

Safety Assessment of Intravenous Application of the Homeopathic Medicine *Viscum Album* D3 in Dogs

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ABSTRACT

Background: *Viscum album* (VA) extracts have a wide variety of biologically active compounds that can be used in the treatment of various diseases, with cancer being the main one. However, few data on the effects of homeopathic VA are found in the literature, even though commercially VA formulations are available, with extremely low doses of its active compounds. Previous studies used the anthroposophical form of *Viscum* and provided information on the mechanisms of action of this drug in tumor cells or in cells of the immune system.

Materials and methods: This study aimed to evaluate the safety of intravenous and subcutaneous application of D3 homeopathic *Viscum album* (VAD3) in dogs. Healthy dogs (n=7) underwent blood collection for blood cells count and biochemistry analysis and clinical examinations 7 days prior and at days 0, 3, 5, 7, 10, 12, and 14 after the beginning of treatment. The dogs received intravenous application of VAD3 at days 0, 5, 10, and 14, and subcutaneous at days 3, 7, and 12.

Results: There was a transient increase in the number of monocytes (P=0.0022) at day 5, while there were no significant (P>0.05) changes in any of the other blood endpoints over time. Nevertheless, all blood parameters remained within the reference values for the species. All animals completed the study in good health conditions. According to the Quality-of-Life Assessment Questionnaire, all animals showed improvement in mood and appetite after receiving VAD3.

Conclusion: The homeopathic medicine VAD3 is safe for intravenous and subcutaneous applications in dogs, besides possibly bringing benefits to the entire organism.

Keywords: Safety, Intravenous, Homeopathic, *Viscum album*, Dog

INTRODUCTION

The homeopathic treatment model is based on three main pillars: the “similarity principle”, “experimentation with substances in healthy organisms” and “dynamized drugs”. For a medicine to be considered “homeopathic”, it must be dynamized [1]. Many drugs prepared in this way are diluted to such an extent that they go beyond the Avogadro number [2,3], such as some homeopathic medicine based on *Viscum album* (VA). VA is a semi-parasitic plant and its extracts can be obtained from several host trees, such as the apple tree, the pine tree, and the oak tree [4,5]. VA extracts have a wide variety of biologically active compounds that can be used in the treatment of various diseases, including cancer. Some of

the substances present in the extracts of VA that have been described are: lectins I, II, III, also called “Mistletoe Lectin” (ML) [5,6,7]; the viscotoxins A1, A2, A3, and B [8-11]; and the triterpenes [8,12,13, 14]. Still, the presence of flavonoids, polysaccharides, amino acids, alkaloids, among others, is also reported [15-17].

The use of VA as a medicine date to the time of the ancient Celtic peoples, being incorporated into popular medicine after the Middle Ages and included among homeopathic medical matters in the 19th century. At the 20th century, around 1917, it was created and used by Rudolf Steiner (1861-1925) and Ita Wegman (1876-1943), in the context of the emergence in Anthroposophical Medicine, for the treatment of tumoral

diseases. This plant was used over time, with extracts being prepared in different ways, such as aqueous, hydroalcoholic, ethanolic extract, among others [15,18,19]. The healing effects observed with the use of these extracts are generally more visible when crude preparations were used, containing the whole plant, instead of using purified VA lectins and viscotoxins alone [20].

Classic studies show that viscotoxins can increase the amount of circulating natural-killer cells and, consequently, improve the anti-tumor immune response [8]. Likewise, viscotoxin has an effective immunomodulatory effect on human and animal granulocytes [8,9,21] and also has action on cell apoptosis [14]. The antitumor action of viscotoxins is related to its cytotoxicity and to its physicochemical characteristics [22-24]. In this context, the use of homeopathic medicines prepared from plant extracts stands out, which have been studied, experimentally, in Brazil and other countries [25-26].

However, data on the effects of prepared VA, according to classical homeopathic pharmacotechnicals, are not found in the literature, even though commercially VA formulations are available, with extremely low doses of its active ingredients [27]. The studies available on literature provide information about the mechanisms of action of this medication in tumor cells, or in cells of the immune system. The safety aspects, including cytotoxicity, and apoptotic, or immunological aspects, were not previously addressed. Thus, the present study aimed to evaluate the safety of the application of the ultra-diluted VA extract (VAD3) in dogs.

MATERIALS AND METHODS

Ethics Committee on Animal Use

This project was approved by the Ethics Committee on Animal Use of the Catholic University of Brasília, under protocol number 002/20, for the use of small animals of the species *Canis familiaris*. All tutors filled out the Free and Informed Consent Form (Appendix S1), confirming their participation in the study for the Safety Assessment of the medication.

