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Chromosomes of Two Species of Antennariid Fishes from Japan

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Recently, reports on fish chromosomes have become abruptly numerous (PARK, 1974; OJIMA *et al.*, 1976). As regards lophiiform fishes, however, no reports on their chromosomes seem to have been published in the world.

As we observed chromosomes of two Japanese species of frogfishes, *Antennarius nummifer* and *Histrio histrio,* the karyotypes of these species are described in the present paper.

Method of chromosome preparation is the same as was given in ARAI and KATSUYAMA (1973). Classification of chromosomes is adopted from LEVAN *et al.* (1964). Metacentrics and submetacentrics are described as two-arm chromosomes, and subtelocentrics and acrocentrics as one-arm chromosomes. The definition of the new arm number (NAN) is referred to ARAI and NAGAIWA (1976).

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

Antennarius nummifer (CUVIER) "Beni-izari-uo"

(Figs. 1 A and C)

A specimen (No. E·41·4), 84.0 mm in total length, was caught at Amatsu-kominato, Awa, Chiba Prefecture (Table 1).

Table 1. Characters of two species of material fishes.

Species	No. of fish	S.L. (mm)	Dorsal	Anal	VN
Antennarius nummifer	1	68.3	III, 11	7	18
Histrio histrio	1	51.1	III, 12	7	18

As shown in Table 2, the diploid chromosome number of this species is 48. The karyotype comprises 8 pairs of metacentric-submetacentric and 16 pairs of subtelocentric-acrocentric chromosomes. The arm number is 64.

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

Species	2n								Total
	42	43	44	45	46	47	48	49	
Antennarius nummifer			1	1	1	2	8		13
Histrio histrio	2	1	1	4	10	1			19

Histrio histrio (LINNAEUS) "Hana-okoze"

(Figs. 1 B and D)

A specimen (No. E·45·6), 66.6 mm in total length, was collected at Tenjin Island, Yokosuka City, Kanagawa Prefecture (Table 1).

The diploid chromosome number is 46 (Table 2). The karyotype comprises 23 pairs of subtelocentric-acrocentric chromosomes. In size, one-arm chromosomes show a gradation from largest to smallest, hence cannot be easily divided into size groups. The arm number is 46. The karyotype of this species differs from that of *Antennarius nummifer* by the diploid chromosome number as well as the arm number.

Chromosomes of Paracanthopterygii

GREENWOOD *et al.* (1966) erected the superorder Paracanthopterygii, which includes Percopsiformes, Gadiformes, Gobiesociformes, Batrachoidiformes and Lophiiformes.

As regards karyotypes of paracanthopterygian fishes, they do not seem to differ

Table 3. Chromosomes of Paracanthopterygii.

Species	2n	NF	NAN	Literature
Gadiformes				
Gadus morhua	46			NYGREN *et al.*, 1974
Micromesistius poutassou	44			NYGREN *et al.*, 1974
Pollachius pollachius	38	48	44	NYGREN *et al.*, 1974
P. virens	40	50	46	NYGREN *et al.*, 1974
Trisopterus minutus	48			NYGREN *et al.*, 1974
Raniceps raninus	48	78	48	NYGREN *et al.*, 1974
Gobiesociformes				
Lepadichthys frenatus	48	56	48	ARAI and NAGAIWA, 1977
Diademichthys lineatus	47	61	48	ARAI and NAGAIWA, 1977
Conidens laticephalus	42	64		ARAI and NAGAIWA, 1977
Batrachoidiformes				
Porichthys notatus	48	78	48	CHEN, 1967
Lophiiformes				
Antennarius nummifer	48	64	48	This paper
Histrio histrio	46	46	46	This paper

