INTRODUCTION
Erythema-ceruminous otitis externa is frequently reported in dogs. Although a large number of cases are associated with an underlying hypersensitivity, secondary microbial proliferations serve as aggravating factors that should always be controlled.1

OBJECTIVES
It has already been demonstrated that the ear cleanser* tested in this study is effective in vitro against bacteria and the yeast Malassezia pachydermatis.2-4 The objectives of this study were to evaluate in vivo, the tolerance and the antimicrobial and clinical activities of an ear cleanser*, when used in animals with erythema-ceruminous otitis externa.

MATERIALS AND METHODS
Animals. Dogs of any breed or sex and with erythema-ceruminous otitis externa associated with elevated Malassezia, cocci, and/or rods populations based on history and clinical signs and assessed by cytologic examinations, were included in this study. Dogs with parasitic otitis externa were not included. Dogs treated with systemic or topical antifungal, antibacterial and anti-inflammatory products within the last week were not included in the study.

Treatment. Both ears were filled with the ear cleanser twice daily during a 2-week period, the base of the ear was massaged after application and the dog was not allowed to shake its head for one minute. No additional treatment was allowed.

Protocol design. The clinical condition of the ears was evaluated by the investigator at the initial visit, and after 7 and 14 days while on treatment. Assessment was based on five clinical parameters: amount of exudate, erythema, stenosis, excoriations on the ear pinna and pain. Assessment by the owner of the dog’s discomfort due to the otitis was also done based on ear scratching, head shaking, pain, and amount of exudate. All six clinical parameters were graded on a scale of 0-4 (none to severe). Ear swabs and cytologic examinations of otic exudate from the horizontal ear canal were performed to evaluate the presence of yeast (cocci and rods) and bacteria (cocci and rods), the specimens were rolled onto a glass microscope slide and stained with Diff-Quik® after heat fixing. For each ear, the mean number of each type of micro-organism were scored on a scale of 0-4 (none to very numerous), by cytological examinations of 20 high power fields (X100 objective).

Assessment of efficacy and statistical analyses. The principal assessment criterion of efficacy was the reduction of the microbial population (yeast and/or bacteria) in both ear canals, after 1 and 2 weeks of treatment. Secondary assessment criterion of efficacy was the improvement in the clinical condition of the dogs. Nonparametric Wilcoxon Signed-Rank test has been used to analyse the scores evolution over the study period, differences between D0 and D7, D7 and D14, and D0 and D14 were compared. The software computer NCSS 2000® has been used for the analyses.

RESULTS
General data. Twenty seven dogs with erythema-ceruminous otitis externa associated with elevated microbial populations were included in the study, 24 were analysed. Three cases were excluded due to deviation from protocol, one for steroid treatment, one for 14-day interval visits instead of 7 and one for missing data at D14 (treatment stopped too early because interpretation of failure by owners). On the 24 analysed cases, there were 14 females and 10 males and the mean age was 5.8 ± 4.5 years; 13 dogs had associated clinical signs recorded and 11 because interpretation of failure by owners). On the 24 cases, 23 were included. Dogs treated with systemic or topical antifungal, antibacterial and anti-inflammatory products within the last week were not included in the study.

Assessment of efficacy. The objectives of this study were to evaluate in vivo, the tolerance and the antimicrobial and clinical activities of an ear cleanser*, when used in animals with erythema-ceruminous otitis externa.

CONCLUSIONS
A cure rate close to 50% and at least 50% of microbial and clinical amelioration, in two weeks, show that this ear cleanser helps in the management of erythema-ceruminous otitis externa in dogs. This study also shows the excellent tolerance of the product.

REFERENCES
2) Lloyd D. & Lamport A.I. - Evaluation of in vivo and in vitro antimicrobial activities of the long-acting bupivacaine. [Veterinary Record, 1997, 140:103-105]
4) Lloyd D. & Lamport A.I. - Evaluation of in vivo antimicrobial activities of the long-acting bupivacaine. [Veterinary Record, 1997, 140:103-105]

Table 1: Evolution of means scores of clinical parameters over the study period

<table>
<thead>
<tr>
<th>Clinical parameters</th>
<th>D0</th>
<th>D7</th>
<th>D14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythema</td>
<td>3.5</td>
<td>2.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Stenosis</td>
<td>2.2</td>
<td>1.5</td>
<td>0.75</td>
</tr>
<tr>
<td>Exudate</td>
<td>2.2</td>
<td>1.5</td>
<td>0.75</td>
</tr>
<tr>
<td>Pain</td>
<td>2.9</td>
<td>2.1</td>
<td>0.85</td>
</tr>
<tr>
<td>Discomfort</td>
<td>2.1</td>
<td>1.4</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Fig.1: Type of microbial population in the 46 ears

Fig.2: Clinical signs and microbial populations recorded (percentages of affected ears)

Fig.3: Evolution of the means of the microbial population (n=46)

Fig.4: Evolution of the means of the clinical scores (n=46)

Fig.5: Men percentages of reduction of the clinical score and of the microbial population (n=46)

Fig.6: Percentage of ears (n=46) clinically and microbiologically cured or ameliorated after two weeks of treatment

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ASSESSMENT OF THE EFFICACY OF AN ANTISEPTIC EAR CLEANSER* ON CLINICAL AND MICROBIAL CRITERIA OF ERYTHEMA-CERUMINOUS OTITIS EXTERNA IN DOGS

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*Epi-Otic® (Virbac S.A.)