



Effect of Ginger Base Extract (*Zingiber Officinale* Var *Rosc*) on Medical Speed of White Rats (*Rattus Novergicus*)

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ABSTRACT

When the skin is scratched by rubbing it on a rough surface, ginger contains anti-inflammatory compounds that help accelerate the healing of scratches. The therapeutic effect of elephant ginger extract (*Zingiber Officinale* Var *Rosc*) on white male rats (*Rattus norvegicus*) Wistar strain? The only real test was an experiment with a control group design. This study was conducted for seven days with samples divided into four groups, namely P1 (NaCl 0.9%), P2 (Gel 0%), P3 (Ginger Agar 8%), and P4 (Ginger Agar 12%). The gel extract application was observed on the 1st, third and fifth days. On the seventh day, it was analyzed by the One Way ANOVA test. The results of the average exfoliated wound area on day 7 P1 = 1.47 cm², P2 = 0.58 cm², P3 = 0.31 cm², P4 = 0 cm², the average healing rate P1 = 4.9%/day, P2 = 10.6%/day, P3 = 12.31 performances. %/day, P4 = 14.2%/day. The results of the one-way ANOVA test showed a significant effect ($p < 0.05$). Elephant ginger extract gel (*Zingiber officinale* var *rosc*) can accelerate the healing of abrasions in white rats (*Rattus norvegicus*).

Keywords : Elephant ginger (*Zingiber officinale* var *rosc*), speed of healing of abrasion wounds, area of abrasion.

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INTRODUCTION

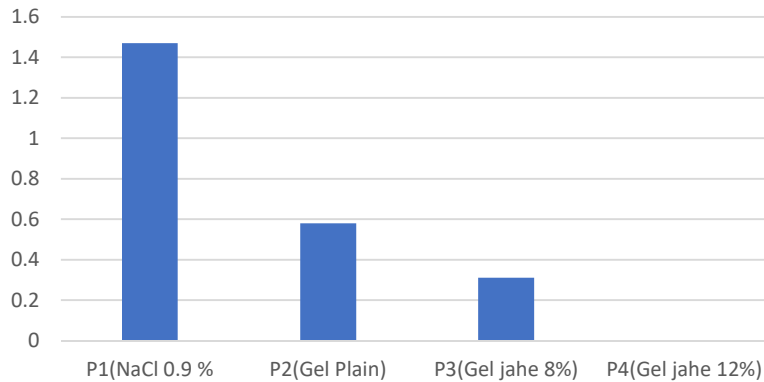
Skin abrasions (vulvar abrasion) are wounds caused by sliding nails, fingernails, and similar sharp objects (Clarysse et al., 2018). Scratches are caused by the separation of the skin from the surface of the body, contact with rough surfaces, and bleeding into skin after an abrasion. In general, we encounter a lot of wear and tear daily (Leung et al., 2019). Investigation of victims of traffic accidents at RSUP Dr. M. Djamil Padang reported In 2010-2011 138 traffic accidents with the highest number of injuries, namely 54 cases (39.2%) (Lucky Isnu et al., 2015). Based on basic health research from the

Ministry of Health of the Republic of Indonesia, the three most common types of injuries experienced by the population are abrasions/bruises (70.9%), sprains (27.5%) and torn wounds (23.2%)(Asyam Ammar et al., 2021). Herbal medicine is an alternative medicine that the people of Indonesia have used for a long time. According to research conducted by the Basic Health Research Agency (Riskesdas) in 2013, 55.3% of Indonesians use tradisional Medicine therapy to maintain their health(Wahidah et al., 2021). Indonesian traditional medicine is currently receiving serious attention from the government. One of the flagship programs of the Ministry of Health in 2011 was the inclusion of herbal medicine in basic health services. Although herbal medicines have been known in Indonesia for a long time, most do not have a clear scientific basis⁵. When you enter the official world, it becomes a hindrance. This is because Evidence-Based Medicine (CPA) is complied with in every medical decision in today's modern medical world. Many herbal plants in Indonesia are genetic phenomena that are believed to be able to cure various diseases And oleoresin, which is an anti-inflammatory compound (Purwanti et al., 2020). The wound healing ability of ginger is believed to have biochemical effects such as anti-inflammatory(Mao et al., 2019), anti-infective(Praditya et al., 2019), and antioxidant(Parham et al., 2020). Ginger has also been found to promote skin healing by increasing cleansing, granulation, tissue formation, and collagen deposition. Various studies have shown that applying the ginger extract to wounds also promotes epithelial regeneration and increases the fiber and density of blood vessels(Ibrahim et al., 2018). The application of ginger to wound healing focuses on the response mechanisms and provides evidence of its effects at various stages of the wound healing process (de Luca et al., 2021).

