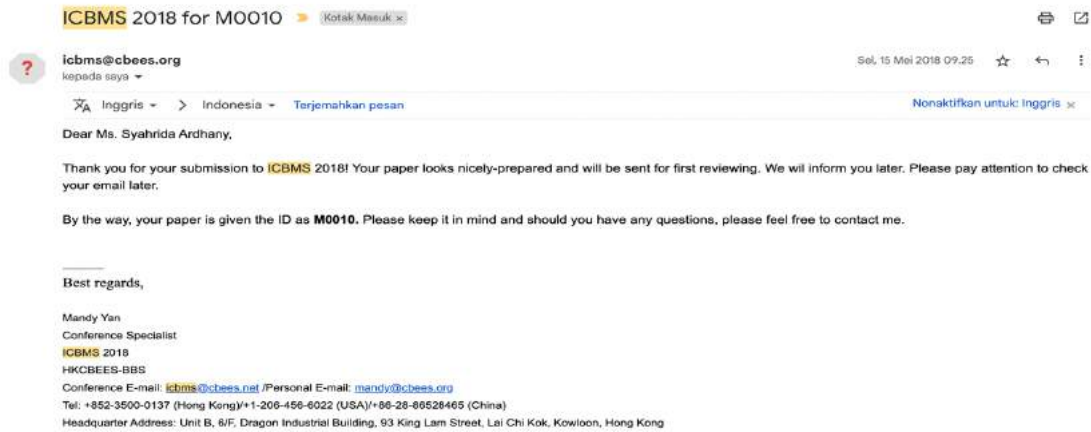


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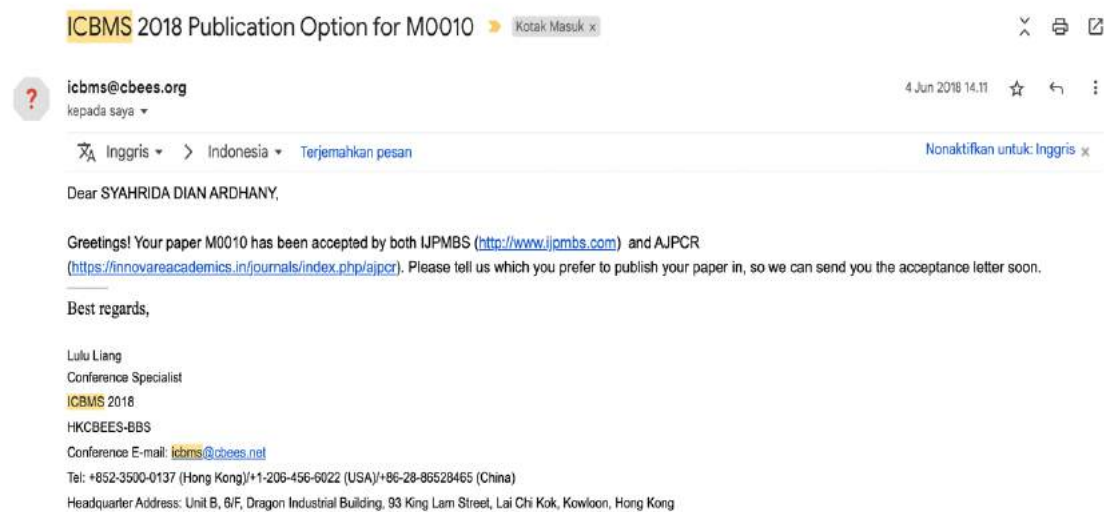
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<b>Nama Jurnal</b>	:	International Journal of Applied Pharmaceutics Vol. 11 Special Issue 3 2019 Hal: 7-10
<b>Index</b>	:	Terindeks pada database internasional bereputasi dan berfaktor dampak (SCOPUS Q3)
<b>Judul Jurnal</b>	:	Antibacterial Activity of Bawang Dayak ( <i>Eleutherine</i> sp.) and Tawas Ut ( <i>Ampelocissus</i> sp.) from Central Kalimantan against <i>Propionibacterium acnes</i>

No	Item	Tanggal	Halaman
1	Register/Submission pada konferensi internasional ICBMS 2018 (International Conference on Biological and Medical Sciences) di Seoul, Korea Selatan 22-24 Agustus 2018	15 Mei 2018	1
2	Artikel accepted pada jurnal AJPCR (Asian Journal of Pharmaceutical and Clinical Research) (M0010)	04 Juni 2018	2
3	Notification dan Review artikel	05 Juni 2018	2
4	Review process (AJPCR)	16 Februari 2019	7
5	Artikel accepted pada jurnal AJPCR namun jurnal tersebut masuk dalam kategori discontinued scopus sehingga panitia konferensi mengganti ke IJAP (International Journal of Applied Pharmaceutics) dengan indeks scopus Q3 (M0010)	13 Maret 2019	15
6	Article for final proof (IJAP)	13 Mei 2019	15
7	Article Published (IJAP)	15 Juni 2019	20
8	Ethical approval	03 Februari 2018	28

1. Register/Submission pada konferensi internasional ICBMS 2018 (International Conference on Biological and Medical Sciences) di Seoul, Korea Selatan 22-24 Agustus 2018



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## 3. Notification dan Review artikel



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**ANTIBACTERIAL ACTIVITY OF BAWANG DAYAK (*ELEUTHERINE SP.*) AND TAWAS UT (*AMPELOCISSUS SP.*) FROM CENTRAL KALIMANTAN AGAINST PROPIONIBACTERIUM ACNES**

SYAHRIDA DIAN ARDHANY\*

 Department of Pharmacy Faculty of Health Science, Muhammadiyah University of Palangkaraya, Central Kalimantan, Indonesia.  
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Received: ???, Revised and Accepted: ???

**ABSTRACT**

**Objective:** The aim of the present study was to investigate phytochemical screenings and the *in vitro* effect antibacterial of BD (*Eleutherine Sp.*) and TU (*Ampelocissus Sp.*) against *Propionibacterium acnes*.

**Methods:** The antibacterial activity was investigated against *Propionibacterium acnes* by well diffusion method.

**Results:** Preliminary phytochemical screenings of BD ethanolic extract were found positive alkaloid, saponin, tannins, and steroid while TU positive flavonoid, saponin, tannins, steroid, and triterpenoid. Antibacterial activity against *Propionibacterium acnes* of ethanolic extract BD with concentration 25 mg/ml and 50 mg/ml showed the zone of inhibition 3.23 mm and 7.8 mm with category weak activity while ethanolic extract TU with same concentration showed zone of inhibition 10 mm [weak activity] and 16.3 mm [moderate activity] which mean ethanolic extract TU have better antibacterial activity. A combination ethanolic extract of both with variant ratio showed a zone of inhibition 6.7 mm (1:1), 3.9 mm (1:2), and 3.63 mm (2:1).

**Conclusion:** In this present study showed the highest potential antibacterial activity against *propionibacterium acnes* is an ethanolic extract of TU and The best ratio combination is 1:1. Furthermore, this study needs more research with variant concentration so that may be possible to be used as natural anti-acne formulations.

**Keywords:** *Ampelocissus*, Antibacterial, *Eleutherine*, *Propionibacterium acnes*.

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**INTRODUCTION**

During the second half of the 20<sup>th</sup> century, the acceptance of traditional medicine as an alternative form of health care and the development of microbial resistance to the classical antibiotics led researchers to investigate the antimicrobial activities of medicinal plants. Antimicrobials of plant origin have the enormous therapeutic potential [1], they are effective in the treatment of infectious diseases while simultaneously mitigating many of the side effects that are often associated with synthetic antimicrobials.

Red bulb plant or "bawang dayak" (*Eleutherine Americana* Merr.) have been widely used as traditional medicine. Empirically the local community of Central Kalimantan, bulb of the plants has been used against cancer, antidiabetic, antifungal, and anti-inflammation. Studies demonstrated that bulbs of *Eleutherine* (*E. bulbosa* and *E. Americana*) contain naphthoquinones (elecanacine, eleutherine, eleutherol, and eleutherinone) [2-6]. Tawas ut (*Ampelocissus rubiginosa*) tubers empirically were used by Palangka Raya people in Central Kalimantan for treating malaria. Research from Arnida *et al.* [7] Tawas ut (*A. rubiginosa*) tubers in *in vitro*, antiplasmodial activity was active.

Medicinal plants are known to contain several compounds with antimicrobial properties, and the uses of these types of compounds are being increasingly reported from different parts of the world [8]. Combination of antimicrobial agents had expressed significant interactions and two or more compounds interact to produce mutual enhancement, amplification of each other's effects when combined. These combinations could enhance the efficacy of the other antimicrobial agents and acted as an alternative to treating infections caused by multidrug-resistant microorganisms having no effective therapy [9,10]. Some of the bioactive compounds could hinder the life processes of

disease-causing bacteria, either by itself or in combination with other therapeutic agents [11]. Therefore, an attempt has been made to study the preliminary phytochemicals screenings and antibacterial activity of bawang dayak (*Eleutherine Sp.*), tawas ut (*Ampelocissus Sp.*), and a combination of both.

