

Treatment and prevention of 40 cases of otitis externa in dogs caused by *Malassezia* Spp., with a Boric Acid, Glycolic Acid and Ceramides Solution (ABELIA® MalaOtic)

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OBJECTIVES

The aim of this study was to test the efficacy of ABELIA® MalaOtic in the treatment and prevention of otitis caused by *Malassezia* spp. in the dog.

INTRODUCTION

Otitis externa, an inflammation of the external ear canal and, sometimes, the pinna, is a common pathology in small animals. It occurs in 4.6% of the population (11) and 40-50% are atopic dogs (8). Within this group, 43% of the owners describe otitis as the first observed clinical sign (9).

Otitis externa has a multifactorial etiology and treatment may be difficult in some cases. The most commonly isolated organisms in dogs with otitis externa are *Staphylococcus* spp, *Pseudomonas* spp, *Streptococcus* spp, *Proteus* spp, *Escherichia coli*, *Klebsiella* spp, *Bacteroides* spp, *Pasteurella* spp and *Malassezia* spp.

Otomycosis accounts for 26.7% of diagnosed cases of otitis (11). The most common microorganism in dog otomycosis is *Malassezia pachydermatis* (Fig. 1). *Malassezia pachydermatis* is a lipophilic yeast that is part of the normal cutaneous microflora of many warm-blooded vertebrates. Alterations in the microclimate of the cutaneous surface or in the host defenses help the proliferation of *Malassezia* (5). Since this microorganism is located in the stratum corneum, topical therapy may be sufficient to resolve clinical signs of infection (5).

ABELIA® MalaOtic is an aqueous otic solution for dogs, cats and horses containing boric acid, glycolic acid and ceramides. It has antimicrobial, cerumenolytic, keratolytic, lipolytic, drying, non-irritating and regenerating properties.

Boric acid has drying action and is effective against *Malassezia* infections (6). The mechanism of action of boric acid is not well known. It has been proposed that boric acid can inhibit the ability of fungi to carry out their metabolism.

Glycolic acid is a very small molecular chain alpha hydroxy acid (AHA), that can easily penetrate the deeper layers of the skin. It is exfoliating, keratolytic and lipolytic. Its exfoliating effect favors the detachment of the most superficial cells of the epidermis, favoring normal keratinization and hydration. In addition, by eliminating dead cells, it allows a greater contact of the active ingredients with the epithelium (12).

Ceramides are a complex of sphingolipids found in the stratum corneum of the skin. Their function is to join the cells together. Their presence contributes to maintain the barrier effect, to repel aggressions and to avoid microorganisms and allergens that penetrate the skin. They promote regeneration and repair of the skin and help to restore its natural hydration.

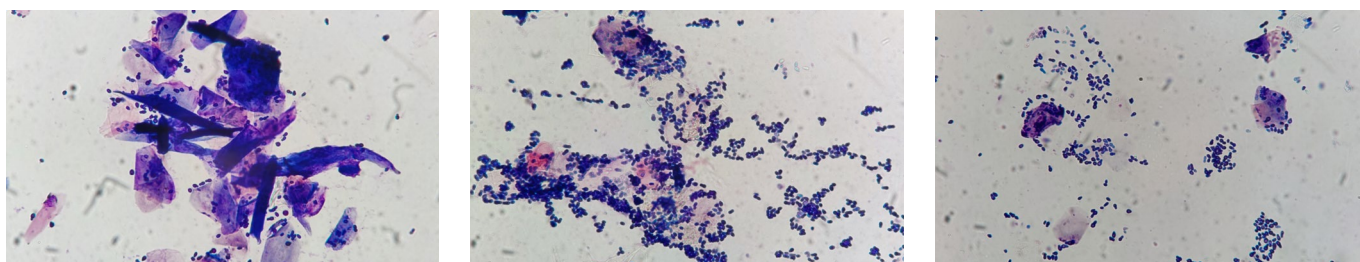


Figure 1: *Malassezia pachydermatis* non-complicated otitis

MATERIALS AND METHODS

This is an open, uncontrolled field study in which all patients received the same treatment. The study included 40 dogs (Table 1) diagnosed with *Malassezia* spp. by cytology. The retrospective study was carried out over 10 months. The treatment that was applied was an otic solution with antimicrobial, cerumenolytic, keratolytic, lipolytic, drying and regenerative properties, based on boric acid, glycolic acid and ceramides. In the initial phase of treatment, the owners applied ABELIA® MalaOtic every 12-48 hours depending on the physical examination or the anatomical characteristics and morphology of the patient's ear. In the maintenance phase, the product was applied every 7 days. Data on breed, sex, age, date of otitis appearance, unilateral versus bilateral, associated pathologies, physical examination, cytological findings, previous treatments, and clinical response were recorded (Table 2). All dogs were reviewed weekly during the initial phase of treatment and every 2-4 weeks in the maintenance phase. The criteria to consider a patient cured and to move to the maintenance phase was based on the resolution of clinical signs: pruritus, pain, ulceration, erythema, characteristic odor to *Malassezia*, brown ceruminous remains, hyperkeratosis thickening of the folds of the pinna, stenosis-duct hyperplasia and subsequent cytology confirming the decrease or disappearance of the population of *Malassezia* (1), considering a count of less than five *Malassezia* spp. per field of 40x (10).

