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A prospective study on the occurrence and clinical signs associated with different types of microfilariasis in dogs of Kerala

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Abstract

This study aimed to screen dogs for microfilariasis. Dogs with clinical signs suggestive of microfilaremia underwent for screening. A total of 442 animals were screened for microfilariasis using wet blood film examination and samples that tested positive for microfilaria underwent Giemsa staining to determine the species of microfilaria based on morphological characteristics. All the positive cases diagnosed as microfilariasis were utilized for age-wise, gender-wise and breed-wise occurrence study. From the present study, unsheathed microfilaria was the most common in older dogs, while sheathed microfilaria had higher rates in dogs aged one to three years. Mixed infections were more prevalent in older age group than young and middle-aged dogs. Labradors were notably susceptible to microfilariasis. Males had higher occurrences in unsheathed and sheathed infections, while in mixed infections, females were more affected. The clinical signs observed in these dogs were classified into generalized signs, gastrointestinal signs, lymphatic signs, and ophthalmological signs.

Keywords: Microfilariasis, sheathed microfilaria, unsheathed microfilaria, occurrences

1. Introduction

Microfilariae, minuscule larvae of parasitic worms transmitted by mosquito bites, infiltrate the blood stream and can lead to serious conditions in various animal species, including dogs. These larvae can affect various body systems including respiratory, cardiovascular and urinary systems. Microfilariasis in dogs can be caused by various filarial worms such as *Dirofilaria immitis*, *Acanthocheilonema reconditum*, *Acanthocheilonema dracunculoides*, *Dirofilaria repens*, *Brugia malay*, and *Brugia pahangi* (Ambily, 2009 and Rani *et al.*, 2010) [1, 2]. The occurrence of canine microfilaremia often exhibits strong associations with host factors like sex, breed, and age.

This study focuses on the occurrence and about the clinical signs associated with microfilariasis, considering age, breed and sex in dogs.

2. Materials and Methods

A total of 442 dogs aged above six months brought to the Teaching Veterinary Clinical Complex in Mannuthy and University Veterinary Hospital in Kokkalai with clinical signs of such as pyrexia, anorexia, vomiting, conjunctivitis, lymphangitis, hair loss, and limb or scrotal oedema were screened for microfilariasis. The screening process includes examination of wet blood film and giemsa stained blood smear.

3. Results and Discussion

3.1 Occurrence of microfilariasis in dogs

Out of 442, 183 dogs (41.40 percent) tested were found dogs positive for microfilariasis by wet blood film examination. The positive diagnosis in wet film examinations was confirmed by the distinct motility pattern exhibited by microfilaria. These patterns included wriggling cum progressively forward movement, rapid forward movement, sluggish forward movement and wriggling movement within the microscopic field (Ambily *et al.*, 2011) [3].

Demonstration of giemsa stained blood smears of positive microfilaria cases revealed different types of microfilaria, including sheathed, unsheathed and mixed infection. Examination of giemsa-stained smears from microfilaremic dogs (183 cases) revealed the presence of sheathed microfilaria in 51 cases (27.86 percent), unsheathed microfilariae in 124

cases (67.76 percent) and mixed infection in eight cases (4.38 percent) Table 1. And Fig. 1. Unsheathed microfilariae noticed in stained smears, featuring a blunt head with two nuclei, a long-tapered tail and absence of cells extending up to the tail tip. Sheathed microfilariae had a pink-stained sheath extending beyond the tail tip, with two discrete overlapping nuclei extending to the tail end and had a cephalic space about twice the width (Ambily *et al.*, 2011, Chirayath *et al.*, 2017)¹³.

⁴⁾ (Fig. 2a, b & c).