Study Design

This study was conducted from March to June 2020 at the private Veterinary Clinic Natural Pet (Brasília – Brazil), and enrolled seven dogs (3 female and 4 male) of different breeds, weighing between 3 and 6 kg. All dogs were castrated, mean age 6,85 (5-8) years old, being 4 Yorkshire terrier, 1 pinscher, 1 shih-tzu and 1 Brazilian terrier. All dogs had the historic of being healthy and underwent SNAP 4Dx Plus exam (IDEXX) to detects antibodies against *Ehrlichia ewingii*, *Ehrlichia canis*, *Anaplasma platys*, *Anaplasma phagocytophilum*, *Borrelia burgdorferi* and *Dirofilaria immitis*.

After this screening, the dogs underwent blood collection for complete blood count and biochemistry seven days before the first application of the medication (Day-7), and at Days 0, 3, 5, 7, 10, 12, and 14. The homeopathic VA was injected IV at days 0, 5, 10, and 14, and SC at days 3, 7, and 12. IV on days. Clinical examinations were also performed at all these timepoints.

Clinical Examinations

In the first clinical exam, the patients underwent anamnesis, in which the tutor was asked about age, sex, breed, medication history, exposure to toxins, type and of frequency of feeding, behavior and frequency of urination, volume and color of urine, and quantity and quality of water. This and all subsequent exams included an evaluation of the dog's general condition, including behavior, nutritional status, hydration status, mucous color, lymph node examination, heart rate, respiratory rate, rectal temperature, and blood pressure measurement.

Hematological Analysis and Serum Biochemistry

Blood samples of 6 ml were collected from the jugular vein, from which 3 ml were recovered in vacutainer tubes with EDTA, for blood count analysis, and 3 ml in vacuum tubes with clot activator (silica) for biochemical analysis. The blood analysis was performed immediately after collection at the Veterinary Laboratory Santé (Brasília, Brazil). The parameters analyzed in the hemogram were the number of red blood cells, hemoglobin concentration, and hematocrit percentage; in the leucogram, counts of leukocytes, band cells, eosinophils, lymphocytes, monocytes and Platelets; and in the blood biochemistry, total protein, urea, creatine, ALT, and GTP.

Quality-of-Life Questionnaire

To obtain any information on possible changes in the animals' behavior observed during the period of the study, the animals' guardians filled out a validated quality of life questionnaire [28] (Appendix S2), at the beginning (Day-7) and at the end of the study (Day 14). Questions regarding the animal's level of activity and movement were included in this document.

Preparation of VAD3

VAD3 ampoules (1.1 ml) were produced according to the German and French pharmacopoeias by the company Injectcenter and donated to the performance of this experiment. The preparation follows using the Hahnemannian Method: one part of the active ingredient was taken with nine parts of an inert ingredient, sterile isotonic solution, was succussed 100 times to obtain Viscum D1 (1×10^{-1}). Then, one part of the preparation VA D1 with nine parts of the inert ingredient was succussed 100 times to obtain VA D2 (1×10^{-2}). One part of the VA D2 preparation with 9 parts

of the inert ingredient was succussed 100 times and to obtain VAD3 (1×10^{-3}) used in the present study.

Treatment with VA

The dogs received an IV injection of a VA ampoule on days 0, 5, 10 and 14 of the study, each ampoule containing 1.1 ml of test drug

Table 1: Times when the animals underwent clinical and laboratory exams and received the injection of VA D3.

	Blood Collection	Clinical Evaluation	Drug Injection (IV)	Drug Injection (SC)
Day -7	X	X	-	-
Day 0	X	X	X	-
Day 3	X	X	-	X
Day 5	X	X	X	-
Day 7	X	X	-	X
Day 10	X	X	X	-
Day 12	X	X	-	X
Day 14	X	X	X	-

X: time of the activity.

(provided by Injectcenter®). On days 3, 7 and 12, each animal received the same drug, injected subcutaneously (SC) (Table 1).

Statistical Model

The analysis considered only the main effects of the period (before or after treatment; days 7 to 0 vs. 1 to 14) or the day of the evaluation (-7 to 14). Given the structure of the data, it was not possible to consider interactions, and the individual effect of the animals was randomized by period or day. The data were subjected to analysis of variance (ANOVA) using the MIXED procedure of the SAS software (SAS University Edition), with repeated measurements over time, to consider the self-correlation between sequential measurement differences between means were compared using the Tukey test. The results are presented as mean \pm SEM. A P value lesser than 0.05 was considered statistically significant.

