

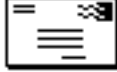


Acarology Bulletin



Newsletter of the **SYSTEMATIC & APPLIED ACAROLOGY SOCIETY**

President's message



Dear colleagues:

Greetings to you all from London on the anniversary of the founding of SAAS. On behalf of the Officers and Executive Committee of SAAS, I would like to thank each of you for the support that you have given to the Society during the past year. Our Society is still at its infancy and will need your continued support for its growth and success.

During this first year, SAAS published four issues of its newsletter *Acarology Bulletin*, which provides members with useful information and also serves as a link among members. SAAS also published the first volume of its journal *Systematic and Applied Acarology* and elected the officers and executive committee.

It was proposed by several members that we should hold the First Symposium of SAAS in 1997. I welcome your suggestions and comments on this issue.

Best wishes!

Zhi-Qiang Zhang



In this issue.....

- 33 President's message
- 33 SAAS Officers
- 34 Acarology and member news
- 35 New books
- 36 Book reviews
- 39 Bibliography
- 42 Contents of Exp. & Appl. Acarol.
- 43 New members of SAAS
- 43 Corrections and changes
- 44 Application form for SAAS
- 44 About the *Acarology Bulletin*

Acarology Bulletin Editors

Editor:

Dr. Zhi-Qiang Zhang (UK)

Assistant editors:

Dr. Xiaoyue Hong (China)

Dr. Renjie Hu (USA)

Dr. Ting-Kui Qin (New Zealand)

SAAS Officers & Executive Committee

President	Zhi-Qiang Zhang (UK)
Secretary	Xiaoyue Hong (China)
Treasurer	Ting-Kui Qin (New Zealand)
Executive Committee Members	Lairong Liang (China)
	Y. S. Chow (Taiwan)
	Chengfeng Mo (Hong Kong)
	Zhimo Zhao (China)
	Long-Shu Li (China)
	Renjie Hu (USA)

Acarology and member news

The Third Symposium of European Association of Acarologists was successfully held during 1-5 July 1996 in Amsterdam, The Netherlands. The Symposium was participated by over 100 acarologists from Europe and other parts of the world. The theme of the symposium was "Ecology and Evolution". Morning sessions were lectures by invited speakers on four themes: (1) Phylogeny and Evolution; (2) Evolutionary Genetics, Morphology and Physiology; (3) Evolutionary Ecology: Behaviour, Life History and Multitrophic Interactions; (4) Host Race Formation and Speciation. The afternoon sessions were biological reviews by invited speakers, followed by sessions of submitted papers on the following themes: (1) Plant-inhabiting Mites; (2) Water Mites; (3) Soil-inhabiting mites; (4) Ecology; (5) Water Mites; (6) Genetics; (7) Physiology.

SAAS members, Prof. U. Gerson, Dr. L. Lundqvist, Dr. Ting-Kui Qin and Dr. Zhi-Qiang Zhang were among the participants.

Mr. Jianzhen LIN (Fujian Provincial Academy of Agricultural Sciences) has been describing species in several families including Tarsonemidae collected in Fujian Province, East China for the forthcoming Fujian Kunchong (Insect Fauna of Fujian Province). The Insect Fauna of Fujian is a huge project, involving many entomologists and acarologists in mainland China and is scheduled to be published next year.

Henan Provincial Entomological Society organized many entomologists and acarologists to collect insect and mite samples in Henan Province this July. This collecting activity aims at publishing Fu Niu Shan Kunchong (Insect Fauna of Funiu Mountain) in the near future. Funiu mountain is an important dividing line between the Oriental Region and the Palaearctic Region in Central China. Mr. Rongshu FU of Shanghai Institute of Entomology (Academia Sinica) has taken part in the collecting soil mites. - X.Y. Hong

