

Screening game in plant–pollinator interactions: compound screening mechanism in flower morphology of *Delphinium caeruleum*

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Abstract

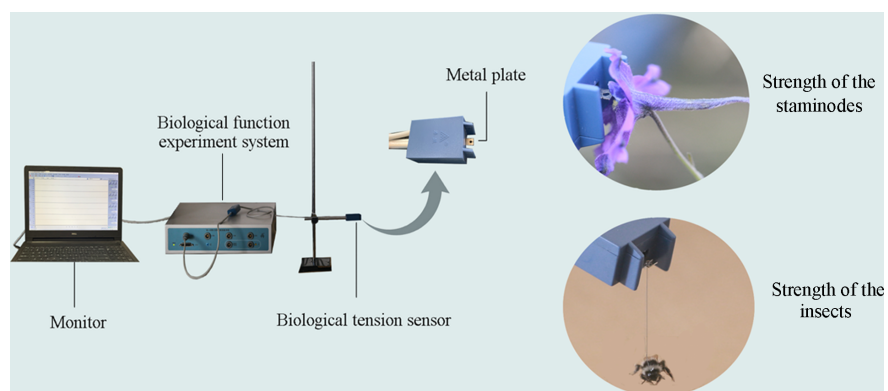
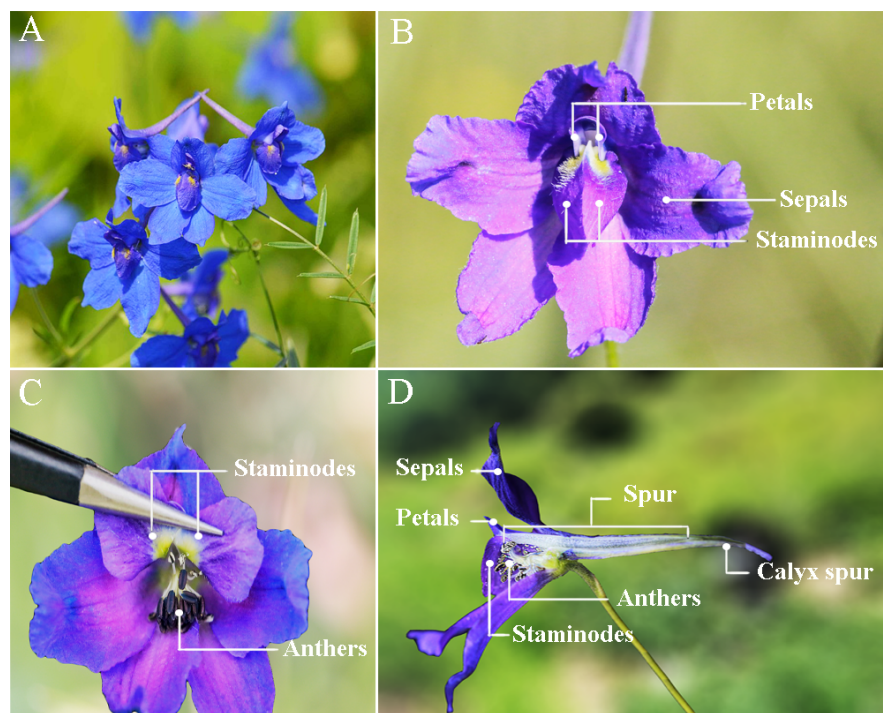
The screening mechanism is an important component of the screening game between plants and pollinators, and also as a theoretical framework for understanding the maintenance and drivers of co-evolution by animals and plants. However, no previous studies have investigated the composite screening mechanism in plants from biomechanical and morphological perspectives. Thus, we observed and measured the insects and flower traits in different populations of *Delphinium caeruleum* J., and compared the operative strength of staminal tubes with the strength that insects were capable of exerting, as well as the length of the nectar spur and proboscis in insects. The flower traits, insect species, visitor frequency, and efficiency differed among three experimental sites. The strength and proboscis length of the insect visitors matched with the operative strength of staminal tubes and the nectar spur length, whereas the opposite was found for non-visitors. Our results demonstrate that *Delphinium caeruleum* J. can screen for efficient pollinator insects through a complex mechanism based on a combination of length screening and biomechanical screening. Pollinators contribute significantly to promoting both the convergence and divergence of flower characteristics, which may be a consequence of plants adapting to local pollinators.

