

The importance of histological appearance in a preclinical test of the plant extracts effectiveness on dermal wound healing



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Nowadays, plant extracts are used as medicinal ingredients because of their active compound with therapeutic effects for dermal wound healing. *Lantana camara* Linn. leaf extracts were used for dermal wound healing ointments. In the preclinical trial, ointment standardization was done. This ointment standardization was carried out, among others, by organoleptic tests, homogeneity, pH, and dispersion.¹ Apart from being the active ingredient in the ointment, the leaf extracts of *L. camara* Linn are also used in creams.² On the other hand, the proteins of *Lumbricus rubellus* powders have also been characterized.³ The results of other studies show that protein extracts derived from snakeheads fish are used as a source of albumin.⁴

Previous research showed changes in Fe and Zn levels in *L. camara* Linn. leaf extracts cream after being stored for 180 days, but Mg levels in the cream did not change during storage. Quercetin was reported as a flavonoid content in the *L. camara* Linn. leaf extracts cream 4% most stable compared with other preparations.² It was also shown that *L. camara* Linn. leaf extracts cream 4% the most durable after being stored for one year.⁵ This fact is used as a base for the extracts standardization of active ingredients in medicinal preparations, including ointments and creams. In addition to using *L. camara* Linn. leaf extracts, *Tagetes*

erecta Linn. leaf extracts are also used in pharmaceutical preparations. Leaf extract of *T. erecta* Linn. formulated as pharmaceutical preparations, including creams, gels, mosquito repellent lotions and hair dyes.⁶ The results of a recent study reported that *Azadirachta indica* extract standardization in the cream needs to be carried out in dermal wound healing tests.⁷

A preclinical trial ointment containing the active ingredient of *L. camara* Linn. leaf extracts showed association with dermal wound healing infected with bacteria. Ointment preparation containing *L. camara* Linn. leaf extracts is 5% more effective than 10% in rat's dermal wound healing.⁸ Furthermore, various preclinical trials have shown that plant extracts play a role in the healing process of dermal wounds. The review results show that the dermal wound healing process plays a part in collagen.⁹ The results of other reviews also show that the wound healing process is indicated by histological changes.¹⁰

It is necessary to carry out a histological assessment in dermal wound healing. Dermal wound healing parameters are carried out qualitatively and semi-quantitatively.¹¹ Histology and tissue morphometry have also been carried out to test *Leptadenia hastata* extract's effectiveness on rat dermal wound healing.¹² Our preclinical research on the efficacy of *T. erecta* Linn. leaf

extracts cream stressed the need for standardization of extracts and wound healing as a variable. The variables we studied included wound size, the strength of wound contraction, percentage of wound contraction, wound healing processes, and histological observation of dermal wound healing processes in Wistar rats.¹³ Histological appearance of wound healing was used as an indicator in the preclinical trial to assess the effectiveness of *Vitis labrusca* extract in Wistar rats by photomicrographs.¹⁴ Recent research shows the histological appearance that the research report focuses on wound healing due to scald.¹⁵ Another preclinical trial demonstrated the histological features like a variable of the hydrogel effectiveness in dermal wound healing.¹⁶

CONCLUSION

In preclinical trials of the effectiveness of plant extracts, the histological appearance is very important to carry out the wound healing process. Until now, the report of dermal wound healing is qualitatively but can give a clear basis for the stage of wound healing. We hope that quantitative measurements of the wound healing process carried out in the future. Thus the stage of dermal wound healing is determined more objectively because it bases on quantitative data.

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CONFLICTS OF INTEREST

The author declared that there is no conflict of interest

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