Table 1: Occurrence of microfilariasis in dogs

Type of microfilariae	Number	Percentage
Unsheathed	124	28.05
Sheathed	51	11.54
Mixed/Both	8	1.81

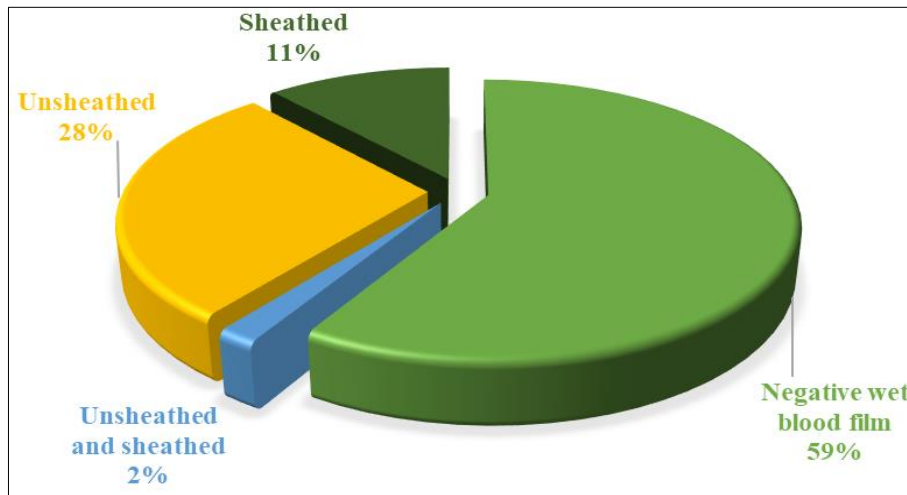


Fig 1: Occurrence of microfilariasis in dogs

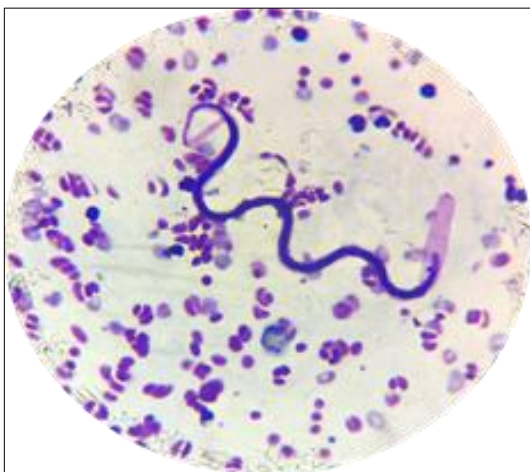


Fig 2a: Giemsa-stained blood smear demonstrating sheathed microfilaria

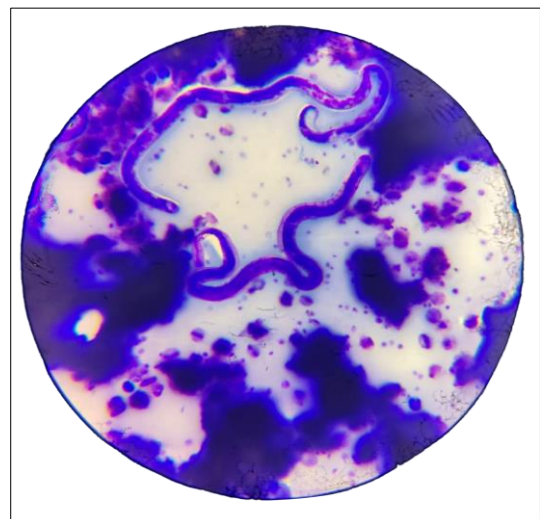


Fig 2c: Giemsa-stained blood smear demonstrating both unsheathed and sheathed microfilaria

