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Bioorganic & Medicinal Chemistry Vol. 17, No. 12, 2009

Contents

Preface

p 4019

PERSPECTIVE

Crop plants versus energy plants—On the international food crisis

pp 4020–4021

P. M. Schmitz ^{*}, A. Kavallari



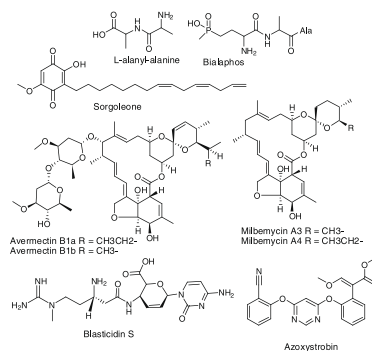
The recent price explosion of important agricultural commodities has led to an international food crisis. The price rise is attributed to fundamental factors, such as the rising demand for dairy and meat products in China and the development of the bioenergy branch as well as on short-term factors such as the behaviour of speculators.

REVIEWS

Natural products in crop protection

pp 4022–4034

Franck E. Dayan ^{*}, Charles L. Cantrell, Stephen O. Duke



This review covers the historical and current use of natural products for pest management in agriculture.

Combinatorial chemistry in the agrosociences

pp 4035–4046

Stephen D. Lindell ^{*}, Lisa C. Pattenden, Jonathan Shannon

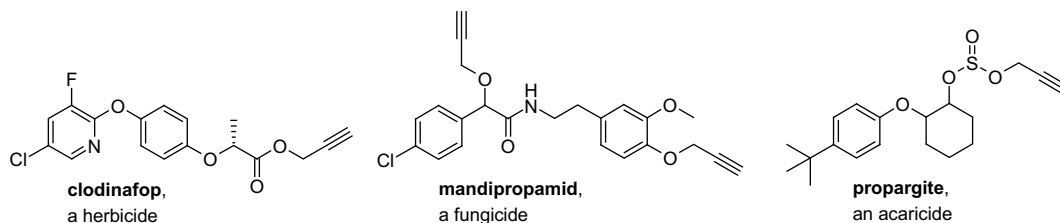


The role of bioavailability guidelines, natural products, privileged structures, virtual screening and X-ray crystallographic protein structures on the design of solid- and solution-phase compound libraries is reviewed.

Alkyne chemistry in crop protection

Clemens Lamberth *

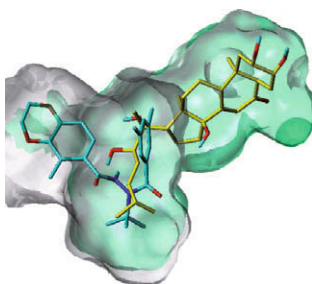
pp 4047–4063



Protein structure based rational design of ecdysone agonists

Graham Holmwood, Michael Schindler *

pp 4064–4070

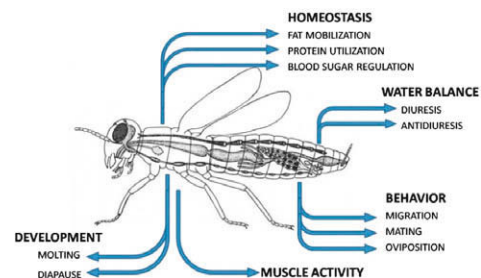


Insect neuropeptides: Structures, chemical modifications and potential for insect control

Jürgen Scherkenbeck *, Tino Zdobinsky

pp 4071–4084

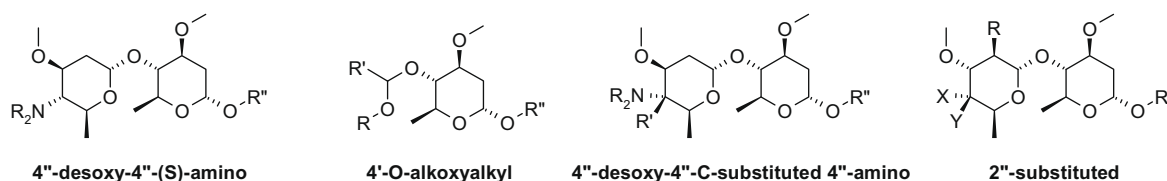
Neuropeptides are ubiquitous in the nervous system of insects and they are by far the most diverse signalling substances, both structurally and functionally. Structure–activity studies, conformational analyses and peptidomimetic modifications of selected insect neuropeptides with a special potential for application in insect control are reported.



