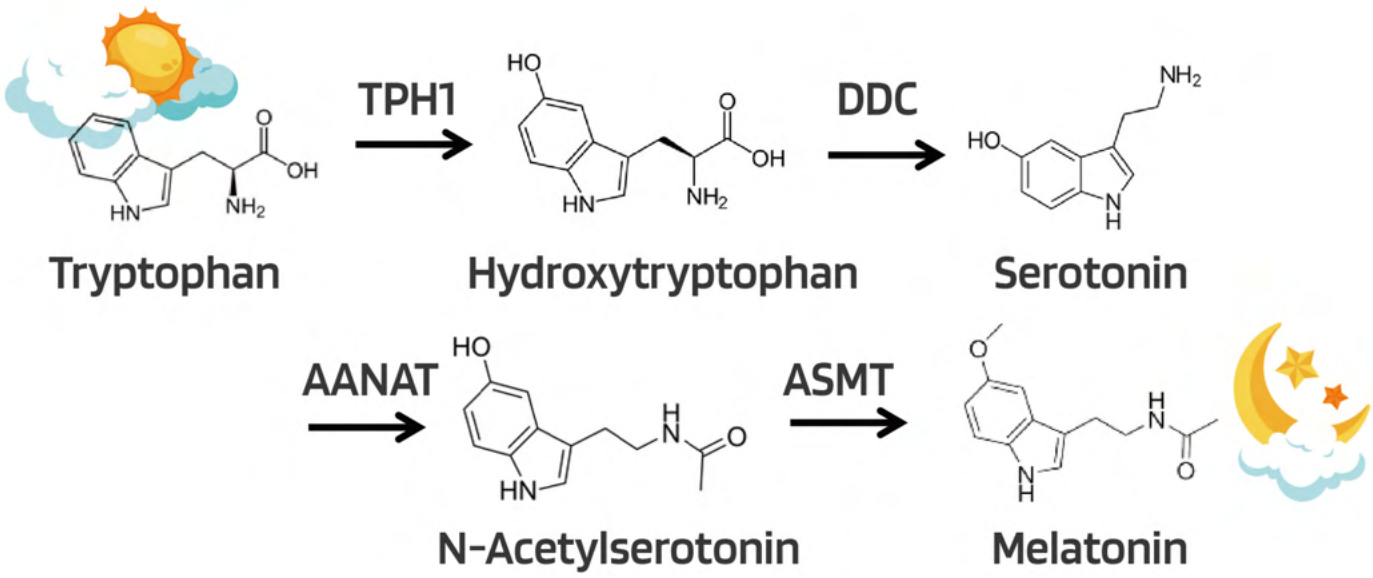
Presenting at 2023 World Sleep congress in Brazil.
Publishing in Sleep Medicine Journal by Elsevier.

Bioceutical Percheron

19F-7, No. 186, Shizheng N. 7th Rd., Taichung City 407612, Taiwan
TEL. +886 4 2255 8171 info@percheron-bio.com

Melatonin/Serotonin Biosynthesis Pathway is closely related to the regulation of circadian rhythm

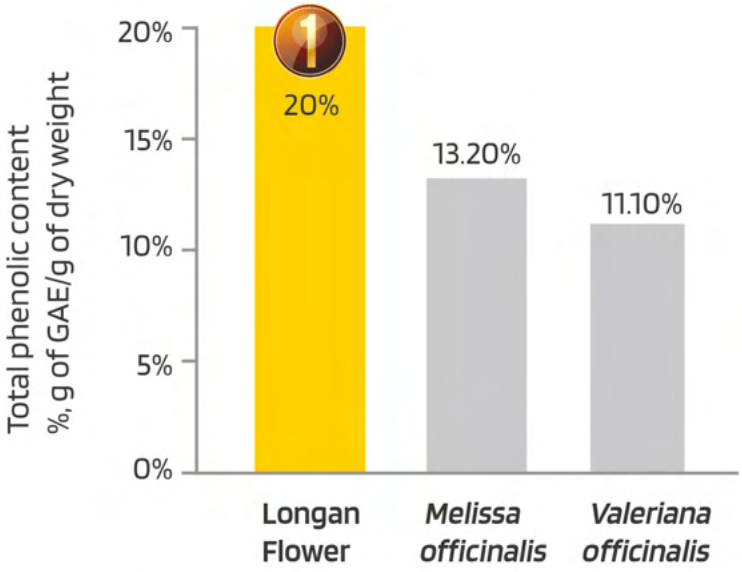
Melatonin and serotonin share the same biosynthesis pathway which directly regulates the circadian rhythm. TPH1, DDC, AANAT, and ASMT are key enzymes envolved in the pathway. During the day, the body converts tryptophan to serotonin, promoting alertness and a positive mood. At night, the body further converts serotonin to melatonin, which helps facilitate the onset of sleep and promote deep sleep.