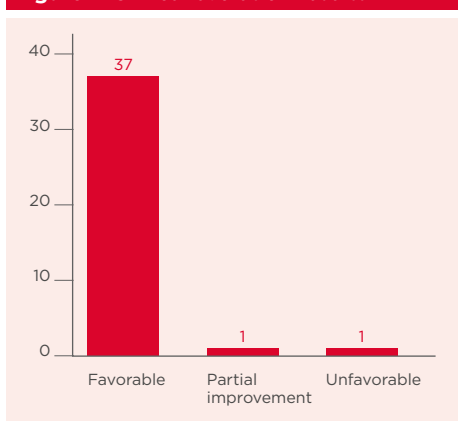
Table 1: Summary data of the individuals included in the study

Sex	13 female	26 male				
Age	4 <1 year	24 2-8 years	11 > 9 anys			
Age of onset	24 <1 year	8 2-8 years	1 > 9 anys	6 Unknown		
Unilateral/Bilateral	29 Bilateral	10 unilateral				
Associated pathologies	12 Atopy	5 alopecia	5 Food allergy/other hypersensibilities	3 Seborrhea	9 Other	5 No pathologies associated

RESULTS

In 95% of the dogs, clinical signs were resolved favorably (Figure 1). Cytology showed a decrease or elimination of *Malassezia* spp. The response to treatment was faster in young animals in which *Malassezia* spp overgrowth had been diagnosed for the first time; in these cases, the average duration of the treatment phase was 15 days. In the more chronic cases, the mean duration of the initial phase of treatment, to reach clinical and cytological resolution, was 45 days. The two refractory cases were very chronic cases with ductal stenosis and hyperplasia; even so, in one of them there was a partial improvement. The product was tolerated perfectly in all cases, provided immediate comfort from the first application, and was not irritating.

Figure 1: Clinical evolution results.



DISCUSSION AND CONCLUSIONS

In the past, when I was facing otitis externa, after cytology, I used to start a cleansing treatment. In most cases, this was not enough to improve the clinical signs and control the overgrowth of *Malassezia* and bacteria, so I had to use topical “cocktail” products combining antibiotics, antifungals and steroids (6). The existing commercial product available in our market do not combine all the ABELIA® properties: if they have great antimicrobial power, they are irritating; and if they carry sphingolipids or ceramides, they are not good cleansers and antimicrobials. ABELIA® MalaOtic prevents and treats otitis externa caused by *Malassezia* without adding antibiotics, antifungals or steroids.

In human medicine, the use of topical antibiotics and steroids has been reported among the predisposing causes of otomycosis (7). Much remains to be learned about the antimicrobial composition and susceptibility of microbiome of the dog’s skin (2). It is not clear that the alteration of the microbiome is the cause or the consequence, but the restoration and stabilization of the microbiome, are key objectives to treat or prevent the disease (2). We must prevent the manipulation of the microbiome of the ear and the skin of the dog avoiding the use of antibiotics and antifungals. The conventional antibiotic treatments we use are destroying most of that microbiome and destroy both beneficial microorganisms and pathogens. The objective would be not to eliminate them in such an indiscriminate way (2). To understand the role of the microbiome, in health and in the disease, it is really important to know the complex interactions between its different bacterial components, between bacteria and other microorganisms, and between the microbiome itself and the immune system (3).

Traditionally, to treat infections in the skin of animals, we focused on using antibiotics to treat the pathogen found in the culture (4). But in practice, the elimination of this is unlikely since clinical cure and cure are not the same. In addition, most of the microorganisms treated are the same as those found in healthy skin (5).

Since we are aware of the spread of multi-drug resistant organisms, such as methicillin-resistant *Staphylococcus*, conventional antibiotic therapies are no longer considered effective or safe.

A high percentage of dogs with otitis externa are atopic (8,9). These have a fewer species in their microbiome and develop dysbiosis of the same when they face the allergens to which they are sensitized (3). That is why we should look for treatments that minimally alter the microbiome.

