

Effect of Leaf Extract Sirih (*Piper betle* L.) and on Future Soaking Time Freshness of Flowers Rose (*Rosa sinensis* L.)

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Abstract

Rose (*Rosa sinensis* L.) is one commodity florikulture important as a component in agribusiness systems and as an ornamental plant. Roses as an ornamental plant has two types, namely roses for the garden and roses for cut flowers. Cut flowers are marketed must have a good quality. One aspect of the desired quality is the life of a cut flower freshness long. Age freshness of cut flowers can be done by granting long soaking solution which is natural as a preservative. This study aims to get the right composition of the soaking solution between betel leaf extract, citric acid and sugar to prolong the freshness of roses. Results showed that betel leaf extract very significant effect on the diameter of the roses in full bloom at 2, 6, 8, and 10 DAT (Days After Treatment), 8 and 10 flower sepals DAT, the index rose florescence 8 and 10 DAT, the index kelayuan rose 6.8 and 10 DAT and organoleptic (color), real influence on organoleptic (texture) and had no significant effect on the diameter of flowers in full bloom 4 DAT, petal number 2, 4, 6, 8 and 10 DAT, sepals index flower 2, 4 and 6 DAT, and florescence index rose 2, 4 and 6 DAT. The best treatment is found in the treatment of betel leaf extract 200 g / L of water. Soaking time no real effect on the diameter of roses in full bloom, the number of petals, sepals index, the index rose florescence, indexes wilted roses and organoleptic (color and texture). Soaking time is best found in the soaking time of 9 days. There is a significant interaction between treatment betel leaf extract and soaking time on indexes sepals on 10 DAT and florescence index rose at 4 DAT.

Keywords: Rose, Betel leaves, soaking solution, Freshness

Introduction

Rose (*Rosa sinensis* L.) have a fascination for the beauty, elegance and fragrance as well known as the queen of all flowers (MIG Corp., 2002). Fresh roses resilience is influenced by internal and external factors such as seeds, climate, means of cultivation, harvesting techniques and post-harvest handling. Roses are always experiencing withering due to decay in the former cutting flower stalks caused by spoilage bacteria proliferate and clog the vascular channels, consequently flowers quickly wither because the food supply is inhibited (Amiarsi, 2011). Degradation of interest among others marked with a bent neck (where the neck of interest no longer able to withstand the load of flowers due to lack of water on the flower neck), being short, withered, and the colors fade (Amiarsi, 2009).

The use of silver nitrate (AgNO_3) as a material for cut flowers marinade solution plays an important role because it can prevent the growth of bacteria that cause decay of the stem (bactericidal), but silver nitrate has many shortcomings. Therefore we need an alternative substitution of silver nitrate having a relatively affordable price, can be made by the public, namely betel leaf extract which is a natural substance that is non-toxic and without leaving any residue after its use (Kurniawan *et al.*, 2008). The use of betel leaf extract can be used as a natural bactericide which can kill bacteria or microorganisms in the solution immersion cut flowers, because they have the essential oil content such as tannins, phenols and saponins as a bactericide (Wikipedia, 2007). Cut flowers freshener solution generally contains carbohydrates as an energy source, nutritional needs can be provided by the addition of sugar, which is then combined with germicides and citric acid as a preservative. Citric acid serves as a bactericide that can decrease the pH in the solution immersion (Amiarsi, 2011).

Based on the description above is not known the effect of extracts of betel leaf and soaking time is right and the combination of the two treatments on freshness future roses. This study is useful to determine the best treatment for freshness future roses. The research objective is to get the exact composition of the soaking solution between betel leaf extract, citric acid and sugar to prolong the freshness of roses.

Materials and Methods

Sample materials

The tools used in this research is measuring cup, analytical balance, blade, rod stirrer, blender, stationery, rulers, camera, filter, scissors, plastic containers and other research supporting tools. Materials used in this study is the rose varieties Super Holland red with a 10-25% rate of efflorescence derived from Bandung. Needs roses used as many as 36 stalks. Betel leaves used are light green betel obtained from the District Rural Lampeuneurut Darul Aceh Besar as much as 9 kg. Other materials used are paper labels, aqua bottle (600 ml) of distilled water as much as 36 L, white sugar 3 kg and 7.8 g of pure citric acid.

