

## The Effects of *Caesalpinia sappan L.* Extract Granule to Antioxidant Activity In Blood Serum of Wistar Rat (*Rattus norvegicus*) With Excessive Iron Condition

Ratu Safitri<sup>1\*</sup>, Nining Ratningsih<sup>2</sup>, Ani Melani Maskoen<sup>3</sup>,  
Prima Nanda Fauziah<sup>4</sup>, Ramdan Panigoro<sup>5</sup>

<sup>1</sup>Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Jl. Raya Bandung - Sumedang Km-21, 45361, Jatinangor, Sumedang West Java, Indonesia

<sup>2</sup>Study Program of Biotechnology, Postgraduate Study, Universitas Padjadjaran, Jl. Dipati Ukur no. 35, 40132, Bandung, West Java

<sup>3</sup>Faculty of Dentistry, Universitas Padjadjaran. Jl. Raya Bandung -Sumedang KM 21, Jatinangor 45363. Sumedang West Java, Indonesia

<sup>4</sup>Department of Medical Laboratory Technology, School of Health Sciences Jenderal Achmad Yani Cimahi, Indonesia

<sup>5</sup>Faculty Of Medicine, Universitas Padjadjaran Jl. Raya Bandung -Sumedang KM 21, Jatinangor45363. Sumedang West Java, Indonesia

**Abstract :** This study aims to determine the effective dose and the granule formulation of sappan wood (*Caesalpinia sappan L.*) extract (SWE) to increase the antioxidant activity in blood serum in excessive iron condition. This study was complete random design with 11 treatments and was repeated three times. Male wistar rat (*R. norvegicus L.*) of 200 g, was given with iron dextran to induce a state of iron excessed. A total of eight groups were then given by two types of granule formulations, and each granule formulation consisting of SWE doses of 0, 100, 200, and 400 mg / kg bw, 3 treatment groups: group that was given by Iron Dextran, distilled water, and deferiprone as a comparison. The study was conducted over 15 days, the parameters observed including: activity of superoxide dismutase (SOD), catalase, glutathione peroxidase (GPx) and the levels of malondialdehyde (MDA). The results showed that administration of Iron Dextran 60 mg / kg caused increase of iron level which also caused the increasing activity of SOD at 90.54%, GPx at 12.25% and the levels of MDA at 31.82%, also decreased the catalase activity at 19.77%. The results also showed that SWE in granule formulation at 200 mg / kg body weight dosage can reduce the activity of SOD at 73.78%, lower the MDA levels at 47.91% and increased the activity of GPx at 145.41% and catalase activity at 25.89 % .

**Keywords :** Sappan wood (*Caesalpinia sappan L.*), antioxidant activity, superoxide dismutase (SOD), catalase, glutathione peroxidase (GPx) malondialdehyde (MDA).

### Introduction

The long term side effects due to recurrence of blood transfusions could lead to excessive iron in various organs. This occurs because every blood unit that have been transfused contains 250-200 mg of iron, and the average of iron body daily intake as hemoglobin is about  $25 \pm 30$  mg. This daily amount of iron is