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Effectiveness of Cherry Tomato Extract in Gel Form to Accelerate the Healing Process of Excision Wounds in Wistar White Rats

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Abstract

Cherry tomatoes (*Solanum lycopersicum* L. var. *cerasiforme*) are rich in antioxidants, particularly flavonoids and lycopene, which help reduce free radicals and promote wound healing. Flavonoids exhibit anti-inflammatory, antioxidant, antibacterial, and antidiabetic properties. They enhance wound contraction, collagen deposition, granulation tissue formation, and epithelialization in wound healing. This study evaluates the efficacy of cherry tomato extract gel in accelerating excision wound healing in Wistar rats. This in vivo experimental study used a post-test control group design. Twenty-five 2–3-month-old Wistar rats with excision wounds were treated with cherry tomato extract gel or controls. The five groups included a positive control (NaCl), a negative control (CMC-Na gel), and treatment groups receiving 8%, 12%, or 16% extract gel. Wound size was measured on days 3, 5, 7, and 9, with data analyzed using One-Way ANOVA and post hoc tests. The extract-treated groups exhibited nearly complete wound closure by day 9. The wound size of the treatment groups significantly differed from the control groups ($p<0.05$). Cherry tomato extract gel significantly accelerates wound closure at 8%, 12%, and 16% concentrations, with the best results observed at 16% ($p<0.05$), surpassing even the positive control. The 16% extract gel group demonstrated the most effective wound healing. Cherry tomato extract gel significantly enhances wound healing, with the 16% concentration demonstrating the most effective acceleration of wound closure. These findings suggest that cherry tomato extract gel, particularly at 16%, holds promise as a potent wound-healing agent.

Keywords: cherry tomatoes extract; wound healing; lycopene.

INTRODUCTION

Wounds are a pathological condition characterized by tissue damage or loss, which can result from various factors such as trauma, temperature fluctuations, chemical exposure, explosions, electrical shock, or animal bites. Based on their classification, wounds can be categorized as open or closed, depending on whether the skin and underlying tissues are compromised. Open wounds, including incisions and excisions, are particularly susceptible to infections and complications if not managed appropriately. (Dewi, 2021)

Wound healing is a complex biological process involving three primary phases: inflammation, proliferation, and maturation. Each phase plays a critical role in restoring tissue integrity. However, several factors can impair wound healing, including infections and systemic conditions such as diabetes. Therefore, appropriate wound management is essential to prevent complications and promote effective recovery.(Abdullah et al., 2022), (Kano et al., 2019)

To accelerate wound healing, the use of effective therapeutic agents is crucial. Among the various alternatives explored, natural compounds such as cherry tomatoes (*Solanum lycopersicum* L. var. *cerasiforme*) have gained attention due to their rich antioxidant and phytochemical content. Studies have demonstrated that cherry tomatoes contain bioactive compounds such as lycopene, flavonoids, and vitamin C, which contribute to wound healing by stimulating fibroblast proliferation, enhancing collagen synthesis, and exhibiting anti-inflammatory and antibacterial properties. (Husna, 2023), (Sikumbang et al., 2022)

Previous research on cherry tomato extracts has shown promising results in promoting wound healing. Studies have indicated that tomato fruit extract can accelerate burn wound healing in rabbit models, with an optimal concentration of 70% demonstrating effectiveness in preventing infection and enhancing collagen formation. Additionally, other investigations have revealed that a 16% concentration of cherry tomato extract gel significantly reduces wound healing time compared to negative controls in murine models.(Husna,

2023) Other studies using tomato seed extract have also shown highly effective results in promoting wound healing. In this study, the experimental group treated with tomato seed extract experienced wound closure three days earlier than the control group, demonstrating a three-day advantage in the healing process. (Ezon-Ebidor et al., 2019)

The global incidence of wounds continues to rise. Data from the Ministry of Health of the Republic of Indonesia indicate that the prevalence of open wounds in Indonesia reached 20.1% in 2018. Given the increasing incidence of wounds and the demand for safe and effective therapeutic solutions, this study aims to explore the potential of cherry tomato extract in gel formulation as a wound-healing agent. The findings of this research are expected to contribute significantly to developing novel wound-healing therapies and improve the quality of life for individuals affected by injuries. (Kemenkes, 2022), (Idzni, 2021), (Widyaningsih, 2022)

