

Review of: "Branching Markov Chains: Survival Thresholds and Applications to Species Navigation"

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Potential competing interests: No potential competing interests to declare.

The manuscript presents a mathematical analysis of branching Markov chains with regard to the problem of survival thresholds. In particular, the authors examine the conditions under which a species, modeled by a branching Markov chain, survives while being forced to return to its native land to give birth.

The results are clear and easy to understand, especially Theorem 1, which is presented in a very compact and mathematically elegant form. The result is also interpreted from a biological perspective in Section 2, while the third and final section contains its proof. The proof follows a linear and clear reasoning that uses essential concepts related to the study of stochastic processes. Overall, I believe that the simplicity of the results is a strength of the article.

To improve the current version of the manuscript, I suggest:

- including a brief introduction with general background and references that cover the state of the art,
- adding concluding statements at the end of the paper,
- incorporating, if possible, a simulation study to provide an application of the theoretical results found.

Additionally, it may be helpful to include more formal mathematical details in Section 1 when the model is defined.