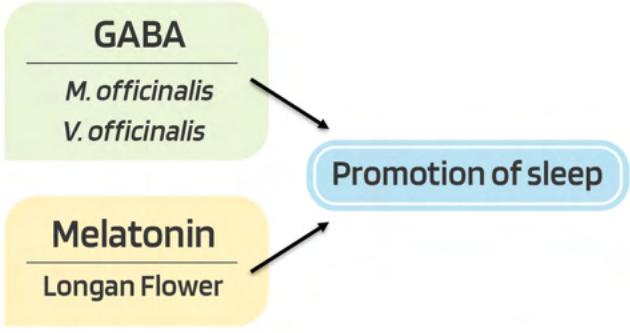


Melatonin/Serotonin Biosynthesis Pathway

Longan flower has the highest polyphenol levels among other sleep-promoting herb (SPH) extracts

- Research indicates that polyphenols may be the functional ingredients in SPHs
- Melatonin and GABA are key factors in promoting high-quality sleep and regulating circadian rhythm
- GABA is for soothing and relaxation, while melatonin works more directly on the onset and duration of sleep
- Unlike most of the SPHs which induce GABA production, longan flower regulates melatonin synthesis pathway



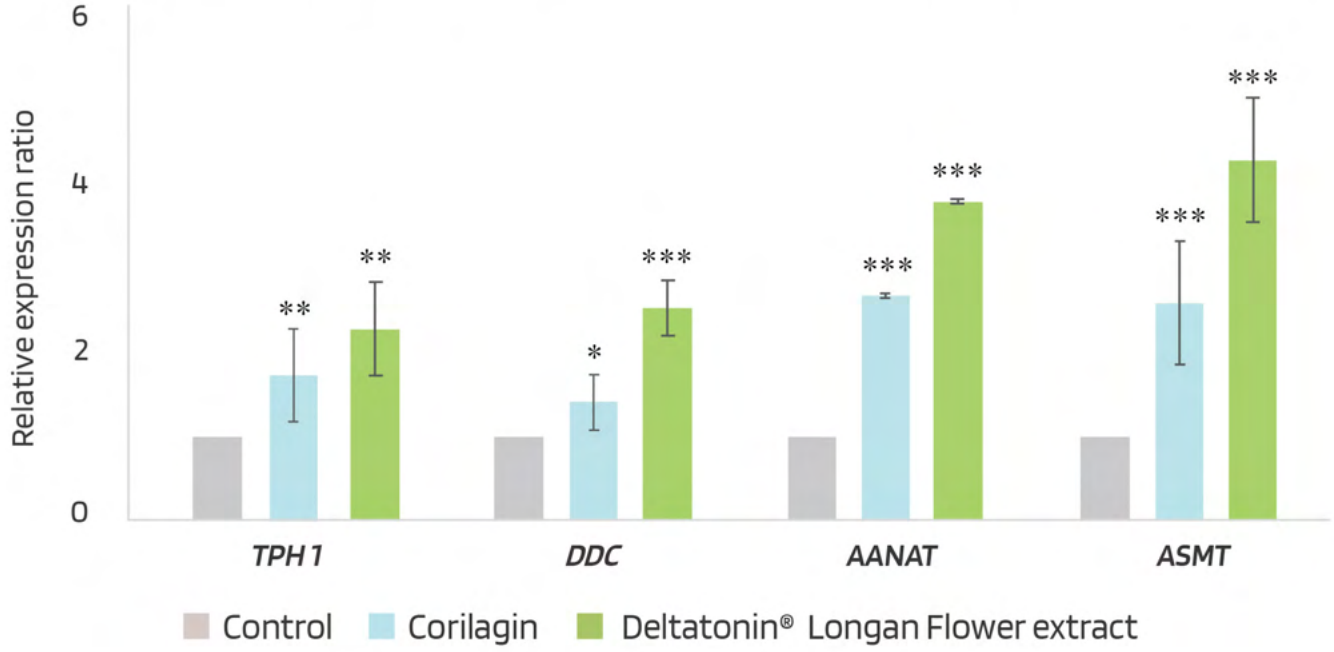


Combining Longan Flower and other SPHs may create a comprehensive sleep-aid formula.

