

THREE OPTIONS ARE BETTER THAN TWO: COMPENSATORY NATURE OF DIFFERENT POLLINATION MODES IN *SALIX CAPREA* L.

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Salix caprea (goat willow) is a dioecious plant that blooms in early spring. The species employs three modes of pollination: diurnal bee pollination, nocturnal moth pollination, and wind pollination. Having three options for pollen delivery may seem redundant. However, we found that pollination by bees and moths may compensate for the lack of wind pollination in situations where nearby males were few or all positioned in the same direction relative to the females. Furthermore, the flowers open in the evening, which might be a strategy to maximize male fitness by prioritizing moth visitation at night while postponing the visitation by pollen-wasteful bees during the day. Thus, the mixed pollination system in *S. caprea* can be described as an "adaptive generalization" to ensure reproduction. It will be particularly advantageous in variable environments where the wind is

unpredictable or where different animal pollinators show strong local differences in their abundance.



Diurnal and nocturnal insect pollinators of Salix caprea. Photos by Kazuharu Ohashi