EFFICACY OF ALOE VERA GEL LEAVES FOR TREATMENT OF SKIN AFFECTION AMONGE ANIMALS.

II) TREATMENT TRIAL OF CALVES DERMATOPHYTOSIS.

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ABSTRACT

Eight naturally infected calves with ring worm (Trichophyton verrucosum) were employed to use the efficacy of herbal medical therapy by once rubbing Aloe Vera gel leaves topically daily on the affected skin lesions compared by traditional topically iodine ointment 10% twice application in a daily base for continuous twenty days. The lesions were confirmed by microscopic examination and on fungal culture were identified as Tricophyton verrucosum. Three weeks treatment course and two weeks post- treatment, notable rapid, effective and curative result with subside of all skin lesions and return to the accepted clinical picture were recorded in Aloe vera gel leaves treated calves comparing by iodine ointment treated ones.
INTRODUCTION

Under rediscovering the treasure of the ancients, using medicinal plants to treat livestock is not new. Many of the active ingredients in chemically manufactured drugs were originally derived from plant compounds. In many developing countries, medicinal plants often are more accessible than manufactured drugs and still being used on a regular basis. There is a renewed interest, especially in developed countries, in using plants to treat livestock, pets, and humans. Because many people believe that plants are less toxic, safer and more natural than manufactured drugs. Medicinal plants can be made at home and are less expensive than manufactured drugs. Beneficial aspects of medicinal plants on skin include: healing of wounds and burn injuries (especially Aloe vera); antifungal, antiviral, antibacterial and acaricidal activity against skin infections such as, herpes and scabies especially tea tree (Melaleuca alternifolia) oil; activity against inflammatory/ immune disorders affecting skin (e.g. psoriasis); and anti- tumor promoting activity against skin cancer (identified using chemically- induced two- stage carcinogenesis in mice), (18).

The Aloe plant is the source of two products used for different therapeutic purposes. Aloe Latex or juice, usually in its deride form, is used as a potent laxative. Aloe gel is used both externally and internally for its wound healing properties and as a general tonic. It is effective, also, for sunburn, scratches, cuts and a cleansing purge for the body or skin. Aloe vera is used in treatment of ringworm, boils, inflamed joints, scalds, itchy allergic conditions, insect stings and bites. It creates a definite softening of external skin, relief from dry or sensitive skin and skin diseases (30). The plant is about 96% water. The rest of its components are active ingredients including essential oil, essential amino acids, minerals, trace elements, vitamins, enzymes and glycoproteins. Aloes have long been in use for a host of diseases, particularly those connected with the digestive system; they have also been used for wounds, burns, dermatitis, cutaneous leishmaniasis and other skin troubles. It is used in eye troubles, spleen and liver ailments (13). Aloe vera is known to contain several pharmacologically active ingredients, including a carboxypeptidase that inactivates bradykinin in vitro, salicylates and a substance (s) that inhibits thromboxane formation in vivo. Scientific studies exist that support an antibacterial and antifungal effect for substance (s) in aloe vera. (16,18). The importance of skin affection in domestic animals draw the attention of many workers to suggest various methods of their control such as application of suitable and rapid method for their diagnosis and treatment. Bovine dermatophytosis causes economic loss due to hide damage and restrictions in showing and marketing infected cattle. The etiology, epidemiology, symptomatology, diagnosis and control of ringworm infections are quite
heterogeneous and complex (19,26). Dermatomphytosis caused by *Trichphyton verrucosum* is also a common zoonosis among farm workers and control or eradication of this disease is therefore highly desirable (12). Eighty percent of dermatophytes infection in human Egyptian population was derived from animal origin (10). Ringworm infection is caused by invasion of cutaneous keratinized epithelial cells and hair follicle by a certain keratinophilic fungi causes dermatomphytosis (32). The disease is named ringworm that commonly applied in clinical field because it describes the circumscribed cutaneous lesion with outward growth of the superficial fungal from the healing area in the center (9). The disease is worldwide and common among animals housed in a close proximity to each other for long periods. *Trichphyton verrucosum, Trichphyton mentagrophytes* and *Trichphyton megnini* are the most commonly fungal species that involved in ringworm (23,24). In Egypt the most common dermatophyte identified among the diseased animals is *Trichphyton verrucosum* (1,2,4,25,33). Several trials for treatment of ringworm by various fungicidal were applied and discussed (4,5). Herbal preparations were evaluated in treatment of bovine and dog dermatomycosis (27,28). Therefore the goals of the present work was carried to investigate the clinical pattern of ringworm disease among calves, and also to determine the therapeutic potential direct effect of the inner gel efficacy of the Aloe vera leaves in treatment of ringworm among calves compared by classical iodine treatment.

