
Natural Selection as Rational Inference

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Abstract

I will sketch the probability concept mainly in natural selection models and referentially in statistical mechanics. In the classical world view, there has been thought that the probabilities appeared in the scientific context is interpreted as frequencies or subjective degrees of beliefs. But when we faced to use the probabilistic models of natural selection, we had to answer the following question. What do the probabilities represent? In this presentation, I will answer the question. First, I analyze Fisher's and Kimura's models of natural selection and show that the probabilities reflect not merely our ignorance but some aspects of reality. Second, I show that in natural selection models we can update the probabilities rationally. And I also clarify the relation between explanation and prediction in evolutionary theory. Then I conclude that the aim of natural selection models is rational explanation or prediction of phenomena.

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