J. Agric. Food Chem.,Vol. 55, No. 26, 2007; *Food Chemistry* 105 (2007) 940–949

Deltatonin® induces the gene expressions of the Melatonin/Serotonin Biosynthesis Pathway

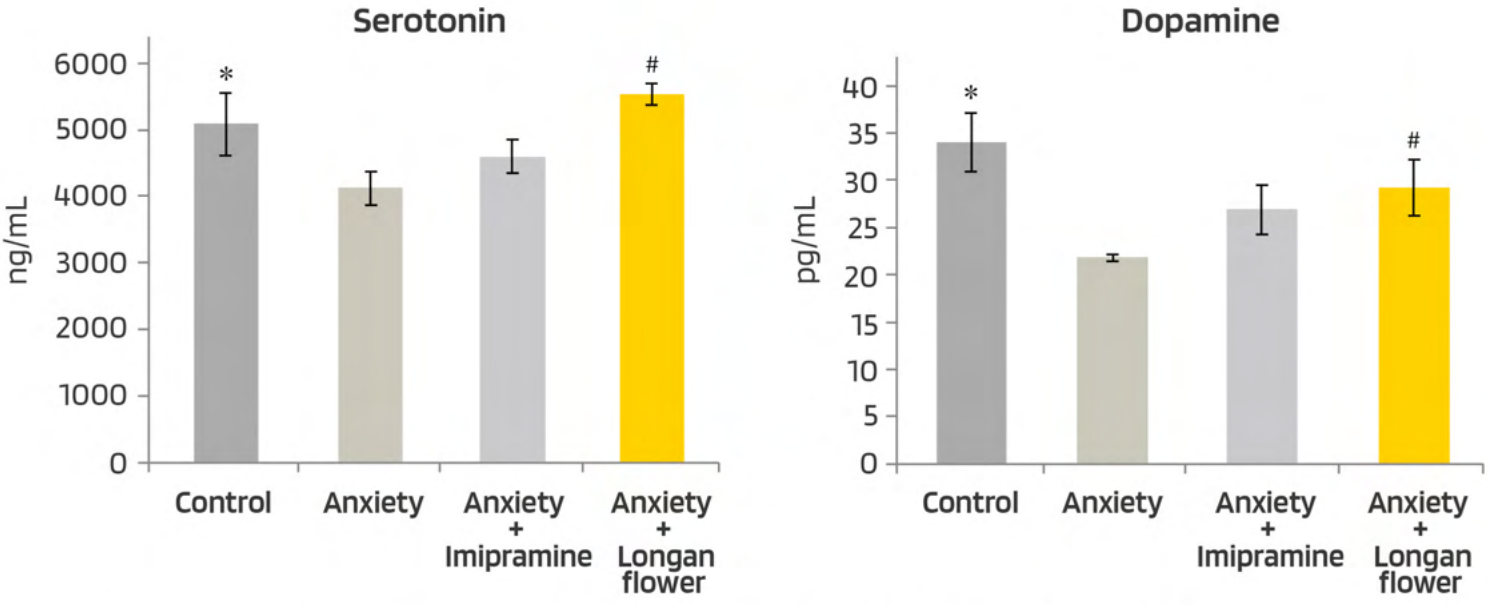
Melatonin is the key factor in regulating circadian rhythm and promoting sleep. Corilagin, which is the major phenolic compound in Deltatonin®, is also tested for gene expressions. Our results show that Deltatonin® and corilagin respectively induce the expression of genes involved in the Melatonin/Serotonin Biosynthesis Pathway. This may contribute to the ability of Deltatonin® in promoting healthy sleep patterns and improving overall sleep quality.



Compared with control * p <0.05; ** p <0.01; *** p <0.001

Animal study: Longan flower extract has the potential to relieve anxiety and depression by inducing serotonin and dopamine secretion

Serotonin and dopamine are related to anxiety and depression, respectively. According to the results, mice in the anxiety group have lower serotonin and dopamine levels. However, longan flower extract is able to restore the secretion of serotonin and dopamine, showing better efficacy than the commercial anti-anxiety drug - Imipramine.

