The fascinating diatom frustule—can it play a role for attenuation of UV radiation? - DTU Orbit (18/01/2019)

The fascinating diatom frustule—can it play a role for attenuation of UV radiation?
Diatoms are ubiquitous organisms in aquatic environments and are estimated to be responsible for 20–25 % of the total global primary production. A unique feature of diatoms is the silica wall, called the frustule. The frustule is characterized by species-specific intricate nanopatterning in the same size range as wave lengths of visible and ultraviolet (UV) light. This has prompted research into the possible role of the frustule in mediating light for the diatoms’ photosynthesis as well as into possible photonic applications of the diatom frustule. One of the possible biological roles, as well as area of potential application, is UV protection. In this review, we explore the possible adaptive value of the silica frustule with focus on research on the effect of UV radiation on diatoms. We also explore the possible effect of the frustules on UV radiation, from a theoretical, biological, and applied perspective, including recent experimental data on UV transmission of diatom frustules.

General information
State: Published
Organisations: Department of Mechanical Engineering, Engineering Design and Product Development, Department of Photonics Engineering, Fiber Optics, Devices and Non-linear Effects, University of Copenhagen
Number of pages: 12
Pages: 3295–3306
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Journal of Applied Phycology
Volume: 28
Issue number: 6
ISSN (Print): 0921-8971
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.59
Web of Science (2017): Impact factor 2.401
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.46
Web of Science (2016): Impact factor 2.616
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.32
Web of Science (2015): Impact factor 2.372
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.88
Web of Science (2014): Impact factor 2.559
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.78
Web of Science (2013): Impact factor 2.492
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.68
Web of Science (2012): Impact factor 2.326
ISI indexed (2012): ISI indexed yes