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FRINGED MARGIN OF A SPECIALIZED PETAL ALLOWS HAWKMOTHS TO GRASP FLOWERS WHILE FORAGING

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Study description

Despite the well-known visual attraction function of petals, their other functions have received little attention. *Habenaria radiata* has specialized petals resembling a white egret's flight. Here, we examined the functional significance of the fringes. Our manipulation experiments demonstrated that fruit set (a proxy for pollinator visits) did not decrease following fringe removal, whereas seed production (a proxy for pollination efficiency per visit) reduced significantly. Observation of pollinator behaviors indicates that fringes allow moths to grasp flowers. Consequently, we concluded that fringes primarily stabilize the hawkmoth's posture, increasing pollen deposition on the stigma. This work significantly broadens our understanding of petal function and diversity.

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Photo 1. *Habenaria radiata* is known as the white egret orchid due to its exquisite flowers resembling a white egret's graceful flight. Photo credit: Kenji Suetsugu.



Photo 2. The natural population of *Habenaria radiata* with an individual bagged to exclude all the pollinators except thrips using polyethylene netting. Our field studies showed that no thrips-mediated fruit set occurred in the populations investigated. Photo credit: Kenji Suetsugu.



Photo 3. Here, we conducted a field-based removal experiment to examine the functional adaptive significance of the highly dissected fringes of the egret orchid. Contrary to our expectations, our experimental manipulation revealed that the fringed lip structures play a limited role in pollinator attraction. The experimental removal of the fringes does not impact fruit set. Photo credit: Kenji Suetsugu.

These photographs illustrate the article "Specialized petal with conspicuously fringed margin influences reproductive success in *Habenaria radiata* (Orchidaceae)" by Kenji Suetsugu, Yusuke Abe, Takeshi Asai, Shuji Matsumoto, and Masahiro Hasegawa published in *Ecology*. https://doi.org/10.1002/ecy.3781