CYTOGENETIC CHARACTERIZATION OF *NODIPECTEN NODOSUS* EMBRYOS (BIVALVIA: PECTINIDAE) FROM SOUTH ATLANTIC COAST OF BRAZIL

CARACTERIZACIÓN CITOGENÉTICA DE EMBRIONES DE *NODIPECTEN NODOSUS* (BIVALVIA: PECTINIDAE) DE LA COSTA SUDATLANTICA DEL BRASIL

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Additional keywords

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Palabras clave adicionales

Cromosomas. Bivalvos.

SUMMARY

Cytogenetic studies from embryos of *Nodipecten nodosus* revealed a modal diploid number equal to 38 chromosomes. The karyotype showed six submetacentric chromosome pairs and seven subtelocentric chromosome pairs. Chromosomal homologies were inferred on the basis of relative lenght arm ratio.

RESUMEN

Estudios citogenéticos de embriones de *Nodipecten nodosus* revelaron un número modal igual a 38 cromosomas. El cariotipo mostró seis pares de cromosomas submetacéntricos. Las homologías cromosómicas fueron inferidas a partir de la relación de longitud relativa del brazo.

INTRODUCTION

During the last few years, the study of bivalvia karyotypes has awaked the interest of several researches, and various species have been studied, specially species related to oestrea. However, the chromosome data collected for Pectinidae from South Atlantic Ocean are still rare.

The importance of knowledge of detailed karyotypic studies may contribute to several areas of aquaculture. One obvious example consists in the identification of species, hybrids or more rarely populations, but the particular importance may be the aplication of polyploidy and gynogenesis in aquaculture (Moynihan and Mahon, 1983).

The present study concerns to a report of the chromosome number and initial analysis of the karyotype of *Nodipecten nodosus* from the South Atlantic coast.

MATERIAL AND METHODS

Embryos of 6-8 hours after artificially fertilized eggs, from *Nodipecten nodosus* **(figure 1)**, were obtained from the marine laboratory Dr. Eduardo Uribe Tapia, Angra dos Reis, Rio de Janeiro, Brazil. Mitotic chromosome preparations were prepared according to the following technique: embryos were transfered to 0.01 p. cent colchicine in seawater for 1:30 min at 25-28°C. Embryos were removed and placed in 0.8 p. cent sodium citrate for 45 min. Fixation was carried out by transference embryos in freshly made solution 3:1 of absolute methanol: glacial acetic acid and submiting them to centrifugation at 800rpm during 10 min. Each sample was submited to three changes of fixative of 10 min duration each. Slides were prepared according to the air-drying method of Egozcue (1971) modified by Bertollo (1978). For karyotypic analysis 6 metaphases were photographed after the modal diploid number had been established. Chromosome pairs were classified according to centromere position (Levan *et al.*, 1964) as metacentric (M), submetacentric (SM), wich refer to biarmed chromosomes and subtelocentric (ST) wich refer to monoarmed chromosomes.

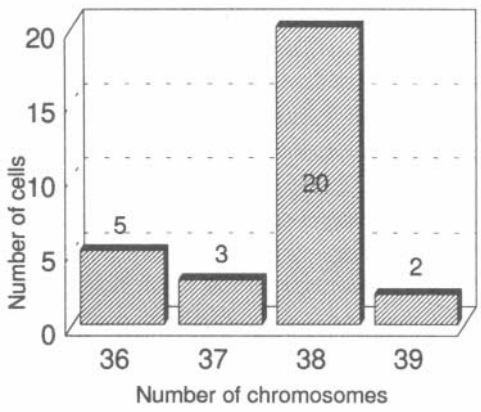

Figure 1. *Diploid number frequencys observed in rnitotic metaphase from* Nodipecten nodosus *embryos.* (Frecuencias del número diploide observadas en la metafase mitótica de embriones de *Nodipecten nodosus*).

RESULTS

The modal diploid number equal to 38 chromosomes **(figure 1)** were determined from 30 cells count from 27 embryos. **Figure 2** shows a representative karyotype of *N. nodosus* (A), and a mitotic metaphase (B) near a morphological structure of an embryo. The karyotype showed three morphological categories: six submetacentric pairs, six metacentric pairs and seven subtelocentric pairs. Chromosomal homologies were inferred on the basis of relative length arm ratio.

Only in a few metaphases, two short secondary constrictions in the submetacentric chromosome group were visible.

DISCUSSION

Although more extensive studies of chromosome number in *Nodipecten nodosus* are necessary, the initial study indicates a diploid number of 38 chromosomes. All kariotypes analysed were show to consist of six metacentric chromosomes. However the number of submetacentric and subtelocentric chromosome pairs varied among cells from different embryos. This variability

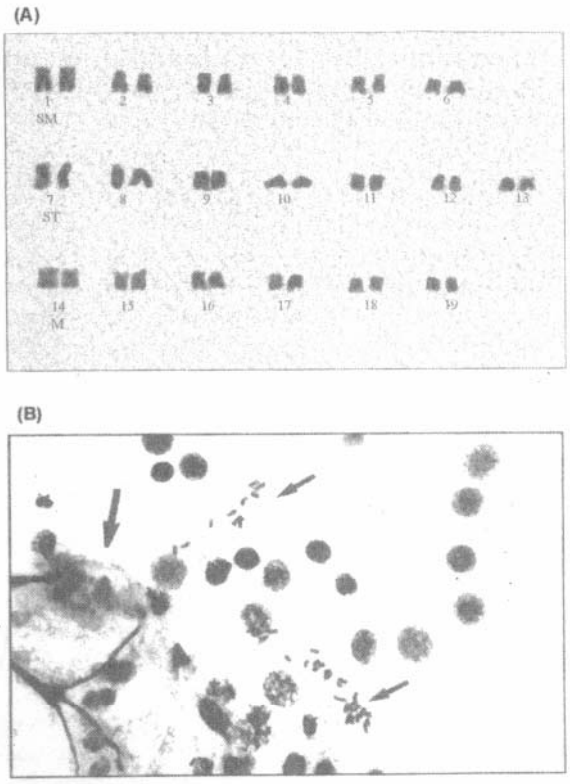

Figure 2. *(A) Karyotype of* Nodipecten nodosus *chromosomes. (B) Somatic metaphase (showing by small arrows) of a embryo from* N. nodosus. ((A) Cariotipo de cromosomas de *Nodipecten nodosus*. (B) Metafase somática (indicada por pequeñas flechas) de un embrión de *N. nodosus*).

could be atributed to pericentric inversions, affecting chromosome structure but involving no alterations in chromosome number. Similar variability was reported by Ahmed and Sparks (1970) using squash preparations of embryos of *M. edulis* and *M. californianus*.

Thorgaard (1976) reported an intra individual Robertsonian in the rainbow trout, although Moynihan and Mahon (1983) described that there was no evidence of that in mollusks so far.

Since the morphological differences observed among the submetacentric and the subtelocentric chromosomes pairs in *N. nodosus* are so near the limit that distinguish the two morphological categories, we think that the few observed differences could be associated with differential contraction of long and short arms of the chromosomes envolved. So, highly contracted chromosomes tend to have their centromeres more median than less contracted cells. Sasaki (1961) and Ledley *et al.* (1972), atributed to

differential contraction rather than to any structural changes, the few observed morphological chromosome differences.

Future studies with more samples of *N. nodosus* and with other species might indicate whether the morphological and karyotypic differences observed in the present study will be maintened among *N. nodosus*, and banding technique would allow us to confirm the definitive karyotype.

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