NOTES

CHROMOSOME COMPLEMENT OF THE INDIAN PEARL OYSTER *PINCTADA FUCATA* (GOULD)

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ABSTRACT

The chromosome number (n = 14, 2n = 28) of the Indian pearl oyster *Pinctada fucata* (Gould) is reported for the first time. It conforms with the chromosome number reported for *P. fucata martensii* from Japan and *P. imbricata* from the Atlantic. It is suggested that, as in the cases of *Crassostrea* spp., genus *Pinctada* may exhibit conservativeness in chromosome number.

The recent development of hatchery technology for production of spat of the Indian pearl oyster, *Pinctada fucata* (Gould), has opened up the possibilities for genetic studies on the species through breeding programmes (Alagarswami et al 1983). Considering it essential to establish the karyotype of the species as a pre-requisite for further genetic work, a study on the number and gross morphology of the chromosomes of *P. fucata* was taken up. The karyotype of the Japanese pearl oyster, *P. fucata martensii,* had been established by Inaba and Ieyama (1973), Wada (1976) and Komaru and Wada (1985).

The aceto-orcein squash method on eggs had been widely used in the karyotype studies on marine pelecypods (Menzel and Menzel 1965, Longwell et al 1967, Ahmed and Sparks 1967, Wada 1976). Adult males and females of *P. fucata* collected from the pearl banks of Gulf of Mannar, off Tuticorin, were thermally induced to spawn in the experimental hatchery. Preparations of fertilized and unfertilized eggs and cleavage stages were made by fixing the material in Carnoy's fluid (ethanol:acetic acid = 3:1). Colchicine metaphases were induced in cleaving eggs by treating in filtered seawater containing colchicine (0.01%) for 30 min. Chromosome squashes of the eggs were prepared on slides in 1% aceto-orcein stain (2-5 min.) under a coverglass. Permanent mounts were made with euparal. The chromosomes were examined under Olympus tri-