**METHODS**

The materials procured for this *in vitro* test compounds were bawang dayak (*Eleutherine bulbosa*) and Tawas ut (*A. rubiginosa*). The test bacteria were *Propionibacterium acnes*, and Mueller-Hinton agar (MHA) plate was used.

**Preparation of plant extracts**

The healthy and fresh bulb of the plant bawang dayak (*Eleutherine bulbosa*) and root of Tawas ut (*A. rubiginosa*) were bought from a traditional market in Palangka Raya, Central Kalimantan. The plant materials were dried under the sun for 5-7 days. The dried plant materials were crushed by grinder without adding any solvent into it. The powder of the plant materials was extracted with 70% ethanol using a Soxhlet extractor and once the process was finished, all extracts were concentrated in a rotary evaporator.

**Phytochemicals screening**

The prepared extract was subjected to phytochemical screening to detect the presence/absence of secondary metabolites [12].

**Evaluation of antimicrobial activity by a zone of inhibition by well diffusion method**

The bacterial isolates were subcultured into a nutrient broth. The 24-h-old bacterial culture was standardized using McFarland standard ( $10^8$  cfu/mL of 0.5 McFarland standard).

MHA was used for bacteria bioassay. MHA was prepared by dissolving 38 g in 1000 ml of distilled water and brought to boil to completely dissolve. Sterilization was achieved by autoclaving at 121°C for 15 min [13].

MHA plates were prepared, and bacterial strains were inoculated by cotton swab and then antibiotic and extract with various concentration applied in it. The plates were incubated at 37°C for 24 h, and the zone of inhibition was measured [14] and recorded later on.

## RESULTS AND DISCUSSION

### Preliminary phytochemical screenings

In general, secondary metabolites compound is widely distributed in plants and contribute significantly toward biological activities or pharmacological effects including antibacterial and antioxidant. In this present study showed secondary metabolites that ethanolic extract of Bawang Dayak (*Eleutherine* Sp.) positive alkaloid, saponin, tannins and steroid while ethanolic extract of Tawas Ut (*Ampelocissus* Sp.) positive flavonoid, saponin, tannins, steroid and triterpenoid.

Tannins have amazing stringent properties. They are known to hasten the healing of wounds and inflamed mucous membranes [15], it is good for anti-acne agent. Furthermore, flavonoids as a potent antioxidant













which prevent oxidative cell damage and terpenoids are also known to possess antimicrobial and antifungal properties. The preliminary phytochemical screening of ethanolic extracts of bawang Dayak (*Eleutherine* Sp.) and Tawas Ut (*Ampelocissus* Sp.) mainly revealed the presence of flavonoid and alkaloid *et al.* (Table 1).

### Antibacterial activity

In few past decades, there has been special interest in the use of abundant naturally occurring antimicrobials and antioxidants such as plants and fruits, *et al.* for medicinal applications. In the present study was conducted antibacterial evaluations of ethanolic extract Bawang Dayak (*Eleutherine* Sp.), ethanolic extract Tawas Ut (*Ampelocissus* Sp.), and a combination of both. The antimicrobial activities can be classified into three levels [18]: Weak activity (inhibition zone <12 mm), moderate activity (inhibition zone between 12 and 20 mm), and strong activity (inhibition zone >20 mm). The results of antimicrobial activity revealed that significant antibacterial activity showed against *Propionibacterium* acnes in comparison with positive control or standards clindamycin (Table 2).

The highest anti-acne effect was found for ethanolic extract TU (*Ampelocissus* Sp.) with 16.3 mm zone of inhibition which means moderate activity, while BD (*Eleutherine* Sp.) has a low zone of inhibition with the same concentration (50 mg/ml) but it is can

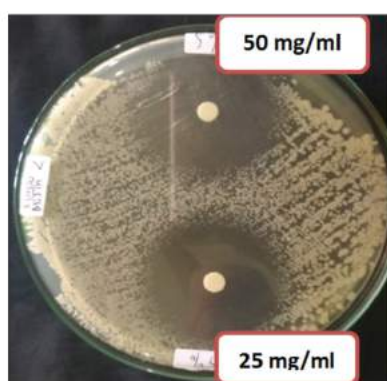
Table 1: Secondary metabolites of an ethanolic extract of Bawang Dayak (*Eleutherine* Sp.) and Tawas Ut (*Ampelocissus* Sp.)

Secondary metabolites	Ethanolic extract of bawang dayak ( <i>Eleutherine</i> Sp.)	Ethanolic extract of tawas Ut ( <i>Ampelocissus</i> Sp.)	References
Flavonoid	- 	+ 	The presence of flavonoids was indicative if pink or magenta-red color developed within 3 min [16].
Alkaloid	+ 	- 	The samples were then observed for the presence of turbidity or precipitation [16].
Saponin	+ 	+ 	The presence of saponin was positive if froth $\geq 1.2$ cm [16].
Tannins	+ 	+ 	Positive tests are confirmed by the addition of the $FeCl_3$ solution to the extract and should result in a characteristic blue, blue-black, green or blue-green color and precipitate (phenolic compounds) [16].
Steroid	+ 	+ 	Formation of red color ring confirmed the presence of steroid [17].
Triterpenoid	- 	+ 	If reddish violet color appeared, the existence of triterpenoids was confirmed [17].

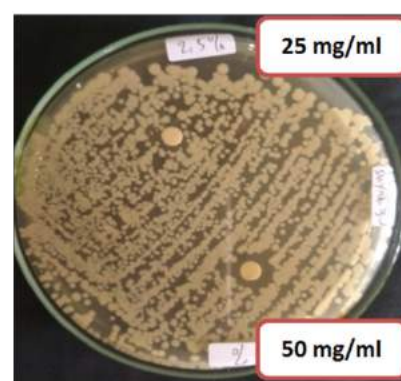


**Table 2: Antibacterial against Propionibacterium acnes effect of positive control, ethanolic extract BD (*Eleutherine Sp.*), ethanolic extract TU (*Ampelocissus Sp.*) and a combination of both by well diffusion method**

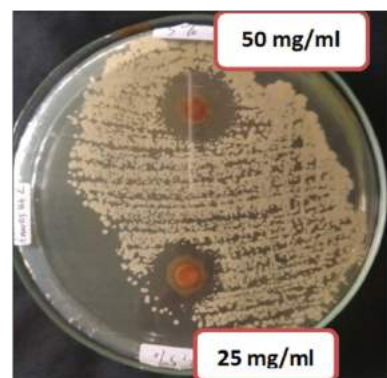
Name of sample	Concentration (mg/ml)	Zone of inhibition (mm)			X±SD
		I	II	III	
Clindamycin (positive control)	25	30.9	29.5	30.6	30.3±0.74
	50	33.5	36.5	30.8	33.6±2.85
BD ( <i>Eleutherine Sp.</i> )	25	3.5	2.2	4	3.2±0.93
	50	6.1	6.7	10.6	7.8±2.44
TU ( <i>Ampelocissus Sp.</i> )	25	7.5	10.6	11.9	10.0±2.26
	50	18.8	12.7	17.3	16.3±3.18
Combination BD+TU	1:1 (25:25)	5.5	4.7	9.9	6.7±2.80
	1:2 (25:50)	4.5	4.3	2.9	3.9±0.87
	2:1 (50:25)	3.3	3.7	3.9	3.63±0.31



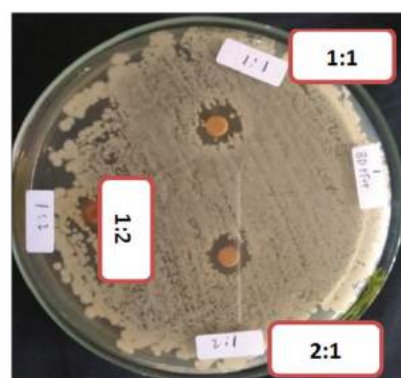
**Fig. 1: Zone of inhibition of clindamycin (positive control)**



**Fig. 3: Zone of Inhibition of ethanolic extract Bawang Dayak (*Eleutherine Sp.*)**



**Fig. 2: Zone of inhibition of ethanolic extract tawas Ut (*Ampelocissus Sp.*)**



**Fig. 4: Zone of Inhibition of a combination ethanolic extract of both**

be potential strong activity if the concentration was increased so ethanol extract TU (*Ampelocissus Sp.*) and this requires further research. Difference zone of inhibition is possible due to the content of triterpenoid and flavonoid in Tawas Ut (*Ampelocissus Sp.*) so zone of inhibition larger than Bawang Dayak (*Eleutherine Sp.*). One study stated that plants containing terpenoid showed a significant inhibitory activity of bacteria. Terpenoid compound treated microbes resulted in the leakage of reducing sugars and proteins through the membrane. It also induced the activity of respiratory chain dehydrogenase. Therefore, it was justified that terpenoid compound was able to destroy the permeability of the

bacterial membrane [19]. Flavonoid significantly contributed to the antibacterial properties [20].