New ventures in the chemistry of avermectins

Thomas Pitterna *, Jérôme Cassayre, Ottmar Franz Hüter, Pierre M. J. Jung, Peter Maienfisch, Fiona Murphy Kessabi, Laura Quaranta, Hans Tobler

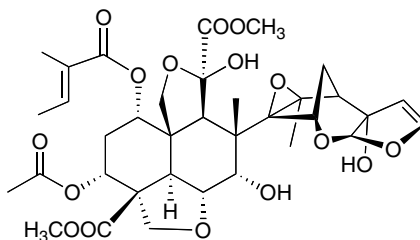
pp 4085–4095



Azadirachtin, a scientific gold mine

pp 4096–4105

E. David Morgan *



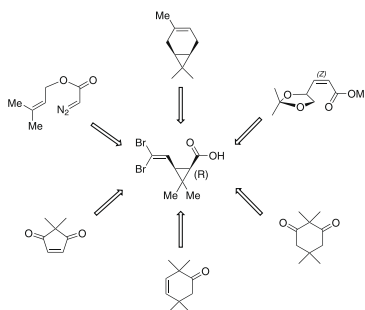
Azadirachtin, a plant-derived substance is of unique chemical and biological interest.

Reprint of "Inspired by flowers: Synthetic routes to scalemic deltamethrinic acid"

pp 4106–4126

[Bioorg. Med. Chem. 17 (2009) 2555–2575]

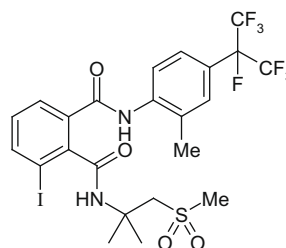
Alain Krief *, Stephane Jeanmart, Adrian Kremer

**New and selective ryanodine receptor activators for insect control**

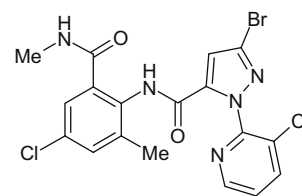
pp 4127–4133

George P. Lahm *, Daniel Cordova, James D. Barry

Diamide insecticides have emerged as one of the most promising new classes of insecticide chemistry owing to their excellent insecticidal efficacy and high margins of mammalian safety. Chlorantraniliprole and flubendiamide, the first two insecticides from this class, demonstrate exceptional activity across a broad range of pests in the order Lepidoptera. This chemistry has been confirmed to control insects via activation of ryanodine receptors which leads to uncontrolled calcium release in muscle. The high levels of mammalian safety are attributed to a strong selectivity for insect over mammalian receptors. This paper reviews the chemistry, biology, and ryanodine receptor activity for these new insecticides.



Flubendiamide

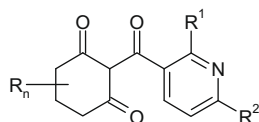
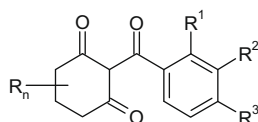


Chlorantraniliprole

Herbicidal 4-hydroxyphenylpyruvate dioxygenase inhibitors—A review of the triketone chemistry story from a Syngenta perspective

pp 4134–4152

Renaud Beaudegnies, Andrew J. F. Edmunds *, Torquil E. M. Fraser, Roger G. Hall, Timothy R. Hawkes, Glynn Mitchell *, Juergen Schaetzer, Sebastian Wendeborn, Jane Wibley



Treated



Control

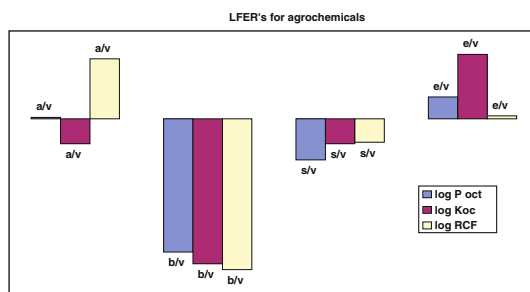
A review, outlining the origins and subsequent development of the triketone class of herbicidal 4-hydroxyphenylpyruvate dioxygenase (HPPD) inhibitors.

