

Effect of Kepok Banana Peel Extract (*Musa Paradisica L.*) on Leading Time in Balb-C Strain Mice

Budi Yuwono¹, Rana Salsabila Satiwi², Tecky Indriana³, Mohammad Nurul Amin⁴, Sulistiyani⁵, Dyah Setyorini⁶, Roedy Budi Rahardjo⁷

¹Concentration of Oral and Maxillofacial Surgery, Faculty of Dentistry, University of Jember, Jember-Indonesia

²Faculty of Dentistry, University of Jember, Jember-Indonesia

^{3,4}Concentration of Biomedical, Faculty of Dentistry, University of Jember, Jember-Indonesia

^{5,6,7} Concentration of Pediatric Dentistry, Faculty of Dentistry, University of Jember, Jember-Indonesia

ABSTRACT

The prevalence of bleeding complications after tooth extraction reached 31.5%. Hemostasis process is needed in this situation to avoid complications after tooth extraction. Kepok banana peel (*Musa paradisiaca L.*) is one of the traditional plants that can help the hemostatic process. Therefore, the purpose of this study was to determine the effect of giving kepok banana peel extract (*Musa Paradisiaca L.*) on bleeding time in cutting the tails of male mice, with the hope that in the future it can be used as an alternative for bleeding therapy after tooth extraction. Observations were made by taking 12 mice as samples and divided into three groups, namely the negative control group (K-), the positive control group (K+), and the treatment group (P). In the K- group, the mice were subjected to aquadest solution of 0.4 ml/20 mg BW, in the K+ group, tranexamic acid was probed at a dose of 0.065 mg/g BW mice as much as 0.4 ml/20 mg BW mice, and in the P group the kepok banana peel extract was probed with a dose of 1.55 mg/g BW mice as much as 0.4 ml/20 mg BW mice orally. All groups were cut on the tails of mice with a length of 0.5 cm. The cut wounds on the tails of mice were dripped onto absorbent paper boxes which were divided into 16 boxes, with an interval of 30 seconds in each box. The results showed that the administration of kepok banana peel extract (*Musa Paradisiaca L.*) had the effect of accelerating bleeding time on tail cutting of mice with BalB-C strain.

KEYWORDS: BalB-C strain mice, bleeding time, kepok banana peel extract, hemostasis.

ARTICLE DETAILS

Published On:
19 September 2023

Available on:
<https://ijmscr.org/>

INTRODUCTION

Tooth extraction or in dentistry terms is referred to as tooth extraction which is an action performed by a dentist to remove a tooth from the alveolus with a special tool if the condition of the tooth can no longer be treated. However, the prevalence of bleeding complications after tooth extraction reached 31.5%. The prevalence of post-odontectomy bleeding complications on the first day reached 96.6%. The prevalence of bleeding in the mandible is more common, which is 80% due to the high vascularity of the base of the tongue.^{1,2} Of these bleeding complications, systemic factors are one of the bleeding factors because there are certain systemic disorders in patients that can increase the risk of bleeding after tooth extraction. If not treated immediately can cause shock, syncope and if further can cause death.³ Therefore, the achievement of the hemostasis process is

needed in these circumstances to avoid complications after tooth extraction.⁴ On bleeding will occur innate hemostatic mechanism that was normally responsible for repairing damage and stopping bleeding from the fine microcirculatory vessels. There are three main steps in the hemostatic mechanism, that were blood coagulation (formation of blood clots), formation of platelet plugs, and vascular spasms.⁵ Administration of hemostatic drugs can help the process of hemostasis in systemic actions such as epinephrine and tranexamic acid. However, there are some disadvantages of using hemostatic drugs when used excessively, such as epinephrine can affect the systemic circulation, and tranexamic acid can cause vascular occlusion events.⁵ Therefore, the use of traditional medicine can provide the best alternative to assist the hemostatic process. This is supported by the World Health Organization (WHO) if the use of

Effect of Kepok Banana Peel Extract (*Musa Paradisica L.*) on Leading Time in Balb-C Strain Mice

traditional medicine is generally considered safer than the use of modern medicine. Traditional medicine has relatively fewer side effects than modern medicine.⁶