Test of combination ethanolic extract Bawang dayak (*Eleutherine Sp.*) and ethanolic extract Tawas Ut was also done by comparison. The highest zone of inhibition is ratio 1:1 with the same concentration (25 mg/ml) in weak activity category (6.7 mm) but still has potential as antibacterial against *Propionibacterium acnes* and may be better inhibitory if given a concentration >25 mg/ml which will later be the basis of further research.

## CONCLUSION

Ethanollic extract Bawang Dayak (*Eleutherine* Sp.), ethanollic extract Tawas Ut (*Ampelocissus* Sp.) and a combination of both can be potential antibacterial effects against *Propionibacterium acnes*. Ethanollic extract Tawas Ut (*Ampelocissus* Sp.) are containing flavonoid, saponin, tannins, steroid, and triterpenoid have a larger zone of inhibition than the ethanollic extract of Bawang Dayak (*Eleutherine* Sp.) that are containing alkaloid, saponin, tannins, and steroid. The greatest ratio combination of both is 1:1 (25 mg/ml). Furthermore, this present study needs more research by raising the concentration or with variant concentration so that may be possible to be used as natural anti-acne formulations.

## ACKNOWLEDGMENT

The author would like to express her great appreciation to the Program Bantuan Seminar Luar Negeri Ditjen Penguatan dan Pengembangan, Kemenristekdikti of Indonesia to facilitate to the 6<sup>th</sup> International Conference on Biological and Medicinal Sciences (ICBMS) 2018 in Seoul, South Korea.

## REFERENCES

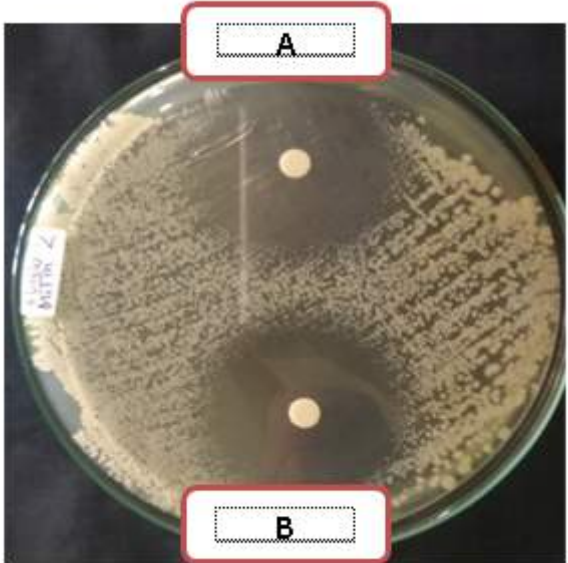
- Cowan MM. Plant products as antimicrobial agents. *Clin Microbiol Rev* 1999;12:564-82.
- Hara H, Maruyama N, Yamashita S, Hayashi Y, Lee KH, Bastow KF, et al. Elecanacin, a novel new naphthoquinone from the bulb of *Eleutherine americana*. *Chem Pharm Bull* 1997;45:1714-6.
- Alves TM, Kloos H, Zani CL. Eleutherinone, a novel fungitoxic naphthoquinone from *Eleutherine bulbosa* (Iridaceae). *Mem Inst Oswaldo Cruz* 2003;98:709-12.
- Jinzhong X, Feng Q, Wenjuan D, Gexia Q, Naili W, Xinsheng Y. New bioactive constituents from *Eleutherine americana*. *Chem J China* 2006;26:320-3.
- Nielsen LB, Wege D. The enantioselective synthesis of elecanacin through an intramolecular naphthoquinone-vinyl ether photochemical cycloaddition. *Org Biomol Chem* 2006;4:868-76.
- Han AR, Min HY, Nam JW, Lee NY, Wiryawan A, Suprpto W, et al. Identification of a new naphthalene and its derivatives from the bulb of *Eleutherine americana* with inhibitory activity on lipopolysaccharide-induced nitric oxide production. *Chem Pharm Bull (Tokyo)* 2008;56:1314-6.
- Amida A, Wahyono W, Mustofa M, Asmahsusidarti R. *In vitro* antiplasmodial activity of ethanol extracts of borneo medicinal

- plants (*Hydrolea spinosa*, *Ampelocissus rubiginosa*, *Uvaria crinita*, *Angiopteris evecta*). *Int J Pharm Pharm Sci* 2015;7:72-5.
- El-Shouny WA, Nanis GA, Maha AE, Afvat MH. Antibacterial response of combination between antibiotics and some plant extracts against multidrug resistant bacteria. *Adv Biol Res* 2016;10:51-7.
- Kamatou GP, Viljoen AM, van Vuuren SF, van Zyl RL. *In vitro* evidence of antimicrobial synergy between *Salvia chamaeleagana* and *Leonotis leonurus*. *South Afr J Bot* 2006;72:634-6.
- Aiyegoro O, Adewusi A, Oyedemi S, Akimpelu D, Okoh A. Interactions of antibiotics and methanolic crude extracts of *Azella africana* (Smith.) against drug resistance bacterial isolates. *Int J Mol Sci* 2011;12:4477-503.
- Sivananthan M. Antibacterial activity of 50 medicinal plants used in folk medicine. *Int J Biosci* 2013;3:104-21.
- Darshpreet K, Prasad SB. Anti-acne activity of acetone extract of *Plumbago indica* Root. *Asian J Pharm Clin Res* 2016;9:285-7.
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- Bhalodia NR, Shukla VJ. Antibacterial and antifungal activities from leaf extracts of *Cassia fistula* L.: An ethnomedicinal plant. *J Adv Pharm Technol Res* 2011;2:104-9.
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- Shahbazi Y. Antibacterial and antioxidant properties of methanolic extracts of apple (*Malus pumila*), grape (*Vitis vinifera*), pomegranate (*Punica granatum* L.) and common fig (*Ficus carica* L.) Fruits. *Pharm Sci* 2017;23:308-15.
- Bana SS, Kingsley JS, Karanarayanan SS, Bana P. Antibacterial activity of different phytochemical extracts from the leaves of *T. Procumbens* Linn.: Identification and mode of action of the terpenoid compound as antibacterial. *Int J Pharm Pharm Sci* 2012;4 Suppl 1:557-64.
- Alghazeer R, Elmansori A, Sidati M, Gammoudi F, Azwai S, Naas H, et al. *In vitro* antibacterial activity of flavonoid extracts of two selected Libyan algae against multi drug resistant bacteria isolated from food products. *J Biol Med* 2017;5:26-8.

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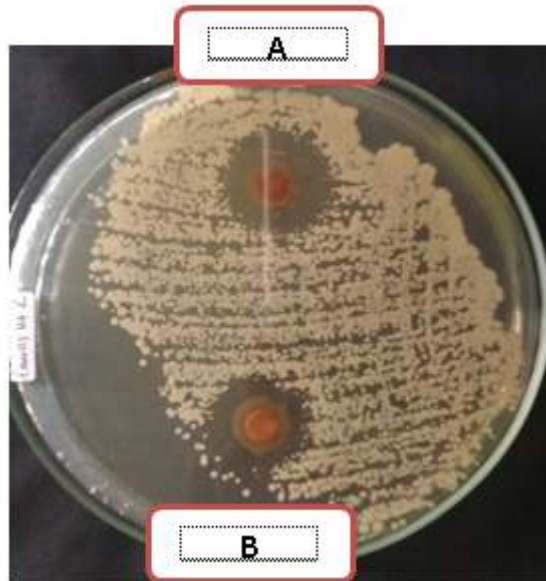
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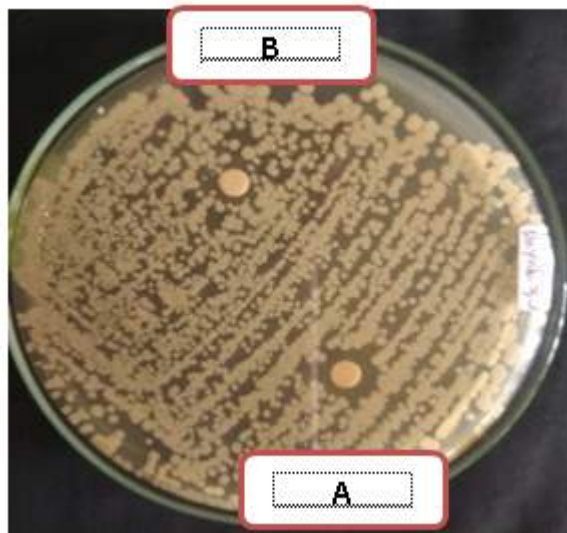
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1	AQ1	Received: 05 June 2018, Revised and Accepted: 16 February 2019
2	AQ2	In this present study ethanolic extract Bawang Dayak (Eleutherine Sp) and ethanolic extract Tawas Ut (Ampelocissus Sp) could be potential antibacterial against Propionibacterium acnes. Furthermore, this study needs more research with variant concentration so that may be possible to be used as natural anti-acne formulations.
3	AQ3	<ol style="list-style-type: none"> <li>1. The preliminary phytochemical screening of ethanolic extracts of bawang Dayak (Eleutherine Sp) dan Tawas Ut (Ampelocissus Sp) mainly revealed the presence of flavonoid, alkaloid, saponin, tannin, steroid and triterpenoid (Table 1).</li> <li>2. In few last decades, there has been especial interest in the use of abundant naturally occurring antimicrobials and antioxidants such as plants, fruits for medicinal applications</li> </ol>
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**Fig. 1:** Zone of Inhibition of Clindamycin (Positive Control): A. concentration is 50 mg/ml, B. concentration is 25 mg/ml

