
Complex systems: A causal approach to biological species

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Abstract

The issue of biological species has been treated in the philosophy of biology either under a semantic (Kripke 1971), or an essentialist (Boyd 1999, Slater 2011) position. In my view, these approaches do not capture the evolving capacities of species, nor the complexity of the causal processes which leads to emergent properties displaying sufficient stability for inductive practices and scientific explanations.

Along with other authors (Depew & Weber 1996, DeLanda 2011) I support "emergence" and "complexity" as central concepts to understanding the behavior of living systems. For this reason, I propose a philosophical approach to the issue of species from the perspective of complex causality.

The concept "complex causality" refers to the fact that, in a dynamic system such as the species, different causes may lead to the same effect. The multiplicity of causes is a mechanism that integrates qualitative and quantitative aspects of processes that maintain stability and lead to the appearance of emergent structures that are responsible for evolution. Both, causes and effects can only be established statistically. (DeLanda: 2002)

The idea of complex causality has important epistemic consequences. For example, the treatment of the species from a holistic perspective helps to avoid epistemic reductionism which has led to discussions on characterization. Furthermore, it allows a redefinition of the concept of "natural kind" which departs from philosophical approaches relying either on essences or on linear causality such as HPC (Boyd 1999, 2010). Finally, it becomes a philosophical account consistent with current scientific research.

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