METHODS

The type of research used is a true experimental using a post-test-only control group design, namely measuring the area of the abrasion wound on the rat's back after being treated for seven days. The sample of this study was a male white rat (*Rattus novergicus* strain Wistar) which matched the inclusion criteria and was taken using Simple Random Sampling with the lottery method¹³. The research in this method used four groups: a control group given 0.9% NaCl, treatment one was given a gel base, treatment two was given ginger extract gel with a concentration of 8%, and treatment three was given ginger extract gel with a concentration of 12%. This method uses five rats in each group, so 20 rats are used. Based on the formula for calculating the number of samples with group comparison one, way ANOVA. Each rat was given 1 ml of gel daily, according to the group. Each rat was given a standard 30g feed and drank per day. Data analysis using One Way ANOVA test, Post Hoc games Howell (Rujirachotiwat & Suttamanatwong, 2021).

Average Abrasion Wound



RESULTS AND DISCUSSION

The results of the study of the extent of abrasions on the backs of rats were obtained from tracing the area of the wounds one by one on the backs of rats with markers and transparent mica on the seventh day after the abrasion was given on the 0th day. After obtaining the results of tracing the area of the wound with a permanent marker, the transparent mica was scanned, then the area of the abrasion wound for each rat was measured using the ImageJ application. The area of the abrasion wound for each white rat was obtained in cm². This study used the One Way ANOVA statistical test followed by the Howell Post Hoc games because the results showed a normal and not homogeneous data distribution. Based on the results of the One Way ANOVA, a value of 0.000 was obtained, which means that there is an overall effect between the P1 (control) group and the P2 (gel base) P3 (elephant ginger extract gel 8%), and P4 (elephant ginger extract gel 12%) on reduction in the area of the abrasion wound. All figures, tables, or informative illustrations are prepared as image file.

Table 1 Results of the average area of abrasion on the seventh day in (cm²), Based on the results.

Group	Area of Abrasion					Average	standard deviation
	Rat 1	Rat 2	Rat 3	Rat 4	Rat 5		
P1	1,8	1,24	1,58	1,43	1,33	1,47	±0,22
P2	0,55	0,68	0,66	0,53	0,49	0,58	±0,08
P3	0,23	0,32	0,29	0,31	0,39	0,31	±0,05
P4	0	0	0	0	0	0	±0

Bonferroni, a value of <0.05 , was obtained in all groups, meaning that the administration of elephant ginger extract gel significantly reduced burn area in white rats. And between groups had significant differences. Based on the table above, it found that there was an increase in the speed of healing of abrasion wounds

starting from the group, namely the group where given gel without concentration of elephant ginger extract the healing speed and increased within the administration of concentration elephant ginger extract gel at, 8 % and 12%. In comparison, the highest speed was found in group P4 which was given elephant ginger extract gel with a concentration of 12% and healing speed in 14.2%.

Table 5.2 the average of healing of abrasion.

Group	Healing of Abrasion.
P1	4,9% day
P2	10,6% day
P3	12,31% day
P4	14,2% day

In this study, the results showed that there was a significant difference between the administration of I elephant concentration and 12% on the seventh day in the area of the abrasion compared to group P1, which was given Nacl 0.9%, and P2, which only given gel without ginger extract which can be seen statistical results post hoc games from Howell, the effectiveness of ginger gel I have seen, three parameters elephant namely speed healing, wound area on, day seven and the results of post hoc I game Howell statistics this based oni it can take concentration gel elephant ginger I of 12% effective healing most wounds because it has sped the healing fastest and most extensive Abrasion wounds on the seventh day the smallest one this is in line research that has with previously, about the healing potential of wounds from extracts ginger ethanol in white mice. Elephant ginger extract gel with a concentration of 8% also showed significant results on the healing process of abrasion wounds wheel compared with P2, namely groups without concentration ginger extract and P1, i.e., treatment was given, NaCl 09%, this shows concentration the elephant ginger extract gel with of 8% is more effective when compared the groups and P2, by results of the previous study on the effectiveness of the administration of ginger extract Acer healing on the oral mucosa of white (Sun et al., 2021). Vessels blood retraction has broken constriction and hemostatic reaction that releases and activates cytokines which include Epidermal Growth Factor (EGF), Insulin-like Growth Factor (IGF), Platelet-derived Growth Factor (PDGF), and Transforming Growth Factor beta (TGF- β) which role in chemotaxis of neutrophils, macrophage cells, endothelial cells and. mast fibroblasts (Jafarzadeh et al., 2021). Furthermore, the phase proliferation, namely Fibroblasts undergo proliferation and .synthesize collagen fibers collagen informed cause strength (Mathew-Steiner et al., 2021). To link the edges of the wound, In this phase begin to occur, granulation, wound contraction, and epithelialization and after that continue with maturation remodeling or .phase This phase is the longest phase in the wound healing process where there is dynamic remodeling of collagen and maturation (Gao et al., 2019). The anti-inflammatory effect of ginger extract gell Elephanta inhibition

