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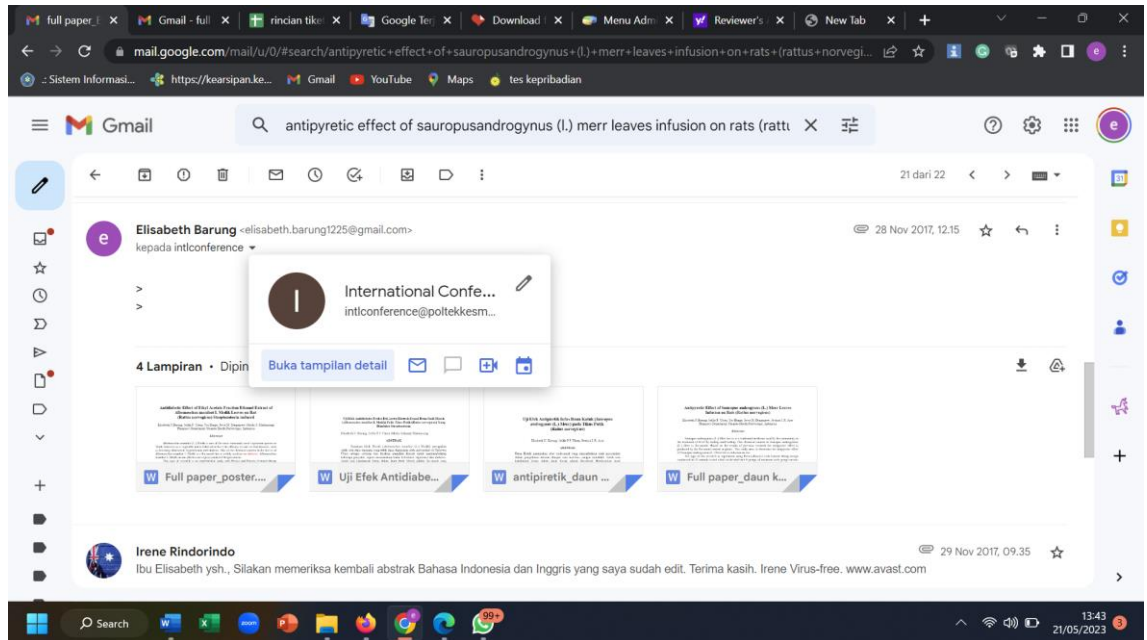
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# Uji Efek Antipiretik Infus Daun Katuk (*Sauropus androgynus* (L.) Merr) pada Tikus Putih (*Rattus norvegicus*)

Elisabeth N. Barung, Selfie P.J. Ulaen, Jestisia I. R. Aror

## ABSTRAK

Daun Katuk merupakan obat tradisional yang dimanfaatkan oleh masyarakat dalam pengobatan demam dengan cara merebus sampai mendidih. Salah satu kandungan kimia dalam daun Katuk adalah flavonoid. Berdasarkan hasil penelitian sebelumnya efek antipiretik dihasilkan oleh karena kandungan flavonoid dalam tumbuhan. Penelitian ini bertujuan untuk mengetahui efek antipiretik infus daun Katuk pada tikus putih.

Jenis penelitian ini adalah eksperimen dengan menggunakan design *Pretest-Posttest with Control Group* yang dilakukan pada 15 ekor hewan uji tikus putih yang dibagi menjadi 3 kelompok perlakuan tiap kelompok terdiri dari 5 ekor tikus putih yakni kelompok kontrol negatif, kelompok infus daun Katuk 8 % dan kelompok kontrol positif. Sebelum diberikan perlakuan, tikus putih dibuat demam dengan menyuntikkan pepton 20 % secara intraperitoneal dengan syarat kenaikan suhu 1,5 °C dari suhu awal. Pengumpulan data diperoleh dari hasil pengukuran suhu tubuh tikus sebelum perlakuan dan setiap 1 jam selama 4 jam waktu pengamatan setelah perlakuan. Hasil pengukuran suhu dianalisa secara deskriptif yang disajikan dalam bentuk grafik dan dianalisa secara statistik menggunakan uji *one way anova*.

Hasil penelitian menunjukkan ada pengaruh pemberian perlakuan pada tikus putih ( $p < 0,05$ ), sehingga dapat disimpulkan bahwa infus daun Katuk 8 % memiliki efek antipiretik.

**Kata Kunci** : Antipiretik, Flavonoid, Infus Daun Katuk

Pendahuluan

Daun Katuk (*Sauropus androgynus* (L.) Merr) merupakan obat tradisional yang dikenal masyarakat karena khasiatnya yang dapat memperlancar produksi ASI, selain itu daun Katuk juga dimanfaatkan oleh masyarakat dalam pengobatan demam (Obi, 2015). Pengobatan demam dengan menggunakan daun Katuk, di masyarakat dibuat dengan cara merebus sampai mendidih 15-30 gram daun Katuk segar menggunakan 1 gelas air bersih, dan diminum 2-3 kali sehari (Hariana, 2015). Kandungan kimia yang terdapat dalam daun Katuk adalah alkaloid, triterpenoid, saponin, tanin galat, steroid, polifenol, glikosida dan flavonoid (Susanti dkk, 2014 ; Ratna dan Sarah, 2016).

Demam adalah suatu reaksi tangkis yang berguna dari tubuh terhadap infeksi. Demam juga adalah suatu gejala dan bukan penyakit tersendiri (Tjay dan Raharja, 2007). Peningkatan suhu tubuh pada keadaan patologik diawali pelepasan suatu zat pirogen endogen atau sitokin seperti interleukin yang memacu pelepasan prostaglandin yang berlebihan di daerah preoptik hipotalamus (Wilmana, 2002).

Menurut penelitian yang dilakukan Adesokan dkk (2008). Efek antipiretik dihasilkan oleh karena kandungan flavonoid dalam tanaman melalui penghambatan sintesis prostaglandin. Flavonoid merupakan senyawa polar yang larut dalam air (Harborne, 1987).

Berdasarkan latar belakang diatas, maka penulis tertarik untuk melakukan penelitian tentang uji efek antipiretik infus daun Katuk (*Sauropus androgynus* (L.) Merr) pada tikus putih (*Rattus norvegicus*).

### Tujuan Penelitian

Untuk mengetahui efek antipiretik infus daun Katuk (*Sauropus androgynus* (L.) Merr) pada tikus putih (*Rattus norvegicus*).

### Pengujian

#### **Pengolahan Sampel**

(*Sauropus androgynus* (L.) Merr) dibersihkan dengan cara dicuci dengan air bersih yang mengalir, setelah itu dikeringkan dengan cara diangin-anginkan tanpa terkena sinar matahari langsung kemudian dihaluskan menggunakan grinder.

#### Prosedur pengujian

- Hewan uji tikus putih dipuaskan makan  $\pm$  8 jam sebelum perlakuan.
- Hewan uji diukur suhu tubuh dengan menggunakan termometer, dicatat sebagai suhu awal ( $t_a$ ).
- Semua hewan uji diinduksi demam dengan cara disuntikkan larutan pepton 20% secara intraperitoneal sebanyak 1 mL/200 g bb tikus putih.

- d. Setelah satu jam penyuntikan larutan pepton 20% diukur suhu tubuh, dicatat sebagai suhu sesudah induksi ( $t_i$ ). Hewan uji dinyatakan demam apabila kenaikan suhu  $>1,5^{\circ}\text{C}$  dari suhu awal.
- e. Setelah suhu sesudah induksi diukur, hewan uji diseleksi berdasarkan kriteria kenaikan suhu yang sesuai untuk perlakuan sebanyak 15 ekor. Hewan uji dibagi menjadi 3 kelompok perlakuan yang terdiri dari masing-masing 5 ekor tikus putih, diberi perlakuan per oral.
- f. Masing-masing kelompok diberikan perlakuan :
  - 1) Kelompok 1 diberikan aquades sebagai kontrol negatif sebanyak 2,5 mL/200 g bb tikus putih
  - 2) Kelompok 2 diberikan suspensi parasetamol sebagai kontrol positif sebanyak 2,5 mL/200 g bb tikus putih
  - 3) Kelompok 3 diberikan infus daun katuk (*Sauropus androgynus* (L.) Merr) konsentrasi 8% sebanyak 2,5 mL/200 g bb tikus putih
- g. Setelah semua hewan uji mendapat perlakuan, dilakukan pengukuran suhu tubuh setiap 1 jam selama 4 jam, dicatat sebagai suhu setelah perlakuan ( $t_1, t_2, t_3, t_4$ ).

## Hasil

Hasil penelitian uji efek antipiretik infus (*Sauropus androgynus* (L.) Merr) terhadap hewan uji tikus putih didapatkan data suhu tubuh sebagai berikut:

Tabel 1. Hasil Pengukuran Suhu Tubuh Tikus Putih Sebelum dan Sesudah Perlakuan

Perlakuan	No. Hewan Uji	Suhu Tubuh Tikus Putih (°C)					
		t <sub>a</sub>	t <sub>i</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>
Infus daun Katuk 8 %	1	36,1	38,0	37,3	36,9	36,3	35,1
	2	35,5	37,0	37,0	36,8	35,9	35,3
	3	35,2	37,1	37,1	36,6	36,1	34,6
	4	35,4	37,0	37,2	36,3	35,6	35,3
	5	35,6	37,9	37,8	37,6	36,6	35,2
	<b>Rerata</b>	35,56	37,40	37,28	36,84	36,10	35,10
Kontrol Positif Suspensi Parasetamol	1	35,7	37,3	36,5	36,1	35,8	35,7
	2	35,0	36,7	36,2	36,1	35,5	34,7
	3	35,3	37,0	36,9	36,8	35,8	35,1
	4	35,3	37,6	36,7	36,0	35,8	34,8
	5	34,9	37,1	36,9	35,7	35,2	34,4
	<b>Rerata</b>	35,24	37,14	36,64	36,14	35,62	34,94
Kontrol Negatif	1	35,2	37,5	37,6	38,5	37,9	36,9
	2	35,2	37,2	37,5	38,0	37,1	37,6
	3	34,6	36,2	37,4	38,0	37,2	36,4
	4	35,0	36,0	36,0	37,1	36,4	36,1
	5	35,2	36,3	36,7	37,6	36,2	35,6
	<b>Rerata</b>	35,04	36,62	37,04	37,84	36,96	36,52

Keterangan :

