

studies in the veterinary literature show that boric acid can reduce or eliminate *Malassezia* in dogs' ears.

Recently published veterinary reports have, however, noted the usefulness of acetic acid in the treatment of both *Pseudomonas* and *Malassezia* otitis externa and as a rinse for Cutaneous *Malassezia*.<sup>2,3,7,8</sup>

## CLINICAL TRIAL

Since boric acid has been documented to be useful against numerous human fungal organisms<sup>5,6</sup> and acetic acid has been determined to be useful against canine Cutaneous *Malassezia*,<sup>2,3,7,5</sup> this study was undertaken to demonstrate the usefulness of an ear-cleaning solution containing both acetic acid and boric acid in the treatment of *Malassezia* otitis externa in the dog.

Seventeen dogs from Alabama (Gotthelf) and Rhode Island (Young) meeting certain criteria completed this study (Table 1). cases presented to either veterinarian over a two-month period (August and September 1996) for the primary complaint of symptomatic ear disease of at least two weeks' duration. Each clinician confirmed the presence of otitis externa by otoscopic exam. To be included in the study, the dog had to be

exhibiting clinical signs, such as pruritus, head shaking, erythema, exudate or ulceration. It also had to have intact tympanic membranes to confirm that the disease was limited to the external ear canal. Six of the 17 dogs in this study had been treated for *Malassezia* otitis externa by the investigators or by other veterinarians within the previous six months.

In addition, there had to be a confirmed high population of *Malassezia* (>15 organisms per high-power field [HPF]) by ear-roll swab cytologic evaluation. To determine which patients had only *Malassezia*, roll swabs were prepared by inserting a small-tip cotton swab into each ear canal and removing some exudate. The swab was then rolled along the length of a precleaned, frosted microscope slide. The case number, sequence number (initial, seven-day, 14-day), and the left ear or right ear swab rolls were labeled on the slide. The slides were dried and stained with Wright's stain. After the stained slide was dried, a coverslip was applied over liquid slide-mounting medium. The roll smear was examined under high power, particularly for clusters of budding *Malassezia* yeasts on the surface of keratinocytes, indicating active growth and reproduction. An

average of the number of *Malassezia* organisms [HPF] for 10 HPFs was determined (Table 2).

Each patient was treated initially by the diagnosing clinician. The procedure for treatment was to fill the ear canal to overflowing with a two percent acetic acid/two percent boric acid solution (**DermaPet MalAcetic Otic**); massage the ear canals; after five minutes, wipe out any over-flow with a cotton ball. The pet owners were then sent home with the acetic acid/boric acid solution and instructed to repeat the same procedure for six additional days and then return to the veterinarian for a follow-up ear cytology. For the next seven days, there was no treatment to the ears. After the seven-day period with no treatment, the owners were instructed to return to the clinic for a 14-day ear exam and cytology. During the 14-day trial, no other skin or ear treatments were used.

At initial presentation, seven days, and 14 days, clinicians filled out observation reports that evaluated clinical disease progression/resolution for each patient. Observations of pain on otoscopic exam; pruritus; erythema (canal erythema vs. pinnal erythema); ulceration along the canals; quantity, color and character of the exudate; and the areas of the canal that were affected were noted on the forms. Ear cytology forms were also completed at initial presentation, seven days and 14 days to assess the amount of bacteria, yeast, neutrophils and red blood cells.

Owners were asked about initial symptoms of their dog's ear disease, including their observations of the severity of odor, scratching, excessive discharge, head shaking, ear pain and head tilt. At the end of the 14-day period, owners were asked for their posttreatment observations.

## RESULTS

A total of 17 dogs completed the two-week protocol (Tables 2 and 3). On initial presentation, all canine subjects showed significant discomfort, evidenced by pruritus, erythema or head shaking. All ear cytology slides showed significant *Malassezia* infestation (>15 organisms/HPF).

Patient	Age	Sex	Breed	Ear Disease	Pruritus	Erythema	Shaking
1B	9 yr	F	Poodle	5 mo	X	X	X
1D	9 yr	M	Lhasa Apso	2 yr	X	X	X
1E	5 mo	M	Labrador Retriever	6 wk	X	X	O
1G	3 yr	M	Mixed Doberman	3 wk	X	X	X
1H	6 yr	M	Cocker	3 mo	X	X	X
1I	4 mo	M	Cocker	2 wk	X	O	O
1J	12 yr	F	Mixed Breed	1 mo	X	X	X
1K	6 yr	F	Yorkshire Terrier	2 wk	X	X	X
1L	8 yr	M	Poodle	3 mo	X	X	X
1M	2 yr	F	Pointer	4 wk	X	X	X
1N	3 yr	F	Beagle	3 wk	X	X	X
2A	6 mo	F	Am. Water Spaniel	1 mo	X	X	X
2B	3 yr	F	Rottweiler	1 yr	X	X	X
2D	1.5 yr	F	Bull Terrier	2 mo	X	X	X
2E	1.5 yr	M	Pug	2 mo	X	X	X
2F	4 yr	F	Basset Hound	2 yr	X	X	X
2G	6 yr	F	Beagle	1 yr	X	X	X
				Total	17/17	16/17	15/17