RESULTS

There was no effect of period ($P > 0.05$) in any of the blood endpoints analyzed (Figure 1), i.e., the average values observed

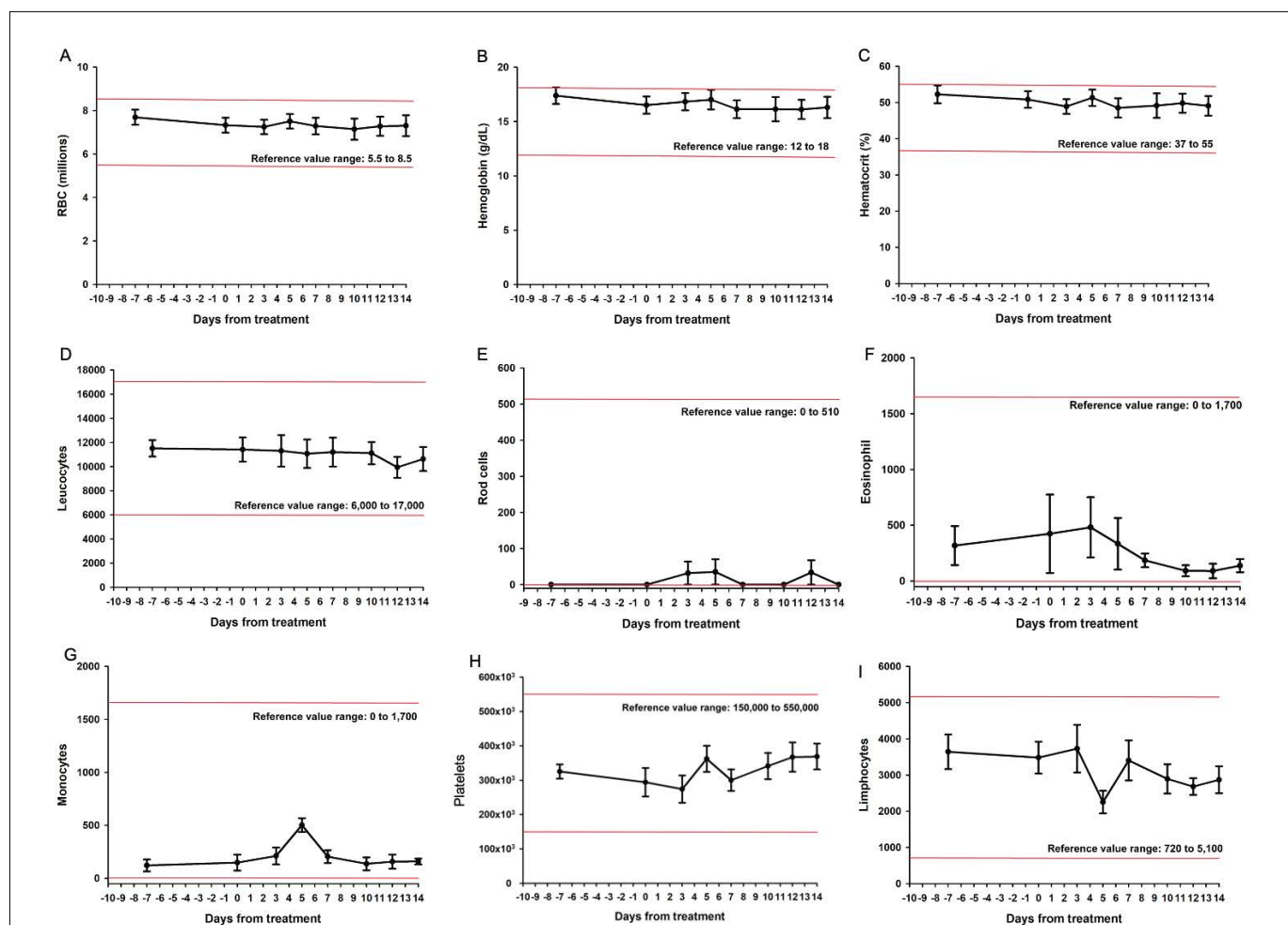


Figure 1: Average hemogram values in healthy dogs undergoing treatment with VA D3 from 7 days prior the application and on. In (A) Number of red blood cells; (B) Hemoglobin concentration; (C) Hematocrit (%); (D) Leukocytes; (E) Band cells; (F) Eosinophils; (G) Lymphocytes; (H) Monocytes and (I) Platelets.

before treatment were similar to those observed after. All averages obtained in the blood tests were within the reference values of the species (exams result available in the Table SI), except for one animal that presented values of ALT above the reference value since day 0. The animals that had some kinds of previous alteration in the exams prior to the application of the VA continued with the same pattern throughout the treatment.

