The Microfilarial Periodicity of *Dirofilaria immitis* Leidy in Thailand

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ABSTRACT

The microfilarial periodicity was observed in seven stray dog from Bangkok infected with *Dirofilaria immitis* Leidy. The microfilariae showed unmarked nocturnally subperiodic type with the maximum number at 24.00 hour and 26.43 to 50.83 average percentages of microfilariae were found during the daytime.

INTRODUCTION

Microfilariae of *Dirofilaria immitis* Leidy may be found in the blood at all times but there is a tendency toward periodicity (Soulsby, 1973). It appears to vary in different countries. Thus in the U.S.A. the maximum microfilariae was at 04.30 hour and the minimum at 11.00 hour (Schnelle, 1944); in France the maximum was at 20.00 hour and the minimum at 08.00 hour (Euzeby and Laine, 1951); in China the maximum was at 18.00 hour and the minimum at 06.00 hour (Webber and Hawking, 1955). To complete the periodicity ranges found in different parts of the world this paper reports the periodicity of *D. immitis* in Thailand.

MATERIALS AND METHODS

The microfilaria carriers were seven dogs collected from stray dog captured routinely by the Department of rabies control, Bangkok municipality. These dogs were kept in the animal house of Faculty of Tropical Medicine, Mahidol University. All microfilariae were identified as *D. immitis*.

The microfilarial periodicities were made from these seven dogs by taking blood from the pinna of the ears. The blood samples were measured by sahli pipette with the amount of 20 c.mm each. Two measured blood samples were obtained for microfilaria count. The blood samples of 20 c.mm were smeared as two thick films on a slide for one dogs. The first sample was taken at 12.00 hour from dog number 1 to 7 and the blood sample were allowed to dry overnight and stained with diluted Giemsa, 2.5% in phosphate buffered water. The microfilariae were counted under compound microscope.

RESULTS

In all seven dogs observed, the microfilariae were found in the blood at all time (Table 1) and there was tendency toward nocturnal periodicity (Table 1). The maximum numbers of microfilariae were between 18 00-04.00

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Table 1 The microfilaria counts in stray dog infected with ***D. immitis***, the counts were made on two 20 c.mm films taken at two-hourly intervals.

Dog Number and sex		Two-hourly microfilaria counts												
		1200	1400	1600	1800	2000	2200	2400	0200	0400	0600	0800	1000	1200
1	M	787	951	1399	1872	2097	2591	2648	2610	2659	2403	1473	958	726
2	M	117	139	187	200	208	283	309	312	315	279	226	197	135
3	F	11	8	16	8	17	10	8	18	33	1	3	1	4
4	F	76	90	100	112	176	261	310	218	207	192	143	95	80
5	M	50	40	121	161	182	210	112	130	186	150	33	65	54
6	F	19	29	27	18	134	52	35	21	12	24	18	12	8
7	M	15	23	20	31	21	30	30	22	9	7	6	4	12
average		153.57	183.85	267.14	343.14	405.00	491.00	493.14	475.85	488.71	436.57	271.71	190.28	145.57

Table 2 The periodicity of microfilaria in dogs. Microfilaria counts expressed as percentages of the highest count.

Dog Number and sex		Two-hourly microfilaria counts												
		1200	1400	1600	1800	2000	22000	2400	0200	0400	0600	0800	1000	1200
1	M	29.59	35.76	52.61	70.40	78.86	97.44	99.58	93.15	100.00	90.37	55.39	36.02	27.30
2	M	37.14	44.12	59.36	63.49	66.03	89.84	98.09	99.04	100.00	88.57	71.74	62.53	42.85
3	F	33.33	24.24	48.48	24.24	51.51	30.30	24.24	54.54	100.00	3.03	9.09	3.03	12.12
4	F	24.51	29.03	32.25	36.12	56.77	84.19	100.00	70.32	66.77	61.93	46.12	30.64	25.80
5	M	23.80	19.04	57.61	76.66	86.66	100.00	53.33	61.90	88.57	71.42	15.71	30.95	25.71
6	F	14.17	21.64	20.14	13.43	100.00	38.80	26.11	15.67	8.95	17.91	13.43	8.95	5.97
7	M	48.38	74.19	64.51	100.00	67.74	96.77	96.77	70.96	29.03	22.58	19.35	12.90	57.14
average		30.13	35.43	48.85	54.90	72.51	76.76	71.16	67.22	70.47	50.83	32.97	26 43	28.15

hours ranging from 31 to 2659 microfilariae per 40 c.mm and the minimum numbers were observed between 06.00 to 14.00 hours ranging from 1 to 726 microfilariae per 40 c.mm (Table 1). The peak count averaged from all numbers of microfilariae at a specific time was at 24.00 hour (Table 1) but the average of the percentages of peak counts was at 22.00 hour (Table 2). The microfilarial periodicity was, therefore, the nocturnally subperiodic type and the periodicity was not marked being peaked at 24.00 hour and and 26.43 to 50.83 average percent of microfilariae were found during the daytime.

DISCUSSION

The microfilarial periodicity of *D. immitis* in dogs observed in this study was unmarked nocturnally subperiodic type. The average peak count was at 24.00 hour and 26.43 to 50.83 average percent of microfilariae were found during the daytime. It cannot be nonperiodic type that the microfilariae are evenly found throughout the day and night.

The maximum numbers of microfilariae observed in different countries e.g. the U.S.A., France and China showed a trend to shift from 04.30 hour from the U S.A. to 20.00 houe from France and 18.00 hour from China. This trend was also observed in each individual e.g. dog No. 1 - 3 at 04.00 hour, No. 4 at 24.00 hour, No. 5 at 22.00 hour and No. 6 and 7 at 20.00 hour and 18.00 hour respectively (Table 1, 2). The hight microfilaria counts had trend to be peaked at 04.00 hour and the low counts toward 18.00 hour except case No. 3.

Others factors which influenced the microfilarial periodicity were excluded: for example, the species of the host influenced microfilarial periodicity (Laing, 1961); the habits of the host (Era, 1959) the species of the parasite (Duke and Wijers, 1958); the strain of the parasite (Edgar et al., 1952; Raghavan, 1957; Turner and Edeson, 1957, Harinasuta et al, 1970).

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