Ting-Kui QIN visited the United States of America, the Netherlands, the United Kingdom and Australia in June and July 1996. He attended the 46th Annual Acarology Summer Programme (17-28 June) in Ohio State University, Columbus, Third Symposium of European Association of Acarologists (1-5 July), Amsterdam, and 1996 Hawaii Conservation Conference (18-19 July), Honolulu. He visited Drs Jerry Krantz and Frank Radovsky of Oregon State University, Corvallis; Drs Bob Smiley, Edward Baker, Mercedes Delfinado-Baker and Douglass Miller of Systematic Entomology Laboratory, United States Department of Agriculture, Beltsville; mite laboratory in University of Amsterdam, Amsterdam, Dr Zhi-Qiang Zhang of International Institute of Entomology, London, Dr Anne Baker of The Natural History Museum, London, Drs Sabina Swift and Frank Howarth of Bishop Museum, Honolulu, Dr Lee Goff of University of Hawaii, Honolulu, and Dr Bruce Halliday of CSIRO Division of Entomology, Canberra. Ting-Kui also met and exchanged ideas on mite research with many other fellow acarologists during the 46th Annual Acarology Summer Programme and the Third Symposium of European Association of Acarologists. He examined and borrowed mite specimens from some mite collections. The visit was very beneficial to his mite career. Ting-Kui is very grateful to his employer, Landcare Research, for financially supporting his trip.

Shortly after his return to Auckland from the above trip, Ting-Kui went to Lincoln, New Zealand, and attended the first joint Annual Conference of New Zealand and Australian Entomological Society during 22-27 August 1996.

Acaphylla theae does not exist in China, although this name has been used for the tea rust mite for many years. The dominant eriophyid mite on the tea plants in China is *Acaphylla steinwedeni* Keifer. (Zhao & Kuang, 1996. Acta Zootaxon. Sin., 21: 82).

Professor Xiwen CHEN, Mr. Siqing HU and their associates have been studying the tetranychid mites in Jiangxi Province since 1986. At the 50 anniversaries of the Chinese Entomological Society Seminar in late 1994, they reported that 12 genera and 52 species in the Tetranychidae, 4 genera and 7 species in the Tenuipalpidae, 1 genus and 1 species in the Tuckerellidae have been identified in the Province. Several species, e.g. *Oligonychus perditus* Pritchard & Baker, *O. punicae* (Hirst), *O. platanus* Haishhi, *Schizotetranychus bambusae* Reck, *Aponychus corpuzae* Rimando, *Tetranychus kanzawai* Kishida cause severe damages to the ornamental plants and vegetables.

Xiaoyue HONG

Graduate research opportunity in comparative arachnology: Dr. Jeff Shultz currently has space and funding available for M.S. and Ph.D. students who are interested in pursuing work in the comparative biology of arthropods, especially arachnids. Current work focuses on the functional morphology and phylogeny of arachnids, but students with related interests are welcome.

Please address inquiries to: Jeff Shultz, Department of Entomology, University of Maryland, College Park, MD 20742-5575 USA. Email: js314@uemail.umd.edu

The Phytoseiidae As Biological Control Agents of Pest Mites and Insects: A Bibliography [1960-1994] by Tuomas S. Kostiaainen & Marjorie A. Hoy.

This bibliography is intended to provide a comprehensive list of publications from 1960 to 1994 that deal with the family Phytoseiidae. To make this bibliographic list usable the authors have included several indices to help in locating publications on a specific topic, including a prey species index, effects of pesticides on phytoseiid index, species description index, general subject index, and author index.

To obtain a **FREE COPY** of this book, contact M. A. Hoy, Dept. of Entomology & Nematology, PO Box 110620, Univ. of Florida, Gainesville, Florida 32611, USA.

NEW BOOKS



The Acari. Physiological and Ecological Aspects of Acari-Host Relationships. (1995) Edited by Kropczynska, D. & Tomczyk, A. Dabor. Warszawa. 698 pp. \$110.00 (post free).

This book is the proceedings of the Second Symposium of the European Association of Acarologists (EURAAC). This book may be ordered with payment (to EURAAC) from Don Macfarlane, 70 Hunters Way, Gillingham, Kent, ME7 3BT, UK.

Eriophyoid Mites. Their Biology, Natural Enemies and Control. (1996) Edited by Lindquist, E.E., Sabelis, M.W. & Bruin, J. Amsterdam, Elsevier. 800 pp. Hardcover. \$300.00. ISBN 0-444-088628-1.