Experimental design

This study uses a completely randomized design (CRD) factorial 4 x 3. There are two factors studied were the first factor concentration betel leaf extract, sugar and citric acid (S) consists of 4 levels, namely:

S0 = 1 L water + sugar + 100 g of citric acid 0.20 g

S1 = betel leaves 200 g / L + sugar + 100 g of citric acid 0.20 g

S2 = betel leaves 250 g / L + sugar + 100 g of citric acid 0.20 g

S3 = betel leaves 300 g / L + sugar + 100 g of citric acid 0.20 g

The second factor, prolonged submersion (L) consists of three levels ie: L1 = 3 days, L2 = 6 days, L3 = 9 days

Overall there were 12 treatment combinations and each combination treatment had 3 replications that this research has 36 experimental units. Data analysis was performed by F test, if it shows the real effect, the analysis continued with a further test using the Least Significant Difference test at 5% level (BNT 0.05).

Research of Procedure

Procedure of the research done by making extracts of betel leaf and roses soaking according to the study treatment.

Parameters research

Variables measured to show the effect on the quality of roses include:

1. Full Bloom Flowers Diameter (cm)
2. The number of Petal Blossom (strands)
3. Sepal Index (Amiarsi and Tejasarwana, 2011).
4. Index rose florescence (Amiarsi and Tejasarwana, 2011)
5. Roses wilting index (Amiarsi and Tejasarwana, 2011)
6. Test Appearance (texture, and color) (Yudiana, 2013)

Result and Discussion

Results of analysis of variance showed that betel leaf extract very significant effect on the diameter of the roses in full bloom at 2, 6, 8, and 10 DAT, sepals index interest at 8 and 10 DAT, the index rose florescence at 8 and 10 DAT, flower wilting index rose at 6, 8 and 10 DAT and organoleptic color, significantly affect the organoleptic texture and no real effect on the diameter of roses in full bloom at 4 DAT, the number of petals at 2, 4, 6, 8 and 10 DAT, flower sepals index and florescence index rose respectively at 2, 4 and 6 DAT. The average treatment period of betel leaf extract against freshness of roses can be seen in Table 1.

Table 1 shows that the diameter of roses in full bloom at 2 DAT widest encountered in the treatment of betel leaf extract 200 g/L of water (S₁) that is significantly different from the treatment of betel leaf extract 250 g/L of water (S₂) and 300 g/L of water (S₃), but no significant with control treatment (S₀). At 6 DAT widest encountered in the treatment of betel leaf extract 200 g/L of water (S₁) that is significantly different from the control (S₀), 250 g/L of water (S₂) and 300 g/L water (S₃). At 8 and 10 DAT widest encountered in the treatment of betel leaf extract 200 g/L of water (S₁) that is significantly different from the control (S₀), 250 g/L of water (S₂) and 300 g/L water (S₃).

Table 2. The index rose florescence at 8 DAT highest encountered in the treatment of betel leaf extract 200 g/L of water (S₁) that is significantly different from 250 g/L of water (S₂) and 300 g/L of water (S₃) leaf extract betel, but did not differ significantly with the control treatment (S₀), but the 10 highest DAT found in betel leaf extract treatment of 200 g/L of water (S₁) that is significantly different from the control treatment (S₀), 250 g/L of water (S₂) and 300 g/L of water (S₃) betel leaf extract.

Organoleptic highest color found in the treatment of betel leaf extract 200 g/L of water (S₁) which is significantly different from the control treatment (S₀) betel leaf extract 250 g/L of water (S₂) and 300 g/L of water (S₃). At the highest organoleptic texture found in betel leaf extract treatment of 200 g/L of water (S₁) that is significantly different from the control treatment (S₀), 250 g/L of water (S₂) and 300 g/L of water (S₃).