MATERIALS AND METHOD

This study utilized an in vivo laboratory experimental design, specifically employing a post-test-only control group methodology. The research was conducted at the Animal House Laboratory and the Biochemistry Laboratory, Faculty of Medicine, Sriwijaya University, in conjunction with the Barokah Anatomical Pathology Laboratory. The experimental procedures were carried out between June and November 2024. Ethical approval for this study was granted by the Research Ethics Commission of Sriwijaya University on July 15, 2024, under approval number 196-2024.

The study involved male Wistar rats (*Rattus norvegicus*), aged 2–3 months, weighing 250 to 300 grams. All subjects were confirmed to be healthy, exhibiting no observable abnormalities. A total of 25 Wistar rats were randomly distributed into five experimental groups using a simple random sampling technique. The groups were as follows: (1) Positive control group—wound induction followed by treatment with 10% povidone-iodine; (2) Negative control group—wound induction followed by treatment with carboxymethyl cellulose sodium (CMC-Na) gel; (3) Treatment Group 1 (P1)—wound induction followed by treatment with 16% cherry tomato extract gel; (4) Treatment Group 2 (P2)—wound induction followed by treatment with 12% cherry tomato extract gel; and (5) Treatment Group 3 (P3)—wound induction followed by treatment with 8% cherry tomato extract gel.

Each experimental group comprised five Wistar rats, each housed individually in separate cages to prevent potential cross-contamination or behavioral interference. Prior to the commencement of the study, the animals underwent an acclimatization period of seven days to ensure adaptation to the laboratory environment. The experimental procedure involved the induction of a standardized excisional wound on the dorsal region of each rat, measuring 5 mm in length, 2 mm in width, and 2 mm in depth. The assigned treatment—cherry tomato extract gel, povidone-iodine, or carboxymethyl cellulose sodium (CMC-Na) gel—was topically applied after wound induction. The treatment regimen was administered once daily for nine consecutive days. All animals received standard laboratory chow and water *ad libitum* throughout the study to maintain consistent nutritional support.

Preparation of Cherry Tomato Extract Gel and Determination of Dosage

A total of 11 kg of cherry tomatoes were weighed, wrapped in aluminum foil, and subjected to boiling in a water bath at 100 °C for 5 minutes. Following thermal processing, the tomatoes were blended and transferred into a 500 mL beaker, after which 1,650 mL of methanol was added, and the mixture was stirred for 5 minutes. The homogenized mixture was then filtered, and the resulting sediment was divided into four 1000 mL Erlenmeyer flasks lined with carbon-coated paper.

Each Erlenmeyer flask was supplemented with a solvent mixture consisting of *n*-hexane, acetone, and methanol in varying ratios: 2:1:1, 1:2:1, and 1:1:1, as well as a polyethylene (PE)-acetone mixture in a 3:1 ratio, with a fixed solvent-to-material ratio of 5:1. The mixtures were subjected to shaking at 150 rpm for 30 minutes and subsequently transferred to a separatory funnel, where 110 mL of distilled water was added. After thorough shaking, the mixtures were left undisturbed to allow phase separation. The upper (non-polar) phase was collected and evaporated using a rotary evaporator to obtain a concentrated extract, which was then stored in a glass bottle for volume measurement.(Junnaeni et al., 2019)

The cherry tomato extract gel was formulated in three concentrations: 8%, 12%, and 16%. The gel was applied twice daily using a cotton bud at a dosage of 0.1 grams per application for nine consecutive days. Wound size measurements were conducted following the treatment period.

Excision Wound Induction

Male white rats (*Rattus norvegicus*) were prepared by shaving the dorsal area using a sterile razor. Local anesthesia was administered via subcutaneous injection of ketamine hydrochloride at a dose of 0.1 cc per 100 g of body weight. Following anesthesia, an elliptical excisional wound measuring approximately 5 mm in length, 2 mm in depth, and 2 mm in width was created on the dorsal region using a sterile surgical scalpel. The wound area was then disinfected with a sterile NaCl solution.

