International Research Journal of Natural and Applied Sciences
Vol. 4, Issue 3, March 2017 Impact Factor- 5.46
ISSN: (2349-4077)

Website: www.aarf.asia Email : editor@aarf.asia , editoraarf@gmail.com

STUDYING THEANTI-INFLAMMATORY AND ANTI-IRRITANT ACTIVITY OF *ALOE VERA*

Alia Farhan[1], Sundus HameedAhmed[2], Samia khalel[3], lekaa hameed[2], Khames Habeb[1]
[1]Ministry of Science and Technology/ Iraq/ Baghdad.
[2]Al Mustansiriyah University / Iraq/ Baghdad.
[3]Al Nahreen University/ Iraq/ Baghdad.

ABSTRACT

Aloe vera under study have tannineflavonids ,and the gel of Aloe have the highest Anti-inflammatory activity in inhibition the protein denaturation and anti protinease in compare with ethanolic extract and Diclofenac, in other hand the Aloe gel healing the irritent skin caused by 50% with in twelve days in compare with Betnosam and control.

Key word: Anti-inflammatory, diclofenac, *Aloevera*, betnosam.

Introduction

The history of traditional Aloe use by Native Americans for intestinal and stomach disorders including hemorrhoids, colitis, constipation, and colon problems. The skin absorbs *Aloe vera* up to four times faster than water, it appears to help pores of the skin open and receive moisture and nutrients of the plants. (1).*Aloevera* (L.)is the most commercialized aloe species, and the leaf gel has become a worldwide industry. In the pharmaceutical industry, it has been used for the manufacture of topical products such as gel preparations and ointments, as well as in the production of tablets and capsules .

In the food industry as afunctional foods, and it has been used In cosmetic and toiletry industry, it has been used as base material for production creams, shampoos, lotions, soaps, and other products (2,3)*Aloe vera* is used on facial tissues where it is promoted as a moisturiser and anti-irritant to reduce chafing of the nose. Cosmetic companies commonly add sap or other derivatives from *Aloe vera* to products such as makeup, tissues, moisturizers, soaps, sunscreens, incense, shaving cream, or shampoos(4). A review of academic literature

notes that its inclusion in many hygiene products is due to its "moisturizing emollient effect(5).Herbal medications is a lower adverse reactions in compared with synthetic pharmaceuticals, also reduced costs of plant preparations, so for this the world go on to use natural therapeutics .

Material and Methods

Plant material

The Aloe leaves collected from Alzorra gardens in Iraq/ Baghdad at September 2016. The plant Identified by Prof. Dr. Ali Al Mosain fig i/ college of science / University of Baghdad.Washed Leaves with water, removed the spines around the leaves by knife, preparing gel as shown in Fig(1), Two hundred gram of gel blended, the blended gel squeezed through muslincloth. Detection the active component

		
3	2	1

		
6	5	4

Extraction Gel from *Aloe Vera* leaves

Determination of total phenolic compounds and Alkaloids

Total phenolic compounds and Alkaloids detection according to(6).

Determination of flavonoid content

Flavonoid was performed by using formaldehyde to precipitate flavonoid compounds, according to(7).The flavonoid content was calculated as the difference of TPC and non-flavonoid compound contents. The results were expressed as Gallic acid equivalents ($mg.L^{-1}$).

Determination of tannin content

Tannins were determination according to (8) with little modificatin. Take 40 ml distilled water and 25 ml of gelatin 25% then add 10mlof the sample mixing well for 10 minute after that adding fifty ml of saturated solution of sodium chloride 1% and 5 g of hydrous aluminum silicate were added stirring well for 20 minutes , centrifugation for 10 minute at 3000 rpm. Solution was used to determination of total phenolic compound(TPC). Calculated tannin content as the difference of TPC and non-tannin compounds contents. Results expressed as equivalents togallic acid ($mg.L^{-1}$).

