

Pollinator-mediated speciation on two continental islands: insights from bird-pollinated *Aeschynanthus*

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The Grant-Stebbins model predicts that a plant species encountering different pollinators across its range may undergo local adaptation and, subsequently, ecological speciation. Pollinator faunas on islands often differ from those of adjacent mainlands and provide natural opportunities to evaluate this hypothesis. Here, we investigated the evolutionary history of the bird-pollinated genus *Aeschynanthus* on two continental islands in East Asia that differ in their avian pollinator composition. Taiwan lacks nectar-specialist sunbirds, whereas Hainan shares a largely similar bird-pollinator fauna with the neighboring mainland, including sunbirds. Using phylogenomic and phylogeographic analyses, together with field studies of pollination biology, we examined the origins of the widespread species *Aeschynanthus acuminatus* and the Hainan endemic *A. moningeriae*. Contrary to expectations that Taiwan's distinctive pollinator environment promoted speciation, *A. acuminatus* did not originate on Taiwan. Instead, genome-wide SNPs revealed a mainland origin, where populations are pollinated by a mixture of sunbirds and generalist passerines. The pollinator niche expansion enabled its subsequent range expansion to Taiwan. In contrast, *A. moningeriae* is phylogenetically nested within the *A. acuminatus* lineage and exhibits localized reverse toward specialized sunbird pollination. Field observations indicate that sunbirds are its primary pollinators and that floral traits, i.e., elongated corolla tubes and peduncles, restrict access by less effective short-beaked visitors. Together, these contrasting island histories reveal that pollinator-mediated speciation cannot be predicted solely from the degree of pollinator turnover between islands and the mainland. Taiwan represents a case where a major pollinator shift promoted island colonization but not speciation, whereas Hainan represents a case where speciation was associated with localized pollinator specialization despite little change in pollinator fauna. Our research highlights the complex role of pollinator shifts in the diversification of island floras.

Keywords: Pollinator shift; Islands; Ornithophily; Generalization; *Aeschynanthus*; Speciation; Range dynamics