Cherry tomato extract gel was applied topically using a cotton bud at a dosage of 0.1 grams, twice daily (morning and evening), for nine consecutive days at

concentrations of 8%, 12%, and 16%. After each application, the wound was covered with sterile gauze.

Figure 1. Excision wound.

The excision procedure was performed after allowing the anesthesia to take effect for five minutes. The designated wound site was cleaned with an alcohol swab and marked using a sterile surgical marker for accurate measurement. The incision was made using sterile surgical scissors modified for precision. Following wound creation, the site was cleaned with NaCl solution and covered with sterile gauze to prevent contamination. (Fazri, 2020)

Statistical Data Analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software, version 26. Initially, tests for normality and homogeneity of variance were performed to assess the suitability of the data for parametric analysis. A one-way analysis of variance (ANOVA) was then conducted to determine differences between groups, with statistical significance set at $p < 0.05$. Post hoc analysis was carried out to identify significant differences between specific treatment groups across the five-dose variables.

RESULTS AND DISCUSSION

Phytochemical Compound Analysis

The phytochemical analysis of the extract aims to identify the classes of compounds present in cherry tomato (*Solanum lycopersicum var. cerasiforme*) extract. The identification of secondary bioactive compounds was conducted using a qualitative phytochemical test. This test involves reactions between specific reagents and the concentrated extract, resulting in characteristic color changes that indicate the presence of secondary metabolites.

Table 1. Phytochemical Analysis of Cherry Tomato Extract.

No	Compound	Result	Description
1.	Alkaloid :		
	a) Dragendroff	a) Orange-red precipitate	+
	b) Mayer	b) Yellowish-white precipitate	+
	c) Wagner	c) Brown precipitate	+
2.	Flavonoid	Dark Brown	+
3.	Triterpenoid/Steroid	Blue green (Steroid)	+
4.	Saponin	Foam formation (2 cm height for 10 min)	+
5.	Tanin	Dark blue	+
6.	Kuinon	Dark green	-

Note: (+) indicates the presence of the tested secondary metabolite.

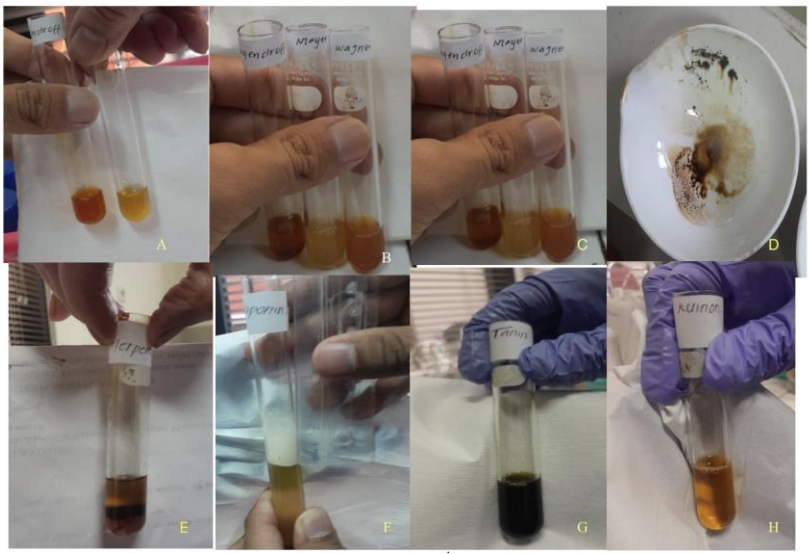

Figure 2. Phytochemical analysis : A, B, C. Alkaloid Test (Dragendroff, Mayer, Wagner), D. Flavonoid test, E.Triterpenoid Test, F.Saponin Test, G. Tanin Test, Quinon Test.

