Comparative ecology of sexual and asexual parasitoid wasps

Different hypotheses predict that species characterized by sexual and asexual reproduction differ in certain ecological attributes, such as ecological generalism and the size of distribution ranges, with opposite predictions depending on the hypothesis. However there are no studies that compare ecological attributes of sexuals and asexuals on a large scale, prohibiting inference of general patterns. Some insect groups present high proportions of asexual species and are thus good systems to test for ecological differences between species with different reproductive modes. In this large-scale comparative analysis, we investigated the ecology and distribution of sexual and asexual parasitoid and phytophagous wasps. Data on distribution and host species for more than 200 asexuals and 10000 sexuals was retrieved from an exhaustive online database. We found that asexuals have more host species and wider distribution ranges than their sexual relatives. These generalist ecologies did not solely evolve after the transition to asexuality. We found that extant asexual lineages often derived from sexuals with relatively many host species and wide distribution ranges, indicating that these ecological attributes favour the transition to and/or success of asexuality. We discuss how ecological pre-adaptations in sexuals determine the evolutionary success of their derived asexuals.

(200 words max)