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Total Flavonoid Content in Mahang (*Macaranga triloba* (thunb.) Mull Arg.) Leaves

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ABSTRACT

The search for flavonoids from plants is still ongoing because currently the use of plant parts in medicine is still widely used by the community. Flavonoids contained in plants can be raw materials or an initial source for modern medicine. Flavonoids are found in almost all parts of plants, such as leaves, flowers, fruit, stems, and roots, and are reported to have antioxidant properties that can help eliminate reactive oxygen species, because they are effective as antivirals, anti-inflammatory and anticancer agents. This research aimed to determine the total flavonoid content of Mahang (*Macaranga triloba* (thumb.) Mull Arg.) leaves extract. The total flavonoid content of the Mahang leaves extract was investigated using *in vitro* assays. Quercetin was used as a standard. The results of the determination of total flavonoid content are 0.603 ppm.

Keywords: Mahang leaves, *Macaranga triloba*, total flavonoid content

INTRODUCTION

Flavonoids are one of the secondary metabolite groups that are mostly found in plant tissue and have various important functions for health, including antioxidant, antibacterial, anti-inflammatory, anti-allergic, and anti-thrombotic (Ladeska & Dingga, 2019; Rais, 2015). The search for flavonoid compounds from plants can be said to be important. This is because flavonoid compounds have potential as basic compounds for pharmacology research. The flavonoid content in plants varies greatly. Variations in flavonoid content in plants can occur due to several factors such as genotype, environmental conditions during the growth process, growth stage, post-harvest handling, and storage conditions. These factors can influence the total flavonoid concentration and flavonoid composition in plants (Hakim & Saputri, 2020).

Flavonoids are an important class of natural compounds that include the largest group of plant polyphenols. The compound consists of fifteen carbon atoms that have the same basic structure of two aromatic rings held together by three carbon atoms. This group of compounds is classified as low molecular weight compared to other groups of polyphenols which are widely distributed in plants. There are several classes of flavonoids, such as flavonols, flavones, flavanones, flavanols, isoflavones, and flavanonols. Present in plant tissues, they play an important role in plant nutrient assimilation, protein synthesis, enzyme activity, photosynthesis, cell signaling, and protection against adverse environmental conditions (Zulkifli et al., 2020).

Reports on Mahang (*Macaranga triloba* (thumb.) Mull Arg.) leaves are very limited. This study aims to measure the total flavonoid content of Mahang leaves which were extracted by maceration using 70% ethanol solvent.

MATERIALS AND METHODS

Materials

Mahang leaves extract, aluminum chloride, acetic acid, quercetin, and UV-VIS spectrophotometer.

Determination of Total Flavonoids Content

A total of 1 mL of extract (1000 ppm), 1 mL of 10% aluminum chloride, and 8 mL of 5% acetic acid were added. The mixture was incubated at room temperature for 20 minutes, and the absorbance was measured at a wavelength of 400 nm using a UV-VIS spectrophotometer and compared with the blank. Synthetic

quercetin was used as the standard. The total content of flavonoid compounds was calculated using a standard curve derived from the quercetin standard and expressed as quercetin equivalent in ppm units (Saputri & Hakim, 2022).

RESULTS AND DISCUSSION

The results of absorbance measurements and the results of the determination of total flavonoid content are in table 1.

Table 1. Results of the determination of total flavonoid content

Replication	Absorbance	Concentration (ppm)	The average concentration of quercetin in ppm of extract = 0.603 ppm
I	0.073	0.592	
II	0.074	0.614	

Reports on Mahang (*Macaranga triloba* (thumb.) Mull Arg.) leaves are very limited. Based on table 1, it is known that the total flavonoid level is 0.603 ppm. Flavonoid content in plants varies according to factors including genotype, growing environmental conditions, growth stage, postharvest handling, and storage conditions. These factors can influence the total flavonoid concentration and flavonoid composition in plants (Rojsanga et al., 2020). Flavonoids are found in almost all parts of plants, such as leaves, flowers, fruit, stems, and roots, and are reported to have antioxidant properties that can help eliminate reactive oxygen species, because they are effective as antivirals, anti-inflammatory and anti-cancer agents. Phenolic compounds found in plants are reported to have a high antioxidant function. When the total polyphenol content increases, physiological activities, such as antioxidants, will increase (Kwon et al., 2020). Phenolics are widespread and found in large quantities in the plant kingdom. According to recent reports, phenolic compounds may contribute to the overall antioxidant action. As efficient radical chain cleavage agents, phenolics play an important role in stabilizing lipid peroxidation by delocalizing unpaired electrons (Thoo et al., 2013).

CONCLUSION

The conclusion of this research was that the total flavonoid content of Mahang (*Macaranga triloba* (thumb.) Mull Arg.) leaves extract was 0.603 ppm.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

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