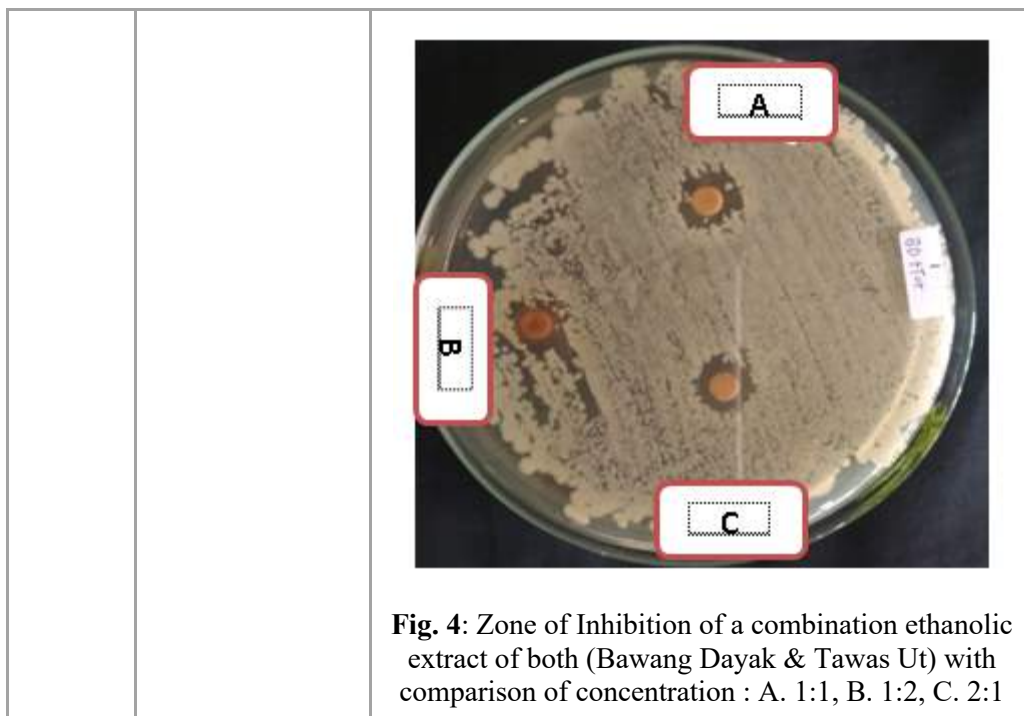


**Fig. 2:** Zone of Inhibition of ethanolic extract Tawas Ut (*Ampelocissus* Sp): A. concentration is 50 mg/ml, B. concentration is 25 mg/ml



**Fig. 3:** Zone of Inhibition of ethanolic extract Bawang Dayak (*Eleutherine* Sp): A. concentration is 50 mg/ml, B. concentration is 25 mg/ml





**Fig. 4:** Zone of Inhibition of a combination ethanolic extract of both (Bawang Dayak & Tawas Ut) with comparison of concentration : A. 1:1, B. 1:2, C. 2:1

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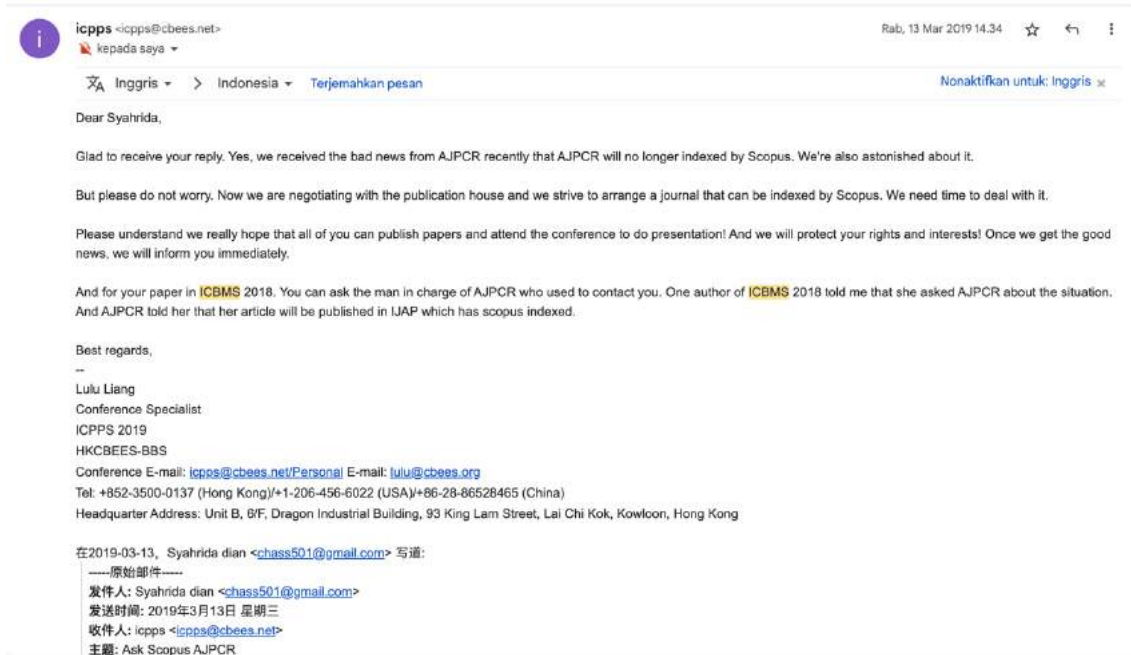
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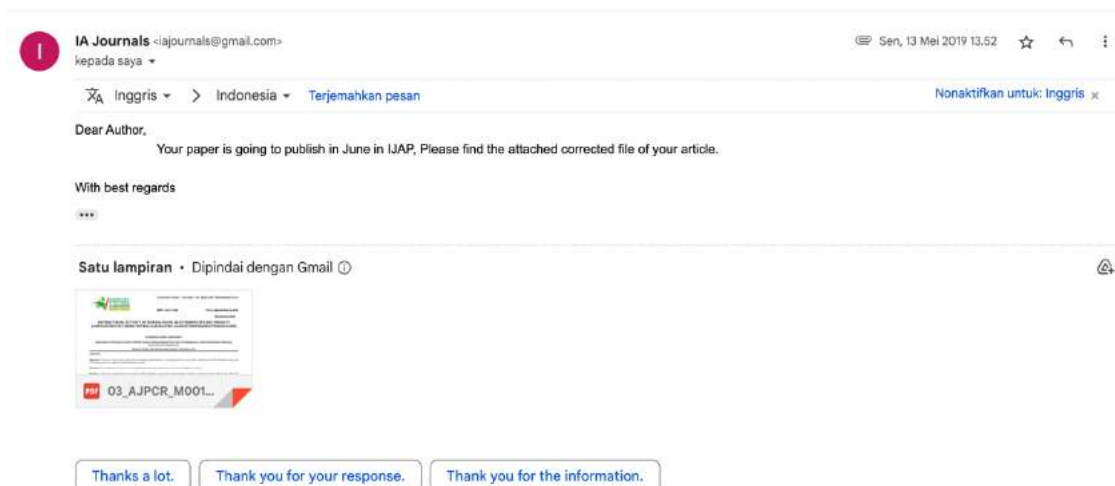
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6. Article for final proof (IJAP)



Research Article

**ANTIBACTERIAL ACTIVITY OF BAWANG DAYAK (*ELEUTHERINE SP.*) AND TAWAS UT (*AMPELOCISSUS SP.*) FROM CENTRAL KALIMANTAN AGAINST PROPIONIBACTERIUM ACNES**

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Received: 05 June 2018, Revised and Accepted: 16 February 2019

**ABSTRACT**

**Objective:** The aim of the present study was to investigate phytochemical screenings and the *in vitro* effect antibacterial of BD (*Eleutherine Sp.*) and TU (*Ampelocissus Sp.*) against *Propionibacterium acnes*.

