



The genus *Dunaliella* and its importance for astrobiology

I. Valentin Petrescu-Mag

SC Bioflux SRL, Cluj-Napoca, Romania; Department of Environment and Plant Protection, Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania; University of Oradea, Oradea, Romania. Corresponding author: I. V. Petrescu-Mag, zoobiomag2004@yahoo.com

Abstract. We present an interesting case of tolerance of a green alga to excessive aridity and its importance for astrobiology. Such species, along with some species of lichens, would be the most effective pioneers in the terraforming of Mars.

Key Words: green alga, aridity, Atacama, Mars terraforming, *Dunaliella atacamensis*.

Several microscopic plants, such as some green algae of the genus *Dunaliella* (Volvocales, Chlorophyceae; Figure 1) which were discovered by Azúa-Bustos et al (2010) in a cave in the Atacama Desert (Chile), can live with very little amount of water. *Dunaliella atacamensis* is one of the weirdest organisms on Earth. Despite living in the driest place on the planet, these single cell organisms develop on top of spiderwebs to absorb dew, the only source of water that condenses in the morning on these spider webs (Azúa-Bustos et al 2010).

D. atacamensis, along with some species of lichens, would be among the most effective pioneers in the terraforming of Mars. As it is known, Mars currently has, or at least had in the past, water on its surface, but probably the water resources we will find there will be limited (Botha et al 2018; Petrescu-Mag 2009).

Important to note that, all previously reported members of the genus *Dunaliella* are found in extremely saline or hyper saline aquatic environments (Oren 2005).

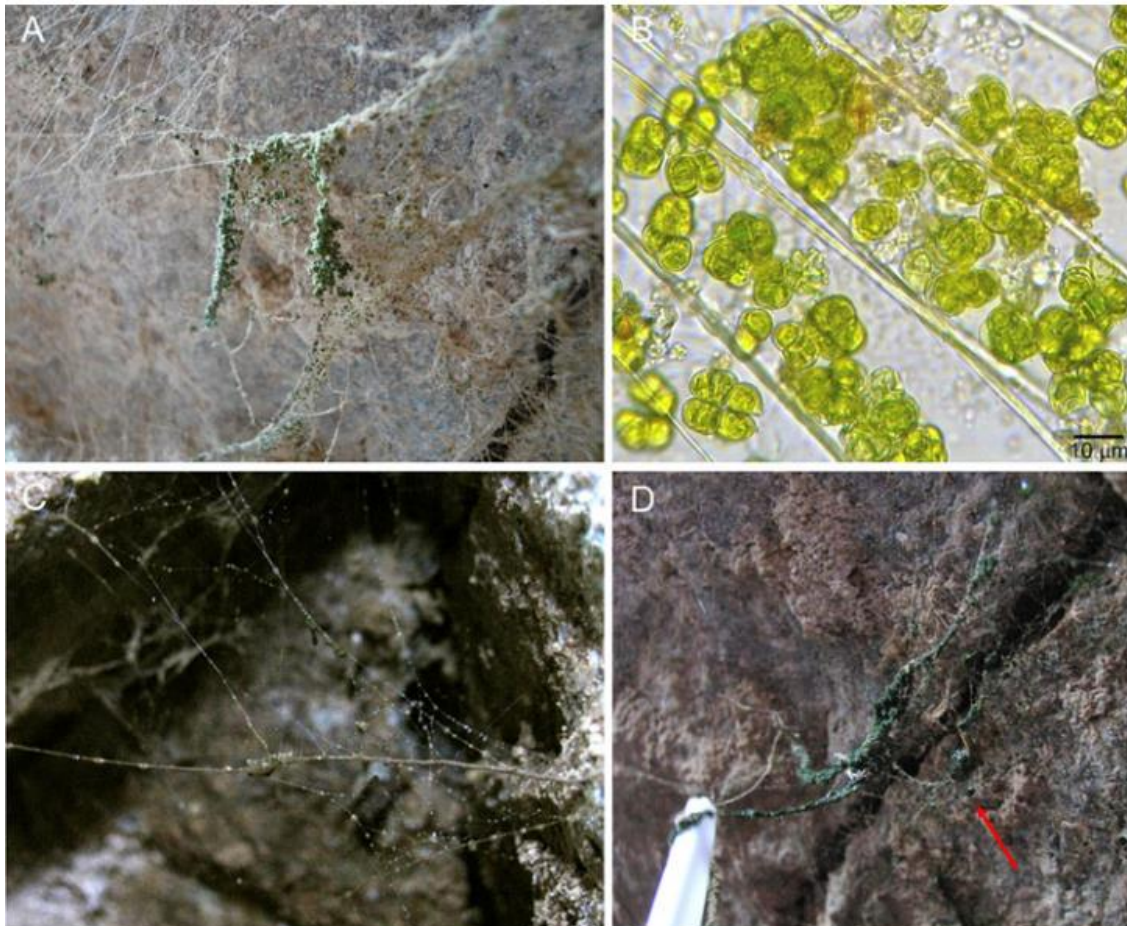


Figure 1. *Dunaliella atacamensis* and its habitat. A. Colonies of *D. atacamensis* cells growing onto spiderwebs attached to the cave walls. B. Bright field micrograph of colonies of *Dunaliella* cells. The silk threads of the spiderweb can also be seen. C. Water condensation on the spiderweb silk threads as seen at 6:30 a.m. D. Water condensation on the colonized spiderweb seen in A. The red arrow points to a colony of cells immersed in a water droplet (Azúa-Bustos et al 2010).

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Author:

I. Valentin Petrescu-Mag, SC Bioflux SRL Cluj-Napoca, 54 Ceahlau Street, 400488 Cluj-Napoca, Romania; Department of Environment and Plant Protection, Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine, 3-5 Calea Mănăştur Street, 400372 Cluj-Napoca, Romania; University of Oradea, 1 Universitatii Street, 410087 Oradea, Romania, e-mail: zoobiomag2004@yahoo.com

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