

## ***Chlorokardion salinarum* sp. n. from Hungary (Xanthophyceae, Chloramoebales)**

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**Abstract** — A new species found in a sodic leaching solution of uranium ores was studied. *Chlorokardion salinarum* sp. n. differs from its congeners by the dimensions, the number of chloroplast, the presence of stigma and the biotope. Different stadia of its life cycle and the multiplication were also observed. With 1 figure.

The genus *Chlorokardion* was established by PASCHER in 1930, and within the family Chloramoebaceae it was separated from the others by characteristic morphological features: the dorsiventral heart-like shape with cavity at the front end; the amoeboid change of form; the two unequal flagella, and the multiplication by longitudinal bipartition of the cells. The products of assimilation are fat, oil and sometimes chrysolaminarin. The only species, belonging to this genus was identified from dystrophic water of pH 4.8–6.2 (PASCHER 1930).

*Chlorokardion pleurochloron* PASCH. is 12–16  $\mu\text{m}$  long and 8–12  $\mu\text{m}$  wide, exhibiting the characteristics of the genus, possessing three (sometimes two or four) chloroplasts. The daughter cells have chloroplasts in different numbers (usually only one).

The specimens of *Chlorokardion salinarum* sp.n. was found in the leaching solution of uranium ores. The leaching system, formed on the top of the ore's prisms, is considered ecologically as shallow pools with high ion-concentration. Cultures were made with Bold's Basal Medium (STEIN 1973) at room temperature. The morphology of the alga was studied in fresh samples and in liquid medium, too.

### ***Chlorokardion salinarum* sp. n.**

Cellulae mobile, biflagellatae; formam cardis habent, cellulae szarum applanatae; membrana cellularum nuda. Flagella inaequa; cellulae 5–6.3  $\mu\text{m}$  long., 3.6–4.5  $\mu\text{m}$  diam., uninucleatae; chromatophorum unum, parietale, colore prasino habent, chloroplasta sunt stigmata; oleum existit. Reproductio asexualis, cellulae per longitudinem in duas partes dividuntur. — Habitat: in aqua salsa, Pécs.

The motile individuals are unicellular and exhibit many of the characteristics of the genus. The cells are 5–6.3  $\mu\text{m}$  long and 3.6–4.5  $\mu\text{m}$  wide. They have slightly flattened, more or less rounded form from the front, and they have a heart-like shape (the apical end is obliquely truncated) in lateral view. In cross-section the cells appear as a curved coin. Two unequal flagella arise from the cavity of the front end, one is 3–4 times longer than the other. The periplast is thin, the individuals exhibit amoeboid change of the shape. Contractile vacuole has not been observed, owing to the quick motion of the cells. The motile unicells possess one (sometimes two) chloroplast of a yellow-green colour, but the yellow colour is dominant. The chloroplasts are stigmated. The products of photosynthesis are stored as oil and fat appearing as smaller or bigger bright refractive bodies at the front end.

The method of multiplication appears to be by longitudinal division during the non-motile stadium.

The non-motile cells possess a thicker wall and ovale shape, but sometimes can be seen rectangular form also. The number of chloroplasts may be from one to four, and they have a characteristic yellow-brownish colour. Bright bodies occur in this stadium as well. The longitudinal division of the cells was observed many times in liquid medium.

*Chlorokardion salinarum* sp. n. is ranged as the second species of the genus *Chlorokardion*, owing to its characteristic shape, unequal flagella arising from the truncated front end, the colour of the chloroplast, the amoeboid change of shape and its reproduction. Although there are other motile forms, e.g. *Ochromonas*, but there no endogenously produced cyst was observed.

The new alga species differs from *Chlorokardion pleurochloron* PASCH. by its dimensions, the number of chloroplasts, the presence of stigma and the biotope in which the examined species occurs.

*Chlorokardion salinarum* sp. n. was observed in the sodic leaching solution of uranium ores first in 1979 then again in 1980. The motile unicells appeared in a large population, lending the water a pale yellow-green colour. The invasion lasted for one week, thereafter the individual number decreased rapidly. The characteristic yellow colour was due to the high ion-concentration, and to the abundance of carotenoid pigments. NIXON (1974) supposed on the basis earlier studies (FOGG 1953; DUNDAS & LARSEN 1962, 1963) the function of the carotenoids to be a protection device of the chlorophyl against photo-oxidation under very high light intensity, partly to evolve mechanisms to utilize as much energy as is available to the system.

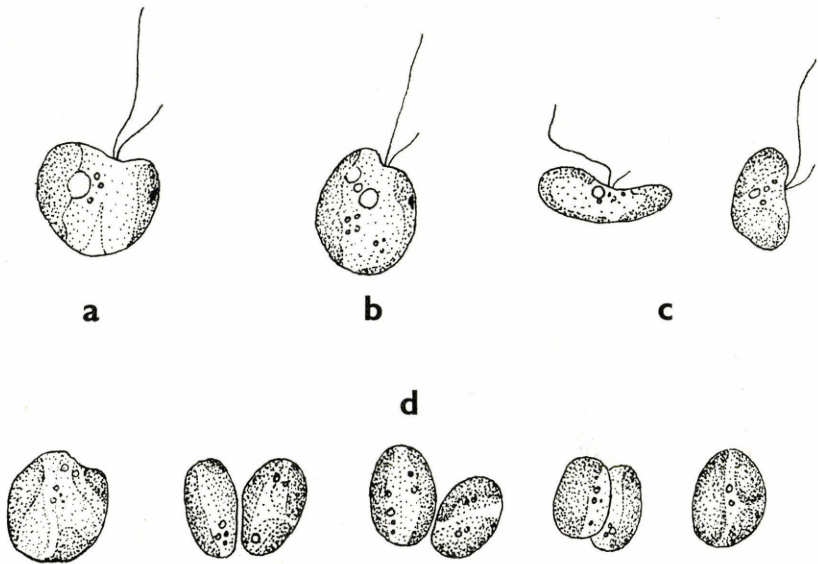


Fig. 1. *Chlorokardion salinarum* sp. n.: a = frontal view, b = lateral view, c = cross-section, d = non-motile cells

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