

Variation Of Andrographolite Conten From Sambiloto (*Andrographis paniculata* Ness) Which Grow In Various Regions

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ABSTRACT

Sambiloto is used as a hepatoprotector, enhancing the immune system, antidiabetic, anti-inflammatory, anti-malaria, antidiarrheal and many more. One of the main ingredients of the bitter plant is andrographolite. This plant is widely spread throughout Indonesia ranging from lowlands to high plains with various types of soil and altitude. The existence of this fairly wide distribution can give effect to the content of andrographolite, so that in this study will be studied about variations in andrographolite levels source from various regions. The results of this study will be used as a quality reference for treatment based on andrographolite. Samples of bitter plants are taken from various regions. Furthermore, parts of plants that are above the ground are separated between leaves, twigs and stems. All samples were dried in an oven at 60 degrees Celsius. Pollinated samples were then sieved. Samples were extracted with ethanol overnight and then analyzed their andrographolite levels with TLC-densitometry. The results of the analysis of andrographolite levels showed that bitter from various regions have different levels. The organs of plants also show different levels of andrographolite as well. Part of the leaf organ is the part that contains the most andrographolite.

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Introduction

Sambiloto is one of the most widely used empirical plants as medicine by various ethnic groups in Indonesia. This plant has also been widely studied (researched) from various aspects, ranging from cultivation, phytochemicals, pharmacology. Research in the field of pharmacology shows that bitter has many benefits, among others, as a protective liver from the damage caused by giving paracetamol to experimental animals (Ulumiah, DU, 2014), as an anticancer of breast in research using TD-47 cell line

(Sukardiman, et al. , 2007), antidiabetic research has also been carried out by Yulinah et al (2001), anti-inflammatory, antimalarial, antidiarrheal and many more. One of the main ingredients of the bitter plant is andrographolite which has been proven to be effective in preventing liver damage in rats induced by carbontetrachlorite and galactosamine (anonymous, 2014).

The content of secondary metabolites in plants is influenced by various factors, including: internal factors (genetic) and external factors (environment). Environmental

factors that influence the content of secondary metabolites include: light, soil and temperature. One of the secondary metabolite content of the bitter plant which has medicinal properties is andrographolite. This research will examine the content of andrographolite in bitter plants that grow from various regions and the distribution of andrographolite in plant organs.

Materials and Methods

Sambiloto (*Andrographis paniculata* Ness) plants were taken from 5 regions, namely: Ternate, Karanganyar (Tawangmangu sub-district, Karangpandan sub-district, Karanganyar sub-district) and Wonogiri district. The origin of this place of growth is the first research factor. Bitter samples are separated based on their organs, namely: leaves, main stems and twigs. Plant organs are the second research factor. All samples were dried in an oven at a temperature of 600C until a fixed weight (about 12% moisture content), then made powder and sieved with mess size 40.

Analysis of andrographolite levels of the samples was carried out with a TLC-densitometer compared to standard andrographolite standards. First a standard standard linear curve is created. The raw andrographolite is weighed as much as 1 mg then dissolved in 10 ml ethanol. The solution was bottled (5 times bottling: 1, 2, 3, 4 and 5 microliters) on the F254 silica gel plate. bottling is done with Linomat 5. Then it is eluted by the mobile phase of Chloroform: ethanol = 9: 1. The elution results are read with a TLC scanner (Camag) at a wavelength of 230 nm.

Samples of dried simplicia bitter are extracted by weighing 100 mg each. The sample was then added with 90% ethanol then followed by sonication for 15 minutes and allowed to stand overnight.

On the following day, the clear part of the solution was taken as much as 3 microliters and then bottled on silica gel plate F 254. The plate was removed with the mobile phase of chloroform: ethanol = 9: 1. The elution results are read by a TLC scanner at a wavelength of

230 nm. The results of the reading (area area) of the sample are compared with the standard standard of andrographolite.