**Methods:** The antibacterial activity was investigated against *Propionibacterium acnes* by well diffusion method.

**Results:** Preliminary phytochemical screenings of BD ethanolic extract were found positive alkaloid, saponin, tannins, and steroid while TU positive flavonoid, saponin, tannins, steroid, and triterpenoid. Antibacterial activity against *Propionibacterium acnes* of ethanolic extract BD with concentration 25 mg/ml and 50 mg/ml showed the zone of inhibition 3.23 mm and 7.8 mm with category weak activity while ethanolic extract TU with same concentration showed zone of inhibition 10 mm (weak activity) and 16.3 mm (moderate activity) which mean ethanolic extract TU have better antibacterial activity. A combination ethanolic extract of both with variant ratio showed a zone of inhibition 6.7 mm (1:1), 3.9 mm (1:2), and 3.63 mm (2:1).

**Conclusion:** In this present study showed the highest potential antibacterial activity against *propionibacterium acnes* is an ethanolic extract of TU and The best ratio combination is 1:1. Furthermore, this study needs more research with variant concentration so that may be possible to be used as natural anti-acne formulations.

**Keywords:** *Ampelocissus*, Antibacterial, *Eleutherine*, *Propionibacterium acnes*.

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**INTRODUCTION**

During the second half of the 20<sup>th</sup> century, the acceptance of traditional medicine as an alternative form of health care and the development of microbial resistance to the classical antibiotics led researchers to investigate the antimicrobial activities of medicinal plants. Antimicrobials of plant origin have the enormous therapeutic potential [1], they are effective in the treatment of infectious diseases while simultaneously mitigating many of the side effects that are often associated with synthetic antimicrobials.

Red bulb plant or "bawang dayak" (*Eleutherine Americana* Merr.) have been widely used as traditional medicine. Empirically the local community of Central Kalimantan, bulb of the plants has been used against cancer, antidiabetic, antifungal, and anti-inflammation. Studies demonstrated that bulbs of *Eleutherine* (*E. bulbosa* and *E. Americana*) contain naphthoquinones (elecanacine, eleutherine, eleutherol, and eleutherinone) [2-6]. Tawas ut (*Ampelocissus rubiginosa*) tubers empirically were used by Palangka Raya people in Central Kalimantan for treating malaria. Research from Arnida *et al.* [7] Tawas ut (*A. rubiginosa*) tubers in *in vitro*, antiplasmodial activity was active.

Medicinal plants are known to contain several compounds with antimicrobial properties, and the uses of these types of compounds are being increasingly reported from different parts of the world [8]. Combination of antimicrobial agents had expressed significant interactions and two or more compounds interact to produce mutual enhancement, amplification of each other's effects when combined. These combinations could enhance the efficacy of the other antimicrobial agents and acted as an alternative to treating infections caused by multidrug-resistant microorganisms having no effective therapy [9,10]. Some of the bioactive compounds could hinder the life processes of

disease-causing bacteria, either by itself or in combination with other therapeutic agents [11]. Therefore, an attempt has been made to study the preliminary phytochemicals screenings and antibacterial activity of bawang dayak (*Eleutherine Sp.*), tawas ut (*Ampelocissus Sp.*), and a combination of both.

**METHODS**

The materials procured for this *in vitro* test compounds were bawang dayak (*Eleutherine bulbosa*) and Tawas ut (*A. rubiginosa*). The test bacteria were *Propionibacterium acnes*, and Mueller-Hinton agar (MHA) plate was used.

**Preparation of plant extracts**

The healthy and fresh bulb of the plant bawang dayak (*Eleutherine bulbosa*) and root of Tawas ut (*A. rubiginosa*) were bought from a traditional market in Palangka Raya, Central Kalimantan. The plant materials were dried under the sun for 5-7 days. The dried plant materials were crushed by grinder without adding any solvent into it. The powder of the plant materials was extracted with 70% ethanol using a Soxhlet extractor and once the process was finished, all extracts were concentrated in a rotary evaporator.

**Phytochemicals screening**

The prepared extract was subjected to phytochemical screening to detect the presence/absence of secondary metabolites [12].

**Evaluation of antimicrobial activity by a zone of inhibition by well diffusion method**

The bacterial isolates were subcultured into a nutrient broth. The 24-h-old bacterial culture was standardized using McFarland standard [ $10^6$  cfu/mL of 0.5 McFarland standard].

MHA was used for bacteria bioassay. MHA was prepared by dissolving 38 g in 1000 ml of distilled water and brought to boil to completely dissolve. Sterilization was achieved by autoclaving at 121°C for 15 min [13].

MHA plates were prepared, and bacterial strains were inoculated by cotton swab and then antibiotic and extract with various concentration applied in it. The plates were incubated at 37°C for 24 h, and the zone of inhibition was measured [14] and recorded later on.

**RESULTS AND DISCUSSION**

**Preliminary phytochemical screenings**

In general, secondary metabolites compound is widely distributed in plants and contribute significantly toward biological activities or pharmacological effects including antibacterial and antioxidant. In this present study ethanolic extract Bawang Dayak (*Eleutherine Sp*) and ethanolic extract Tawas Ut (*Ampelocissus Sp*) could be potential antibacterial against *Propionibacterium acnes*. Furthermore, this study needs more research with variant concentration so that may be possible to be used as natural anti-acne formulations.

Tannins have amazing stringent properties. They are known to hasten the healing of wounds and inflamed mucous membranes [15], it is good for













anti-acne agent. Furthermore, flavonoids as a potent antioxidant which prevent oxidative cell damage and terpenoids are also known to possess antimicrobial and antifungal properties. The preliminary phytochemical screening of ethanolic extracts of bawang Dayak (*Eleutherine Sp*) dan Tawas Ut (*Ampelocissus Sp*) mainly revealed the presence of flavonoid, alkaloid, saponin, tannin, steroid and triterpenoid (Table 1).

**Antibacterial activity**

In few last decades, there has been especial interest in the use of abundant naturally occurring antimicrobials and antioxidants such as plants, fruits for medicinal applications. In the present study was conducted antibacterial evaluations of ethanolic extract Bawang Dayak (*Eleutherine Sp.*), ethanolic extract Tawas Ut (*Ampelocissus Sp.*), and a combination of both. The antimicrobial activities can be classified into three levels [18]: Weak activity (inhibition zone <12 mm), moderate activity (inhibition zone between 12 and 20 mm), and strong activity (inhibition zone >20 mm). The results of antimicrobial activity revealed that significant antibacterial activity showed against *Propionibacterium acnes* in comparison with positive control or standards clindamycin (Table 2) Fig 1.

The highest anti-acne effect was found for ethanolic extract TU (*Ampelocissus Sp.*) with 16.3 mm zone of inhibition which means moderate activity Fig 2, while BD (*Eleutherine Sp.*) has a low zone

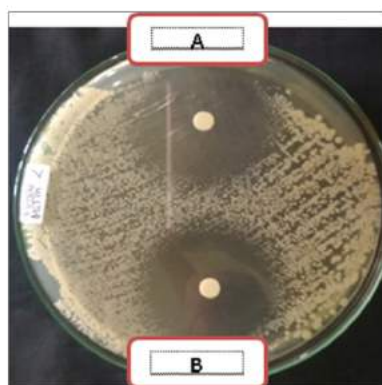
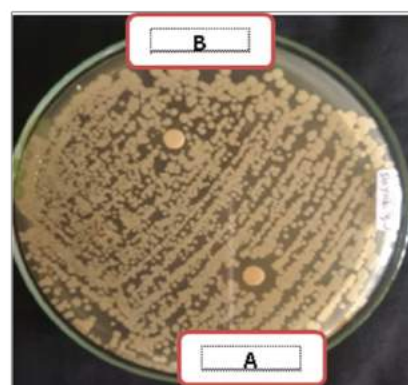
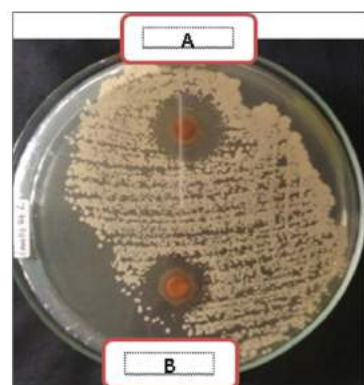
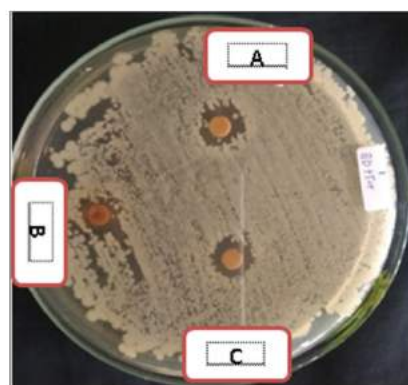
**Table 1: Secondary metabolites of an ethanolic extract of Bawang Dayak (*Eleutherine Sp.*) and Tawas Ut (*Ampelocissus Sp.*)**

