INDONESIAN PHARMACOPEIA JOURNAL

IPJ Vol. 2 No. 2, Tahun 2025
Online ISSN : 3032-5455

RESEARCH ARTICLE OPEN ACCESS

# Antidiarrheal Effectiveness Test of Moringa Leaf Infusion (*Moringa oleifera* L.) on Male Mice (*Mus musculus*)

**Siti Saidah[1*], Hartalina Mufidah[2], Shinta Mayasari[3]**
[1.]Universitas dr Soebandi, Jl. dr. Soebandi No. 99 Cangkring, Patrang, 68111
[2.]Universitas dr Soebandi, Jl. dr. Soebandi No. 99 Cangkring, Patrang, 68111
[3.]Universitas dr Soebandi, Jl. dr. Soebandi No. 99 Cangkring, Patrang, 68111
Email: sitisaidahh467@gmail.com

**Submitted: 26 Juli 2025 Accepted: 30 Juli 2025 Published: 31 Juli 2025**

## ABSTRACT
Diarrhea is a condition that causes sufferers to have frequent, loose or watery bowel movements. The latest data from the Indonesian Nutritional Status Survey (2022) indicates that the prevalence of diarrhea is 10.2%, up from the 2021 SSGI (National Nutritional Status Survey) of 9.8%. Most synthetic antidiarrheal medications can cause unwanted side effects, so safer, natural alternatives are needed. One herbal plant, Moringa oleifera L., is known to contain flavonoid compounds with potential antidiarrheal properties.. This study aimed to evalute the optimal dosage 200, 400 and 800 mg/kgBW of Moringa oleifera L. Leaf infusion for its antidiarrheal efficacy in male Mus musculus exhibiting oleum ricini by induced diarrhea. This study used a laboratory experimental study using male white mice (Mus musculus) induced by oleum ricini. Twenty mice were used and divided into 5 groups: a negative control group (CMC Na), a positive control group (loperamide HCl), and a moringa leaf infusion treatment group with infusion doses of 200, 400, and 800 mg/KgBW. The parameters analyzed were diarrhea frequency, stool consistency, stool weight, and duration of diarrhea. The results of phytochemical screening of Moringa leaf infusion showed that Moringa leaf infusion contains flavonoids, alkaloids, and tannins. The results of observations on the antidiarrheal effectiveness of Moringa leaf infusion (Moringa oleifera L.) at the most optimal dose, namely a dose of 400 mg/KgBW with parameters of an average frequency of diarrhea of 6.5 times, an average stool weight of 0.62 grams, and an average duration of diarrhea of 95 minutes. The data obtained were analyzed by ANOVA at a 95% confidence level. Moringa leaf infusa (*Moringa oleifera* L.) has activity as antidiarrheal in male white mice (*Mus musculus*) induced by oleum ricini with the most effective dose is at a dose of 400 mg/KgBW.

**Key words:** Anti-diarrhea, Moringa leaf (*Moringa oleifera* L.), Oleum ricini

## INTRODUCTION
Diarrhea is a digestive tract disorder characterized by increased frequency of defecation accompanied by excretion of feces with a watery or liquid consistency.. This condition is generally caused by consuming food or drink contaminated by pathogenic microorganisms, such as viruses, bacteria, or parasites. Acute diarrhea usually lasts less than 14 days, but in some cases, it can last longer, becoming chronic. Although diarrhea generally resolves on its own, if left untreated, worsening diarrhea can lead to serious complications (Ministry of Health, 2022).

INDONESIAN PHARMACOPEIA JOURNAL

IPJ Vol. 2 No. 2, Tahun 2025
Online ISSN : 3032-5455

RESEARCH ARTICLE OPEN ACCESS

According to the WHO (2024), Diarrhea ranks third as the main cause of death in the toddler age group, with an estimated 443,832 deaths annually. Based on the 2022 Indonesia Nutrition Status Survey (SSGI), the prevalence of diarrhea in toddlers in Indonesia was recorded at 10.2%, an increase compared to the previous year, which was 9.8% in the 2021 SSGI. Data from the 2022 Indonesian Health Profile also shows that diarrhea is the second highest known cause of death in the toddler age group (12–59 months), with a percentage of 5.8%, below pneumonia which reached 12.5%. Meanwhile, from the results of the Indonesian Health Survey (2023), the prevalence of diarrhea in infants under 1 year old was 6.4%, in toddlers 1 to 4 years old 7.4% and in all ages 4.3%. From these results, there was a decrease in the prevalence of diarrhea in infants, toddlers and all ages, the results of the 2023 SKI compared to the results of the 2018 basic health research which were 10.6%, 12.3% and 8%, respectively. (Ministry of Health, 2024)