This analysis confirms the presence of various secondary metabolites in cherry tomato extract, including alkaloids, flavonoids, steroids, saponins, and tannins, while quinones were not detected. These bioactive compounds contribute to the medicinal properties of cherry tomatoes, particularly in wound healing applications. This result indicates that the extraction method employed in the phytochemical analysis successfully preserved the presence of alkaloids, flavonoids, triterpenoids/steroids, saponins, and tannins in the cherry tomato (*Solanum lycopersicum var. cerasiforme*) extract. These compounds represent key bioactive components in this study, contributing to their potential therapeutic effects.

Wound Healing

The descriptive analysis of wound size in rats indicated that groups treated with cherry tomato extract gel at various concentrations (16%, 12%, and 8%) significantly reduced in wound size from day 3 to day 9. On day 3, the treatment groups had smaller average wound sizes than the negative control group. The highest average wound size was observed in the negative control group (25.42 mm^2), while the smallest was recorded in the 16% extract gel group (13.56 mm^2).

Table 2. Wound Size on days 3, 5, 7 and 9.

Groups (n=5)	Mean	Std deviasi	CI 95%		Min-Max
			lower	upper	
Day 3					
CGE 16%	13.56	3.00	9.83	17.29	10.39 - 17.54
CGE 12%	16.05	1.75	13.87	18.22	14.60 - 18.63
CGE 8%	18.63	3.34	14.47	22.78	13.01 - 21.38
Positive control	29.06	3.66	24.50	33.61	25.67 - 34.92
Negative control	25.24	2.57	22.03	28.44	21.67 - 28.46
Day 5					
CGE 16%	4.22	1.64	2.18	6.26	3.11 - 7.10
CGE 12%	10.11	0.841	9.06	11.15	8.90 - 11.17
CGE 8%	13.27	2.50	10.16	16.38	11.00 - 16.50
Positive control	21.12	2.21	18.36	23.87	18.00 - 23.33
Negative control	20.06	1.96	17.62	22.51	18.08 - 23.30
Day 7					
CGE 16%	0.46	0.59	-0.27	1.19	0.00 - 1.47
CGE 12%	4.31	1.49	2.45	6.17	2.67 - 6.34
CGE 8%	7.61	2.09	5.00	10.22	4.57 - 9.60
Positive control	13.62	5.21	7.14	20.10	7.20 - 21.77
Negative control	14.38	0.92	13.23	15.54	13.53 - 15.70
Day 9					
CGE 16%	0.00	0.00	-0.00	0.00	0.00 - 0.00
CGE 12%	0.50	0.37	0.03	0.97	0.11 - 1.00
CGE 8%	2.53	0.69	1.67	3.39	1.58 - 3.45
Positive control	8.13	4.05	3.09	13.16	4.46 - 14.59
Negative control	9.98	1.41	8.22	11.74	8.86 - 11.59

Based on the One-Way ANOVA statistical test results in Table 2, wound size consistently decreased across all treatment and control groups from day 3 to day 9 ($p < 0.001$). On day 3, the treatment group receiving the 16% concentration exhibited the smallest wound size compared to the control groups. By day 9, a similar trend was observed, with the 16% concentration group recording the smallest wound size (0.0010 ± 0.00182), indicating optimal wound healing.

These findings indicate a significant difference in wound healing progression among the groups, with the cherry tomato extract treatment demonstrating a statistically meaningful improvement compared to both control groups.

Table 3. Multiple comparisons between all groups on Day 3

Groups Compared	Mean Difference	Standard Error	p-value
CGE 16% vs CGE 12%	-2.484	1.863	1
CGE 16% vs CGE 8%	-5.062	1.863	0.133
CGE 16% vs PC	-15.49600*	1.863	<.001
CGE 16% vs NC	-11.67400*	1.863	<.001
CGE 12% vs CGE 8%	-2.578	1.863	1
CGE 12% vs PC	-13.01200*	1.863	<.001
CGE 12% vs NC	-9.19000*	1.863	<.001
CGE 8% vs PC	-10.43400*	1.863	<.001
CGE 8% vs NC	-6.61200*	1.863	0.02

Bonferroni Post Hoc Test on Day 3

Based on the data in Table 3, statistical analysis indicates a significant difference in wound healing among rats on day 3 between the treatment and control groups ($p < 0.05$). The treatment groups with 16%, 12%, and 8% concentrations exhibited significant differences compared to the positive and negative control groups. The treatment group with a 16% concentration exhibited the greatest mean difference compared to both the negative and positive control groups.