Determination Inhibition denaturation of albumin

Prepare the reaction solution (Bovine serum albumin and different concentration s of Aloe gel) take two ml from this solution and incubated at 37C^{o} or 20 minute and then heated at 57C^{o} for 30 min. Then optical density measured by using spectrophotometr660 nm. Then calculatedInhibition denaturation of protein by using the following formula:

Inhibition (%) = (Absorbance of control – Absorbance of sample) X 100/ Absorbance of control

Proteinase inhibition activity

Detection Proteinase inhibitory activity was determined according to(9). Add (80µg trypsin + 20 mMTriesHClbuffer) to different concentrations of Aloe gel, (pH 7.4). Reaction mixture incubated at 37C^{o} for 5 min and added1% casein. The mixture was incubated further 15 minutes. Added per chloricacid addedto stop the reaction. Then centrifuge reactionmixture and the optical density of the supernatant determination by spectrophotometer at210 nm against blank. The inhibitory of proteinase activity calculated by using thefollowing formula:

Inhibition (%) = (Optical density of control – Optical density of sample) X 100/ Optical density of control

Anti-Irritation Test

Thirty mice albino maletheir age between 12-14 week with weight(24-26g). The mice were allowed standard mice pellet. Shaved a spot in itsback and divide in to six groups:

-Group one treated with 50% phenol(positive Control)
- Group two non-treated with 50% phenol(negative Control)
- Group three treated with 50% phenol and 100% Aloe gel
- Group four treated with 50% phenol and 20% Aloe gel
- Group five treated with 50% phenol and 30% Aloe gel
- Group six treated with 50% phenol and Betnosam cream

Treatment evrey dayfor twelve days

Result and Discussion

Table (1) showed the active component of Aloe gel such as Total phenols Tannine andflavonoid and this agreed with (10). Denaturation of proteins is a marker of inflammation.

Protein denaturation in which proteins lose their natural structure by express the protein to strong acid, base, or heat. Most biological proteins lose their biological, function when denatured appear. The Aloe gel Ithad a good affectionin inhibiting denaturation albumin by heating. Highest inhibition appears at by Aloe gel 91%, ethanoicextract of Aloe 82.9% while Diclofenac, a standard anti-inflammation drug its inhibition effect 72.7% in compared with control (Fig1).(Fig2) showed that Aloe gel have highest anti-proteinaseinhibition activity% in compare with the alcoholic extract and Diclofenac 55.93, 55.4%,respectively. Leukocytes proteinase play an important role in damaged tissues during inflammatory reactions and proteinase inhibitors provided protection for tissues (11).

Table 1:The active component of Aloe gel

Phytochemical components of qualitative analysis	Results
Total Phenol	+
Alkaloids	+
Tannin	+
Flavonoids	+