By the blood exams, it can also be evaluated the function of both kidney (Figure 2) and liver (Figure 3) with the treatment with the homeopathic.

One dog presented altered ALT throughout the entire evaluation period (average 680.4 ± 32.7), accounting for the relatively high standard deviation for this parameter (Figure 3A).

There was a transient but significant ($P < 0.0022$) increase in monocyte count on Day 5 (Table 2, Figure 1G). Values on this day were greater ($P < 0.05$) than all in other days (Table 3), which were similar to each other. Despite of this fluctuation, values were within the physiological range, as defined by the reference values between 150-1,350 monocytes per ml.

At the clinical analysis, all dogs were active/highly active, as well as good nutritional and hydration status. The results of the

Table 2: Isolated effects of the period (before or after treatment, days -7 to 0 vs. 1 to 14) or day (-7 to 14) on blood parameters under analysis in healthy dogs undergoing treatment with VA D3 from day 0 on.

Parameter	P Value	
	Period	Day
Red Cells	0.6878	0.9869
Hemoglobin	0.6599	0.9568
Hematocrit	0.5572	0.9628
Leukocytes	0.6477	0.9715
Bands	0.3657	0.6597
Neutrophils	0.9564	0.9137
Eosinophils	0.5930	0.7287
Basophils *	-	-
Lymphocytes	0.3061	0.2457
Monocytes	0.2195	0.0022
Platelets	0.5337	0.4519
Protein	0.7449	0.8597
Creatine	0.5973	0.4649
ALF	0.6952	0.9956
GTP	0.9792	0.6860
Urea	0.2220	0.1360

* Basophil analysis was not performed due to lack of variation in values.

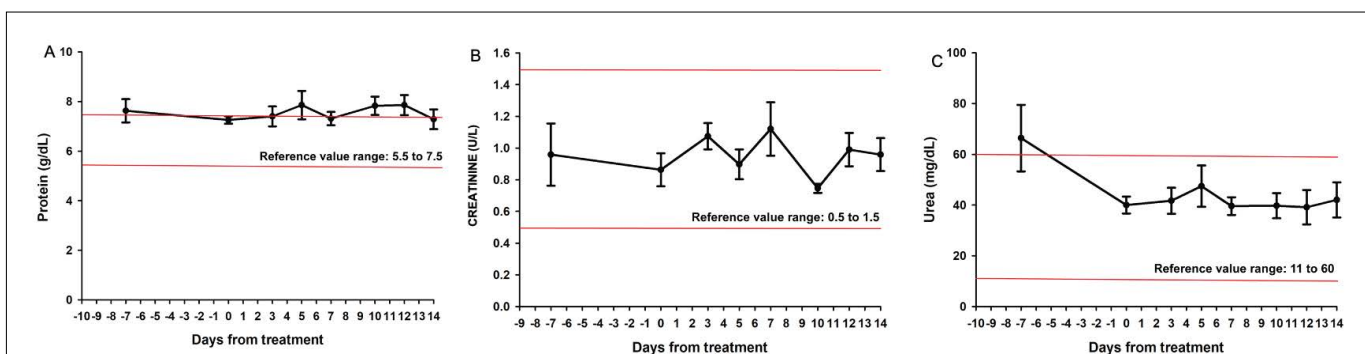


Figure 2: Average values of (A) Total Protein, (B) Urea, and (C) Creatine for renal evaluation of healthy dogs undergoing treatment with VA D3 from day -7 on.