RESEARCH PAPERS

Beyond physical properties—Application of Abraham descriptors and LFER analysis in agrochemical research

pp 4153–4159

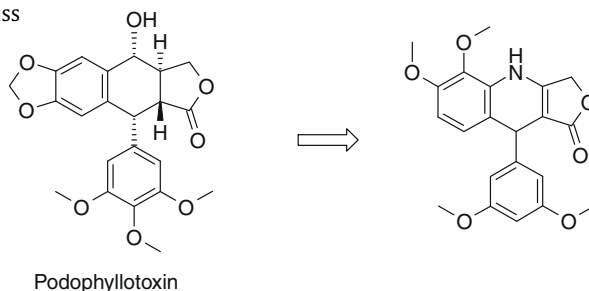
Eric D. Clarke *



Insecticidal heterolignans—Tubuline polymerization inhibitors with activity against chewing pests

pp 4160–4184

Jens Frackenhohl *, Isabelle Adelt, Horst Antonicek, Christian Arnold, Patricia Behrmann, Nicole Blaha, Jutta Böhmer, Oliver Gutbrod, Roman Hanke, Sabine Hohmann, Marc van Houtdrevre, Peter Lösel, Olga Malsam, Martin Melchers, Valentina Neufert, Elisabeth Peschel, Udo Reckmann, Thomas Schenke, Hans-Peter Thiesen, Robert Velten, Kathrin Vogelsang, Hans-Christoph Weiss

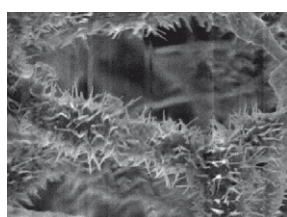


Discovery of the butenyl-spinosyn insecticides: Novel macrolides from the new bacterial strain

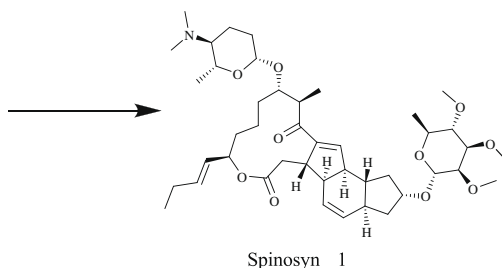
pp 4185–4196

Saccharopolyspora pogona

Paul Lewer, Donald R. Hahn, Laura L. Karr, Dennis O. Duebelbeis, Jeffrey R. Gilbert, Gary D. Crouse, Thomas Worden, Thomas C. Sparks, Pat McKamey Rex Edwards, Paul R. Graupner



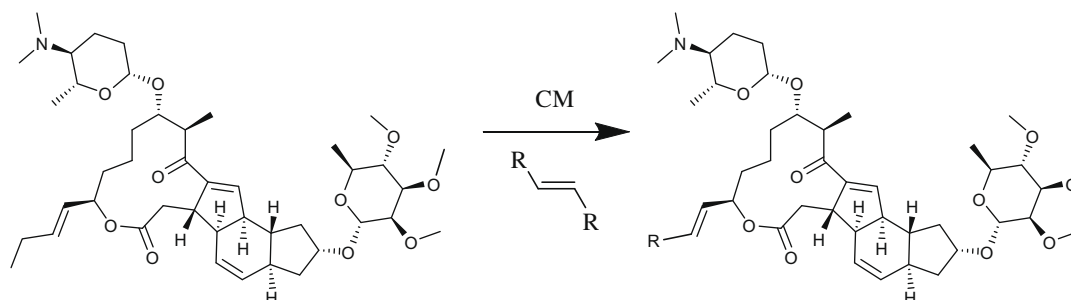
Saccharopolyspora Pogona
(x 20,000)



Modification of the butenyl-spinosyns utilizing cross-metathesis

pp 4197–4205

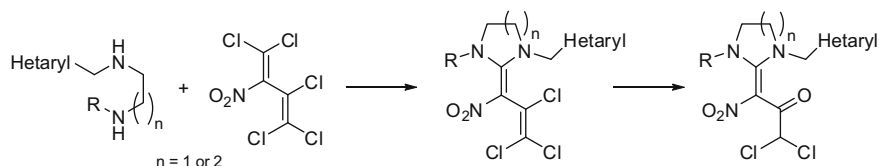
John Daeuble, Thomas C. Sparks, Peter Johnson, Paul R. Graupner *



