

Influence of Glyphosate on Flower Morphogenesis and Pigmentation in *Petunia hybrida*

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Glyphosate showed a remarkable effect inducing the change of flower symmetry from the actinomorphic to the zygomorphic type in *Petunia hybrida*. Glyphosate [*N*-(phosphonomethyl)glycine] reduced the anthocyanin content and showed a weak inhibitory effect against phenylalanine ammonia-lyase (PAL) activity. L-2-Aminooxy-3-phenylpropionic acid (APA), an inhibitor of PAL activity, reduced the anthocyanin content but had no effect on flower shape. Additional phenylalanine or *trans*-cinnamic acid, the intermediates of glyphosate inhibition against PAL activity, could not recover the change of flower shape induced by glyphosate. These results suggested that the reduction of PAL activity alone could not account for the two characteristic changes of flower symmetry and pigmentation induced by glyphosate. On the other hand, the results of application of glyphosate-related compounds suggested that the structure of glyphosate contributed to induce the morphological change of *Petunia* flower. Glyphosate may thus be a very useful agent in the elucidation of unresolved questions of flower morphogenesis and the related metabolism.

Key words: Glyphosate, Flower Symmetry, *Petunia hybrida*