

REFEREE REPORT PCI ECOLOGY  
INFLUENCE OF SEX-LIMITED MIMICRY ON EXTINCTION RISK  
IN ACULEATA: A THEORETICAL APPROACH

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Dear Editor,

the authors present an ordinary differential equation based model for Aculeata male and female population sharing a common predator community and exhibiting competition for resources. More precisely, they explore:

- the effect of sex-ratio and female noxiousness on local extinction risk (one-species model);
- the effect of mimicry on species persistence and co- existence, with particular focus on the dynamics motivated by changes in the sex ratio (males/females) and the females' noxiousness.
- And finally, the interaction between mimicry and sex-ratio in the case of a coexistence equilibrium when dual sex-limited mimicry occurs between sympatric species.

It is, therefore, a really interesting problem to tackle.

The model itself is explicitly defined in the Material & Methods section. Therein, the authors assume mathematical representations, supported on previously published papers, for (a) offspring production, (b) competition intra and interspecies, and (c) adult mortality. This results into a quite accurate model, too complex for an analytic analysis, which necessarily is approached numerically. However some of the parameters are, approximately, obtained from the literature, some others (like birth/death rates, initial values of any sex population, predations rates, etc) have been chosen randomly. Instead of a possible dynamical systems' analysis the approach presented in the manuscript is based on a suitable number of realisations (with the above-mentioned randomly chosen parameters), mainly 500, and a subsequent study of their averaged consequences. The results and accurate biological conclusions are presented in the final section.

The paper is well written and correctly structured: an introduction with many references to previous literature, a good justification of the different pieces forming the model, and an interesting final biological interpretation of the numerical results and their discussion. Because all of this, I believe **it deserves being accepted for publication.**