Academy of Romanian Scientists *Volume 11, No. 1, 2022, pp. 7-18*
Annals Series on Biological Sciences Online ISSN 2285 – 4177
 ORIGINAL PAPERS

The Emergence and Evolution of the Ecosphere

Stoica GODEANU[1], Nicolae DONIȚĂ[2], Laura Mariana POPA[3]

[1] Prof., PhD, Full member of Academy of Romanian Scientists and "Ovidius" University of Constanţa, Romania (stoicagodeanu@gmail.com)
[2]Prof., PhD, Full member of Academy of Agricultural and Foresty Sciences from Romania "Gheorghe Ionescu-Sisești", Bucharest, Romania
[3] PhD, "Ovidius" University of Constanţa, Romania (popalauramariana@gmail.com

Abstract. *The ecosphere is a natural construction, the development of which fundamentally differs from the way the other planets in our solar system evolved. Life emerged consequently to the connection between non-living factors and macromolecules – complex carbon-based compounds. Living beings had the capacity of creating a new type of informational pattern, which soon assumed the coordination of major processes at the planetary level, and the non-living components – the atmosphere, the hydrosphere and the lithosphere – were substantially modified by the biosphere. Our approach regarding thr evolution of life is an ecological one; emphasis is put on the interrelations between the living and the non-living worlds: the emergence of metabolism, interspecific relations, the use of multiple energy sources; the emergence of life generated biogeochemical cycles and evolutionary processes characterized by self-control, self-organization and self-improvement. A special role was played by the transition from the use of chemical energy to the use of light energy, with the release of oxygen, which, owing to oxidative reactions, became the main element in the global development of most energetic processes. Life progressed from self-reproducing organic macromolecules to protoorganisms, then single-celled organisms (prokaryotes) and finally eukaryotic organisms emerged. In time, they populated all environments: the marine, the brackish, the freshwater, the terrestrial and the underground one. Living beings created two planetary covers: the biosphere and the pedosphere. The interconnection of the biosphere with the non-living covers (the atmosphere, the hydrosphere, the lithosphere and the pedosphere) resulted in the emergence of the ecosphere.*

Keywords: ecosphere, biological information, biological processes, ecological processes, evolution.

DOI https://doi.org/10.56082/annalsarscibio.2022.1.7

1. Introduction

The constitution of a functional ecosphere at the Earth's level is the result of several millions years of evolution, during which several forms of evolution of the organic matter and of different types of nonliving matter (physical, chemical, mineral etc) functioned concomittently (but at different speeds) [9], [11], [12] [13]. In the meantime, a multitude of complex relations and interrelations occurred between the various kinds of nonliving