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Prof. Dr. Özer Çınar

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DEVELOPMENT OF ECOLOGICAL BIODESIGN PRODUCTS BY BACTERIAL BIOCALCIFICATION

Tugba Keskin Gundogdu^a, Irem Deniz^b, Alpcan Aric-Burak T. Yilmazsoy^a, Ozge Andic Cakir^a,
Aysegul Erdogan^c, Gulden Kokturk-Aylin S. Urkmez^d, Didem Altun- Feyzal Ozkaban^e, Ayca
Tokuc-Burcu F. Demirci^e

^aBioengineering Department, Engineering Faculty, Ege University

^bBioengineering Department, Engineering Faculty, Manisa Celal Bayar University

^cApplication And Research Center For Testing And Analysis, Ege University

^dElectrical Electronical Eng., Engineering Faculty, Dokuz Eylul University And Bioengineering Department,
Ege University

^eArchitecture Faculty, Dokuz Eylul Universty

*keskin.tugba@gmail.com

Abstract:

Biodesign is an interdisciplinary field in which biological processes are combined with many different fields to produce environmentally friendly and economically feasible products. Within the scope of this study, first CaCO₃ production potential of *Sporosarcina pasteurii* has been observed and optimized, and then the capability of hardening of the sand is examined. In this study the growth curve of *Sporosarcina pasteurii* was sketched. Also the optimum CaCl₂ concentration for maximized CaCO₃ formation was found as 50 mM. The ecological urban element was designed and its mold was produced by 3D printer at lab scale. The *Sporosarcina pasteurii* was mixed with sand and filled into the mold. The sand was mixed with 50 mM CaCl₂ solution every day until hardening is observed. At the end of one week, a sitting element from hardened sand was produced. The CaCO₃ formation was observed with XPS analysis. Thus, an interdisciplinary approach was used to produce ecological biodesign products. .

Keywords: Biocalcification, Biodesign, Urban Living Elements, Sand Hardening, *Sporosarcina Pasteurii*

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