



NICOTIANA TABACUM AS FLEA ERADICATOR FOR JUVENILE CANIS FAMILIARIS

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Abstract

Objectives: Tobacco (*Nicotiana tabacum*) is the most widely grown commercially, contributing a sizable amount to the economy. The researcher came up with this study to analyze and evaluate the use of *Nicotiana tabacum* (NT) as a flea eradicator for juvenile *C. familiaris* (CF).

Methods: This experimental method aimed to investigate the effectiveness of NT as an insecticidal product, particularly as a flea eradicator for juvenile CF. Trial and error were used to determine the most effective ratio in making the dried and fresh NT a flea eradicator for juvenile CF. Mention the test and control group, period and level of treatment, etc

Findings: From the three tests of NT-dried solution, treatment three registered the highest total, mean, and percentage, which is mean and 70%. For fresh leaves solution, Treatment 3 got the highest total average mean, percentage, and several fleas that died. It shows that out of 119 total average fleas, 8.67 died. The results show that NT solution-dried is the most effective flea eradicator, wherein fleas are eradicated on day 3 of application. It is followed by polycote, wherein fleas are eradicated on day 5. NT fresh is the least effective product among the three; fleas are not eradicated within the given days of application.

Novelty: Flea is the major cause of skin diseases among dogs; hence this organic flea-eradicator, which can be easily found in the community, can be widely produced.

Keywords: *Nicotiana tabacum*, Flea eradicator, Juvenile dogs, Herbal Treatment, Chemical Treatment

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1. Introduction

Fleas can be a real problem. The strong hind legs of this insect enable it to jump from the host; they can jump 7 to 8 inches vertically and 14 to 16 inches horizontally; they are a major factor affecting the health of animals and humans. Fleas are bloodsuckers, and where there is one, you can be certain there is much more than you expect. Besides the usual minor itching and scratching a flea infestation causes, some dogs are extra-sensitive to flea saliva. Just one bite may be enough to bring on the unbearable itching of Flea-Allergy Dermatitis (FAD). In severe cases, the cycle of itching and scratching causes the dog's skin to thicken and her hair to fall out. The raw skin is also more vulnerable to bacterial infections. Unfortunately, even if there are a variety of well-tested and readily available products to kill or repel fleas like borates, it is still a problem to massively minimize the rate of flea infestation, especially in rural areas wherein these products are usually unavailable in the market due to its high price and rural people are not familiarize with this products.

Moreover, many over-the-counter insect control products for pets, even when used as directed, can cause "serious health consequences to pets and humans," according to a report by the Natural Resources Defense Council (NRDC). Many of these products contain organophosphate (OP) compounds, which have been used for insect control for decades and are known to have toxic effects. Most immediate health concerns are caused by improper use of these products, but there is some evidence that prolonged exposure can cause more insidious health problems. Many flea and tick products sold in pet stores have multiple active ingredients, and using them simultaneously can cause issues.

The NRDC discovered that dangerously high levels of pesticide residue could persist on a dog or cat's fur for weeks after the animal has been fitted with a flea collar. The NRDC also discovered that levels from two pesticides used in flea collars, tetrachlorvinphos, and propoxur, were high enough to put children and adults who play with their pets at risk.

While there are better, gentler ways to treat parasites and strategies to avoid some of the worst pests, we may not be able to reverse the trend of global warming that is lengthening the insect season in some regions of the country.

Due to the potential for a severe skin reaction, many people are hesitant to utilize chemical flea treatments. The question is, "How can it be safe for my pet if it is not for my kids?" Using kinder and safer techniques for flea eradication and control may yield positive results unless serious flea infestation occurs.

Keeping ticks away is important because they contain harmful germs. The researchers identify solutions to assist pet owners and caregivers who smoke using the observations and data they have acquired.

One of the natural repellents that many people have success with, particularly in the indigenous areas of the Cordillera Region in the Philippines, is Tobacco extract, which is significantly abundant in the place.

Tobacco chewing and smoking have been practiced and have become a tradition of the Kalinga people. Their elders pass their doings from their descendants, unknowing of its proper use as a pesticide, particularly insecticide, to the juvenile flea dogs. Properly utilizing these plants is essential to prevent the diseases carried and transmitted by the flea of animals to humans and also detrimental to animals.

