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**EVALUATION OF ACTIVITY AGAINST TICKS AND FLEAS ON
DOGS AND CATS OF AN ELECTRONIC ULTRASOUND
EMISSION DEVICE (BATTERY-POWERED) CALLED**

TICKLESS PET

**EVALUATION OF ACTIVITY AGAINST TICKS AND FLEAS ON
HUMANS OF AN ELECTRONIC ULTRASOUND EMISSION
DEVICE (BATTERY-POWERED) CALLED**

TICKLESS HUMAN

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1. INTRODUCTION

Infestation by fleas is the most widespread form of external parasitosis encountered in pets, and in recent years the number of reports in urban settings have increased in frequency, due to the increase of the canine and feline population in built-up areas. The control of flea infestations is usually based on the combination of several strategies that include the use of insecticides on animals and environmental insecticides. Numerous pharmacological agents that act against adult and/or immature fleas are commercially available, and are sold in different formulations: topical (Imidacloprid: Advantage, Advantix; Fipronil: Frontiline; Metaflumizone: Promeris; Selamectin: Stronghold) and oral (Spinosad: Comfortis; Nitenpyram: Capstar; Lufenuron: Program).

When choosing an anti-parasite product for use on an animal, several different characteristics must be considered, such as the speed, duration and spectrum of action, compatibility with other topical and systemic treatments, the emergence of side effects, the precociousness of administration (with respect to the age of the dog) and the means of administration (systemic or topical products).

Speed of action is important if the aim is to rapidly prevent fleas from feeding (as in the case of flea allergies) or if fleas are also feeding on pet owners. If the animal is suffering from flea allergy dermatitis (FAD), it is inadvisable to use topical products in contact with the infected and inflamed skin. The choice of an anti-parasite product must also be made according to the ease of application (*compliance*) for the owners, and the frequency with which the animal comes into contact with water. Given that products for topical use are deposited on the surface layers of the skin, studies carried out have shown that their effectiveness is not impaired by the use of modest amounts of water, but may be reduced by the application of shampoos and abundant quantities of water. In addition, they have a residual activity of only brief duration, and must therefore be applied at monthly intervals. The use of oral products is not affected by frequent baths or shampoos, but the duration of activity is on average 24 to 48 hours (except for Spinosad), and side effects may also emerge, even though only in a low number of cases, affecting the gastrointestinal system, such as vomiting (which can reduce the absorption of the active principle), or interactions with other pharmacological treatments in progress, such as to exacerbate the adverse effects.

Finally, it must be emphasized that most pharmacological anti-parasite products that are used cannot be administered to dogs before 8 to 14 weeks of age.

With regard to the spectrum of action, some commercial formulations combine adulticides with insect growth regulators (IGRs) such as Methoprene or Pyriproxyfen, or with development inhibitors (IDIs), such as for example Lufenuron.

When a flea control programme is started, even if this is applied at the same time as an aggressive environmental control programme, immature fleas will continue to develop into adults, so that the flea problem will continue for several weeks after the start of treatment.

Even more worrying are tick infestations, which acting in different ways can cause notable



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disturbances and transmit numerous infectious diseases.

There are various mechanisms of action, and these can be **mechanical** and **chemical**: the penetration of the rostrum causes lacerations to the skin of the animal, accompanied by the introduction of anticoagulant, histolytic and anaesthetic substances that allow reactions by the host to be prevented.

Another effect is that of causing anaemia. Ticks feed on blood, and a massive infestation can cause losses of blood that may even be extremely serious.

Some species of ticks **inoculate toxins** capable of causing the paralysis of the rear limbs, and finally, some ticks **transmit diseases**, with a wide variety of pathogens transferred through the salivary glands:

- ☐ **Ehrlichiosis**, a canine and human disease, the etiological agent of which is *Ehrlichia canis*;
- ☐ **Rickettsiosis**, a disease caused by *Rickettsia conorii*, which in humans is responsible for Mediterranean boutonneuse fever;
- ☐ **Borreliosis**, or Lyme Disease, caused by *Borrelia burgdorferi*, a disease affecting both dogs and humans;
- ☐ **Anaplasmosis**, a disease caused by micro-organisms of the *Anaplasma* genus, responsible for serious and sometimes fatal anaemia;
- ☐ **Feline Infectious Anaemia**, a disease transmitted by both fleas and ticks caused by *Mycoplasma haemofelis*, an intracellular responsible for the destruction of red cells, with consequent severe haemolytic anaemia that can kill cats.