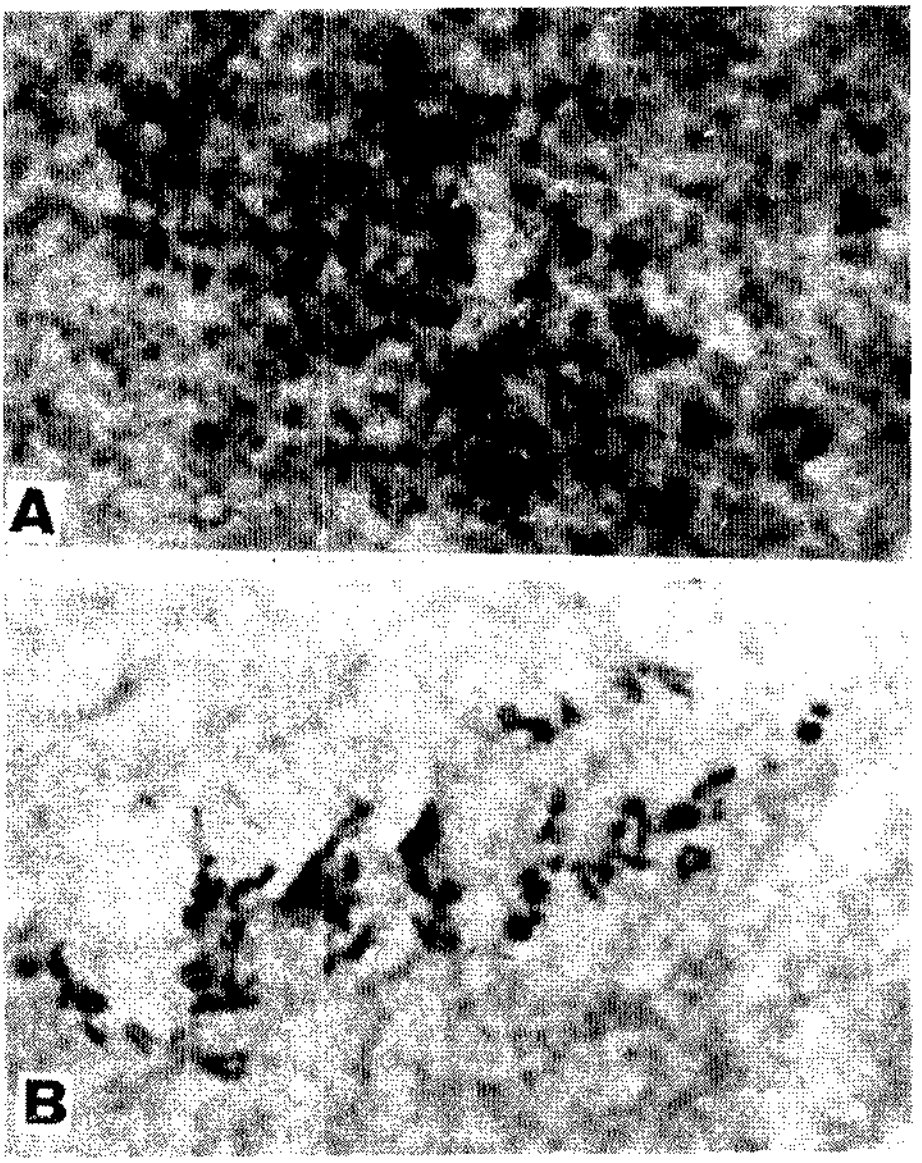

PLATE I. A. Chromosomes in meiotic metaphase I of fertilised egg of *Pinctada fucata*. B. Chromosomes in mitotic metaphase of colchicine-treated embryo of *P. fucata*.

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nocular microscope and photographs taken. Camera-lucida drawings were made with plain-top mirror. Several slides were examined to study the number and gross morphology of the chromosomes.

A spread-out of chromosomes in the metaphase I of fertilized egg is shown in Pl. I, A. The chromosomes in metaphase II are shown in Fig. 1.

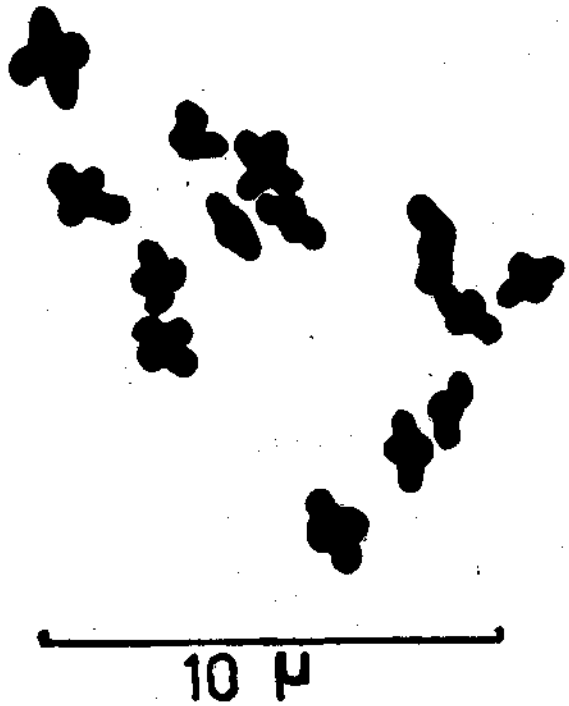

FIG. 1. Chromosomes in meiotic metaphase II of fertilised egg of *Pinctada fucata*.

Fourteen chromosomes have been counted in these plates. In the Colchicine-treated embryos, the chromosome number is 28 in the mitotic metaphase (Pl. I, B). The chromosome number n = 14, 2n = 28, has been confirmed based on examination of several well-spread plates. In this preliminary study, the karyotype of *P. fucata* could not be constructed as the chromosome arms could not be measured correctly. However, the chromosomes have appeared to be mainly metacentric or sub-metacentric.

Ojima and Maeki (1955) had observed 18 haploid chromosomes in *Pinctada martensii* (= *P. fucata*). Tranter (1958) had reported that the haploid number of *Pinctada albina* had been approximately 10. For the first time, Inaba and Ieyama (1973) observed the chromosome number as haploid 14 and diploid 28 in *P. fucata* of Japan. Subsequently, Wada (1976) confirmed this through

the aceto-orcein squash of eggs of *P. fucata* from two regions in Japan, Ago Bay and Koshiki Island, and found that there was no difference in chromosome number between those collected from the two places. Adopting the chopping method on the trochophore larvae of *P. fucata martensii*, Komaru and Wada (1985) determined the karyotype of the species and found that, out of the 14 pairs, 11 pairs were metacentrics or sub-metacentrics, two were sub-metacentrics or sub-telocentrics and one was telocentric.

It is observed now that the pearl oyster *P. fucata* from the Indian region has the same chromosome number as that of the species from Japan ($n = 14$, $2n = 28$). Wada (1978) stated that *P. imbricata* from the Atlantic too has the same number. The observation of Tranter (1958) on *P. albina* from Australia referred to earlier was incidental, based on gonad sections. Patterson (1969) noted that most species of oyster *Crassostrea* from different regions have 10 pairs of chromosomes, thereby exhibiting conservativeness. This phenomenon may equally be true to the pearl oyster of genus *Pinctada*.

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References

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