ABELIA® MalaOtic is a promising alternative to conventional treatments for otitis due to its effectiveness against *Malassezia* because it does not alter the dog’s ear microbiome and because of the low possibility of inducing fungal resistance.

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Breed	Age	Sex	Initial Onset	Unilateral or Bilateral	Associated Pathology	Exam at Start of Treatment	Cytology	Previous Treatment	Result
Bichon Maltese	7 years	Male	6 months	Bilateral	Bladder stones / Epilepsy	Erythema, pruritis, odor, <i>Malassezia</i>	<i>Malassezia</i>	EpiOtic	Favorable
Bichon Maltese	7 years	Female	1 year	Bilateral	Hypersensitivity	Erythema, pruritis	<i>Malassezia</i>	EpiOtic	Favorable
Boxer	11 years	Female	8 months	Bilateral	Seborrhea / Mast cell tumor / Ruptured anterior cruciate	Erythema, odor, <i>Malassezia</i> , hypoplastic canals	<i>Malassezia</i> , Cocci, keratinized cells	EpiOtic Panolog Otomax	Favorable
Bull Terrier	1 year	Male	8 months	Unilateral		Erythema, odor, <i>Malassezia</i> , brown wax	<i>Malassezia</i>	None	Favorable
French Bulldog	6 years	Male	2 years	Unilateral	Atopy / Dispondilosis / Panniculitis	Erythema, pruritis, odor, <i>Malassezia</i> , hypoplastic canals	<i>Malassezia</i> , Cocci, PMN	EpiOtic	Favorable
French Bulldog	5 years	Male	5 years	Bilateral		Erythema, odor, <i>Malassezia</i>	<i>Malassezia</i>	None	Favorable
French Bulldog	10 years	Female	6 months	Bilateral	Atopy / Multiresistant <i>Malassezia</i>	Erythema, odor, <i>Malassezia</i>	<i>Malassezia</i>	None	Favorable
Carolina Dog	2 years	Male	10 months	Unilateral		Stenosis, hypoplastic canals, hyperkeratosis, odor, <i>Malassezia</i> , purulent exudate	<i>Malassezia</i> , Cocci, Bacilli, PMN, Culture - multiresistant Staph	EpiOtic, Food allergy management, Aurizon, Posatex	Unfavorable
Chow Chow	2 years	Female	6 months	Bilateral	Narrow canal	Brown discharge, odor, <i>Malassezia</i>	<i>Malassezia</i>	None	Favorable
Cocker Spaniel	11 years	Male	Unknown	Bilateral	Seborrhea	Stenotic ducts, erythema, odor, <i>Malassezia</i>	<i>Malassezia</i>	EpiOtic Easotic	Favorable
Golden Retriever	5 years	Female	2 years	Bilateral	Cornel dystrophy	Hypoplastic canals, erythema, seborrhea, odor, <i>Malassezia</i>	<i>Malassezia</i> , keratinized cells	Unknown	Favorable
Labrador	9 years	Male	1 year	Bilateral	Mast cell tumor	Erythema, pruritis, odor, <i>Malassezia</i>	<i>Malassezia</i> , keratinized cells	EpiOtic Easotic	Favorable
Labrador	11 years	Male	9 months	Unilateral	Atopy/Hemiated disc	Erythema, hypoplastic canals, brown discharge, odor, <i>Malassezia</i>	<i>Malassezia</i> , PMN	EpiOtic Panolog Easotic	Favorable
Labrador	6 years	Male	1 year	Unilateral	Atopy	Odor, <i>Malassezia</i>	<i>Malassezia</i> , Cocci	EpiOtic Food allergy management Panolog Otomax Aurizon	Favorable
Labrador	3 years	Male	1 year	Bilateral	Atopy	Erythema, odor, <i>Malassezia</i>	<i>Malassezia</i>	EpiOtic, Food allergy management Otomax	Favorable
Labrador	2 years	Male	11 months	Bilateral	Possible food allergy	Erythema, brown discharge, odor, <i>Malassezia</i>	<i>Malassezia</i>	Douxo Easotic	Favorable
Labrador	7 years	Female	Unknown	Bilateral	Atopy	Brown discharge, odor, <i>Malassezia</i> , erythema, pruritis	<i>Malassezia</i>	Otfree Easotic	Favorable
Labrador	11 months	Male	7 months	Bilateral	Food allergy/Atopy	Erythema, hypoplastic canals, brown discharge, odor, <i>Malassezia</i>	<i>Malassezia</i> , Cocci, PMN	EpiOtic Posatex	Favorable
