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Karyotypes of Two Sea Anemones (Cnidaria; Anthozoa) from Korea

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The chromosome numbers of two sea anemones, Anthopleura midori and A. kurogane, were determined to be 2n=18 in both by the air-drying method. The chromosomes of A. midori are all telocentric, while the first pair of chromosomes of A. kurogane is subtelocentric and the remainders are all telocentric.

Previous karyotypic studies on sea anemones have been done only with one species (Fukui, 1993) and a few of neighbored groups such as coral (Heyward, 1985) and hydroids (Niiyama, 1944; Makina, 1956; Datta 1970; Rahat et al., 1985, Kubota, 1992).

None of A. midori and A. kurogane have been karyotyped in spite of the implication in biodiversity that the two species are so common in the coastal areas of Korea (Song, 1984) and that they can represent the anthozoan fauna of Korea. Hence, the authors report chromosome numbers of the two Korean anthozoans.

Materials and Methods

Chromosomes were investigated by the modified method of the air-drying technique (Yum and Choe, 1996) on *A. midori* (23 specimens) and *A. kurogane* (19 specimens) collected from the intertidal rocky shore at Kotchi, Anmyon in April 1998. Mitotic metaphase was arrested by treating early spermatogenetic gonad with colchicine solution (0.01%) for 12-18 hours prior to soaking in 0.75 mol/L KCl solution for hypotonicity. Levan et al. (1964) was followed for the karyotype.

Results

Anthopleura midori Uchida, 1958

Karyotypes obtained from thirteen metaphases were characterized by chromosome size and centromeric position (Table 1). The diploid number turned out to be 2n=18 (Fig. 1A). The chromosome complements were all telocentric to be expressed accordingly as 9t.

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Anthopleura kurogane Uchida, 1958

Results of seventeen metaphase chromosome analyses are shown in Table 1. The diploid number turned out to be 2n=18 (Fig. 1B). The karyotype of *A. kurogane*

Table 1. Chromosome measurements and morphology of *Anthopleura midori* and *A. kurogane*

Species	Chromosome No	Relative length Mean (±SD)	Arm ratio	Morphology
A. midori	1	14.5 (1.6)	-	T
	2	13.5 (3.1)	-	T
	3	12.4 (1.7)	-	T
	4	17.8 (2.8)	-	T
	5	10.6 (4.1)	-	T
	6	10.1 (2.4)	-	T
	7	9.6 (1.8)	-	T
	8	9.2 (3.2)	-	T
	9	8.3 (2.8)	-	T
A. kurogane	1	43.1 (3.6)	3.5	ST
	2	39.5 (1.8)	-	T
	3	37.8 (1.5)	-	T
	4	35.1 (2.4)	-	T
	5	33.3 (3.0)	-	T
	6	32.2 (1.0)	-	T
	7	30.5 (3.4)	-	T
	8	27.8 (2.1)	-	T
	9	26.0 (2.9)	-	T

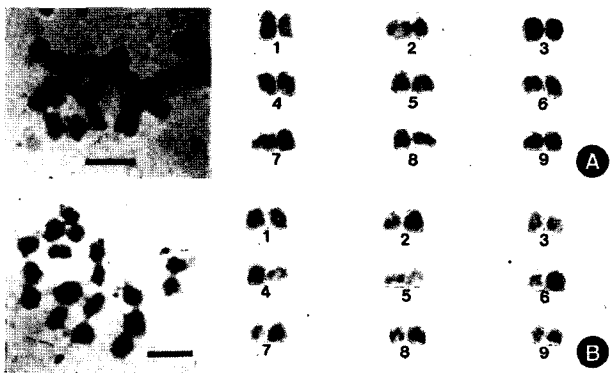

Fig. 1. The metaphases and karyotypes of *Anthopleura midori* (A) and *A. kurogane* (B). Scale bars=5 μm.

could be expressed as 1st and 8t, which consisted of 1 pair of subtelocentric (1) and 8 pairs of telocentric (2, 3, 4, 5, 6, 7, 8, and 9) chromosomes.

Discussion

Karyotypical data can be applied to taxonomy studies. The two species reported here have similar features and habitat along the Korean coast. Both have the same number and similar morphology of chromosomes. The only morphological difference is the first pair chromosome, which is subtelocentric in *A. kurogane*, and telocentric in *A. midori*. It can be suggested that a very close evolutionary relationship must be present between these two species.

This study showed difference in chromosome number from that (2n=32) of *Haliplanella luciae* (Fukui, 1993). In the case of hydroids, one could see the variable chromosome numbers from n=6 to n=16. Taken together, the results lead us to suggest the possibility of variability in chromosome number among actiniarian species.

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References

Datta M (1970) Somatic chromosomes in two species of *Hydra*. *Nucleus* 13: 132-135.

Fukui Y (1991) Embryonic and larval development of the sea anemone *Haliplanella lineata* from Japan. *Hydrobiologia* 216/217: 137-142.

Fukui Y (1993) Chromosomes of the sea anemone *Haliplanella luciae* (*H. lineata*) (Coelentaerata: Actiniaria). *J Mar Biol Ass U K* 73: 971-973.

Heyward AJ (1985) Chromosomes of the coral *Goniopora lobata* (Anthozoa: Scleractinia). *Heredity* 55: 269-271.

Kubota S (1992) Chromosome number of a bivalve-inhabiting hydroid, *Eugymnanthea japonica* (Leptomedusae: Eirenidae) from Japan. *Pub Seto Mar Biol Lab* 35: 383-386.

Levan A, Fredga K, and Sandberg AA (1964) Nomenclature for centromeric position on chromosomes. *Hereditas* 52: 199-219.

Makina S (1956) A Review of the Chromosome Number in Animals. Hokuryukan, Tokyo, pp 1-3.

Niiyama H (1944) A study on chromosomes in Hydra. *Cytologia* 13: 204-209.

Rahat A, Rahat M, and Searle JB (1985) A simple method for the preparation of hydra chromosome spreads: introducing chromosome counts into hydra taxonomy. *Experientia* 41: 282-283.

Song JI (1984) A systematic study on the Korean Anthozoa. 8. Actinaria (Hexacorallia). *J Korean Res Inst Bet Liv Ehwa Womans Univ Seoul* 34: 69-80.

Yum SS and Choe BL (1996) The chromosomes of four chiton species (Polyplacophora) *Korean J Malacol* 12: 133-140.

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