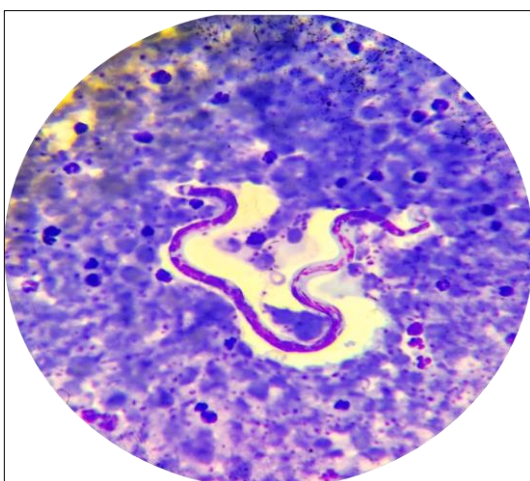


Fig 2b: Giemsa-stained blood smear demonstrating unsheathed microfilaria

3.2 Age wise occurrence

In this study, unsheathed microfilariasis was more prevalent in dogs aged above six years (34.68 percent), followed by dogs aged between one to three years (33.87 percent), three to six years (29.03 percent) and less than one year (2.42 percent). These results were consistent with the findings of Chirayath and Alex (2011)¹⁵, who noted a higher occurrence of unsheathed microfilariasis in older dogs compared to younger ones. Sheathed microfilaria was more frequently found in dogs aged one to three years (58.82 percent). While dogs aged three to six years and above six years had a prevalence of 17.65 percent each and least occurrence was observed in the year age group of less than one year (5.88 percent). Similarly, Chirayath *et al.*, (2017)¹⁴ found a higher occurrence of sheathed microfilaria in the age of one to three years. In cases of mixed infection higher occurrence observed

in age group of one to three years (37.5 percent) followed by three to six years and greater than six years with 25 percent

each. Ambily (2009)^[1] found high microfilariasis infestation in dogs aged two to four years. (Fig. 3.)

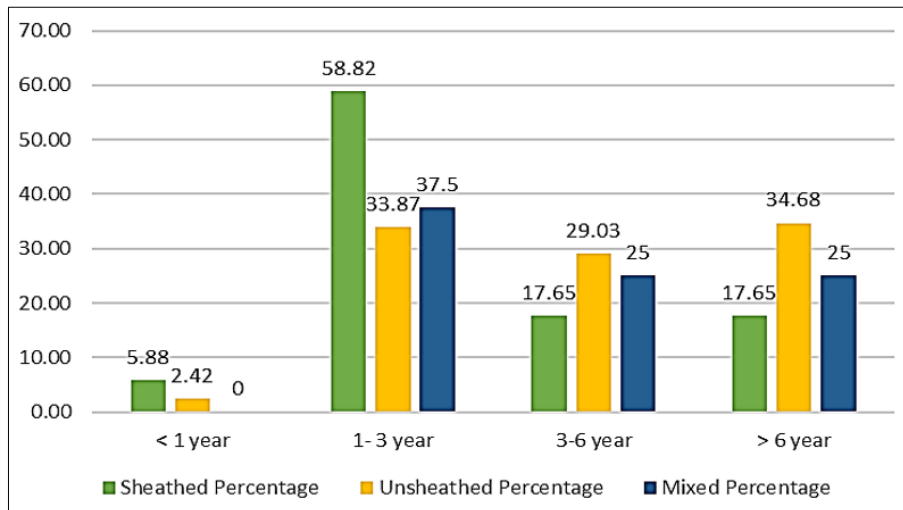


Fig 3: Age wise occurrence of microfilariasis in dogs

3.3 Breed wise occurrence

Labradors showed a higher level of occurrence with unsheathed microfilariae (45.10 percent) followed by sheathed microfilaria (43.55 percent) and in mixed infection (37.5 percent). This finding was in accordance with Ambily, (2009)^[1] and Sadarama, (2017)^[6] and this could be attributed to the frequent presentation of these breeds to the hospital. In the case of sheathed microfilaria, occurrence of infection Labrador were Rottweiler (11.76 percent), Doberman (7.84 percent), Pit bull (5.88 percent), Dachshund (3.92 percent), Great dane (3.92 percent), Non - descript (3.92 percent), beagle (3.92 percent), Pug (1.96 percent), Bulldog (1.96 percent), Cocker spaniel (1.96 percent), Dalmatian (1.96 percent), German shepherd dog (1.96 percent), Husky (1.96

percent) and Spitz (1.96 percent). In the case of unsheathed microfilariae occurrence of infection followed by Labrador breeds were Non-descript (18.55 percent), Rottweilers (7.26 percent), Dachshund (6.45 percent), Spitz (4.84 percent), Dobermans (4.03 percent), Pitbull (3.23 percent), Great dane (2.42 percent), German shepherd dog (2.42 percent), Golden retriever (2.42 percent) and beagle, American bully, Jack russel, Rajapalayam, Boxer, Pug has 0.81 percent each. In cases of mixed infection Labrador breeds showed the highest occurrence, followed by non-descript breeds (25 percent) and Dobermans, Pugs, and beagles at 12.5 percent each. It's worth noting that there was no breed predilection observed in dogs infected with *Dirofilaria repens*, according to Suprabha and Devada (2003)^[7] (Fig.4).

