

Introduction of genetic markers suitable for identification and isolation of *Scenedesmus* microalgae species

Yalda Seyed hosseini¹

Jafar Razeghi^{2*}

Nader Farsad Akhtar³

1. Master, Department of Plant Sciences, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran.

2. Associate Professor, Department of Plant Sciences, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran.

3. Assistant Professor, Department of Plant Sciences, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran.

***Corresponding author:**

jafar_razeghi@tabrizu.ac.ir

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Abstract

The unicellular alga *scenedesmus* is green algae of great industrial and nutritional value. Therefore, further identification of this genus and its prolific species will be very useful. Usually, the identification of species of this microalga with different morphological and physiological methods has not been very successful, because these traits can change under different growth conditions and cause confusion in the classification of this alga. Therefore, in this study, molecular markers were used to better and more accurately identify this alga, and the genetic diversity of some strains of *scenedesmus* algae in Aras River was investigated using molecular markers. In this study, 2 samples of *scenedesmus* algae related to Aras river and ornamental fish breeding place in Tabriz were DNA extracted and polymerase chain reaction was performed using specific primers of ITS, *tufA*, 18s rRNA, CV genes, following sequencing of PCR products. DNA sequences were performed and analyzed. The phylogenetic tree related to markers was drawn into three models by Mega7 software and the trees were compared and based on the results, the *tufA* marker was selected as the appropriate marker. By examining the phylogenetic tree related to the *tufA* marker, the studied sample of *scenedesmus* related to Aras River and ornamental fish breeding place in Tabriz was placed in a cluster with *S. aluminatus* algae which was used as a control and has a close relationship. This confirms the morphological similarity of these algae. The use of this marker seems to be more accurate compared to 18s rRNA, CV and ITS markers.

Keywords: *Scenedesmus*, morphological identification, molecular marker, Aras River.