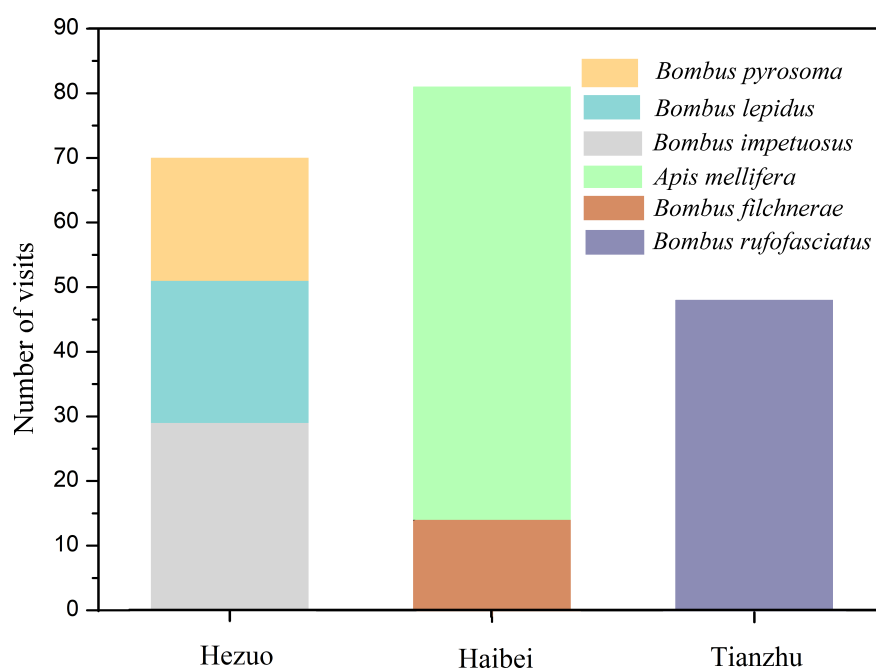
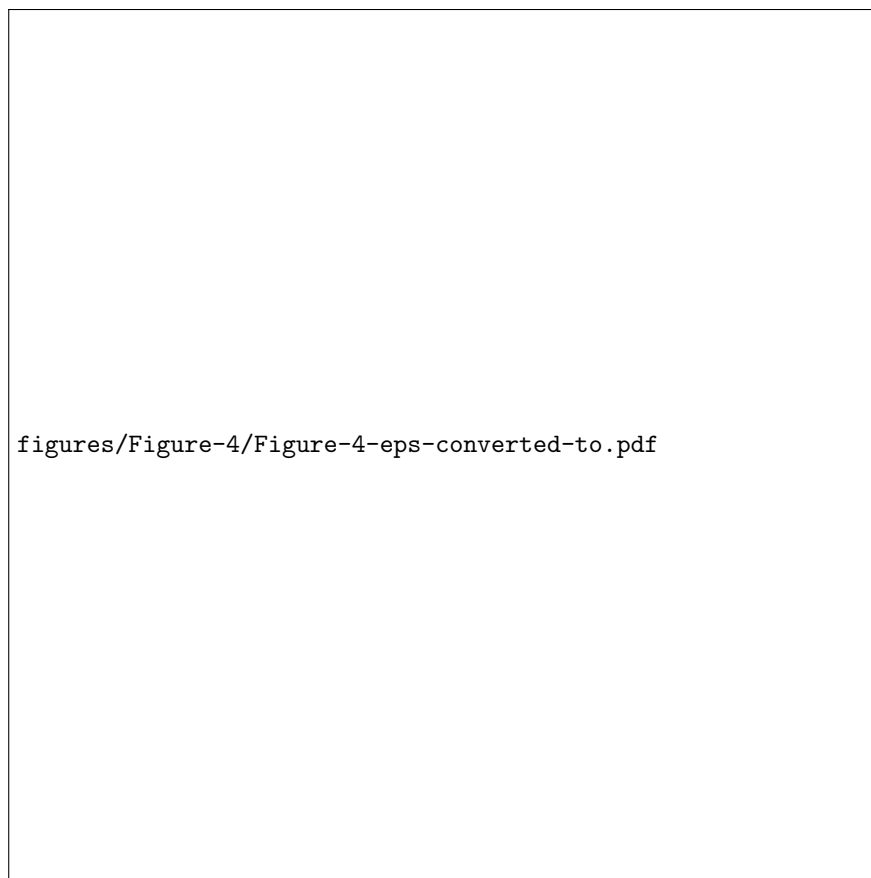
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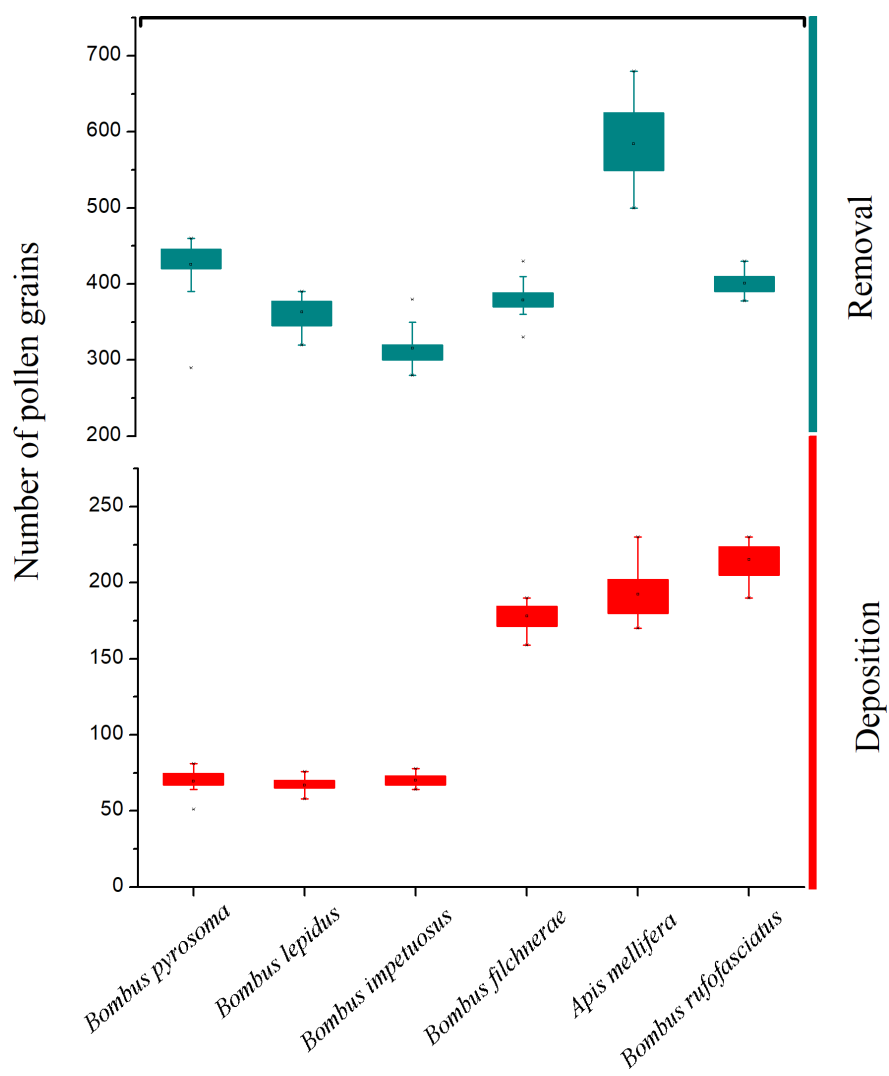
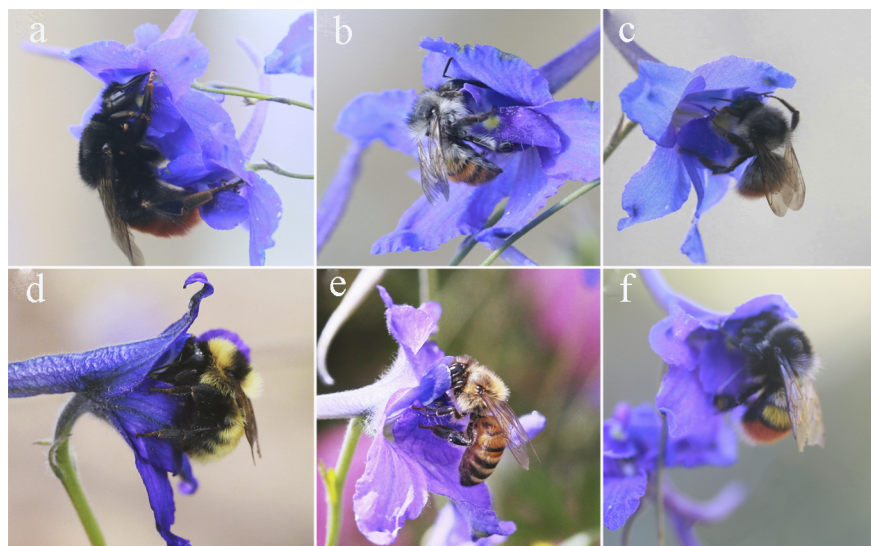
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Figure_1.eps available at <https://authorea.com/users/497430/articles/578475-screening-game-in-plant-pollinator-interactions-compound-screening-mechanism-in-flower-morphology-of-delphinium-caeruleum>







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