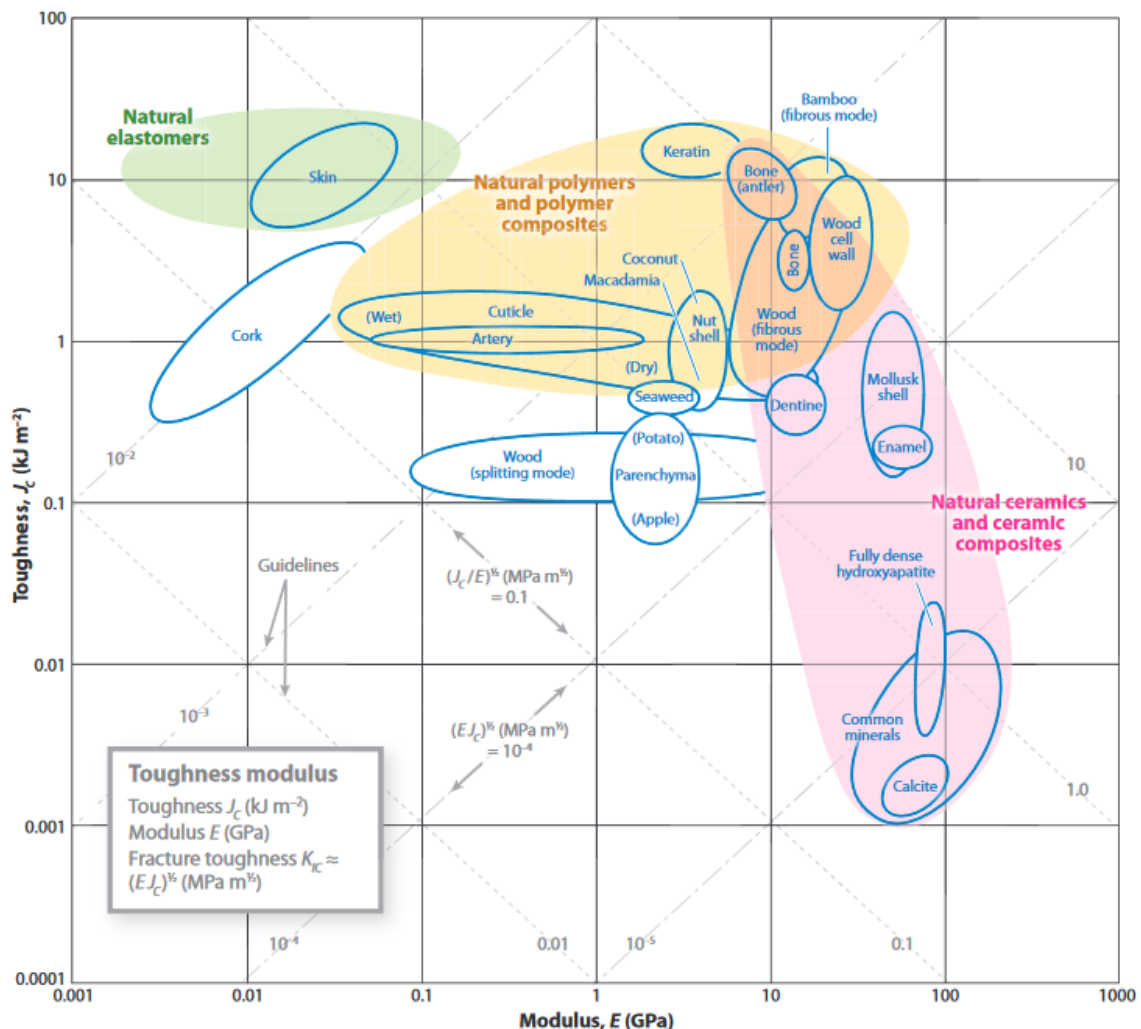


# Biological Composites

## Abstract

Most natural materials are composites based on biopolymers and some minerals. Despite the relative paucity of these constituents, their combination yields materials with outstanding properties and a great variation in functionality. A particular characteristic of biological composites is their multifunctionality. The basis for achieving this property is usually a complex hierarchical architecture in which an adaptation to the function(s) is possible at different structural levels. Only a few biological composites have been thoroughly studied from a materials science perspective; nacre is a prominent example. Fueled by the increasing interest in bioinspired materials research, biological composites are now studied more widely, and it has become apparent that Nature often solves materials problems in an unexpected way. This review discusses some striking examples. Many more are likely to emerge in the near future.



**Figure 1**

Materials property chart showing the relation between toughness and modulus for natural materials. Materials vary widely for both parameters, but many mechanically important materials populate the upper right corner, where both stiffness and toughness are large. Drawn from Reference 4 with permission from Taylor and Francis (<http://www.informaworld.com>).