Secondary metabolites	Ethanolic extract of bawang dayak ( <i>Eleutherine Sp.</i> )	Ethanolic extract of tawas Ut ( <i>Ampelocissus Sp.</i> )	References
Flavonoid	- 	+ 	The presence of flavonoids was indicative if pink or magenta-red color developed within 3 min [16].
Alkaloid	+ 	- 	The samples were then observed for the presence of turbidity or precipitation [16].
Saponin	+ 	+ 	The presence of saponin was positive if froth ≥1.2 cm [16].
Tannins	+ 	+ 	Positive tests are confirmed by the addition of the FeCl <sub>3</sub> solution to the extract and should result in a characteristic blue, blue-black, green or blue-green color and precipitate (phenolic compounds) [16].
Steroid	+ 	+ 	Formation of red color ring confirmed the presence of steroid [17].
Triterpenoid	- 	+ 	If reddish violate color appeared, the existence of triterpenoids was confirmed [17].



**Table 2: Antibacterial against Propionibacterium acnes effect of positive control, ethanolic extract BD (*Eleutherine Sp.*), ethanolic extract TU (*Ampelocissus Sp.*) and a combination of both by well diffusion method**

Name of sample	Concentration (mg/ml)	Zone of inhibition (mm)			X±SD
		I	II	III	
Clindamycin (positive control)	25	30.9	29.5	30.6	30.3±0.74
	50	33.5	36.5	30.8	33.6±2.85
BD ( <i>Eleutherine Sp.</i> )	25	3.5	2.2	4	3.2±0.93
	50	6.1	6.7	10.6	7.8±2.44
TU ( <i>Ampelocissus Sp.</i> )	25	7.5	10.6	11.9	10.0±2.26
	50	18.8	12.7	17.3	16.3±3.18
Combination BD+TU	1:1 (25:25)	5.5	4.7	9.9	6.7±2.80
	1:2 (25:50)	4.5	4.3	2.9	3.9±0.87
	2:1 (50:25)	3.3	3.7	3.9	3.63±0.31

**Fig. 1: Zone of Inhibition of Clindamycin (Positive Control): A. concentration is 50 mg/ml, B. concentration is 25 mg/ml****Fig. 3: Zone of Inhibition of ethanolic extract Bawang Dayak (*Eleutherine Sp.*): A. concentration is 50 mg/ml, B. concentration is 25 mg/ml****Fig. 2: Zone of Inhibition of ethanolic extract Tawas Ut (*Ampelocissus Sp.*): A. concentration is 50 mg/ml, B. concentration is 25 mg/ml****Fig. 4: Zone of Inhibition of a combination ethanolic extract of both (Bawang Dayak & Tawas Ut) with comparison of concentration : A. 1:1, B. 1:2, C. 2:1**

of inhibition with the same concentration (50 mg/ml) Fig 3 but it is can be potential strong activity if the concentration was increased so ethanol extract TU (*Ampelocissus Sp.*) and this requires further research. Difference zone of inhibition is possible due to the content of triterpenoid and flavonoid in Tawas Ut (*Ampelocissus Sp.*) so zone of inhibition larger than Bawang Dayak (*Eleutherine Sp.*). One study stated that plants containing terpenoid showed a significant inhibitory activity of bacteria. Terpenoid compound treated microbes resulted in the leakage of reducing sugars and

proteins through the membrane. It also induced the activity of respiratory chain dehydrogenase. Therefore, it was justified that terpenoid compound was able to destroy the permeability of the bacterial membrane [19]. Flavonoid significantly contributed to the antibacterial properties [20].

Test of combination ethanolic extract Bawang dayak (*Eleutherine Sp.*) and ethanolic extract Tawas Ut was also done by comparison. The

highest zone of inhibition is ratio 1:1 with the same concentration (25 mg/ml) in weak activity category (6.7 mm) Fig 4 but still has potential as antibacterial against *Propionibacterium acnes* and may be better inhibitory if given a concentration >25 mg/ml which will later be the basis of further research.

#### CONCLUSION

Ethanol extract Bawang Dayak (*Eleutherine* Sp.), ethanol extract Tawas Ut (*Ampelocissus* Sp.) and a combination of both can be potential antibacterial effects against *Propionibacterium acnes*. Ethanol extract Tawas Ut (*Ampelocissus* Sp.) are containing flavonoid, saponin, tannins, steroid, and triterpenoid have a larger zone of inhibition than the ethanol extract of Bawang Dayak (*Eleutherine* Sp.) that are containing alkaloid, saponin, tannins, and steroid. The greatest ratio combination of both is 1:1 (25 mg/ml). Furthermore, this present study needs more research by raising the concentration or with variant concentration so that may be possible to be used as natural anti-acne formulations.

#### ACKNOWLEDGMENT

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#### REFERENCES

- Cowan MM. Plant products as antimicrobial agents. *Clin Microbiol Rev* 1999;12:564-82.
- Hara H, Maruyama N, Yamashita S, Hayashi Y, Lee KH, Bastow KF, et al. Elecanacin, a novel new naphthoquinone from the bulb of *Eleutherine americana*. *Chem Pharm Bull* 1997;45:1714-6.
- Alves TM, Kloos H, Zani CL. Eleutherinone, a novel fungitoxic naphthoquinone from *Eleutherine bulbosa* (Iridaceae). *Mem Inst Oswaldo Cruz* 2003;98:709-12.
- Jinzhong X, Feng Q, Wenjuan D, Gexia Q, Naili W, Xinsheng Y. New bioactive constituents from *Eleutherine americana*. *Chem J China* 2006;26:320-3.
- Nielsen LB, Wege D. The enantioselective synthesis of elecanacin through an intramolecular naphthoquinone-vinyl ether photochemical cycloaddition. *Org Biomol Chem* 2006;4:868-76.
- Han AR, Min HY, Nam JW, Lee NY, Wiryawan A, Suprpto W, et al. Identification of a new naphthalene and its derivatives from the bulb of *Eleutherine americana* with inhibitory activity on lipopolysaccharide-induced nitric oxide production. *Chem Pharm Bull (Tokyo)* 2008;56:1314-6.
- Arnida A, Wahyomo W, Mustofa M, Asmahusidarti R. *In vitro* antiplasmodial activity of ethanol extracts of borneo medicinal plants (*Hydrolea spinosa*, *Ampelocissus rubiginosa*, *Urtica crinita*, *Angiopteris evecta*). *Int J Pharm Pharm Sci* 2015;7:72-5.
- El-Shouny WA, Nanis GA, Maha AE, Afwat MH. Antibacterial response of combination between antibiotics and some plant extracts against multidrug resistant bacteria. *Adv Biol Res* 2016;10:51-7.
- Kamatou GP, Viljoen AM, van Vuuren SF, van Zyl RL. *In vitro* evidence of antimicrobial synergy between *Salvia chamaedryfolia* and *Leonotis leonurus*. *South Afr J Bot* 2006;72:634-6.
- Aiyegoro O, Adewusi A, Oyedemi S, Akimpelu D, Okoh A. Interactions of antibiotics and methanolic crude extracts of *Azela africana* (Smith.) against drug resistance bacterial isolates. *Int J Mol Sci* 2011;12:4477-503.
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- Bama SS, Kingsley JS, Karanarayanan SS, Bama P. Antibacterial activity of different phytochemical extracts from the leaves of *T. Procumbens* Linn.: Identification and mode of action of the terpenoid compound as antibacterial. *Int J Pharm Pharm Sci* 2012;4 Suppl 1:557-64.
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Department of Pharmacy Faculty of Health Science, Muhammadiyah University of Palangkaraya, Central Kalimantan, Indonesia

DOI: <https://doi.org/10.22159/ijap.2019.v11s3.M0010>

Keywords: Ampelocissus, Antibacterial, Eleutherine, Propionibacterium acnes

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ANTIBACTERIAL ACTIVITY OF BAWANG  
DAYAK (ELEUTHERINE SP.) AND TAWAS

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## INTRODUCTION

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Medicinal plants are known to contain several compounds with antimicrobial properties and the uses of these types of compounds are being increasingly reported from different parts of the world [8]. Combination of antimicrobial agents had expressed significant interactions and two or more compounds interact to produce mutual enhancement, amplification of each other's effects when combined. These combinations could enhance the efficacy of the other antimicrobial agents and acted as an alternative to treating infections caused by multidrug-resistant microorganisms having no effective therapy [9,10]. Some of the bioactive compounds could hinder the life processes of disease-causing bacteria, either by itself or in combination with other therapeutic agents [11]. Therefore, an attempt has been made to study the preliminary phytochemicals screenings and antibacterial activity of bawang dayak (*Eleutherine* Sp), tawas ut (*Ampelocissus* Sp) and a combination of both.