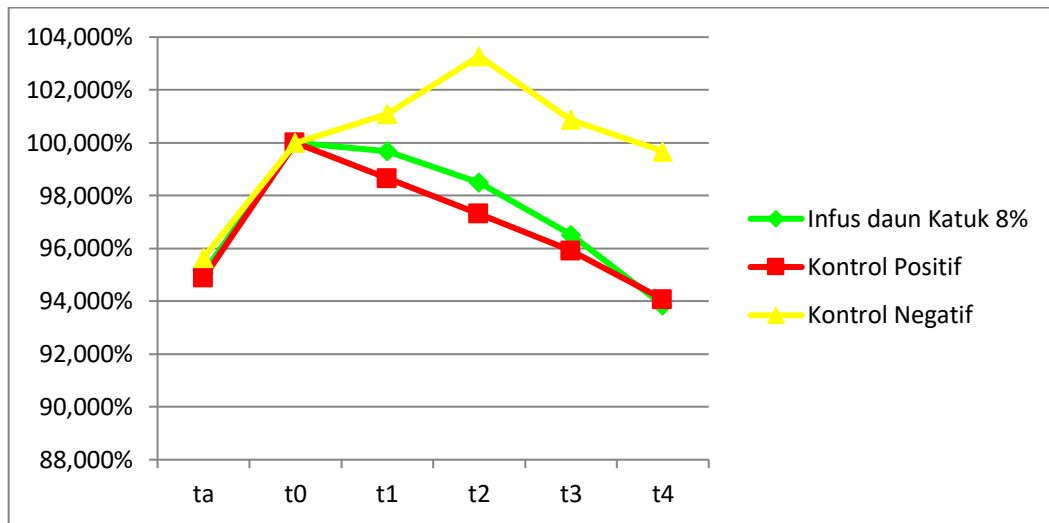
- t<sub>a</sub> : suhu tubuh awal tikus putih  
t<sub>i</sub> : suhu tubuh setelah induksi dengan pepton 20%  
t<sub>1</sub> : suhu tubuh setelah 1 jam perlakuan  
t<sub>2</sub> : suhu tubuh setelah 2 jam perlakuan  
t<sub>3</sub> : suhu tubuh setelah 3 jam perlakuan  
t<sub>4</sub> : suhu tubuh setelah 4 jam perlakuan

Tabel 2. Persentase pengukuran suhu tubuh tikus putih sebelum dan sesudah perlakuan.

Perlakuan	No. Hewan Uji	Persentase Suhu Tubuh Tikus Putih (%)					
		t <sub>a</sub>	t <sub>i</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>
Infus daun Katuk 8 %	1	95	100	98,15	97,10	95,52	92,36
	2	95,94	100	100	99,45	97,02	95,40
	3	94,87	100	100	98,65	97,30	93,26
	4	95,67	100	100,54	98,10	96,21	95,40
	5	93,93	100	99,73	99,20	96,57	92,87
	<b>Rerata</b>	95,082	100	99,684	98,5	96,524	93,858
Kontrol Positif Suspensi Parasetamol	1	95,71	100	97,85	96,78	95,98	95,71
	2	95,36	100	98,63	98,36	96,73	94,55
	3	95,41	100	99,73	99,46	96,75	94,86
	4	93,88	100	97,60	95,74	95,21	92,55
	5	94,07	100	99,46	96,22	94,88	92,72
	<b>Rerata</b>	94,886	100	98,654	97,312	95,910	94,078
Kontrol Negatif	1	93,86	100	100,26	102,66	101,06	98,40
	2	94,62	100	100,80	102,15	99,73	101,07
	3	95,58	100	103,31	104,97	102,76	100,55
	4	97,22	100	100,00	103,05	101,11	100,27
	5	96,96	100	101,10	103,58	99,72	98,07
	<b>Rerata</b>	95,648	100	101,094	103,282	100,876	99,672

Data suhu tubuh tikus putih pada Tabel 2 dapat digambarkan pada grafik di bawah ini.





Grafik 1. Suhu Tubuh Tikus Putih

Hasil pengukuran suhu tubuh tikus putih yang diberikan infus daun Katuk 8 % mengalami penurunan pada jam pertama hingga jam keempat sesudah perlakuan dengan penurunan sebesar 2,3 °C. Penurunan suhu tubuh tikus disebabkan oleh adanya kandungan senyawa flavonoid yang mekanisme kerjanya sama seperti parasetamol yaitu menghambat pembentukan prostaglandin yang merupakan mediator terjadinya demam.

Pemberian kontrol positif menunjukkan penurunan suhu pada jam pertama hingga jam keempat dengan besar penurunan 2,2 °C. Pada kelompok kontrol positif diberikan suspensi parasetamol karena khasiatnya sebagai antipiretik dengan mekanisme kerja menghambat sintesis prostaglandin dan memiliki waktu paruh 1 sampai 4 jam.

Kelompok kontrol negatif diberikan larutan Na CMC 1 % menunjukkan suhu mengalami kenaikan pada t1 sebesar 0,42 °C dan t2 sebesar 0,80 °C kemudian mulai mengalami penurunan pada t3 hingga t4 sebesar 1,32 °C,

Perbedaan efek antipiretik antar semua kelompok perlakuan dianalisa secara statistik dengan menggunakan uji *one way anova*. Hasil dari uji *one way anova* dapat dilihat pada tabel 3.

Tabel 3. Hasil analisa uji *one way anova*

ANOVA					
Suhu tubuh tikus putih					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	636.462	17	37.439	33.71	.000
Within Groups	79.820	72	1.109		

Total	716.282	89
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Berdasarkan hasil uji *one way anova* dengan taraf signifikan 0,05 menunjukkan ada pengaruh pemberian perlakuan pada tikus putih ( $p < 0,05$ ).

Hasil uji statistik sebelum dan sesudah perlakuan dapat dilihat pada tabel 4.

Tabel 4. Hasil Uji Statistitik

Kelompok Perlakuan	Sebelum Perlakuan	Sesudah Perlakuan	Signifikan
Infus daun Katuk 8 %	Infus t0	Infus t1	1.000
		Infus t2	.713
		Infus t3	.000
		Infus t4	.000
Kontrol Positif	Kontrol (+) t0	Kontrol (+) t1	.849
		Kontrol (+) t2	.014
		Kontrol (+) t3	.000
		Kontrol (+) t4	.000
Kontrol Negatif	Kontrol (-) t0	Kontrol (-) t1	.971
		Kontrol (-) t2	.001
		Kontrol (-) t3	.997
		Kontrol (-) t4	1.000

Berdasarkan hasil uji statistik, perbedaan suhu sebelum dan sesudah perlakuan pada kelompok infus daun Katuk terdapat perbedaan yang bermakna ( $p < 0,05$ ) pada t3 dan t4. Pada kelompok kontrol positif menunjukkan adanya penurunan suhu yang bermakna ( $p < 0,05$ ) pada t2, t3 dan t4, sedangkan pada kelompok kontrol negatif terdapat tidak terdapat perbedaan yang bermakna ( $p > 0,05$ ).

## **Kesimpulan**

Berdasarkan hasil penelitian dapat disimpulkan bahwa infus daun Katuk (*Sauropus androgynus* (L.) Merr) 8 % memiliki efek antipiretik.

## **Saran**

1. Perlu Pengujian lebih lanjut untuk mengetahui kandungan dari daun Katuk yang berefek antipiretik.
2. Disarankan untuk melakukan fraksinasi untuk menarik senyawa-senyawa yang berkhasiat antipiretik dalam daun Katuk.

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# **Antipyretic Effect of Sauropus androgynus (L.) Merr Leaves Infusion on Rats (*Rattus norvegicus*)**

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## **Abstract**

Sauropus androgynus (L.) Merr leaves is a traditional medicine used by the community in the treatment of fever by boiling until boiling. One chemical content in Sauropus androgynus (L.) Merr is flavonoids. Based on the results of previous research the antipyretic effect is produced by the flavonoid content in plants. This study aims to determine the antipyretic effect of Sauropus androgynus (L.) Merr leaves infusion on rats.

The type of this research is experiment using Pretest-Posttest with Control Group design conducted on 15 animals tested white rat divided into 3 groups of treatment each group consists of 5 rats ie the negative control group, the infusion group of Sauropus leaves of 8 % and the positive control group. Prior to treatment, rats were febrile by injecting 20% intraperitoneal peptone with a temperature increase of 1.5 ° C from the initial temperature. Data collection was obtained from the results of rat body temperature measurements before treatment and every 1 hour for 4 hours of observation time after treatment. The result of temperature measurement was analyzed descriptively presented in graphical form and analyzed statistically using one way anova test.

The results showed there was effect of treatment on rat ( $p < 0,05$ ), so it can be concluded that infusion 8 % of Sauropus androgynus (L.) Merr leaves have antipyretic effect.

**Keywords:** antipyretic, flavonoids, Sauropus androgynus

## **Introduction**

Sauropus androgynus (L.) Merr leaves is a traditional medicine known to the public because of its usefulness that can facilitate the production of breast milk, in addition Sauropus androgynus (L.) Merr leaves also used by people in the treatment of fever (Obi, 2015). Treatment of fever by using Sauropus androgynus (L.) Merr leaves, in the community is made by boiling until boiling 15-30 grams of fresh Sauropus androgynus (L.) Merr leaves using 1 cup of clean water, and drink 2-3 times a day (Hariana, 2015). The chemical content contained in Sauropus androgynus (L.) Merr leaves is alkaloids, triterpenoids, saponins, tannin errors, steroids, polyphenols, glycosides and flavonoids (Susanti et al, 2014; Ratna and Sarah, 2016).

Fever is a useful counter-defense of the body against infection. Fever is also a symptom and not a separate disease (Tjay and Raharja, 2007). Increased body temperature in pathological conditions begins the release of an endogenous pyrogen substance or cytokines such as interleukins that promote excessive release of prostaglandins in the hypothalamic preoptic region (Wilmana, 2002).

According to research conducted Adesokan et al (2008). The antipyretic effect is produced by the flavonoids in the plant through inhibition of prostaglandin synthesis. Flavonoids are polar compounds that are soluble in water (Harborne, 1987).

Based on the above background, the authors are interested to conduct research on the antipyretic effect of leaf infusion Sauropus androgynus (L.) Merr in Rat.

## **Research purposes**

To know the antipyretic effect of Sauropus androgynus (L.) Merr in rat (*Rattus norvegicus*).

## **RESEARCH METHODS**

Type of research used is experimental research in laboratory with Pretest-Posttest with Control Group design.

### **Sample**

The sample is Sauropus androgynus (L.) Merr leaves.

### **Sample Processing**

Sauropus androgynus (L.) Merr leaves taken then cleaned by washing with clean, running water. After that, dry them without direct sunlight then ground using a grinder.