**MATERIALS AND METHODS**

*Animals:* Eight naturally suffered calves with skin lesion clinically appeared as ringworm (dermatomycosis) was employed in this study. The animals under investigation were from villages belong the Menoufia province, Egypt. Complete clinical examination was applied on diseased calves that include degree of appetite, body temperature, respiratory and pulse characters, and ruminal movement. Skin lesion was inspected, examined and described. Two- skin scraping were collected from the skin lesions periphery after cleaning by 70% alcohol, to subside the superficial organic organisms, in sterile screw capped vials. The first samples were usually examined microscopically for hyphae and arthroconidia after keratinous debris has been cleared by suspending the scraping in saline containing mixture of dimethyl sulphoxide and potassium hydroxide, (7,20). Dyes as blue- black ink with potassium hydroxide were added as clearing agents to stain the fungi (20). The second skin scraping samples were used, if it microscopically negative, and cultured on Sabouraud’s dextrose agar media. The isolation and identification of colonies were done (23).
**Preparation of Aloe vera leaves gel:** Mature fresh leaves of Aloe vera were collected (Fig. 1). The fresh leaves of the Aloe vera were spited by a sharp scalpel and the parenchyma (the mucilaginous material) of the leaves was removed to expose the gelatinous juice this so-called “gel-filet.”

**Treatment strategy:** The animals classified into two groups, the first includes three calves and treated by topical applied of iodine ointment 10% on base of twice daily application. The second group contains five calves to determine the efficacy of herbal medical therapy by rubbing Aloe vera gel leaves directly on skin lesion fourth times daily on the affected skin lesions for continuous twenty days.

**RESULTS**

The clinical examination of the diseased animals revealed normal range and charter of body temperature, pulse and respiratory rates. The skin lesion sites were dry alopecic spots, circular; grayish white dandruff raised above the skin and reach 5-8 cm in diameter sited on head, neck, dewlap and chest area (Fig. 2). Mycological examination of skin lesions in animals clinically appeared as ringworm revealed positive result to *Trichophyton verrucosum*. For twenty continuous days, twenty applications of Aloe vera gel leaves compared with forty iodine ointment 10% applications. Aloe vera gel offer better therapeutic effect than iodine therapy currently in use. Ringworms were debilitating after six days of treatment. Lesions started to subside gradually and within two weeks the hair restarted to grow (Fig.3). In iodine treated group ringworms were debilitating after ten days of treatment and hair regrowth began after two weeks. Within one month there was a complete recovery in both treated groups.

**DISCUSSION**

The ringworm fungi are able to penetrate all skin layers but rarely invade the deeper ones. Nevertheless, it can cause sever lesions with persistent distress in hosts that leads to significant economic losses (8). The development of fungal infection on animals is linked to and is assisted by different factors that are both intrinsic to the organism and to extrinsic conditions as young age, nutritional deficient status, intercurrent skin disease and transitory or permanent immunodepressive state (19,22,24).

