OTYCIS

Lotion for daily ear cleansing in cats and dogs

OTYCIS (O-TY-CIS)

The name is inspired by the Greek word «ὦτα» which means «ears» Liddell HG, Scott R. *An Intermediate Greek-English Lexicon.* Oxford: Clarendon Press; 1889.

A mild cleansing formula with antimicrobial properties, destined for everyday use. Various microorganisms can colonize the external ear canal, and they can proliferate with damage or inflammation¹. Several bacterial species are involved in otitis externa and often *Malassezia* yeasts are simultaneously present. Otitis externa is often a severe problem in veterinary medicine because of the resistance of the involved pathogens to conventional drugs. Daily cleansing of the external ear canal with OTYCIS lotion helps maintain the balance of the local microbiota and improves itchiness, redness and malodor.

Oregano oil

Origanum vulgare L. is a widely used aromatic plant, especially due to its content in essential oil (OEO). As it has been shown by an increased number of studies in the field, OEO is presented as an efficient alternative antimicrobial agent against both Gram-positive and Gram-negative bacteria, as well as a potent antifungal agent².

OEO has been used as an ethnoveterinary remedy in ear infections³. The essential oils of *Origanum vulgare* L., and *Thymus vulgaris* L. exhibited very strong free radical scavenging activity. The highest antimicrobial activity, tested against 13 bacterial strains and six fungi, was expressed by the essential oil of oregano, even on multiresistant strains of *Pseudomonas aeruginosa* and *Escherichia coli*⁴.

In a study regarding the antibacterial and antifungal activity of certain essential oils against pathogens responsible for otitis externa in dogs and cats, it was demonstrated that OEO exerted the best action against staphylococci⁵, in accordance with other studies. The major compounds of oregano EO—carvacrol, thymol, and terpenoids—seem to contribute to the expressed antimicrobial activity⁶, and potentially they could disrupt the membrane of bacteria. Oregano oil, thyme oil, carvacrol and thymol showed good in vitro bactericidal and fungicidal activity against 100 isolates from dogs with otitis externa, including some highly drug-resistant isolates⁷. A newer study confirmed the antimicrobial properties of commercial OEO and other essential oils against Gram-positive and Gram-negative bacteria and *M. pachydermatis* cultured from ears of dogs affected by otitis externa⁸.

Calendula extract

Calendula extract has been used as an ethnoveterinary remedy towards ear infections³. In a systematic review on its use in canine dermatology⁹, seven *in vitro* studies confirmed Marigold to inhibit the growth of skin-relevant bacteria, three in vitro references confirmed an antifungal effect and two references confirmed beneficial effects on the skin such as an increase of its moisture and firmness, and a decrease in the trans-epidermal water loss. Marigold could strengthen skin and alleviate it from secondary infections.

IN VITRO STUDIES¹⁰

A modified and adapted for dermatophytes CLSI M44A Ed3 method for yeasts was applied using the hole diffusion method. The microorganisms tested were *Trichophyton mentagrophytes* (n=10); *Microsporon canis* (n=10); *Microsporon gypseum* (n=10) and *M. pachydermatis* (n=10). Plates were incubated at 32°C for 48h – 96h depending on growth rates of dermatophytes and *M. pachydermatis* strains tested, then the zones diameter inhibitions were measured.

Origanum oil appeared as the most active against all assayed fungi *M. canis and M. gypseum* (20.3 mm) (Fig. 1), *T. mentagrophytes* (20.5 mm) (Fig. 2), *M. pachydermatis* (10.40 mm) (Fig. 3). Tea tree oil showed also strong activity against *M. canis* and *M. gypseum* (10.1 mm) (Fig. 1). The combination of all assayed EOs in a ratio between them similar to the one by which they are included in the Dermycis formula exerted an interesting activity against *T. mentagrophytes* (10.0 mm) (Fig. 2). All other EOs did not cause significant dermatophyte inhibition (<10 mm inhibition zone).



Fig. 1. Compounds C (Oregano oil) and D (Tea tree oil) against *M. canis*



Fig. 2. Compounds C (Oregano oil) and F (Dermycis mixture of oils) against *T. mentagrophytes*



Fig. 3. Compounds C (Oregano oil), E (Thyme oil), and F (Dermycis mixture of oils) against *M. pachydermatis*

References

- Greene, C.E. Otitis externa. In *Infectious Diseases of the Dogs and Cats*, 3rd ed.; Greene, C.E., Ed.; Saunders Elsevier: St. Louis, MO, USA, 2006; pp. 815– 823
- Lombrea, A.; Antal, D.; Ardelean, F.; Avram, S.; Pavel, I.Z.; Vlaia, L.; Mut, A.-M.; Diaconeasa, Z.; Dehelean, C.A.; Soica, C.; Danciu, C. A Recent Insight Regarding the Phytochemistry and Bioactivity of *Origanum vulgare* L. Essential Oil. *Int. J. Mol. Sci.* 2020, 21, 9653.
- Lans C, Turner N, Khan T. Medicinal plant treatments for fleas and ear problems of cats and dogs in British Columbia, Canada. *Parasitol Res.* 2008 Sep;103(4):889-98
- 4. Bozin B, Mimica-Dukic N, Simin N, Anackov G. Characterization of the volatile composition of essential oils of some Lamiaceae spices and the antimicrobial and antioxidant activities of the entire oils. *J Agric Food Chem.* 2006 Mar 8;54(5):1822-8.
- 5. Ebani VV, Nardoni S, Bertelloni F, Najar B, Pistelli L, Mancianti F. Antibacterial and Antifungal Activity of Essential Oils against Pathogens Responsible for Otitis Externa in Dogs and Cats. *Medicines (Basel).* 2017 Apr 21;4(2):21.

- Barros, J.C.; De Conceicão, M.L.; Da Gomes Neto, N.J.; Costa, C.V.; Da Siqueira Júnior, J.P.; Basílio Junior, I.D.; De Souza, E.L. Interference of *Origanum vulgare* L. essential oil on the growth and some physiological characteristics of Staphylococcus aureus strains isolated from foods. *LWT—Food Sci. Technol.* 2009, 42, 1139–1143.
- Sim JXF, Khazandi M, Chan WY, Trott DJ, Deo P. Antimicrobial activity of thyme oil, oregano oil, thymol and carvacrol against sensitive and resistant microbial isolates from dogs with otitis externa. *Vet Dermatol.* 2019 Dec;30(6):524-e159.
- 8. Ebani VV, Pieracci Y, Cagnoli G, Bertelloni F, Munafò C, Nardoni S, Pistelli L, Mancianti F. In Vitro Antimicrobial Activity of *Thymus vulgaris, Origanum vulgare, Satureja montana* and Their Mixture against Clinical Isolates Responsible for Canine Otitis Externa. *Vet Sci.* 2023 Jan 1;10(1):30.
- Tresch, M., Mevissen, M., Ayrle, H. et al. Medicinal plants as therapeutic options for topical treatment in canine dermatology? A systematic review. *BMC Vet Res* 15, 174 (2019).
- 10. In house (Aenorasis) unpublished data