Kepok banana peel (*Musa paradisiaca L.*) is one of the traditional plants that can help the hemostatic process. This is supported by research conducted by Syakri⁷ that patch plaster of kepok banana peel with a concentration of 30% is the best in healing wounds on the skin, as well as research conducted by Sembiring and Nasution⁸ that ethanol extract of kepok banana peel can improve healing. wound in white mice. Kepok banana peel contains flavonoids, tannins, and saponins, which flavonoids can accelerate the increase in the number of platelets and maintain the permeability of blood vessels so that bleeding stops.⁹ Meanwhile, tannins provide vasoconstrictor effects and dangerous platelet aggregation with saponins can help assist the hemostasis process by causing capillary vasoconstriction effects.¹⁰

The purpose of this study was to determine the effect of giving kepok banana peel extract (*Musa Paradisiaca L.*) on bleeding time in cutting the tails of male mice. Researchers took kepok banana peels because the banana plant is a native Indonesian garden which can be easily found in almost every place, as well as utilizing banana peel waste as an alternative to reduce the volume of fruit waste because banana production in Indonesia is not small, reaching more than 7 tons. in 2016 .¹¹ So from this research, it is also expected to provide information about the effect of giving kepok banana peel extract (*Musa Paradisiaca L.*) on bleeding time in cutting the tails of male mice, and can be used as an alternative for bleeding therapy after tooth extraction.

METHOD

This research uses laboratory experimental research with post test only control group design. In this design, the results will be compared between the control group and the experimental group.¹² This research was conducted at the Bioscience Laboratory of the Faculty of Dentistry, University of Jember, Biomedical Laboratory of the Faculty of Dentistry, University of Jember, and the Integrated Agricultural Development Unit of the Jember State Polytechnic in January 2022.

RESEARCH SUBJECT

In this study, 3 groups were used, namely the negative control group (K-), the positive control group (K+), and the treatment

group (P), so the sample size was 12 mice. Furthermore, the extract was used on the ripe kepok banana peel in the village of Baratan, Patrang District, Jember Regency, which was shown by brown dots on a yellow base. Kepok banana peels with a ripe age of 110 days were extracted using the maceration method with 96% ethanol solvent in a 1:3 ratio and stirred until homogeneous.

RESEARCH PROCEDURE

The administration of kepok banana peel extract and aquadest using a gastric probe was different in each group. In the K group, the mice were subjected to aquadest solution of 0.4 ml/20 mg BW orally, in the K+ group, tranexamic acid was probed with a dose of 0.065 mg/g BW in 0.4 ml/20 mg BW mice orally, and in the group P was probed with kepok banana peel extract at a dose of 1.55 mg/g BW mice as much as 0.4 ml/20 mg BW mice orally. All groups were cut on the tails of mice with a length of 0.5 cm. The cut wounds on the tails of mice were dripped onto absorbent paper boxes which were divided into 16 boxes, with an interval of 30 seconds in each box.

DATA ANALYSIS

Data on the average bleeding time (bleeding time) obtained were tabulated, then analyzed by the Saphiro-Wilk test for normality test, and Levene's test for homogeneity test. If the data is normally distributed and homogeneous ($p > 0.05$) then it can be continued with the one way annova test to find out there is a significant difference ($p < 0.05$) and continued with the LSD test (Least Significance Different) to find out there is a significant difference between groups.

RESULTS

Based on the results of the study and the results of the calculation of bleeding time, it showed that the order of bleeding time values from the fastest was the K+ group, the P group, and the last was the K group. The average bleeding time value is described in Table 1. Bleeding time values in tranexamic acid positive controls with a dose of 0.065 mg/g BW of mice with an average bleeding time of 2 minutes, then the second fastest was the treatment group giving kepok banana peel extract at a dose of 1.55 mg/g BW of mice with an average bleeding time of 3.875 minutes. While the bleeding time in the K-group using aquadest was the longest bleeding time with an average of 7.625 minutes.

Table 1. The average value of bleeding time in mice strain balb/c

No	Group	N	Average (minutes) \pm SD
1	K-	4	7.625 \pm 0.4787
2	K+	4	2 \pm 0.8165
3	P	4	3.875 \pm 1.1815

N: Number of samples; K-: Group giving with aquadest; K+: Administration group with tranexamic acid at a dose of 0.065 mg/g BW in mice; P: The administration group with kepok banana peel extract at a dose of 1.55 mg/g BW mice.

