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Effect of a mixture of *Centellaasiatica* and Ginger on skin wound of cat

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Abstract:

The present study shows the effect of a mixture of *C. asiatica* and *Z. officinale (Ginger)*. The plants powder was applied on injured cat skin caused by accident, with a proportion of 5g of each plant powder. After one week of treatment, the diameter of the wound skin decreases from 4 to 2 cm. The wound disappear totally after two weeks. The result can be explained by the effect of Asiaticoside (triterpene glycoside) present in *C. asiatica* powder on the wounded skin. The ginger act by its anti-inflammatory effect, the powder contains inhibitors against prostaglandin biosynthesizing enzyme (PG synthetize).

Key-words: Centellaasiatica, Zingiberofficinale, injured cat skin, anti-inflammatory, collagen biosynthesises.

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Introduction:

Cutaneous injury is characterised by fibroplasia, angiogenesis and re-epithelisation [1]. These steps are controlled by a variety of bioactive molecules like cytokines and can lead to the development of a chronic wound [2].

Researches are being made to discover agents that can promote healing and save the patient from severe complications [3]. One of plant used for this purposes is Centellaasiatica [3].

This plant is a stoloniferous perennial herb belonging to the plant family Apiaceae (Umbelliferae), which contains 20 different species. It is a slender, creeping plant, rooting at the nodes, growing in the damp areas in different tropical countries [4].

According to the European Pharmacopoeia the herbal substance consists of the dried, fragmented aerial parts, containing minimum 6% of total triterpenoid derivatives, expressed as asiaticoside ($C_{48}H_{78}O_{19}$, Mw 959.15) (IUPAC name: 6-[[3,4-dihydroxy-6-(hydroxymethyl) 5 (3,4,5-trihydroxy-6-methyl-oxan-2-yl)oxy-oxan-2-yl]oxymethyl]-3,4,5-trihydroxy-oxan-2yl]10,11-dihydroxy-9-(hydroxymethyl)-1,2,6a,6b,9,12a-hexamethyl 2,3,4,5,6,6a,7,8,8a,10,11,12,13,

14b-tetradecahydro-1H-picene-4a-carboxylate) [5].

It has been reported that topical application of asiaticoside significantly enhanced the rate of wound healing as assessed by increase in collagen synthesis [6]. Asiaticoside is the main active principles of Centellaasiatica [3], the application of the plant extract can act by the effect of asiaticoside alone or by a combination of multiple molecules present in C. asiatica powder.

Ginger (Zingiberofficinale Roscoe) is a creeping perennial on a thick tuberous rhizome, which spreads underground.

Ginger has long been used in traditional medicine as a cure for many diseases [7]. It contains active phenolic compounds characterized by their antioxidant [8], anti-cancer [9] and anti-inflammatory activities [10].

In the present work, we will study the effect of a mix of Ginger and Centellaasiatica leaves on the cat skin wound.

Materials and Methods

Plant Material

Plant leaves founded in Thaneai village, Yangon, Myanmar since 1940. The plant is used for cut, Scrapes, Puncture wounds, open wound, Abrasion, animal bite wound, cut vein & vascular treatment [11].

Preparation & Methods of Medicine

Prepare 5g of native ginger powder & 5 g of native *Centella* dried leaves. Then, mix together and bake it till to get fine Ashes (Figure. 1).