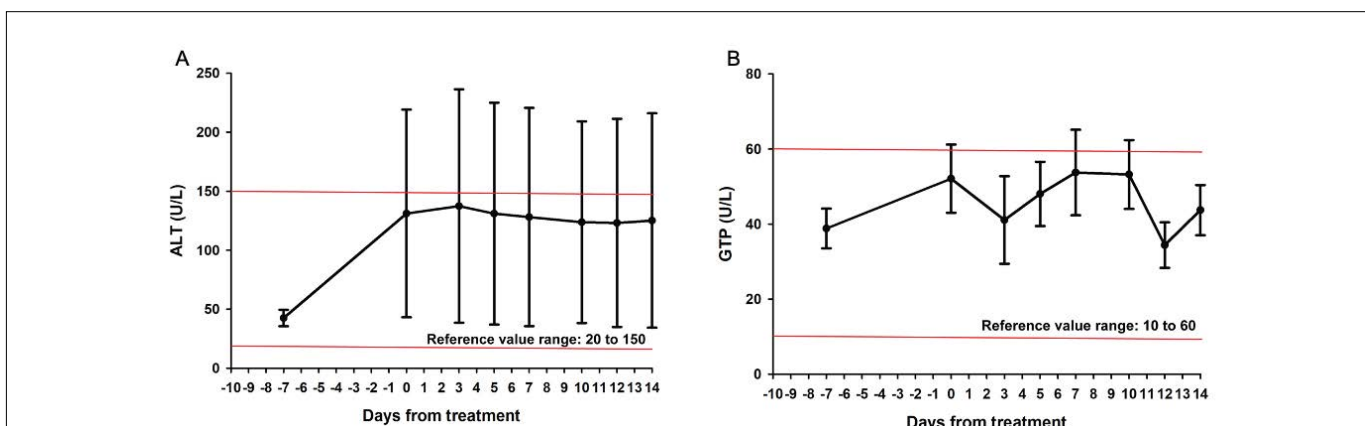


Figure 3: Average ALT (A) and GTP (B) dosage for liver assessment of dogs undergoing treatment with VA D3 from day-7 on.

Table 3: Contrasts for monocyte counting on different days compared to Day 5 in healthy dogs undergoing treatment with VA D3 from day 0 on.

Contrasts Day		Day	P Value
-7	vs	5	0.0024
0	vs	5	0.0058
3	vs	5	0.0410
7	vs	5	0.0338
10	vs	5	0.0040
12	vs	5	0.0078
14	vs	5	0.0084

analysis of rectal temperature, mucosal staining and the other tests were also all within the expected standard threshold. Three months after the end of the applications, the animals remained stable and without any clinical alteration.

According to the Quality-of-Life Assessment Questionnaire completed by the tutors, 6 animals were active or highly active in the beginning of the study and all became highly active at the end. One animal was classified as neither active nor dejected in the beginning and was active in the end. All the other classifications showed that 6 animals were walking and jumping in a good manner, keeping that along the study. Only one animal was having mobility difficulties (not jumping, getting up reasonably) at the first time, but presented better movements at the end of the study, according to the tutor.

DISCUSSION AND CONCLUSION

In the present study we aimed to evaluate the safety of intravenous application of the medication based on *viscum album* in health dogs. Our results showed that the blood parameters of animals did not change after receiving applications of VAD3 and they had a general increase in the level of activity.

The extract of VA contains a variety of immunoactive compounds with dose-dependent cytotoxic activity, and it has been used as accessory therapy in cases of cancer [29,30] hypertension [31], among other diseases.

Many studies indicate the efficacy of the extract of VA [32,33] and some were performed using clinical evaluation of homeopathic VA [34]. In the current study we used the ultradiluted form of the VA, not the extract, and no adverse effects were observed, either through clinical observation or in hematological exams, corroborating the findings of other studies with VA [14,30,34]. By the blood exams, it can also be evaluated that the treatment with the ultradiluted VA did not cause any injury in both kidney and liver of the studied animals. One animal presented an alteration in ALT values during the whose study, but it could

not be associated to the treatment, as it was present since before the application of VA. Even with the normal oscillation present in these figures, the values of the tests in the animals that had normal exams continued with their standards within the expected reverence value for the test.

The goal of the study was the analysis of safety of the medicine based on VA. We decided to study this potency, despite not being a homeopathic potency, as this is very close to homeopathic potencies and still have a considerable amount of extract. Beyond, another positive result presented in the current experiment was the analysis of data regarding the effects related to post-application quality of life and treatment tolerability. This was an interesting finding that may be related to improved immunity or decreased inflammation in the body [18], a factor that should be better studied in future research.

Another question that should be addressed in the future concerns the validity of using VA homeopathic as an additional preventive option in patients at high-intermediate risk of non-invasive cancer [29], since this drug has been widely used in cancer patients and has not shown any signs of contraindication as demonstrated in this study.

