Can plants elicit cryptic female choice through the morphology of their pistils ?

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Résumé

Sexual selection, acting through competition for the access to mates and their gametes, successfully explained numerous reproductive strategies in animals. Sexual selection typically emerges when females produce fewer numbers of larger gametes than males – a situation called anisogamy – which fosters competition among males for accessing the rare ovules. Sexual selection theory should thus be universally valid for all sexually reproducing anisogamous organisms encompassing plants. While the idea that sexual selection acts on plants is largely admitted, most predictions of the sexual selection theory remain untested in the plant kingdom. Here, we test the basic assumptions of 'runaway' and 'good-genes' models in the angiosperm species Brassica rapa by testing whether pistil traits can bias paternity for good-quality pollen donors. By performing controlled crosses where we compete the pollen of several paternal plants on maternal ones, we show not only that pollen traits influence ovule fertilization success but also that several pistil traits biais paternity in favour of pollen donors bearing specific pollen traits. Our results suggest that simple variation in the morphology of the female plant reproductive organ - the pistil - can elicit a cryptic female choice process, thus calling for a test of female choice models predictions in plants.

Mots-Clés: Angiosperms, Sexual selection, Cryptic female choice, Pollen, pistil interaction, Brassica rapa

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