Effect of Kepok Banana Peel Extract (*Musa Paradisca L.*) on Leading Time in Balb-C Strain Mice

To find out whether the data is normally distributed, a normality test was performed using the Shapiro-Wilk test. If the significance value of $p > 0.05$, then the data is normally distributed. However, if the significance of $p < 0.05$ then the data is not normally distributed. The results of the Shapiro-Wilk test found that the significance value of the K- group was 0.272 ($p > 0.05$) indicating that the data were normally distributed, the significance value of the K+ group was 0.683 ($p > 0.05$) indicating that the data were normally distributed, and the group significance value was P is 0.220 ($p > 0.05$) indicating that the data is normally distributed. It can be concluded that all group significance values are normally distributed.

The next test on the examination of bleeding time is the homogeneity test using the Levene test. If the significance

value of $p > 0.05$, then the data is homogeneous. However, if the significance of $p < 0.05$ then the data is not homogeneous. Levene test results obtained data $p = 0.379$ ($p > 0.05$), so it can be seen that the variance of all groups is homogeneous.

Because the data is normally distributed and the data is homogeneous, it fulfills the assumption of normality to carry out the One Way ANOVA test, so that it is continued with parametric tests to determine whether there are differences in all groups. If the significance value of $p < 0.05$ then the average is different, and if the significance value of $p > 0.05$ then the average is the same. Based on the known significance value of $0.000 < 0.05$, so it can be concluded that the average of the three groups is significantly different. Based on the results of the parametric test, it can be continued with the LSD test.

Tabel 2. LSD Test Results

Group	K-	K+	P
K-	-	0.000*	0.000*
K+	0.000*	-	0.014*
P	0.000*	0.000*	-

K-: Group giving with aquadest; K+: Administration group with tranexamic acid at a dose of 0.065 mg/g BW in mice; P: The administration group with kepok banana peel extract at a dose of 1.55 mg/g BW mice.

From the LSD test results in the bleeding time examination table above, it can be stated that there are significant differences between the K- and K+ groups, the K- and P groups have significant differences, and the K+ and P groups have significant differences as well.

DISCUSSION

The K- group had a longer average bleeding time than the K+ group. The results of statistical analysis using the LSD test showed that the P group of kepok banana peel extract had a significant difference with the K+ group given tranexamic acid. A significant difference can be seen from the difference in the average length of bleeding time which is quite far between the K- and K+ groups. the K- group had the longest average bleeding time of 7 minutes 37.5 seconds, while the K+ group had the fastest bleeding time of 2 minutes.

The treatment group given the kepok banana peel extract had a faster average bleeding time than the K- group. The results of statistical analysis using the LSD test showed that the kepok banana peel extract treatment group had a significant difference with the k- group which was given aquadest solution. This is because the kepok banana peel contains hemostatic compounds, namely flavonoids, tannins, and saponins that can accelerate bleeding time. This is related to the research conducted by Syakri⁷ that the patch plaster of the kepok banana peel with a concentration of 30% is the best in healing wounds on the skin, as well as the research conducted by Sembiring and Nasution⁸ that the ethanol extract of the kepok banana peel can improve healing. wound in white mice.

The researcher gave the distance between dosing in mice orally using a gastric probe by cutting the tail for one hour. This is because the onset of tranexamic acid to work reaches its peak is one hour during which tranexamic acid will be absorbed in the gastrointestinal system and will be continued in the blood circulation. Meanwhile, the highest concentration of flavonoids occurred at 45 minutes after giving the extract to mice. Therefore, in this study, the time interval between oral doses of mice and cutting the tail was one hour.¹³

The use of kepok banana peel extract in the future is expected to be used as an alternative medicine for hemostatic agents that can minimize or side effects, but further research is needed, especially regarding the content of active compounds in kepok banana peel extracts, especially flavonoid, tannin, saponin active compounds in the development of hemostatic agents for bleeding in dentistry and other health fields.

CONCLUSION

Based on the results of the discussion, it can be concluded that the administration of kepok banana peel extract (*Musa Paradisiaca L.*) has the effect of accelerating bleeding time in cutting the tails of mice with BalB-C strain.

