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Phytochemical in the methanol extract of *Piper sarmentosum*

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ABSTRACT

Piper sarmentosum has important biological activities. This aim of the study was conducted to isolate and identify phytocomponents in the methanol extract of *Piper sarmentosum*'s leaves, stalks, stems and fruits. These methanol extract was analyzed for phytocomponent content using Gas Chromatography-Mass Spectrometry (GC-MS). The results showed that the leaves, stalks and stems extract contained the main component of elemicin, while the fruits extract contained the main component of myristicin.

Key words *: Elemicin, Myristicin, Piper sarmentosum.*

Introduction

Indonesia is a tropical country, so the various of tropical diseases can easily develop (Wibawa and Satoto, 2016). During this time, synthetic drugs or antibiotics are still used to overcome tropical diseases (Pujara *et al*., 2016; Gradman, 2016; Handayani *et al*., 2017). The continuous use of antibiotics can disrupt the immune system and resistance (Camiel and Whelan, 2008; Tjandrawinata *et al*.2017; Costa *et al*., 2017). Therefore, people switch to using natural medicines from plants (Devendra *et al*., 2011; Mzid *et al*., 2017).

Piper sarmentosum or *'Karuk'* plant belongs to the family of Piperaceae which has high potential as an antimicrobial and antioxidant materials (Fernandez *et al*., 2012; Sanusi *et al*., 2017; Atiax *et al*., 2011; Ismail *et al*., 2018; Chanprapai and Chavasin, 2017; Ab Rahman *et al*., 2016). There are variety of secondary metabolites contained in *Piper sarmentosum,* such as flavonoids, alkaloids, amides, lignans, phenylpropanoids, tannins, pyrons, sterols, neolignans, phenolics, polyphenols, ascorbic acid, carotenes, vitamin C, vitamin E and xanthophyll (Hussain *et al*., 2010; Sumazian *et al*., 2010; Ee *et al*., 2009; Sim *et al*., 2009; Chanwitheesuk *et al*., 2005; Wan-Ibrahim *et al*., 2010).

In previous studies, there are no information about bioactive compound of *Piper sarmentosum*'s leaves, stalks, stems, and fruits that originated from Surabaya, East Java, Indonesia. The purpose of this study was conducted to isolate and identify phytocomponents in the methanol extract of *Piper sarmentosum*'s leaves, stalks, stems and fruits.

Materials and Methods

Plant materials

Piper sarmentosum were obtained from the Bratang flower market, Surabaya, East Java, Indonesia. Plant identification was carried out at the plant physiology laboratory, Faculty of Science and Technology, Universitas Airlangga, Surabaya.

Leaves extraction

The plant organs of *P. sarmentosum* such as leaves,

stems, stalks, and fruits were cut. Then its were washed using tap water to release the contaminants and impurities. Then, its were dried for ± 7 days. After that, the plant organs were crushed using mortar to form fine powder. The weight of each organs's powder were leaves at 6 g, stalks at 1.91 g, stems at 7.47 g and fruits 0.67 g which is then extrated with methanol in 3 days. The results of extracted solution that have been filtered on each organ, then analyzed for secondary metabolites content using GC-MS.

Results and Discussion

The methanol extract of *Piper sarmentosum*'s leaves (Table 1.), stalks (Table 2.), stems (Table 3.) and fruits (Table 4.) contains a variety of compounds. The results in this study can be seen in Tables 1-4. The methanol extracts of leaves, stalks, stems and fruit each contain 2, 6, 8 and 13 kinds of compounds, respectively.

The extract of leaves, stalks and stems contain the main compound, that is elemicin. Leaves extracts contain more elemicin compared to other extracts, which is 8.83%. While the extract of fruit has the main component of myristicin at 77.56%. Elemicin is phenylpropene, a natural organic compound, and a constituent of the essential oils of several plant species. Elemicin is present in the extract and essential oil of *Myristica fragrans* (Matulyte *et al*., 2019; Ramesh *et al*., 2016; Abourashed and El-Alfy, 2016). Elemicin inhibits Stearoyl-CoA Desaturase 1 (SCD1) activity in the liver by metabolic activation. Elemicin is found in *Daucus carota* and has antibacterial activity against *Campylobacter jejuni* (Rossi *et al*., 2007).

Myristicin is a natural organic compound found in nutmeg, parsley, fennel, etc. Myristicin has anti-insecticide activity (Srivastava *et al*., 2008). Myristicin also has neurotoxic effect on dopaminergic neurons. Other than that, elemicin and myristicin also have biological activities as anti-inflammatory (Andrade *et al*., 2014). The conclusion in this study was that elemicin and myristicin found in *Piper sarmentosum* have important biological activi-

Table 1. The result of analysis phytocomponent from *Piper sarmentosum*'s leaves extract.

No.	Retention time	Phytocomponent	Area (%)
1.	13.41	Elemicin	8.83
2.	14.28	Methoxyeugenol	2.63

Table 2. The result of analysis phytocomponent from *Piper sarmentosum*'s stalks extract.

No.	Retention time	Phytocomponent	Area (%)
1.	11.74	Methyleugenol	0.14
2.	12.34	5-beta-H,7-beta,10-alpha-selina-4(19),11-diene	0.33
3.	12.47	Gamma-Selinene	0.42
4.	13.51	Elemicin	6.73
5.	17.99	n-Hexadecanoicacid	0.57
6.	19.53	Lineloic acid	1.59

Table 3. The result of analysis phytocomponent from *Piper sarmentosum*'s stems extract.

No.	Retention time	Phytocomponent	Area (%)
1.	9.95	Safrole	1.11
2.	10.90	5-(Hydroxymethyl)-2-Furancarboxaldehyde	2.30
3.	11.68	Metyleugenol	1.14
4.	13.48	Elemicin	5.20
5.	13.72	Cis-asarone	0.87
6.	14.32	Methoxyeugenol	1.06
7.	24.21	N-(2Z)-3-(4-bromophenyl)-3-(3-pyridyl)-2-propenylidene) methylamine N-oxide	2.93
8.	27.48	(3-beta., 24.xi)-Stigmast-5-en-3-ol	0.58

Table 4. The result of analysis phytocomponent from *Piper sarmentosum*'s fruits extract.

No.	Retention time	Phytocomponent	Area (%)
1.	9.92	Safrole	0.46
2.	10.78	4-Vinylguaiacol	0.92
3.	10.89	Copaene	1.44
4.	11.45	Caryophyllene	1.36
5.	11.90	.alpha,-Caryophyllene	0.20
6.	12.34	.beta-Selinene	1.21
7.	12.47	.alpha-Selinene	1.15
8.	13.11	Myristicine	77.56
9.	13.59	Elemicin	5.58
10.	14.22	Methoxyeugenol	1.05
11.	18.01	n-Hexadecanoicacid	0.66
12.	19.51	Linoleicacid	0.78
13.	24.21	N-(2Z)-3-(4-bromophenyl)-3-(3-pyridyl)-2-propenylidene)methylamine N-oxide	1.41

ties, so further research needs to be developed.

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