Diarrhea can be treated through two therapies: pharmacological and non-pharmacological. Pharmacological therapy involves reducing the frequency of diarrhea using thickening agents and reducing bowel movements through parasympatholytic agents. Meanwhile, non-pharmacological therapy to prevent diarrhea can be done by avoiding triggers, such as adopting a healthy lifestyle (Santi et al., 2017). Most synthetic antidiarrheal medications can cause unwanted side effects, so it is hoped that safer alternatives from natural ingredients will be found (Suliska et al., 2019). Several studies have shown that medicinal plants containing chemical compounds such as saponins, tanins, flavonoids, alkaloids, and steroids have potential as antidiarrheal agents. These compounds are known to play an active role in inhibiting diarrhea symptoms through various pharmacological pathways (Fauzi et al., 2020).

One plant from the Moringaceae family with many benefits is the Moringa oleifera L. leaf. Based on phytochemical screening, moringa leaf extract contains various secondary metabolites such as alkaloids, flavonoids, phenolic compounds, triterpenoids or steroids, and tannins (Dwika et al., 2016). Moringa leaves (Moringa oleifera L.) contain flavonoids that may have antidiarrheal properties. Flavonoids work by inhibiting intestinal motility, thereby reducing fluid and electrolyte secretion. Previous research by Rifda Naufa Lina et al. (2024) found that ethanol extract of moringa leaves (*Moringa oleifera* L.) has antidiarrheal activity in male white mice (*Mus musculus*) induced by oleum ricini.

Oleum ricini, or castor oil, is used as a diarrhea inducer. In the small intestine, oleum ricini is hydrolyzed by the enzyme lipase into glycerol and ricinoleic acid. Ricinoleic acid is the active ingredient in laxatives (Rizal et al., 2017).

The infusion method was chosen because it offers several advantages over maceration, such as ease of use, simple equipment, relatively low cost, greater applicability to the community, and closer approximation to traditional medicine-making methods (Ainia, 2017). Muna (2022) in her research stated that Moringa leaf water extract contains flavonoids, alkaloids, saponins, and tannins. This indicates that these compounds are water-soluble. Compounds with antidiarrheal activity include tannins, flavonoids, steroids, alkaloids, and terpenoids (Inderiyani et al., 2024).

Based on this description, this study aims to evaluate the effectiveness of Moringa leaf infusion as an antidiarrheal agent in mice (*Mus musculus*) induced by oleum ricini.

INDONESIAN PHARMACOPEIA JOURNAL

IPJ Vol. 2 No. 2, Tahun 2025
Online ISSN : 3032-5455

RESEARCH ARTICLE OPEN ACCESS

## MATERIAL AND METHODS

The research was conducted at the Pharmacology Laboratory and the Biology Laboratory of the Undergraduate Pharmacy Study Program, Dr. Soebandi University, Jember. The results of the plant determination letter number 99/PL17.8/PG/2025 indicate that the part used in this study was Moringa oleifera L. leaves. The results of the researcher's ethical feasibility statement in the ethical certificate letter number 1088/KEPK/UDS/III/2025 stated that the researcher was ethically fit. The plant determination was conducted at the Jember State Polytechnic.

The tools used in this study were an infusion pan, an AJ302B matrix analytical balance with an accuracy of 0.01 grams, glassware, an oral probe, a 1ml syringe (Onemed(R)), a stopwatch, a water bath, a hot plate, tissue, filter paper, a tray, a mouse cage, a mouse food and drink container, wood fiber, and cleaning equipment. The materials used in this study include distilled water, Moringa oleifera L. leaves with doses of 200, 400 and 800 mg/kgBW. In this study, oleum ricini was also used as an induction agent, sodium carboxymethyl cellulose (CMC-Na), 2 mg loperamide which was used as a treatment for experimental animals, as well as Dragendorff's reagent, Mg powder, concentrated HCl, 2 N HCl, and FeCl3 which were used for phytochemical screening tests. This study used male white mice (*Mus musculus*) as test animals, which were selected as a biological model for testing the antidiarrheal effect.