Tobacco turns out to be an effective remedy against ticks and fleas. It is a perennial herb that contains a chemical compound known as nicotine which acts as a powerful insecticide against these blood-sucking monsters to safeguard your puppy's sensitive skin. Rubbing tobacco leaves directly on your dog's skin is safe for getting rid of ticks. Take a bunch of leaves in your hands and start rubbing them against your puppy's body parts where there is a potential flea infestation. Tobacco leaves are a great natural substance to get rid of ticks and fleas, and at the same time, they can also prevent further infestation. Water extracts of the leaves or tobacco juice can be directly sprayed on your pet and work as a wonderful repellent against ticks and fleas. So, tobacco can not only make your doggo tick-free, but it can also prevent ticks from getting a grip on your dog's sensitive skin ever again if it is used regularly.

Research Gap

In addition, the need to identify alternatives to synthetic pesticides has reignited interest in plant pharmacopeia and the discovery of more environmentally friendly pest management methods. Adenubi et al. (2018), Benelli et al. (2016), Maine et al. (2011), Niroumand et al. (2016), and Rahuman (2011) all discuss how limited access to expensive chemicals by less affluent populations has prompted many groups to review and/or rediscover ethnobotanical drugs of medicinal, veterinary, and crop protection relevance. Tobacco is a common ingredient in traditional pharmacopeia and is used as an insect or tick repellent to stop the spread of vector-borne diseases (Jufri et al., 2016; Pavela et al., 2016). Tobacco, besides nicotine, has other bioactive molecules besides the N molecule, which is high in anabasine. Glauca has been classified as an insect deterrent (dos Santos Silva et al., 2014). Anabasine-linked anti-trypansomal action has also been noticed

in parasitized bumble bees consuming flower nectar that contains this alkaloid (Richardson et al., 2018). According to Eich (2008), Leffingwell (1999), and Rodgman and Perfetti (2013), crude leaf methanolic extracts from tobacco leaves are extremely complex combinations with more than 4,000 components. Due to the probable chemical multiple interactions between molecules (synergy, potentiation, inhibition, or coalition), the activity of mixtures may differ significantly from the simple additive effect of individual constituents' activities. Therefore, examining mixtures and their major components may further our understanding of the observed biological effects (Hayes et al., 2019). In addition, more studies must be conducted on the effectiveness of tobacco as a dog flea eradicator. The result of this study may contribute to this problem as reference material for future studies on natural remedies to eradicate dog fleas. Thus, the researchers came up with this study to analyze and evaluate the use of *Nicotiana tabacum* as a flea eradicator for juvenile dogs considering the factors that will affect it.

2. Methodology

The researchers used the experimental method. It is the most appropriate method for the study because there is a manipulation of data variables that the researchers applied in the study. This experimental method aimed to investigate the effectiveness of *nicotiana tabacum* as an insecticidal product, particularly as a flea eradicator for juvenile *Canis Familiaris*. The method will explain how the research was conducted and undertaken. This study was conducted at Barangay Bulanao, Tabuk, Kalinga because, according to the City Veterinary Office, Bulanao has the highest dog population in the city based on their latest survey update and also in the province with a total number of 800, which is

almost 15 % of the dog population with 40 Barangay and with a total of 5,047 dog population in the city. The dog specimens with flea infestation were selectively chased at different Purok of Barangay Bulanao. It includes 3 juvenile dogs in each treatment in testing the efficacy of the naturally made products- nicotiana tabacum- fresh and dried, with a total of 18 juvenile dogs and another 3 dogs were used in the comparison of three products, a single juvenile dog was used in each product including the commercialized one- the Polycote. A total of 21 dogs were used in the study. The materials used in the study were the ff: Nicotiana tabacum leaves (fresh and dried) as the main material that the researchers used; Water as the solvent to form the solution product; Mortar and Pestle for pounding nicotiana tabacum leaves; Weighing scale for measuring the mass of the leaves; Stirring rod for mixing; Beaker that served as a container for the leaves extract and for measuring the volume of the liquid; Strainer for straining the debris of the solution; placard for the identification of sample products; Camera for documentation.

Procedures for data gathering

1. Nicotiana tabacum (dried leaves)

The researchers gathered the raw materials, which were the leaves of the tobacco plant; the gathered leaves were washed and dried under the sun until the color turned brown. After the total drying, weigh the leaves and prepare all the materials needed for experiments. Use the mortar and pestle to pound the tobacco leaves until it is powdered; Put the powdered leaves in water and mix it with a stirring rod; after equal mixing, use the strainer to strain the debris and other solid materials in the solution. The product of Nicotiana tabacum is finally made.

2. Nicotiana tabacum (Fresh leaves)

The researchers gathered the raw materials, which are the fresh leaves of the nicotiana tabacum plant; the gathered leaves were washed. After washing, weigh the leaves and prepare all the materials needed for the experiments. Use the mortar and pestle to pound the fresh leaves of tobacco until the juice extract of the leaves is produced. Strain the nicotiana tabacum extract to remove the debris from the solution. The product of nicotiana tabacum solution is finally made.

