

## Documents

Ahmed, D.A., Petrovskii, S.V., Tilles, P.F.C.

**The "Lévy or diffusion" Controversy: How important is the movement pattern in the context of trapping?**  
(2018) *Mathematics*, 6 (5), art. no. 77, . Cited 2 times.

### Abstract

Many empirical and theoretical studies indicate that Brownian motion and diffusion models as its mean field counterpart provide appropriate modeling techniques for individual insect movement. However, this traditional approach has been challenged, and conflicting evidence suggests that an alternative movement pattern such as Lévy walks can provide a better description. Lévy walks differ from Brownian motion since they allow for a higher frequency of large steps, resulting in a faster movement. Identification of the 'correct' movement model that would consistently provide the best fit for movement data is challenging and has become a highly controversial issue. In this paper, we show that this controversy may be superficial rather than real if the issue is considered in the context of trapping or, more generally, survival probabilities. In particular, we show that almost identical trap counts are reproduced for inherently different movement models (such as the Brownian motion and the Lévy walk) under certain conditions of equivalence. This apparently suggests that the whole 'Levy or diffusion' debate is rather senseless unless it is placed into a specific ecological context, e.g., pest monitoring programs. © 2018 by the author.

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