### Moringa Leaf Extraction

The making of Moringa leaf simplicia begins with the process of picking leaves from old plants, dark green leaves from fresh plants obtained from Glundegan Village, Wuluhan District, Jember Regency. One kilogram of Moringa leaves is then wet sorted to remove impurities (dust, insects, and twigs). Afterward, they are washed with clean running water and dried for approximately 7 days at a temperature of 20-30°C. Next, dry sorting is performed to ensure the extract is free of impurities. The extract is then ground using a blender.

Extraction is carried out using the infusion method, where infusion is a extraction process using water as a solvent with heating to 90°C for a period of 15 to 20 minutes (Suprihanto, 2022). Moringa leaf simplicia was prepared in a 1:10 ratio, namely 100 grams of simplicia powder mixed with 1000 mL of distilled water (aquadest). A total of 100 grams of simplicia powder was weighed, placed in an infusion pan, then added 1000 mL of distilled water as a solvent for the extraction process. Boiled for 15 minutes calculated when the temperature reaches 90°C, then evaporated over a water bath until it becomes thick. After that, the thick extract that has been obtained is weighed and the percent yield is calculated (Ariani et al., 2022).

### Phytochemical Screening

This study conducted a phytochemical screening test for flavonoids, alkaloids, saponins, and tannins. The flavonoid test was performed by adding 2 ml of extract to Mg powder and 5 drops of concentrated HCl. A positive flavonoid test was performed if a color change of red, orange, or yellow occurred (Widarto et al., 2021). The alkaloid content test was carried out by adding a few drops of Dragendorff's reagent to the sample. The presence of alkaloid compounds is indicated by the formation of an orange or reddish-brown precipitate as a positive reaction (Widarto et al., 2021). The saponin compound test was carried out by placing the sample in a test tube and dissolving it in

10 mL of hot distilled water, then cooling it and shaking it for 10 seconds. 1 drop of HCl was added to determine the foam resistance. If a stable foam or froth with a height of 1-3 cm that can last for 15 minutes is formed, the sample contains saponins (Widarto et al., 2021). Tannin content testing is performed by adding a few drops of 1% $FeCl_3$ reagent to 2 mL of the sample. A positive indication for the presence of tannin compounds is indicated by a color change to dark blue or blackish green (Widarto et al., 2021).

**Test Animal Preparation**

The mice were acclimatized by providing a standard pellet diet and water for approximately one week prior to treatment. They were fasted for 1-8 hours but still given water. Next, the mice were randomly divided into five treatment groups. The negative control group was given 0.2 mL of 0.5% CMC-Na suspension per 20 grams of mouse body weight. The positive control group received loperamide HCl treatment at a dose of 0.26 mg/kgBW. The other three treatment groups were each given Moringa leaf infusion at graded doses of 200 mg/kgBW, 400 mg/kgBW, and 800 mg/kgBW.. All mice were given 0.5 ml of oleum ricini orally and waited until diarrhea occurred. After diarrhea, each mouse was given the treatment assigned to the treatment group and observed every 30 minutes for four hours, including diarrhea frequency, stool weight, stool consistency, and duration.

**Data Analysis**

Data analysis in this study was conducted using the IBM SPSS program version 25.0 with the One-Way ANOVA statistical method. Before the ANOVA test was conducted, a normality test was first performed using the Shapiro-Wilk method to determine whether the data were normally distributed. Next, a homogeneity of variance test was performed using the Levene test to ensure the uniformity of variance between groups. Data were declared to meet the requirements for normality and homogeneity if the significance value (p) was more than 0.05 ($p>0.05$). Normality and homogeneity tests are required as prerequisites before conducting a one-way ANOVA test with a 95% confidence level to determine significant differences between treatment groups. If the ANOVA results show a significance value of less than 0.05 ($p<0.05$), then a Post hoc test using the LSD method was continued to determine pairs of groups that were significantly different. If the data did not meet the assumption of normality, then an alternative non-parametric test was used, namely the Kruskal-Wallis. For stool consistency parameters, the assessment was carried out by referring to the Bristol Stool Chart literature.

## RESULT AND DISCUSSION

The study entitled "Test of Antidiarrheal Effectiveness of Moringa Leaf Infusion (*Moringa oleifera* L.) on Male Mice (*Mus musculus*) With Oleum Ricini Induction" aims to determine the optimum dose of Moringa leaf infusion as an antidiarrheal. It begins with determining the plant and conducting ethical testing. The results of the plant determination with letter number 99/PL17.8/PG/2025 indicate that in this study the part used is Moringa leaf (*Moringa oleifera* L.), and the results of the researcher's ethical statement in the ethical statement letter with no. 1088/KEPK/UDS/III/2025 contained in attachment 2 stated that the researcher is ethically worthy.

