

## ANTIDIABETES TYPE 2 PHYTOMEDICINE : MANGOSTEEN (*GARCINIA MANGOSTANA* L.) - A REVIEW

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**ABSTRACT :** Diabetes mellitus (DM) is considered to be one of the most common chronic diseases worldwide. Medicinal plants from Indonesia may lead to the discovery of the novel drugs. Mangosteen or *Garcinia mangostana* L. is a native tropical fruit from Southeast Asia and known to contain bioactive compounds which have a particular function as an antioxidant. This study was performed to review the phytochemical and anti-diabetic compounds of the whole plant of mangosteen. The review was carried out by analysing peer-reviewed and indexed journals of *Garcinia mangostana* L. from Google Scholar, PubMed, Scopus, and so on. Interestingly, the main xanthone derivative are alpha-mangostin and gamma-mangostin, these compounds have a variety of pharmacological activities such as antidiabetic. This review showed the potential pharmacological benefits of mangosteen in preventing and treating type-2 DM. In sum, mangosteen exhibits it as a valuable plant and establish it as a candidate for future drug development of DM.

**Key words :** Antidiabetes, diabetes mellitus, *Garcinia mangostana* L., medicinal plant.

### INTRODUCTION

Diabetes mellitus (DM) is a global health problem with high levels of morbidity and mortality (Kang *et al*, 2014). In 2013, a total of more than 350 million people worldwide with DM and in 2035 are predicted to increase to 592 million people. In addition, lifestyle changes due to urbanization and population growth tend to provide an increase of 55% of people with DM worldwide in 2035 (Guariguata *et al*, 2014). However, Indonesia had around 8.4 million people in 2000 (the fourth highest in the world) and by 2030 it was expected to increase by 21.3 million people (Wild *et al*, 2004). Furthermore, the number of people living with DM in Indonesia has continued to increase over the last 6 years (Arifin *et al*, 2019).

Indonesia is covered by many vegetations, including tropical rain forest (Nugraha and Keller, 2011). In addition, Indonesia is the top five countries in the world that has high plant diversity (Ministry of Environment and Forestry of Indonesia, 2014), including approximately 6,000 medicinal plants (Nugraha and Keller, 2011).

Consequently, Indonesia is rich in medicinal plants used by its population in curing many diseases (Ansori *et al*, 2020; Fadholly *et al*, 2019; Fadholly *et al*, 2020; Sukardiman and Ervina, 2020; Tacharina *et al*, 2020).

Medicinal plants provide alternatives for DM therapy (Ansori *et al*, 2019). Medicinal plants are used in many countries with natural diversity resources, including Indonesia (Ansori *et al*, 2020). The medicinal plants are not only hypoglycemic (Tacharina *et al*, 2020), but also preventing the DM complications (Ansori *et al*, 2019). Some have been shown in delaying the insulin resistance (Sukardiman and Ervina, 2020) and  $\beta$ -cells regeneration (Husen *et al*, 2017a). More than 1,200 medicinal plants were found for anti-diabetic substances (Pandey *et al*, 2011), such as: *Momordica charantia* (Meles *et al*, 2019), *Cassia fistula* (Noorhajati *et al*, 2012), *Abelmoschus esculentus* (Husen *et al*, 2019a; Husen *et al*, 2019b; Husen *et al*, 2020a), *Swietenia mahagoni* (Sukardiman and Ervina, 2020), *Cynodon dactylon* (Tacharina *et al*, 2020), *Terminalia catappa* (Hayaza *et*