The use of homeopathic therapy is already widespread and growing [2,25]. Medicines used here are often considered safe and risk-free, and their use by the general practitioner is often disregarded, usually due to lack of knowledge of their properties. Therefore, it is worth emphasizing the importance of this kind of study to attest that there is no type of adverse reaction to the administration of homeopathic medicines, in addition to the result of good physiological responses, as occurred in the present study. Thus, this study demonstrated that the homeopathic medicine *Viscum album* D3, in the dose studied, was safe for both intravenous and subcutaneous use in dogs, with possibly benefits to their organism.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All experiments performed on small animals of the species *Canis familiaris* were approved by the Ethics Committee on Animal Use of the Catholic University of Brasilia (CEUA - UCB), Brazil (CEUA No. 002/20). The patient's tutors were advised and signed the informed consent.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

FUNDING

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AUTHORS' CONTRIBUTIONS

AV, HB, PM and RA contributed to the study design. AV, PM, HB, RA performed the experiments, carried out the statistical analysis. LA and HB drafted the manuscript. AV, HB, LA, PM and RA conceived the study, coordinated the work described, and contributed to the manuscript preparation. All authors read and approved the final manuscript.

AVAILABILITY OF DATA AND MATERIALS

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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APPENDIX S1

FREE AND INFORMED CONSENT FORM

For legal purposes, I authorize the practice of veterinary procedures for the application of ultra-diluted *Viscum album* in the animal of my property, being aware of its participation in Clinical Research.

I also declare to be fully aware of all aspects involving the procedures for applying the ultra-diluted *Viscum album*.

I have received from the veterinarian all the information requested, as well as other subsidiaries, as follows:

- That the nature, purpose, peculiarities, benefits, risks, and possible complications of the procedures have been explained to him in detail.
- That this clinical study is important for the establishment of safety of treatment with ultra-diluted *Viscum album*.
- That throughout the treatment the animal should be accompanied by the veterinarian.
- That the tests that should be performed throughout the study should be requested.
- Who has been informed that applications of the ultra-diluted *Viscum album* may occur complications during the procedure, such as allergic reactions, changes in blood pressure, vomiting and diarrhea.
- That each of the complications and the meaning of his technical name was explained to him in detail by the veterinarian.
- That these complications sometimes stem from imponderable and unpredictable factors, such as the patient's own organic reactions.
- That, due to the above, the use of invasive monitoring may be imperative, over which the owner of the patient was already sufficiently informed (a).
- That if complications occur or unforeseen, the veterinary medical team may adopt a clinical/surgical procedure different from the scheduled one, always for the benefit of the patient.
- That there is no compensation or indemnity if you have any complications arising from it.
- That there will be no charge of the value of the drug or the tests to the tutor, being the cost subsidized by the researchers, the Veterinary Clinic and the laboratory of clinical pathology.
- That with such explanations and clarifications is fully satisfied, having understood, and accepted to submit to the study with application of the proposed ultra-diluted *Viscum album*.
- That the person responsible for the exposed clinical trial is Dr. Ana Catarina Viana Valle and Dr. Rosângela Vieira de Andrade, who can be contacted by e-mails catarinavalle@gmail.com and rosangelavand@gmail.com, respectively; the contact can also be made via telephone directly with Dr. Ana Catarina Viana Valle: (61) 99662-9006.
- That the project was approved by the Ethics Committee on Animal Use of UCB.
- That the researchers are authorized to disseminate the results obtained, as well as: diagnostics of image, films, photos and / or others that are considered important.

Furthermore, I declare the specifications of the animal owned by me, i give and i sign this document, with force of contract for the provision of medical and veterinary services.

Name:	Sex:	Age:
Species:	Race:	
Owner:		
Phone:		
Email:		
I.d:	Cpf:	

And to record your full consent to submit to research with application of ultra-diluted *viscum album*, signs this document.

_____, _____ of _____ of 20____.

City, Day, Month, Year.

Animal Tutor

Appendix S2: Quality of Life Questionnaire

Quality of Life Questionnaire

Animal name: _____ Tutor's ID: _____ Weigh: ____ kg ECC: _____ (1-9)
 Session Number: _____ Date: ____ / ____ / ____
 Tutor's Name: _____ Phone Number: _____

Mark with an X just one answer for each question. The one that explains the state of your animal for the previous session.

1 - Your pet's state of mind:

highly active active neither active nor dejected dejected very down

2 - The animal plays?

Eager with desire grudgingly very unwillingly do not play

3 - The animal cries in pain?