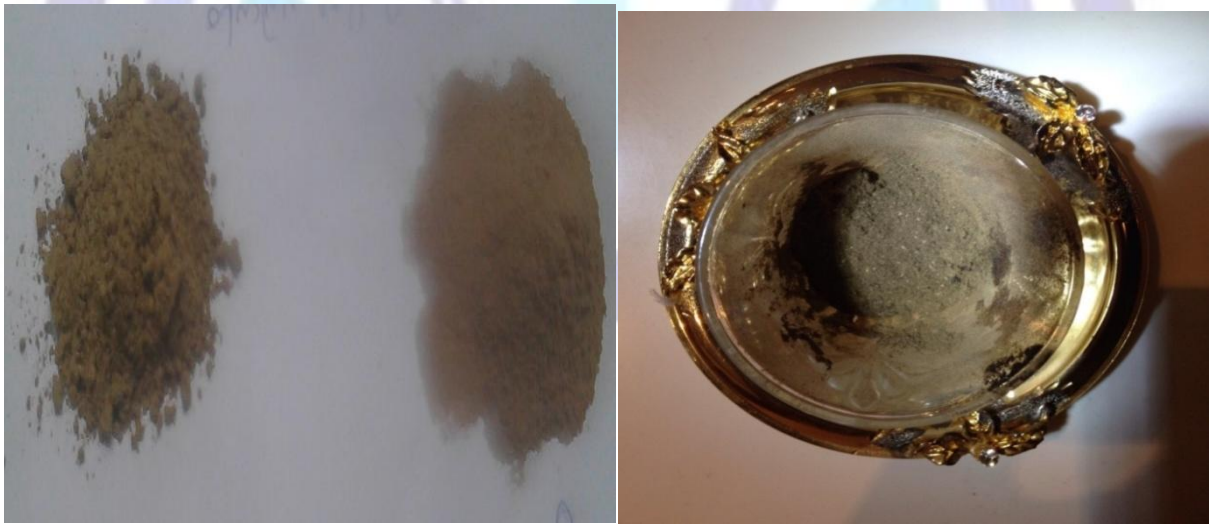

Fig 1: Ginger and Centella dried powder.

Medicament & how to applied medicine to the injured area

1st step: wash & clean with warm water

2nd Step: Apply the Ash (dried plant powder) to the injured area

3rd Step: Wrap with the bandage

Characteristic of injured Cat (Figure.2.)

Name of cat: ShweKyo

Current Age : 3 and half month old

Color: Black, White and light Gray

Gender: Female

Injured area : Left leg

Size of wound: 4 cm

Number of Sibling: 4

Cause of injury: Accident

Place of treatment: Thaneai village, Myanmar

Fig 2: Injured cat.

Results and discussion:

After application of the plant powder on the injured skin, results show a reduction in wound diameter as function of time (figure 3). The wound diameter rundown from 4cm to 2 cm for a period of one week with a total recovery of the injured skin during two weeks (Table 1). In comparison with normal cat (without any treatment), the wound diameter disappear and a total recover can be noted after a period of one month (Table 1).

Table 1. Diameter of the wound according to days

Time (Days)	Wound Diameter (cm) (injured cat treated with plant powder)	Wound Diameter (cm) (injured cat without treatment)
2	4	4
7	2	4
15	0	2
30	0	0

Fig 3: Injured skin (2cm diameter) after 7 days of plant powder application.

The mechanism of action of the total triterpenoid fraction extracted from *CentellaAsiatica* (TTFCA) was evaluated using human skin fibroblasts cultures as the experimental system. In particular its influence on the biosynthesis of collagen, fibronectin and proteoglycans was considered. The presence of TTFCA (25 micrograms/ml) does not seem to affect cell proliferation, total protein synthesis or the biosynthesis of proteoglycans in a significant way. A statistically important increase was observed in the percentage of collagen and, as revealed by immunofluorescence measurements, in cell layer fibronectin. This effect on collagen and fibronectin may help to explain the action of TTFCA in promoting wound healing, and suggests an interesting working hypothesis for its action on basal endothelia [12].

Centellaasiatica effect on the cat injured skin can be concluded by its ability to stimulate the collagen through the mechanism of action of the total triterpenoid . The effect of ginger powder on the cat skin can be deduced from its anti-inflammatory action. It was reported that Ginger (*Zingiberofficinale*) contains potent inhibitors against prostaglandin biosynthesizing enzyme (PG synthetize) [13].

Early in vivo studies have shown that the water organic solvent extract of ginger possess anti-oxidative and anti-inflammatory properties. In a study, researchers evaluated weather ethanol extract of ginger possess anti-tumour promoting effects in a mouse skin. Edema and hyperplasia are conventionally used markers of skin tumours promotion. Pre-application of ginger extract to mouse skin afforded significant inhibition of epidermal edema and hyperplasia [10].

It was also shown that ginger may act as an anti-inflammatory agent by suppression of pro-inflammatory cytokine, TNF-α [14].

Other studies showed the inhibitory effect of ginger on NFκB (pro-inflammatory transcription factor)[15,16].

The plant contain natural active compounds (gingerols and zerumbone) found to be potent inhibitors for NFκB and pro-inflammatory cytokine TNF-α [17].

