

# New Horizons in Evolutionary Biology

Guest Editor: Eviatar Nevo

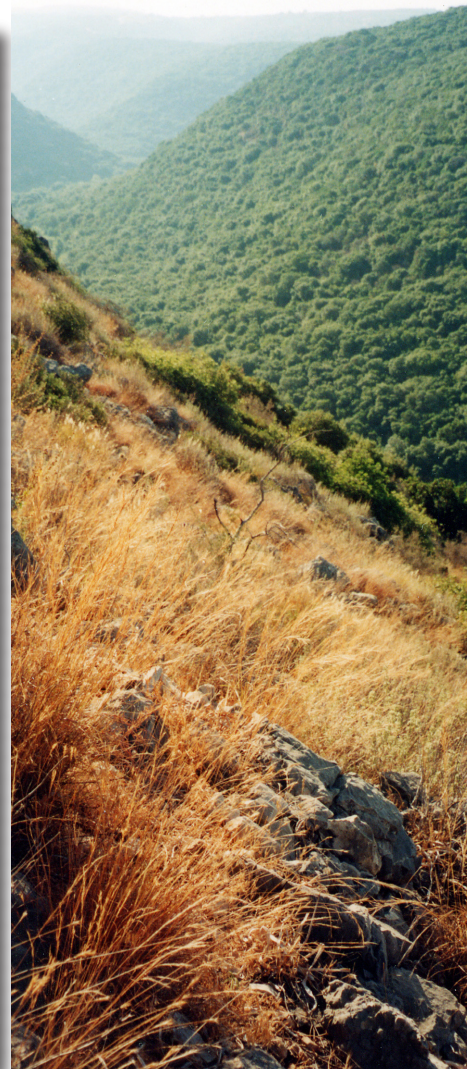
Participants of the 2007 conference-workshop “New Horizons in Evolutionary Biology”, held by the University of Haifa’s Institute of Evolution, represented many countries and comprised a mix of naturalists, experimentalists, statisticians, mathematicians, and theoreticians, combining the intuition and experience of the former and analytical insights of the latter. The highlight of the meeting was the “Evolution Canyon” model, a microsite of active evolution across life from bacteria through fungi, plants, and animals; the model focuses on biodiversity evolution and the twin processes of adaptation and speciation, and the relative importance of the driving forces of evolution.

The resulting compendium, published as a special double issue of the *Israel Journal of Ecology & Evolution* (Vol. 52: 3-4), includes 21 papers and represents all six of the conference sessions: (I) Evolutionary Processes and Theory; (II) Genome and Molecular Evolution; (III) Stress and Adaptive Evolution; (IV) Speciation; (V) Population Genetics, Ecology, and Evolution; and (VI) “Evolution Canyon”: Active Evolution at a Microscale.

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New horizons in evolutionary biology—Overview **E. Nevo** § Miriam Rothschild: naturalist, conservationist, and protagonist (1908–2005) **E. Nevo** § Cancer and evolution **W.F. Bodmer** § Revisiting heritable variation and limits to species distribution: Recent developments **A. Hoffmann and V. Kellermann** § Adaptive mutations in RNA-based regulatory mechanisms: Computational and experimental investigations **D. Barash, J. Sikorski, E.B. Perry, E. Nevo, and E. Nudler** § Codon signature extremes in eukaryote genomes **S. Karlin and D. Carmelli** § On the origin of cells and viruses: A comparative-genomic perspective **E.V. Koonin** § Retrotransposons: Metaparasites and agents of genome evolution **F. Sabot, R. Kalendar, M. Jääskeläinen, C. Wei, J. Tanskanen, and A.H. Schulman** § Has simple sequence repeat mutability been selected to facilitate evolution? **Y. Kashi and D.G. King** § Evolution of the circadian clock mechanism in prokaryotes **V. Dvornyk** § On ribosome conservation and evolution **I. Agmon, A. Bashan, and A. Yonath** § Early molecular evolution **E.N. Trifonov** § Genomic organization and molecular evolution of the genes for neuroglobin and cytoglobin in the hypoxia-tolerant Israeli mole rat, *Spalax carmeli* **F. Gerlach, A. Avivi, A. Joel, T. Burmester, E. Nevo, and T. Hankeln** § Regressive evolution of pigmentation in the cavefish *Astyanax* **W.R. Jeffery** § Do energetic costs underlie variability and evolutionary potential across variably stressful environments? **P.A. Parsons** § Speciation in the new millennium: What’s left to know? **M.A.F. Noor and J.A. Coyne** § Lateral transfer: A survey and new developments **S. Snir** § Biodiversity of earthworms in the Levant **T. Pavlíček, C. Csuzdi, and E. Nevo** § Modeling the evolutionary and ecological consequences of selection and adaptation in heterogeneous environments **D. Cohen** § “Evolution Canyon”: A microcosm of life’s evolution focusing on adaptation and speciation **E. Nevo** § Enigmatic flies: Is *Drosophila* in the “Evolution Canyon” a model for incipient speciation? **A. Korol, E. Rashkovetsky, and E. Nevo** § On the necessity to study natural bacterial populations—The model of *Bacillus simplex* from “Evolution Canyons” I and II, Israel **J. Sikorski and E. Nevo** § Identifying the fundamental units of diversity among *Bacillus* isolates from “Evolution Canyon” III **E.B. Perry, D. Krizanc, A.P. Rooney, J. Sikorski, E. Nevo, and F. M. Cohan**



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