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JUDUL PAPER Phenolics Total And Antioxidant Activity Of Strawberry (*Fragaria chiloensis*)

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1. Manuscript

Phenolics Total And Antioxidant Activity Of Strawberry (*Fragaria chiloensis*)

Rince Alfia Fadri¹, Rilma Novita¹, Yenni Muchrida¹, Sri Kembaryanti Putri¹, Fidela Violalita¹ ¹ Program Study of Food Technology, Polytechnic of Agricultural, University of

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Abstract — The purpose of this research is to know the total of phenolics and antioxidant activity of Strawberry that grows in the area Alahan Panjang Solok Regency and Padang Panjang city. This research was carried out at the Chemical Laboratory of Agricultural Polytechinc State of Payakumbuh with a long six months time needed. To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode. The results of research that methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample.

Keywords— strawberry; phenolics total; antioxidant activity

I. INTRODUCTION

Strawberry (Fragaria chiloensis) originally an imported fruit, but now strawberries are very familiar in Indonesia. Many farmers are cultivating strawberries and some are merely a hobby at home. Strawberry production in West Sumatra reches 2,400 tons with a total area harvest 150 acres scattered across in the Alahan Panjang area, Padang Panjang, Batu Sangkar and Bukittinggi (BPS, 2009).

Strawberries have a high nutrient content and edible part of the strawberry reaches 96%. In addition strawberries contain variety of essential nutrients, strawberries contain lycopene, anthocyanin, elagic acid, a phenolic compounds also vitamin C and vitamin E that are potentially as anti carsinogenic. Red on strawberry is the main pigment called anthocyanin (Gould, 2008). But according to Astawan (2004), red on strawberries is caused by licopene substance content in it. The number of active compounds that have characteristic as antioxidants in Strawberry make a well antioxidant network to ward off free radicals.

The function of Anthocyanin is as antioxidants in the body that can prevent the occurrence of hyper cholesterolemia (Fadri, 2010). In addition it also relaxes the blood vessels to prevent atherosclerosis and other cardiovascular diseases (Houghton, 1995). Lycopene plays a role in organizing cholesterol metabolism, by hampering the *HMG-CoA reduktase* enzyme actions, which plays a role in the synthesis process of cholesterol in the liver, so it has hypocholesterolemi effect. From the research noted that the daily intake of 40 mg likopen can reduce LDL oxidation (Houghton, 1995).

The purpose of this research is to know the total of phenolics and antioxidant activity of Strawberry that grows in the area Alahan Panjang Solok Regency and Padang Panjang city.

II. METHODE

A. Time and Place

This research was carried out at the Chemical Laboratory of Agricultural Polytechine State of Payakumbuh with a long six months time needed.

B. Tools and Materials

The tools used are: Blender, filter paper Whatman No. 1, vaporizer cup, rotary evaporator, digital scales, measuring flasks, plate drops, measuring pipette, micro-pipette, spatel, aluminum foil, oven, desiccator, erlemeyer, watches, vial, measuring cup, funnel, test tubes, magnetic stirer, UV spectrophotometer set – Vis (shimadzu 265).

The materials used are: Strawberries from Alahan Panjang and Padang Panjang, aquabidest acid, methanol, galat acid p.a (Merck), Reagent Folin-Ciocalteu, sodium carbonate p. a. (Merck), 2,2-diphenyl-1-pikrilhidrazil (DPPH) p. A (Merck), heksan p. a. (Merck), acetone (Merck), methanol, ethanol 96%, vitamin C.

C. Research Design

The design used was experimental research in vitro laboratoriy that aim to measure the total phenols and the activities of methanol extracts of Strawberry from two regions, Alahan Panjang Solok Regency and Padang Panjang city.

D. Research Implementation

To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode.

E. Sampling

The sample used is strawberry, which were taken in the area Alahan Panjang Solok Regency and from Padang Panjang City.

F. Sample Prepaation

250 g of fresh strawberries weighed, blender for 3 minutes and then maceration with 250 ml of methanol, while shaked. Do for 3 repetitions then filter by using filter paper whatman No. 1, mixing it with the filtrate. The filtrate is thicked by using a rotary evaporator, so the extracts that can be poured obtained.

G. Determination of Phenolic Total Content by Folin-Ciocalteu Method (Scrambled, h. h., 2006)

From The prime of Galat Acid solution (5 mg/ml), taken by pipette tes 1, 1.5, 2, 2.5, 3, 3.5 ml and to be diluted with aquadest to volume 25 ml. so that the concentration to be resulted are 200, 300, 400, 500, 600, and 700 mg/L galat acid. By each concentration above,taken by pipette tes 0,2 ml added 15.8 ml of aquadest added 1 ml Folin Ciocalteu Reagent and to be shaked. Let it for 8 minutes, add 3 ml of 20% solution of Na2CO3 and shake until homogeneous. Let it for 2 hours at room temperature. Measure the absorption at amaximum wavelength absorption 765 nm, and create its calibration curve the relationship between concentration of galat acid (mg/L) and absorban.

Sample (Strawberry extract) first diluted with 10 ml of aquadest, then to be taken by pipette test 0,2 ml and 15.8 ml of aquadest added. Then add 1 ml of Folin-Ciocalteu reagent and shaked. Let it for 8 minutes then add 3 ml of 20% Na2CO3 to the mix, let the solution stands for 2 hours at room temperature. Measure its absorbtion with UV-Vis spectrophotometer at a absorption wavelength maximum 765 nm which will provide complex blue. Do 3 repetitions so that levels of phenols obtained, the result obtained as mg equivalent galat acid/L.

H. Examination Of Antioxidant Activity (Hanani, E, 2005; Okawa, M, 2001)

10 mg of extract to be weighed, then dissolve in 10 ml of methanol in measurement flask *ad 10 ml*, so, found a concentration of 1 mg/ml. then do the dilution by adding methanol thus samples with concentrations (20,40, 60, 80,100 glow g/ml) obtained.

For the determination of antioxidant activity of each concentration to be taken by pipette test as much as 0.2 ml of the sample solution with a micro pipette and input into the vial, then add 3.8 ml of solution DPPH 50µm. The compound to be homogeneous and left for 30 minutes in a dark place, the absorption is measured by UV-Vis spectrophotometer at a wavelength of 515 nm.

I. Determination Of The Dpph Maximum Wavelength Absorption (Okawa, M., 2001)

3.8 ml of solution DPPH 50 μ M taken by pippette test and add with a 0,2 ml of methanol. After 30 minutes left in a dark place, absorption solution to be measured by UV-Vis spectrophotometer at a wavelength of 400 - 800 nm.

J. Data Processing

Antioxidant activity of samples is determined by the size of the radical DPPH obstacle through calculation of the inhibition percentage of DPPH absorption by using the formula:

% inhibition = <u>AbsControl – AbsSample x 100%</u> AbsControl

Description

Abs control: The Absorption of DPPH radical 50 μ M at a wavelength 515 nm. Abs Samples : Sample absorption in DPPH radical 50 μ M at a wavelength 515 nm.