Never rarely sometimes often very often

4- Does the animal walk?

very easily easily with difficulty with great difficulty don't walk

5 - Does the animal trot (walk fast)?

very easily easily with difficulty with great difficulty don't trot

6 - Does the animal gallop (runt)?

very easily easily with difficulty with great difficulty don't gallop

TABLE SUPPLEMENTAR

ANIMAL	DAY	BLOOD COUNT										TOTAL PROTEIN (5.5 - 7.5 g/dL)	BLOOD BIOCHEMISTRY			
		RED BLOOD CELLS (5.5 - 8.5 μ E3)	HEMOGLOBIN (12 - 18 g/dL)	HEMATOCRIT (37 - 55%)	LEUKOCYTES (6,000 - 17,000/ μ L)	BAND CELLS (0 - 510/ μ L)	NEUTROPHILS (3,600 - 13,090/ μ L)	EOSINOPHILS (0 - 1,700/ μ L)	LYMPHOCYTES (720 - 5,100/ μ L)	MONOCYTES (0 - 1,700/ μ L)	PLATELETS (150,000 - 500,000/ μ L)		CREATININE (0.5 - 1.5 mg/dL)	ALT (20 - 150) U/L	GTP (10 - 60) U/L	UREA (11 - 60 mg/dL)
1	D-7	7.38	16.9	50.7	10,500	0	6,720	210	3,360	210	353,000	6.40	0.50	29	62.70	35.80
	D0	7.82	17.1	53.2	10,400	0	6,656	0	3,744	0	303,000	7.00	0.57	35	58.40	31.00
	D3	7.93	18.4	53.3	8,900	0	6,052	356	2,314	178	196,000	7.00	0.97	32	61.60	30.60
	D5	8.01	17.9	55	8,700	0	6,003	87	1,827	783	346,000	7.00	0.83	29	60.60	31.60
	D7	7.37	16.9	49.6	12,700	0	8,636	127	3,556	381	284,000	6.20	1.36	28	57.50	28.50
	D10	7.53	16.9	50.6	10,700	0	7,597	0	3,103	0	307,000	7.00	0.75	28	57.70	38.10
	D12	7.83	17.3	54.7	9,500	0	6,840	0	2,470	190	294,000	7.00	0.85	27	56.90	29.50
D14	7.43	16.6	50.2	11,300	0	8,701	113	2,373	113	297,000	6.00	0.82	19	55.50	33.30	
2	D-7	7.21	15.7	46.4	13,500	0	7,155	270	5,670	405	366,000	7.00	0.82	34	34.70	69.00
	D0	6.46	14.4	44.3	145,000	0	8,410	0	5,510	580	218,000	7.20	1.12	32	36.60	51.00
	D3	6.79	15.3	44.4	13,700	0	8,220	411	4,521	548	203,000	7.00	1.32	32	29.70	54.50
	D5	7.06	14.3	46.9	14,200	0	11,360	0	2,272	568	320,000	7.20	1.39	34	31.90	64.40
	D7	6.42	13.9	41.9	13,700	0	8,631	137	4,795	137	152,000	7.00	1.60	29	26.80	48.20
	D10	6.39	13.9	42.9	15,300	0	10,251	0	4,590	459	320,000	7.40	0.83	28	32.50	49.30
	D12	6.88	15.3	45.1	13,400	0	9,380	0	3,484	536	354,000	8.00	1.06	31	37.10	44.80
D14	6.93	15.6	45.8	15,100	0	10,268	0	4,530	302	328,000	7.00	0.99	34	37.70	54.50	
3	D-7	7.7	18.1	51.1	8,400	0	5,796	168	2,436	0	245,000	7.20	0.73	52	53.70	27.70
	D0	6.94	15.5	47.7	7,800	0	5,460	234	2,028	78	179,000	7.00	0.84	47	43.30	40.50
	D3	6.68	15.4	45.5	6,500	0	4,290	195	1,885	130	250,000	6.00	1.12	42	38.70	30.60
	D5	6.86	15.8	46.8	6,600	0	5,016	198	1,122	264	206,000	6.00	1.00	42	38.80	32.40
	D7	7.01	16.1	46.8	6,000	0	4,200	120	1,500	180	261,000	6.80	0.87	37	41.40	36.40
	D10	6.39	14.5	43.8	7,600	0	5,244	228	2,052	76	210,000	6.40	0.82	38	45.70	32.20
	D12	6.57	15	46.5	6,000	0	3,960	60	1,920	60	234,000	7.00	0.93	32	46.30	33.10