### **Test procedure**

- The rats were fast fed  $\pm$  8 hours before treatment.
- The test animals body temperature was measured by using a thermometer, recorded as the initial temperature ( $t_a$ ).
- All test animals were induced fever by injection intraperitoneally of 20%-pepton solution with 2 mL / 200 g bw rat.

- Recorded the temperature after induction (ti). Test animals expressed fever if temperature rose > 1.5 ° C from the initial temperature.
- After measuring the temperature after induction, the test animals were selected based on the appropriate temperature rise criteria for the treatment of 15 rats. The test animals were divided into 3 treatment groups consisting of 5 rats each, treated orally.
- Each group was given treatment:
  - 1) Group 1 was given aquades as negative control of 2.5 mL / 200 g bw
  - 2) Group 2 was given paracetamol suspension as positive control of 2.5 mL / 200 g bw
  - 3) Group 3 was given infusion of Sauropus androgynus (L.) Merr leaves concentration of 8 % as much as 2.5 mL / 200 g bw.
- After all test animals were treated, a body temperature measurement was taken every hour for 4 hours, recorded as temperature after treatment (t1, t2, t3, t4).

## Results

The results of antipyretic effect test of infusion of Sauropus androgynus (L.) Merr leaves to rats test animals obtained body temperature data as follows:

Table 1. Results of Rats Body Temperature Measurement Before and After Treatment

Perlakuan	No. Hewan Uji	Suhu Tubuh Tikus Putih (°C)					
		t <sub>a</sub>	t <sub>i</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>
Infusion daun Katuk 8 %	1	36,1	38,0	37,3	36,9	36,3	35,1
	2	35,5	37,0	37,0	36,8	35,9	35,3
	3	35,2	37,1	37,1	36,6	36,1	34,6
	4	35,4	37,0	37,2	36,3	35,6	35,3
	5	35,6	37,9	37,8	37,6	36,6	35,2
	<b>Rerata</b>	35,56	37,40	37,28	36,84	36,10	35,10
Kontrol Positif Suspensi Parasetamol	1	35,7	37,3	36,5	36,1	35,8	35,7
	2	35,0	36,7	36,2	36,1	35,5	34,7
	3	35,3	37,0	36,9	36,8	35,8	35,1
	4	35,3	37,6	36,7	36,0	35,8	34,8
	5	34,9	37,1	36,9	35,7	35,2	34,4
	<b>Rerata</b>	35,24	37,14	36,64	36,14	35,62	34,94
Kontrol Negatif	1	35,2	37,5	37,6	38,5	37,9	36,9
	2	35,2	37,2	37,5	38,0	37,1	37,6



	3	34,6	36,2	37,4	38,0	37,2	36,4
	4	35,0	36,0	36,0	37,1	36,4	36,1
	5	35,2	36,3	36,7	37,6	36,2	35,6
	<b>Rerata</b>	35,04	36,62	37,04	37,84	36,96	36,52

Information :

ta: the initial body temperature of rats

ti: body temperature after induction with pepton 10%

t1: body temperature after 1 hour treatment

t2: body temperature after 2 hours treatment

t3: body temperature after 3 hours treatment

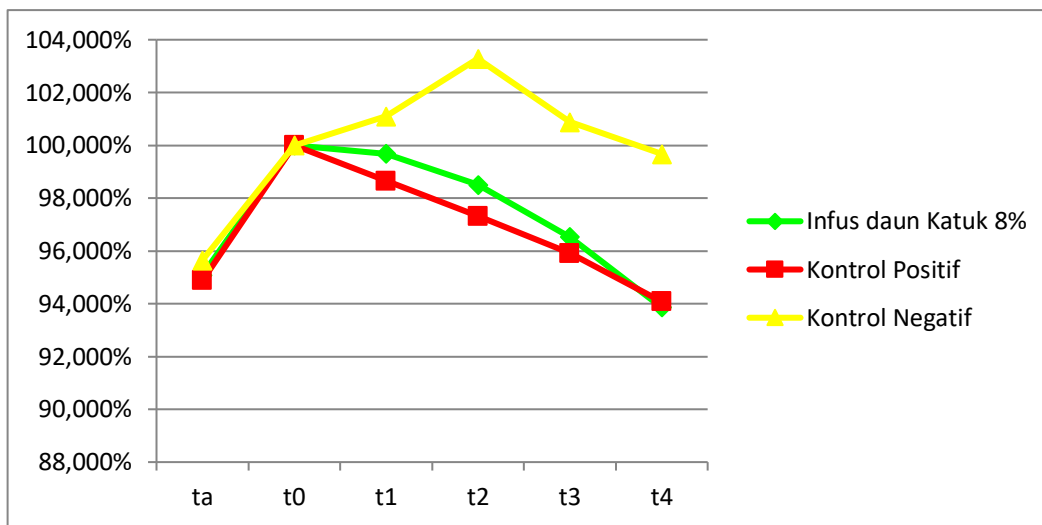
t4: body temperature after 4 hours treatment

Table 2. Results of Rats Body Temperature Persentation Before and After Treatment

Perlakuan	No. Hewan Uji	Persentase Suhu Tubuh Tikus Putih (%)					
		t <sub>a</sub>	t <sub>i</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>
Infus daun Katuk 8 %	1	95	100	98,15	97,10	95,52	92,36
	2	95,94	100	100	99,45	97,02	95,40
	3	94,87	100	100	98,65	97,30	93,26
	4	95,67	100	100,54	98,10	96,21	95,40
	5	93,93	100	99,73	99,20	96,57	92,87
	<b>Rerata</b>	95,082	100	99,684	98,5	96,524	93,858
Kontrol Positif Suspensi Parasetamol	1	95,71	100	97,85	96,78	95,98	95,71
	2	95,36	100	98,63	98,36	96,73	94,55
	3	95,41	100	99,73	99,46	96,75	94,86
	4	93,88	100	97,60	95,74	95,21	92,55
	5	94,07	100	99,46	96,22	94,88	92,72
	<b>Rerata</b>	94,886	100	98,654	97,312	95,910	94,078
Kontrol Negatif	1	93,86	100	100,26	102,66	101,06	98,40
	2	94,62	100	100,80	102,15	99,73	101,07
	3	95,58	100	103,31	104,97	102,76	100,55

4	97,22	100	100,00	103,05	101,11	100,27
5	96,96	100	101,10	103,58	99,72	98,07
<b>Rerata</b>	95,648	100	101,094	103,282	100,876	99,672

The rats body temperature data in Table 2 can be illustrated in the graph below



Graph 1. Graph of Rats Body Temperature Measurement Before and After Treatment

The results of rats body temperature measurement given infusion of *Sauropus androgynus* (L.) Merr leaves 8% decrease at first hour until fourth hour after treatment with decrease equal to 2,3 oC. Decrease in body temperature of rats caused by the content of flavonoid compounds whose mechanism works the same as paracetamol that inhibits the formation of prostaglandins which is a mediator of fever.

Positive control showed a decrease in temperature in the first hour to the fourth hour with a large decrease of 2.2 oC. In the positive control group, paracetamol suspension was suspended because of its antipyretic properties with a working mechanism inhibiting prostaglandin synthesis and having a half-life of 1 to 4 hours.

Negative control group given 1% Na CMC solution showed temperature rise at t1 of 0.42 oC and t2 of 0.80 oC then began to decrease at t3 to t4 of 1.32 oC,

Differences in antipyretic effects among all treatment groups were statistically analyzed using one way anova test. The results of the one way anova test can be seen in table 3.

Table 3. The results of one way anova test analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	636.462	17	37.439	33.71	.000

Within Groups	79.820	72	1.109
Total	716.282	89	

Based on the results of one way anova test with a significant level of 0.05 indicates there is an effect of treatment on rats ( $p < 0.05$ ).

The result of statistical test before and after treatment can be seen on table 4.

Table 4. The results of statistical test before and after treatment

	Sebelum Perlakuan	Sesudah Perlakuan	Signifikan
Infus daun Katuk 8 %	Infus t0	Infus t1	1.000
		Infus t2	.713
		Infus t3	.000
		Infus t4	.000
Kontrol Positif	Kontrol (+) t0	Kontrol (+) t1	.849
		Kontrol (+) t2	.014
		Kontrol (+) t3	.000
		Kontrol (+) t4	.000
Kontrol Negatif	Kontrol (-) t0	Kontrol (-) t1	.971
		Kontrol (-) t2	.001
		Kontrol (-) t3	.997
		Kontrol (-) t4	1.000

Based on the result of statistical test, the difference of temperature before and after treatment on leaf infusion group of katuk there was a significant difference ( $p < 0,05$ ) at t3 and t4.

In the positive control group, there was no significant difference ( $p < 0.05$ ) in the negative control group ( $p < 0.05$ ) at  $t_2$ ,  $t_3$  and  $t_4$ , whereas in the negative control group there was no significant difference ( $p > 0,05$ ).

### Conclusion

Based on the result of this research can be concluded that infusion of *Sauropus androgynus* (L.) Merr leaves 8% have antipyretic effect.