Table 1. Average effect of betel leaf extract of the diameter of roses in full bloom, the Petals Total, sepals index

Parameters	Days	Leaf Extract Sirih				BNT 0.05
		S ₀ (control)	S ₁ (200 g/L)	S ₂ (250 g/L)	S ₃ (300 g/L)	
Diameter of roses in full bloom (cm)	2 DAT	5,78 bc	6,11 c	4,33 a	4,78 ab	1,05
	4 DAT	7,44	8,22	7,78	7,22	-
	6 DAT	7,22 b	8,44 c	7,11 b	5,78 a	0,88
	8 DAT	5,89 b	7,44 c	6,00 b	4,89 a	0,73
	10 DAT	4,44 a	7,00 c	5,44 b	4,56 b	0,97
Petals Total	2 DAT	5,78	6,11	4,89	4,67	-
	4 DAT	22,67	23,44	23,44	24,56	-
	6 DAT	16,33	18,78	18,67	17,67	-
	8 DAT	13,33	14,11	12,11	12,67	-
	10 DAT	10,67	12,78	11,33	10,56	-
sepals index	2 DAT	2,33	2,78	2,56	2,33	-
	4 DAT	4	4,11	3,89	4,22	-
	6 DAT	5	4,89	4,78	4,89	-
	8 DAT	4,67 b	4,11 a	4,67 b	4,67 b	0,43
	10 DAT	5,00 c	4,11 a	4,78b	4,78 b	0,04

Description: Figures followed by the same letter on the same line had no significant at level 5% chance (BNT 0.05).

Table 2. Average effect of betel leaf extract against efflorescence index rose, withering index, organoleptic

Parameters	Days	Leaf Extract Sirih				BNT 0.05
		S ₀ (Control)	S ₁ (200 g/L)	S ₂ (250 g/L)	S ₃ (300 g/L)	
Efflorescence index rose	2 DAT	2,33	2,78	2,56	2,33	-
	4 DAT	4	4,11	3,89	4,22	-
	6 DAT	5	4,89	4,78	4,89	-
	8 DAT	4,56 b	4,00 a	4,89 b	4,89 b	0,37
	10 DAT	5,00 b	4,00 a	4,89 b	5,00 b	0,17
Withering index	2 DAT	-	-	-	-	-
	4 DAT	-	-	-	-	-
	6 DAT	1.56 b	1.00 a	1.33 ab	2.22 c	0.49
	8 DAT	2.11 ab	1.44 a	1.78 a	2.78 b	0.76
	10 DAT	2.89 b	2.11 a	2.33 a	3.00 b	0.46
Organoleptic	Colour	2,67 ab	3,56 c	2,11 a	2,22 ab	0,72
	Texture	2,67 ab	3,55 c	2,55 ab	2,44 a	0,63

Description: Figures followed by the same letter on the same line had no significant at level 5% chance (BNT 0.05).

Effect of Long Period of Immersion against Freshness Roses

Results of analysis of variance showed that the soaking time is not real effect on the diameter of roses in full bloom, the number of petals, sepals index, the index rose florescence, indexes wilted roses and organoleptic (color and texture). The average length of immersion betel leaf extract for freshness future roses can be seen in Table 3.

Table 3. The average length to diameter roses in full bloom, the number of petals, sepals index, the index rose florescence, wilting index, organoleptic

Parameters	Days	Soaking Time		
		L ₁ (3 day)	L ₂ (6 day)	L ₃ (9 day)
Diameter roses in full bloom (cm)	2 DAT	5.25	5.00	5.50
	4 DAT	7.83	7.58	7.58
	6 DAT	7.42	6.92	7.08
	8 DAT	6.00	6.33	5.83
	10 DAT	5.25	5.67	5.17
Petals Total	2 DAT	5.33	5.42	5.33
	4 DAT	23.92	23.75	22.67
	6 DAT	16.67	18.58	18.33
	8 DAT	13.67	12.75	12.75
	10 DAT	11.75	11.33	10.92
Sepal Indeks	2 DAT	2.75	2.33	2.42
	4 DAT	4.25	3.92	4.00
	6 DAT	5.00	4.75	4.92
	8 DAT	4,41	4,5	4,66
	10 DAT	4,5	4,75	4,75
Index rose florescence	2 DAT	2.50	2.25	2.17
	4 DAT	4.58	4.42	4.42
	6 DAT	4.83	4.50	4.92
	8 DAT	4,42	4,58	4,67
	10 DAT	4,67	4,75	4,75
Wilting index	2 DAT	-	-	-
	4 DAT	-	-	-
	6 DAT	1.50	1.50	1.58
	8 DAT	2.25	1.83	2.00
	10 DAT	2.42	2.67	2.67
Organoleptic	Colour	2,91	2,33	2,33
	Texture	3,25	2,67	2,5

