IN VITRO ANTIMICROBIAL ACTIVITY
OF SCAVON VET CREAM

Dr. Ratnamma,
Department of Microbiology, Veterinary College Hebbal, Bangalore, India

Dr. Bhagwat V.G* and Dr. Mitra S.K.,
The Himalaya Drug Company, Makali, Bangalore, India

* Corresponding author

Livestock Line, February 2009

INTRODUCTION
Antimicrobials are one of the most important weapons in fighting infections and have greatly benefited the health-related quality of animal life since their introduction. There are many local and systemic factors that interfere with the healing of a wound. The increasing prevalence of multidrug resistant strains of bacteria and the recent appearance of strains with reduced susceptibility to antibiotics raises the specter of untreatable bacterial infections and adds urgency to the search for new infection-fighting strategies (Sieradski et al. 1999). Further, it is associated with adverse effects like tissue irritation, depletion of beneficial microorganisms, immunosuppression, and allergic reactions (Idose et al., 1968). Therefore, there is a need to develop alternative antimicrobial drugs for the treatment of infected wounds, including medicinal plants. Keeping the above facts in view, a polyingredient formulation SCAVON vet cream (containing Linum usitatissimum, Eucalyptus globulus, Cinnamomum camphora, Ocimum sanctum, Acorus calamus, and Yashada bhasma) was developed by The Himalaya Drug Company, Bangalore, India. The purpose of present study was to evaluate the in vitro antimicrobial potential of SCAVON vet cream.
MATERIALS AND METHODS

Micro organisms
The bacterial test organisms used were (Veterinary clinical samples) *Staphylococcus aureus*, *Escherichia coli*, *Salmonella spp, Klebsiella spp, Proteus spp*, and *Pasturella spp*.

Culture media
The culture media used were Muller Hinton agar and Brain heart infusion (BHI) broth procured from Hi-media Pvt Ltd, Mumbai, India

The bacterial cultures were inoculated into BHI broth and incubated at 37°C for 24 hours. The inoculum was standardized according to Mc Farland turbidity standards. The turbidity was compared with McFarland 0.5 standard, which provides turbidity comparable to a bacterial suspension containing $1.5 \times 10^8$ CFU/ml (Connie. R. Mahon and George Manvoelis, 1995).

1. **Agar well diffusion test**: A standard inoculum of bacterial culture was inoculated on plate containing Muller Hinton agar. 6 mm diameter wells were punched in to the agar and filled with SCAVON vet cream. The plates were incubated at 37°C for 24 hrs. The antibacterial activity was evaluated by measuring the diameter of zone of inhibition.

2. **Broth macrodilution test (Tube dilution test)**: Broth dilution MIC tests performed in test tubes are referred to as broth macrodilution or tube dilution test. 1 ml of standard test inoculum of bacterial suspension was added to the tubes containing 1 ml of broth with different concentration of SCAVON vet cream. The concentrations used were 5mg/ml (0.5%), 10mg/ml (1%), 20mg/ml (2%), 25mg/ml (2.5%), 50mg/ml (5%), 100mg/ml (10%), 150mg/ml (15%) and 200mg/ml (20%).

The tubes were incubated at 37°C for 24 hrs. Subcultures were made from these tubes on BHI agar and the presence, reduction or absence of growth was observed. If growth was observed, the particular compound was considered as inactive against the particular organism. If the growth was absent, the particular concentration of antibacterial agent was considered as effective in killing the microorganism.
MIC (minimum inhibitory concentration) is read as lowest concentration of antibacterial agent that inhibits the visible growth of the test bacterium or that reduces the number of colonies of the test bacterium.

MBC (minimum bactericidal concentration) is read as the lowest concentration of antibacterial agent that kills all test bacterium (complete absence of bacterial growth).

The results were compared with positive control containing media with specific organisms and negative controls containing plain media with no organism (Baron et al., 1994; Barbara, 1989; Ahmad et al., 1998).

RESULTS AND DISCUSSION

The result of zone of inhibition, MIC and MBC for SCAVON vet cream are presented in Tables 1 and 2. The MIC and MBC for E. coli and Klebsiella spp. were 10% and 20% respectively, and for Salmonella spp., it was 2.5% and 10% respectively. Further, the MIC and MBC for Staphylococcus aureus was 10% and 15%. MIC for Proteus and Pasturella spp was 10 % and 15%, and that of MBC was 15% and more than 20%. In agar well diffusion method, all the bacterial isolates were found to be sensitive to SCAVON vet cream with zone of inhibition ranging from 10 mm to 15 mm. It is evident from the results that SCAVON vet cream has broad-spectrum antimicrobial activity. The antimicrobial activity of SCAVON vet cream on the microorganisms may be due to the individual ingredients or the combination of the ingredients.

