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On Some Feature of Deformation Behavior of a Bird Eggshell

Peter Panfilov[1], Maxim Mezhenov[1,2], Jinming Guo[3], Dmitry Zaitsev[1,2]

[1] Ural Federal University named after the First President of Russia B.N. Yeltsin, Mira str. 19, Yekaterinburg, 620002, Russia
[2] Ural State Mining University, Kuibyshev str. 30, Yekaterinburg, 620144, Russia
[3] Hubei University, Wuhan, China

Received: July 26, 2024 Corresponding author: Peter Panfilov

Abstract. Behavior of bird eggshells—biominerals consisting of about 90% of calcium carbonate—under bending is examined. Eggs of several birds were used with two sets of samples cut from every bird eggshell. Mechanical testing was carried out on dry and wet samples in air. Cracks in eggshell samples under bending were studied in situ using a light microscope. Eggshell exhibits brittle behavior on the macroscopic scale in both dry and wet states. However, the crack width could be increased by increasing bending de-flection similar to ductile metals under tension. Wet samples show lower bending strength. The morphology of cracks in an eggshell under bending is close to the crack in neck region of a flat aluminum sample. It may be concluded that a bird eggshell under bending exhibits some features of ductile fracture on the microscopic scale.

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View Table of Contents: https://reviewsamt.com/issues

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