IC value 50

each sample concentration to be calculated the IC value 50 by using a linear regression equation formula.

III. RESULT AND DISCUSSION

The extraction is done by maceration because the way is easily done at room temperature and using simple tools in a way the samples soaked in the solvent. The solvent used was methanol because it can dissolve almost all organic compounds in the samples mainly polar compound. Methanol easily evaporate so it liberated from the extract easily, and disposed cheaper compared to other organic solvents. All the filtrate obtained from extraction results to be evaporated with the rotary evaporator so that the strawberries methanol extracts obtained that can be poured as much as 11: 57% (Strawberries from Padang Panjang) and 7.74% (Strawberries from Alahan Panjang) from the initial weight of each.

Determination levels of phenols total used as galat acid as standard solution. The maximum galat acid absorption is obtained at a wavelength 768 nm. By the time the examination of the levels of phenols total strawberries done, firstly made the calibration curve galat acid standard solutions with a concentration series 200-700 mg/l. Making this calibration curve is useful to help determine the levels of phenol in the sample through the equation of regression of the calibration curve. From an examination of the standard galat acid solution the calibration curve obtained by a regression equation y = 0.000979 x + 0.03455 and coefficient correlation(r) price that is 0.998. On the determination of the levels strawberries phenolat total from Strawberry extract of Alahan Panjang value obtained 232.6694 mg/L and The levels of Padang Panjang Strawberry Phenolat total extract value obtained 120.3098 mg/l.

This value equal to the Alahan Panjang Strawberry phenolat total level 1800.219 mg/kg of fresh samples and Padang Panjang strawberry phenolat total 1392.502 mg/kg of fresh samples. This result shows that the Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than the Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample. According to Howard and Hager (2007) strawberries phenol total range between 43-94 mg/100 g of fresh weight and 202-275 mg/100 g of fresh weight.

TABLE I

Galat Acid Concentrate	
(ppm)	Absorban Values
200	0.217
300	0.326
400	0.445
500	0.534
600	0.621
700	0.707

Absorban measurement results of standard glatacid solution at a wavelength 765 nm with UV-VIS spectrophotometer

The method used in testing antioxidant activity was radical DPPH absorption method. Measurement of sample antioxidant activity done at a wavelength 515 nm which is the the maximum DPPH wavelength, with concentration of DPPH 50 μ m. Antioxidant activity of the samples caused discoloration of DPPH solution in methanol that originally strong violet into a pale yellow.



Picture 1. Galat acid calibration curve in folin-Ciocalteu reagent at a wavelength 768 nm

Antioxidant activity of Strawberry methanol extract expressed in its percent inhibition against DPPH radical. Percentage of inhibition obtained from the difference absorban between DPPH absorban with sample absorban that measured with a spectrophotometer UV Vis. The amount of antioxidant activity marked by IC 50, that is the concentration of the sample solution is needed to inhibit 50% DPPH free radical. Antioxidant activity Test using the DPPH method of strawberries methanol extracts from Alahan Panjang and Padang Panjang concentration 20,40, 60, 80,100 µg/ml, it is obtained IC 50 each 152,9 and 232,6 µg/ml. Whereas the value of the IC 50 of vitamin C is 3.63 µg/ml to the DPPH 50 µM (Andayani, et al., 2008). This indicates that Strawberries extract originally from Alahan Panjang have better antioxidant activity than strawberries extract originally from Padang Panjang. But the antioxidant activity of vitamin C is far higher. Molyneux (2004) Stated that a substance has antioxidant characteristic when the value of the IC50 less than 200 ppm. When the value of the IC50 ranging between 200-1000 ppm, then the substance is less active but still has potential as antioxidant. Strawberry antioxidant activity test results can be seen in table and picture 1.

TABLE 2Strawberries extract methanol antioxidant activityUsing the DPPH 50 mM

Compa-	Concen-	Absorbancy	%	IC50
Rator	tration		Inhibition	(µg/ml)
Padang	20	0,227	0,3204	
Panjang				
Strawberry	40	0,216	0,3533	
(PP)	60	0,213	0,3623	232,6
	80	0,208	0,3772	
	100	0,204	0,3892	
Alahan	20	0,231	0,4238	
Panjang				
Strawberry	40	0,230	0,4250	152,9
(AP)	60	0,228	0,4300	
	80	0,220	0,4500	
	100	0,210	0,4750	
Vitamin C	2	0,132	20,09	
	3	0,235	42,82	
	4	0,189	54,01	3,63
	5	0,123	70,07	
	6	0,065	84,18	



Picture 2. Strawberry extract anti oxidant activities curve

IV. CONCLUSIONS

From the results of research that has been done can be taken the following conclusions:

- The methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample
- The methanol extract of Strawberries originally from Alahan Panjang and Padang Panjang have the ability to muffle DPPH free radical but smaller than the ability of vitamin C (3.63-µg/ml).

IC 50 value of Strawberry extract originally from Alahan Panjang is 152,9 µg/ml whereas IC 50 value of Strawberry extract from Padang Panjang is 232,6 µg/ml.

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Dear colleague,

Acceptance to present a paper for the conference

Thank you for submitting an abstract entitled:

Phenolics Total And Antioxidant Activity Of Strawberry (Fragaria chiloensis)

for the International Conference-Sustainable Agriculture, Food and Energy (SAFE2015).

We are pleased to inform you that the committee has decided that your paper has been accepted for oral presentation in this conference. The full paper is optional. If you want to publish your paper in SAFE2015 official journal, you must submit their original and unpublished full papers through the 3rd International Conference Sustainable Agriculture, Food, and Energy (SAFE2015) using <u>EasyChair for SAFE2015 Submission System</u> at <u>http://safe2015.safetainability.org</u> or by e-mail to: <u>safetainability2013@gmail.com</u>.

If you want to publish in IJASEIT, your manuscript is strictly limited to 4-10 pages of A4 paper in single space using Template_SAFE2015. The deadline for full paper submission is 15th September 2015.

Thank you very much and looking forward to seeing you in Ho Chi Minh City!

TRUONG DAI HOC NÔNG

Assoc.Prof. Dr. Nguyen Hay SAFE2015 Chairman

Yours sincerely,

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Dr.Novizar Nazir Executive Chairman of SAFE 2015 SAFE-Network Coordinator

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REVIEW FORM

16th August 2015 Ref. No. 11/ReV/IJASEIT/VIII/2015

Dear Rince Alfia Fadri,

Program Study of Food Technology, Polytechnic of Agricultural, University of Andalas, 26271 Payakumbuh, West Sumatera, Indonesia Corresponding Author: <u>rince.alfia@yahoo.co.id</u>

Title:	Phenolics Total and Antioxidant ActivityOf Strawberry (Fragaria chiloensis)
Author(s)	Rince Alfia Fadri, Rilma Novita, Yenni Muchrida, Sri Kembaryanti Putri, Fidela Violalita
Paper-ID	591

A. Technical aspects

		0	1	2	3	4	5
	1. The paper is within the scope of the Journal.						
	2. The paper is original.						
	3. The paper is free of technical errors.						
B. (Communications aspects						
		0	1	2	3	4	5
						_	
	1. The paper is clearly readable.						
	 The paper is clearly readable. The figures are clear & do clearly convey the intended message. 						
	 The paper is clearly readable. The figures are clear & do clearly convey the intended message. The length of the paper is appropriate. 						





