

Possible Photosynthetic Microbes in the Dark Dune Spots

Tibor Gánti¹, András Horváth²,
Eörs Szathmáry^{1,3}

¹Collegium Budapest (Institute for Advanced Study),

H-1014 Budapest, Szentháromság tér 2., Hungary,

²Konkoly Observatory, H-1525 Budapest Pf. 67, Hungary,

³Eötvös University, Dept. Plant Taxonomy and Ecology,
H-1117 Budapest, Pázmány s. 1/a. Hungary

Abstract:

There are two kinds of evidence for **Martian life**, past and present. As to the past, the role of putative **microfossils found in meteorites** of Martian origin has widely been discussed but remains controversial.

Seasonally appearing and developing **Dark Dune Spots (DDSs)** in the **South Polar region of Mars** constitute some evidence for **currently existing**, albeit refugial, **Martian life forms**. We have hypothesized that the annual morphogenesis of DDSs is due to the **life cycle of Martian Surface Organisms (MSOs)**, of which at least one type must be photosynthetic. These organisms grow during the extended sunny period of the polar winter and spring, and partly form their own living conditions between the soil and the frost/ice layers. Some **Antarctic bacterial consortia** are the closest **earthly analogues**.

We know of two potential rival, non-biological explanations: simple frosting-defrosting and the venting of CO₂, H₂O and some other compounds from cracks in the dunes. Whereas the former explanation can be ruled out easily, the second explanation may hold. Morphometric measurements on better images documenting DDS growth could confirm or rule out the biological explanation.