Table 4. Multiple Comparison between all groups on Day 5

Groups Compared	Mean Difference	Standard Error	p-value
CGE 16% vs CGE 12%	-5.89000*	1.21492	<.001
CGE 16% vs CGE 8%	-9.05200*	1.21492	<.001
CGE 16% vs PC	-16.89800*	1.21492	<.001
CGE 16% vs NC	-15.84600*	1.21492	<.001
CGE 12% vs CGE 8%	-3.162	1.21492	0.17
CGE 12% vs PC	-11.00800*	1.21492	<.001
CGE 12% vs NC	-9.95600*	1.21492	<.001
CGE 8% vs PC	-7.84600*	1.21492	<.001
CGE 8% vs NC	-6.79400*	1.21492	<.001

Bonferroni Post Hoc Test on Day 5

Table 5. Multiple Comparison Between All Groups on Day 7.

Groups Compared	Mean Difference	Standard Error	p-value
CGE 16% vs CGE 12%	-3.85482	1.67514	0.323
CGE 16% vs CGE 8%	-7.15527*	1.67514	0.004
CGE 16% vs PC	-13.16396*	1.67514	<.001
CGE 16% vs NC	-13.92863*	1.67514	<.001
CGE 12% vs CGE 8%	-3.30045	1.67514	0.628
CGE 12% vs PC	-9.30914*	1.67514	<.001
CGE 12% vs NC	-10.07381*	1.67514	<.001
CGE 8% vs PC	-6.00869*	1.67514	0.018
CGE 8% vs NC	-6.77336*	1.67514	0.006

Bonferroni Post Hoc Test on Day 7

The table above indicates that on the fifth and seventh days, the wound closure process progressed better than on the previous days. The treatment group with a 16% extract concentration exhibited the most effective wound closure compared to all other treatment groups. The treatment groups with 12% and 8% extract concentrations also showed significant differences compared to the positive and negative control groups

Table 6. Multiple Comparison Between All Groups on Day 9.

Groups Compared	Mean Difference	Standard Error	p-value
CGE 16% vs CGE 12%	-0.50169	1.23608	1
CGE 16% vs CGE 8%	-2.53455	1.23608	0.537
CGE 16% vs PC	-8.12984*	1.23608	<.001
CGE 16% vs NC	-9.98710*	1.23608	<.001
CGE 12% vs CGE 8%	-2.03286	1.23608	1
CGE 12% vs PC	-7.62815*	1.23608	<.001
CGE 12% vs NC	-9.48541*	1.23608	<.001
CGE 8% vs PC	-5.59529*	1.23608	0.002
CGE 8% vs NC	-7.45255*	1.23608	<.001

Table 6 shows that on the ninth day, wounds treated with 8% and 12% extract concentrations had begun to close completely, similar to those treated with a 16% extract concentration. In contrast, the wound size in the positive and negative control groups remained relatively large, resulting in statistically significant differences from the treatment groups.

DISCUSSION

This study employs a methodological approach focused on developing stimulatory agents that facilitate the biological healing processes in Wistar strain albino mice. The wound healing process follows distinct phases: hemostasis, inflammation, proliferation, and remodeling. The research investigates the efficacy of active compounds extracted from cherry tomatoes (*Solanum lycopersicum* L. var. Cerasiforme) using n-hexane, acetone, and methanol as solvents. These solvents are widely utilized in the pharmaceutical industry for drug formulation, extraction of bioactive compounds from natural materials, and various medicinal preparations.(Hakim & Saputri, 2020)

The excision wound model used in this study involved creating an elliptical wound on Wistar strain albino mice, followed by topical application of an ethanol-based cherry tomato extract gel. The gel was applied twice every 24 hours until wound healing was observed. The healing process was assessed based on the contraction of wound edges, drying of the wound area, natural scab detachment, and complete wound closure. Observations were conducted until full wound closure was achieved on day 9 for all experimental groups. Wound healing efficacy was quantified by measuring wound length, width, and depth changes at regular 24-hour intervals.