D14	6.42	14.4	44.9	61,000	0	4,270	0	1,647	183	237,000	6.20	0.87	34	44.50	30.70	
4	D-7	8.68	18.5	58.6	11,000	0	8,580	110	2,310	0	336,000	7.00	0.82	34	34.70	69.00
	D0	8.2	18.7	56.2	12,500	0	9,250	0	3,125	125	202,000	8.00	0.73	65	97.20	25.90
	D3	8.2	18.6	54.4	11,000	0	8,690	110	2,200	0	268,000	8.00	0.80	73	100.10	22.90
	D5	8.11	18.5	55.3	12,300	246	9,471	246	1,968	369	345,000	9.80	0.80	69	52.20	28.60
	D7	8.7	18.5	56.9	11,800	0	8,614	354	2,714	118	331,000	8.00	0.81	68	109.80	28.20
	D10	8.15	17.8	56.7	11,100	0	9,213	0	1,665	222	363,000	9.00	0.74	63	93.60	15.40
	D12	8.16	18.6	54.9	11,800	236	9,322	0	2,124	118	475,000	10.00	0.84	65	31.80	18.60
D14	8.42	18.3	55.1	11,200	0	7,728	224	3,136	112	403,000	9.00	0.85	67	77.60	22.90	
5	D-7	80.8	18.8	57.4	13,500	0	7,695	1,350	4,455	0	393,000	9.20	1.43	74	32.60	97.00
	D0	7.84	17.5	55.4	14,800	0	7,844	2,516	4,292	148	325,000	7.00	0.76	45	31.00	41.90
	D3	7.49	17.5	52.2	17,300	0	8,304	2,076	6,747	173	504,000	7.40	1.23	43	24.10	57.30
	D5	7.68	18.1	54.2	15,500	0	9,765	1,705	3,410	620	468,000	8.00	0.88	37	34.10	50.80
	D7	7.89	17.9	54.9	15,400	0	9,394	462	5,390	154	306,000	8.00	0.80	43	38.00	52.30
	D10	8.05	18.6	56.8	10,600	0	7,526	318	2,650	106	510,000	9.00	0.79	52	34.80	47.60
	D12	7.15	15.7	49.7	9,400	0	6,298	470	2,632	0	324,000	7.00	1.00	39	30.30	45.00
D14	7.82	18.1	53.5	10,400	0	7,800	416	2,080	104	412,000	7.80	1.01	36	32.70	44.50	
6	D-7	8.72	19.8	59.5	12,200	0	7,564	0	4,514	122	259,000	9.60	1.90	20	23.50	123.69
	D0	8.18	18.9	56.9	9,200	0	5,980	0	3,220	0	501,000	7.00	0.67	39	66.70	48.00
	D3	7.92	19.1	52.2	10,500	0	5,880	105	4,515	0	263,000	9.40	0.80	30	6.30	51.60
	D5	8.75	20.5	58.7	10,200	0	6,528	0	3,264	408	512,000	10.00	0.60	26	91.80	86.90
	D7	7.92	17.1	52.3	9,600	0	5,472	96	4,032	0	423,000	8.00	0.64	25	75.50	43.50
	D10	8.57	19.8	58.5	12,900	0	8,901	0	3,999	0	421,000	8.00	0.64	30	77.10	54.90
	D12	8.95	18.8	59.1	9,800	0	6,174	0	3,528	98	562,000	8.00	1.56	27	4.80	73.90
D14	8.95	19.3	57.4	10,400	0	6,448	208	3,640	104	548,000	8.00	1.52	33	29.30	76.60	
7	D-7	6.09	13.9	42.2	11,500	0	8,510	115	2,760	115	325,000	7.00	0.51	54	29.80	42.80
	D0	5.87	13.5	42.3	10,700	0	7,918	214	2,461	107	331,000	7.60	1.35	61	31.50	41.70



	D3	5.74	13.5	40.4	11,200	224	6,496	112	3,920	448	234,000	7.00	1.28	52	27.10	44.30
	D5	6.11	14	42.4	10,000	0	7,500	100	1,900	500	338,000	7.00	0.78	54	26.90	37.60
	D7	5.72	12.6	37.3	9,200	0	6,900	0	1,840	460	343,000	7.20	1.76	52	27.20	40.10
	D10	4.94	11.5	34.8	9,600	0	7,200	96	2,208	96	258,000	8.00	0.65	54	31.10	40.70
	D12	5.41	12.1	38.8	9,700	0	6,887	97	2,619	97	327,000	8.00	0.69	54	33.50	29.10
	D14	5.15	11.8	36.7	9,900	0	7,029	0	2,673	198	357,000	7.00	0.65	50	28.80	31.80