Treatment of bovine dermatophilosis with Sena alata, Lantana camara and Mitracarpus scaber leaf extracts

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Abstract

This study describes interesting preliminary results on the therapeutic effects of ointments prepared with extracts of medicinal plants on bovine dermatophilosis. Our results show that the use of ointments made with ethanolic extracts of leaves of Senna alata, Lantana camara and Mitracarpus scaber, as topical treatments on chronic crusty or acute lesions of dermatophilosis, induces healing of the disease in the nine infected animals treated without recurrence. This is opposed to what is observed by using oxytetracycline, terramycin long-acting (TLA), or procaine-penicillin, antibiotics commonly used parenterally for the treatment of dermatophilosis in the Republic of Benin which could not prevent the recurrence of the disease. These ointments, when applied once a day for 8–15 days, provoked the falling off of the crusts after 3–4 days of treatment. Hair grows on the treated areas, which heal without scarring, within 3–4 weeks after the end of the treatment. The healed animals became free of dermatophilosis without recurrence for more than 3 years and were in good health.

Keywords: Bovine; Dermatophilosis; Medicinal plants; Senna alata syn. Cassia alata; Lantana camara; Mitracarpus scaber; Healing; Benin

1. Introduction

Dermatophilosis infection in cattle is an enzootic bacterial skin disease in tropical and subtropical countries. It may be acute or chronic, partial or progressive exudative dermatitis that could lead to death of the animal, and cause economic losses to farmers, in the case of a severe acute form.

The treatment of dermatophilosis still remains a matter of great concern owing to the recurrence of the disease and the difficulties to cure it using antibiotics by the parenteral route. Terramycin long-acting (TLA) was described to be the only drug effective in parenteral treatment of dermatophilosis (Ilemobade et al., 1979), while 2 years later, it was claimed that animals treated with TLA became reinfected even after recovering from the disease (Ogwu et al., 1981). One acaridic bath a week with Butex® (a synthetic pyrethroid), associated with 75000 IU of spiramycin per kilogram of body weight parenterally healed the infection in 85% of cases, while TLA, in the same conditions cured 89% of the infected animals. The healed animals, when controlled after 45 days, showed no recurrence (Sarradin et al., 1985). However, the focus is still on topical treatment of dermatophilosis, so many other treatments were tested mixing several natural drugs, regardless of the risk of toxicity and without scientific protocol, but none of them gave complete healing without recurrence (Nwufoh, 1985). Owing to the various economic problems of our countries, we decided to explore the therapeutic activities of three medicinal plants used to treat human skin infections in traditional medicine in Benin, on bovine skin lesions due to Dermatophilus congolensis.

Previous data on these plants indicate that aqueous extracts of leaves of Senna alata were used to treat eczema, itching and skin infections in humans (Palanichamy and Nagarajan, 1990; Morah and Omunu, 1991; Nwalozie et al., 1994). In animals, it also cured an infestation by the mite, Psoroptes cuniculi Delafond (Acarina), in rabbits in Indonesia (Murdirati and Marurung, 1991). Aqueous extracts of Lantana camara had antifungal activity (Singh et al., 1993) and the alcoholic one was shown to possess insecticidal properties (Mukhtar and Ahmad, 1991; Saxena et al., 1992). Lantana camara was also reported to be toxic on ruminants.

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Intoxications results from the ingestion of toxic varieties of *L. camara* containing high quantities of lantadene A and lantadene B, two triterpene acids inducing intra hepatic cholestasis leading to liver injury with jaundice, photosensitisation and ruminal stasis (Pass, 1986; Gisalberti, 2000). Seawright and Hrdlicka (1977) observed similar toxic effects in experimental, therapeutic oral and intraruminal administration of lantadene A and lantadene B. However, in indigenous practice, people use aqueous extracts of *L. camara* externally to cure skin diseases in Republic of Benin, without any report on toxicity (de Souza, 1988). *Mitracarpus scaber* leaf extracts were used to treat successfullly human dermatitis and eczema in Benin (Adjanonhou et al., 1989; Adjanonhou, 2001), while its essential oil was used to treat ringworm and eczema in humans in Nigeria with good results (Ekpendu et al., 1993). Later, Ekpendu et al. (1994) showed the efficacy of petroleum ether and methanolic extracts of *M. scaber* in the treatment of skin diseases and other infections.

Our aim was to find simple, cheap, riskless and effective natural remedies for the topical treatment of dermatophilosis in Benin.

2. Material and methods

2.1. Plant material

In this study, we focused our work on alcoholic leaf extracts of three medicinal plants including *S. alata* (L.), synonym *Cassia alata*, Roxb. (Fabaceae: Cesalpinioideae); *L. camara* (Verbenaceae); *M. scaber* Zucc. and ex Schult + Schult.f. (Rubiaceae). These plants were collected in the areas of Comonou, Abomey Calavi and were identified and authenticated by Professor Dr. E. Akoegninou (Department of Botanique (UAC), Director of the National Herbarium of the University of Abomey Calavi). Voucher specimens were deposited in the National Herbarium of the University of Abomey Calavi in the Republic of Benin.

The plants were first dried at room temperature for 5 days and were turned over every day. The leaves were finally dried in an oven at 50°C for 48 h and were reduced to coarse powder (European Pharmacopeia, 2002) using a grinder.