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C. Comments to the authors

Thank you very much for the submission through the online system. The manuscript has been reviewed. Please look into this and resubmission your manuscript after revision.

Please find the revision in the attachment!

The novelty: Antioxidant activity Test using the DPPH method of strawberries methanol extracts indicates that Strawberries extract originally from Alahan Panjang have better antioxidant activity than strawberries extract originally from Padang Panjang. But the antioxidant activity of vitamin C is far higher.

The Title: The title summarizes the main idea or ideas of your study. A good title contains the fewest possible words that adequately describe the contents and/or purpose of your research paper. The title is without doubt the part of a paper that is read the most, and it is usually read first. The title of this paper is good and informative.

The abstract: has already explained, "What is the importance of research". [An abstract should be between 150-250 words.]. Please improve the English, use simple sentence and provide the implication of research.

Abstract— ABSTRACK

Abstract – The purpose of this research is to know the total of phenolics and antioxidant activity of Strawberry that grows in the area Alahan Panjang Solok Regency and Padang Panjang city. This research was carried out at the Chemical Laboratory of Agricultural Polytechine State of Payakumbuh with a long six months time needed. To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode. The results of research that methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample.

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The Introduction typically occupies 10-15% of the paper. The Introduction typically occupies 10-15% of the paper. The introduction should consists of two parts: It should include a few general statements about the subject to provide a background to your paper and to attract the reader's attention. It should try to explain why you are writing the paper. The introduction section has included a general introduction, problem definition, problem solution, study motivation, aims and objectives, gaps in the literature.

Noted: I Please clearly mention the objective of study in Introduction. Add some recent literature to strengthen the need for this research to be carried out explained.

Results and Discussion have included findings, comparison with prior studies, causal arguments, and deductive arguments.

Noted: 1. This section responds to the question "What have you found?" Hence, only representative results from your research should be presented. The results should be essential for discussion. The author should improve his/her analyzing and also present the comparison between performance of his/her approach and other researches. Results given in figures should not be repeated in tables. This section report the most important findings, including results of analyses as appropriate. It is very important to prove that the manuscript has a significant value and not trivial.

All results should be described, including unexpected findings. Authors should include both descriptive statistics and tests of significance. The Publication Manual provides information on tests of significance, including null hypothesis testing, effect sizes, confidence intervals, inferential statistics, and supplementary analyses. In the Discussion section, the writer evaluates and interprets the findings.



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Take into account the following tips:

1. Avoid statements that go beyond what the results can support.

2. Avoid unspecific expressions such as "higher temperature", "at a lower rate", "highly significant". Measurement of sample antioxidant activity done at a wavelength 515 nm which is the the maximum DPPH wavelength, with concentration of DPPH 50 μm"

3. Avoid sudden introduction of new terms or ideas; you must present everything in the introduction, to be confronted with your results here.

4. Speculations on possible interpretations are allowed, but these should be rooted in fact, rather than imagination. To achieve good interpretations think about:

- a. How do these results relate to the original question or objectives outlined in the Introductionsection?
- b. Do the data support your hypothesis?
- c. Are your results consistent with what other investigators have reported?
- d. Discuss weaknesses and discrepancies. If your results were unexpected, try to explain why
- e. Is there another way to interpret your results?
- f. What further research would be necessary to answer the questions raised by your results?
- g. Explain what is new without exaggerating
- 5. Please improve the citation for discussion

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The Conclusion has been written in relation to the objectives included in the introduction. This section shows how the work advances the field from the present state of knowledge. In some journals, it's a separate section; in others, it's the last paragraph of the Discussion section. Whatever the case, without a clear conclusion section, reviewers and readers will find it difficult to judge your work and whether it merits publication in the journal. The author should provide a clear scientific justification for your work in this section, and indicate uses and extensions if appropriate. Moreover, the author can suggest future experiments and point out those that are underway. Author can propose present global and specific conclusions, in relation to the objectives included in the introduction.





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Reference:

The author has added references to the publication, which has been published for the past three years, according to the reviewer's advice. Please make sure that the format of "Index Terms" is correct.

Decision: As a result of research with an appropriate methodology, this paper is **ACCEPTED for publication with minor revision.**

Additional Comments:

There are some grammatical mistakes and some mistakes in Punctuation.

D. Recommendation (Tick one)

1. Accepted without modifications.	
2. Accepted with minor corrections.	
3. Accepted with major modification.	
4. Rejected.	

E. Comments to the editors (These comments will not be sent to the authors)

Please makes sure that all reviewers comment already answered by the author and fixed it in the manuscript.

Sincerely,

Regards,

Rahmat Hidayat

Editor in Chief International Journal on Advanced Science, Engineering and Information Technology http:/ijaseit.insightsociety.org

Revisi Pertama

Phenolics Total And Antioxidant Activity Of Strawberry (*Fragaria chiloensis*)

Rince Alfia Fadri¹, Rilma Novita¹, Yenni Muchrida¹, Sri Kembaryanti Putri¹, Fidela Violalita¹ ¹Program Study of Food Technology, Polytechnic of Agricultural, University of Andalas, 26271 Payakumbuh,, West Sumatera, Indonesia E-mail rince.alfia@yahoo.co.id

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The materials used are: Strawberries from Alahan Panjang and Padang Panjang, aquabidest acid, methanol, galat acid p.a (Merck), Reagent Folin-Ciocalteu, sodium carbonate p. a. (Merck), 2,2-diphenyl-1pikrilhidrazil (DPPH) p. A (Merck), heksan p. a. (Merck), acetone (Merck), methanol, ethanol 96%, vitamin C.

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the total phenols and the activities of methanol extracts of Strawberry from two regions, Alahan Panjang Solok Regency and Padang Panjang city.

D. Research Implementation

To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode.

E. Sampling

The sample used is strawberry, which were taken in the area Alahan Panjang Solok Regency and from Padang Panjang City.

F. Sample Prepaation

250 g of fresh strawberries weighed, blender for 3 minutes and then maceration with 250 ml of methanol, while shaked. Do for 3 repetitions then filter by using filter paper whatman No. 1, mixing it with the filtrate. The filtrate is thicked by using a rotary evaporator, so the extracts that can be poured obtained.

