The Number of Chromosomes in some Species of *Porphyra*

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The number of chromosomes in five species of *Porphyra* from Hokkaido are reported in the present paper. The materials used for the present study were collected at the following localities:

P. amplissima – at Nosappu, in the province of Nemuro, on August 2, 1966;
P. moriensis – at Mori, in the province of Oshima, on April 8, 1965;
P. pseudocrassa – at Akkeshi, in the province of Kushiro, on October 19, 1964 and on August 1, 1966;
P. pseudolinearis – at Hakodate, in the province of Oshima, on March 2, 1965 and on February 23, 1967;
P. umbilicalis f. *linearis* – at Kushiro, in the province of Kushiro, on July 28, 1966.

Of these species, *P. umbilicalis* f. *linearis* is the only species that has ever been treated cytologically (cf. YABU & TOKIDA, 1963, Table 1).

The materials were fixed late at night after being kept alive in vats filled with filtered sea-water. *P. moriensis* was fixed with Navashin's fluid, cut into pieces 3μ thick by the paraffin method, and stained with Heidenhain's haematoxylin. Wittmann's smear method (WITTMANN, 1965; YABU & TOKIDA, 1966) was used on *P. amplissima* and *P. umbilicalis* f. *linearis*, and both the paraffin and the smear methods were used on *P. pseudocrassa* and *P. pseudolinearis*. The nuclei and chromosomes usually appear smaller in the preparations made by the paraffin method than in those by the smear method.

The number of chromosomes found in each of the five species are as follows:

P. amplissima — n=3, 2n=6;
P. moriensis—n=4, 2n=8;
P. pseudocrassa—n=3, 2n=?;
P. pseudolinearis—n=4, 2n=?;
P. umbilicalis f. *linearis*—n=4, 2n=8.

The haploid chromosome numbers were counted in the miotsis of vegetative cells of leafy thalli and in the mitosis leading to spermatium-formation, while the diploid numbers were counted in the mitosis of fertilized carpogonia and their daughter cells. Unfortunately, no good mitotic figures could be observed in the female fertile area of *P. pseudocrassa* and *P. pseudolinearis*, probably because they were collected at an unfavorable time.

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Reference

YABU, H. & TOKIDA, J. (1963). Mitosis in *Porphyra*. *Bull. Fac. Fish. Hokkaido Univ.* (3), 131-136.

——— & ——— (1966). Application of aceto-iron-haematoxylin-chloral hydrate method to chromosome staining in marine algae. *Bot. Mag.*, Tokyo 79 (937), 381.

WITTMANN, W. (1965). Aceto-iron-haematoxylin-chloral hydrate for chromosome staining. *Stain Tech.* 40 (3), 161–164.

Explanation of Plates

PLATE I

Porphyra umbilicalis (L.) f. *linearis* (GREVILLE) HARVEY

Photomicrographs of cells stained by the smear method showing nuclear divisions in spermatium- and carpospore-formation

Figs. A-G. Showing haploid chromosomes (n=4) in the division leading to spermatium-formation

Figs. H-J. Showing diploid chromosomes (2n=8) in the division leading to carpospore-formation

(Figs. A-J, × 1230)