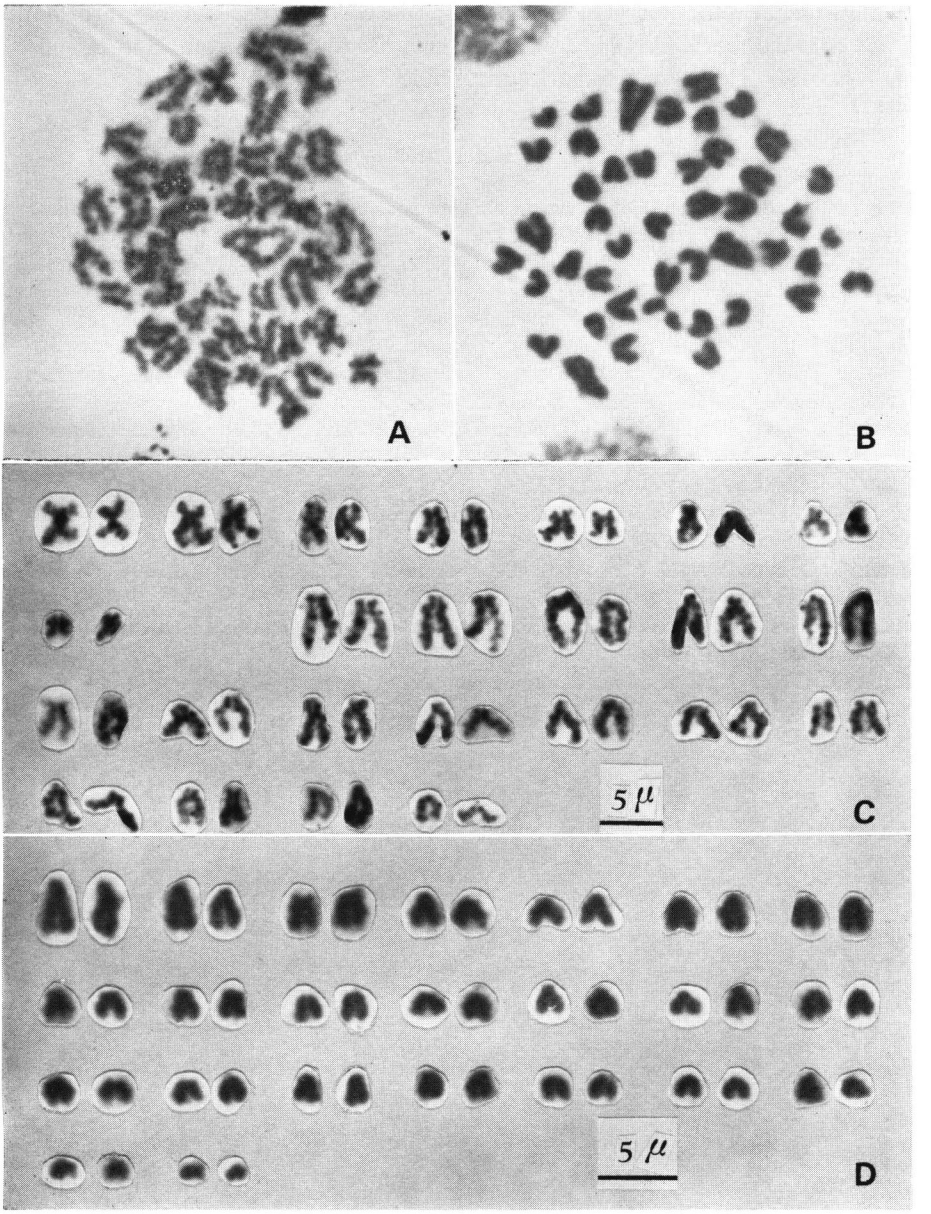

Fig. 1. Photomicrographs of mitotic metaphase chromosomes and karyotypes from gill epithelial cells of frogfishes. —— A, *Antennarius nummifer,* 2n=48, ×1610; B, *Histrio histrio,* 2n=46, ×2060; C, *Antennarius nummifer,* from Fig. A, NF=64, ×1650; D, *Histrio histrio,* from Fig. B, NF=46, ×2040.

from those of acanthopterygian fishes in diploid chromosome number, arm number, and new arm number (NAN), i.e., 2n ranges from 38 to 48, NF from 46 to 78 and NAN from 44 to 48. These are summarized in Table 3.

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