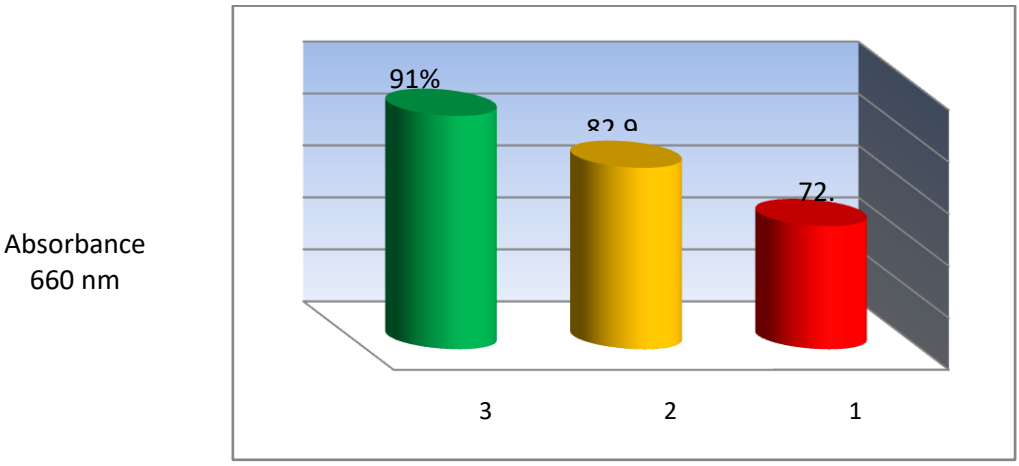


Figure 1:Determination Inhibition denaturation of albumin by Aloe gel

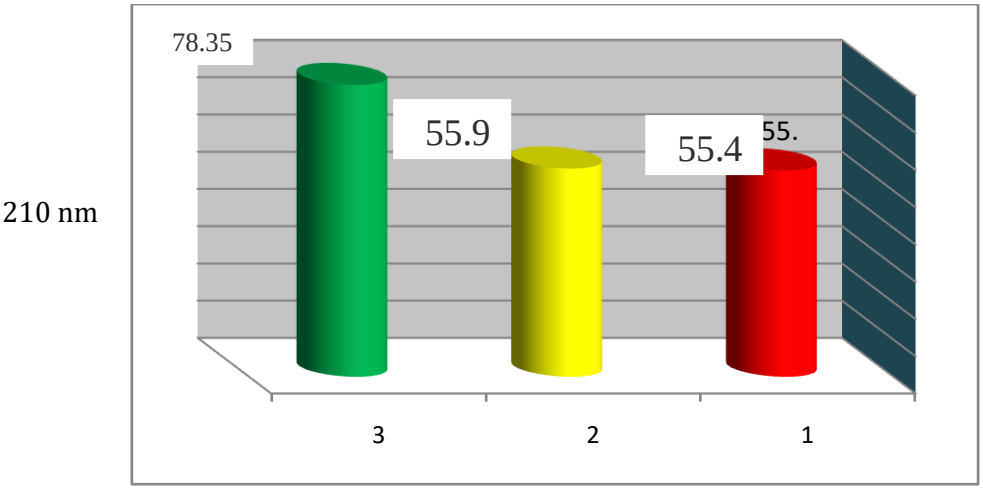


Figure 2:Proteinase inhibition activity by Aloe gel

The Aloe vera gel have an important healing activity of irritant mice skin Effected by phenol 50% as shown in Fig3,4 we found that mice treated with gel 100%gave healing within four days with a good hair growth in compear with 20and30% they gave a good healing after seven days while Betnosam cream healing appeared after nine days with very weak hair growth,the activity of Aloe gel may be due to existence of Mannosepolymer which activated Macrophage to produce Cytokines and the gel contain Bradykininase which inhibits the inflammation action (12).

