Human Adaptations Inspired by an Extremophile and Resilient Organism:The Tardigrades

Mohammad Hossein Khodabandehloo[1], Ali Akbar Moosavi-Movahedi[1,2,3,*]

This article explores tardigrades, microscopic invertebrates renowned for their resilience to extreme environmental conditions and examines parallels to human resilience and the Human Development Index (HDI). Tardigrades use unique mechanisms like cryptobiosis to survive harsh conditions, including extreme temperatures, dehydration, radiation, and high pressures. In parallel, resilience as a component of HDI reflects a society's ability to face economic and social challenges. This article highlights these organisms' adaptive traits, such as heat shock proteins and DNA repair, as inspiration for human development and offers an alternative view on HDI, proposing that true human development embodies a transcendent understanding of nature's laws, enabling individuals to harness knowledge and faith for societal benefit.

Keywords: Tardigrade, Human Development Index, Transcendental Virtue, Resilience, Extremophile, Nature, Biotechnology.

[*] Corresponding Author, Professor, Tel: +9821-66409517, Fax: +9821-66404680, E-mail: moosavi@ut.ac.ir
[1] Institute of Biochemistry and Biophysics, University of Tehran, Tehran, Iran
[2] Universal Scientific Education and Research Network (USERN), Institute of Biochemistry and Biophysics (IBB), University of Tehran, Tehran, Iran
[3] Fellow, Iran Academy of Sciences; Fellow, The World Academy of Sciences (TWAS); Fellow Islamic World Academy of Sciences