### Suggestion

1. Need further testing to determine the content of *Sauropus androgynus* (L.) Merr leaves antipyretic effect.
2. It is recommended to fractionate to attract antipyretic compounds in *Sauropus androgynus* (L.) Merr leaves

### Lampiran 4. Dokumentasi Penelitian



Infus daun  
Katuk 8%  
Larutan  
Pepton 20 %



Larutan



Na CMC 1 % untuk  
Infus  
Larutan  
Na CMC  
1%



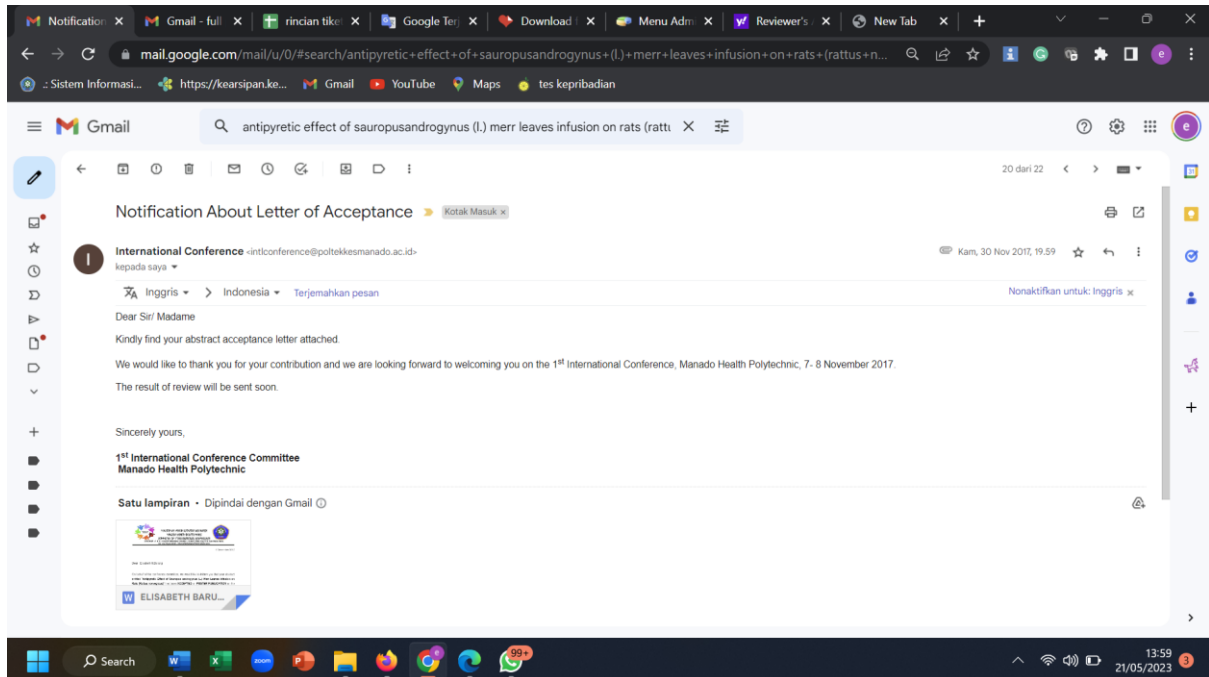
Penimbangan  
Seleksi Hewan Uji



Penginjeksian Pepton 20 %



## 2. Bukti Notification About Letter of Acceptance (30 November 2017)





elisabeth barung <elisabeth.barung1225@gmail.com>

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## Notification About Letter of Acceptance

---

**International Conference** <intlconference@poltekkesmanado.ac.id>  
Kepada: elisabeth.barung1225@gmail.com

30 November 2017 pukul 19.59

Dear Sir/ Madame

Kindly find your abstract acceptance letter attached.

We would like to thank you for your contribution and we are looking forward to welcoming you on the 1<sup>st</sup> International Conference, Manado Health Polytechnic, 7- 8 November 2017.

The result of review will be sent soon.

Sincerely yours,

**1<sup>st</sup> International Conference Committee**

**Manado Health Polytechnic**

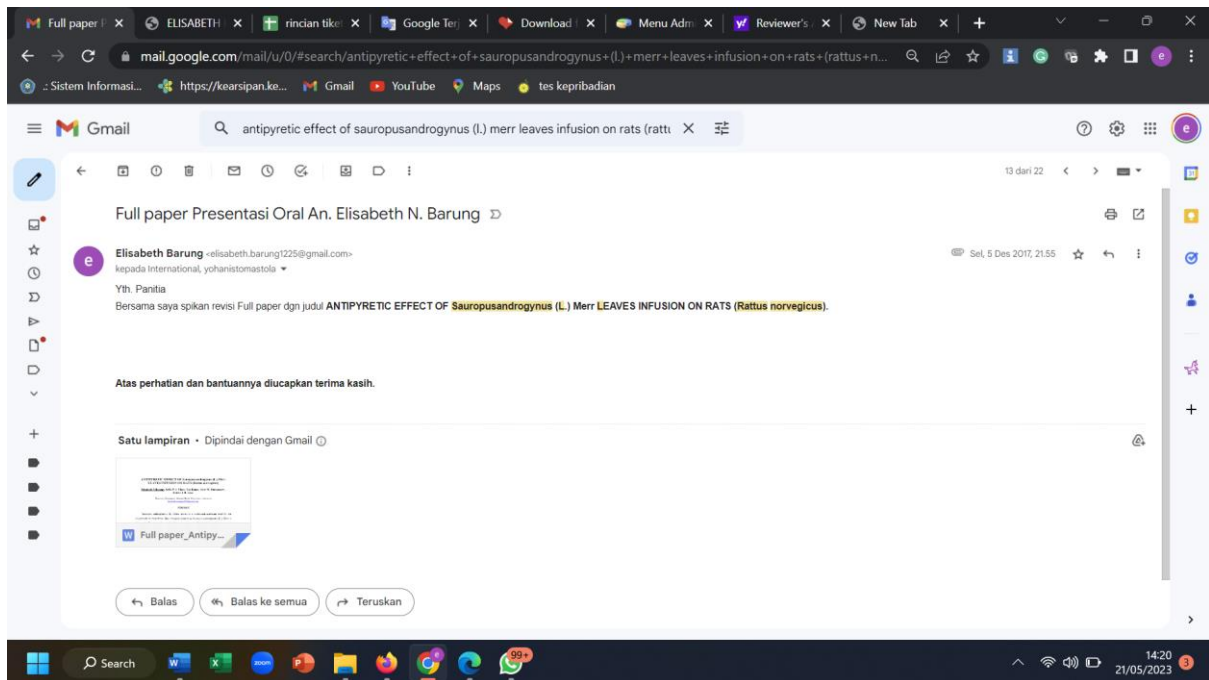
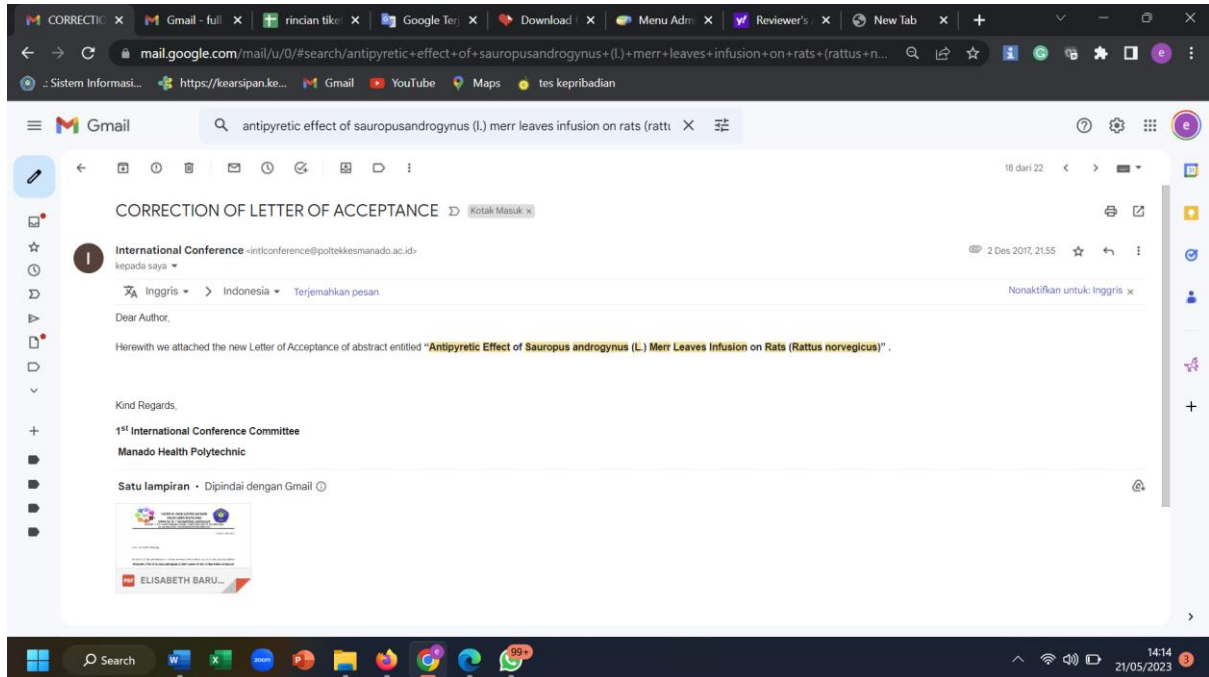


**ELISABETH BARUNG.docx**

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### 3. BUKTI PENYAMPAIAN CORRECTION OF LETTER OF ACCEPTANCE

(2 Desember 2017)







elisabeth barung &lt;elisabeth.barung1225@gmail.com&gt;

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## CORRECTION OF LETTER OF ACCEPTANCE

---

**International Conference** <intlconference@poltekkesmanado.ac.id>

2 Desember 2017 pukul 21.55

Kepada: elisabeth barung &lt;elisabeth.barung1225@gmail.com&gt;

Dear Author,

Herewith we attached the new Letter of Acceptance of abstract entitled "**Antipyretic Effect of Sauropus androgynus (L.) Merr Leaves Infusion on Rats (Rattus norvegicus)**".

Kind Regards,

**1<sup>st</sup> International Conference Committee****Manado Health Polytechnic****ELISABETH BARUNG ORAL.pdf**

559K



MINISTRY OF HEALTH REPUBLIC INDONESIA  
MANADO HEALTH POLYTECHNICS  
COMMITTEE OF 1<sup>ST</sup> INTERNATIONAL CONFERENCE

SECRETARIAT : JL. R. W. MONGISIDI MALALAYANG II MANADO - SULAWESI UTARA 95263 TELP. 0431-833773; 833774  
FAX. 0431-834310 E-MAIL : INTLCONFERENCE@POLTEKKESMANADO.AC.ID

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1 December 2017

Dear Elisabeth N.Barung

On behalf of the conference committee, we would like to inform you that your abstract entitled “Antipyretic Effect of *Sauropus androgynus* (L.) Merr Leaves Infusion on Rats (*Rattus norvegicus*)” has been **ACCEPTED** on **POSTER PUBLICATION** on the 1<sup>st</sup> International Conference, Manado Health Polytechnic, Novotel Manado Convention Center, December 7-8<sup>th</sup> 2017.

The dimension for each poster (w x h) is 60 x 80 cm. Authors presenting posters are request to be ready for answering the questions during the poster display.