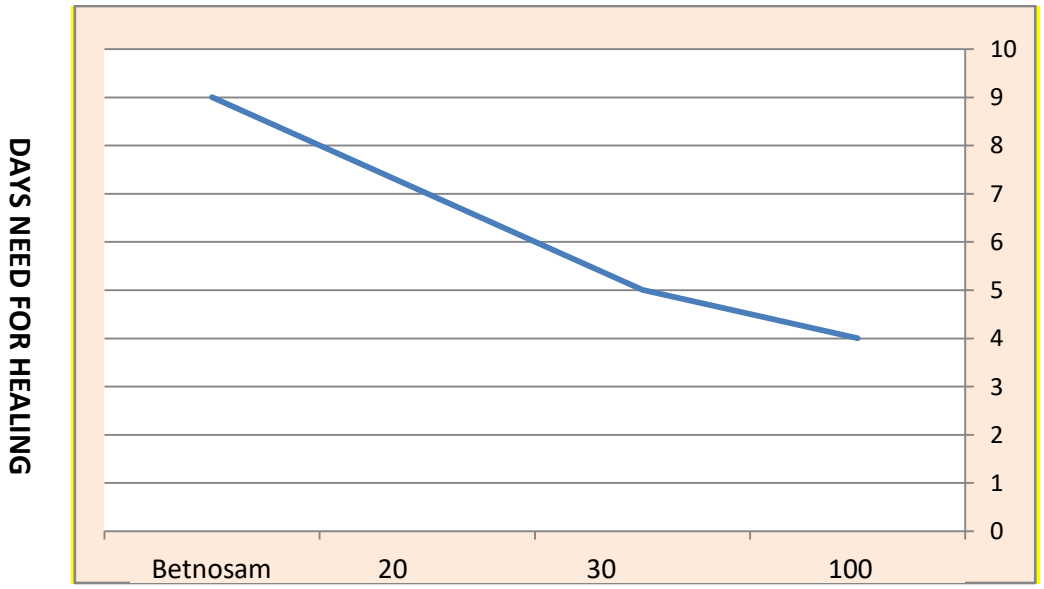


Figure 3: Relation between different treatment and treatment days