INDONESIAN PHARMACOPEIA JOURNAL

IPJ Vol. 2 No. 2, Tahun 2025
Online ISSN : 3032-5455

RESEARCH ARTICLE OPEN ACCESS

**Moisture Content Test Results for Moringa (*Moringa oleifera* L.) Leaf Powder**

The moisture content test is one parameter used to determine the residual water content after the drying process. The purpose of testing the moisture content is to ensure quality stability and prevent the growth of microorganisms such as mold during storage. Determination of the moisture content of Moringa (*Moringa oleifera* L.) leaf powder was performed using a moisture balance. To determine the moisture content of Moringa (*Moringa oleifera* L.) leaf powder, weigh 2 grams of the leaf powder, set the temperature to 105°C, turn it on, and wait until the instrument beeps, indicating the completion of the analysis. The moisture content displayed on the moisture balance is then recorded. The moisture content is considered to be within the required limits if the powder does not exceed 10% (Dewi et al., 2024). Based on the analysis results, the water content in the Moringa leaf simple powder in this study was 2.99%, as shown in Table 2.

**Moringa Leaf Extraction**

The preparation of Moringa leaf infusion was carried out by taking fresh Moringa leaves and processing them into a dry powder, weighing 100 grams. The infusion was then made using 1000 ml of distilled water at 90°C for 15 minutes, starting from when the temperature reached 90°C. The resulting infusion was then evaporated using a water bath until a thick extract was obtained. This study yielded a yield of 26.64%, as shown in Table 3.

**Results of Identification of Chemical Compound Content of Moringa Leaf Infusion**

Phytochemical screening tests on Moringa leaf extract showed the presence of tannin, alkaloid and flavonoid compounds.. However, the moringa leaf extract contained negative saponins. This is likely due to the low concentration of saponins, which prevented their detection in the extract. Saponins are present throughout the plant, with higher concentrations in certain parts, and are influenced by plant variety and growth stage (Dwika et al., 2016). These results are supported by research (Fauzi et al., 2020) which shows that the results of identification of compounds in Moringa oleifera Lam. leaves using the maceration method and 70% ethanol solvent are positive for containing flavonoids, alkaloids and tannins and do not contain saponins.

**Antidiarrheal Effectiveness Test Parameters**

Antidiarrheal effectiveness test using oleum ricini as an inducer. Oleum ricini in the intestine will be hydrolyzed into ricinoleic acid by the lipase enzyme, so that it can accelerate intestinal peristalsis which can cause increased intestinal motility resulting in diarrhea characterized by liquid feces and increased stool frequency (Adrianto et al., 2017). Mice were randomly divided into 5 treatment groups, then an adaptation process was carried out for 7 days before the study was carried out. Mice were fasted for 1-8 hours and were still given water. Each mouse was weighed, then given an induction of oleum ricini 0.5ml/20 grams of mouse body weight orally until the mice had diarrhea. Next, the mice were given treatment according to the predetermined groups, namely the negative control group, the positive control group, and three treatment groups of moringa leaf infusion with doses of 200, 400 and 800 mg/kgBW, respectively. Observations on test animals were carried out based on predetermined parameters,

including frequency of diarrhea, stool consistency, stool weight, and duration of diarrhea.

The results of observations of the frequency of diarrhea in male white mice (*Mus musculus)* for 240 minutes can be seen in Table 5. That when compared with negative controls, all treatments can show antidiarrheal activity through a decrease in the number of diarrhea frequencies with an average in the positive control group of 5.25±1.25 times, with the most effective dose being at a dose of 400 mg/KgBB with an average diarrhea frequency of 6.5±1.29 which indicates that at a dose of 400 mg/KgBB it has activity equivalent to loperamide HCL as an antidiarrheal and is not significantly different from the positive control loperamide HCl.

Furthermore, the results of stool consistency observations can be seen in Table 6. tool consistency can be broken down into three levels that can be symbolized by (+) with normal consistency levels, soft stool consistency, and watery or slimy stool consistency. Stool consistency is said to be slimy or watery if the air content of the stool exceeds 80% and there is a thick, gel-like liquid. Stool consistency is said to be soft if the water content of the stool does not exceed 80% but has a texture that is still slightly watery. Stool consistency is said to be normal if the weight and composition of the stool is 100% dregs, slightly hard and tends to be slightly oily (Purwaningdyah et al., 2015). In the positive control group of loperamide HCl and the treatment group with moringa leaf infusion, there was a change in stool concentration that gradually became normal, characterized by a solid and non-liquid stool shape with a dose that had a consistency equivalent to the positive control of loperamide HCl at a dose of 400 mg/KgBW.

