Experience-dependent natal philopatry of breeding greater flamingos

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Summary

1. Contrary to the generally high level of natal philopatry (i.e. likelihood that individuals breed at their natal colony) found in first-breeding colonial birds, little is known of natal philopatry later in life. Most hypotheses advanced to explain natal philopatry are valid at all ages. However, for young and inexperienced birds, the benefits of natal philopatry may be counterbalanced by the costs of intraspecific competition at the natal colony making dispersal temporarily advantageous. In turn, experience may increase competitive ability and make natal philopatry advantageous again.

2. We evaluated this hypothesis on the large-scale dispersal of greater flamingos *Phoenicopterus roseus* breeding among three colonies comprising >85% of the Western Mediterranean meta-population. The Camargue (France) and Fuente de Piedra (Spain) are large and saturated colonies while Molentargius (Sardinia) is a recent and growing colony.

3. We used a 20-year capture-mark-resighting dataset of 4900 flamingos ringed as chicks in Camargue and Fuente de Piedra and breeding at the three colonies. We assessed the effects of natal colony and breeding experience (first-time observed breeders *versus* confirmed experienced breeders) on dispersal using multistate capture-recapture models. Dispersal to an unobservable state accounted for temporary emigration.

4. Fidelity was higher at the natal colony (>84%) than elsewhere. Fidelity increased with experience in the two large colonies (Camargue and Fuente de Piedra) suggesting a large-scale experience-related despotic distribution. Breeding dispersal was significant (up to 61% and 52% for first-time breeders and experienced breeders, respectively) so that colony dynamics is affected by exchanges with other colonies. Except for Fuente-born breeders leaving Molentargius, dispersal to the natal colony was higher than to any other colonies.

5. Survival was not higher at the natal colony. Inexperienced birds likely had lower breeding success at the Camargue and skipped reproduction after having emigrated to the other large colony but not to Molentargius. Breeding at Molentargius could allow avoiding queuing (and non-breeding) at the large colonies while gaining experience and competitive ability for future attempts.

6. Natal philopatry appears as an important driver of large-scale breeding dispersal in the Greater flamingo. The fitness advantage of natal philopatry is likely experience-dependent and mediated by the variations of intraspecific competition.

Key-words: breeding dispersal, ideal despotic distribution, intraspecific competition, M-SURGE, outbreeding, flyway, phenotype matching