

CHROMOSOME NUMBER OF TWO COLOR TYPES OF THE DALL'S PORPOISE*

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Dall's porpoises, *Phocoenoides dalli* True, 1885, are commonly distributed in the entire subarctic North Pacific Ocean, Sea of Japan, Sea of Okhotsk and Bering Sea. Of the two major color types known to this species, the *dalli*-type is widely distributed in the subarctic North Pacific Ocean including Sea of Japan, Sea of Okhotsk and Bering Sea. Whereas the *truei*-type is mainly distributed in areas off the Pacific coast of southern Kuril Islands and northern Japan, although some sporadic sightings have been recorded from offshore western North Pacific and Bering Sea (Nishiwaki, 1967; Kasuya 1978; Morejohn, 1979; Kasuya and Jones, 1984; Miyazaki, Jones and Beach, 1984).

Makino (1948) studied chromosomes of a male *P. dalli* using traditional sectioning of testis tissue. Since it was generally accepted in those days that the two color morphs represent separate species (Kuroda, 1954; Houck, 1976), his study was possibly based on the present "*dalli*-type" individuals. The present paper is a preliminary report of a study conducted to further investigate the chromosomal differences between the two color types of the Dall's porpoise.

Materials are ten *dalli*-types (five males of 97 to 156 cm and five females of 68 to 127 cm in body length) and six male *truei*-types (182.1 to 220 cm in body length) taken in May and June 1984 by the RV *Hoyo Maru No. 53* chartered by the Japan Fisheries Agency. Immediately after catching the animals, pieces of gonad, liver and kidney were removed and fixed with acetic alcohol (acetic acid 1 : ethanol 3). These materials were smeared with aceto-iron-haematoxylin-chroral hydrate solution recommended by Wittmann (1965). The metaphase nuclei available for the chromosome count were obtained only in the testis from each two males of *dalli*- and *truei*-types (Table 1).

In both color types, we found very easily the same chromosome number of $2n=44$ in the spermatogonial metaphase and $n=22$ in the secondary spermatocyte metaphase (Figs 1 and 2). The chromosome numbers in many delphinids have been reported as $2n=44$ including characteristic X Y chromosome (Makino, 1948; Wallen and Madin, 1965; Tsuchiya, 1979;

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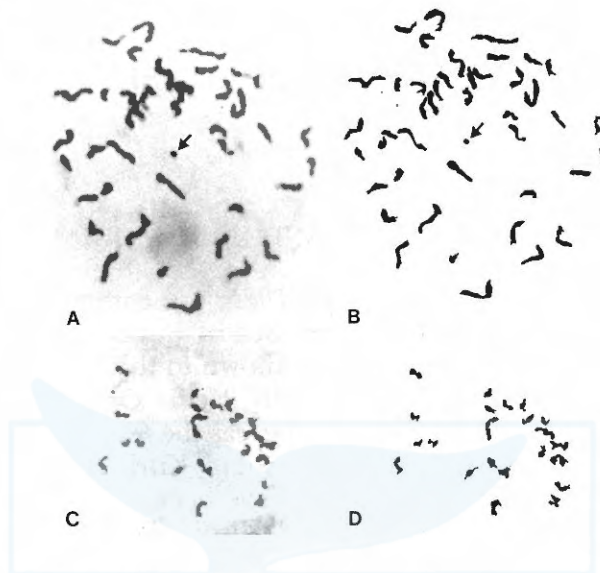


Fig. 1. Chromosomes of Dall's porpoise. $\times 960$
 The small chromosome in A and B is indicated by an arrow.
 A. Spermatogonial metaphase.
 B. Drawing of A.
 C. Secondary spermatocyte metaphase.
 D. Drawing of C.

TABLE 1. DATA OF DALL'S PORPOISE SPECIMENS AND THEIR CHROMOSOME NUMBERS

| Color type | Sex | Body length (cm) | Body weight (kg) | collected on | collected at | Chromosome number | |
|--------------------|------|------------------|------------------|--------------|------------------|-------------------|----|
| | | | | | | 2n | n |
| <i>dalli</i> -type | Male | 200 | 164 | May 16 | 46°48'N 157°18'E | 44 | 22 |
| | Male | 195 | 142 | May 17 | 48°37'N 164°68'E | 44 | 22 |
| <i>truei</i> -type | Male | 216 | 159 | May 12 | 38°31'N 150°17'E | 44 | 22 |
| | Male | 201.5 | 123 | June 14 | 41°31'N 151°29'E | 44 | 22 |

Arnason, 1981; Stock, 1981). Our observations in the testis were not enough to discriminate such X Y elements, nevertheless, as seen in Fig. 1 (A and B) and Fig. 2 (A and B), spermatogonial metaphase in the both types comprised extremely small rod-shaped chromosome resembling Y element pointed out by Makino (1948) in *dalli* (True).

The chromosome number of $2n=44$ is uniform in all phocoenids, del-

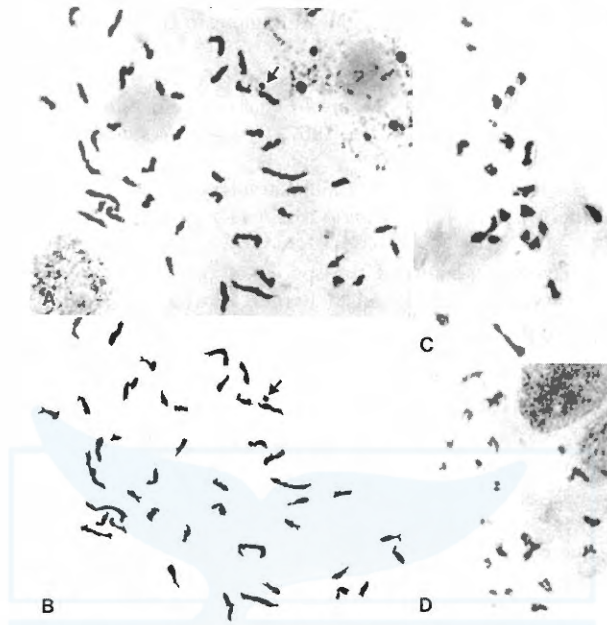


Fig. 2. Chromosomes of *truei*-type Dall's porpoise. $\times 960$
 The small chromosome in A and B is indicated by an arrow.
 A. Spermatogonial metaphase.
 B. Drawing of A.
 C and D. Secondary spermatocyte metaphase.

phinids and monodontids studied in the past (Makino, 1948; Wallen and Madin, 1965; Duffield, Ridgway and Sparkes, 1967; Andrews, Dill, Masui and Fisher, 1973; Arnason, 1974; Tsuchiya, 1979). In the above groups, the killer whale in delphinids has quite different chromosomal morphology from other species (Carr, Singh, Miller and McGeer, 1966; Horrall, Taylor and Taylor, 1968; Kulu, Veomett and Sparkes, 1971).

Since Makino's (1948) work, no other studies on the chromosome of Dall's porpoises have been done. Therefore, further chromosomal studies must be needed to know the strict intra-specific relationship between two color-types of the Dall's porpoise.

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