3. Methods of Applying nicotiana tabacum to Juvenile Dogs.

Twenty-one juvenile dogs with flea infestation were selected from different puroks of Barangay Bulanao, Tabuk City. The ocular inspection was done to identify the households with flea infestation puppies. These fleas of juvenile dogs were transferred into dogs without fleas to know the total population of fleas. The selected juvenile dogs were divided into three groups. Each group was isolated and housed so they could not acquire fleas from the wandering dogs outside. A meter away from the house was sprayed with the made products.

The first group of juvenile dogs was sprayed with different dried nicotiana tabacum concentrations; the second group was sprayed with concentrated fresh N.tabacum leaf extract, and the third group was treated with the commercialized flea eradicator for dogs. After applying the different products, a comb was used to eliminate the dead fleas and counted. The counted dead fleas were added to the fleas that were still alive to get the total number of fleas. The dog was bathed and housed for the next day's application with the same steps until there is total eradication of fleas.

3. Results and Discussion

3.1. Effect of herbal treatment

Table 1. Effect of tobacco dried leaves solution to dog fleas with the different treatment applied.

Treatments (T)	V (g)	V (ml)	V (min)	R	n	Ex	x	Percentage
T1	500	500	5	1	167	117	0.7	70%
				2	143	101	0.71	71%
				3	124	85	0.69	69%
Total Average					145	101	0.70	70%
T2	500	750	5	1	134	64	0.48	48%
				2	152	70	0.46	46%
				3	133	63	0.47	47%
Total Average					140	66	0.47	47%
T3	500	1000	5	1	128	36	0.28	28%
				2	126	37	0.29	29%
				3	141	42	0.3	30%
Total Average					132	38	0.29	29%

Nicotiana tabacum dried leaves extract:
Table 1 shows the different water volume soaked with the same weight of dried N. tabacum leaf and the same duration and time of application; the total number of flea before treatment and number of flea died after treatment of this product; it shows three trials in each treatment with its total average; and lastly it shows the mean and the percentage which determine its effectiveness.

Treatment 1 shows a ratio of 500 grams of tobacco leaves: 500 ml of water (1:1) with a constant time of 5 minutes with the total average of fleas before treatment which is 145 and eradicated 101 fleas after treatment with the total average mean of 70 and 70% within three replication.

Treatment 2 shows a ratio of 500 grams of tobacco leaves: 750 ml of water (1:1.5) with a constant time of 5 minutes with the total average of mean that is 47 and 47% within three replication, while

Treatment 3 shows a ratio of 500 grams of tobacco leaves: 1000 ml of water (1:2) with also a constant time of 5 minutes with the total average of flea before treatment which is 132 and eradicated which with the total average of mean that is .29 and 29% percentage within three replication. The 3 tests in the application of the three treatments of N. tabacum-dried solution, treatment | registered the highest total average mean and percentage which is 70,

70% compared to the second and third treatment which registered a mean and percentage of .47 and 47%, .29 and 29% respectively which interprets that treatment 1 is the most effective flea eradicator among the three treatments.

Treatment 1 will be then used in comparison to commercially prepared flea eradicator and to fresh nicotiana tabacum-fresh, concentrated extract.

Nicotiana tabacum fresh leaves extract:

Table 2. Effect of tobacco fresh leaves extracts on dog fleas with the different treatments applied.

Treatments (T)	V (g)	V (ml)	V (min)	R	n	Ex	x	Percentage
T1	500	100	1	1	113	2	0.02	2.0%
				2	122	5	0.04	4.0%
				3	141	7	0.05	5.0%
Total Average					125	4.7	0.036	3.67%
T2	500	100	3	1	98	3	0.03	3.0%
				2	127	9	0.07	7.0%
				3	124	11	0.09	9.0%
Total Average					116	7.7	0.063	6.33%
T3	500	100	5	1	104	6	0.06	6.0%
				2	115	8	0.07	7.0%
				3	139	12	0.09	9.0%
Total Average					119	8.7	0.073	7.3%

Table 2 shows the different periods of time in the application of *N. tabacum* fresh product with the constant volume of extract concentrated *N. tabacum* fresh leaves; the total number of flea before and after treatment; the mean and percentage with their total averages which determine their effectiveness.

Treatment 1 shows that out of 125 total averages of fleas before treatment, 4.7 fleas have died after the treatment with a total average mean of .036 and 3.67% total average of percentage within three replications.

