



**CYTOTOXICITY EFFECT OF *Gynura procumbens* EXTRACTS ON HUMAN
RED BLOOD CELLS**

By

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ABSTRACT

CYTOTOXICITY EFFECT OF *Gynura procumbens* EXTRACTS ON HUMAN RED BLOOD CELLS

Gynura procumbens (*G. procumbens*) (Lour.) Merr. known as *Sambung nyawa* is a traditional medicinal plant with ability to treat diseases. However, there is still lack of information regarding the cytotoxicity of *G. procumbens* on human red blood cells based on its haematological activities which is the formation of haemolysis. In this study, the cytotoxicity effect of *G. procumbens* extracts were determine by using hemolysis assay on human red blood cells of the different blood groups which are blood group A, B, AB and O treated against different concentration of *G. procumbens* from 0 to 1600 µg/ml in aqueous and ethanol extracts. All data were expressed by using SPSS version 21.0 which are One-Way ANOVA and T-test. The results showed that both extracts which are ethanolic and aqueous extract of *G. procumbens* are non-toxic to the human red blood cells at different concentration and no significant different where ($p>0.05$). Moreover, there is also no significant different effect of *G. procumbens* extracts among the different blood groups which are blood group A, B, AB and O where ($p>0.05$). Thus, this study suggest that *G. procumbens* extracts is non- toxic towards human red blood cells within the range 0 to 1600 µg/ml of concentration and different blood groups does not affect hemolysis of red blood cells.

Keywords: *Gynura procumbens*, aqueous extract, ethanolic extract, hemolysis, ABO blood groups, human red blood cells and cytotoxicity.

CHAPTER 1

INTRODUCTION

1.1 Overview

Gynura procumbens (*G. procumbens*) (Lour.) Merr. is known as *Sambung nyawa* in Malay is a type of plants that came from the family of Asteraceae. *G. procumbens* is a fast growing herbaceous plant with a fleshy stem and a purple tint. *G. procumbens* usually grows up 1 to 3 meter height, 3.5 to 8 cm long and 0.8 to 3.5 cm wide and have an ovate-elliptic or lanceolate leaves shape. Besides that, the flowering heads of this plant are narrow, panickled yellow and 1 to 1.5 cm long (Mustafizur Rahman & Sharif Asad, 2013). Geographically, this plant can be found at the Southeast Asia such as Indonesia, Thailand and Peninsular Malaysia. According to Perry *et al.* (1980), *G. procumbens* had been used traditionally to treat the eruptive fever, rash, kidney disease, migraines, constipation diabetes mellitus, cancer and hypertension.

Cytotoxicity on the red blood cell membrane can be observed by the mechanical stability of the red blood cell membrane itself affected by various compound *in-vitro* (Sharma & Sharma, 2001). The cytotoxicity on the red blood cells can be detected via the hemolysis formation since that the hemolysis is an indicator for the erythrocytes membrane damage result in the releasing hemoglobin into the environment (Hess, Sparrow, Van Der Meer, Acker, Cardigan & Devine, 2009). The altitude of the hemolysis is affected by many factors such as bacterial contamination, improper blood storage and the condition of donor such as inherent cell membrane weakness or prescribed drugs that are taken by the donor (Sawemimo-Coker, 2002).