

**Studies on the genetic variation of the green unicellular alga *Haematococcus pluvialis* (Chlorophyceae) obtained from different geographical locations using ISSR and RAPD molecular marker.**

**ABSTRACT**

*Haematococcus pluvialis* (Flotow) is a unicellular green alga, which is considered to be the best astaxanthin-producing organism. Molecular markers are suitable tools for the purpose of finding out genetic variations in organisms; however there have been no studies conducted on ISSR or RAPD molecular markers for this organism. The DNA of 10 different strains of *H. pluvialis* (four strains from Iran, two strains from Finland, one strain from Switzerland and three strains from the USA) was extracted. A genetic similarity study was carried out using 14 ISSR and 12 RAPD primers. Moreover, the molecular weights of the bands produced ranged from 0.14 to 3.4 Kb. The PCA and dendrogram clustered the *H. pluvialis* strains into various groups according to their geographical origin. The lowest genetic similarity was between the Iran2 and USA2 strains (0.08) and the highest genetic similarity was between Finland1 and Finland2 (0.64). The maximum numbers of bands produced by the ISSR and RAPD primers were 35 and 6 bands, respectively. The results showed that ISSR and RAPD markers are useful for genetic diversity studies of *Haematococcus* as they showed geographical discrimination.

**Keyword:** Genetic diversity; *Haematococcus*; ISSR; RAPD; Strains; Geographical origins.