Nitrogen Metabolism and Flower Symmetry of Petunia Corollas Treated with Glyphosate

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A change of flower shape was observed in petunia corollas treated with 0.5 mM glyphosate. Glyphosate changed the flower symmetry from the actinomorphic type to the zygomorphic type. Corollas treated with glyphosate showed an increased free amino acid content. Free amino acid profiles in petunia corollas revealed that glyphosate had no significant effect on aromatic amino acid levels but increased the level of proline. Soluble protein content in glyphosate-treated corollas did not cause any significant changes. The contents of soluble phenolics, lignin, and IAA in the corollas were not significantly affected by the glyphosate treatment. In contrast, glyphosate reduced the nitrate content and the RNA content of petunia corollas by 45% and 63% of the control, respectively. However, the DNA content in glyphosate-treated corollas was similar to that of the control.

Low concentrations of glyphosate did not show any phytotoxic effects on the whole plants and any remarkable changes on aromatic amino acid metabolism and protein synthesis. However, glyphosate reduced the RNA content of petunia corollas and changed the flower symmetry from the actinomorphic type to the zygomorphic type. The results of nonprotein nitrogen metabolism in glyphosate-treated petunia corollas suggested that glyphosate application at low concentration may influence the regulation of flower symmetry through the change of RNA biosynthesis.

Key words: Glyphosate, RNA, *Petunia hybrida*