Ticks of North-West Europe. Synopses of the British Fauna (New Series) No. 52. (1996) By Hillyard, P. Shrewsbury, Field Studies Council Publications for the Linnean Society of London/Estuarine and Coastal Sciences Association. 179 pp.

Mite Pests and their Predators on Cultivated Plants in Southern Africa: Vegetables and Berries. (1996) By Magdalena K.P. Smith Meyer. Publisher: ARC - Plant Protection Research Institute, Biosystematics Division, National Collection of Arachnida, Private Bag X134, Pretoria, South Africa. 90 pp, luxury paperback (A6 format) (170 x 245 mm). \$35.00. ISBN 0 621 17330 4.

Lyme Borreliosis (1994) Ed. by Axford, J.S. & Rees, D.H.E. New York & London, Plenum Press. Hardback. 332 pp. ISBN 0 306-44664-2.

Aspects of Lyme Borreliosis (1993) Ed. by Weber, K. & Burgdorfer, W. Berlin, Springer-Verlag. Hardback. 384 pp. ISBN 3-540-55628-1 & 0-387-55628-1.

Tick Vector Biology. Medical and Veterinary Aspects (1992) Ed. by Fivaz, B., Petney, T. & Horak, I. Berlin, Springer-Verlag. Hardback. 193 pp.

Book Review



A Guide to the Spider Mites (Tetranychidae) of the United States. By E. W. Baker and D. M. Tuttle, 1994. Michigan: Indira Publishing House. 347 pp. ISBN: 0-930337-12-3. US\$123.00.

Spider mites (Acari: Tetranychidae) are phytophagous and feed on almost all crops and horticultural and ornamental plants. Many species cause serious damage to their host plants and are important pests. In terms of economic loss caused by the Acari, spider mites are ranked number one on the list. Owing to their economic importance, spider mites are better studied and known, compared with most other groups of mites. Monographs on the Tetranychidae have been published on a world basis (e.g. Pritchard & Baker, 1955; Helle & Sabelis, 1985) or in particular regions (e.g. Wang, 1981). 'A Guide to the Spider Mites (Tetranychidae) of the United States' is a updated edition of Pritchard & Baker (1955), but only deals with the North American fauna.

The book is arranged into different sections. The Abstract and Acknowledgements sections are very brief, followed by a table of Contents. The Introduction states the importance of spider mites, including a list of the names of some important pest species, reviews important literature on the American tetranychids and sets out the aims or objectives of the book, which are to enable users to identify spider mites. The morphology of the family is summarised in the Morphology and Terminology section, which also explains the terminology adopted for setal notation. It should be pointed out that the terminology used for the ventral setae by the authors should not be regarded as a model. The current trend is to use the terminology proposed by Lindquist (1985), which will hopefully be consistent across all of the Acariformes.

The main part of the book (pp. 15-322) deals with the taxonomy of spider mites in the US, covering 218 species and 31 genera.

The family Tetranychidae is classified into two subfamilies and seven tribes: Bryobiinae consisting of Bryobiini, Hystrichonychini, Petrobiini and Neotrichobiini, and Tetranychinae containing Eurytetranychini, Tenuipalpoidini and Tetranychini. A key to subfamilies, tribes and genera is provided. Brief descriptions (usually diagnostic features) are given for family, each subfamily, tribe, genus and species. Keys to species are provided for all non-monotypic genera. Readers should keep in mind that these keys were designed based on the United States fauna and may not work for species collected from other parts of the world. The type species of each genus is indicated; however, the authors have not specified whether the type species was originally or subsequently designated. Although the type-species designation is obvious for many (or most) genera, there are cases where type species were not designated by the original authors, especially the early authors. All species are illustrated, and the illustrations for each species include the dorsum, part of the venter, some legs and some other parts such as setal enlargement, peritreme, and aedeagus. Known distributions and host plants of the species are listed. It would be more helpful if the families of the host plants were also included. The final part of the book includes the literature cited in the text, and separate indices to genera, species, and scientific and available common names of the host plants.

