

## BIOAVAILABILITY STUDY OF SAMBILOTO (*Andrographis paniculata*) HERBS INFUSION IN RABBIT

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### ABSTRACT

*Andrographis paniculata* or sambiloto is one of the most widely used medicinal herbs in Indonesia. The main bioactive chemical constituent, andrographolide, has been reported to have various pharmacological activities. Besides its function for medical purposes, the sambiloto herbs infusion is frequently taken to maintain health. This study was conducted to determine the bioavailability of sambiloto herbs infusion in rabbit plasma, stomach, and liver, calculated as total andrographolide. Fourteen male New Zealand white rabbits were used in this study. Sambiloto herbs infusion were administered orally at the dose 7.04mL/kg body weight to each rabbit. Blood samples were taken at intervals 0.0; 0.5; 1.5; 2.0; 3.0; and 5.0h after infusion administration. Sambiloto herbs infusion, which are calculated as andrographolide, levels in plasma, stomach, and liver were analyzed by high performance liquid chromatography using C-18 column as stationary phase and a mixture of methanol-double distilled water (60:40) as mobile phase. Bioavailability parameters obtained were  $C_{max}$  0.5549 $\mu$ g/mL (in stomach), 0.2136 $\mu$ g/mL (in plasma), 0.0051 $\mu$ g/mL (in liver); while  $t_{max}$  1h (in stomach), 1.5h (in plasma), 2h (in liver); and AUC 1.7451 $\mu$ g.h/mL (in stomach), 0.434 $\mu$ g.h/mL (in plasma), 0.0038 $\mu$ g.h/mL (in liver). These data showed that in healthy animals, sambiloto herbs infusion was fastly absorbed from the stomach, distributed in the circulation system, and metabolized in the liver, in subsequent process. Sambiloto herbs infusion showed good bioavailability in rabbit.

**Key words:** andrographolide, *Andrographis paniculata*, bioavailability, sambiloto

### INTRODUCTION

*Andrographis paniculata* or sambiloto is one of the most widely used medicinal herbs in Indonesia. This plant also grows in many other Asian countries such as China, India, Thailand and Sri Lanka. It is particularly known for its extremely bitter properties and is used traditionally as a remedy against common cold, fever, inflammation, etc. The main bioactive chemical constituent, andrographolide, has been reported to have various pharmacological activities including anti-inflammatory *via* different mechanisms (Chiou *et al.*, 2000; Shen *et al.*, 2002; Satyanarayana *et al.*, 2004; Xia *et al.*, 2004; Abu-Ghefreh *et al.*, 2009; Levita, *et al.*, 2010), anticancer and antitumour (Satyanarayana *et al.*, 2004; Shen *et al.*, 2009). Besides its function for medical purposes, sambiloto herbs

infusion is frequently used to maintain health.

Andrographolide, an active component of *Andrographis paniculata*, is the major labdane diterpenoidal constituent in this plant, which has an  $\alpha$ -alkylidene  $\gamma$ -butyrolactone, two olefin bonds at C8(17) and C12(13), and three hydroxyl groups at C3, C19, and C14 (Nanduri *et al.*, 2004).

Bioavailability of drugs refers to the extent and rate at which the active moiety (drug or metabolite) enters systemic circulation, thereby accessing the site of action. Pharmacological response is related with drug concentration at the receptor, therefore bioavailability of drug is an important element a clinical pharmaceutical effects (Chereson, 1996).

Previous study on the determination of bioavailability parameters of andrographolide