

Chromosomes of Three Species of Clingfishes from Japan

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Clingfishes have many specialized characters and their phylogenetic position has not been fixed (BRIGGS, 1955; GOSLINE, 1970). In Japan six genera and seven species of clingfishes have been reported (MIURA *et al.*, 1973; MASUDA *et al.*, 1975).

On the other hand, karyological approach to fish systematics has become more important. As far as we know, however, clingfish chromosomes have not been reported in the world, and we tried to observe chromosomes of clingfishes. They are small in size and difficult to experiment. Though we had been unable to obtain good chromosome figures for these three years, we could at last get those of three species, *Lepadichthys frenatus*, *Conidens laticephalus* and *Diademichthys lineatus*. Their karyotypes are described in the present paper.

Method of chromosome preparation is the same as that of ARAI and KATSUYAMA (1973). Classification of chromosomes is adopted from LEVAN *et al.* (1964). Metacentrics and submetacentrics are described as two-arm chromosomes, and subtelo-centrics and acrocentrics as one-arm chromosomes.

All the specimens used for the experiments are deposited in the fish collection of the Department of Zoology, National Science Museum, Tokyo.

Table 1. Characters of three species of material fishes.

Species	No. of fish	S.L. (mm)	Dorsal	Anal	VN
<i>Lepadichthys frenatus</i>	1	62.2	18	14	14+20
<i>Conidens laticephalus</i>	7	31.1-38.6	8-9	5-7	15+13-15
<i>Diademichthys lineatus</i>	1	56.4	15	15	17+21

Lepadichthys frenatus WAITE "Misaki-uba-uo"

(Fig. 1)

A specimen (No. E-73-21), 69.1 mm in total length, was collected at Kusugô (30°25'N, 130°36'E), Yakushima Island, off southern Kyushu (Table 1).

We could not get clear chromosome figures sufficient for determining the karyo-

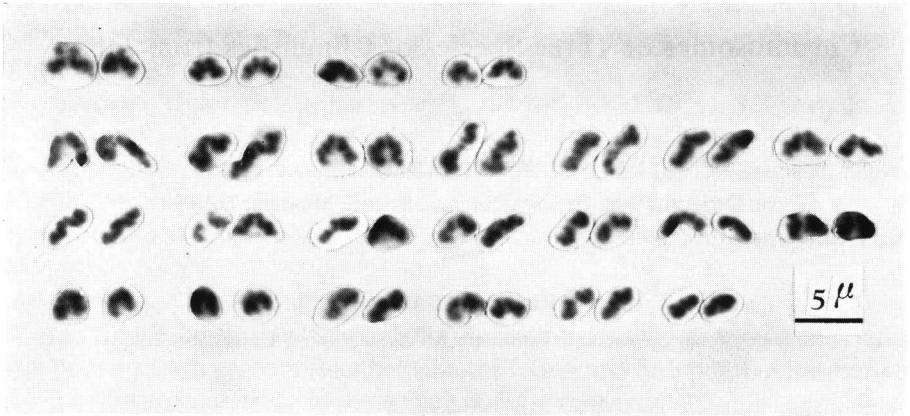


Fig. 1. Karyotype from gill epithelial cells of *Lepadichthys frenatus*, $2n=48$, $NF=56$, $\times 1770$.

type of this species. However, we tentatively report it as follows. The diploid chromosome number of this species is 48 (Table 2). The karyotype comprises 4 pairs of metacentric-submetacentric, and 20 pairs of subtelocentric-acrocentric chromosomes. The arm number is 56.

Table 2. Frequency distributions of diploid chromosome counts in material fishes.

Species	2n														Total
	38	39	40	41	42	43	44	45	46	47	48	49	50		
<i>Lepadichthys frenatus</i>									1		3			4	
<i>Conidens laticephalus</i>	1	3	4	3	21	2	1	1		1				37	
<i>Diademichthys lineatus</i>				1		2	1	1	6	10	2	1		24	

Conidens laticephalus (TANAKA) “Ankou-uba-uo”

(Figs. 2 A and C)

Seven specimens (Nos. E·81·22–E·81·27 and E·81·66), 36.1 to 43.6 mm in total length, were caught at Amatsu-kominato, Awa, Chiba Prefecture (Table 1).

As shown in Table 2, the diploid chromosome number is 42. The karyotype comprises 6 pairs of metacentric, 5 pairs of submetacentric, and 10 pairs of subtelocentric-acrocentric chromosomes. The arm number is 64. Several large metacentrics seem to be produced by centric fusion. The karyotype of this species differs from that of *Lepadichthys frenatus* by the diploid chromosome number.