Results and Discussion

The content of andrographolite of bitter plants (*Andrographis paniculata* Ness) varies greatly. These variations occur in bitter which grows in various regions and also from their growing organs. The highest content of andrographolite is found in bitter plants derived from wonogiri and the lowest content in bitter ones derived from corpandan and ternate. The overall results can be seen in the table below.

Table 1. Average content (%) of Sambiloto andrographolite which grows from several regions and from different organs

asal organ	Tawa ngma ngu	karan gpand an	karang anyar	tern ate	won ogiri
Daun	0,5	TT	1,17	TT	2,31
Ranting	0,48	TT	TT	TT	1,07
Batang	0,1	TT	TT	TT	0,31

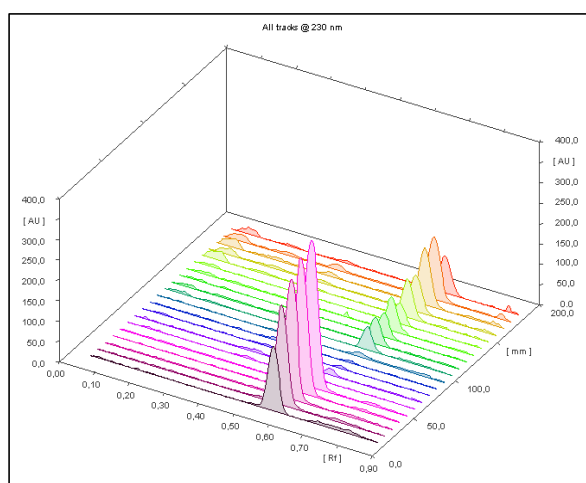
The results of research Sharma., M and M.G. Sharma, (2013) found that the content of andrographolite in bitter varied between 0.42% to 2.02%. In that study the best results were achieved on 110-day-old bitter plants or plants in a condition before flowering. Besides being influenced by age, variations in andrographolite levels in bitter are also influenced by the place of growth. Sambiloto that grows in the lowlands has a lower andrographolite content than those that grow in the middle level. In the lowlands the content is 1.37% while in the middle plains it can reach 2.27%. The lowest content occurs in bitter growing in the highlands where the content of andrographolite is 0.89% (Pujiasmanto et al, 2007).

Variations in andrographolite levels are also determined by the time of harvest. This can be seen from the Sambiloto samples taken from the Karangpandan area in this study could not be detected. Even though the data

contained in the quality control report (unpublished) at the Research and Development Center for Medicinal Plants and Traditional Medicines shows that during the period January - September 2016, bitter which originated from the same place showed quite high variations in andrographolite content. The andrographolite content in January to September is as follows: January = 0.65%, February = 0.9%, March = 0.67%, April = not detected, May = 1.6%, June = 1.4% , July = 1.2%, August = 0.67% and September = 0.9%.

In addition to growth factors, variations in the content of andrographolites also occur in the organs of the plant itself. In the table above it is known that the highest content of andrographolite is found in the leaves and then the branches and the lowest is in the main stem.

In the table above there is a bitter which cannot be detected. This does not mean that the Sambiloto does not contain andrographolite at all because the results of the TLC curve densitometer show that there is a curve (see picture below) on the same Rf as the standard Rf of andrographolite.



Picture 1. The TLC densitometer profile derived from coral reefs.

In the figure, it appears that the 5 leading curves are the standard andrographolite standard profile, respectively 5 profiles behind it are the content of andrographolite in the stem, the 5 profiles behind it again are the content of andrographolite from the branches

and the 5 most backward profiles are content of andrographolite from leaves.

In the picture above it appears that the entire sample curve is lower than the lowest standard standard of andrographolite but also shows that the sample actually also shows the presence of andrographolite content in the sample.

Conclusion

The content of andrographolite in bitter plants (*andrographis paniculata* Ness) varies greatly. One of the variations in the content is caused by the place to grow. The amount of andrographolite content ranging from undetectable to plants which have a content of 2.31%.

Andrographolite content in bitter plants also occurs variations in plant organs. The highest content is in the leaf organs and then the lower is in the twigs and the lowest is in the main stem.

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