These evidently are only some of the consequences of flea and tick infestations in both domestic animals and in humans.

The product in question, hereinafter called "**TICKLESS PET**" for animals and "**TICKLESS HUMAN**" for humans, is marketed as a "*revolutionary device against ticks and fleas*".

To this aim, the company Promogreen.com, with registered office at 27 Via Emilia, Voghera (PV), has asked myself, Professor Vincenzo Cuteri, Professor of Microbiology and Parasitology, Professor of Infectious Diseases and Avian Pathology and Chief of the Medical Microbiology and Infectious Diseases Laboratory of the School of Veterinary Medical Sciences of the University of Camerino, to verify the effectiveness of the ultrasounds emitted by "**TICKLESS PET / TICKLESS HUMAN**" in reducing the number of parasites present, or to prevent their increase, on dogs that are certainly infested.

3. PROPERTIES AND CHARACTERISTICS OF "TICKLESS PET"/"TICKLESS HUMAN"

The Technical Information Sheet provided by the manufacturer is shown here:

TICKLESS Pet



Technical data sheet

what it is: a revolutionary and intelligent ticks and fleas repeller for dogs and cats who is suitable for: to **dogs and cats of all sizes and ages**, particularly older people or to animals weakened by disease, puppies, lactating females, animals that live in the family

when it is useful: **always**, as a prophylaxis prior and as a treatment of the parasites during the season (March / October)

how it works: by issuing a series of **ultrasonic pulses**, which can act on ticks and fleas, keeping away from the animal and simultaneously preventing the attack. So it is **completely harmless** to people and animals, **non-toxic and odorless**

adjustment: **automatic**. Once you remove the tab, the device goes into operation without need for further adjustments. By push of button, it is possible to **check the operation at any time**

coverage: operating range about **1,5m** in open space

battery life: **10-12 months**, meaning full season

weight: only **10 gr**

dimensions: as a **small pendant**, 4.0 x 2.8 x h1.5 cm

materials: polycarbonate and synthetic rubber allergy

package: 22 pieces per display, 4 displays per cardboard

packaging (88 pieces)



TICKLESS Human



Technical data sheet

what it is: a revolutionary and intelligent ticks and fleas repeller for persons who is suitable for: **everyone**, children, adults or elderly

when it is useful: **every time you place an outdoor activity**, particularly in the period March / October, for both business and leisure facilities (camping, fishing, a golf course, a picnic, while hiking, in field work, in the control of rural areas, ...)

how it works: by issuing a series of **ultrasonic pulses**, which can act on ticks and fleas, keeping away. So it is **completely harmless** to people and animals, **non-toxic and odorless**

adjustment: **automatic**. Once you remove the tab, the device goes into operation without need for further adjustments. By push of button, **you can power cycle the device as needed**

coverage: operating range about **3m** in open space

non-replaceable battery life: depending on usage, but **not less than 3,000 hours**

weight: only **20 gr**

dimensions: as a **small keyring**, 6.0 x 2.7 x h2.1 cm

materials: polycarbonate and synthetic rubber allergy

package: 16 pieces per display, 4 displays per cardboard

packaging (64 pieces)





4. EVALUATION OF ACTIVITY AGAINST FLEAS AND TICKS

The aim of the study was to assess the effectiveness of an ultrasound device (**TICKLESS PET / TICKLESS HUMAN**) in controlling an infestation of *Ctenocephalides felis / canis* and of ticks of various genera and species on dogs. In particular, the capacity to reduce the number of infesting fleas and ticks on dogs or to prevent an increase in their number was assessed, together with the duration of effectiveness up to 30 days after application.

The study was conducted at two municipal sanitary dog shelters. At each of these facilities 30 subjects to be included in the study were selected. The inclusion criteria envisaged that the dog had not been treated in the previous month with external spot-on anti-parasitic products, or in the previous three months with collars containing substances active against ticks and fleas, and that the minimum number of fleas or ticks counted on the body of the dog (according to the method to be described below) was at least 4. Dogs with dark hair or skin and dogs with too thick a coat were excluded from the study, since the count of the number of parasites could have been difficult or inaccurate.