G. Determination of Phenolic Total Content by Folin-Ciocalteu Method (Scrambled, h. h., 2006)

From The prime of Galat Acid solution (5 mg/ml), taken by pipette tes 1, 1.5, 2, 2.5, 3, 3.5 ml and to be diluted with aquadest to volume 25 ml. so that the concentration to be resulted are 200, 300, 400, 500, 600, and 700 mg/L galat acid. By each concentration above, taken by pipette tes 0,2 ml added 15.8 ml of aquadest added 1 ml Folin Ciocalteu Reagent and to be shaked. Let it for 8 minutes, add 3 ml of 20% solution of Na2CO3 and shake until homogeneous. Let it for 2 hours at room temperature. Measure the absorption at amaximum wavelength absorption 765 nm, and create its calibration curve the relationship between concentration of galat acid (mg/L) and absorban.

Sample (Strawberry extract) first diluted with 10 ml of aquadest, then to be taken by pipette test 0,2 ml and 15.8 ml of aquadest added. Then add 1 ml of Folin-Ciocalteu reagent and shaked. Let it for 8 minutes then add 3 ml of 20% Na2CO3 to the mix, let the solution stands for 2 hours at room temperature. Measure its absorbtion with UV-Vis spectrophotometer at a absorption wavelength maximum 765 nm which will provide complex blue. Do 3 repetitions so that levels of phenols obtained, the result obtained as mg equivalent galat acid/L.

H. Examination Of Antioxidant Activity (Hanani, E, 2005; Okawa, M,2001)

10 mg of extract to be weighed, then dissolve in 10 ml of methanol in measurement flask *ad 10 ml*, so, found a concentration of 1 mg/ml. then do the dilution by adding methanol thus samples with concentrations (20,40, 60, 80,100 glow g/ml) obtained.

For the determination of antioxidant activity of each concentration to be taken by pipette test as much as 0.2 ml of the sample solution with a micro pipette and input into the vial, then add 3.8 ml of solution DPPH 50 μ m. The compound to be homogeneous and left for 30 minutes in a dark place, the absorption is measured by UV-Vis spectrophotometer at a wavelength of 515 nm.

I. Determination Of The Dpph Maximum Wavelength Absorption (Okawa, M., 2001)

3.8 ml of solution DPPH 50 μ M taken by pippette test and add with a 0,2 ml of methanol. After 30 minutes left in a dark place, absorption solution to be measured by UV-Vis spectrophotometer at a wavelength of 400 – 800 nm.

J. Data Processing

Antioxidant activity of samples is determined by the size of the radical DPPH obstacle through calculation of the inhibition percentage of DPPH absorption by using the formula:

% inhibition = <u>AbsControl – AbsSample x 100%</u> AbsControl

Description

Abs control : The Absorption of DPPH radical 50 μ M at a wavelength 515 nm.

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IC value 50 each sample concentration to be calculated the IC value 50 by using a linear regression equation formula.

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The extraction is done by maceration because the way is easily done at room temperature and using simple tools in a way the samples soaked in the solvent. The solvent used was methanol because it can dissolve almost all organic compounds in the samples mainly polar compound. Methanol easily evaporate so it liberated from the extract easily, and disposed cheaper compared to other organic solvents. All the filtrate obtained from extraction results to be evaporated with the rotary evaporator so that the strawberries methanol extracts obtained that can be poured as much as 11: 57% (Strawberries from Padang Panjang) and 7.74% (Strawberries from Alahan Panjang) from the initial weight of each.

Determination levels of phenols total used as galat acid as standard solution. The maximum galat acid absorption is obtained at a wavelength 768 nm. By the time the examination of the levels of phenols total strawberries done, firstly made the calibration curve galat acid standard solutions with a concentration series 200-700 mg/l. Making this calibration curve is useful to help determine the levels of phenol in the sample through the equation of regression of the calibration curve.

From an examination of the standard galat acid solution the calibration curve obtained by a regression equation y = 0.000979 x + 0.03455 and coefficient correlation(r) price that is 0.998. On the determination of the levels strawberries phenolat total from Strawberry extract of Alahan Panjang value obtained 232.6694 mg/L and The levels of Padang Panjang Strawberry Phenolat total extract value obtained 120.3098 mg/l. This value equal to the Alahan Panjang Strawberry phenolat total level 1800.219 mg/kg of fresh samples and Padang Panjang strawberry phenolat total 1392.502 mg/kg of fresh samples.

This result shows that the Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than the Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample. According to Howard and Hager (2007) strawberries phenol total range between 43-94 mg/100 g of fresh weight and 202-275 mg/100 g of fresh weight.

TABLE I

ABSORBAN MEASUREMENT RESULTS OF
STANDARD GLATACID SOLUTION AT A
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Galat Acid Concentrate (ppm)	Absorban Values
200	0.217
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SPECTROPHOTOMETER

The method used in testing antioxidant activity was radical DPPH absorption method. Measurement of sample antioxidant activity done at a wavelength 515 nm which is the the maximum DPPH wavelength, with concentration of DPPH 50 μ m. Antioxidant activity of the samples caused discoloration of DPPH solution in methanol that originally strong violet into a pale yellow.





Antioxidant activity of Strawberry methanol extract expressed in its percent inhibition against DPPH radical. Percentage of inhibition obtained from the difference absorban between DPPH absorban with sample absorban that measured with a spectrophotometer UV_Vis. The amount of antioxidant activity marked by IC 50, that is the concentration of the sample solution is needed to inhibit 50% DPPH free radical. Antioxidant activity Test using the DPPH method of strawberries methanol extracts from Alahan Panjang and Padang Panjang concentration 20,40, 60, 80,100 µg/ml, it is obtained IC 50 each 152,9 and 232,6 µg/ml.

TABLE 2 Strawberries extract methanol antioxidant activity using the DPPH 50 mM

Compa-	Concen-	Absorb	%	IC50
Rator	tration	ancy	Inhibition	(µg/ml)
Padang	20	0,227	0,3204	
Panjang				
Strawberry	40	0,216	0,3533	
(PP)	60	0,213	0,3623	232,6
	80	0,208	0,3772	
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Strawberry	40	0,230	0,4250	152,9
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	100	0,210	0,4750	
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	3	0,235	42,82	
	4	0,189	54,01	3,63
	5	0,123	70,07	•
	6	0.065	84,18	

Whereas the value of the IC 50 of vitamin C is 3.63 µg/ml to the DPPH 50 µM (Andayani, et al., 2008). This indicates that Strawberries extract originally from Alahan Panjang have better antioxidant activity than strawberries extract originally from Padang Panjang. But the antioxidant activity of vitamin C is far higher. Molyneux (2004) Stated that a substance has antioxidant characteristic when the value of the IC50 less than 200 ppm. When the value of the IC50 ranging between 200-1000 ppm, then the substance is less active but still has potential as antioxidant. Strawberry antioxidant activity test results can be seen in table and picture 1.



Picture 2. Strawberry extract anti oxidant activities curve

IV. CONCLUSIONS

From the results of research that has been done can be taken the following conclusions:

- The methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample
- The methanol extract of Strawberries originally from Alahan Panjang and Padang Panjang have the ability to muffle DPPH free radical but smaller than the ability of vitamin C (3.63µg/ml).
- IC 50 value of Strawberry extract originally from Alahan Panjang is

152,9 μ g/ml whereas IC 50 value of Strawberry extract from Padang Panjang is 232,6 μ g/ml.