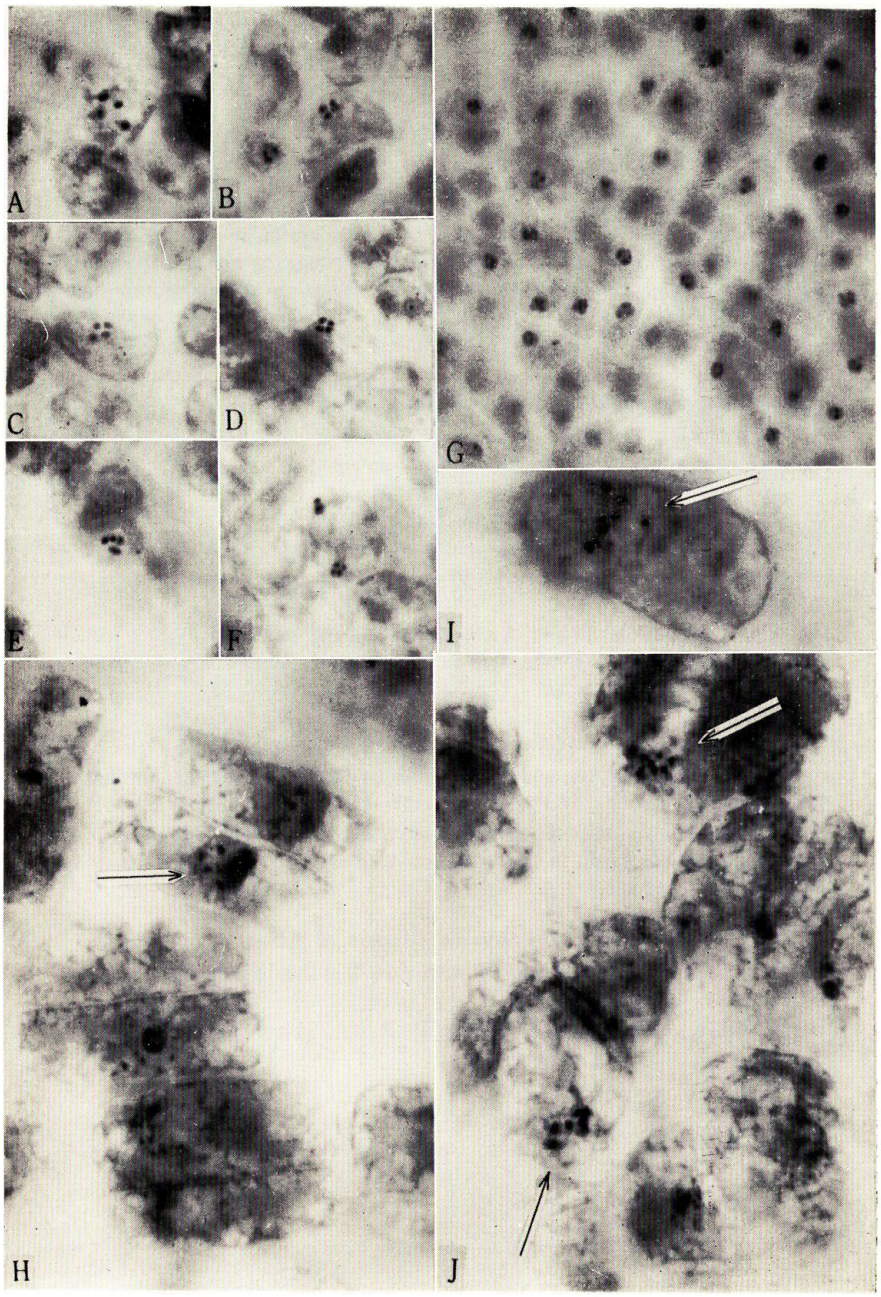

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PLATE II

Photomicrographs of cells stained by the paraffin method (Figs. A-C, F, G) and by the smear method (Figs. D,E,H-J) showing nuclear divisions in metaphase in vegetative cells and in spermatium- and carpospore-formation

Porphyra pseudolinearis UEDA

Figs. A-C. Showing haploid chromosomes (n=4) in the division leading to spermatium-formation; by the paraffin method

Figs. D & E. Showing haploid chromosomes (n=4) in the division leading to spermatium-formation; by the smear method

Porphyra moriensis OHMI

Fig. F. Showing haploid chromosomes (n=4; not clearly shown in this photograph) in the division leading to spermatium-formation; by the paraffin method

Fig. G. Showing diploid chromosomes (2n=8; not clearly shown in this photograph) in the division leading to carpospore-formation; by the paraffin method