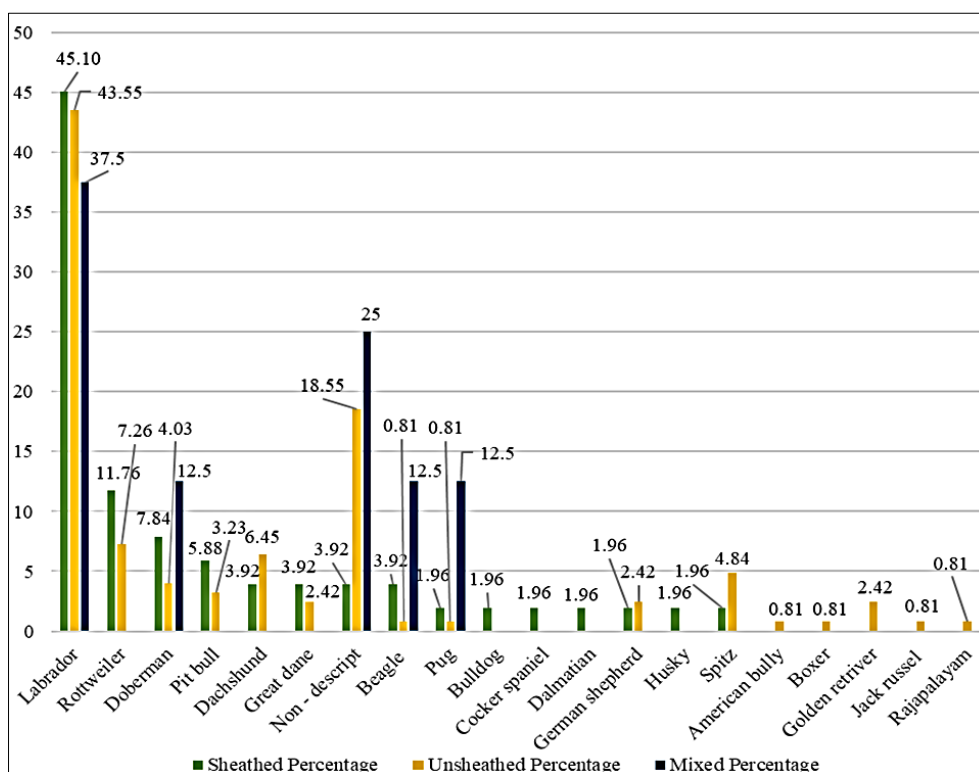


Fig 4: Breed wise occurrence of microfilariasis in dog

3.4 Sex wise occurrence

Sheathed microfilariae were found in 58.82 percent of male dogs and 41.18 percent of female dogs, signifying a greater infection rate in males than females. In unsheathed microfilaria higher infestation observed in male (52.42

percent) than female dogs (47.58 percent). This might be due to the potential impact of hormones in dogs susceptibility to infestation (Ananda and D'Souza 2006) [8] whereas, mixed infection were more prevalent in female dogs (62.5 percent) than male dogs (37.5 percent) (Fig. 5.).

