Histopathological Study about effect of T.verrucosum on skin of the rabbits and treated by yellow sap and gel of Aloe vera


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Abstract
Background : The dermatophytesare taxonomically related fungi causing different skin infections referred to as tineas in man or ringworm in man and animals .
Objective: This study was established to investigate theof effect of yellow sap and gel of Aloe vera on skin of the rabbits which infected with T.verrucosum.
Methods : Twelveskin biopsy were taken from rabbits for histopathological study to know the the effects of the T.verrucosumand treated with yellow sap and gel.
Results : the results of histopathological study of effect of yellow sap and gel of Aloe vera on skin of the rabbits which infected with T.verrucosum showed the concentration of the gel of aloe vera at 75% was more effectted to treat the infective area of skin with T.verrucosum compared with the skin which treated with yellow sap at 20% inspite of was gave recovery the infective skin by T.verrucosum after 18 days.
Conclusion This study concludes that Aloe vera may be used as antifungal.

I. Introduction
The dermatophytes are taxonomically related fungi causing different skin infections referred to as tineas in man or ringworm in man and animals . the zoophilic dermatophyteTrichophyton. verrucosum is associated principally with cattle and camal ringworm (1) . but it has been reported toinfect wide range of animal hosts together with man (2) . Ringworm has longbeen associated with rodents and rabbits , it is common in rabbits and guineapigs (3).In animals the lesion start with thickening of skin alopecia andscalinness they may involve small circular area or become confluent in extensive area , the exudates of inflammatory process glues hair together in tothick grey asbestos like crusts which reveal bleeding ulcerated area onremoval (4). One of medicinal herps used is Aloe vera , it belong to family:Asphodelaceae, genous : Aloe L , Species : Aloe barbadensis miller(5). The plant has stiff gray-green lance shaped leaves , containingclear gel in central mucilagenous pulp and when leaf is cut an orange yellowsap drips from the open end this called yellow sap and when the green skin offleaf is remove mucilaginous substance appeare that contain fibers this calledthe gel of Aloe vera , consist of 93.3% water , the remaining 0.7% is madesolid with glucose and mannose (6). Aloe vera extract are larger used as medicin drug to treated animal disease from dermatitis to cancer (7). And used at this time to treated skin diseases as antibacterial ,antiviral , antifungal and ulceration . Aloe veranother medical uses like treated wound and burn as well as use the gel ofAloe vera to treated X-rays burn in skin cancers (8,9).

II. Materials and methods
1- Pure culture of fungi (T.verrucosum) was collected and examination in microbiology laboratory.
2- method of extraction of the yellow sap and gel of Aloe vera:
   a-The yellow sap : wash the plant with D.W and then with sharp scalpelcut the leaves from the base of stem of plant , put it disinfected glass ( Becare ) wide base of leaves in lower ( in side becare), overlook and lifted up after few hours so the golden yellow sap is collected and filtrated used directly after prepare the concentration 20% this concentration is benfit toinhibit to growth of T.verrucosum in vitro (10).
   b-The gel : after take the yellow sap the leaves was used to obtain thegel by remove the green skin of leaves by sharp scalpel so the gelatinous substance inside the leaves take it and put it in clean container and take it tomix
by electrical blender for 15 second and filtered and direct used after prepare the concentration 75% this concentration is benfit to inhibit to growththof *T.verrucosum* in vitro (10).

3. experimental animals : used 12 rabbits for 4 groups:

**Group 1**: 3 rabbits used as negative control group without infection.

**Group 2**: 3 rabbits used for induce the infection by *T.verrucosum* bychoose area of skin of rabbits then clipping and shaving the skin, then used 2 blunt scalpels to make scratch of skin, after that the skin becomes ready for adding the fungus *T.verrucosum*. This group treatment only by D.W.

**Group 3**: 3 rabbits infected with *T.verrucosum* and treated with yellow sap at concentration 20%.

**Group 4**: rabbits infected with *T.verrucosum* and treated with gel at concentration 75%.

4. histological study: take skin biopsy from each groups. skin biopsy was excised for histopathological study to know the effect of both extracted on infected skin with *T.verrucosum*.

### III. Results

The results of the skin infection depend on groups:

**group 1**: the skin sections showed no pathological changes.

**group 2**: the lesion appear after 3 weeks characteristic by inflammation , redness , scaling , alopecia .this group is treated with D.W(type of the solvent that used for preparation of concentration of yellow sap and the gel of aloe vera). The skin section showed hyperkeratosis and a canthosis with congestion of blood vessel of dermis (fig1). Furthermore there is deep ulceration with sever hemorrhage on the surface , the subcutaneous tissues showed extensive area hemorrhage with dilated and congestion of blood vessel of dermis (fig 2,3).

**group 3**: in the area of skin the infection with *T.verrucosum* appear after 3 weeks then treated with yellow sap at concentration 20% for 18 days compare with control group (treated with only D.W.) showed disappearance of redness, scaling and growth of hair not complete. The histopathological showed marked section of dermis especially around groups of hair follicles (fig 4). The mild infiltration of neutrophils in the dermis(fig 5), withabscessation of hair follicales are also seen (fig 6).

**group 4**: in the area of the infection with *T.verrucosum* appear after 3 weeks then treated with Aloe vera gel at concentration 75% for 19 days compared with control group (treated with only D.W.) showed disappearance of redness, scaling and growth of hair completely. The histopathological showed completely regeneration of epidermis and sclerosis of dermis layer seen in (fig 7,8).

### IV. Discussion

In vivo, the use of yellow sap of Aloe vera at 20% gave complete restoration of infected areas after 18 days of treatment , which confirmed by the disappearance of scales ,redness as well as growth of hair in the treated area compared with control areas, and the infected areas treated with vehicle only. The yellow sap of aloe vera contain the anthraquinones which used as antifungal (11), and contain also the saponins ,tannins these composition which acts as antibacterial and antifungal (12). The tannine which isolated from the medicinal plants which have antifungal effect (anti- Dermatophyticeffect because have ability to bind with protein so as effect on enzymes and change it.

In vivo, the use of 75% concentration of gel for the treatment of skin infections in rabbits with *T.verrucosum*, gave restoration after 16 days of treatment , which confirmed by the disappearance of scales , redness and the growth of hair in the treated areas compared with control area as well as result the infected area treated with vehicle only. The used high concentration 75% have more effects on infected skin of rabbits because the Aloe vera gel have more components like the succinic acid and malic acid which used for treated the skin diseases also contain mineral like magnesium and salicylic acid were work as asprine was inhibited production of prostaglandin which prevent the pain and inflammation on infected area (10), and contain the enzymes like Bradykininase was used for relieving pain , itch , congestion and arterial contraction to reduce the odema and redness in infected area due to infection. Also contain the saponins which using amodify way which succeed in disposing polysaccharides and glycosides which obstructs the appearance of saponins (13). Acemannan had shown to bind tissue growth factors and stabilize their activity , protection them against heat and enzyme degradation (14). Acemannan effect on repair the skin from fungal infection.

### References


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Fig 7: showing complete regeneration of epidermis and sclerosis of dermis layer (H&E X40)

Fig 8: showing complete regeneration of epidermis and sclerosis of dermis layer (H&E X40)