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In vitro antimicrobial activity of two topical antiseptic products against *Malassezia furfur*

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Introduction and Objectives

Seborrhoeic dermatitis is a chronic, scaly inflammatory skin condition usually affecting the scalp and face. This condition consists of discrete, red and sharply marginated lesions covered with greasy-looking scales. Eyebrow and eyelid involvement is common. *Malassezia furfur,* the causative agent of pityriasis versicolor and malassezia folliculitis, has been implicated as a causative agent of seborrhoeic dermatitis and dandruff.

The aim of this study was to investigate the antimicrobial activity of two commercially available antiseptic emollients, Dermol cream™ (DERC) and Dermol lotion™ (DERL), against *M. furfur in vitro.*

Both DERC and DERL are UK licenced antiseptic emollients indicated for the treatment of dry and pruritic skin conditions, especially eczema and dermatitis, and for use as soap substitutes. They have been specially developed for their antimicrobial action and their lack of topical irritancy. This is achieved by the inclusion of two antiseptic ingredients, namely chlorhexidine dihydrochloride and benzalkonium chloride, at a relatively low concentration of only 0.1% w/w as their antimicrobial activity was shown to be synergistic. Furthermore, a **non-ionic** soap substitute was used in the formulation, thus avoiding the irritant effect of ordinary **anionic** soaps and detergents, whilst still providing cleansing properties.

Materials and Methods

- A stock culture of *M. furfur* NCPF 3644 was streaked on *Malassezia spp* growth medium and incubated at 33ºC±1ºC for 7 days.
- After incubation a suspension of approximately 1.0×10^4 cfu/ml was prepared in Maximum Recovery Diluent.
- 20ml of each test product was inoculated with 200µl of the suspension to achieve a final concentration of between 10^1 and 10^2 organisms per ml. 20ml of inoculated Maximum Recovery Diluent was used as a control.
- 1ml of each test and control was then transferred to separate 9ml quantities of inactivation liquid (as per BSI DD177:1988), immediately after inoculation and after 5, 10, 20, 30 and 60 minutes.
- Further dilutions were prepared in inactivation liquid as required and 1ml aliquots from each dilution were spread on *Malassezia spp* medium plates. The plates were incubated at 33ºC for 7 days.
- After incubation, the numbers of colonies on each plate were counted and expressed as cfu/ml. If no counts were observed, a <10 count was recorded.

Validation of Recovery of Low Numbers

1ml of each product was diluted 10 fold in 9ml of inactivation liquid (as per BSI DD177:1988). Sufficient amounts of the organism suspension was added to these tubes to give an organism concentration of 1.0×10^2 cfu/ml. Also 9ml aliquots of inactivation liquid (as per BSI DD177:1988) with no product added were similarly prepared to act as controls. 1ml of each of the tubes were spread onto the surface of pre-poured *Malassezia spp* medium plates and incubated. The plates were then examined and the number of colonies on each plate counted.

Validation Results

Table 1: Validation of Recovery of Low Numbers

Product tested	Count control	Test Count	Valid
DERC	20	16	Yes
DERL	20	21	Yes

The data is considered valid if the test counts are ± 50% of the control count.

Test Results

The control count was 1.9×10^4 cfu/ml. As presented in Table 2, both DERC and DERL had <10 counts at all tested time points, except for immediately after inoculation test point for DERL when 1.4×10^2 cfu/ml were detected.

Table 2: Test results at various time points (0-60min)

Recovery after time (minutes) cfu/ml product						
Product tested	0 min	5 min	10 min	20 min	30 min	60 min
DERC	<10	<10	<10	<10	<10	<10
DERL	1.4×10^2	<10	<10	<10	<10	<10

Conclusion

The results of this test confirm that topical antiseptic emollients, Dermol Cream™ and Dermol Lotion™, are effective *in vitro* against *M. furfur.*

Please turn over for poster summary

Dermol Cream and Dermol Lotion antimicrobial emollients demonstrate antifungal activity against *Malassezia furfur (M.furfur)*

Dermol Cream and Dermol Lotion are antimicrobial emollients indicated for the treatment of dry and pruritic skin conditions, especially eczema and dermatitis, and for use as soap substitutes. They have been specially developed for their antimicrobial emollient action and their lack of topical irritancy. This is achieved by the synergistic combination of two antiseptics, benzalkonium chloride and chlorhexidine dihydrochloride, both present at a concentration of 0.1%. Two emollients are also included to maintain the skin's normal barrier function, and cetomacrogol, a non-ionic soap substitute for cleansing.

Seborrhoeic dermatitis is a chronic, scaly inflammatory skin condition usually affecting the scalp, face and chest. This condition consists of discrete, red and sharply marginated lesions covered with greasy-looking scales. *Malassezia furfur (M. furfur),* the causative agent of pityriasis versicolor and malassezia folliculitis, has been implicated as a causative agent of seborrhoeic dermatitis and dandruff.

The study summarised overleaf shows that Dermol Cream and Dermol Lotion are effective *in vitro* against *M. furfur,* a fungus implicated in seborrhoeic dermatitis and dandruff.

Summary of Poster Overleaf:

- Suspensions of *M. furfur* were inoculated with Dermol Lotion, Dermol Cream or control. The suspensions were then inactivated after differing periods of time (0, 5, 10, 20, 30 and 60 minutes) and incubated at 33°C for 7 days on *Malassezia spp* medium plates.
- After incubation, the number of colonies on each plate were counted and expressed as colony forming units/ml (cfu/ml). If no counts were observed, a <10 count was recorded.
- Both Dermol Cream and Dermol Lotion had <10 counts at all tested time points, except for immediately after inoculation (0 minutes) for Dermol Lotion when 1.4×10^2 cfu/ml were detected. The control count was 1.9×10^4 cfu/ml.

Conclusion:

"The results of this test confirm that topical antiseptic emollients, Dermol Cream™ and Dermol Lotion™, are effective *in vitro* against *M. furfur.*"

Dermol® 500 Lotion

Benzalkonium chloride 0.1% w/w, chlorhexidine dihydrochloride 0.1% w/w, liquid paraffin 2.5% w/w, isopropyl myristate 2.5% w/w.

Dermol® Cream

Benzalkonium chloride 0.1% w/w, chlorhexidine dihydrochloride 0.1% w/w, liquid paraffin 10% w/w, isopropyl myristate 10% w/w.

Click **here** for the Dermol Range Prescribing Information or scan the QR code below

Adverse events should be reported. Reporting forms and information can be found at yellowcard.mhra.gov.uk. Adverse events should also be reported to Dermal.

'Dermol' is a registered trademark

DERMAL TOPICAL INNOVATION
www.dermal.co.uk

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