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Can birds enhance the dispersal of freshwater macrocrustaceans?

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Background/Question/Methods

The freshwater crustaceans*, Crangonyx pseudogracilis*, *Atyaephyra desmaresti* and *Procambarus clarkii* (hereby referred to as FCs) are non-native in several areas of their distribution range presumably due to human-mediated introductions. Here we test dispersal by waterbirds as a complementary mechanism of dispersal of these 3 species. For *P. clarkii*, we studied the transport of recently hatched juveniles while, for the other two species, adults were used. In an initial experiment, we evaluated the effect of environmental conditions and size on FCs desiccation survival time. Next,

we performed a set of experiments to evaluate the likelihood of FCs taking a bird transport vector. This was quantified using a freshly dead mallard (*Anas platyrhynchos*) or mallard's feet under still or moving conditions. A third set of experiments evaluated FCs survival probability during transport by birds. For that purpose we released, at several distances, pigeons carrying FCs on a small mesh bag. In addition, we also used a freshly dead mallard mounted on the top of a moving vehicle and carrying FCs on its feathers.

Results/Conclusions

All 3 species were capable of clinging to mallard's feathers and to mallard's feet resulting in successful transport. A value of the probability of taking the transport vector was obtained for each species under each set of experimental conditions. This probability depends on the water depth, on the resting time of the vector and on the stillness or movement of the vector. The time lengths for 50% or 90% mortality (LT_{50} and LT_{90}) of the FCs when removed from the water and also when transported by birds show that they are capable of surviving overland bird transport. We found that some *P. clarkii* juveniles survived distances up to 150 km outside a moving vehicle simulating bird flight and up to 62 km when transported by birds. Nevertheless, the majority of the FCs was only capable of surviving much smaller distances. Our results have shown that FCs ectozoochory is possible and that, distance, size and environmental conditions can significantly affect the likelihood of survival of FCs during bird flight.

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When:
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Where:
Minneapolis, MN

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