I believe that some other information should be included in such a comprehensive study. For example, including collecting and mounting techniques as in Pritchard & Baker (1955) would be very helpful for the users, considering the authors have aimed at a wide audience. The authors have been well known specialists on this group of the mites for a long time and readers would appreciate their ideas on the phylogeny of the Tetranychidae. Pritchard & Baker (1955) indicated that their recognition of different levels of taxa (subfamilies, tribes, genera and species group) reflect phylogenetic relationships within the family. This is not stated in the present work, but it is presumably also true.

Another omission in this book is a discussion on the taxonomic history of the family, subfamilies, tribes and some genera. However, there is no doubt that the publication is a very important contribution to the systematics of spider mites. It is a very useful book for all those who need to study and identify spider mites and/or who are just interested in mites in general.

References

Helle, W. & Sabelis, M. W. (eds) (1985) *Spider Mites, Their Biology, Natural Enemies and Control*. Amsterdam, Oxford, New York and Tokyo, Elsevier. Volume 1A. 405 pp. Volume 1B. 457 pp.

Lindquist, E. E. (1985) External anatomy. pp. 3-28. In: Helle, W. & Sabelis, M. W. (eds) *Spider Mites, Their Biology, Natural Enemies and Control*. Amsterdam, Oxford, New York and Tokyo, Elsevier. Volume 1A. pp. 3-28.

Pritchard, A. E. & Baker, E. W. (1955) *A Revision of the Spider Mite Family Tetranychidae. Memoirs Series Volume 2*. San Francisco: Pacific Coast Entomological Society. 472 pp

Wang, H. F. (1981) *Economic Insect Fauna of China, Fasc. 23. Acarina: Tetranychoidae*. Beijing: Science Press. 150 pp. (In Chinese)

Ting-Kui QIN

Manaaki Whenua - Landcare Research
Private Bag 92170
Auckland, New Zealand

The Acari: Reproduction, Development and Life-history Strategies, Edited by Reinhart Schuster and Paul W. Murphy, Chapman & Hall, London, 1991, xxiii + 554 pp. ISBN 0-412-36070-5.

As the first of its kind for the European Association of Acarologists (EURAAC), a symposium with the main theme: The Acari: Reproduction, Development and Life-history

Strategies was held from August 9 to 12, 1988 in Graz, Austria. More than 100 acarologists from 15 European countries together with their counterparts from USA and Israel attended the symposium. This book is the collection of contributions to the symposium including seven invited papers related to the main theme and fifty one submitted papers fit within the framework of the theme.

The book is divided into five parts. Part one entitled "Life-history Strategies" comprises five papers. The authors of these papers provide evidence to highlight general life strategies developed by mites and to define their adaptive strategies to habitats they select to live in relation to their constraints and perturbations. In those papers, authors also elucidate evolution of spider mite life history as well as that of transformation of osmotic regulation in freshwater mites. Furthermore, the genetic adaptation in a colonized mite in unpredictably varying environments plus development and life history strategies in mussel mites are also discussed in this part. Part two, Reproduction, consists of 11 papers. The authors outline various aspects of systemic and functional implications in mite reproduction using examples of their speciality. Discussions are particularly focused on spermatology in the mite including distribution, mechanisms, and evolutionary significance of parthenogenesis, indirect sperm transfer and spermatophore deposition in relation to atmospheric humidity. In addition, sex ratio control, duration of copulation and egg reproduction in several mite groups are reviewed. Part three named Diapause, Development and Trophic Relations includes nine papers presenting results of studies on the subject. These studies demonstrate profound similarities of physiological aspects, which induce diapause, found in several groups of mites with emphases on photoperiodic and thermoperiodic response mechanisms. Reproduction, embryonic and postembryonic development of mites in response to