The next observation is the observation of feces weight which can be seen in table 7. In table 7, it can be seen that in the positive group and the group with infusion treatment experienced a decrease in average feces weight when compared to the negative control group with an average in the positive control group of 0.56 ± 0.06 grams and in the treatment group with infusion dose of 400 mg/kgBW moringa leaf extract showed the most optimal results with an average feces weight of 0.62 ± 0.04 grams, approaching the effectiveness of Loperamide HCl (0.56 ± 0.06 grams). The test group is declared to have an antidiarrheal effect if the feces weight obtained is smaller than the control group with 0.5% Na-CMC suspension. The heavier the feces obtained, the weaker the antidiarrheal effect will be (Gultom et al., 2021). Feces weight can be observed with the help of tissue to facilitate weighing the feces. A smaller stool weight value indicates an improving diarrhea condition, and reduced water or mucus content due to diarrhea will reduce stool weight (Nugrahani et al., 2021)

The final observation is the duration of diarrhea which is done by calculating the time from the beginning of diarrhea until the last time of diarrhea presented in Table 8. The results of the study related to the duration of diarrhea are presented in Table 8. The data show that the treatment group given Moringa leaf infusion experienced an accelerated diarrhea cessation time. The shortest duration was recorded in the group with a dose of 400 mg/kgBW, with an average diarrhea cessation time of 95.0 ± 5.71 minutes. Based on the duration of diarrhea, the 400 mg/kgBW dose was the most effective dose, and did not show a statistically significant difference compared to the positive control group given loperamide HCl.

Based on the analysis results, the data on diarrhea frequency, stool weight, and duration of diarrhea showed a normal distribution with a significance value (p) of more than 0.05, indicating that the normality assumption was met. Therefore, the analysis

can be continued with a homogeneity test. The homogeneity test using the Levene method produced a significance value ($p>0.05$), meaning the data were homogeneous. The one-way ANOVA test obtained a significance value of 0.000 ($p<0.05$), indicating a significant difference between the groups. The LSD test results showed that the negative control group had a significantly higher frequency of diarrhea than all other treatment groups ($p<0.05$). This indicates that the test material given was able to reduce the effectiveness of antidiarrheals. The positive control group (Loperamide HCl) did not differ significantly with a dose of 400 mg/kgBW, which means this dose has an antidiarrheal effect equivalent to loperamide. Meanwhile, doses of 200 mg/kgBW and 800 mg/kgBW also significantly reduced the frequency of diarrhea compared to the negative control, but the effect was not equivalent to loperamide. Overall, the 400 mg/kgBW dose was the most effective dose, as it had a significant difference with most groups and was equivalent to the standard drug.

Based on the results and discussion above, Moringa leaf infusion has antidiarrheal activity based on test parameters, namely diarrhea frequency, stool consistency, stool weight, and duration of diarrhea. From these results, it was obtained that doses of 200 mg/kgBW, 400 mg/kgBW, and 800 mg/kgBW have antidiarrheal activity, while the most effective dose is 400 mg/kgBW, because the 400 mg/kgBW dose is not significantly different from the positive control group of loperamide HCl in all parameters. The higher the dose, the antidiarrheal effect is not better, this shows that the increase in dose is not proportional to the antidiarrheal effect.

One of the compounds found in moringa leaves that is beneficial as an antidiarrheal agent and can inhibit intestinal motility is flavonoids. The mechanism of flavonoids in stopping oleum ricini-induced diarrhea is by inhibiting intestinal motility, thereby reducing fluid and electrolyte secretion. Another activity of flavonoids, particularly quercetin, is by inhibiting the release of acetylcholine in the gastrointestinal tract. Inhibition of nicotinic acetylcholine release mediates smooth muscle contraction and activation of muscarinic acetylcholine receptors, which regulate gastrointestinal motility and smooth muscle contraction (Yulis Azizah et al., 2023).