Description: Figures followed by the same letter on the same line had no significant at level 5% chance (BNT 0.05).

Table 3 shows the diameter of roses in full bloom at 2 DAT tend to be the widest in the treatment of soaking period of 9 days (L₃), at 4 and 6 DAT tend to be the widest in the treatment of soaking time 3 days (L₁), whereas at 8 and 10 DAT tend to be widest in treatment of soaking time 6 days (L₂).

Effect of Interaction between Betel Leaf Extract and Old Immersion

Results of analysis of variance showed that there were significant interaction between treatment and betel leaf extract soaking time to time on the freshness of roses florescence index rose 4 and 10 DAT. On average interaction can be seen in Table 4.

Table 4 shows the index rose 4 DAT florescence highest concentrations found in betel leaf extract 250 g/L of water (S₂) with a soaking time of 9 days (L₃) which is significantly different from the control treatment (S₀) with a soaking time 3 days (L₁). Indeks florescence rose 10 highest DAT found in betel leaf extract treatment of 200 g/L (S₁) with a soaking time 6 days (L₂) and 9 days (L₃), but significantly different from 3 day (L₁). In the treatment of betel leaf extract 200 g/L of water (S₁) was significantly different to the treatment of 250 g/L of water (S₂) with a soaking time 3 days (L₁).

Table 4. Average index florescence rose at 4 and 10 DAT

Parameter	Leaf Extract	Soaking Time			BNT _{0,05}
	Sirih	L ₁ (3 day)	L ₂ (6 day)	L ₃ (9 day)	
Sepals Indeks 10 DAT	S ₀ (Kontrol)	5,00 aB	5,00 aB	5,00 aB	0,10
	S ₁ (200 g/L)	4,33 bA	4,00aA	4,00 aA	
	S ₂ (250 g/L)	4,33 aA	5,00 bB	5,00 bB	
	S ₃ (300 g/L)	4,33 aA	5,00 bB	5,00 bB	
Roses in full bloom Indeks 4 DAT	S ₀ (kontrol)	5.00bA	4.67 abB	4.00aA	0,73
	S ₁ (200 g/L)	4.33 aA	4.33 aA	4.67 aAB	
	S ₂ (250 g/L)	4.33 abA	4.00 aA	5.00 bB	
	S ₃ (300 g/L)	4.67 aA	4.67 aA	4.00 aA	

Description: Figures followed by the same letters (lowercase seen by row and column capitals by) not significant at 5% level (BNT 0.05).

Conclusion

1. The betel leaf extract very significant effect on the diameter of the roses in full bloom at 2, 6, 8, and 10 DAT, flower sepals 8 and 10 DAT, the index rose florescence 8 and 10 DAT, kelayuan index rose 6.8 and 10 DAT and organoleptic (color), real influence on organoleptic (texture) and had no significant effect on the diameter of flowers in full bloom 4 DAT, petal number 2, 4, 6, 8 and 10 DAT, flower sepals index 2, 4 and 6 DAT, and florescence index rose 2, 4 and 6 DAT. The best treatment is found in the treatment of betel leaf extract 200 g/L of water.
2. Long soaking effect is not noticeable to the diameter of roses in full bloom, the number of petals, sepals index, the index rose florescence, indexes wilted roses and organoleptic (color and texture). Soaking time is best found in the soaking time 3 days.
3. There is a significant interaction between treatment betel leaf extract and soaking time on indexes sepals on 10 DAT and florescence index rose at 4 DAT.

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