temperature changes are also described. Moreover, it is indicated by several studies that resource allocation and utilization contrasts as well as the influence of different host plants may be contributors to the reproductive potential of the Acari. The classification of some acarine groups remains problematic and requires further investigations. Part four of the book - Systematics, Morphology, Physiology and Behaviour - include 13 contributions dealing with some of such a difficult concept. Specialists in the field describe in detail the morphological, physiological and behavioural features important for the systematics of mites in the groups including Oribatida, Tenuipalpidae, Trombiculidae, Hydrachnididae, and etc. One paper (by F. Bernini and Avanzati) suggests that the genetic basis of the phenotype in the oribatid systematics should not be ignored. The authors further propose the use of enzyme polymorphisms by biochemical methods as a new approach to this basic question. Part five entitled "Field Studies and Applied Aspects" apparently occupies the largest space in the book with 20 papers included. Researchers, mostly from European countries, present their findings on usefulness and significance of the Acari in diversified areas such as agriculture, food industry, and public health. Most of these papers are not related to the main theme of the book but rather fit within its framework.

In addition to the five parts as the bulk of the book, a glossary for symbols and abbreviations, index to plant genera and species, index to animal genera and species, author index, and subject index are also provided. I found them very useful and convenient for better understanding the concepts and quickly finding the information that are most interesting to me.

Although this book covers a variety of aspects related to the subjects as the title indicated, the information provided within the pages of the book is somewhat limited to the mite group in which the authors specialize. Nevertheless, I, shared with the editors, hope that readers will be stimulated by these and many other equally

fascinating insights into the life processes of the Acari.

Renjie HU

Department of Entomology
Iowa State University
Ames, IA 50011, USA

Acarine Biocontrol Agents: An illustrated Key and Manual. (1996) Gerson, U. & Smiley, R. L. Chinese edition translated by Liang, L.-R., Zhong, J., Hu, C.-Y. & Dong, H.-Q. Shanghai, Fudan University Press. 209 pp. ISBN 7-309-01617-3. Paper cover. 12 Yuan.

This is a Chinese translation of the English edition published by Chapman & Hall in 1990. In the Preface of this edition, the authors provided a review of literature published between 1989-1993 with a list of 184 papers. The book is arranged in two parts. Part I consists of an illustrated key to 29 mite families of importance in biocontrol, followed by an description of the diagnosis, biology and usefulness in biocontrol of each family. Part II consists of ten short reviews on such topics as effects of host plants and pesticides on mite biocontrol agents, followed by a list of references and recommendations for future studies. This second part serves a useful addition to topics covered in Hoy *et al.* (1983).

One main feature of the book is the concise review of the subject and list of useful references. Of the 209 pages of the Chinese edition, 83 pages contain list of references (in English). Thus, this new book is useful not only to Chinese readers but English readers as well. The price of the Chinese edition is only a small fraction of the English one. It is likely to reach a larger audience for a greater impact.

Reference

Hoy, M.A., Cunningham, G.L. & Knutson, L. (eds) (1983) *Biological control of Pests by Mites*. University of California Special Publication no. 3304. 185 pp.

Zhi-Qiang Zhang
International Institute of Entomology
56 Queen's Gate
London SW7 5JR, UK

Bibliography of Systematic and Applied Acarology

Recent Chinese literature on the carmine spider mite, *Tetranychus cinnabarinus* (Acari: Tetranychidae)

XIAOYUE HONG

Dept. of Plant Protection, Nanjing Agricultural University, Nanjing, Jiangsu 210095, China

Cai, S. H. (1985) Studies on the occurrence of *Tetranychus cinnabarinus* and its control target. *China Cotton*, No. 5: 39-40.

Chang, H. Y. & Chen, C. N. (1984) Review of the mite problems and their biological control in Taiwan. *NTU Phytopathologist and Entomologist*, No. 11: 137-156.

Chen, Z. J., Zhang S. L., Zhang, M. R., Wu, G. J. & Zhang, X. (1995) Effects of several insecticides on the cotton red spider mite and their application methods. *Acta Univ. Agric. Boreali-occidentalis*, 23(3): 45-50.

