〔Jpn. J. Parasitol., Vol. 33, No. 3, 221-223, June, 1984〕

Research Note

A Karyotype Study of the Oriental Eye Worm, *Thelazia callipaeda* (Thelaziidae : Nematoda)

YUJI SAKAGUCHI AND SHIGEO KIHARA

(Received for publication ; December 5, 1983)

Key words : *Thelazia callipaeda*, chromosome, karyotype, C-banding pattern, cytology

Thelazia callipaeda, a nematode parasitic in the conjuncitival sac of the dog, rabbit and cattle has been known to cause considerable damage to the human eye in some Asian regions, by an accidental infection.

This paper deals with the karyotype and C-banding pattern in both sexes of *T. callipaeda* ; the chromosomes of this species have not been reported.

Adult worms were obtained from the eye of stray dogs captured in Hita City, Oita Prefecture. Chromosome preparations were made by means of the air-drying technique of Imai *et al.* (1977). The conventional Giemsa staining was employed for estimation of the chromosome number and a modified (Hirai *et al.* 1981) BSG method of Sumner (1972) to demonstrate the C-banding pattern.

The haploid and diploid chromosome numbers of *T. callipaeda* were determined to be 4 (n) and 8 (2n), respectively, in both sexes (Figs. 1-5). The diploid complement consisted of 3 large submeta- or subtelocentrics, 3 medium-sized subtelocentrics and 2 small subtelocentrics in the male, while in the female there were 4 large submeta- or subtelocentrics, 2 medium-sized subtelocentrics and 2 small subtelocentrics (Figs. 6-9).

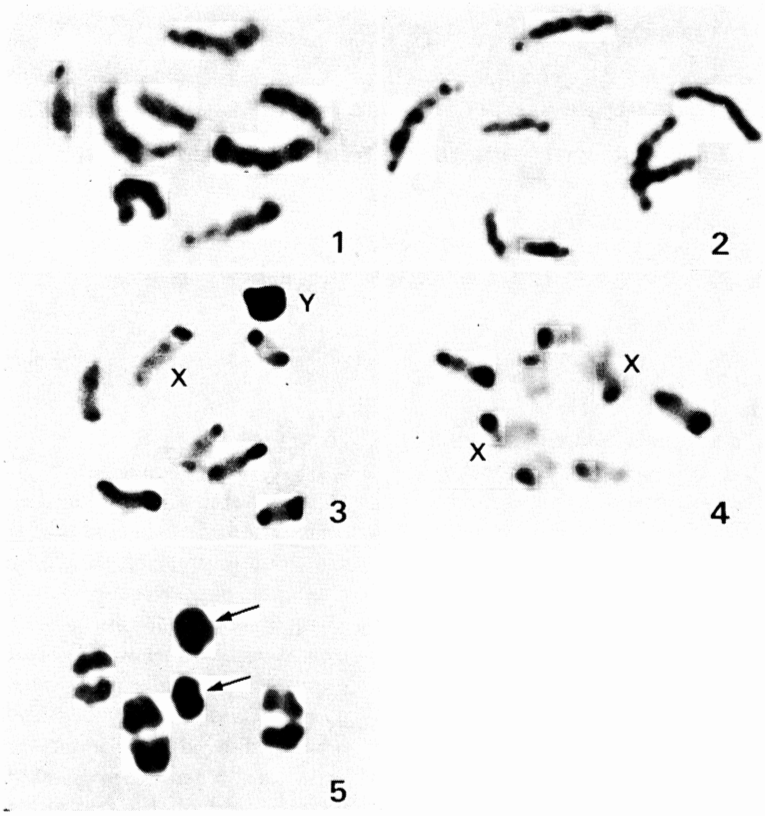
The primary spermatocytes were comprised of 3 bivalents and 2 univalents, the letter being different in size (Fig. 5).