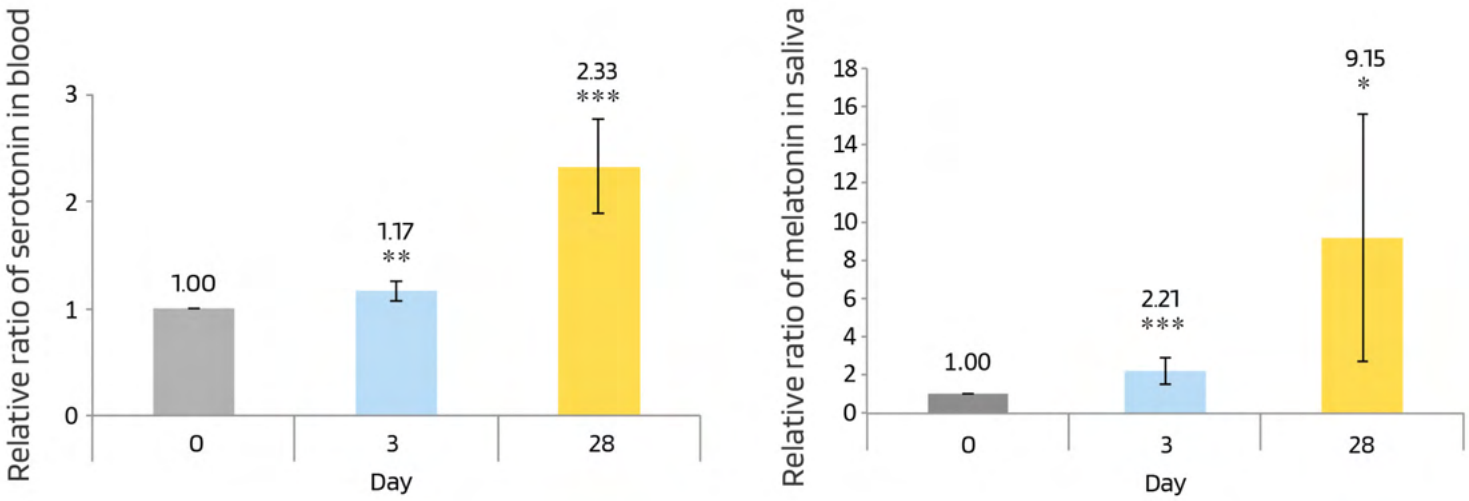


Compared with the anxiety group *, # p <0.05

Ref.: *Taiwan Agricultural Research Institute (TARI) Annual Report* (2019) p.51
The original data is from TARI

Human trial: Deltatonin® induces serotonin and melatonin secretion efficiently

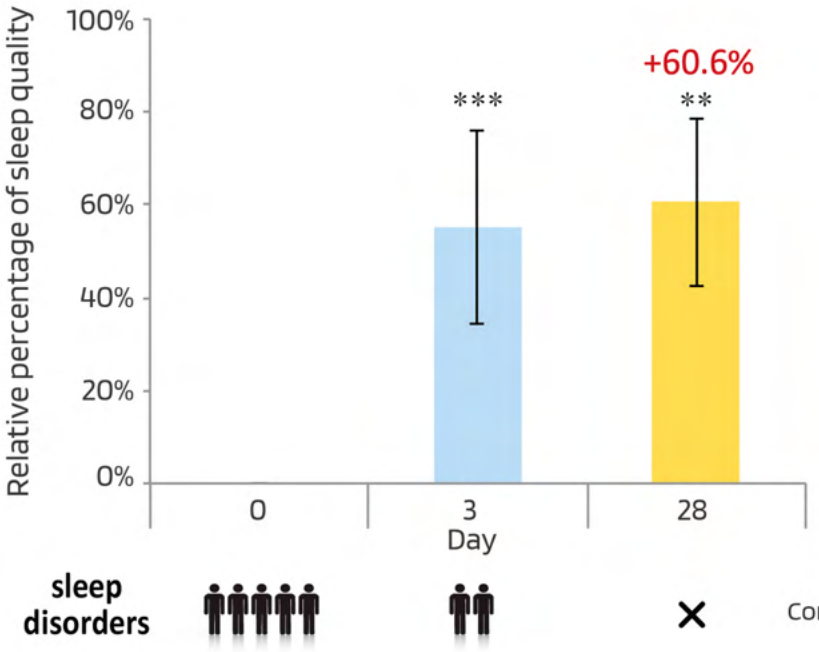
The results demonstrate that Deltatonin® is able to enhance serotonin and melatonin secretion rapidly. The participants possess higher levels of serotonin and melatonin after 3 days of consumption. Most importantly, melatonin secretion of the participants is dramatically increased by 9.15-folds at the end of the trial (Day 28).



Compared to Day 0: $*p<0.05$; $**$ $p<0.01$; $***$ $p<0.001$

Human trial: Deltatonin® enhances sleep quality within 3 days of consumption

The quality of sleep is evaluated with the Pittsburgh Sleep Quality Index (PSQI). The sleep quality of the participants can be significantly improved by 55% after taking Deltatonin® for three days; after 28 days, the improvement rate reaches 60%. Noticeably, the sleep disorders of all participants are alleviated at the end of the trial.



Compared to Day 0: $**$ $p<0.01$; $***$ $p<0.001$

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These products are not intended to diagnose, treat, cure or prevent disease. This is for informational purposes only.