Flaxseed oil contains phytoestrogen lignans and alpha-linolenic acid. Flaxseed was able to reduce the lesional area of the skin test response of atopic horses, alter the fatty acid profile of the hair, reduce inflammation, and did not elicit any negative side effects in the experimental horses (Wendy O’ Neill et al., 2002).

Eucalyptus globules have antiseptic properties (Mahran, 1967) and antibacterial activities against 9 microorganisms, including Salmonella type, Klebsiella spp, Streptococcus A, Proteus sp, and Staphylococcus aureus (Hmamouchi et al., 1992). E. coli strain resistant to several antibiotics is susceptible to Eucalyptus globules (Mouncid et al., 2005).
The growth of Aflatoxin flavus decreased progressively with increasing concentration of essential oil *Cinnamomum camphora* (Singh et al., 2008).

Essential oils extracted from the leaves of *Ocimum sanctum* have been found to inhibit in-vitro growth of *E. coli*, *B. anthracis* and *P. aeruginosa*. Also possessing anti-tubercular, anti-fungal and anti-viral activity (Prakash and Gupta N, 2005, Rajeshwari, 1992).

Methanol extract of *Acorus calamus* Linn. rhizomes exhibited high activity against filamentous fungi: *Trichophyton rubrum*, *Microsporum gypseum*, and *Penicillium marneffei* with IC50 values of 0.2, 0.2 and 0.4 mg/ml, respectively. It showed moderate activity against yeasts: *Candida albicans*, *Cryptococcus neoformans* and *Saccharomyces cerevisiae* (MIC 0.1-1 mg/ml) and low activity against bacteria (MIC 5->10 mg/ml) (Phongpaichit *et al.*, 2005). Ethanol extract of *Acorus calamus* caused 95.56% and 17.78% mortality to *S. zeamais* at 314.54 µg/cm² and 78.63 µg/cm² 4 days after treatment, while (Z)-asarone brought about 100.00% and 15.56% mortality at 40.89 µg/cm² and 15.73 µg/cm² respectively. The insecticidal activity of the *Acorus calamus* extract may be due to (Z)-asarone.

Tankana bhasma contains calcinated Borax processed by traditional means and has antiseptic and wound healing properties. It is used in urticaria, psoriasis, pruritis, gangrenous buboes, and sloughing ulcers (Nadkarni 1976).

Above findings are in agreement with the findings of Vidya and Parimala Vidya, 2000. *In vitro* antimicrobial activity of SCAVON vet cream was evaluated on various organisms from standard culture isolates and veterinary wound isolates. The results from the study indicate that the individual ingredients and mixture of active ingredients possess potent antimicrobial activity.

Studies are reported for the potential activity of the individual ingredients of SCAVON vet cream.
Agar well diffusion method:

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Zone of inhibition (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. coli</em></td>
<td>10-12</td>
</tr>
<tr>
<td>Salmonella spp.</td>
<td>10</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>15</td>
</tr>
<tr>
<td>Klebsiella spp.</td>
<td>15</td>
</tr>
<tr>
<td>Proteus spp</td>
<td>10</td>
</tr>
<tr>
<td>Pasturella spp</td>
<td>10</td>
</tr>
</tbody>
</table>

Broth dilution method:

<table>
<thead>
<tr>
<th>Organisms</th>
<th>MIC (%)</th>
<th>MBC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. coli</em></td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Salmonella spp.</td>
<td>2.5</td>
<td>10</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Klebsiella spp.</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Proteus spp</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Pasturella spp</td>
<td>15</td>
<td>&gt;20</td>
</tr>
</tbody>
</table>

**SUMMARY**

*In-vitro* antimicrobial activity of SCAVON vet cream was evaluated on various organisms from veterinary clinical isolates. The results from the study indicate that the SCAVON vet cream possesses potent antimicrobial activity.

**ACKNOWLEDGEMENT**

The authors thankfully acknowledge the support offered by the Himalaya Drug Company, Makali, Bangalore, India for this trial.

**REFERENCES**


