Prospects for amino acid biosynthesis inhibitors in crop protection and pharmaceutical chemistry

BCPC Monograph No. 42

Proceedings of a Conference organised by the Biophysical and Physiochemical Panel of the Society of Chemical Industry Pesticides Group with the support of the British Crop Protection Council held at Churchill College, Cambridge 5th–7th September, 1989

BCPC Registered Office
49 Downing Street
Farnham, Surrey GU9 7PH, UK
## Contents

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>vii</td>
</tr>
<tr>
<td>viii</td>
</tr>
<tr>
<td>viii</td>
</tr>
<tr>
<td>ix</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>23</td>
</tr>
<tr>
<td>31</td>
</tr>
<tr>
<td>43</td>
</tr>
<tr>
<td>57</td>
</tr>
<tr>
<td>61</td>
</tr>
<tr>
<td>67</td>
</tr>
<tr>
<td>75</td>
</tr>
<tr>
<td>79</td>
</tr>
<tr>
<td>83</td>
</tr>
<tr>
<td>85</td>
</tr>
<tr>
<td>95</td>
</tr>
<tr>
<td>99</td>
</tr>
<tr>
<td>105</td>
</tr>
<tr>
<td>107</td>
</tr>
<tr>
<td>117</td>
</tr>
</tbody>
</table>

**1. The biosynthesis of amino acids in plants**
R. M. WALLSGROVE

**Natural amino acids as enzyme inhibitors**
M. J. JUNG

**Amino acid biosynthesis: an Aladdin’s Cave of new pesticide targets?**
J. B. PILLMOOR

**Screening techniques for amino acid biosynthesis inhibitors**
K. POWELL and S. B. REES

**2. Use of mutagenesis to probe the structure and function of AATase**

**New techniques for transferring and specifically expressing traits in crop plants**
B. J. MIFLIN

**Discovery, transfer to crops, expression and biological significance of a bialaphos resistance gene**
J. BOTTERMAN and J. LEEMANS

**Transfer of in vitro selected imidazolinone resistance to commercial maize hybrids**
R. R. FINCHER

**3. Synthesis of analogues of 5-fluoro-4-aminopentanoic acid**
M. G. SMITH, J. M. RENGA and P. G. RAY

**Reconstruction of an amino acid biosynthesis pathway in vitro**
B. LABER and N. AMRHEIN

**Inhibition of purified acetolactate synthase from barley (Hordeum vulgare L.) by chlorsulfuron and imazaquin**
J. DURNER and P. BÖGER

**Acetohydroxyacid synthase – imidazolinone interaction**
B. J. SINGH, K. E. NEWHOUSE, M. A. STIDHAM and D. L. SHANER

**Mechanism of action of 1,2,4-triazolo[1,5-a] pyrimidine sulfonyamide herbicides**
M. V. SUBRAMANIAN, V. LONEY and L. PAO

**Aspartate kinase from amino acid analog-resistant tobacco cell cultures**
R. A. GONZALES and J. CLOUSE

**4. Polamine biosynthesis inhibitors**
P. BEY (no written submission)

**Inhibitors of bacterial D-alanine biosynthesis and metabolism**

**Alanine racemose inhibitors – mode of action**
B. BADET and C. T. WALSH
Studies of herbicides which inhibit branched chain amino acid biosynthesis
T. R. HAWKES

The chemistry and biochemistry of triazolopyrimidine sulfonanilides – a new class of acetylacetate synthase inhibitors
W. A. KLESCHICK and B. C. GERWICK

Origin of the herbicide binding site of acetylacetate synthase
J. V. SCHLOSS

5. Exploration of the shikimic acid pathway: opportunities for study through the synthesis of inhibitors and intermediates
P. A. BARTLETT, K. L. McLAREN, D. G. ALBERG, et al

Inhibitors of aromatic amino acid biosynthesis
J. R. COGGINS (no written submission)

Inhibitors of glutamine synthetase and their effects in plants
H. KOCHER

Inhibitors of δ-aminolaevulinic acid biosynthesis
L. J. ROGERS

6. POSTERS
Effects of imazaquin and sulfometuron methyl on extractable acetoxy acid synthase activity in plants
D. L. SHANER and D. LITTLE

α-Aminophosphonous acid antimetabolites – a bio-isosteric approach to the finding of new amino acid biosynthesis inhibitors.
J. G. DINGWALL

Acetolactate synthase from thermophilic bacterium TU/AA
H-P. SCHAR, O. GHISALBA, A. KAPTEIN, et al

A fast and sensitive method for the simultaneous determination of the two possible products of acetohydroxy acid synthase
D. ADAM, M. EHRAT, G. DUVENNECK, et al

The effect of freezing and waterlogging on AHAS in plants
J. KUEH, J. C. CASELEY and C. BOND

Large scale testing of acetolactate synthase
M. C. EHRAT, E. MOSINGER and H. R. FELIX

Synthesis of optically pure amino acids and derivatives for use as chiral intermediates for amino acid biosynthesis inhibitors

Metabolism of alanine phosphoanalogues in E. coli extracts. Acetylphosphinate and acetylphosphonate generation
A. I. BIRYUKOV, I. G. VASILYEVA, Yu. N. ZHUKOV, et al

A new assay for plant acetohydroxy synthase
P. GENIX and A. RACHON