Conclusion:

The present study has shown that a mixture of *Centellaasiatica* and ginger powder in equal proportion can treat totally a wounded cat skin in two weeks. The *C. asiatica* effect can be explained by its ability to stimulate collagen through the mechanism of action of the total triterpenoid, more analysis must be conducted to explain the effect of this plant on the collagen synthetises. . Ginger effect can be deduced from its anti-inflammatory action.

References:

[1] Clark, R.A.F. 1991. Cutaneous Wound Repair. Oxford University, New York, p. 576.

[2] Ingold, W.M. 1993. Wound therapy: growth factors as agents to promote healing. Trends in Biotechnology 11, 387-392.

[3] Shukla, A., Rasik, A.M., Jain, G.K., Shankar, R., Kulshrestha, D.K., Dhawan, B.N. 1999. In vitro and in vivo wound healing activity of asiaticoside isolated from *Centellaasiatica*. Journal of Ethnopharmacology, 65, 1-11.

[4] Arora, D., Kumar, M., Dubey S. D. 2002. *Centellaasiatica* - A review of its medicinal uses and pharmacological effects.JOURNAL OF NATURAL REMEDIES. Vol. 2/2, 143 - 149.

[5] Assessment report on *Centellaasiatica* (L.) Urban, herba. 2010. EMA/HMPC/291177/2009 Committee on Herbal Medicinal Products (HMPC).European Medicines Agency.

[6] Maquart, F.X., Bellon, G., Gillery, P., Wegrowski, Y., Borel J.P. 1990. Stimulation of collagen synthesis in fibroblast cultures by a triterpene extracted from *Centellaasiatica*. Connective Tissue Research 24, 107-120.

[7] Afzal, M., Al-Hadidi, D., Menon, M., Pesek, J., Dhami, M.S.2001. Ginger: an ethno-medical, chemical and pharmacological review. Drug Metabol Drug Interact.18, 159-90.

[8] Jeyakumar, S.M., Nalini, N., Menon, V.P. 1999. Antioxidant activity of ginger (*Zingiberofficinale*) in rats fed a high fat diet. Med Sci Res. 27, 341-44.

[9] Shukla, Y., Singh, M. 2007. Cancer preventive properties of ginger: A brief review. Food ChemToxicol.45, 683-90.

[10] Hudson, E.A., Fox, L.H., Luckett, J.C.A & Manson, M.M. 2006.Ex vivo cancer chemoprevention research possibilities. Environmental Toxicology and pharmacology, 21, 204-14.

[11] Brinkhaus, B., Lindner, M., Schuppan, D., Hahn, E.G. 2000. Chemical, pharmacological and clinical profile of the East Asian medical plant *Centellaaslatica*.Phytomedicine. Volume 7, Issue 5, 427-448

[12] Tenni, R., Zanaboni, G., De Agostini, M.P., Rossi, A., Bendotti, Cetta G. 1988. Effect of the triterpenoid fraction of *Centellaasiatica* on macromolecules of the connective matrix in human skin fibroblast cultures.The Italian Journal of Biochemistry., 37, 2, 69-77.

[13]Samir, M., Amir, P. 2003. Medicinal properties of Ginger (*Zingiberofficinale*). Natural Product Radiance., vol 2, 6, 296-301.

[14] Hudson, E.A., Fox, L.H., Luckett, J.C.A & Manson, M.M.2006. Ex vivo cancer chemoprevention research possibilities.Environmental Toxicology and pharmacology.21, 204-14.

[15] Surh, Y. 2003. Cancer chemoprevention with dietary phytochemical.Nat Rev Cancer.3, 768-80.

[16] Kim, S.O., Chun, K.S., Kundu, J., Surh, Y.J. 2004. Inhibitory effects pg 6-gingerol on PMA-induced COX-2 expression and activation of NFκB and p38 MAPK in skin mouse.Biofactors. 21, 27-31.

[17] Shafina, H. M. H., Suzana, M., Noor, A. A. H., Srijit, D., Wan, Z. W. N., Yasmin, A. M. Y. 2008. Ginger extract (*Zingiberofficinale*) has anti-cancer and anti-inflammatory effects on Ethionine-induced Hepatoma rats. Clinics. 63, 807-13.