2.2. Preparation of ointments with alcoholic extracts of plants

For each plant, we macerated 500 g of powder in 41 of ethanol (Merck) for 72 h under constant shaking. The mixture was filtered and concentrated at reduced pressure at 50°C. The yields of extraction were, respectively, 22.88% for *S. alata*, 12.68% for *L. camara* and 12.62% for *M. scaber*. Then, an ointment was prepared with each plant extract by mixing three parts of karite butter (prepared from the nut of *Butyrospermum parkii* (G. Don) Kotschy) and one part of extract. The resulting ointments were kept in pots at room temperature until use.

2.3. Schedule of ointment application

The treatment was carried out in the rainy season, July 1998, on nine chronically infected cows showing established oozing and hard crusty lesions of dermatophilosis.

Smears and culture of crusts collected from these animals were performed first to confirm the presence of *D. congolensis* (van Saechem) Gordon (Dermatophilaceae, Actinomycetales). The animals were treated against worms with Bentac® (Albendazol, an imidazol derivative, Laprovet, France). The rectal temperature of these animals was determined daily and they were normally kept in the herd.

| Treatment schedule for naturally infected animals with ointments of plant extracts |
|---|---|---|
| Animal reference no. | Lesions observed before treatment | Plant extract used | Number of applications | Start of crusts falling off |
| TC1 | Crusts confluent lesions on the flank under erected hair | *Senna alata* | Once a day for 10 days | Fourth day of treatment |
| TC2 | Crusts lesions under erected hair on the back, the flank, the belly and the shoulder | *Lantana camara* | Once a day for 10 days | Fourth day of treatment |
| TC3 | Oozing crusty lesions on the periungual and scrotal region | *Mitracarpus scaber* | Once a day for 8 days | Third day of treatment |
| T01 | Hard and oozing crusty lesions on perineum and scrotal region and the belly and the breast | *Senna alata* | Twice a day for 15 days* | Fourth day of treatment |
| T02 | Crusts lesion on the breast | *Lantana camara* | Once a day for 10 days | Third day of treatment |
| T03 | Hard crustles lesions scattered on the back and the ramp | *Mitracarpus scaber* | Once a day for 8 days | Third day of treatment |
| T05 | Hard and oozing crusty lesions on perineum belly and scrotal region | *Senna alata* | Once a day for 10 days | Fourth day of treatment |
| T02 | Hard and oozing crusty lesions on perineum belly and scrotal region | *Lantana camara* | Twice a day for 10 days* | Fourth day of treatment |

* Ventral oozing lesions.
without particular care. Three animals were treated with each plant extract ointment for 8–15 days as indicated in Table 1. When the damaged area showed hard crusts, the ointments were applied once a day. When the damage was located on the ventral parts of the body, which are in continuous contact with the soil or high humidity areas such as the belly, breast, mammary glands, scrotum and perineum area, the ointments were applied twice a day to allow prolonged contact between the extract and the wound in order to avoid crust reformation or other secondary infections.

3. Results

The application of ointments containing alcoholic extracts of the different plants penetrated and softened dermatophilosis crusty lesions. The crusts started falling off from the lesions after the third or the fourth day of application of the ointment, leaving wounds or erythematous areas as showed in pictures 1b, 2b and 3b (Fig. 1).

The falling off of the crusts was progressive. They all fell off within 8 days of treatment and the rough border of

![Fig. 1. Infected, treated and healed animals.](image-url)
the crusted lesions disappeared. Wounds dried up progressively and growth of hair was observed after 8 days. The skin of the animals healed and looked normal without any scarring within 3–4 weeks after the end of the treatment as illustrated in pictures 1c, 2c and 3c (Fig. 1).

The disease did not recur on the treated animals over at least 3 years after the last application: they keep a nice and smooth skin, and are good looking.

The ointments cured ordinary wounds provided by thorny bushes or other trauma on the body of the animals. They also acted as fly repellents, preventing the treated areas from suffering any other infections.

4. Discussions and conclusions

Topical treatment may be the best way of limiting the spread of D. congolensis. The extracts as ointments, applied early on localised crusts as soon as they appeared, induced good results in a short period: the ointment reached the affected area directly, and penetrated through the epidermis of the skin. Crusts detected under erected hair and treated with any of the ointments healed within 3 weeks. When the crusted lesions were oozing, the direct and continuous contact of the extract with the area left by falling off of the crusts inhibited the development of D. congolensis. Our ointments destroyed directly D. congolensis in the border of the crusted lesions which became smooth. In fact, we think that when animals are parenterally treated with antibiotics such as oxytetracycline (Alamycin®), TLA or procaine-penicillin, some crusts could remain and the rough border of the damaged skin did not completely disappear. Then, D. congolensis which can persist in such areas, starts to develop again in the next rainy season. This could explain the fact that none of these antibiotics prevented the recurrence of the disease on treated animals.

Other topical treatments have failed because of the thickness of the crusts preventing the drug from coming into direct contact with the infected areas (Lloyd and Noble, 1982). Our ointments infiltrated the crusted lesions, acting by softening the hard crusts and their borders, and induced their falling off at the third or fourth day, as observed with parenteral treatment with oxytetracycline (Wilson and Amakiri, 1989). Furthermore, these ointments of plant extracts with the area left by falling off of the crusts inhibited the development of that disease and to heal the skin lesions without any risk of over doses despite the prolonged treatment it may require for effective therapeutic results in some persistent cases. In this respect, the economic impact resulting from the use of these convenient, efficient and cheap ointments will be of great benefit for the development of animal production and of mixed farming.

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