of their cyclooxygenase pathway, resulting in decreased prostaglandins production of thromboxane (B2 TxB2) (PGF2a, PGE2, and PGD2) Extract gel elephant ginger lipoxygenase. Also, epoxy genes interact with pathways, including in a reduction activity enzyme (Rusmini et al., 2022).

These will leukotrienes result in a decrease in prostaglandin, which are mediators of inflammation and plays inhibiting their production of interleukin and if $TNF\alpha$ in the activating macrophages (Abachi et al., 2021). Thus, the number of macrophages in the wound area increases, the production of cytokines (IL-1 β /TNF) has a role in healing wound, and the fibroblast activating mechanism causes the time required wound to undergo a phase in which inflammation is shortened, so that phase of healing immediately goes to to the proliferative phase which causes increase production of extracellular matrix including fibroblasts(Desjardins-Park et al., 2018). With the increase in macrophages, the wound healing fibroplasia process will increase, where stimulation of proliferation fibroblast cells is very important in wound healing. The wound healing process from the effect of the ginger extract is also influenced by the antibacterial effect of the elephant ginger extract gel, which works synergistically with the anti-inflammatory effect of the elephant ginger extract gel. The antibacterial effect of the elephant ginger extract gel is known to be due to the terpenoid content of the elephant ginger extract gel, which inhibits the synthesis of the enzyme 6-hydroxymethyl-7, 8-dihydropyran pyrophosphokinase in bacteria which plays a role in the synthesis of folic acid which is one of the important components of DNA synthesis from bacteria. This study extracted gel elephant ginger the wound, which was abrasion influenced. Factors and endogenous exogenous factors Endogenousi includes the presence of the body, which can help wound healing mouse naturally, while exogenous factor i is in the form of the adaptation process, each which is different so that wound affects healing environmental factor and mouse activity white it self(Iismaa et al., 2018).

Another exogenous factor is in the form of a heating effect that has the potential to arise from the content of elephant ginger extract, namely the school effect, which can cause discomfort to rats so that it interferes with the healing process of abrasion wounds from the mechanism of shogaoli induces a feeling of through heat, it is known that the effect of induction of adrenaline secretion through activation vanilloid potential -receptor 1 in this study did not see a hot reaction in rats because the method of extracting gel extract this elephant ginger in a study using ethanol solvent so that content shogaoli extraction the elephant ginger had evaporated when carried out vaporation. This study has limitations. Namely, the rats in this study were not given dressings, so the humidity was not maintained properly, and wounds could be in direct contact with husks mixed with the urine and rats. For further research, it is necessary to vary and the wounds used are not only abrasion wounds but also incisions with wounds. Types of wounds other from the various facts found this research, and through statistical studies, the is about the effectiveness of giving vary officinale Zingiber elephant ginger extract gel rosctheon speed of healing abrasions of rats Wistar white hypothesis. Proved Ineffective. This is Iis strongly suspected .due to the anti- inflammatory properties

contained in the gel Zingiber extract of elephant ginger extract (*officinale var rosc*) (Wanniatie et al., 2022).

CONCLUSION

Administration of Extract (elephant ginger Zingiber (*officinale var rosc*) was effective in accelerating the healing process of abrasion wounds in white rat strain Wistar Rattus norvegicus) and Gel extract ginger elephants (*Zingiber officinale var rosc.*) with a concentration of 12% was most effective in reducing their area of abrasion rats (white .wistar Rattus norvegicus).

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