The proliferative phase of wound healing involves the formation of granulation tissue, which includes the

development of new capillary blood vessels, macrophage activation, and fibroblast proliferation. This phase encompasses several key processes, such as epithelialization, fibroplasia, and tissue reconstruction. Following injury, this phase typically begins around day 3 and can extend until the third week. However, other sources suggest that it occurs between days 6 and 21. During this phase, inflammatory cells such as neutrophils and lymphocytes are present in lower numbers compared to the inflammatory phase, indicating a transition toward tissue repair and regeneration. (Alfiaturrohmah et al., n.d.). This study observed wound closure starting on day 9, particularly in the treatment group that received cherry tomato (*Solanum lycopersicum var. cerasiforme*) extract. Therefore, a punch biopsy was performed on day 9.

The results of this study demonstrate that the application of cherry tomato extract gel significantly accelerates the wound healing process in Wistar strain albino mice. Notably, there was a statistically significant reduction ($p < 0.05$) in wound size across different treatment groups, particularly on days 3, 5, 7, and 9. The accelerated healing was characterized by faster wound contraction, reduced wound dimensions, increased fibroblast proliferation, and enhanced collagen density in the treatment groups. Statistical analysis using One-Way ANOVA and the Kruskal-Wallis test confirmed the significant effect of the 16% cherry tomato extract concentration, which yielded the most substantial reduction in wound size compared to the control group by day 9 (mean wound size: 0.001 ± 0.00182), indicating near-complete healing.

These findings align with previous studies, including research by Stevani (2019) and Chopsticks (2021), which also demonstrated the high efficacy of 16% cherry tomato extract gel in expediting excision wound healing in Wistar strain albino mice. The effectiveness of this treatment can be attributed to the presence of lycopene and other bioactive phytochemicals such as flavonoids and vitamin C, which synergistically contribute to the wound healing process through multiple mechanisms. Lycopene, as a potent antioxidant, mitigates oxidative stress by neutralizing free radicals that cause tissue damage. In wound healing, excessive oxidative stress can impair fibroblast activity and collagen synthesis, which are critical for tissue regeneration. By reducing oxidative stress, lycopene creates a more favorable environment for cellular activity during wound repair. (Supit et al., 2021), (Krinsky, 1998)

Furthermore, lycopene modulates inflammatory pathways by inhibiting pro-inflammatory mediators such as tumor necrosis factor-alpha (TNF-α) and interleukin-6 (IL-6). Excessive levels of these mediators can prolong the inflammatory phase, delaying the transition to the proliferative stage. By reducing TNF-α and IL-6 levels, lycopene facilitates a timely progression to the proliferative phase, promoting fibroblast activity and granulation tissue formation. Granulation tissue quality is crucial for collagen deposition and epithelialization. These findings are further supported by research from Gupta et al. (2022), which demonstrated that lycopene enhances granulation tissue formation by stimulating fibroblast proliferation and improving collagen stability and organization. Well-structured collagen networks contribute to the mechanical strength of newly formed tissue, reducing the likelihood of wound reopening and expediting the remodeling phase.

In addition to lycopene, other phytochemicals in cherry tomatoes, such as flavonoids, exhibit complementary anti-inflammatory properties. Flavonoids inhibit pro-inflammatory enzymes such as cyclooxygenase-2 (COX-2) and reduce tissue edema, thereby mitigating inflammation, promoting faster wound resolution, and supporting tissue regeneration. These combined effects underline the potential of cherry tomato extract as a promising natural therapeutic agent for enhancing wound healing. (Krinsky, 1998; Shafe et al., 2024)