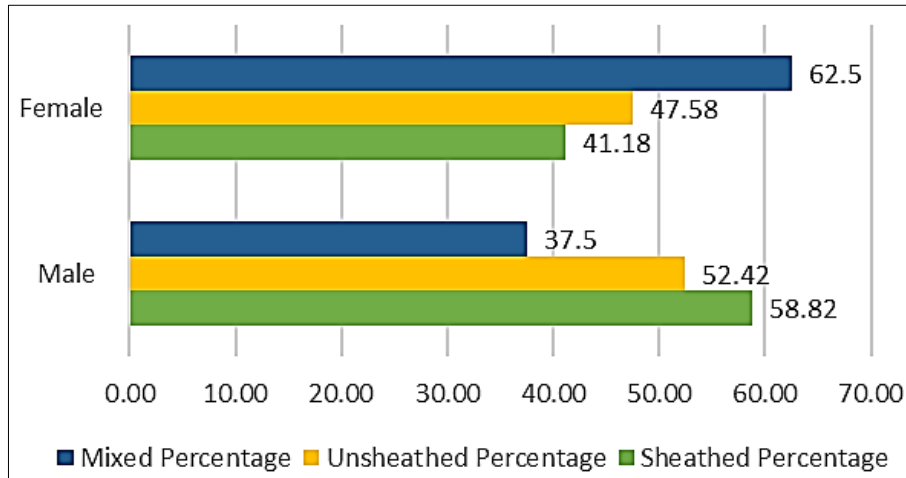


Fig 5: Sex wise occurrence of microfilariasis in dogs

3.5 Clinical signs

Clinical signs associated with microfilariae were categorised into generalised signs including anorexia, pyrexia, icterus, and congested mucous membranes; gastrointestinal signs including diarrhoea and vomiting; lymphatic signs such as lymphadenopathy, lymphangitis, limb oedema, scrotal oedema, and lameness; and ophthalmological signs, including lacrimation and corneal opacity. Similar clinical signs also reported by Ambily *et al.* (2011) [3], Chirayath (2013) [9] and Sadarama (2017) [6] Among these clinical symptoms, in case of sheathed, unsheathed and mixed infection of microfilariasis

anorexia was the most common presenting sign in 60.78, 76.61 and 50 percent respectively. Beyond general signs, lymphadenopathy was most prevalent at 21.87 percent, followed by lacrimation at approximately 9.8 percent in case of sheathed microfilariasis. Whereas in unsheathed microfilariasis beyond anorexia and pyrexia was the commonly observed clinical sign, followed by gastrointestinal signs, lameness and skin lesions. In mixed infection anorexia and pyrexia were common followed by gastrointestinal and ophthalmic signs. (Table 2).

Table 2: Occurrence of clinical signs in microfilariasis

	Clinical signs	Sheathed		Unsheathed		Mixed	
		Number	Percentage	Number	Percentage	Number	Percentage
Generalized signs	Anorexia	31	60.78	95	76.61	4	50
	Pyrexia	3	5.88	8	6.45	2	25
	Icterus	1	1.96	1	0.81	0	0
	Congested mucous membrane	15	29.41	2	1.61	0	0
Gastrointestinal signs	Diarrhoea & Vomiting	2	3.92	1	0.81	0	0
	Diarrhoea	1	1.96	3	2.42	0	0
	Vomiting	2	3.92	6	4.84	1	12.5
Lymphatic signs	Limb oedema	4	7.84	2	1.61	0	0
	Lameness	3	5.88	1	0.81	0	0
	Dilated lymphatics	4	7.84	0	0	0	0
	Scrotal oedema	2	3.92	0	0	0	0
Ophthalmic signs	Lymphadenopathy	11	21.57	0	0	0	0
	Lacrimation	5	9.80	0	0	1	12.5
	Corneal opacity	1	1.96	0	0	0	0
Others	Skin lesion	1	1.96	3	2.42	0	0
	Respiratory distress	2	3.92	1	0.81	0	0
	Epilepsy	1	1.96	1	0.81	0	0

4. Conclusion

This study showed that higher occurrence of unsheathed microfilariasis exhibited the highest occurrence of microfilariasis in dogs aged above six years. While higher occurrences of sheathed microfilaria were found in dogs aged one to three years. In cases of mixed infection, a higher occurrence was observed in dogs aged one to three years. The Labrador breed showed a high susceptibility to microfilariasis

infection. Male dogs had a higher occurrence compared to female dogs in unsheathed and sheathed infection, whereas, in cases of mixed infection, the pattern was reverse. In case of clinical signs anorexia was the most common in all types of microfilariasis followed by congested mucous membrane, lymphadenopathy, lacrimation, limb oedema, dilated lymphatics, pyrexia, lameness, diarrhoea & vomiting, respiratory distress, icterus, corneal opacity, skin lesion and

epilepsy in sheathed microfilariasis. In unsheathed microfilariasis anorexia is followed by pyrexia with subsequent gastrointestinal signs, lameness, and skin lesions. Whereas, in mixed infections anorexia precedes pyrexia, followed by gastrointestinal and ophthalmic signs.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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