## CONCLUSION

Based on the research results, it can be concluded that Moringa leaf infusion has an antidiarrheal effect induced by oleum ricini based on the frequency of diarrhea, stool consistency, stool weight, and duration of diarrhea with the most optimum dose being 400 mg/kgBW. Suggestions in this study are that it is necessary to conduct clinical trials and toxicity tests of Moringa leaf infusion (*Moringa oleifera* L.) so that its safety when used as an antidiarrheal can be determined.

## ACKNOWLEDGEMENT

The author would like to thank dr. Soebandi University, Jember, for facilitating and allowing the researcher to conduct this research. Thanks are also due to everyone who contributed to this research, including parents, siblings, mentors, and friends.

## REFERENCE

Adrianto, A., Santoso, J., & Suprasetya, E. (2017). Antidiarrheal Effectiveness Test of Ethanol Extract of Jujube Leaves (*Ziziphus maurtiana* Lam.) in Male Mice (*Mus*

*musculus*) Induced by Oleum Ricini. Indonesian Gem Journal, 8 (November), 59–74.

Ainia, N. (2017). Phytochemical Test of Concentrated Bitter Melon Fruit Infusion (*Momordica charantia* L.) and the Effect of Therapy Duration with Varied Doses on Alloxan-Induced Reduction of Blood Glucose Levels in Mice (*Rattus norvegicus)*. Thesis of Maulana Malik Ibrahim State Islamic University of Malang, 1–161.

Ariani, N., Musiam, S., Niah, R., & Febrianti, D. R. (2022). The Effect of Drying Methods on Flavonoid Content of Ethanol Extract of Avocado Fruit Peel (*Persea americana* Mill.) Using UV-Vis Spectrophotometry. Jurnal Pharmascience, 9(1), 40.

Dewi, L., Slamet, T., & Zianida, N. (2024). Antioxidant Activity of Ethanol Extract of Black Potato Leaves (*Plectranthus rotondifolius* (Poir) Spreng) Using the DPPH (2-2-Diphenyl-1-Picrylhydrazyl) Method. 12(1), 1–7.

Dwika, W., Putra, P., Agung, A., Oka Dharmayudha, G., & Sudimartini, L. M. (2016). Identification of Chemical Compounds of Ethanol Extract of Moringa Leaves (*Moringa oleifera* L.) in Bali. Indonesia Medicus Veterinus October, 5(5), 464–473.

Fauzi, R., Fatmawati, A., & Emelda, E. (2020). Antidiarrheal Effect of Ethanol Extract of Moringa Oleifera L. Leaves on Male White Mice. Pharmaceutical Journal of Indonesia, 6(1), 35–39.

Gultom, E. D., Rambe, R., Paramitha, R., & Ginting, O. S. B. (2021). Antidiarrheal Activity Test of Ethanol Extract of Ciplukan (*Physallis minima* L.) Leaves on Male Mice (Mus musculus). Forte Journal, 1(1), 26–44.

Inderiyani, Herdaningsih, S., Pramana, Y., & Olivia. (2024). Antidiarrheal Activity Test of Long Bean (*Vigna sinensis* L.) Infusion on Male White Mice (*Mus musculus*). Indonesian Journal of Pharmacy, 7(1), 54–64.

Muna, L. (2022). Antioxidant Activity of Moringa Oleifera Leaf Water Extract Using the DPPH Method and Qualitative Analysis of Secondary Metabolite Content. Sasambo Journal of Pharmacy, 3(2), 91–96.

Nugrahani, A. W., Islami, L. F. N., & Khumaidi, A. (2021). Antidiarrheal Activity of Ethanol Extract of Red Castor Oil (*Jatropha gossypifolia*) Leaves in Mice Induced by Escherichia Coli. Veterinary Journal, 22(3), 414–421.

Nugrahani, R., Andayani, Y., & Hakim, A. (2016). Phytochemical Screening of Bean (*Phaseolus vulgaris* L.) Fruit Extract in Powder Preparation. Journal of Science Education Research, 2(1).

Purwaningdyah, Y. G., Widyaningsih, T. D., & Wijayanti, N. (2015). Effectiveness of Papaya Seed Extract (*Carica papaya* L.) as an Antidiarrheal in Mice Induced by Salmonella Typhimurium. Effectiveness of Papaya Seed Extract (Carica Papaya L.) as an Antidiarrheal in Mice Were Induced by Salmonella Typhimurium. 3(4), 1283–1293.

