

Abstract Submitted
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Biomaterial Structure and Strength of Barnacle Exoskeletons

NATHAN SWIFT, Colgate University — Studying the construction of organic-inorganic compound structures through biomineralization is potentially very useful. During biomineral formation, organisms restructure naturally occurring minerals in conjunction with their own organically produced minerals to create new structures. While there is extensive knowledge about material properties and structure of the raw minerals themselves, insight into how specific biomineral structures and compounds contribute to an object's mechanical properties is lacking. In this study, the exoskeletons of barnacles from the genus *Balanus* were examined, both for their physical structure (how they're put together) and for their mechanical properties (strength, hardness, and elasticity). Scanning electron microscopy produced close-up, detailed images of the inner shell structure to determine what type of structure barnacles build during exoskeleton formation. Energy dispersive x-ray spectroscopy was used to map the elemental components of the shells. Nanoindentation tested the mechanical properties of these mapped structures to determine how certain characteristics of the exoskeleton contribute to its mechanical properties.

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