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REVIEW FORM

21th September 2015 Ref. No. 19/ReV/IJASEIT/IX/2015

Dear Dear Rince Alfia Fadri,

Program Study of Food Technology, Polytechnic of Agricultural, University of Andalas, 26271 Payakumbuh, West Sumatera, Indonesia. Corresponding Author: <u>rince.alfia@yahoo.co.id</u>

Title:	Phenolics Total And Antioxidant Activity Of Strawberry (Fragaria chiloensis)
Author(s):	Rince Alfia Fadri, Rilma Novita, Yenni Muchrida, Sri Kembaryanti Putri, Fidela Violalita
Paper-ID	591

A. Technical aspects

	0	1	2	3	4	5
1. The paper is within the scope of the Journal.						
2. The paper is original.						
3. The paper is free of technical errors.						
B. Communications aspects						
	0	1	2	3	4	5
1. The paper is clearly readable.						
2. The figures are clear & do clearly convey the intended message.						
3. The length of the paper is appropriate.						



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C. Comments to the authors (You may use another sheet of paper.)

Thank you very much for the submission through the online system. The manuscript has been reviewed. Please look into this and resubmission your manuscript after revision.

Please find the revision in the attachment!

The novelty: Antioxidant activity Test using the DPPH method of strawberries methanol extracts indicates that Strawberries extract originally from Alahan Panjang have better antioxidant activity than strawberries extract originally from Padang Panjang. But the antioxidant activity of vitamin C is far higher.

The Title: The title summarizes the main idea or ideas of your study. A good title contains the fewest possible words that adequately describe the contents and/or purpose of your research paper. The title is without doubt the part of a paper that is read the most, and it is usually read first. The title of this paper is good and informative.

The abstract: has already explained, "What is the importance of research". [An abstract should be between 150-250 words.]. Please improve the English, use simple sentence and provide the implication of research.

Abstract— ABSTRACK

Abstract – The purpose of this research is to know the total of phenolics and antioxidant activity of Strawberry that grows in the area Alahan Panjang Solok Regency and Padang Panjang city. This research was carried out at the Chemical Laboratory of Agricultural Polytechine State of Payakumbuh with a long six months time needed. To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode. The results of research that methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample.

Keywords: strawberry; phenolics total; antioxidant activity





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The Introduction typically occupies 10-15% of the paper. The introduction should consists of two parts: It should include a few general statements about the subject to provide a background to your paper and to attract the reader's attention. It should try to explain why you are writing the paper. The introduction section has included a general introduction, problem definition, problem solution, study motivation, aims and objectives, gaps in the literature. Noted: Please clearly mention the objective of study in Introduction. Add some recent literature to strengthen the need for this research to be carried out.

To clearly establish the context for the study, the introduction contains four main components:

- a. General background information
- b. Specific background information
- c. A description of the gap in our knowledge that the study was designed to fill
- d. A statement of study objective, and (optionally) a brief summary of study

The introduction is already mentioned in the Introduction.

The Materials and methodology is good. The methods have described how the research **question was answered, explain how the results were analysed.**Noted: Make the materials and methods more detailed, so others can also do the same. How to determine added value also needs to be explained. The goal of this article is to define what is research methodology, guide novice researchers in their research methodology writing, and to help them gain a clear understanding of a research methodology's structure.

Materials and methods has been written in more detailed

Results and Discussion have included findings, comparison with prior studies, causal arguments, and deductive arguments.

Noted:

- a. The discussion section, which follows the results section, will include an explanation of the results. In this section, you should connect your results to previous research studies, make explicit connections back to your research question(s) and include an explanation about how the results might be generalized. This is where you make an argument that supports your main conclusions.
- b. The results section is very direct and reports the outcome from the statistical analyses conducted. Tables and figures can help break up this section, as it can be very technical. In addition, using visuals in this way makes the results more accessible to readers.





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c. Note: Some articles collapse the Discussion and Conclusion sections together under a single heading (usually "Conclusion"). If you don't see a separate Discussion section, don't worry. Instead, look in the nearby sections for the types of information described in the paragraph above.

Result and discussion has been written in accordance with scientific principles

Conclusion:

The research gap identified in the introduction indicates what the researchers wanted to look at; what did they claim, ultimately, when they completed their research? What did it show them—and what are they showing us—about the topic? Did they get the results they expected? Why or why not? The thesis is not a sweeping proclamation; rather, it is likely a very reasonable and conditional claim.

The Conclusion has been written in relation to the objectives included in the introduction.

Reference:

The author has added references to the publication, which has been published for the past three years, according to the reviewer's advice.

Decision: As a result of research with an appropriate methodology, **this paper is ACCEPTED for publication**

Additional Comments:

There are some grammatical mistakes and some mistakes in Punctuation.

D. Recommendation (Tick one)

- 1. Accepted without modifications.
- 2. Accepted with minor corrections.
- 3. Accepted with major modification. \Box
- 4. Rejected.



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E. Comments to the editors (These comments will not be sent to the authors)

Please makes sure that all reviewers comment already answered by the author and fixed it in the manuscript. The paper was perceived to be superficial, presenting only previously published knowledge and unproven results. The entire problem was not well defined and no new technique/solution was proposed. The factors that lead to my recommendation to major revision. 2. Grammar MUST be extensively improved. Some sentences have poor sentence structure. They are hardly understandable. The more serious issue is, there are spelling mistakes in the article. To show professionalism, the authors should cross-check these before submission. Please makes sure that the template for this manuscriopt should be revised and decimal data should use point(.) instead of coma (,)

Sincerely,

Regards,

Rahmat Hidayat

Editor in Chief International Journal on Advanced Science, Engineering and Information Technology http:/ijaseit.insightsociety.org

Phenolics Total And Antioxidant Activity Of Strawberry (*Fragaria chiloensis*)

Rince Alfia Fadri¹, Rilma Novita¹, Yenni Muchrida¹, Sri Kembaryanti Putri¹, Fidela Violalita¹ ¹Program Study of Food Technology, Polytechnic of Agricultural, University of Andalas, 26271 Payakumbuh,, West Sumatera, Indonesia E-mail rince.alfia@yahoo.co.id

Abstract — The purpose of this research is to know the total of phenolics and antioxidant activity of Strawberry that grows in the area Alahan Panjang Solok Regency and Padang Panjang city. This research was carried out at the Chemical Laboratory of Agricultural Polytechine State of Payakumbuh with a long six months time needed. To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode. The results of research that methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample.

Keywords— strawberry; phenolics total; antioxidant activity

I. INTRODUCTION

Strawberry (Fragaria chiloensis) originally an imported fruit, but now strawberries are very familiar in Indonesia. Many farmers are cultivating strawberries and some are merely a hobby at home. Strawberry production in West Sumatra reches 2,400 tons with a total area harvest 150 acres scattered across in the Alahan Panjang area, Padang Panjang, Batu Sangkar and Bukittinggi (BPS, 2009).