Rifda Naufa Lina, Hasty Martha Wijaya, Annis Rahmawaty, & Jamiyah Nur Rohmah. (2024). Antidiarrheal Activity Test of Ethanol Extract of Moringa Leaves (*Moringa oleifer*a Lam.) on Male White Mice (Mus Musculus) Induced by Oleum Ricini. Journal of General Health and Pharmaceutical Research (Jrikuf), 2(2), 72–82.

Rizal, M., Yusransyah, Y., & Stiani, S. N. (2017). Antidiarrheal Activity Test of 70% Ethanol Extract of Jengkol Fruit Peel (*Archidendron pauciflorum* (Benth.) I.C.

Nielsen) on Male Mice Induced by Ricini Oleum. Manuntung Scientific Journal, 2(2), 131–136.
Santi, I., Herman, H., & Aninditia, D. D. (2017). Study of Diarrhea Medication Use in Pediatric Inpatients at Andi Djemma Masamba Regional Hospital, North Luwu Regency, January–December 2014. As-Syifaa Scientific Journal, 9(2), 122–130.
Sari, E. K., & Hidayati, S. (2021). In Vitro Antioxidant Activity and Gc-MS Analysis of Ethanolic Mangkokan Leaves Extract (Polyscias balfouriana (Sander Ex Andre) L.H. Bailey). Jurnal Katalisator, 6(1), 117–125.
Sri Sulasmi, E., Adi Nugraha, L., Sapta Sari, M., Juriusan Biologi, S., & Negeri Malang Jalan Semarang Malang No, U. (2018). Phytochemical Screening and Thin Layer Chromatography Analysis of Active Compounds of Kalakai (*Stenochlaena palustris* (Burm.F) Beddome) in Baluran National Park. Proceedings of the 6th National Seminar on Hayati 2018, 6(September), 1–9.
Sukmawati, I. K., Sukandar, E. Y., & Kurniati, N. F. (2018). Antidiarrheal Activity of Ethanol Extract of Suji Leaves (*Dracaena angustifolia* Roxb). Pharmacy: Jurnal Farmasi Indonesia (Pharmaceutical Journal of Indonesia), 14(2), 173–187.
Suliska, N., E, T. D., & Herlinda, H. (2019). Antidiarrheal Effect of Senggani Leaf Infusion (*Melastoma malabathricum* L.) on Male Swiss Webster Mice Induced with Oleum Ricini. Indonesian Journal of Pharmaceutical Sciences, 17(2), 126.
Widarto, M., Khuluq, H., & Pudji Rahayu, T. (2021). Study of the Anti-Inflammatory Activity Test of 70% Ethanol Extract of Gnetum Gnemon L. Leaves on Wistar Strain White Rats That Induced Carrageen. Urecol, 918–931.
Yulis Azizah, Rizka Mulya Miranti, Dedi Hartanto, & Retna Eka Dewi. (2023). The Effectiveness of Red Ginger Infusion (Zingiber Officinale Var. Rubrum)

## TABLE AND FIGURE

Table 1 Test Group

| Group | Treatment |
|---|---|
| Negative control | CMC Na 0.5% |
| Positive control | Loperamide HCL 0,26 mg/kgBB |
| Treatment 1 | Moringa leaf extract at a dose of 200 mg/kgBB |
| Treatment 2 | Moringa leaf extract at a dose of 400 mg/kgBB |
| Treatment 3 | Moringa leaf extract at a dose of 800 mg/kgBB |

Table 2 Water content test of Moringa leaf simplex

| Simplisia | Weight (gram) | Test | Conten (%) |
|---|---|---|---|
| Moringa leaf | 2,004 | Water content | 2,99 |

INDONESIAN PHARMACOPEIA JOURNAL
IPJ Vol. 2 No. 2, Tahun 2025
Online ISSN : 3032-5455
RESEARCH ARTICLE OPEN ACCESS

Table 3 Moringa Leaf Extraction Results

| Weight of simplisia (gram) | Weight of condensed extract (grams) | Yield (yield) |
|---|---|---|
| 100 | 26,64 | 26,64 |

Table 4 Phytochemical screening of mangosteen leaf extracts

| Compound Reagents | Reagents | Changes that happens | Results |
|---|---|---|---|
| Flavonoids | Magnesium+ concentrated HCl | Color change to orange or yellow | + |
| Alkaloid | Dragendorff's reagent | Range or reddish-brown precipitate appears | + |
| Saponin | HCl + distilled water | No stable foam forms | - |
| Tanins | FeCl3 | Color change occurs dark green to black | + |