Porphyra amplissima (KJELLMAN) SETCHELL et HUS

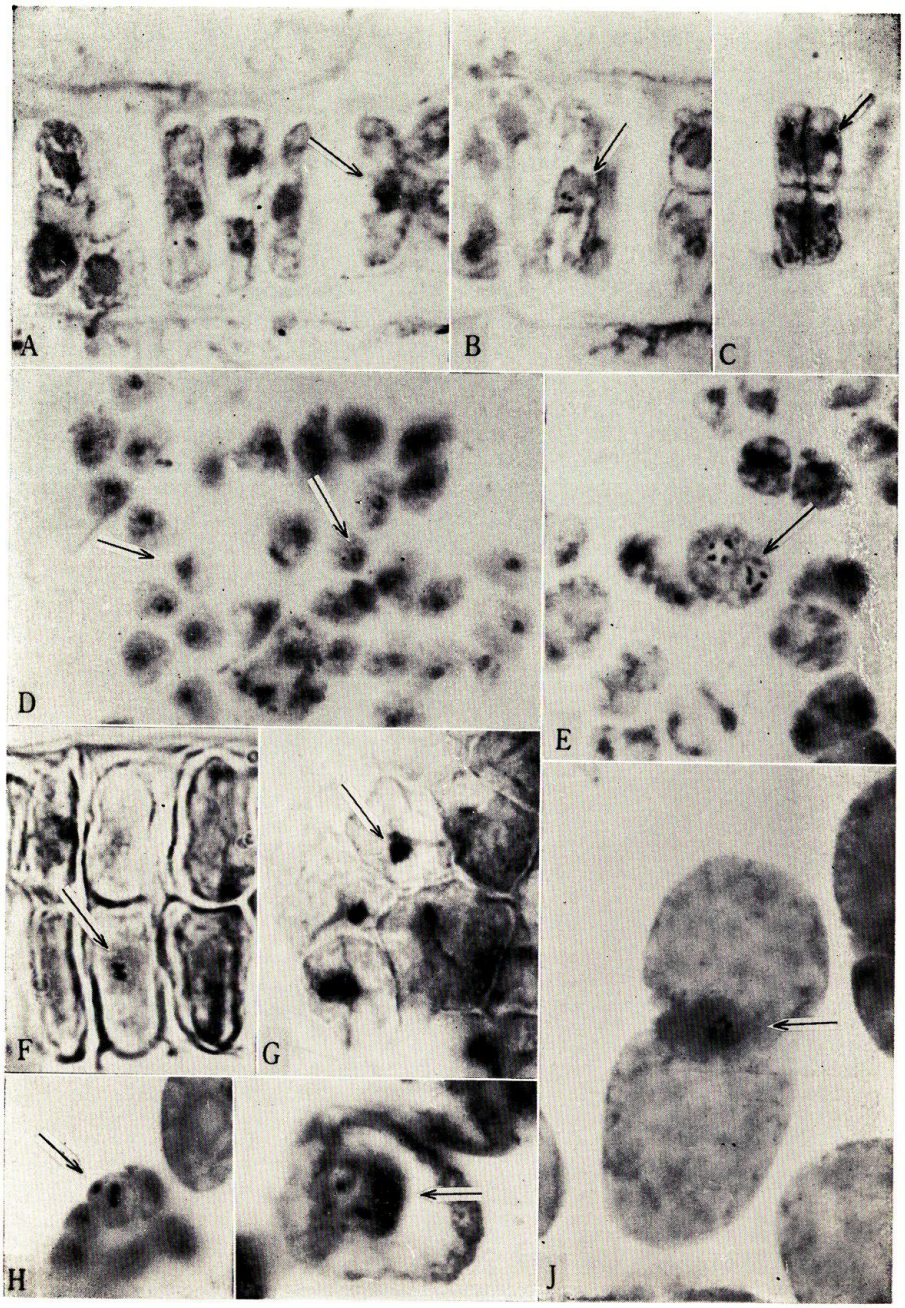
Fig. H. Showing haploid chromsomes (n=3) in the division leading to spermatium-formation; by the smear method

Fig. I. Showing diploid chromosomes (2n=6; only four chromsomes are seen in the photograph) in the division leading to carpospore-formation; by the smear method

Porphyra pseudocrassa YAMADA et MIKAMI

Fig. J. Showing haploid chromosomes (n=3) in the division of a vegetative cell; by the smear method

(Figs. A-C, F-I, × 1230; Figs. D, E, J, ×1120)



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