The procedure chosen for counting consisted in accurately observing the subject for a standard time of 5 minutes. During this time the operator had to raise and move the hair of the dog to view the skin clearly, counting the total number of parasites present. This count was carried out at the level of the rear limbs and the ventral area of the dog (where normally it is easier to detect parasites, since hair is absent or thinner): in particular, the perineal area, the rear part of the thigh, abdomen and groin, rear part of the rump in the area around the start of the tail.

For every subject, a questionnaire with individual data and physical characteristics of the dogs was filled in, together with details on any symptoms or lesions attributable to the direct or indirect action of the parasites.

All counts on all subjects, including subsequent checks, were always made by a single operator for each sub-unit.

On the first day of the study, the 30 dogs selected were numbered and divided into 3 groups each (two control groups and one treatment group). As far as possible, the three groups were homogeneous with respect to each other with regard to the total presence of parasites.

The three groups were composed as follows:

Group A- no. 20 subjects treated with the ultrasound device activated.

Group B- no. 5 subjects treated with a spot-on anti-parasite product based on Fipronil and Lufenuron. The non-activated ultrasound device was applied to these subjects.

Group C- untreated control group: no. 5 subjects to which the non-activated ultrasound was applied. Since all dogs were fitted with a device, and as the operator was unable to distinguish if the device was on or off, and therefore unable to determine to which group the individual dogs belonged, the count was made in blind conditions and without external influences ("blinded study").



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The subjects included in the experimentation were kept in separate enclosures for the entire duration of the study, ideally in individual enclosures or with a number of other similar dogs.

Follow-up.

The first check was made 3 days after the start of the study. The next 2 checks were made 2 and 4 weeks after the start of the study, so as to be able to ascertain any duration of effectiveness over the period of one month.

With every check, the count of the number of parasites was repeated on all the subjects included in the study, following the same procedure already used.

A short questionnaire was also completed to record any improvements or worsening of the symptoms in progress, or any emergence of side effects attributable to the use of the device or the spot-on anti-parasite product.



Assessment of the effectiveness of the *TICKLESS PET* device in controlling infestations of fleas/ticks in dogs

Date/...../2011

Observe for 5 minutes and count the total number of parasites present in the perineal area, rear part of the thigh, rear part of the rump in the area around the start of the tail, abdomen and groin.

Date/...../2011 (treatment start T0)



Subject number.....

Part of group.....

Number of fleas (T0).....

■ Data of dog

Breed short hair ☐

long hair ☐

Size big ☐

medium ☐

small ☐

Sex M ☐

F ☐

Date of birth: year

■ Presence of cutaneous lesions attributable to the action of fleas (brief description):

.....
.....
.....

■ Previous anti-parasite treatments no ☐ yes ☐ When

Repellent collar ☐

Spot-on products ☐

None ☐

Other.....



5. CONCLUSIONS

The results obtained 30 days after the activation of the product show the effectiveness of **"TICKLESS PET"** in not permitting an increase in the number of ticks and fleas in all subjects studied in the experimentation and to reduce the number of parasite in some subjects.

In the group of control animals with **"TICKLESS PET"** not activated and pharmacologically treated, at T1 a drastic reduction of the number of parasites was recorded, and this situation remained stable for the entire duration of the experimentation.

In the group of control animals with **"TICKLESS PET"** not activated and not pharmacologically treated, the number of parasites remained stable in some subjects, but increased considerably in others.

Finally, in the group of animals treated with **"TICKLESS PET"** activated, the number of parasites remained stable, and in some subjects a considerable reduction was observed. In no case was an increase in the concentration of parasites recorded.

It must be noted that in some subjects belonging to all groups, some devices (4 in number) were replaced because they failed to function correctly due to bites from other dogs while playing. It is believed however that this in no way influenced the experimentation, since the maximum period of inactivity of devices was equivalent to 12 hours.

"TICKLESS PET" seems therefore capable of preventing parasites, always present in the place where the dogs were kept, from infesting the host. The advice for the best use of the device is therefore to treat animals with a pharmacologically active product, and to then activate the device so as to prevent a new infestation.

No hearing disturbances were reported by operators during the entire experimentation phase.

The results obtained by the application of **"TICKLESS PET"** / **"TICKLESS HUMAN"** confirm the effectiveness of the product in not permitting an increase of the parasites and in reducing the number of parasite in some subjects, which can therefore be used, without side effects of any kind, on subjects for which an infestation of ticks/fleas has been confirmed, so as to avoid the worsening of the situation, and in healthy subjects so as to prevent infestation.

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