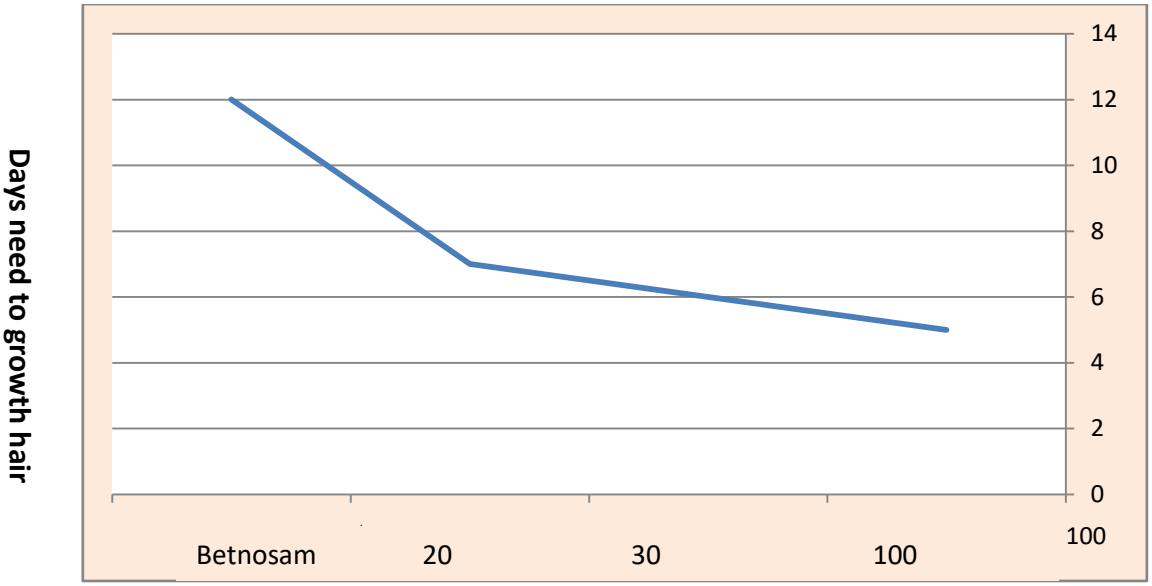
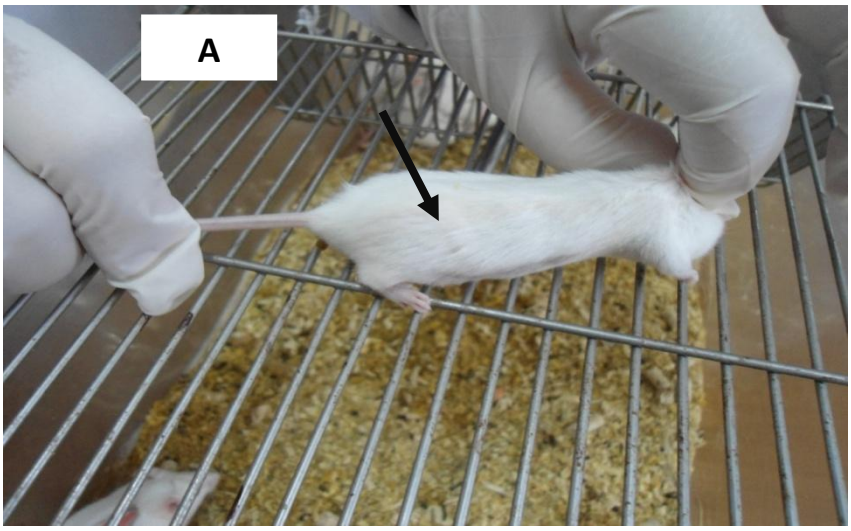
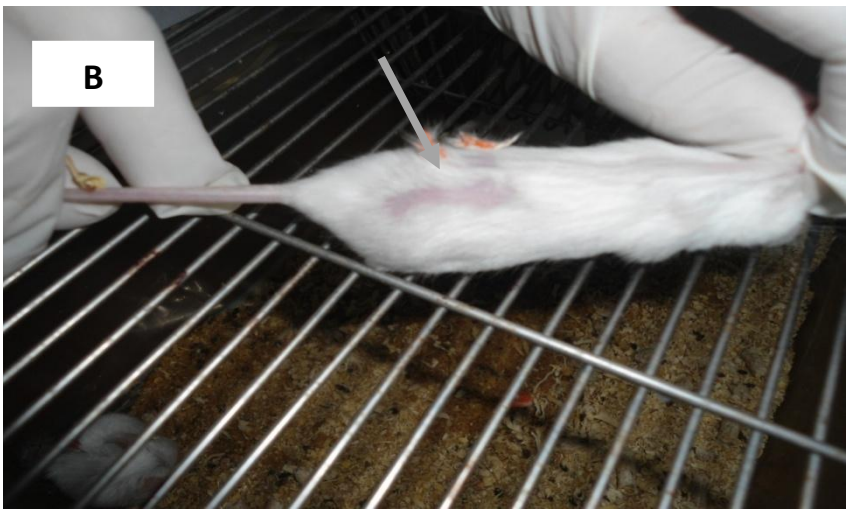