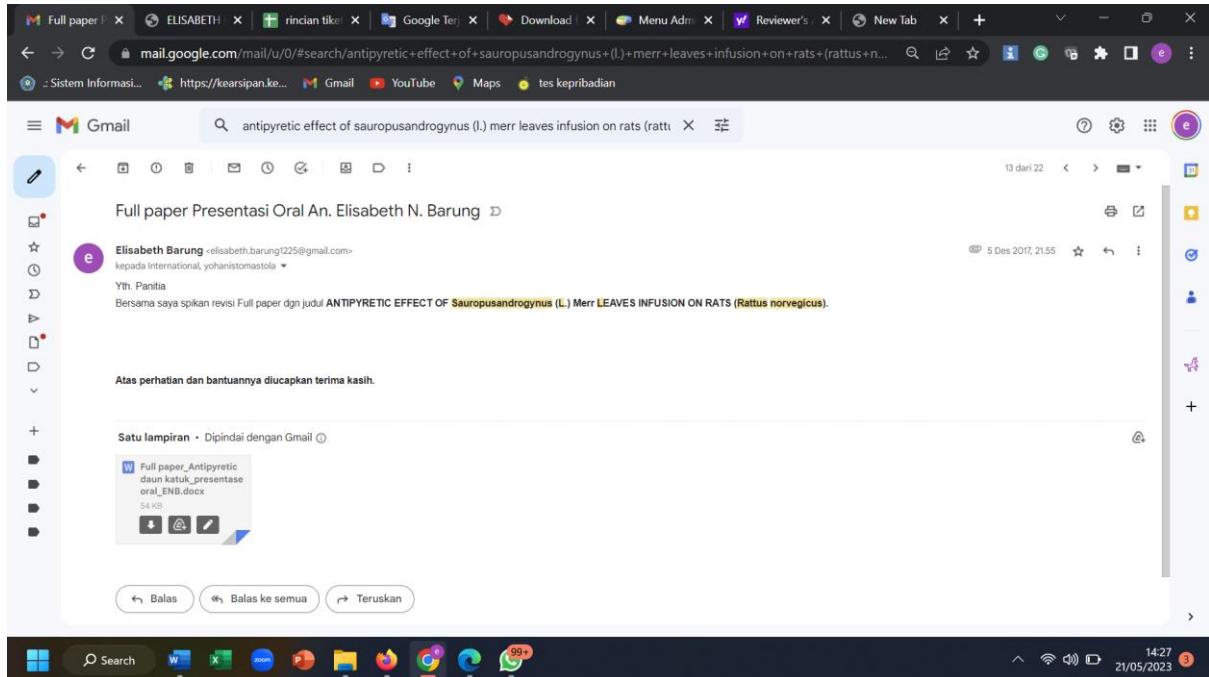
Thank you for your interest in participating on the 1<sup>st</sup> International Conference, Manado Health Polytechnic. We look forward to seeing you soon.

Sincerely Yours,

**1<sup>st</sup> International Conference Committee**

**Manado Health Polytechnic**

#### 4. Bukti konfirmasi submit revisi, respon kepada reviewer, dan artikel yang diresubmit (5 Desember 2017)



# **ANTIPYRETIC EFFECT OF *Sauropus androgynus* (L.) Merr LEAVES INFUSION ON RATS (*Rattus norvegicus*)**

**Elisabeth N.Barung, Selfie P. J. Ulaen, Yos Banne, Jovie M. Dumanauw,  
Jestisia I. R. Aror**

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[elisabeth.barung1225@gmail.com](mailto:elisabeth.barung1225@gmail.com)

## **Abstract**

*Sauropus androgynus* (L.) Merr leaves is a traditional medicine used by the community to treat fever. One chemical content in *Sauropus androgynus* (L.) Merr is flavonoids. Based on the results of previous research, flavonoids have the antipyretic effect. This study aimed to determine the antipyretic effect of *Sauropus androgynus* (L.) Merr leaves infusion on rats.

This was an experimental research using Pretest-Posttest with Control Group design. The study conducted on 15 rats that divided into 3 treatment groups ie negative control group, 8% leaf infusion leaf group and positive control group. Each group consists of 5 rats. Prior to treatment, rats were febrile by injecting 20% peptone intraperitoneally. Rats expressed fever if the body temperature increase of 1.5 °C from the initial temperature. Data were obtained from the results of rat body temperature measurements before treatment and every 1 hour for 4 hours of observation time after treatment. The data were analyzed descriptively presented in graphical form and statistically using one-way anova test.

The results showed that there was an effect of treatment on rat ( $p < 0,05$ ), so it can be concluded that 8% *Sauropus androgynus* (L.) Merr infusion leaves have an antipyretic effect.

**Keywords:** antipyretic, flavonoids, *Sauropus androgynus*, infusion.

## **Introduction**

Sauropus androgynus (L.) Merr leaves is a traditional medicine in Indonesia. Its usefulness to facilitate the production of breast milk, the leaves also used in the treatment of fever (Obi, 2015). For fever treatment, it's fresh leaves boiling 15-30 grams using 1 cup of water, and drink 2-3 times a day (Hariana, 2015). The chemical contents contained in Sauropus androgynus (L.) Merr leaves are alkaloids, triterpenoids, saponins, tannin errors, steroids, polyphenols, glycosides and flavonoids (Susanti et al, 2014; Ratna and Sarah, 2016).

Fever is a useful counter-defense of the body against infection. Fever is also a symptom and not a separate disease (Tjay and Raharja, 2007). Increased body temperature in pathological conditions begins the release of an endogenous pyrogen substance or cytokines such as interleukins that promote excessive release of prostaglandins in the hypothalamic preoptic region (Wilmana, 2002).

According to research conducted Adesokan et al (2008), the antipyretic effect is produced by the flavonoids in the plant through inhibition of prostaglandin synthesis. Flavonoids are polar compounds that are soluble in water (Harborne, 1987). Based on the background, the authors are interested to conduct research on the antipyretic effect of Katuk leaf infusion (Sauropus androgynus (L.) Merr) on Rats (*Rattus norvegicus*). The aim of this study was to determine the antipyretic effect of Sauropus androgynus (L.) Merr on rats (*Rattus norvegicus*).

## **Methods**

This was an experimental research in laboratory with Pretest-Posttest with Control Group design. The sample is Sauropus androgynus (L.) Merr leaves.

### **Sample Processing**

Sauropus androgynus (L.) Merrn fresh leaves taken and then dried without direct sunlight. The leaves ground using a grinder.

### **Procedure**

#### **1. Making of Infusion**

Weighted 8 grams dried leaves, and then heated with 75 mL of water at 90 °C for 15 minutes, filtered and sufficient volume up to 100 mL with warm water.

#### **2. Treatment**

The rats were fast fed  $\pm$  8 hours before treatment. The body temperature of rats were measured by using a thermometer, recorded as the initial temperature ( $t_a$ ). All rats were induced fever by injection intraperitoneally of 20%-pepton solution with a dose of 2 mL/200 g BW and recorded as after induction temperature ( $t_i$ ). Animals expressed fever if temperature rose  $> 1.5$  °C from the initial temperature. The test animals were divided into 3 treatment groups consist of 5 rats each, treated orally. Each group was given treatment:

- 1) Group 1 was given aquades as negative control
- 2) Group 2 was given paracetamol suspension as positive control with a dose of 2.5 mL/ 200 g BW
- 3) Group 3 was given infusion of *Sauropus androgynus* (L.) Merr leaves concentration of 8 % as much as 2.5 mL/200 g BW.

The body temperature measurement was taken every hour for 4 hours, recorded as after treatment temperature ( $t_1, t_2, t_3, t_4$ ).

## Results

The results of antipyretic effect test of infusion of *Sauropus androgynus* (L.) Merr leaves to rats test animals obtained body temperature data as follows:

Table 1. Rats Body Temperature Before and After Treatment

Treatment Groups	No. of Rats	Rats body temperature (°C)					
		$t_a$	$t_i$	$t_1$	$t_2$	$t_3$	$t_4$
8 % leaves infusion	1	36.10	38.00	37.30	36.90	36.3	35.1
	2	35.50	37.00	37.00	36.80	35.9	35.3
	3	35.20	37.10	37.10	36.60	36.1	34.6
	4	35.40	37.00	37.20	36.30	35.6	35.3
	5	35.60	37.90	37.80	37.60	36.6	35.2
	<b>Average</b>	35.56	37.40	37.28	36.84	36.10	35.10
Positive control (Paracetamol)	1	35.70	37.30	36.50	36.10	35.80	35.70
	2	35.00	36.70	36.20	36.10	35.50	34.70
	3	35.30	37.00	36.90	36.80	35.80	35.10

	4	35.30	37.60	36.70	36.00	35.80	34.80
	5	34.90	37.10	36.90	35.70	35.20	34.40
	<b>Average</b>	35.24	37.14	36.64	36.14	35.62	34.94
Negative control	1	35.20	37.50	37.60	38.50	37.90	36.90
	2	35.20	37.20	37.50	38.00	37.10	37.60
	3	34.60	36.20	37.40	38.00	37.20	36.40
	4	35.00	36.00	36.00	37.10	36.40	36.10
	5	35.20	36.30	36.70	37.60	36.20	35.60
	<b>Average</b>	35.04	36.62	37.04	37.84	36.96	36.52

Table 2. Percentage of Rats Body Temperature Before and After Treatment

Treatment Groups	No. of Rats	Percentage of Rats Body Temperature (%)					
		t <sub>a</sub>	t <sub>i</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>
8 % leaves infusion	1	95.00	100	98.15	97.10	95.52	92.36
	2	95.94	100	100.00	99.45	97.02	95.40
	3	94.87	100	100.00	98.65	97.30	93.26
	4	95.67	100	100.54	98.10	96.21	95.40
	5	93.93	100	99.73	99.20	96.57	92.87
	<b>Average</b>	95.08	100	99.68	98.50	96.52	93.86
Positive control (Paracetamol)	1	95.71	100	97.85	96.78	95.98	95.71
	2	95.36	100	98.63	98.36	96.73	94.55
	3	95.41	100	99.73	99.46	96.75	94.86
	4	93.88	100	97.60	95.74	95.21	92.55
	5	94.07	100	99.46	96.22	94.88	92.72
	<b>Average</b>	94.89	100	98.65	97.31	95.91	94.08
Negative control	1	93.86	100	100.26	102.66	101.06	98.40
	2	94.62	100	100.80	102.15	99.73	101.07
	3	95.58	100	103.31	104.97	102.76	100.55
	4	97.22	100	100.00	103.05	101.11	100.27

5	96.96	100	101,10	103.58	99.72	98.07
<b>Average</b>	95.65	100	101.09	103.28	100.88	99.67

The rats body temperature data in Table 2 can be illustrated in the graph below :

