

Statistical Physics and Anomalous Dynamics of Foraging

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This is a brief review talk about the question whether biologically relevant search strategies can be identified by statistical data analysis and mathematical modeling. A famous paradigm in this field is the Lévy hypothesis. It states that under certain conditions Lévy flights, which are a key concept in stochastic anomalous dynamics, provide an optimal search strategy for foraging organisms. This hypothesis may be understood biologically as the claim that Lévy flights represent an *evolutionary adaptive* optimal search strategy for foraging organisms. Another interpretation, however, is that Lévy flights *emerge* from the interaction between forager and a given (scale-free) distribution of food sources. This hypothesis is discussed very controversially in the current literature. I will give examples and counterexamples of experimental data and their analyses confirming and refuting it.