One large element in the male and two large ones in the female showed a prominent C-band only at one end. The other large elements and two medium-sized ones in both sexes showed C-bands at both ends of the arm, while one of the three medium-sized elements of the male was darkly stained along its entire length (Figs. 3, 8). In contrast, two small elements in the male showed prominent C-bands at both ends of the arm. The remaining two small elements of the female showed a prominent C-band at one end and a less prominent C-band on the opposite end of the arm (Figs. 8, 9).

On the basis of the above findings of karyotype and C-banding analyses, we concluded that one large element showing a single C-band in the male and two such elements in the female represent the X chromosome, and one darkly stained medium-sized element the Y chromosome. Hence, the sex-determining mechanism of this species is proposed to be the XY-XX type.

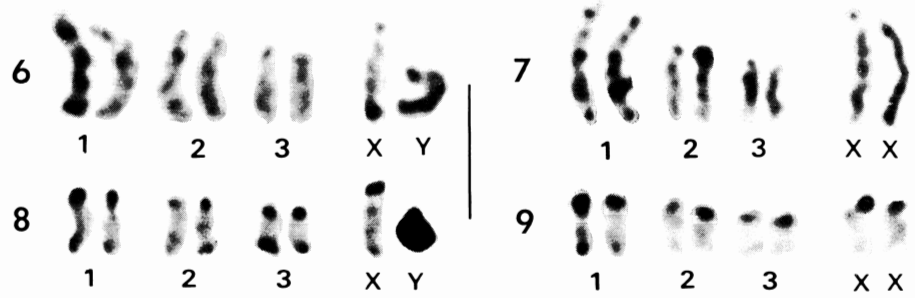
Recently, we found a C-band heteromorphism in the chromosomes of the lung fluke, *Paragonimus ohirai* (Hirai *et al.* 1981). However, there has been no reports on the C-band heteromorphism in the parasitic nematodes so far studied. Whether the somewhat different C-band patterns observed between male and female specimens of the present species, as shown in Figs. 8-9, especially in the small elements of the third pair, may or may not represent an autosomal heteromorphism remains to be settled.

Department of Parasitic Diseases, Kumamoto University, School of Medicine, Kumamoto 860, Japan.



Figs. 1-4 Spermatogonial (1, 3) and oogonial (2, 4) metaphases of *Thelazia callipaeda*, showing 8 chromosomes with Giemsa staining (1, 2) and C-band staining (3, 4). Ca×3,400

Fig. 5 Diakinesis with 3 bivalents and 2 univalents (arrowed) in spermatocyte, the latter being most probably the sex elements. Ca×3,400



Figs. 6-9 Karyotype analyses of spermatogonial (6, 8) and oogonial (7, 9) metaphases from *T callipaeda*, after Giemsa (6, 7) and C-band staining (8, 9). Bar indicates 5 μm.

Acknowledgments

The authers are grateful to Dr. Motomichi Sasaki of Hokkaido University and to Dr. Isao Tada of Kumamoto University for their reading the manuscript.

References

1) Imai, H., R. H. Crozier and R. W. Taylor (1977): Karyotype evolution in Australian ants. Chromosome (Berl.). 59, 341-393.
2) Hirai, H., Sakaguchi, Y and Imai, H. T. (1981): C-band polymorphism in a Japanese lung fluke *Paragonimus ohirai* (Trematoda; Platyhelminthes). Heredity. 47, 249-252.
3) Sumner, A. T. (1972): A simple technique for demonstrating centromeric heterochromatin. Exp. Cell Res. 75, 304-306.

短　報

東洋眼虫（*Thelazia callipaeda*）の核型分析

坂口祐二　木原滋陽

（熊本大学医学部寄生虫病学教室）

東洋眼虫の染色体をエアードライ法で作製したプレパラートで観察し，その核型分析を行った．又標本の一部はC-バンド処理を施し，そのパターンを分析した．得られた成績は次の通りである．

1)　東洋眼虫の染色体数は雌雄共 n＝4，2n＝8である．

2)　性染色体は XY-XX 型で雄は XY，雌では XX である．

3)　X染色体は大形でアームの一端がC-バンド法により特に濃染する．Y染色体は中形で全体がC-バンド法により濃く染まる．