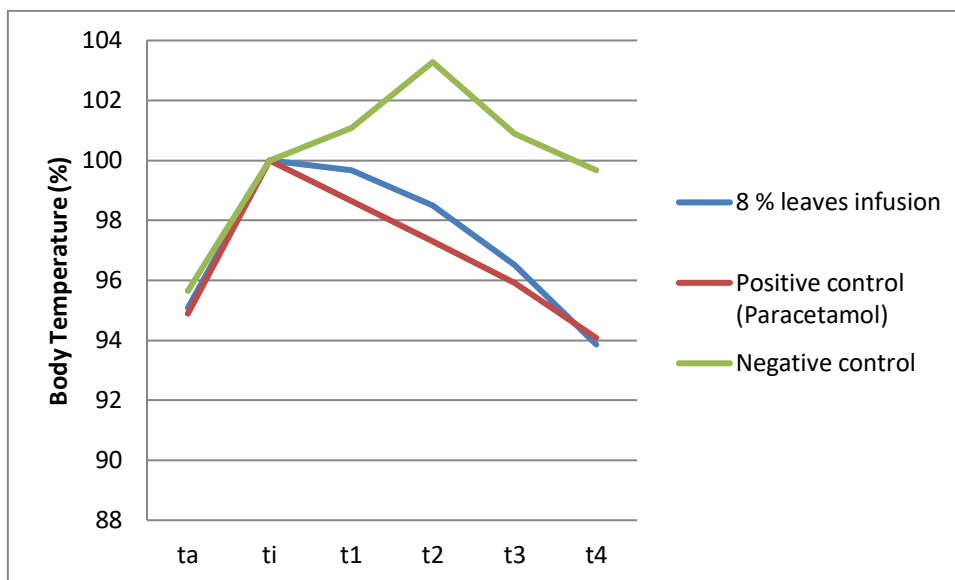


Figure 1. Percentage of Rats Body Temperature Before and After Treatment

## Discussion

The rats body temperature given *Sauropus androgynus* (L.) Merr leaves infusion decrease at first hour until fourth hour after treatment with decrease equal to 2,3 °C. The decrease of rats body temperature caused by the content of flavonoid compounds whose mechanism works the same as paracetamol that inhibits the formation of prostaglandins which is a mediator of fever.

Positive control showed a decrease in temperature at the first hour to the fourth hour with a decrease of 2.2 °C. Paracetamol was chosen as the positive control because of its antipyretic properties with a working mechanism inhibiting prostaglandin synthesis and having a half-life of 1 to 4 hours.

Negative control group given water(aquadest) showed a temperature rise at t1 of 0.42 °C and t2 of 0.80 °C then began to decrease at t3 to t4 of 1.32 °C. The differences in antipyretic effects among all treatment groups were statistically analyzed using one way anova test. The results of the one way anova test can be seen in table 3.



Table 3. The results of one way anova test analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	636.462	17	37.439	33.71	.000
Within Groups	79.820	72	1.109		
Total	716.282	89			

Based on the results of one way anova test with a significant level of 0.05 indicates there is an effect of treatment on rats ( $p < 0.05$ ). The result of statistical test before and after treatment can be seen on table 4.

Table 4. The results of statistical test before and after treatment

	Sebelum Perlakuan	Sesudah Perlakuan	Signifikan
8 % leaves infusion	Infusio t0	Infusion t1	1.000
		Infusion t2	.713
		Infusion t3	.000
		Infusions t4	.000
Positive control	Control (+) t0	Control (+) t1	.849
		Control (+) t2	.014
		Control (+) t3	.000
		Control (+) t4	.000
Negative control	Control (-) t0	Control (-) t1	.971
		Control (-) t2	.001
		Control (-) t3	.997
		Control (-) t4	1.000

Based on the result of statistical test, the difference of temperature before and after treatment on leaves infusion group there was a significant difference ( $p < 0,05$ ) at t3 and t4. In the positive control group, there was no significant difference ( $p < 0.05$ ) in the negative control group ( $p < 0.05$ ) at t2, t3 and t4, whereas in the negative control group there was no significant difference ( $p > 0,05$ ).

## Conclusion

Based on the result of this research, it can be concluded that 8 % *Sauropus androgynus* (L.) Merr leaves infusion have the antipyretic effect.

## Suggestion

1. It still needs further study to determine the content of *Sauropus androgynus* (L.) Merr leaves that has the antipyretic effect.
2. It is recommended to fractionate to antipyretic compounds in *Sauropus androgynus* (L.) Merr leaves

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# **ANTIPYRETIC EFFECT OF *Sauropus androgynus* (L.) Merr LEAVES INFUSION ON RATS (*Rattus norvegicus*)**

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## **Abstract**

*Sauropus androgynus* (L.) Merr leaves is a traditional medicine used by the community to treat fever. One chemical content in *Sauropus androgynus* (L.) Merr is flavonoids. Based on the results of previous research, flavonoids have the antipyretic effect. This study aimed to determine the antipyretic effect of *Sauropus androgynus* (L.) Merr leaves infusion on rats.

This was an experimental research using Pretest-Posttest with Control Group design. The study conducted on 15 rats that divided into 3 treatment groups ie negative control group, 8% leaf infusion leaf group and positive control group. Each group consists of 5 rats. Prior to treatment, rats were febrile by injecting 20% peptone intraperitoneally. Rats expressed fever if the body temperature increase of 1.5 °C from the initial temperature. Data were obtained from the results of rat body temperature measurements before treatment and every 1 hour for 4 hours of observation time after treatment. The data were analyzed descriptively presented in graphical form and statistically using one-way anova test.

The results showed that there was an effect of treatment on rat ( $p < 0,05$ ), so it can be concluded that 8% *Sauropus androgynus* (L.) Merr infusion leaves have an antipyretic effect.

**Keywords:** antipyretic, flavonoids, *Sauropus androgynus*, infusion.

## **Introduction**

Sauropus androgynus (L.) Merr leaves is a traditional medicine in Indonesia. Its usefulness to facilitate the production of breast milk, the leaves also used in the treatment of fever (Obi, 2015). For fever treatment, it's fresh leaves boiling 15-30 grams using 1 cup of water, and drink 2-3 times a day (Hariana, 2015). The chemical contents contained in Sauropus androgynus (L.) Merr leaves are alkaloids, triterpenoids, saponins, tannin errors, steroids, polyphenols, glycosides and flavonoids (Susanti et al, 2014; Ratna and Sarah, 2016).

Fever is a useful counter-defense of the body against infection. Fever is also a symptom and not a separate disease (Tjay and Raharja, 2007). Increased body temperature in pathological conditions begins the release of an endogenous pyrogen substance or cytokines such as interleukins that promote excessive release of prostaglandins in the hypothalamic preoptic region (Wilmana, 2002).

According to research conducted Adesokan et al (2008), the antipyretic effect is produced by the flavonoids in the plant through inhibition of prostaglandin synthesis. Flavonoids are polar compounds that are soluble in water (Harborne, 1987). Based on the background, the authors are interested to conduct research on the antipyretic effect of Katuk leaf infusion (Sauropus androgynus (L.) Merr) on Rats (Rattus norvegicus). The aim of this study was to determine the antipyretic effect of Sauropus androgynus (L.) Merr on rats (Rattus norvegicus).

## **Methods**

This was an experimental research in laboratory with Pretest-Posttest with Control Group design. The sample is Sauropus androgynus (L.) Merr leaves.

### **Sample Processing**

Sauropus androgynus (L.) Merrn fresh leaves taken and then dried without direct sunlight. The leaves ground using a grinder.

### **Procedure**

#### **1. Making of Infusion**

Weighted 8 grams dried leaves, and then heated with 75 mL of water at 90 °C for 15 minutes, filtered and sufficient volume up to 100 mL with warm water.

#### **2. Treatment**

The rats were fast fed  $\pm$  8 hours before treatment. The body temperature of rats were measured by using a thermometer, recorded as the initial temperature ( $t_a$ ). All rats were induced fever by injection intraperitoneally of 20%-pepton solution with a dose of 2 mL/200 g BW and recorded as after induction temperature ( $t_i$ ). Animals expressed fever if temperature rose  $> 1.5$  °C from the initial temperature. The test animals were divided into 3 treatment groups consist of 5 rats each, treated orally. Each group was given treatment:

- 1) Group 1 was given aquades as negative control
- 2) Group 2 was given paracetamol suspension as positive control with a dose of 2.5 mL/ 200 g BW
- 3) Group 3 was given infusion of *Sauropus androgynus* (L.) Merr leaves concentration of 8 % as much as 2.5 mL/200 g BW.

The body temperature measurement was taken every hour for 4 hours, recorded as after treatment temperature ( $t_1, t_2, t_3, t_4$ ).

## Results

The results of antipyretic effect test of infusion of *Sauropus androgynus* (L.) Merr leaves to rats test animals obtained body temperature data as follows:

Table 1. Rats Body Temperature Before and After Treatment

Treatment Groups	No. of Rats	Rats body temperature (°C)					
		$t_a$	$t_i$	$t_1$	$t_2$	$t_3$	$t_4$
8 % leaves infusion	1	36.10	38.00	37.30	36.90	36.3	35.1
	2	35.50	37.00	37.00	36.80	35.9	35.3
	3	35.20	37.10	37.10	36.60	36.1	34.6
	4	35.40	37.00	37.20	36.30	35.6	35.3
	5	35.60	37.90	37.80	37.60	36.6	35.2
	<b>Average</b>	35.56	37.40	37.28	36.84	36.10	35.10
Positive control (Paracetamol)	1	35.70	37.30	36.50	36.10	35.80	35.70
	2	35.00	36.70	36.20	36.10	35.50	34.70
	3	35.30	37.00	36.90	36.80	35.80	35.10

	4	35.30	37.60	36.70	36.00	35.80	34.80
	5	34.90	37.10	36.90	35.70	35.20	34.40
	<b>Average</b>	35.24	37.14	36.64	36.14	35.62	34.94
Negative control	1	35.20	37.50	37.60	38.50	37.90	36.90
	2	35.20	37.20	37.50	38.00	37.10	37.60
	3	34.60	36.20	37.40	38.00	37.20	36.40
	4	35.00	36.00	36.00	37.10	36.40	36.10
	5	35.20	36.30	36.70	37.60	36.20	35.60
	<b>Average</b>	35.04	36.62	37.04	37.84	36.96	36.52

Table 2. Percentage of Rats Body Temperature Before and After Treatment

Treatment Groups	No. of Rats	Percentage of Rats Body Temperature (%)					
		t <sub>a</sub>	t <sub>i</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>
8 % leaves infusion	1	95.00	100	98.15	97.10	95.52	92.36
	2	95.94	100	100.00	99.45	97.02	95.40
	3	94.87	100	100.00	98.65	97.30	93.26
	4	95.67	100	100.54	98.10	96.21	95.40
	5	93.93	100	99.73	99.20	96.57	92.87
	<b>Average</b>	95.08	100	99.68	98.50	96.52	93.86
Positive control (Paracetamol)	1	95.71	100	97.85	96.78	95.98	95.71
	2	95.36	100	98.63	98.36	96.73	94.55
	3	95.41	100	99.73	99.46	96.75	94.86
	4	93.88	100	97.60	95.74	95.21	92.55
	5	94.07	100	99.46	96.22	94.88	92.72
	<b>Average</b>	94.89	100	98.65	97.31	95.91	94.08
Negative control	1	93.86	100	100.26	102.66	101.06	98.40
	2	94.62	100	100.80	102.15	99.73	101.07
	3	95.58	100	103.31	104.97	102.76	100.55
	4	97.22	100	100.00	103.05	101.11	100.27