Labrador	10 months	Female	6 months	Unilateral	Possible immunodeficiency	Erythema, pruritis, brown discharge, odor, <i>Malassezia</i>	<i>Malassezia</i>	None	Favorable
Labrador	3 years	Male	1 year	Bilateral	Atopy/ Immunotherapy	Pruritis, erythema, odor, <i>Malassezia</i>	<i>Malassezia</i>	None	Favorable
Mix	3 years	Male	6 months	Bilateral	Food allergy	Pruritis, pain, erythema, ulceration, hypoplastic canals, odor, <i>Malassezia</i>	<i>Malassezia</i>	EpiOtic Douxo Otomax	Favorable
German Shepherd	2 years	Male	Unknown	Bilateral	Food allergy/Atopy	Pruritis, erythema, odor, <i>Malassezia</i>	<i>Malassezia</i>	EpiOtic Easotic	Favorable
German Shepherd	5 years	Male	1 year	Bilateral	Atopy	Pruritis, erythema, odor, <i>Malassezia</i>	<i>Malassezia</i>	None	Favorable
Catalan Shepherd	6 years	Female	Unknown	Unilateral		Pain, pruritis, erythema, stenosis, brown discharge, hypoplastic canals	<i>Malassezia</i> , Cocci, PMN	EpiOtic Easotic Aurizon	Favorable
Water Dog	9 years	Female	4 years	Bilateral	Alopecia / Hypothyroidism	Pruritis, odor, <i>Malassezia</i>	<i>Malassezia</i>	None	Favorable
Pitbull	9 years	Male	3 years	Bilateral	Obesity / Seborrhea / Mast cell tumor	Brown discharge, odor, <i>Malassezia</i> , hairs	<i>Malassezia</i>	Otfree	Favorable
Miniature Schnauzer	3 years	Male	1 year	Bilateral	Alopecia / Atopy	Hypoplastic canals, hyperkeratosis, brown discharge	<i>Malassezia</i> , keratinized cells	EpiOtic Food allergy management Otomax	Favorable
Miniature Schnauzer	2 years	Female	9 months	Unilateral	Alopecia	Pain, erythema, ulceration, hypoplastic canals, brown discharge, odor, <i>Malassezia</i> , hyperkeratosis	<i>Malassezia</i> , Cocci, PMN	Food allergy management Otomax Aurizon	Favorable
Shar-Pei	5 years	Male	Unknown	Bilateral	Food allergy/ Chronic atopy	Pruritis, odor, <i>Malassezia</i> , hairs	<i>Malassezia</i>	None	Favorable
Shih-Tzu	1 year	Female	10 months	Bilateral	Alopecia	Stenosis, hypoplastic canals, hyperkeratosis, purulent exudate, pain	<i>Malassezia</i> , Cocci, PMN	Unknown	Partial improvement
Shih-tzu	2 years	Male	8 months	Bilateral	Alopecia	Erythema, pruritis, odor, <i>Malassezia</i> , hairs	<i>Malassezia</i>	None	Favorable
Newfoundland	2 years	Female	1 year	Bilateral	Flea bite allergic dermatitis / Demodex	Erythema, brown discharge, odor, <i>Malassezia</i> , hairs	<i>Malassezia</i>	EpiOtic Easotic	Favorable
Unknown	12 years	Male	7 months	Bilateral	Atopy	Brown discharge, odor, <i>Malassezia</i>	<i>Malassezia</i>	Otfree	Favorable
Unknown	9 years	Male	3 years	Unilateral	Atopy	Erythema, pain, ulceration, hyperplastic canals, odor, <i>Malassezia</i>	<i>Malassezia</i> , Cocci, PMN	EpiOtic Otomax Aurizon	Favorable
Unknown	7 years	Male	2 years	Unilateral		Erythema, pain, hyperplastic canals, odor, <i>Malassezia</i>	<i>Malassezia</i>	Cleanaural EpiOtic Otomax Easotic	Favorable
Yorkshire Terrier	15 years	Male	15 years	Bilateral	Stage 3 chronic renal failure	Pain, erythema, ulceration, hyperplasia, purulent discharge	<i>Malassezia</i> , Cocci, PMN	EpiOtic Otomax Aurizon	Favorable
Yorkshire Terrier	12 years	Male	8 years	Bilateral	Cushing's Disease	Erythema, brown discharge, hypoplastic canals, odor, <i>Malassezia</i>	<i>Malassezia</i> , PMN	None	Favorable
Yorkshire Terrier	9 years	Female	Unknown	Bilateral	Seborrhea	Erythema, seborrhea, hypoplastic canals, odor, <i>Malassezia</i>	<i>Malassezia</i> , Cocci, PMN	EpiOtic Douxo Otomax Aurizon	Favorable
Bichon Maltese	3 years	Male	1 year	Bilateral	Alopecia	Erythema, brown discharge, odor, <i>Malassezia</i>	<i>Malassezia</i>	None	Favorable