Chemistry of polyhalogenated nitrobutadienes, 8: Nitropolychlorobutadienes—Precursors for insecticidal neonicotinoids

pp 4206–4215

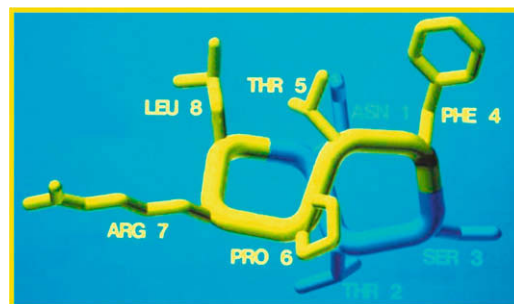
Viktor A. Zapol'skii, Reiner Fischer, Jan C. Namyslo, Dieter E. Kaufmann *



Potent activity of a PK/PBAN analog with an (*E*)-alkene, *trans*-Pro mimic identifies the Pro orientation and core conformation during interaction with HevPBANR-C receptor

pp 4216–4220

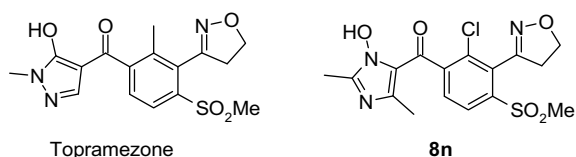
Ronald J. Nachman *, Young-Joon Kim, Xiaodong J. Wang, Felicia A. Etzkorn, Krzysztof Kaczmarek, Janusz Zabrocki, Michael E. Adams *



Design, synthesis and herbicidal activity of new iron chelating motifs for HPPD-inhibitors

pp 4221–4229

Matthias Witschel *

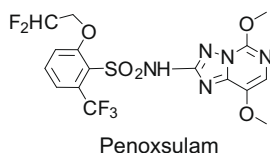


The target activity of herbicidal benzoylpyrazoles, such as the recently introduced topramezone developed by BASF, is based on chelation of the redox-active iron center of the enzyme *p*-hydroxyphenylpyruvate dioxygenase (HPPD). By replacing the hydroxypyrazole functionality of these compounds with the isosteric *N*-hydroxyimidazole, a similar or even improved inhibition on the target could be achieved, but with lower activity in the greenhouse.

Penoxsulam—Structure–activity relationships of triazolopyrimidine sulfonamides

pp 4230–4240

Timothy C. Johnson *, Timothy P. Martin, Richard K. Mann, Mark A. Pobanz

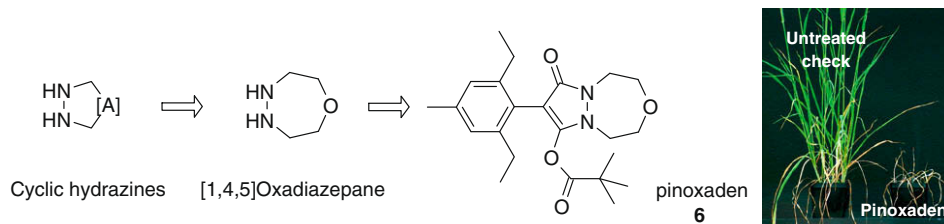


Investigations of the triazolopyrimidine SAR led to the discovery of penoxsulam, a new herbicide developed for grass, sedge and broadleaf weed control in rice.

Aryldiones incorporating a [1,4,5]oxadiazepane ring. Part I: Discovery of the novel cereal herbicide pinoxaden


pp 4241–4256

Michel Muehlebach ^{*}, Manfred Boeger, Fredrik Cederbaum, Derek Cornes, Adrian A. Friedmann, Jutta Glock, Thierry Niderman, André Stoller, Trixie Wagner

**OTHER CONTENTS****Instructions to contributors**

p I

*Corresponding author

 Supplementary data available via ScienceDirect

COVER

Plant Protection is one of the most fundamental preconditions to secure the nutrition of an ever growing world population. The global climate change will have an additional major impact on the nature of plant diseases and infestations with insect pests both on growing plants but also on stored food products. These challenges can be met only with modern, selective and environmentally beneficial plant protection products. The cover picture displays all structures which are covered by the review- or research-articles in this special issue 'Modern Trends in Agrochemistry'.

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