

Ethylamine Content and Theanine Biosynthesis in Different Organs of *Camellia sinensis* Seedlings

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We examined the distribution of ethylamine, glutamic acid and alanine, which are utilized in theanine biosynthesis, and other major amino acids in leaves, stems, cotyledons and roots of 6-week-old tea seedlings. Ethylamine and glutamic acid, which are substrates of theanine synthetase, were distributed almost uniformly in all parts of the seedlings; the contents in $\mu\text{mol/g}$ fresh wt varied from 0.44–0.88 (ethylamine) and 1.6–2.4 (glutamic acid). The content of alanine, a possible precursor of ethylamine synthesis, was significantly higher in roots (3.1 $\mu\text{mol/g}$ fresh wt) than in other parts. Incorporation of radioactivity from $[\text{U-}^{14}\text{C}]$ -alanine into theanine was also higher in roots than in other organs. In 10-week-old seedlings, $[\text{1-}^{14}\text{C}]$ ethylamine was converted to theanine in young and developed leaves, stems, main and lateral roots; the highest rates of conversion were detected in the main and lateral roots. These results suggest that the theanine synthesis preferentially takes place in roots but is not restricted to them; substrates and the enzymatic machinery for theanine synthesis are available in all parts of tea seedlings.

Key words: Alanine, Ethylamine, Theanine Biosynthesis, *Camellia sinensis*