Strawberries have a high nutrient content and edible part of the strawberry reaches 96%. In addition strawberries contain variety of essential nutrients, strawberries contain lycopene, anthocyanin, elagic acid, a phenolic compounds also vitamin C and vitamin E that are potentially as anti carsinogenic. Red on strawberry is the main pigment called anthocyanin (Gould, 2008). But according to Astawan (2004), red on strawberries is caused by licopene substance content in it. The number of active compounds that have characteristic as antioxidants in Strawberry make a well antioxidant network to ward off free radicals.

The function of Anthocyanin is as antioxidants in the body that can prevent the occurrence of hyper cholesterolemia (Fadri, 2010). In addition it also relaxes the blood vessels to prevent atherosclerosis and other cardiovascular diseases (Houghton, 1995). Lycopene plays a role in organizing cholesterol metabolism, by hampering the *HMG-CoA reduktase* enzyme actions, which plays a role in the synthesis process of cholesterol in the liver, so it has hypocholesterolemi effect. From the research noted that the daily intake of 40 mg likopen can reduce LDL oxidation (Houghton, 1995).

The purpose of this research is to know the total of phenolics and antioxidant activity of Strawberry that grows in the area Alahan Panjang Solok Regency and Padang Panjang city.

II. METHODE

A. Time and Place

This research was carried out at the Chemical Laboratory of Agricultural Polytechine State of Payakumbuh with a long six months time needed.

B. Tools and Materials

The tools used are: Blender, filter paper Whatman No. 1, vaporizer cup, rotary evaporator, digital scales, measuring flasks, plate drops, measuring pipette, micro-pipette, spatel, aluminum foil, oven, desiccator, erlemeyer, watches, vial, measuring cup, funnel, test tubes, magnetic stirer, UV spectrophotometer set – Vis (shimadzu 265).

The materials used are: Strawberries from Alahan Panjang and Padang Panjang, aquabidest acid, methanol, galat acid p.a (Merck), Reagent Folin-Ciocalteu, sodium carbonate p. a. (Merck), 2,2-diphenyl-1pikrilhidrazil (DPPH) p. A (Merck), heksan p. a. (Merck), acetone (Merck), methanol, ethanol 96%, vitamin C.

C. Research Design

The design used was experimental research in vitro laboratoriy that aim to measure

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D. Research Implementation

To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode.

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	6	0,065	84,18	

Whereas the value of the IC 50 of vitamin C is 3.63 μ g/ml to the DPPH 50 μ M

(Andayani, et al., 2008). This indicates that Strawberries extract originally from Alahan Panjang have better antioxidant activity than strawberries extract originally from Padang Panjang. But the antioxidant activity of vitamin C is far higher. Molyneux (2004) Stated that a substance has antioxidant characteristic when the value of the IC50 less than 200 ppm. When the value of the IC50 ranging between 200-1000 ppm, then the substance is less active but still has potential as antioxidant. Strawberry antioxidant activity test results can be seen in table and picture 1.



Picture 2. Strawberry extract anti oxidant activities curve

IV. CONCLUSIONS

From the results of research that has been done can be taken the following conclusions:

- 1. The methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample
- 2. The methanol extract of Strawberries originally from Alahan Panjang and Padang Panjang have the ability to muffle DPPH free radical but smaller than the ability of vitamin C (3.63-µg/ml).
- IC 50 value of Strawberry extract originally from Alahan Panjang is 152,9 μg/ml whereas IC 50 value of Strawberry extract from Padang Panjang is 232,6 μg/ml.

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REVIEW FORM

11th October 2015 Ref. No. 5/ReV/IJASEIT/X/2015

Dear Rince Alfia Fadri,

Program Study of Food Technology, Polytechnic of Agricultural, University of Andalas, 26271 Payakumbuh, West Sumatera, Indonesia Corresponding Author: rince.alfia@yahoo.co.id

Title:	Phenolics Total And Antioxidant Activity Of Strawberry (Fragaria chiloensis)
Author(s):	Rince Alfia Fadri, Rilma Novita, Yenni Muchrida, Sri Kembaryanti Putri, Fidela Violalita
Paper-ID	591

A. Technical aspects

	0	1	2	3	4	5
1. The paper is within the scope of the Journal.						
2. The paper is original.						
3. The paper is free of technical errors.						
B. Communications aspects	0	1	2	3	4	5
1. The paper is clearly readable.						
2. The figures are clear & do clearly convey the intended message.						
3. The length of the paper is appropriate.						





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C. Comments to the authors (You may use another sheet of paper.)

Thank you very much for the submission through the online system. The manuscript has been reviewed. Please look into this and resubmission your manuscript after revision. Please find the revision in the attachment!

The novelty: TAntioxidant activity Test using the DPPH method of strawberries methanol extracts indicates that Strawberries extract originally from Alahan Panjang have better antioxidant activity than strawberries extract originally from Padang Panjang. But the antioxidant activity of vitamin C is far higher.

The Title: The title summarizes the main idea or ideas of your study. A good title contains the fewest possible words that adequately describe the contents and/or purpose of your research paper. The title is without doubt the part of a paper that is read the most, and it is usually read first. The title of this paper is good and informative.

The abstract: has already explained, "What is the importance of research". [An abstract should be between 150-250 words.]. Please improve the English, use simple sentence and provide the implication of research.

Abstract— ABSTRACK

Abstract – The purpose of this research is to know the total of phenolics and antioxidant activity of Strawberry that grows in the area Alahan Panjang Solok Regency and Padang Panjang city. This research was carried out at the Chemical Laboratory of Agricultural Polytechine State of Payakumbuh with a long six months time needed. To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode. The results of research that methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample.

Keywords: strawberry; phenolics total; antioxidant activity





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The Introduction typically occupies 10-15% of the paper. The introduction should consists of two parts: It should include a few general statements about the subject to provide a background to your paper and to attract the reader's attention. It should try to explain why you are writing the paper. The introduction section has included a general introduction, problem definition, problem solution, study motivation, aims and objectives, gaps in the literature.

The introduction is already mentioned in the Introduction.

Noted: I Please clearly mention the objective of study in Introduction. Add some recent literature to strengthen the need for this research to be carried out. A good place to start for your results section, it's to restate the aim and objective of your research paper, so that your readers can refocus on the core of your article. So far in your research paper, your readers covered the introduction, literature review, research methodology and now it's the time and place to bring their attention back to the purpose. A short paragraph is sufficient to restate your paper's purpose.

The Materials and methodology is good. The methods have described how the research question wasanswered, explain how the results were analysed.

Noted: Make the materials and methods more detailed, so others can also do the same. How to determine added value also needs to be explained. This article is part of an ongoing series on academic writing help of scholarly articles. Previous parts explored how to write an introduction for a research paper, literature review outline and format, and how to write a research methodology.

