Priority effects among parasites were **less common** than expected, and **rarely consistent** with **ecological theory.**

Evaluating the frequency and common drivers of within-host priority effects during coinfection.

Fletcher W Halliday & Jason R Rohr
@fletch_halliday

Interactions among parasites

- Occur within host individuals
- Often depend on infection sequence

Question: Is disease risk influenced by infection sequence during natural epidemics?

HYPOTHESES (from Vannette & Fukami 2013)

Priority effects are more common when:

1. Parasites have high niche overlap
2. Late arrivers have narrow host breadth
3. Early arrivers have high virulence

APPROACH

1. Compiled a database of longitudinal surveys of host individuals (i.e., mark-recapture data), where hosts were unmanipulated and surveyed for infection by multiple parasites.
2. Common analytical method to detect priority effects (from Halliday et al 2017).
3. Priority effect probability and effect sizes tested using GLMM (weighted by # of surveys per host individual).

THE DATABASE

- 25 contributors
- 13 host species
- 110 parasite species
- >25,000 observations

RESULTS

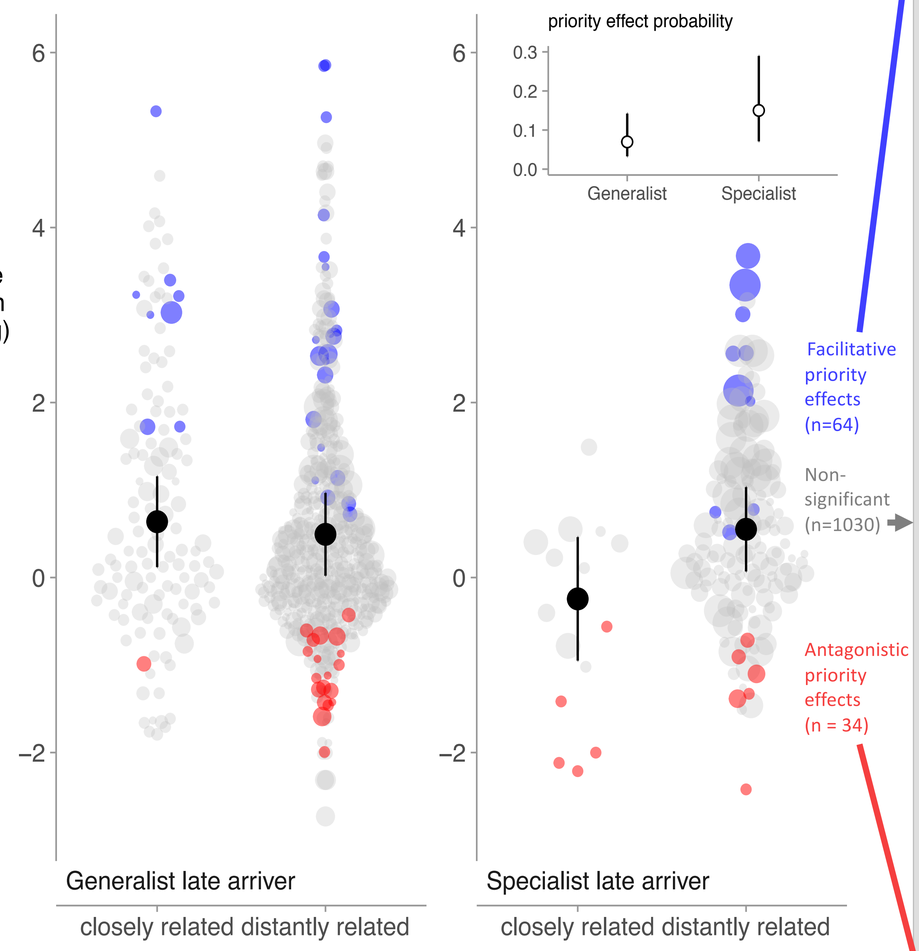
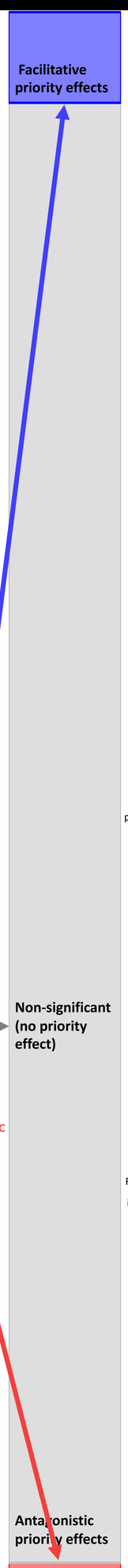


