

Pipecolic Acid from the Developing Fruits (Pericarp and Seeds) of *Coffea arabica* and *Camellia sinensis*

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SUMMARY

The methyl groups of methylamine and γ -glutamylmethylamide (γ -GM) are precursors of the biosynthesis of caffeine in leaves of tea seedlings and mature plants. Methylamine is also a precursor of caffeine biosynthesis in leaves of *Coffea arabica*; however, γ -GM was not detected on two-dimensional thin-layer chromatography (2D-TLC; silica gel 60, Merck) of the free amino acids of the young developing leaves and unripe fruit of *C. arabica*.

In contrast to this, two ninhydrin- and isatin-positive substances on 2D-TLC of the free amino acids of the developing immature fruits (pericarps and seeds) of tea were coincident with cyclic imino acids, pipecolic acid and hydroxyproline. In the maturing seeds, pipecolic acid almost disappeared, but lysine was detected. Pipecolic acid together with proline and hydroxyproline was also detected in the developing leaves and unripe fruits (pericarps and seeds) of *C. arabica*.

The inhibition of growth of Chinese milk vetch (*Astragalus sinicus*) and weeping mulberry (*M. alba* var. *pendula* Dippel) exposed to 20 and 5mM pipecolic acid, respectively, was found to occur in the radicle of germinating seeds.