Result and discussion has been written in accordance with scientific principles

Results and Discussion have included findings, comparison with prior studies, causal arguments, anddeductive arguments. The results section gives you the opportunity to: summarize the collected data in the form of descriptive statistics and report on the findings from relevant and appropriate inferential statistical analyses and interpretation that are aimed at answering your article's research questions or supporting your hypotheses, and show your research significance.

Conclusion:

The Conclusion has been written in relation to the objectives included in the introduction. This section shows how the work advances the field from the present state of knowledge. In some journals, it's a separate section; in others, it's the last paragraph of the Discussion section. Whatever the case, without a clear conclusion section, reviewers and readers will find it difficult to judge your work and whether it merits publication in the journal. A common error in this section is repeating the abstract, or just listing experimental results. Trivial statements of your results are unacceptable in this section. The author should provide a clear scientific justification for your work in this section, and indicate uses and extensions if appropriate. Moreover, the author can suggest future experiments and point out those that are underway. Author can propose present global and specific conclusions, in relation to the objectives included in the introduction.



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Reference:

The author has added references to the publication, which has been published for the past three years, according to the reviewer's advice.

Decision: As a result of research with an appropriate methodology, **this paper is ACCEPTED for publication**

Additional Comments:

There are some grammatical mistakes and some mistakes in Punctuation.

D. Recommendation (Tick one)

1. Accepted without modifications.	
2. Accepted with minor corrections.	
3. Accepted with major modification.	
4. Rejected.	

E. Comments to the editors (These comments will not be sent to the authors)

Please makes sure that all reviewers comment already answered by the author and fixed it in the manuscript.

Sincerely,

Regards,

Rahmat Hidayat

Editor in Chief International Journal on Advanced Science, Engineering and Information Technology http:/ijaseit.insightsociety.org Leave this box blank Remove it before converting to pdf

Phenolics Total And Antioxidant Activity Of Strawberry (*Fragaria chiloensis*)

Rince Alfia Fadri¹, Rilma Novita¹, Yenni Muchrida¹, Sri Kembaryanti Putri¹, Fidela Violalita¹

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Abstract — The purpose of this research is to know the total of phenolics and antioxidant activity of Strawberry that grows in the area Alahan Panjang Solok Regency and Padang Panjang city. This research was carried out at the Chemical Laboratory of Agricultural Polytechinc State of Payakumbuh with a long six months time needed. To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode. The results of research that methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample.

Keywords- strawberry; phenolics total; antioxidant activity

I. INTRODUCTION

Strawberry (Fragaria chiloensis) originally an imported fruit, but now strawberries are very familiar in Indonesia. Many farmers are cultivating strawberries and some are merely a hobby at home. Strawberry production in West Sumatra reches 2,400 tons with a total area harvest 150 acres scattered across in the Alahan Panjang area, Padang Panjang, Batu Sangkar and Bukittinggi (BPS, 2009).

Strawberries have a high nutrient content and edible part of the strawberry reaches 96%. In addition strawberries contain variety of essential nutrients, strawberries contain lycopene, anthocyanin, elagic acid, a phenolic compounds also vitamin C and vitamin E that are potentially as anti carsinogenic. Red on strawberry is the main pigment called anthocyanin (Gould, 2008). But according to Astawan (2004), red on strawberries is caused by licopene substance content in it. The number of active compounds that have characteristic as antioxidants in Strawberry make a well antioxidant network to ward off free radicals.

The function of Anthocyanin is as antioxidants in the body that can prevent the occurrence of hyper cholesterolemia (Fadri, 2010). In addition it also relaxes the blood vessels to prevent atherosclerosis and other cardiovascular diseases (Houghton, 1995). Lycopene plays a role in organizing cholesterol metabolism, by hampering the *HMG-CoA reduktase* enzyme actions, which plays a role in the synthesis process of cholesterol in the liver, so it has hypocholesterolemi effect. From the research noted that the daily intake of 40 mg likopen can reduce LDL oxidation (Houghton, 1995).

The purpose of this research is to know the total of phenolics and antioxidant activity of Strawberry that grows in the area Alahan Panjang Solok Regency and Padang Panjang city.

II. METHODE

A. Time and Place

This research was carried out at the Chemical Laboratory of Agricultural Polytechine State of Payakumbuh with a long six months time needed.

B. Tools and Materials

The tools used are: Blender, filter paper Whatman No. 1, vaporizer cup, rotary evaporator, digital scales, measuring flasks, plate drops, measuring pipette, micro-pipette, spatel, aluminum foil, oven, desiccator, erlemeyer, watches, vial, measuring cup, funnel, test tubes, magnetic stirer, UV spectrophotometer set – Vis (shimadzu 265).

The materials used are: Strawberries from Alahan Panjang and Padang Panjang, aquabidest acid, methanol, galat acid p.a (Merck), Reagent Folin-Ciocalteu, sodium carbonate p. a. (Merck), 2,2-diphenyl-1-pikrilhidrazil (DPPH) p. A (Merck), heksan p. a. (Merck), acetone (Merck), methanol, ethanol 96%, vitamin C.

C. Research Design

The design used was experimental research in vitro laboratoriy that aim to measure the total phenols and the activities of methanol extracts of Strawberry from two regions, Alahan Panjang Solok Regency and Padang Panjang city.

D. Research Implementation

To determine the levels of phenols total used Folin-Ciocalteu methode, and as a standard also to be used galat acid, while on antioxidant activity testing used DPPH free radical absorption methode.

E. Sampling

The sample used is strawberry, which were taken in the area Alahan Panjang Solok Regency and from Padang Panjang City.

F. Sample Prepaation

250 g of fresh strawberries weighed, blender for 3 minutes and then maceration with 250 ml of methanol, while shaked. Do for 3 repetitions then filter by using filter paper whatman No. 1, mixing it with the filtrate. The filtrate is thicked by using a rotary evaporator, so the extracts that can be poured obtained.

G. Determination of Phenolic Total Content by Folin-Ciocalteu Method (Scrambled, h. h., 2006)

From The prime of Galat Acid solution (5 mg/ml), taken by pipette tes 1, 1.5, 2, 2.5, 3, 3.5 ml and to be diluted with aquadest to volume 25 ml. so that the concentration to be resulted are 200, 300, 400, 500, 600, and 700 mg/L galat acid. By each concentration above,taken by pipette tes 0,2 ml added 15.8 ml of aquadest added 1 ml Folin Ciocalteu Reagent and to be shaked. Let it for 8 minutes, add 3 ml of 20% solution of Na2CO3 and shake until homogeneous. Let it for 2 hours at room temperature. Measure the absorption at amaximum wavelength absorption 765 nm, and create its calibration curve the relationship between concentration of galat acid (mg/L) and absorban.