Treatment 2 shows that out of 116 total average of fleas before treatment, 77 fleas died after treatment with a total average mean of .063 and a 6.3% percentage within three replications. Treatment 3 shows that out of 119 total average fleas,

8.67 died after treatment with 2 total average mean of .07 and 7.0% percentage within three replications.

Treatment 3 got the highest total average mean, percentage, and the number of fleas died with the longest time to apply to the fleas of juvenile dogs.

Treatment 3 will be used compared to commercialized flea eradicator product and *N. tabacum* solution-dry.

Table3. Shows the progress in treating flea-infested juvenile dogs with the different products with daily application and visitation on the dogs.

T1 - Nicotina tabacum - Dried

T2 - Nicotina tabacum - Fresh

T3 - Polycote, Commercial flea eradicator

3.2. Effect of herbal cum chemical treatment

Table 3. Mean, and percentage of flea infestation on juvenile dogs treated with *N. tabacum* (dried), *N. tabacum* (fresh), polycote.

Treatments (T)	No. of flea before treatment (N)	Number of Flea After Treatment with Percentage				
		Days Post Treatment				
		1 5 min.	2 5 min.	3 5 min.	4 5 min.	5 5 min.
T1 (100 ml)	164	53 (67.68%)	13 (92.07%)	0 (100%)	0	0
T2 (100 ml)	129	121 (6.20%)	109 (15.50%)	99 (23.26%)	91 (29.46)	84 (34.88)
T3 (100 ml)	133	78 (41.35%)	43 (67.67%)	26 (80.45%)	9 (93.23)	0 (100%)

Table 3 shows that in the day one of treatment 1, 67.68% fleas were died after treatment, 92.07% fleas were died in day two and 100% fleas were died in day three of applying *Nicotina tabacum* to juvenile *Canis familiaris*. Treatment 2 shows that

on the first day of application, 6.20% fleas died, in 2 days, 15.50% fleas died, day 3, 23.26% fleas died, day 4, 29.46% fleas died and on day 5, 34.88% fleas died. Treatment 2 shows that it can not eradicate the fleas in the given days of application.

In treatment 3 shows that in the first days of application, 41.35% of fleas died; on the second day, 67.67% of fleas died, on the third day, 80.45% of fleas have died, and on the fourth day, 93.23% of fleas died, and in the last day of application, 100% of fleas died.

Table 3 results show that *Nicotiana tabacum* solution-dried is the most effective flea eradicator wherein fleas are eradicated on day 3 of application, followed by polycote wherein fleas are totally eradicated, followed by polycote wherein fleas are totally eradicated on the fifth day of application. *N. tabacum* fresh is the least effective product among the three; fleas are not totally eradicated within the given days of application.

4. Conclusions

The following conclusions were surfaced from the findings and observations in this study.

1. *Nicotiana tabacum* is prepared in two ways, the dried leaf as a solution and the fresh as pure extraction.
It was found out that 1:1 is the preferable ratio of *N. tabacum* based on its effectiveness.
The leaf of *Nicotiana tabacum* is used because it is where its nicotine is mostly stored.
2. *Nicotiana tabacum* is an effective flea eradicator based on the results of the tests.
Nicotiana tabacum solution dry is the most effective flea eradicator compared to concentrated fresh extract and to Polycote.
3. Fleas of domesticated animals are a great factor that affects the health of humans and animals
Based on our observations the problems encountered by the people and animals in relation to the fleas of juvenile *Canis familiaris* include

irritability and skin diseases like scabies.

Nicotiana tabacum is not hazardous to the health of juvenile dogs since it does not possess tropane alkaloid substances, which are often poisonous to humans and other animals.

4. *Nicotiana tabacum* is externally and directly applied to the body of juvenile dogs to eliminate their fleas.

Based on our findings *N. tabacum* can totally eradicate the flea of juvenile dogs within two days or more depending on its severity.

Nicotiana tabacum is used once a day as a flea eradicator to juvenile dogs.

Recommendations

1. Users should carefully follow in applying the product.
2. It is strongly recommended to the remote areas where the market and commercialize establishments are not accessible.
3. Tobacco should be introduced to the community for the people to know its uses as an effective insecticide.
4. This study is recommended to the Department of Agriculture to encourage the farmers the use of tobacco as a pesticide.
5. Farmers must be encouraged to propagate tobacco not only for human consumption but also for its other beneficial uses.
6. This research study is also recommended to the veterinarians for them to use this product and introduce it to their clients having dogs with flea infestation.
7. Since the results of the study were found to be effective, it is highly recommended for its use.

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