Comparative study of sexual and asexual parasitoid wasps

Asexual reproduction provides certain advantages as compared to sexual reproduction, such as … Notably, it has been suggested that asexual species tend to appear in smaller species, or that asexual species are more susceptible to environmental variability. Studies testing these theories are always based on small taxonomic groups, prohibiting inferring general patterns. Some insect groups present high proportions of asexual species and are thus good system to study these hypotheses.

In this large-scale comparative analysis, we investigated the ecology and distribution of asexual chalcid wasps (Hymenoptera: Chalcidoidea). We used a previously compiled detailed asexual species list, and extracted distribution and host species data from exhaustive online databases. Although asexuality often occurs in small species, pairwise analysis between asexual and sexual sister species revealed no significant association between reproductive mode and body size. We also found that asexuals have more host species and wider distribution ranges than their sexual relatives, indicating that they tend to have more generalist ecologies than their sexual counterparts, which allows them to colonize larger geographic areas. Our results show that asexuality tend to appear more often in already widespread sexual species, rather than becoming widespread afterwards due to their ecological success. To our knowledge, this is the first time these hypotheses have been tested on such a large scale.