Ding, X. F., Ding, Z. K., Wang, S. Q. & Huang, P. Z. (1996) Forecasts on the occurrence degree of *Tetranychus cinnabarinus* (Boisduval) in seedling stage in the seaboard cotton area, north of Jiangsu Province. *Entomological Knowledge*, 33(3): 141-144.

Dong, H. F. (1990) Control effect of the enhanced Liuyangmycin on leaf mites and its influence on the beneficial predators. *Chinese Journal of Biological Control*, 6(3): 97-101.

Dong, H. F., Guo, Y. J. & Niu, L. P. (1987) Species identification of three common spider mites through cross breeding in China. *Acta Phytopylacica Sinica*, 14(3): 157-161.

Fan, Z. J. & Chen, N. C. (1996) Studies on the insecticidal resistance mechanisms of cotton spider mite. *Acta Phytopylacica Sinica*, 23(2): 175-180.

Fan, Z. J. & Chen, N. C. (1996) Studies on the insecticidal resistance mechanisms of cotton spider mite. *Acta Phytopylacica Sinica*, 23(2): 175-180.

Gao, Z. R., Qiu, F. & Li, Q. S. (1990) Studies on the infestation of spider mites *Tetranychus* spp. on cotton and their economic threshold. *Acta Phytopylacica Sinica*, 17(4): 331-336.

Gao, Z. R., Li, Q. S., Liu, X. C., Qiu, F. & Liu, Q. X. (1991) The effect of some insecticides on biological aspects of spider mite, *Tetranychus cinnabarinus* (Boisduval). *Acta Phytopylacica Sinica*, 18(3): 283-286.

Guo, Y. Y., Dai, X. F., Liu, Q. X., Gao, Z. R., Li, Q. S. & Qiu, F. (1994) On the dynamic compound action thresholds of second generation cotton bollworm and spider mites damage to cotton in the northern China cotton. *Acta Phytopylacica Sinica*, 21(4): 339-344.

Ho, C. C. & Chen, W. H. (1992) Species survey of spider mites and seasonal occurrence of *Thrips palmi*, *Chlorita biguttula biguttula*, and *Tetranychus cinnabarinus* on eggplant. *Chinese Journal of Entomology*, 12(4): 259-268.

Ho, C. C., Chen, W. H. & Cheng, C. C. (1993) Distribution and estimates of the optical sample size of *Tetranychus cinnabarinus* (Acari: Tetranychidae) on eggplant. *Chinese Journal of Entomology*, 13(2): 125-140.

Hong, X. Y., Wang, Y. C. & You, Z. P. (1994a) Scanning electron microscopic observation on the body surface of the adult mites of *Tetranychus cinnabarinus* (Boisduval). *The Journal of Nanjing Agricultural University*, 17(2): 48-53.

Hong, X. Y., Wang, Y. C. & You, Z. P. (1994b) Cuticle structure and moulting process of *Tetranychus cinnabarinus* (Boisduval). *The Journal of Nanjing Agricultural University*, 17(4): 37-45.

Hong, X. Y., Wang, Y. C. & You, Z. P. (1995) Sperm fine structure and spermiogenesis of *Tetranychus cinnabarinus* (Boisduval). *The Journal of Nanjing Agricultural University*, 18(2): 44-50.