Sample (Strawberry extract) first diluted with 10 ml of aquadest, then to be taken by pipette test 0,2 ml and 15.8 ml of aquadest added. Then add 1 ml of Folin-Ciocalteu reagent and shaked. Let it for 8 minutes then add 3 ml of 20% Na2CO3 to the mix, let the solution stands for 2 hours at room temperature. Measure its absorbtion with UV-Vis spectrophotometer at a absorption wavelength maximum 765 nm which will provide complex blue. Do 3 repetitions so that levels of phenols obtained, the result obtained as mg equivalent galat acid/L.

H. Examination Of Antioxidant Activity (Hanani, E, 2005; Okawa, M,2001)

10 mg of extract to be weighed, then dissolve in 10 ml of methanol in measurement flask *ad 10 ml*, so, found a concentration of 1 mg/ml. then do the dilution by adding methanol thus samples with concentrations (20,40, 60, 80,100 glow g/ml) obtained.

For the determination of antioxidant activity of each concentration to be taken by pipette test as much as 0.2 ml of the sample solution with a micro pipette and input into the

vial, then add 3.8 ml of solution DPPH 50 μ m. The compound to be homogeneous and left for 30 minutes in a dark place, the absorption is measured by UV-Vis spectrophotometer at a wavelength of 515 nm.

I. Determination Of The Dpph Maximum Wavelength Absorption (Okawa, M., 2001)

3.8 ml of solution DPPH 50 μ M taken by pippette test and add with a 0,2 ml of methanol. After 30 minutes left in a dark place, absorption solution to be measured by UV-Vis spectrophotometer at a wavelength of 400 – 800 nm.

J. Data Processing

Antioxidant activity of samples is determined by the size of the radical DPPH obstacle through calculation of the inhibition percentage of DPPH absorption by using the formula:

Description

Abs control : The Absorption of DPPH radical 50 μ M at a wavelength 515 nm. Abs Samples : Sample absorption in DPPH radical 50 μ M at a wavelength 515 nm.

IC value 50

each sample concentration to be calculated the IC value 50 by using a linear regression equation formula.

III. RESULT AND DISCUSSION

The extraction is done by maceration because the way is easily done at room temperature and using simple tools in a way the samples soaked in the solvent. The solvent used was methanol because it can dissolve almost all organic compounds in the samples mainly polar compound. Methanol easily evaporate so it liberated from the extract easily, and disposed cheaper compared to other organic solvents. All the filtrate obtained from extraction results to be evaporated with the rotary evaporator so that the strawberries methanol extracts obtained that can be poured as much as 11: 57% (Strawberries from Padang Panjang) and 7.74% (Strawberries from Alahan Panjang) from the initial weight of each.

Determination levels of phenols total used as galat acid as standard solution. The maximum galat acid absorption is obtained at a wavelength 768 nm. By the time the examination of the levels of phenols total strawberries done, firstly made the calibration curve galat acid standard solutions with a concentration series 200-700 mg/l. Making this calibration curve is useful to help determine the levels of phenol in the sample through the equation of regression of the calibration curve. From an examination of the standard galat acid solution the calibration curve obtained by a regression equation y = 0.000979 x + 0.03455 and coefficient correlation(r) price that is 0.998. On the determination of the levels strawberries phenolat total from Strawberry extract of Alahan Panjang value obtained 232.6694 mg/L and The levels of Padang Panjang Strawberry Phenolat total extract value obtained 120.3098 mg/l. This value equal to the Alahan Panjang Strawberry phenolat total level 1800.219 mg/kg of fresh samples and

Padang Panjang strawberry phenolat total 1392.502 mg/kg of fresh samples. This result shows that the Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than the Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample. According to Howard and Hager (2007) strawberries phenol total range between 43-94 mg/100 g of fresh weight and 202-275 mg/100 g of fresh weight.

 TABLE I

 Absorban measurement results of standard glatacid solution at a wavelength 765 nm with UV-VIS spectrophotometer

Galat Acid Concentrate (ppm)	Absorban Values
200	0.217
300	0.326
400	0.445
500	0.534
600	0.621
700	0.707



Picture 1. Galat acid calibration curve in folin-Ciocalteu reagent at a wavelength 768 nm

The method used in testing antioxidant activity was radical DPPH absorption method. Measurement of sample antioxidant activity done at a wavelength 515 nm which is the the maximum DPPH wavelength, with concentration of DPPH 50 μ m. Antioxidant activity of the samples caused discoloration of DPPH solution in methanol that originally strong violet into a pale yellow.

Antioxidant activity of Strawberry methanol extract expressed in its percent inhibition against DPPH radical. Percentage of inhibition obtained from the difference absorban between DPPH absorban with sample absorban that measured with a spectrophotometer UV_Vis. The amount of antioxidant activity marked by IC 50, that is the concentration of the sample solution is needed to inhibit 50% DPPH free radical. Antioxidant activity Test using the DPPH method of strawberries methanol extracts from Alahan Panjang and Padang Panjang concentration 20,40, 60, 80,100 µg/ml, it is obtained IC 50 each 152,9 and 232,6 µg/ml. Whereas the value of the IC 50 of vitamin C is 3.63 µg/ml to the DPPH 50 µM (Andayani, et al., 2008). This indicates that Strawberries extract originally from Alahan Panjang have better antioxidant activity than strawberries extract originally from Padang Panjang. But the antioxidant activity of vitamin C is far higher. Molyneux (2004) Stated that a substance has antioxidant characteristic when the value of the IC50 less than 200 ppm. When the value of the IC50 ranging between 200-1000 ppm, then the substance is less active but still has potential as antioxidant. Strawberry antioxidant activity test results can be seen in table and picture 1.

 TABLE 2

 Strawberries extract methanol antioxidant activity

 Using the DPPH 50 mM

Compa-	Concen-	Absorbancy	%	IC50
Rator	tration		Inhibition	(µg/ml)
Padang	20	0,227	0,3204	
Panjang				
Strawberry	40	0,216	0,3533	
(PP)	60	0,213	0,3623	232,6
	80	0,208	0,3772	
	100	0,204	0,3892	
Alahan	20	0,231	0,4238	
Panjang				
Strawberry	40	0,230	0,4250	152,9
(AP)	60	0,228	0,4300	
	80	0,220	0,4500	
	100	0,210	0,4750	
Vitamin C	2	0,132	20,09	
	3	0,235	42,82	
	4	0,189	54,01	3,63
	5	0,123	70,07	
	6	0,065	84,18	



Picture 2. Strawberry extract anti oxidant activities curve

IV. CONCLUSIONS

From the results of research that has been done can be taken the following conclusions:

- The methanol extract of Strawberries originally from Alahan Panjang have phenol total 180 mg/100 g of fresh sample and higher than Strawberries originally from Padang Panjang with phenol total 139.2 mg/100 g of fresh sample
- The methanol extract of Strawberries originally from Alahan Panjang and Padang Panjang have the ability to muffle DPPH free radical but smaller than the ability of vitamin C (3.63-µg/ml).
- IC 50 value of Strawberry extract originally from Alahan Panjang is 152,9 µg/ml whereas IC 50 value of Strawberry extract from Padang Panjang is 232,6 µg/ml.

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