## MATERIAL AND METHODS

The materials procured for this in vitro test compounds were bawang dayak (*Eleutherine bulbosa*) and Tawas ut (*Ampelocissus rubiginosa*). The test bacteria were *Propionibacterium acnes* and Mueller Hinton agar plate was used.

### Preparation of Plant extracts

The healthy and fresh bulb of the plant bawang dayak (*Eleutherine bulbosa*) and a root of Tawas ut (*Ampelocissus rubiginosa*) was bought from a Traditional market in Palangka Raya, Central Kalimantan. The plant materials were dried under the sun for 5-7 days. The dried plant materials were crushed by grinder without adding any solvent into it. The powder of the plant materials was extracted with 70% ethanol by using a soxhlet extractor and once the process was finished all extracts were concentrated in a rotary evaporator.

### Phytochemicals screening

The prepared extract was subjected to phytochemical screening to detect the presence/absence of secondary metabolites [12]

### Evaluation of Antimicrobial Activity by Zone of Inhibition by Well Diffusion Method

The bacterial isolates were subcultured into a nutrient broth. The 24-hour-old bacterial culture was standardized using McFarland standard (10<sup>6</sup>cfu/mL of 0.5 McFarland standard).

Mueller Hinton Agar (MHA) was used for bacteria bioassay. MHA was prepared by dissolving 38g in 1000ml of distilled water and brought to boil to completely dissolve. Sterilization was achieved by autoclaving at 121° C for 15 minutes [13].

MHA plates were prepared and bacterial strains were inoculated by cotton swab and then antibiotic and extract with various concentration applied in it. The plates were incubated at 37° C for 24 hours and the zone of inhibition was measured [14] and recorded later on.





## RESULTS AND DISCUSSION









### Preliminary phytochemical screenings

In general secondary metabolites compound are widely distributed in plants and contribute significantly toward biological activities or pharmacological effects including antibacterial, antioxidant, etc. In this present study showed secondary metabolites that ethanolic extract of Bawang Dayak (*Eleutherine Sp*) positive alkaloid, saponin, tannins and steroid while ethanolic extract of Tawas Ut (*Ampelocissus Sp*) positive flavonoid, saponin, tannins, steroid and triterpenoid.

Tannins have amazing stringent properties. They are known to hasten the healing of wounds and inflamed mucous membranes [15], it is good for anti acne agent. Furthermore flavonoids as a potent antioxidant which prevent oxidative cell damage and terpenoids are also known to possess antimicrobial dan antifungal properties. The preliminary phytochemical screening of ethanolic extracts of bawang Dayak (*Eleutherine Sp*) dan Tawas Ut (*Ampelocissus Sp*) mainly revealed the presence of flavonoid, alkaloid, saponin, tanin, steroid and triterpenoid (Table 1).

**Table 1.** Secondary Metabolites of an Ethanolic extract of Bawang Dayak (*Eleutherine Sp*) & Tawas Ut (*Ampelocissus Sp*).

Secondary Metabolites	Ethanolic extract of Bawang Dayak ( <i>Eleutherine Sp</i> )	Ethanolic extract of Tawas Ut ( <i>Ampelocissus Sp</i> )	References
Flavonoid	- 	+ 	The presence of flavonoids was indicative if pink or magenta-red color developed within 3 min [16].
Alkaloid	+ 	- 	The samples were then observed for the presence of turbidity or precipitation [16].

Saponin	+		+		The presence of saponin was positive if froth $\geq$ 1.2 cm [16].
Tannins	+		+		Positive tests are confirmed by the addition of the FeCl <sub>3</sub> solution to the extract and should result in a characteristic blue, blue black, green or bluegreen color and precipitate (phenolic compounds) [16].
Steroid	+		+		Formation of red colour ring confirmed the presence of steroid [17].
Triterpenoid	-		+		If reddish violate colour appeared, the existence of triterpenoids was confirmed [17].

### Antibacterial activity

In few last decades, there has been especial interest in the use of abundant naturally occurring antimicrobials and antioxidants such as plants, fruits for medicinal applications. In the present study was conducted antibacterial evaluations of ethanolic extract Bawang Dayak (*Eleutherine Sp*), ethanolic extract Tawas Ut (*Ampelocissus Sp*) and a combination of both. The antimicrobial activities can be classified into three levels [18]: weak activity (inhibition zone lower than 12 mm), moderate activity (inhibition zone between 12 and 20 mm) and strong activity (inhibition zone higher than 20 mm). The results of antimicrobial activity revealed that significant antibacterial activity was showed against *Propionibacterium acnes* in comparison with positive control or standards clindamycin (Table 2).

The highest anti acne effect was found for ethanolic extract TU (*Ampelocissus Sp*) with 16.3 mm zone of inhibition which means moderate activity, while BD (*Eleutherine Sp*) has a low zone of inhibition with the same concentration (50 mg/ml) but it is can be potential strong activity if the concentration was increased so are ethanol extract TU (*Ampelocissus Sp*) and this requires further research. Difference zone of inhibition is possible because of the content of triterpenoid and flavonoid in Tawas Ut (*Ampelocissus Sp*) so zone of inhibition larger than Bawang Dayak (*Eleutherine Sp*). One study stated that plants containing terpenoid showed a significant inhibitory activity of bacteria. Terpenoid compound treated microbes resulted in the leakage of reducing sugars and proteins through the membrane. It also induced the activity of respiratory chain dehydrogenase. Therefore it was justified that terpenoid compound was able

to destroy the permeability of the bacterial membrane. [19]. Flavonoid significantly contributed to the antibacterial properties [20].

Test of combination ethanolic extract Bawang dayak (*Eleutherine Sp*) and ethanolic extract Tawas Ut was also done by comparison. The highest zone of inhibition is ratio 1:1 with the same concentration (25 mg/ml) in weak activity category (6.7 mm) but still has potential as antibacterial against *propionibacterium acnes* and may be better inhibitory if given a concentration greater than 25 mg/ml which will later be the basis of further research.

**Table 2.** Antibacterial against *Propionibacterium acnes* effect of positive control, ethanolic extract BD (*Eleutherine Sp*), ethanolic extract TU (*Ampelocissus Sp*) and a combination of both by well diffusion method

Name of Sample	Concentration (mg/ml)	Zone of Inhibition (mm)			$\bar{X} \pm SD$
		I	II	III	
Clindamycin (Positive Control)	25	30.9	29.5	30.6	$30.3 \pm 0.74$
	50	33.5	36.5	30.8	$33.6 \pm 2.85$
BD ( <i>Eleutherine Sp</i> )	25	3.5	2.2	4	$3.2 \pm 0.93$
	50	6.1	6.7	10.6	$7.8 \pm 2.44$
TU ( <i>Ampelocissus Sp</i> )	25	7.5	10.6	11.9	$10.0 \pm 2.26$
	50	18.8	12.7	17.3	$16.3 \pm 3.18$
Combination BD + TU	1:1 (25:25)	5.5	4.7	9.9	$6.7 \pm 2.80$
	1:2 (25:50)	4.5	4.3	2.9	$3.9 \pm 0.87$
	2:1 (50:25)	3.3	3.7	3.9	$3.63 \pm 0.31$

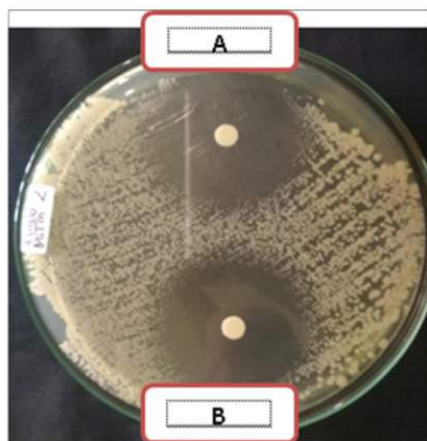


Fig. 1: Zone of Inhibition of Clindamycin (Positive Control): A. concentration is 50 mg/ml, B. concentration is 25 mg/ml

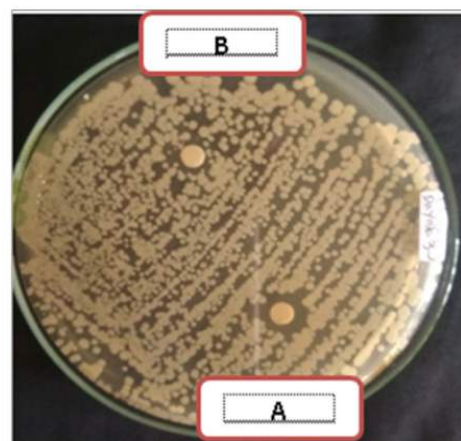


Fig. 3: Zone of Inhibition of ethanolic extract Bawang Dayak (*Eleutherine Sp*): A. concentration is 50 mg/ml, B. concentration is 25 mg/ml

