

**REPORT ON THE ACTIVITY OF AN ELECTRONIC DEVICE WITH ULTRANOSIC EMISSION (40 KHz) FOR MONITORING THE TICK AND FLEA INFESTATION ON CATS AND DOGS**

**MATERIALS AND METHODS**

Tests have been made on 25 dogs of different breeds, sex and age (Table 1), some domestic and some hosted in a kennels assessed "at high risk of tick infestation".

The device has been fixed to a common collar and then applied on the dogs subject to testing. The device was applied on 5 domestic dogs (protocol nr.1-5) for preventive purposes between the end of July and the beginning of August - before parasites appeared on the animals' coat in September 1992 and on 5 other dogs (protocol 6-10), domestic as well, already infested (August 7 to 18).

A final test has then been made on 16 dogs (protocol nr.11-25, from August 13 to September 6, 1992) kept in a kennels hosting 70-90 dogs; the dogs, grouped three by three, were chosen according to the level of infestation present in 6/8 subjects kept in 5 different boxes. The conditions of the kennels and state of maintenance of the animals, in fact, make tick infestation more probable. For these reasons, routine treatments with a solution containing Asuntol and Naguvon are carried out in order to keep infestation under control.

The experimental protocol states that:

- 1) at least 70% subjects (5/7) present in each box chosen for testing should be infested with ticks
- 2) the lapse of time between the parasiticide treatment and the application of the collar could not be shorter than 30 days
- 3) the collar should be applied to 15 subjects (5 for each box) with a level of infestation assessed as medium/high ( $\geq 15$ )
- 4) a further treatment with Asuntol and Neguvon should be administered to 6 subjects found positive to infestation after 7 days from the application of the collar, in order to establish the differences between the treatments (see Table 1 and 2.2)

The dogs also underwent clinical tests to establish if any disturb or allergy might occur as a consequence of the collar and parasitological tests to assess its on days 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup>, 14<sup>th</sup> and 35<sup>th</sup> from the application (day 0). (see table 2.2)

During the tests, several specimens of ticks have been observed and collected for identification.

**Table 1: anamnestic data regarding the dogs used for testing**

Dog #	Sex	A g e	Breed	Domestic Y/N	Previous treatments*
1	M	2	Half-breed	S	1991
2	M	7	German shepherd	S	1991
3	F	5	Half-breed	S	1991
4	M	2	Fox Terrier	S	1991
5	F	8	Cocker	S	1991
6	F	3	German shepherd	S	1991
7	F	1	Cocker	S	-
8	M	8	Half-breed	S	-
9	M	5	English Setter	S	1991
10	F	4	English Setter	S	1991
11	F	5	Half-breed	N	13/7/92
12	M	1	Half-breed	N	13/7/92
13	M	2	Half-breed	N	13/7/92
14	F	4	Half-breed	N	30/6/92
15	M	3	Half-breed	N	30/6/92
16	M	1	Half-breed	N	30/6/92
17	M	10	English Setter	N	30/6/92
18	M	1	Half-breed	N	30/6/92
19	M	1	Half-breed	N	30/6/92
20	M	8	Half-breed	N	13/7/92
21	F	9	German Shepherd	N	13/7/92
22	F	6	Half-breed	N	13/7/92
23	F	2	Half-breed	N	13/7/92
24	M	4	Half-breed	N	13/7/92
25	F	2	Half-breed	N	13/7/92

\*products with parasiticide power

## RESULTS AND CONCLUSIONS

All the specimens collected during the tests turned out to belong to 1 species, *Rhipicephalus sanguineus*.

As far as the tolerability of the product is concerned, none of the subjects to which the collar was applied showed either symptoms related allergy or disturb; we can consequently state that ultrasonic waves emitted do not interfere on the normal behaviour of the animals.

With reference to the effectiveness of the device applied on the group of 5 dogs for preventive purposes before the mites appeared on the animals' coats, no cases of infestation have been observed during the whole season at risk (from August to October). Good results have also been obtained on the domestic subjects; though the initial number of parasite was limited (1-5 ticks per subject), parasitological tests made after 7 days from the application turned out to be negative for 4 subjects out of five. After 9 days, no ticks were found on any of the subjects, and the situation did not vary until the 35<sup>th</sup> day after the application (Table 2.1). A further test made at the end of the season at risk (October 1992) proved that only 1 tick (mature female) was found on 1 subject.

Finally, the results obtained on the tests carried out on dogs living in the kennels are particular interesting since the high pressure of the parasite population present therein had been proved since a long time and had required several parasiticide treatments with chemical products (Table 2). After 7 days from the application of the device, the total number of ticks found on the dogs had decreased by 76% (from 430 to 102). After 35 days, the percentage had reached 97% (8 ticks found at the end of the test as opposed to 275 observed on day 0) for the subjects treated only with the collar, while the reduction percentage on the 6 dogs treated with Asuntol and Neguvon on the 7<sup>th</sup> day of the test was 92%.

