Pitchaya Pothinuch 2010: Melatonin in Mulberry Leaves and Mulberry Leaf Tea: Effect of Cultivars, Leaf Ages and Tea Processing. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Mrs. Sasitorn Tongchitpakdee, Ph.D. 106 pages.

The objective of this study was to determine melatonin content in mulberry leaves and mulberry leaf tea using high performance liquid chromatography combined with fluorescence detector (HPLC-FLD). The preparation procedures for melatonin analysis in plant including ultrasonic technique in combination with solid phase extraction (ultrasonic/SPE procedure) and homogenization in combination with liquid-liquid extraction (homogenization/LLE procedure) were investigated. Melatonin content in mulberry leaves cv. KPS-MB-42-1 was compared with its fruits as well as five plants which can alleviate sleep disorders (siamese senna leaves, acapulo leaves, margosa flowers, long pepper fruits and noni fruits). The effects of cultivars (cv. Buriram 60, Sakonnakhon and Khunphai) and leaf ages (tip of leaves, young leaves and old leaves) on melatonin content in mulberry leaves were studied. In additon, the effect of tea processing including green and black tea processes on melatonin content in mulberry leaf tea was also studied. The results showed that the ultrasonic/SPE procedure had higher recovery rate than the homogenization/LLE procedure. The recovery rate of ultrasonic/SPE procedure was more than 70%, while the recovery rate of homogenization/LLE procedures were less than 40%. Melatonin was only found in mulberry leaves and fruits. Mulberry leaves contained higher melatonin level (416.9 ng/g dry weight) than its fruits (81.2 ng/g dry weight) ($p \leq 0.05$), whereas it could not be detected in other plants. Furthermore, the cultivars and leaf ages affected on melatonin content in mulberry leaves. The highest average melatonin level was found in cv. Buriram 60 (295.9 ng/g dry weight) followed by Sakonnakhon (106.5 ng/g dry weight) and Khunphai (43.1 ng/g dry weight) ($p \leq 0.05$). The tip of leaves in all cultivar had the highest melatonin content, while the old leaves had the lowest content ($p \leq 0.05$). Tea processing including green tea and black tea affected on melatonin stability. The melatonin contents in mulberry leaf green and black tea decreased approximately 87 %, when compared to that of the fresh leaves. There were no significant differences between the melatonin contents of the mulberry leaf green and black tea ($p > 0.05$).

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