

CASE REPORT

PRELIMINARY OBSERVATIONS OF A NATURAL EYE OINTMENT FROM *CURCUMA AROMATICA* TO TREAT GOAT KERATOCONJUNCTIVITIS AND UVEITIS

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SUMMARY. The livestock industry has been relying merely on chemically synthesised antibiotic for eye infections as sprays and ointment. A natural remedy from *Curcuma* spp. has been tested for efficacy in curing keratoconjunctivitis and uveitis. A severe case of uveitis was cured within 7 days, with impaired vision restored. These results were observations of a preliminary study conducted in a goat with uveitis.

Keywords: keratoconjunctivitis, uveitis, natural product therapy

INTRODUCTION

The use of natural products in the treatment of eye infection in humans has been practised by Siddha masters for thousands of years. However, in the mid-20th century with the dominance of chemically synthesised drugs, natural therapy has been kept in the dark. In the livestock industry, eye infections were treated mainly with tetracycline and oxytetracycline ointment and sprays, which are costly. Therefore, this novel attempt of curing eye infections in a veterinary practice was to evaluate the efficacy and cost effectiveness of natural therapy from

a nutraceutical derived from *Curcuma aromatica*.

Curcuma spp. belongs to the family Zingiberaceae among which are *Curcuma xanthorrhiza* and *Curcuma aromatica* species, both widely used as preservatives, food ingredient and medicine (Anjusha and Gangaprasad, 2014). The bright yellow colour of turmeric comes mainly from fat soluble, polyphenolic pigments known as curcuminoids. Curcuminoids constitutes 3 main compounds namely curcumin, demethoxycurcumin and bisdemethoxycurcumin. Curcuminoids possesses potent anti-inflammatory and anti-bacterial activities (Akram *et al.*, 2010).

Turmeric is one of nature's powerful healer with various biological effects (Debjit B. *et al.*, 2009). The anti-microbial and anti-inflammatory effects are being utilised in this trial, in light of possible toxicity not yet found. Synergistic anti-oxidant properties has been utilised for possible damage and preventive measures to cornea, conjunctiva, iris and lens of the eyes (Rodrigo *et al.*, 2013).

MATERIALS AND METHOD

High grade *Curcuma aromatica* was obtained from Tamil Nadu, India. Curcuminoid was extracted using methanol as solvent (Rana *et al.*, 2012). The extract was then measured for total curcuminoid using a curcuminoid standard curve established earlier. The extract was then hygienically blended with sesame oil as the carrier. A concentration of 200 microgram (0.2 mg) per gram (w/w) was prepared. Thus, the curcuminoid medicated oil was then filled in an aerosol can as a spray.

A 3-year-old female goat suffering from severe bilateral uveitis and blindness was selected for the experiment. It was blind for a few days as bilateral uveitis had impaired its vision and was kept in confinement as free grazing was impossible. The doe could not see and eat its own feed. The prepared compound is known to be safe and non-irritating to the cornea and conjunctiva. The topical eye spray was applied once daily for seven days (Akram *et al.*, 2010).

RESULTS AND DISCUSSION

This novel attempt to cure severe eye infections could be accomplished with

curcuminoids as an antibiotic. The curcuminoid is effective against a wide range of gram-positive and gram-negative bacteria (Gunes *et al.*, 2013). Therefore, the compound could be further purified to develop natural antibiotics for a wide range of veterinary and medical treatment. The concentration and the advantage over chemically synthesised antibiotics are compared in Table 1.

The curcuminoids is effective at a 1/10 concentration of oxytetracycline eye spray being used for a long time in the livestock industry. The cost of the curcuminoid is much lower than the imported Terramycin® pink eye spray. Apparently, the use of natural antibiotics may pave a way to reduce dependency on imports as well as improving the bioeconomy of *Curcuma* spp. farming for novel drug development.

In addition, it also prevents the 2R (resistance and residue) issues currently haunting the healthcare industry. The curcuminoids could also be developed into intramuscular and intravenous injections apart from capsule and tablet forms.

The efficacy of curcuminoid could prevent invasive and painful subconjunctival injection of antibiotics applied in livestock eye infections, especially in ruminants. Infections by the bacteria *Moraxella bovis* in combination with other bacteria are treated

Table 1. The comparison of natural and chemically synthesized antibiotics.

Item	Curcuminoid Eye Spray	Oxytetracycline Eye Spray (Terramycin Pink Eye Spray)
Nature	Natural Product	Chemically synthesized
Concentration of active ingredient	0.2 miligram	2.0 miligram
Cost (RM)	40/400 ml can	50/150 ml can



Figure 1. (Left) left eye, (right) right eye: The goat was presented with the right eye was severely infected and has keratoconjunctivitis and uveitis. Vision impaired.



Figure 2. (Left) left eye, (right) right eye (3rd day post spray): The inflammation or the reddening reduced with the iris and pupil visible.

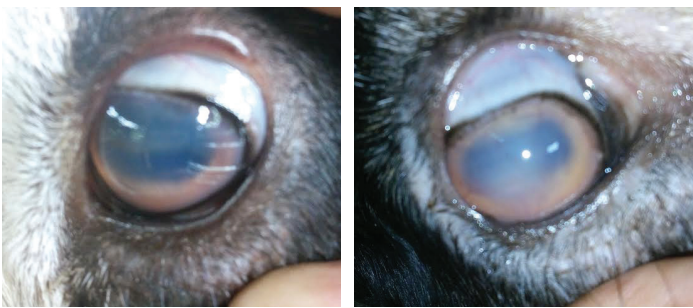


Figure 3. (Left) left eye, (right) right eye (5th day post spray): The uveitis further reduced to reveal normal brownish iris with slight corneal opacity.



Figure 4. (Left) left eye, (right) right eye (7th day post spray): The eye resumed its normal brown colour of iris with slight corneal opacity of the right eye.

with topical antibiotics (The Veterinary Merks Manual, 1998). In cases of resistance and non-responsiveness to treatment; invasive injections such as penicillin-streptomycin is infused into the subconjunctiva. These chemically synthesised antibiotics are often formulated with preservatives such as benzalkonium that is irritating to the eyes and further causes corneal and conjunctival reactions. Animals sensitive to the chemically synthesised antibiotics in turn may cause subconjunctival swelling and pain.

The side-effects and toxicity of natural products are generally much lower compared to chemical therapeutics because they are functional foods and nutraceuticals. Therefore, effort has to be initiated to spur its development in the biopharmaceutical industry. The spillover effect on the tropical economy will be very great as it stimulates the cultivation and farming of these nutraceuticals in Asean countries, as these are the tropical countries which harbours the greatest diversity of biologically active flora. As such, the poor countries in Asia could be transformed to be a bioeconomic giant with the development of the biopharmaceutical industry (Leland *et al.*, 2010).

The clinical improvements of the eyes are shown in Figures 1 to 4.

CONCLUSION

This study, albeit a preliminary trial, enlightens the veterinary and medical chemists and professionals of possible natural compounds used in curing animals without side effects, toxicity and allergic reactions.

The research has to be further pursued to identify the optimum concentration of curcuminoid and possible formulations with carriers for injectable formulation as a natural antibiotic for parenteral administration with the collaboration of pharmacologists and pharmaceutical chemists.

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