As for the effectiveness of the device towards the **prevalence values** (i.e. the number of subjects still infested/the number of subjects treated), the reduction percentage was 50% for the first group (3 negative subjects out of six treated) and 67% for the second group, which included subjects treated only with the ultrasonic device (3 positive subjects out of 9 treated).

Although these data are not significantly different on the statistic level ( $\chi^2=.012$   $p>.05$ ), they prove that the activity of the ultrasonic device is at least equal to the one of the most common chemical parasiticide products used in Italy.

The action of the ultrasonic waves is particularly effective and rapid in fighting the ticks at their early life stages (larvae and nymphs) and the male ticks; due to their biological features, in fact, their relationship with the host is not so tight and their blood feeds are not prolonged.

Such result is also confirmed by the observation of ticks made on subjects nr. 16, 17, 19, 21 and 22, on which some nymphs – probably contracted because of the high pressure of the parasite population – were found on the 9<sup>th</sup> and 14<sup>th</sup> day after the application of the device.

In such cases, the episodes of re-infestation have caused a sudden and dramatic increase of the parasite presence, as happened to subject nr 17 (from 5 ticks on the 7<sup>th</sup> day to 20 ticks on the 9<sup>th</sup> day) and to subject nr. 22 (from 2 ticks on the 7<sup>th</sup> day to 10 ticks on the 9<sup>th</sup> day).

Yet, on the 15<sup>th</sup> day both subjects showed a reduction in the number of ticks equal to 90% and 80% respectively, thus proving the effectiveness of the device in keeping the episodes of re-infestation under control.

Finally, our results do not differentiate significantly in terms of effectiveness related either to the length of the coat or to the animal size. The “repulsive” effect is gradual and reaches the highest level after 2-4 weeks from the application; the first parasites removed are those present on the dogs’ head and periorbital regions.

On the basis of the above mentioned results, we can conclude that the ultrasonic device used during the tests is well tolerated by the dog; the effectiveness of the device in removing the parasites from the dog has been proved as very successful and, however, as powerful as that of two active principles such as Asuntol and Neguvon whose parasiticide action is well renowned.

Claudio Genchi

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**Table 2.1 Parasiticide effectiveness of a device emitting ultrasonic waves on dogs**

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Dog	Coat	Number of ticks observed								
		Day								
		0	1	2	3	5	7	9	15	35
Domestic dogs										
6	Medium/short	1	1	1	1	0	0	0	0	0
7	Long	2	2	1	1	1	0	0	0	0
8	Short	5	5	3	3	2	1	0	0	0
9	Long	2	2	2	1	0	0	0	0	0
10	Long	3	3	2	2	2	0	0	0	0

**Table 2.2 Parasiticide effectiveness of a device emitting ultrasonic waves on dogs**

Dog	Coat	Number of ticks observed								
		Day								
		0	1	2	3	5	7	9	15	35
<b>Dogs kept in kennels</b>										
11	Medium/short	15	10	10	10	6	6*	2	2	2
12	Medium	30	25	20	20	15	10*	2	2	2
13	Short	15	10	10	8	4	2	2	1	0
14	Short	40	16	16	16	8	7	7	5	3
15	Medium	10	8	8	8	3	2*	2	2	0
16	Medium	35	21	15	14	10	1	2 (1)	2 (1)	0
17	Long	30	20	20	15	15	5	20(1)	2	2
18	Short	50	45	40	30	20	10	10	4	0
19	Medium	15	6	6	3	3	1	2(1)	2(1)	0
20	Long	>60	30	30	30	25	25*	25	1	0
21	Short	30	25	20	10	10	5	2	2(1)	0
22	Short	15	10	9	8	8	2	10(1)	2(1)	0
23	Medium/long	45	30	30	30	9	9	4	3	3
24	Medium	40	25	25	18	10	10*	5	1	1
25	Short	18	15	10	10	9	9*	1	1	0
<b>Total</b>		<b>430</b>	<b>296</b>	<b>269</b>	<b>230</b>	<b>157</b>	<b>102</b>			
<b>Effectiveness</b>		<b>3</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>7</b>				
		<b>1</b>	<b>7</b>	<b>7</b>	<b>3</b>	<b>6</b>				
		<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>				
<b>Subjects treated also with parasiticide products</b>								<b>37</b>	<b>9</b>	<b>5</b>
<b>Effectiveness</b>								<b>40%</b>	<b>85%</b>	<b>92%</b>
<b>Subjects treated only with ultrasonic waves</b>								<b>59</b>	<b>21</b>	<b>8</b>
<b>Effectiveness</b>								<b>78%</b>	<b>92%</b>	<b>97%</b>

(1) treatment made by sponging dogs with a solution of Asuntol and Neguvon

\* nymphs

Translation carried out by a skilled translator on Kem-o-Tek Italia's behalf.  
The Translation has been written according to the original Italian text.