Acacia farnesiana seedlings which will cleave both the thioether and sulphoxide forms of *S*-alkyl cysteines has been purified essentially to homogeneity [6]. It has a MW of about 144000 consisting of one subunit of 96000 and another of *ca* 48000 daltons. One mol of pyridoxal phosphate is bound per mol of enzyme. The energy of activation with L-djenkolate as the substrate is 12·7 kcal. The partial specific volume is 0·56 and the sedimentation coefficient 7·26S. The enzyme will also utilize *O*-methyl-DL-serine as a substrate and much less effectively *β*-methylamino-*α*-aminopropionate.

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Non-protein Amino acids derived from Primary Secondary Biosynthetic Pathways

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The non-protein amino acids are produced either by secondary pathways derived from protein amino acids or other primary metabolites or by branching from primary pathways used for the production of protein amino acids. This distinction is used as a basis for a discussion of three groups of amino acids, the straight-chain C_4-amino acids, the amino acids related to lysine, and the aromatic amino acids.

Two newly discovered amino acids, *N*-(3-amino-3-carboxypropyl)azetidine-2-carboxylic acid and *N*-[*N*-(3-amino-3-carboxypropyl)-3-amino-3-carboxypropyl]azetidine-2-carboxylic acid are derived from azetidine-2-carboxylic acid. Azetidine-2-carboxylic acid can chemically be transformed to a number of amino acids including methionine and homoserine [1]. On this basis the possible roles of azetidine-2-carboxylic acid as intermediate and end-product are discussed. Vinylglycine has recently been synthesized [2] and isolated from a mushroom [3]. This amino acid has previously been proposed as intermediate in transformations of threonine and other amino acids.

The biosynthesis of lysine in barley takes place via the diaminopimelic acid pathway [4]. No amino acids have been found in higher plants deriving from this pathway. The previous claim of the presence of diaminopimelic acid has not been validated and dilution experiments indicate that the level of free diaminopimelic acid in barley is very low or nil. On the other hand, a large number of amino acids and other compounds are produced by transformation of lysine.

The pathways leading to phenylalanine, tyrosine, and tryptophan from shikimic acid by branching give rise to a number of plant amino acids including 3-(3-carboxyphenyl)-alanine, 3-(3-carboxy-4-hydroxyphenyl)alanine, and *p*-aminophenylalanine [5–7]. The reactions leading to the large variety of compounds derived from chorismic acid have recently been rationalized into a coherent framework [7].

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Some New Aromatic Amino Acids

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Phenylalanine and tyrosine are found in all living organisms and it has been known for many years that 3,4-dihydroxyphenylalanine occurs in certain plants. Other aromatic amino acids which have been found more recently include 3-hydroxyphenylglycine [1], 3,5-dihydroxyphenylglycine [1], 3-hydroxyphenylalanine (*m*-tyrosine) [2], 2,4-dihydroxy-6-methylphenylalanine (*β*-orcylalanine) [3], 3-carboxyphenylalanine [4], 3-carboxytyrosine [5], 3-hydroxymethylphenylalanine [6], 4-hydroxy-3-hydroxymethylphenylalanine [6], 4-aminophenylalanine [7] and the D amino acids 3-carboxy-D-phenylglycine [8, 9] and 3-carboxy-4-hydroxy-D-phenylglycine [10].

In the seeds of *Combretum zeyheri* from Zambia we have found high concentrations of tyrosine, 3-carboxy-L-phenylalanine, 3-hydroxymethyl-L-phenylalanine and two other aromatic amino acids. The first of these analysed as *N*-methyltyrosine, an amino acid reported in the earlier literature as occurring in extracts of the barks of *Geoffroya surinamensis*, *Ferreira spectabilis* and *Andira anthelmintica* [11] and reported as the D-isomer. Studies indicating the L configuration for the isolate from *C. zeyheri* are now reported. The second compound was isolated and shown to be a new amino acid 3-aminomethylphenylalanine—the structure being confirmed by synthesis from 3-cyanophenylalanine, kindly supplied by Professor P. O. Larsen. Preliminary experiments indicate that the new amino acid is derived from shikimic acid, *de novo* synthesis having been shown to occur in the plant seedlings.

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