Figure 4: Relation between different treatment and growth the mice hair





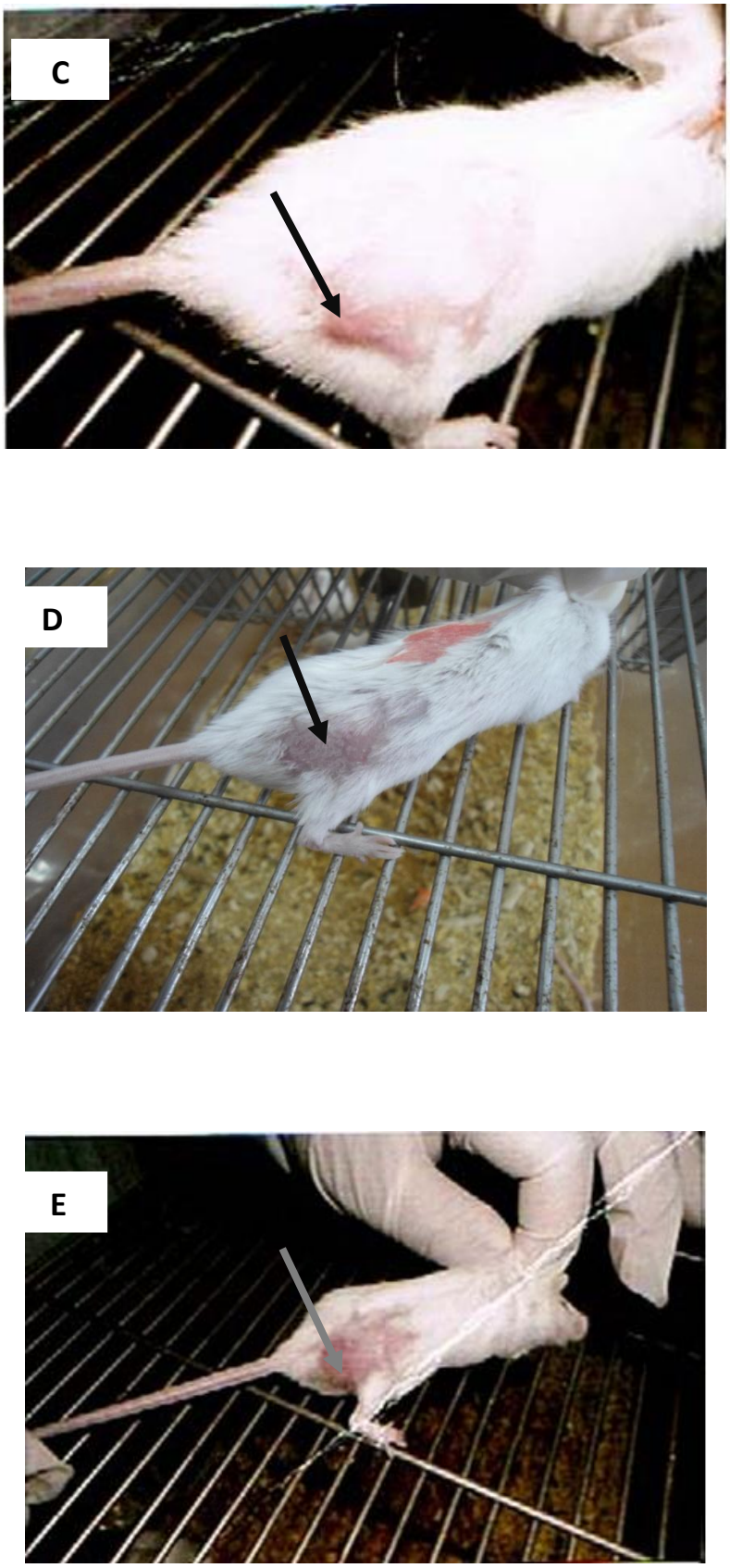


Figure 5:The healing of mice after treatment with Differentconcentration s of Aloe gel (A(100%, B(30%), C(20%)and Betnosam after twelve days.

References:

1. Davis, H.R. (1997). *Aloe vera*: A scientific approach. Published by Vantage Press, New York. 3-5.
2. Liu RH. Supplement quick fix fails to deliver. Food Technol Int. 2000;3:71–72.
3. Herraiz T, Galisteo J. Endogenous and dietary indoles: a class of antioxidants and radical scavengers in the ABTS assay. Free Radical Res. 2004;3:323–331.
4. Reynolds, Tom (Ed.) (2004) *Aloes: The genus Aloe (Medicinal and Aromatic Plants - Industrial Profiles*. CRC Press.
5. Eshun K, He Q (2004). "Aloe vera: a valuable ingredient for the food, pharmaceutical and cosmetic industries--a review". *Crit Rev Food SciNutr*. 44 (2): 91–6.
6. KIRALP, S.; TOPPARE, L. Polyphenol content in selected Turkish wines, an alternative method of detection of phenolics. Process Biochemistry, v. 41, n. 1, p. 236-239, 2006. 1965.
7. OUGH, C. S.; AMERINE, M. A. Methods for analysis of must and wines. 2th ed. New York: John Wiley & Sons, 1988.
8. ALDÉS, H. L. et al. Métodoanalítico para la cuantificación de taninosen el extractoacuoso de romerillo. RevistaCubanaPlantasMedicinales, v. 5, n. 1, p. 17-22, 2000.
9. GrindlayD.and Reynolds T.1986."The aloe vera phenomenon; a review of the properties and modern uses of the leaf parenchyma gel".J.Ethnopharmacol.Sofowara,A.,1993.
10. Medicinal plants and Traditional medicine in Africa.Spectrum Books Ltd, Ibadan, Nigeria, pp: 289.
11. Das SN and Chatterjee S. Long term toxicity study of ART-400. Indian Indg Med 1995; 16 (2):117-123.
12. Vazquez, B.; Avila, G.; Segura, D.; Escalante, B. Anti inflammatory activity of extracts from Aloe vera gel. *J. Ethnopharmacol.* 1996, *55*, 69-75