Diademichthys lineatus (SAUVAGE) “Hashinaga-uba-uo”

(Figs. 2 B and D)

A specimen (No. E·52·81), 62.6 mm in total length, was collected at Kabira Bay,

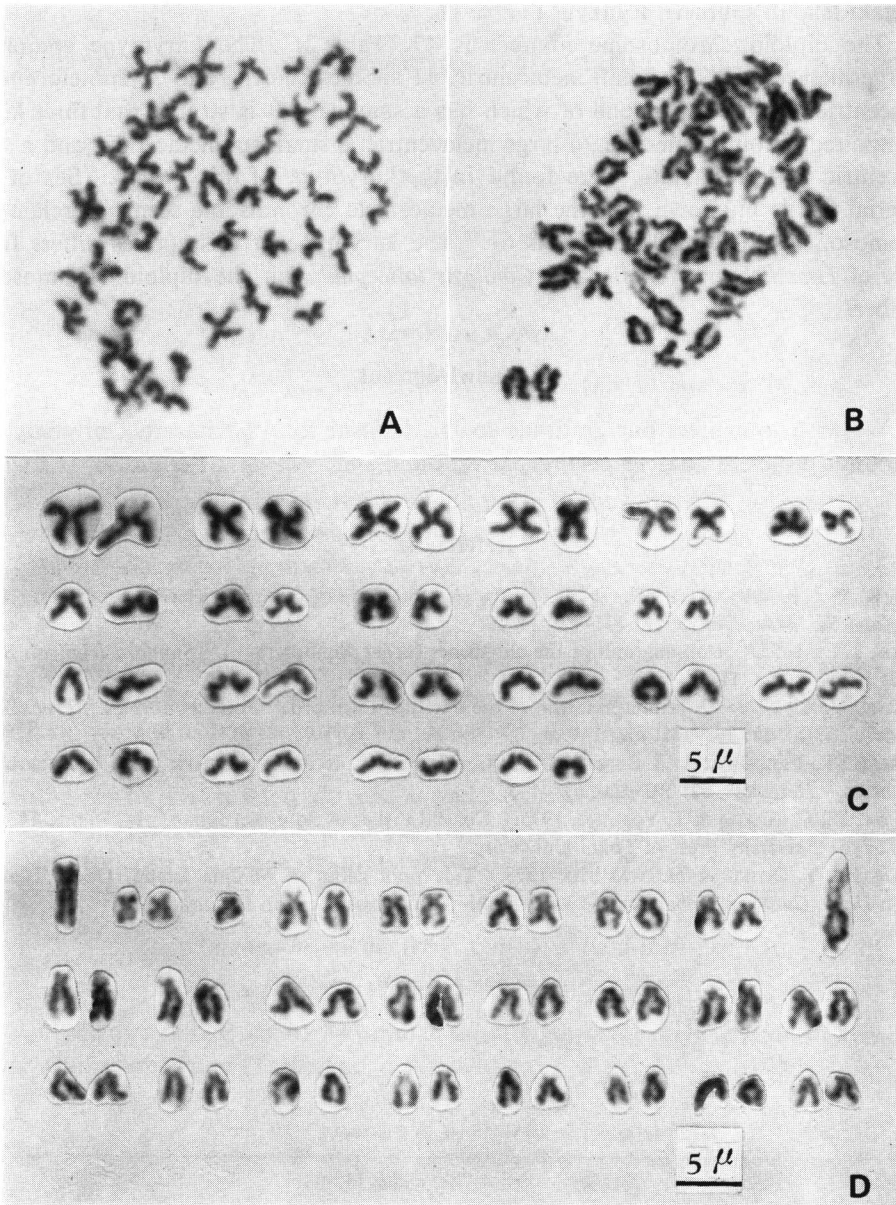


Fig. 2. Photomicrographs of mitotic metaphase chromosomes and karyotypes from gill epithelial cells of clingfishes. — A, *Conidens laticephalus*, $2n=42$, $\times 1680$; B, *Diademichthys lineatus*, $2n=47$, $\times 1750$; C, *Conidens laticephalus*, from Fig. A, $NF=64$, $\times 1680$; D, *Diademichthys lineatus*, from Fig. B, $NF=61$, $\times 1750$.

Ishigaki Island, southern Ryukyus (Table 1).

The diploid chromosome number is 47 (Table 2). The karyotype comprises a large metacentric, two small metacentric, 11 submetacentric, and 33 subtelocentric-acrocentric chromosomes, one of which has a satellite. It is strange that three kinds of unpaired chromosomes, i.e., a large metacentric, a small submetacentric and a subtelocentric with a satellite, were found in the karyotype of this species. Sex of the material fish is unknown, but the large metacentric chromosome seems to relate sex chromosomes. The arm number is 61. The karyotype of this species differs from those of *Lepidichthys frenatus* and *Conidens laticephalus* in the diploid chromosome number.

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