5	96.96	100	101,10	103.58	99.72	98.07
<b>Average</b>	95.65	100	101.09	103.28	100.88	99.67

The rats body temperature data in Table 2 can be illustrated in the graph below :

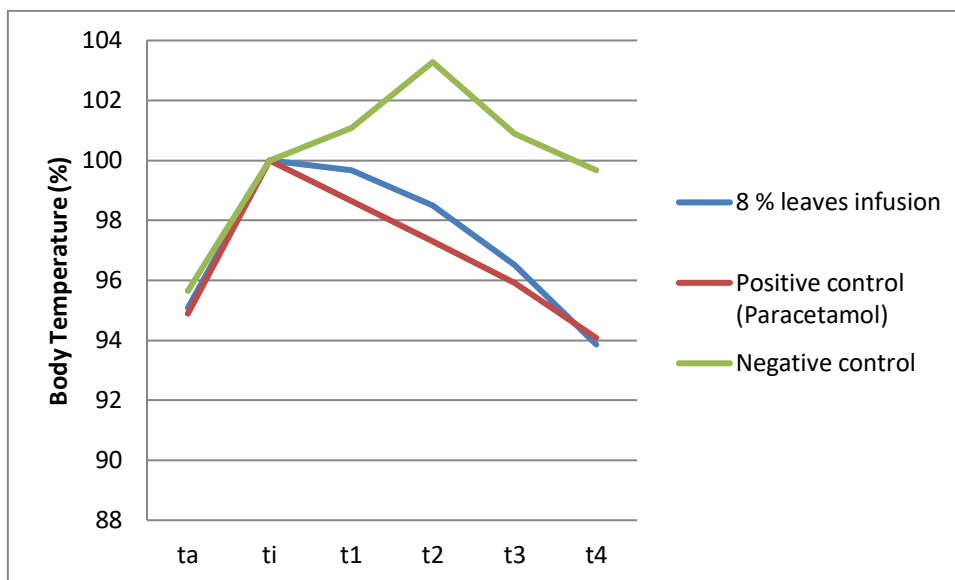


Figure 1. Percentage of Rats Body Temperature Before and After Treatment

## Discussion

The rats body temperature given *Sauropus androgynus* (L.) Merr leaves infusion decrease at first hour until fourth hour after treatment with decrease equal to 2,3 °C. The decrease of rats body temperature caused by the content of flavonoid compounds whose mechanism works the same as paracetamol that inhibits the formation of prostaglandins which is a mediator of fever.

Positive control showed a decrease in temperature at the first hour to the fourth hour with a decrease of 2.2 °C. Paracetamol was chosen as the positive control because of its antipyretic properties with a working mechanism inhibiting prostaglandin synthesis and having a half-life of 1 to 4 hours.

Negative control group given water(aquadest) showed a temperature rise at t1 of 0.42 °C and t2 of 0.80 °C then began to decrease at t3 to t4 of 1.32 °C. The differences in antipyretic effects among all treatment groups were statistically analyzed using one way anova test. The results of the one way anova test can be seen in table 3.



Table 3. The results of one way anova test analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	636.462	17	37.439	33.71	.000
Within Groups	79.820	72	1.109		
Total	716.282	89			

Based on the results of one way anova test with a significant level of 0.05 indicates there is an effect of treatment on rats ( $p < 0.05$ ). The result of statistical test before and after treatment can be seen on table 4.

Table 4. The results of statistical test before and after treatment

	Sebelum Perlakuan	Sesudah Perlakuan	Signifikan
8 % leaves infusion	Infusio t0	Infusion t1	1.000
		Infusion t2	.713
		Infusion t3	.000
		Infusions t4	.000
Positive control	Control (+) t0	Control (+) t1	.849
		Control (+) t2	.014
		Control (+) t3	.000
		Control (+) t4	.000
Negative control	Control (-) t0	Control (-) t1	.971
		Control (-) t2	.001
		Control (-) t3	.997
		Control (-) t4	1.000

Based on the result of statistical test, the difference of temperature before and after treatment on leaves infusion group there was a significant difference ( $p < 0,05$ ) at t3 and t4. In the positive control group, there was no significant difference ( $p < 0.05$ ) in the negative control group ( $p < 0.05$ ) at t2, t3 and t4, whereas in the negative control group there was no significant difference ( $p > 0,05$ ).

## Conclusion

Based on the result of this research, it can be concluded that 8 % *Sauropus androgynus* (L.) Merr leaves infusion have the antipyretic effect.

## Suggestion

1. It still needs further study to determine the content of *Sauropus androgynus* (L.) Merr leaves that has the antipyretic effect.
2. It is recommended to fractionate to antipyretic compounds in *Sauropus androgynus* (L.) Merr leaves

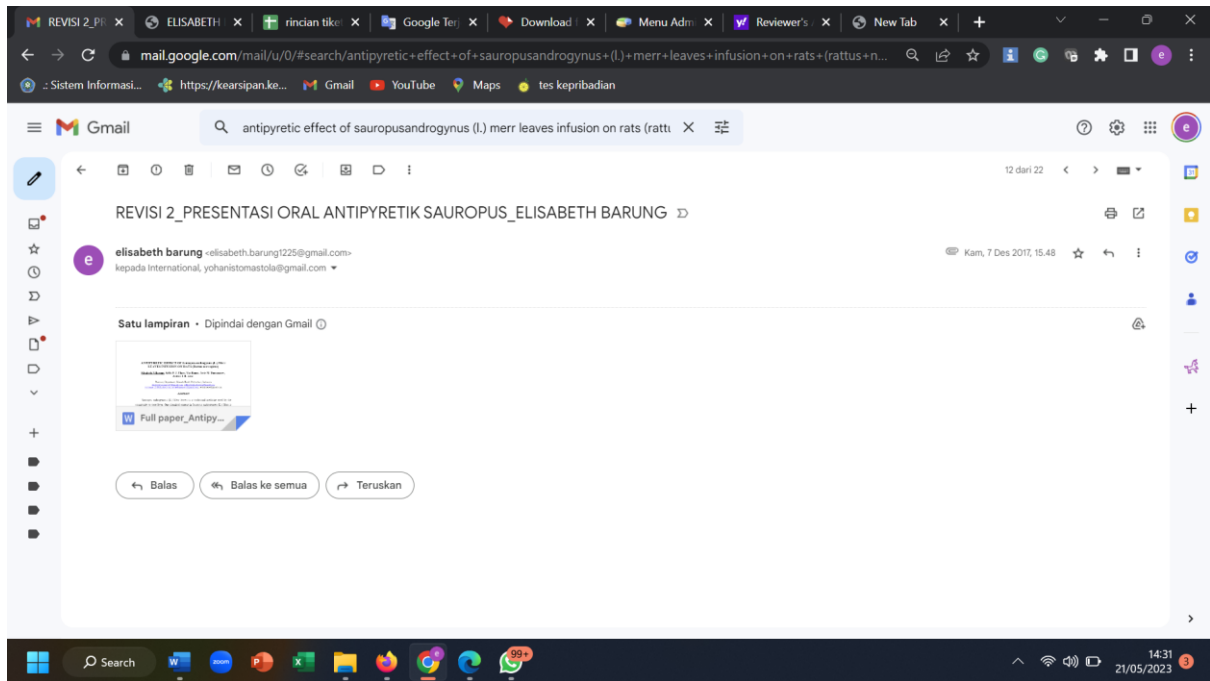
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## 5. Bukti konfirmasi submit revisi kedua, respon kepada reviewer, dan artikel yang Diresubmit (7 Desember 2017)





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## REVISI 2\_PRESENTASI ORAL ANTIPYRETIK SAUROPUS\_ELISABETH BARUNG

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7 Desember 2017 pukul 15.48

Kepada: International Conference <intlconference@poltekkesmanado.ac.id>, "yohanistomastola@gmail.com" <yohanistomastola@gmail.com>



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## 7. Bukti Bukti artikel published online (29 Maret 2018)

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The praise of our gratitude to the Almighty God for his wisdom and grace so that the Health Polytechnic of the Ministry of Health of Manado can organize the International Seminar in 2017, the material of the National Seminar is made a Proceeding in which there is a collection of abstracts from the research results.

The proceedings take the theme of "Interprofessional Collaboration on Global Challenges of Non Communicable Diseases (NCDs)" and presented material from resource persons and abstract research results presented in oral presentations and posters from academics and practitioners, and educational institutions but also health service agencies in Indonesia and elsewhere. This Proceeding is also a form of scientific publication as a form of accountability of research results that have been done to be a reference material for the development of science in the field of health. Finally we thank the Director of the Health Polytechnic of the Ministry of Health Manado Samuel Layuk, SKM, M.Kes and his staf, Budi Luhur International Network for Education (BIN For Edu), Professional Organizations, seminar participants, resources persons, editors, oral and poster presenters, and sponsorships and all work hard so that this seminar can be done well.

**Published: 2018-03-29**

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## **ANTIPYRETIC EFFECT OF *Sauropusandrogynus* (L.) Merr LEAVES INFUSION ON RATS (*Rattus norvegicus*)**

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### **Abstract**

*Sauropusandrogynus* (L.) Merr leaves is a traditional medicine used by the community to reduce fever. One chemical content in *Sauropusandrogynus* (L.) Merr is flavonoids. Based on the results of previous research, flavonoids had the antipyretic effect. This study aims to determine the antipyretic effect of *Sauropusandrogynus* (L.) Merr leaves infusion on rats.

This was an experimental research using Pretest-Posttest with Control Group design. The study conducted on 15 tested white rats that were divided into 3 treatment groups, i.e. negative control group, 8% leaf infusion group and positive control group. Each group consists of 5 rats. Prior to treatment, rats were febrile by injecting 20% peptone intraperitoneally. Rats got fever when the body temperature raised 1.5 °C from the initial temperature. Data was obtained from the result of measurement of the rat's temperature before the treatment and every an hour during 4 consecutive hours since the rats were undergone treatment. Data was analyzed descriptively in graphical form and statistically using one-way anova test.

