

Contents

Introduction

M. Lindauer.....	1
------------------	---

EVOLUTION AND GENETICS

The Evolution of Honeybees

F. Ruttner (With 8 Figures).....	8
----------------------------------	---

Behavior Genetics of Honeybees (*Apis mellifera* L.)

R. F. A. Moritz and C. Brandes (With 5 Figures).....	21
--	----

THE FORAGING HONEYBEE

Social Foraging by Honeybees: How a Colony Tracks Rich Sources of Nectar

T. D. Seeley and R. A. Levien (With 7 Figures).....	38
---	----

New Perspectives on the Dance Orientation of the Asian Honeybees

F. C. Dyer (With 4 Figures).....	54
----------------------------------	----

Perception of Foraging Costs and Intakes, and Foraging Decisions

K. D. Waddington (With 2 Figures).....	66
--	----

The Bee's E-Vector Compass

S. Rossel and R. Wehner (With 11 Figures).....	76
--	----

PHYSIOLOGICAL ASPECTS OF BEHAVIOR

Texture Sensitivity in the Life of Honeybees

P. G. Kevan..... 96

Thermoregulation by Individual Honeybees

B. Heinrich..... 102

Sleep Research on Honeybees: Neurophysiology and Behavior

W. Kaiser and J. Steiner-Kaiser (With 3 Figures)..... 112

Behavioral and Pharmacological Analysis of the Stinging Response in Africanized and Italian Bees

N. Balderrama, M. Díaz, A. Sequeda, J. Núñez, H. Maldonado (With 4 Figures)..... 121

VISUAL SYSTEM

The Structural Basis of Information Processing in the Visual System of the Bee

W. A. Ribi (With 4 Figures)..... 130

Processing of Visual Information in the Honeybee Brain

H. Hertel and U. Maronde (With 10 Figures)..... 141

Motion Sensitive Descending Interneurons, Ocellar L_D Neurons and Neck Motoneurons in the Bee: A Neural Substrate for Visual Course Control in *Apis mellifera*

L. J. Goodman, W. A. Fletcher, R. G. Guy, P. G. Mobbs (With 8 Figures)..... 158

Color Vision in Honeybees: Metric, Dimensions, Constancy, and Ecological Aspects

W. Backhaus, A. Werner and R. Menzel (With 7 Figures)..... 172

The Ocellar System of the Honeybee

J. J. Milde (With 9 Figures)..... 191

NEUROANATOMY AND SIGNAL PROCESSING IN THE BRAIN

Chemical Neuroanatomy of the Honeybee Brain

G. Bicker, S. Schäfer, V. Rehder (With 7 Figures)..... 202

Synaptic Connectivity in the Mushroom Bodies of the Honeybee Brain: Electron Microscopy and Immunocytochemistry of Neuroactive Compounds	
F.-W. Schürmann and K. Elekes (With 3 Figures).....	225
Immunohistochemical Localization of a Gastrin / CCK-like Peptide in the Brain of the Honeybee	
M. J. Noble and L. J. Goodman (With 3 Figures).....	235
Biogenic Amines and the Bee Brain	
A. Mercer (With 4 Figures).....	244
Neural Signal Processing in the Median Protocerebrum of the Bee	
J. Erber and U. Homberg (With 6 Figures).....	253
DEVELOPMENT	
<hr/>	
Hormonal Regulation of Age Polyethism in the Honeybee, <i>Apis mellifera</i>	
G. E. Robinson (With 4 Figures).....	266
Organization and Plasticity of the Olfactory System of the Honeybee, <i>Apis mellifera</i>	
C. Masson and G. Arnold (With 5 Figures).....	280
LEARNING AND MEMORY	
<hr/>	
Flower-shape, Landmark, and Locale Memory in Honeybees	
J. L. Gould (With 6 Figures).....	298
Memory Traces in Honeybees	
R. Menzel (With 8 Figures).....	310
SUBJECT INDEX	327