Cherry tomatoes are herbal plants with potential wound-healing properties. Plant polyphenols have been considered for their remarkable antioxidant properties. (Leri et al., 2020) This effect is primarily attributed to their rich antioxidant content, including lycopene, vitamin C, and flavonoids, which play a crucial role in accelerating the healing process by reducing oxidative stress in the wound area. Lycopene, the predominant carotenoid compound in cherry tomatoes, is particularly significant in promoting wound healing through various biological mechanisms. Its strong antioxidant capacity helps inhibit oxidative damage caused by free radicals around the wound, thereby protecting tissue cells from premature apoptosis. This protective effect facilitates fibroblast proliferation and granulation tissue formation. (Wiyono & Mustofani, 2019), (Kresnapati et al., 2023)

Apart from lycopene, cherry tomatoes contain other bioactive compounds, such as flavonoids and vitamin C, which have a synergistic effect on wound healing. These compounds exert their effects through antioxidant, anti-inflammatory, and tissue regeneration mechanisms, collectively accelerating wound recovery in Wistar strain albino rats. Flavonoids, a class of polyphenolic compounds, act as potent antioxidants in the wound healing process by reducing oxidative stress, exerting anti-inflammatory effects, and stimulating angiogenesis. (Kresnapati et al., 2023), (Sanjaya et al., 2023)

Vitamin C, or ascorbic acid, plays a vital role as a cofactor in collagen synthesis. As a water-soluble antioxidant, vitamin C protects fibroblast and endothelial cells from oxidative damage during the inflammatory phase, allowing fibroblasts to function optimally in producing extracellular matrix components. Furthermore, vitamin C enhances the activity of phagocytic cells, such as neutrophils and macrophages, which are critical for wound healing. (ISWAN, 2021), (Sebayang & Ritonga, 2021)

The findings of this study underscore the potential of cherry tomato extract as an effective natural wound-healing agent. The bioactive compounds in cherry tomatoes—such as lycopene, flavonoids, and vitamin C—offer various benefits for wound healing. Lycopene, as a potent antioxidant, reduces oxidative stress and inflammation, which often hinder the healing process. Flavonoids exhibit anti-inflammatory properties and promote the formation of new tissue by stimulating fibroblast activity. Additionally, vitamin C is crucial in collagen synthesis, contributing to granulation tissue formation and improving wound tissue quality. These results highlight the significant potential of cherry tomato extract for clinical applications, particularly in developing topical formulations for treating mild to moderate wounds. This study further suggests that cherry tomato extract could serve as a safe and effective natural alternative for wound healing, offering a promising complementary approach in medical therapies. (Supit et al., 2021), (Kresnapati et al., 2023) Further investigations should include a detailed analysis of lycopene levels in cherry tomato extract to accurately determine its bioactive content. This assessment is crucial for identifying specific bioactive components in the extract and gaining a clearer understanding of their role in promoting excisional wound healing.

CONCLUSION

The application of cherry tomato (Solanum lycopersicum var. cerasiforme) extract in gel form at concentrations of 16%, 12%, and 8% significantly influences the wound healing process in Wistar strain albino rats, as evidenced by the reduction in wound size. These effects are notably more significant when compared to both the negative and positive control groups. Among the tested concentrations, the 16% cherry tomato extract gel formulation demonstrated the highest efficacy in promoting wound healing in Wistar strain albino rats, making it the most effective concentration for enhancing the excisional wound healing process. The gel formulation of *Solanum lycopersicum var***.** cerasiforme extract exhibits significant wound healing properties, providing a scientific foundation for its medicinal applications. We propose that the presence of bioactive compounds, particularly lycopene, in the extract is responsible for its potent wound-healing effects. The findings of this study offer robust scientific evidence supporting the therapeutic potential of cherry tomatoes in wound treatment.

Authors' Contributions: Veny Larasati designed the study, performing data analysis, and wrote the manuscript, Soilia Fertilita analyzed the data, Muhammad Zulfadli carried out the laboratory work, Riana Sari Puspita Rasyid and Fifa Argentina were reviewing the manuscript and the laboratory results, Yudhie Tanta and Medina Athiah helped analyzing the data. All authors read and approved the final version of the manuscript.

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