The results showed that there was an effect of the treatment on rat ( $p < 0,05$ ), so it can be concluded that infusion of 8% of *Sauropusandrogynus* (L.) Merrinfusion leaves have the antipyretic effect.

**Keywords:** antipyretic, flavonoids, *Sauropusandrogynus*, infusion.

### **INTRODUCTION**

*Sauropusandrogynus* (L.) Merr leaves is a traditional medicine in Indonesia. It does not only has the benefit to increase supply of breast milk, but also used to reduce fever (Obi, 2015). To treat fever, 15-30 grams fresh leaves were boiled using 1 cup of water, and suggested to drink 2-3 times a day (Hariana, 2015). The chemical contents in *Sauropusandrogynus* (L.) Merr leaves are alkaloids, triterpenoids, saponins, tannin errors, steroids, polyphenols,

glycosides and flavonoids (Susanti et al, 2014; Ratna and Sarah, 2016).

Fever increases immune system defense of the body against infection. Fever is a symptom and not a disease (Tjay and Raharja, 2007). Increased body temperature in pathological conditions starts the release of an endogenous pyrogen substance or cytokines such as interleukins that promote excessive release of prostaglandins in the hypothalamic preoptic region (Wilmana, 2002).



According to research conducted by Adesokan et al (2008), the antipyretic effect is produced by the flavonoids in the plant through inhibition of prostaglandin synthesis. Flavonoids are polar compounds that are soluble in water (Harborne, 1987). Based on the reason, the researchers conducted the research on the antipyretic effect of Katuk leaf infusion (*Sauropusandrogynus* (L.) Merr) on Rats (*Rattus norvegicus*). The aim of this study is to determine the antipyretic effect of *Sauropusandrogynus* (L.) Merr on rats (*Rattus norvegicus*).

## METHODS

This is an experimental research in laboratory with Pretest-Posttest with Control Group design. The sample is *Sauropusandrogynus* (L.) Merr leaves.

### Sample Processing

*Sauropusandrogynus* (L.) Merr fresh leaves were taken and then dried without direct sunlight. The leaves were chopped using a grinder.

### Procedure

#### 1. Making of Infusion

Eight grams of dried leaves were weighed, then heated with 75 ml of water at 90 °C for 15 minutes, distilled and added sufficient warm water volume up to 100 ml.

#### 2. Treatment

The rats were fasted for around 8 hours before treatment. The body temperature of the rats were

measured using a thermometer, recorded as the initial temperature ( $t_0$ ). All rats were induced fever through the injection intraperitoneally of 20%-pepton solution with a dose of 2 mL/200 g BW and recorded after induction temperature ( $t_1$ ). Animals showed fever symptoms when temperature rose  $> 1.5$  °C from the initial temperature. The tested animals were divided into 3 treatment groups, consist of 5 rats each, treated orally. Each group was given treatment:

- 1) Group 1 was given aquades as negative control
- 2) Group 2 was given paracetamol suspension as positive control with a dose of 2.5 mL/ 200 g BW
- 3) Group 3 was given infusion of *Sauropusandrogynus* (L.) Merr leaves concentration of 8 % as much as 2.5 mL/200 g BW.

The measurement of body temperature was made in every hour for four consecutive hours, recorded after treatment temperature ( $t_1, t_2, t_3, t_4$ ).

## RESULT

The results of antipyretic effect test of infusion of *Sauropusandrogynus* (L.) Merr leaves on rats' temperature are as follows.

Table 1. Rats' Body Temperature Before and After Treatment

Treatment Groups	No. of Rats	Rats body temperature (°C)					
		t <sub>a</sub>	t <sub>i</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>
8 % leaves infusion	1	36.10	38.00	37.30	36.90	36.3	35.1
	2	35.50	37.00	37.00	36.80	35.9	35.3
	3	35.20	37.10	37.10	36.60	36.1	34.6
	4	35.40	37.00	37.20	36.30	35.6	35.3
	5	35.60	37.90	37.80	37.60	36.6	35.2
	<b>Average</b>	35.56	37.40	37.28	36.84	36.10	35.10
Positive control (Paracetamol)	1	35.70	37.30	36.50	36.10	35.80	35.70
	2	35.00	36.70	36.20	36.10	35.50	34.70
	3	35.30	37.00	36.90	36.80	35.80	35.10
	4	35.30	37.60	36.70	36.00	35.80	34.80
	5	34.90	37.10	36.90	35.70	35.20	34.40
	<b>Average</b>	35.24	37.14	36.64	36.14	35.62	34.94
Negative control	1	35.20	37.50	37.60	38.50	37.90	36.90
	2	35.20	37.20	37.50	38.00	37.10	37.60
	3	34.60	36.20	37.40	38.00	37.20	36.40
	4	35.00	36.00	36.00	37.10	36.40	36.10
	5	35.20	36.30	36.70	37.60	36.20	35.60
	<b>Average</b>	35.04	36.62	37.04	37.84	36.96	36.52

Table 2. Percentage of Rats' Body Temperature Before and After Treatment

Treatment Groups	Nu. of Rats	Percentage of Rats Body Temperature (%)					
		t <sub>a</sub>	t <sub>i</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>
8 % leaves infusion	1	95.00	100	98.15	97.10	95.52	92.36
	2	95.94	100	100.00	99.45	97.02	95.40
	3	94.87	100	100.00	98.65	97.30	93.26
	4	95.67	100	100.54	98.10	96.21	95.40
	5	93.93	100	99.73	99.20	96.57	92.87
	<b>Average</b>	95.08	100	99.68	98.50	96.52	93.86
Positive control (Paracetamol)	1	95.71	100	97.85	96.78	95.98	95.71
	2	95.36	100	98.63	98.36	96.73	94.55
	3	95.41	100	99.73	99.46	96.75	94.86
	4	93.88	100	97.60	95.74	95.21	92.55
	5	94.07	100	99.46	96.22	94.88	92.72
	<b>Average</b>	94.89	100	98.65	97.31	95.91	94.08
Negative control	1	93.86	100	100.26	102.66	101.06	98.40
	2	94.62	100	100.80	102.15	99.73	101.07
	3	95.58	100	103.31	104.97	102.76	100.55
	4	97.22	100	100.00	103.05	101.11	100.27
	5	96.96	100	101,10	103.58	99.72	98.07
	<b>Average</b>	95.65	100	101.09	103.28	100.88	99.67

The data of rats' body temperature in Table 2 can be seen in the graph below.

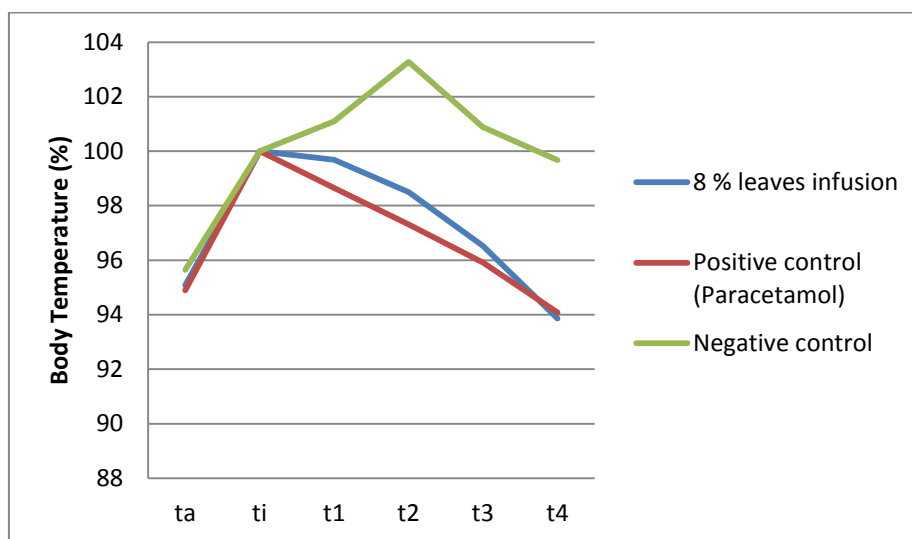


Figure 1. Percentage of Rats' Body Temperature Before and After Treatment

## DISCUSSION

After the rats were given *Sauropusandrogynus* (L.) Merr leaves, the temperature of the tested rats was regularly reduced by 2,3 °C from the first to the fourth hour after treatment. The decrease of rats' body temperature was caused by the content of flavonoid compounds which mechanism works similar to paracetamol that inhibits the formation of prostaglandins which is the mediator of fever.

Positive control group showed a decrease in temperature from the first to the fourth hour with a decrease of 2.2 °C. Paracetamol was chosen as the

positive control because of its antipyretic effects with a working mechanism inhibiting prostaglandin synthesis and having a half-life of 1 to 4 hours.

Negative control group given plain water (aquades) showed a temperature rise at t1 of 0.42 °C and t2 of 0.80 °C then began to decrease at t3 to t4 of 1.32 °C. The differences in antipyretic effects among all treatment groups were statistically analyzed using one way anova test. The results of the one way anova test can be seen in table 3.

Table 3. The results of one way anova test analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	636.462	17	37.439	33.71	.000
Within Groups	79.820	72	1.109		

Total	716.282	89
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Based on the results of one way anova test with a significant level of 0.05 indicates there is an effect of treatment

on rats (p <0.05). The result of statistical test before and after treatment can be seen on table 4.

Table 4. The results of statistical test before and after treatment

	Before treatment	After treatment	Sig.
8 % leaves infusion	Infusion t0	Infusion t1	1.000
		Infusion t2	.713
		Infusion t3	.000
		Infusions t4	.000
Positive control	Control (+) t0	Control (+) t1	.849
		Control (+) t2	.014
		Control (+) t3	.000
		Control (+) t4	.000
Negative control	Control (-) t0	Control (-) t1	.971
		Control (-) t2	.001
		Control (-) t3	.997
		Control (-) t4	1.000

Based on the result of statistical test, there was a significant difference of temperature before and after treatment (p <0,05) at t3 and t4. In the positive control group, there was no significant difference (p <0.05) in the negative control group (p <0.05) at t2, t3 and t4, whereas in the negative control group there was no significant difference (p> 0,05).

**CONCLUSION**

Based on the results of this research, it can be concluded that 8% *Sauropusandrogynus* (L.) Merr leaves infusion have the antipyretic effect.

**SUGGESTION**

1. It still needs further study to determine the content of *Sauropusandrogynus* (L.) Merr leaves that has the antipyretic effect.
2. It is recommended to use the antipyretic compounds in *Sauropusandrogynus* (L.) Merr leaves

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