Fig 1. Priority effects were more commonly observed when late-arriving parasites were host specialists (weighted p < 0.001, unweighted p = 0.007), supporting hypothesis two. Among specialists, more closely related parasites tended to experience more competition (p = 0.003), though this group had less data than other groups. Black circles are model estimated means, error bars are 95% confidence intervals; colored points are estimates from each individual pairwise combination of studies, with size corresponding to the number of samples per host individual. The inset shows the model estimated probability of a priority effect on the y-axis as a function of late-arriver host specificity.



CONTRIBUTORS


Microcebus rufus — T Aivelo


Microcebus murinus — AM Hämäläinen, JH Rakotoniaina, E Kaesler, & C Kraus


Hydrochoerus hydrochaeris — P Beldomenico


Pan troglodytes — M Huffman


Homo sapiens — A Blackwell


Nasua nasua — N Olifers, AM Júnior, EP de Araujo, R de Cassia Bianchi, APN Gomes, PHD Cançado, ME Gompper, & PS D'Andrea


Syncerus caffer — V Ezenwa, A Jolles, & E Gorsich


Cerdocyon thous


C Fichtel, C. Defolie


Lymnea stagnalis — M Soldanova


Geothlypis trichas — C Freeman-Gallant


Microtus agrestis — C Taylor


Festuca arundinacea — F Halliday


Your organism — **You?**

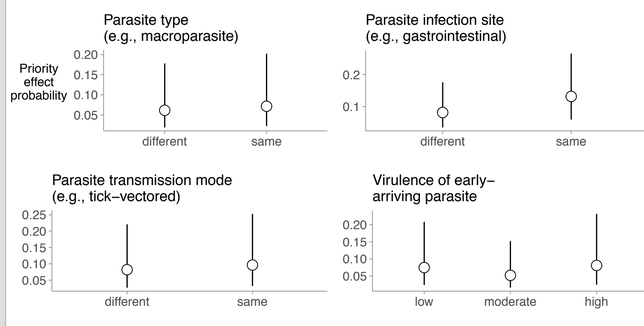


Fig 2. Priority effects were weakly more common among parasites of the same type, infection site, and transmission mode (weighted p<0.05; unweighted p>0.05), lending marginal support to H1. However, priority effects were no more commonly observed when early arriving species had high impacts on their hosts.

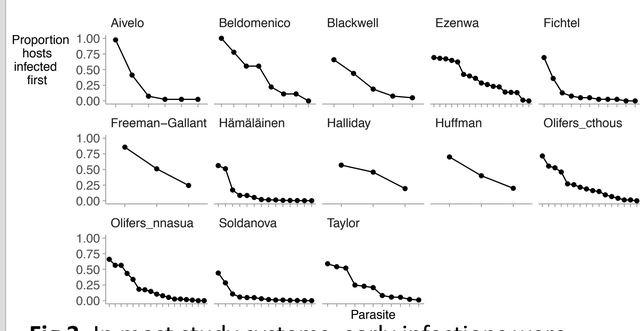


Fig 3. In most study systems, early infections were dominated by one or a few parasites. This lack of variation in infection sequence may explain why fewer priority effects were observed than expected. Each point is a single parasite species. The y-axis represents the proportion of hosts whose first infection was associated with that parasite. Values on the y-axis sum to >1 due to simultaneous infections.

Universität Zürich[UZH]

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