REFERENCES

- I. S. K. Nagraj *et al.*, "Interventions for treating post-extraction bleeding," *Cochrane Database of Systematic Reviews*, vol. 2018, no. 3. 2018, doi: 10.1002/14651858.CD011930.pub3.

Effect of Kepok Banana Peel Extract (*Musa Paradisica L.*) on Leading Time in Balb-C Strain Mice

- II. T. Yagyuu *et al.*, “Risk factors for post-extraction bleeding in patients with haemophilia: a retrospective cohort study,” *Br. J. Oral Maxillofac. Surg.*, vol. 59, no. 3, 2021, doi: 10.1016/j.bjoms.2020.08.121.
- III. J. Wuisan, B. Hutagalung, and W. Lino, “PENGARUH PEMBERIAN EKSTRAK BIJI PINANG (*ARECA CATECHU L.*) TERHADAP WAKTU PERDARAHAN PASCA EKSTRAKSI GIGI PADA TIKUS JANTAN WISTAR (*RATTUS NORVEGICUS L.*),” *J. Ilm. SAINS*, vol. 17, no. 1, 2015, doi: 10.35799/jis.15.2.2015.9572.
- IV. R. Tedjasulaksana, “Ekstrak Etil Asetat dan Etanol Daun Sirih (*Piper betle L.*) dapat Memperpendek Waktu Perdarahan Mencit (*Mus Musculus*),” *Dental Health Journal*, vol. 1, no. 1, 2013.
- V. L. Sherwood, “Fisiologi Manusia dari Sistem ke Sel,” *Hum. Physiol. From Cells to Syst.*, 2018.
- VI. R. Superani, M. Hubeis, and B. Purwanto, “Prospek Pengembangan Obat Tradisional Perusahaan Farmasi Skala Kecil Menengah (Kasus PT. Molex Ayus Pharmaceutical) Richtiarty Superani, Musa Hubeis dan Budi Purwanto,” *J. MPI*, vol. 3, no. 2, 2008.
- VII. S. Syakri, “Uji Farmakologi Sediaan Plester Patch Dari Limbah Kulit Pisang Kepok (*Musa Acuminata*) Untuk Penyembuhan Luka Bakar,” *J. Kesehat.*, vol. 12, no. 1, pp. 58–62, 2019, doi: 10.24252/kesehatan.v12i1.7395.
- VIII. B. M. Sembiring and S. Nasution, “UJI EFEKTIVITAS EKSTRAK ETANOL DARI KULIT PISANG KEPOK (*Musa Paradisiaca*) UNTUK PENYEMBUHAN LUKA SAYAT PADA TIKUS,” *J. Penelit. Farm. Herb.*, vol. 3, no. 1, pp. 112–121, 2020, doi: 10.36656/jpjh.v3i1.361.
- IX. W. Puspa, “Perbedaan efektivitas air seduhan daun teh hi jau dan daun teh hi tam terhadap efek hemostasi s pada luka potong ekor mencit (*Mus musculus*),” *Skripsi*, 2016.
- X. A. Shalehah *et al.*, “MANUSIA SEHAT SECARA IN VITRO IN VITRO EFFECT OF ETHANOLIC EXTRACT OF KAJAJAHI (*Leucosyke capitellata Wedd.*) LEAVES ON BLOOD CLOTTING AND PLATELET AGGREGATION OF HEALTHY HUMAN BLOOD,” *Pharmacy*, vol. 12, no. 02, pp. 140–152, 2015.
- XI. Y. Rohmah, “Outlook Komoditas Pertanian Sub Sektor Holtikultura Pisang,” *Pus. Data dan Sist. Inf. Pertanian, Kementeri. Pertan.*, 2016.
- XII. T. D. Hastjarjo, “Rancangan Eksperimen-Kuasi,” *Bul. Psikol.*, vol. 27, no. 2, 2019, doi: 10.22146/buletinpsikologi.38619.
- XIII. L. S. Lijaya, W. Adriatmoko, and Z. Cholid, “Perpanjangan Waktu Perdarahan pada Pemberian Perasan Bawang Merah (*Allium ascalonicum*),” *J. Pustaka Kesehat.*, vol. 2, no. 3, 2014.