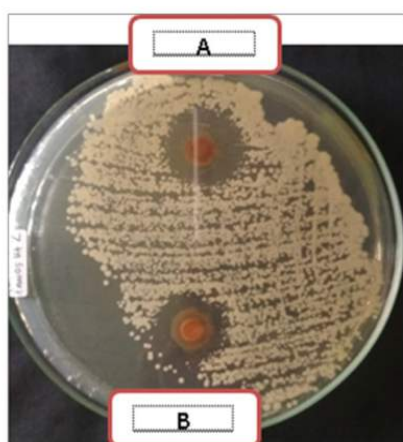


Fig. 2: Zone of Inhibition of ethanolic extract Tawas Ut (*Ampelocissus Sp*): A. concentration is 50 mg/ml, B. concentration is 25 mg/ml

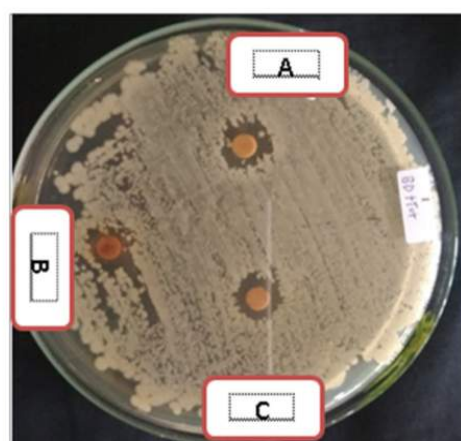


Fig. 4: Zone of Inhibition of a combination ethanolic extract of both (Bawang Dayak & Tawas Ut) with comparison of concentration : A. 1:1, B. 1:2, C. 2:1

## CONCLUSION

Ethanollic extract Bawang Dayak (*Eleutherine Sp*), ethanollic extract Tawas Ut (*Ampelocissus Sp*) and a combination of both can be potential antibacterial effects against propionibacterium acnes. Ethanollic extract Tawas Ut (*Ampelocissus Sp*) are containing flavonoid, saponin, tannins, steroid and triterpenoid have a larger zone of inhibition than the ethanollic extract of Bawang Dayak (*Eleutherine Sp*) that are containing alkaloid, saponin, tannins and steroid. The greatest rasio combination of both is 1:1 (25 mg/ml). Furthermore this present study needs more research by raising the concentration or with variant concentration so that may be possible to be used as natural anti acne formulations.

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## REFERENCES

1. Cowan, M.M. Plant products as antimicrobial agents. *Clin Microbiol Rev* 1999; 12 (4): 564-582
2. Hara H, Maruyama N, Yamashita S, Hayashi Y, Lee KH, Bastow KF, Chairul, Marutomo R, Imakura Y. Elecanacin, a novel new naphthoquinone from the bulb of *Eleutherine Americana*. *Chem Pharm Bull* 1997; 45:1714-1716
3. Alves TMA, Helmut K, Carlos LZ, Eleutherinone a novel fungitoxic naphthoquinone from *Eleutherine bulbosa* (Iridaceae). *Mem Ins Oswaldo Cruz Rio de Janeiro* 2003; 98: 709-712
4. Jinzhong X, Feng Q, Wenjuan D, Gexia Q, Naili W, Xinsheng Y. New Bioactive Constituents from *Eleutherine Americana*. *Chem j Chin* 2006; 26: 320-323
5. Nielsen LB and Wege D. The Enantioselective Synthesis of Elecanacin through an intramolecular naphthoquinone-vinyl ether photochemical cycloaddition. *Org Biomol Chem* 2006; 4: 868-876
6. Han AR, Min HY, Nam JW, Lee NY, Wiryawan A, Suprpto W, Lee SK, Lee KR, Seo Ek. Identification of a new naphthalene and Its derivatives from the bulb of *Eleutherine Americana* with inhibitory activity on lipopolysaccharide-induced nitric oxide production. *Chem Pharm Bull* 2008; 56: 1314-1316
7. Arnida, Wahyono, Mustofa, Asmahsusidarti R. In vitro antiplasmodial activity of ethanol extracts of borneo medicinal plants (*Hydroleaspinosa*, *Ampelocissusrubiginosa*, *Uraria crinite*, *Angiopterisevecta*). *Int J Pharm Pharm Sci* 2015; Vol.7 Issue 5
8. El-Shouny W.A.E, Nanis G. A, Maha A.E.K and Afwat M.H. Antibacterial response of combination between antibiotics and some plant extracts against multidrug resistant bacteria. *Adv Bio Res* 2016; 10 (1): 51-57
9. Kamatou, G.P.P, Viljoen A.M, van Vuuren S.F. and van Zyl R.L. In vitro evidence of antimicrobial synergy between *Salvia chamelaegana* and *Leonotis leonurus*, *South Afr. J Bot* 2006; 72 (4): 634-636
10. Aiyegoro, O., Adewusi A, Oyedemi S, Akinpelu D and Okoh A. Interactions of antibiotics and methanolic crude extracts of *Azzeria Africana* (Smith) against drug resistance bacterial isolates. *Int J.Mol. Sci* 2011; 12 (7): 4477-4503



11. Sivananthan, M. Antibacterial activity of 50 medicinal plants used in folk medicine. *Int J Biosci* 2013; 3 (4) :104-121
12. Kaur Darshpreet and Prasad SB. Anti-acne activity of acetone extract of *Plumbago Indica* Root, *Asian J Pharm Clin Res* 2016; Vol. 9 Issue 2: 285- 287
13. Mhatre, J, Smita N, Shraddha K. Formulation and Evaluation of Antibacterial Activity of a Herbal Ointment Prepared from Crude Extracts of *Aegle marmelos*, (BAEL), *Int J Pharm Pharm Sci* 2014; Vol.6. suppl 2
14. Bhalodia NR and Shukla VJ. Antibacterial and antifungal activities from leaf extracts of *Cassia fistula* l.: An ethnomedicinal plant, *J Adv Pharma Tech Res* 2011; Vol. 2 Issue 2: 104-109
15. Yadav M., Chatterji S., Gupta S.K. and Watal G. Preliminary Phytochemical Screening of Six Medicinal Plants Used in Traditional Medicine, *Int J Pharm Pharm Sci* 2014; Vol.6 Issue 5:539-542
16. Mojab F, Kamalinejad M, Ghaderi N and Vahidipour H R. Phytochemical Screening of Some Species of Iranian Plants. *Iranian J Pharm Res* 2003; 2:77-82
17. Ghosal M and Mandal P. Phytochemical Screening and Antioxidant Activities of Two Selected 'Bihi' Fruits used as Vegetables in Darjeeing Himalaya. *Int J Pharm Pharm Sci* 2012; Vol. 4 Issue 2:567-574
18. Shahbazi Y. Antibacterial and Antioxidant Properties of Methanolic Extracts of Apple (*Malus pumila*), Grape (*Vitis vinifera*), Pomegranate (*Punica granatum* L.) and Common Fig (*Ficus carica* L.) Fruits. *Pharm Sci* 2017; 23: 308-315
19. Bama S.S., Kingsley J.S., Karanarayanan S.S., Bama P. Antibacterial Activity of Different Phytochemical Extracts from The Leaves of *T.Procumbens* Linn.: Identification and Mode of Action of The Terpenoid Compound as Antibacterial, *Int J Pharm Pharm Sci* 2012; Vol.4 Suppl 1:557-564
20. Alghazeer R, Elmansori A, Sidati M, Gammoudi F, Azwai S, Naas H, Garbaj A, Eldaghayes I. In Vitro Antibacterial Activity of Flavonoid Extracts of Two Selected Libyan Algae Against Multi Drug Resistant Bacteria Isolated from Food Products, *J Bio Med* 2017;5:26-28



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Perihal : Rekomendasi Penelitian

Sehubungan dengan telah dilaksanakannya sidang Etik Penelitian kepada:

Nama : Syahrída Dian Ardhaný  
NIK : 14.0601.033  
Judul : Uji aktivitas antibakteri Bawang Dayak (*Eleutherine Sp.*) dan Tawasut (*Ampelocissus Sp.*) asal Kalimantan Tengah terhadap *Propionibacterium acnes*

Telah **DISETUJUI** untuk dilanjutkan penelitiannya.

Demikian surat persetujuan ini diterbitkan untuk dipergunakan dengan penuh tanggung jawab.

Menyetujui

An. Ketua

Sekretaris Komite Etik Penelitian



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