Clinical examination of the investigated calves declared normal physical examination associated with ringworm skin lesions. The same cutaneous clinical signs were also obtained (3,9,11,31,32). *Trichphyton verrucosum* was the only dermatophyte identified in examined animals. This is parallel to the pervious isolation
report that mentioned the *Trichophyton verrucosum* was the main cause of ringworm in cattle and sheep (2,4,9,25). With regards to the traditional chemical types of treatment of cattle ringworm our result showed recovery of the infected cases within a forty application of iodine ointment. This result was in agreement with who gets curative result by iodine treatment in concentration 4% with combination of salicylic acid 3%, sulphur 5% and benzoic acid 6% (3). The result was confided with the result of who showed that sulfur in concentration of one to ten percent has fungicidal effect (15) and disagreement with who reported that calves did not respond to topical treatment with various antifungal drugs within the anticipated period of nine weeks (31). Throughout of the modern old calling “return to the nature” and belonging to the modern recent interest in organic agriculture we try to solve the health problems among animals especially that used for human consummation by alternative natural materials therapy. Since classical fungicidal resistance mechanisms also adversely affect the efficacy of chemicals used for control of fungal infection. Aloe vera gel is an extraordinary demulcent compound, composed of mannuronic and glucuronic units combined to form a polymer of high molecular weight (13).

The curative benefit of Aloe vera gel leaves in our study was confirmed by subsides of the clinical skin lesions without relapse. This therapeutically benefit of Aloe vera gel leaves might be due to its properties and chemical components. The active component is a polysaccharide that forms a protective and soothing coating when applied on the skin (29). The penetrated power of Aloe vera gel to epidermis is shown (top layer), the trauma to the substratum of tissues beneath and the migration of white cells, especially neutrophils, to the site of infection (34). Also the potency of Aloe vera in curing ringworm might be due to increasing the ability of internal immunity of the treated calves by a newly discovered compound in Aloe, acemannan, that strength the natural resistance by boosting T- lymphocyte cells that aid the immune system (14,17). Beside that Aloe vera curative effect was prompted by the anti-inflammatory components, including several glycoproteins and salicylates, and substances that stimulate growth of skin and connective tissue. Above the previously mentioned factors, Aloe vera contains a number of vitamins and minerals that are necessary to healing, including vitamin C, vitamin E, and zinc. It also contains several antiseptic compounds as phenol and sulphur that proved their fungicidal effect were proved (30). Comparing the efficacy and application of Aloe vera gel treated group with the classical iodine treated group we found that the number of applied Aloe vera gel on infected calves (twenty) was lower than iodine ointment group (forty). It means that the number of animal dealing with is reduced in Aloe vera group and it had faster curative therapeutic effect beside that the low treatment coast that is preferable.
It could be concluded that application of crude Aloe vera gel has a potent antifungal therapeutic effect that can cure ringworm safely without any clinical side effect even with occasional licking by the animal. Therefore, further research on those applications will provide further evidence of the therapeutic potential of the Aloe vera leaves inner gel.

REFERENCES


Fig. 1 Aloe vera plant
Fig. 2  Ringworm lesion at two sides of head, neck and dewlap of calf pretreatment by Aloe vera gel leaves.

Fig. 3  Subside of ringworm lesion post- treatment by Aloe vera gel leaves.
كفاءة ورق الصبار لعلاج الإصابات الجلدية في الحيوانات

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أستخدم في هذه الدراسة 8 عجل مصابين طبيعياً بمرض القراع الجلدي لدراسة الكفاءة العلاجية لورق الصبار بوضعه على حكة مرة واحدة موضعياً وضع الإصابة ومقارنه بجرم اليوس كعلاج تقليدي لهذه الحالة. أكملت مناطق الإصابة بالفحص الميكروسكوبى والزرع على المستويات الفطرية أن سبب الإصابة هو قشر الدراكيفتون فربكريم. أظهرت نتيجة العلاج تحسن ملحوظ ورجوع مناطق الإصابة إلى الصورة الإكلينيكية المفقودة مع اختفاء الصورة المرضية من الحيوان المصاب بعد أسبوعين من العلاج بأوراق نبات الصبار.