Table 5 Antidiarrheal parameters based on diarrhea frequency

| Group | frequency of diarrhea | | | | Amount | Mean ± SD |
|---|---|---|---|---|---|---|
| | Replication | | | | | |
| | 1 | 2 | 3 | 4 | | |
| CMC Na 0,5% | 11 | 16 | 14 | 17 | 58 | 14,5±2,64 |
| Loperamide HCL 0,26 mg/KgBB | 5 | 4 | 7 | 5 | 21 | 5,25±1,25 |
| Moringa Leaves 200 mg/KgBW | 10 | 12 | 9 | 13 | 44 | 11±1,82 |
| Moringa Leaves 400 mg/KgBW | 7 | 5 | 8 | 6 | 26 | 6,5±1,29 |
| Moringa Leaves 800 mg/KgBW | 9 | 10 | 8 | 12 | 39 | 9,75±1,70 |

Table 6 Antidiarrheal parameters based on stool consistency

| Group | Stool consistency at the 1st minute | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 |
| CMC Na | ++ | +++ | +++ | +++ | ++ | ++ | ++ | + |
| | +++ | +++ | ++ | +++ | ++ | ++ | ++ | ++ |
| | +++ | +++ | +++ | +++ | ++ | +++ | ++ | ++ |
| | ++ | +++ | +++ | ++ | +++ | +++ | ++ | ++ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Loperamide HCl | +++ | ++ | ++ | + | - | - | - | - |
| | ++ | ++ | ++ | - | + | - | - | - |
| | ++ | ++ | + | + | - | - | - | - |
| | +++ | +++ | ++ | + | + | - | - | - |
| Moringa Leaves 200 mg/KgBW | ++ | +++ | ++ | - | ++ | - | + | - |
| | +++ | ++ | ++ | ++ | ++ | - | - | ++ |
| | ++ | +++ | ++ | ++ | + | + | - | - |
| | +++ | +++ | +++ | ++ | ++ | - | ++ | - |
| Moringa Leaves 400 mg/KgBW | +++ | ++ | ++ | + | - | - | - | - |
| | +++ | +++ | ++ | + | + | - | - | - |
| | ++ | +++ | ++ | ++ | + | - | - | - |
| | ++ | +++ | ++ | + | - | - | - | - |
| Moringa Leaves 800 mg/KgBW | ++ | +++ | ++ | + | - | - | - | - |
| | +++ | +++ | ++ | ++ | + | - | - | - |
| | +++ | ++ | ++ | ++ | + | - | - | - |
| | ++ | +++ | ++ | ++ | - | ++ | - | - |

Table 7 Antidiarrheal parameters based on stool weight

| Group | Feces Weight (grams) | | | | Amount | Mean ± SD |
|---|---|---|---|---|---|---|
| | Replication | | | | | |
| | 1 | 2 | 3 | 4 | | |
| CMC Na 0,5% | 1,65 | 1,42 | 1,74 | 1,83 | 6,64 | 1,66±0,17 |
| Loperamide HCL 0,26 mg/KgBB | 0,62 | 0,49 | 0,61 | 0,55 | 2,27 | 0,56±0,06 |
| Moringa Leaves 200 mg/KgBW | 1,17 | 1,2 | 1,13 | 1,36 | 4,86 | 1,21±0,10 |
| Moringa Leaves 400 mg/KgBW | 0,6 | 0,61 | 0,57 | 0,7 | 2,48 | 0,62±0,04 |
| Moringa Leaves 800 mg/KgBW | 0,88 | 0,95 | 1,05 | 0,99 | 3,87 | 0,96±0,07 |

Table 8 Antidiarrheal parameters based on the duration of diarrhea

| Group | Duration of Diarrhea (minutes) | | | | Amount | Mean ± SD |
|---|---|---|---|---|---|---|
| | Replication | | | | | |
| | 1 | 2 | 3 | 4 | | |
| CMC Na 0,5% | 212 | 198 | 217 | 203 | 830 | 207,5±8,58 |
| Loperamide HCL 0,26 mg/KgBB | 79 | 90 | 81 | 92 | 342 | 85,6±6,45 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Moringa Leaves 200 mg/KgBW | 152 | 137 | 143 | 164 | 596 | 152,5±11,74 |
| Moringa Leaves 400 mg/KgBW | 92 | 102 | 89 | 97 | 380 | 95,0±5,71 |
| Moringa Leaves 800 mg/KgBW | 126 | 130 | 121 | 119 | 496 | 124,0±4,96 |