- Jin, D. R.**, Bu, Y. H., Liu, C. Y. & Guo, H. X. (1987) Effects of *Tetranychus cinnabarinus* on physiology and production of cotton. Acta Phytophylacica Sinica, 14(3): 145-150.
- Ke, L. S.**, Yang, Y. Y. & Xin, J. L. (1990) Selection and genetic analysis of dimethoate resistance in *Amblyseius pseudolongispinosus* (Acarina: Phytoseiidae). Acta Entomologica Sinica, 33(4): 393-397.
- Ke, D. X.**, He, H. J., Huang, M. S. & Xiong, Y. Q. (1995) Functions of field rotation of cotton and paddy rice in controlling *Tetranychus cinnabarinus* (Boisduval). Plant Protection, 21(5): 2-4.
- Kong, J. A.** & Zhang, N. X. (1986) Chemical relationship between *Amblyseius fallacis* (Garman) and its prey. Chinese Journal of Biological Control, 2(4): 158-161.
- Kuang, H. Y.** & Cheng, L. S. (1990) Studies on the differentiation of two sibling species, *Tetranychus cinnabarinus* (Boisduval) and *T. urticae* Koch. Acta Entomologica Sinica, 33(1): 109-116.
- Li, C. X.**, Jiang, H. Z. & Li, J. H. (1990) Some soil treatments with systemic insecticides to transplant cotton for controlling cotton spider mite. Acta Phytophylacica Sinica, 17(2):183-187.
- Liu, Q. X.**, Lin, X. C., Qiu, F. & Gao, Z. R. (1987) Life table and population dynamics of *Tetranychus cinnabarinus* (Acarina: Tetranychidae). Acta Agriculturae Boreali Sinica, 2(4):85-93.
- Liu, Q. Z.** (1994) A preliminary study on the spatial patterns and spatial dynamics of the hawthorn spider mite. Acta Agriculturae Boreali-Sinica, 9(1):108-113.
- Liu, Q. Z.** & Li, R. J. (1993) Bionomics of *Tetranychus cinnabarinus* (Boisduval) in jujube trees (*Ziziphus sativa*) and its control. Entomological Knowledge, 30(2): 94.
- Liu, X. C.** & Wu, K. M. (1988) The influences of different host plant to development and reproduction of carmine spider mite, *Tetranychus cinnabarinus*. Acta Agriculturae Boreali Sinica, 3(4): 86-91.
- Lo, P. K. C.**, Ho, C. C. & Tseng, C. K. (1984) An ecological study of spider mites on strawberry in Taiwan. Journal of Agricultural Research of China, 33(3): 337-344.
- Lu, W. X.**, Yuan, Q. C. & Zhang, G. Q. (1986) Studies on the effects of cotton red spider mites injury on the growth and yield of cotton and its economic threshold. Acta Phytophylacica Sinica, 13(3): 179-184.
- Qin, Y. C.**, Cai, N. H., Hu, D. X. & Huang, K. X. (1990) Study on the mixed damage of sweet cherry spider mite and European red mite to apple leaf and fruit. Acta Phytophylacica Sinica, 17(4): 349-353.
- Qiu, F.** (1992) The natural population life table of *Tetranychus cinnabarinus* in cotton fields. Entomological Knowledge, 29(4): 199-201.
- Qiu, F.** & Li, Q. S. (1988) The biology and dynamics of cotton carmine spider mite, *Tetranychus cinnabarinus* (Boisduval). Entomological Knowledge, 25(6): 334-338.
- Wang, H. Z.**, Zhao, H. L., Zhang, D. X. & Gao, Z. M. (1993) The ecological effects of cotton interplanted in wheat fields on cotton pests. Acta Phytophylacica Sinica, 20(2): 163-167.
- Wu, K. M.** (1989) The effect of carmine spider mite infestation on the physiological activities of cotton. Acta Phytophylacica Sinica, 16(2): 99-105.
- Wu, K. M.** (1990) Study on density effect of *Tetranychus cinnabarinus* (Boisduval). Entomological Knowledge, 27(4): 213-216.
- Wu, K. M.** (1991) Leaf area loss of cotton plant infested by carmine spider mite, *Tetranychus cinnabarinus*. Chinese Journal of Ecology, 10(4):1-3.
- Wu, K. M.** & Liu, Q. X. (1994a) Genetic analyses of the resistance of carmine spider mite to monocrotophos. Scientia Agricultura Sinica, 27(3):50-55.

- Wu, K. M.** & Liu, Q. X. (1994b) A fuzzy model for prediction of cotton spider mite (*Tetranychus cinnabarinus*) in Henan province. *Acta Agriculturae Boreali-Sinica*, 9(4): 75-80.
- Wu, K. M.** & Liu, Q. X. (1995) Resistance dynamics of cotton spider mites to dicofol and omethoate. *Entomological Knowledge*, 32 (5): 266-270.
- Wu, K. M.**, Liu, X. C., Qin, X. Q. & Lou, G. Q. (1990) Investigation of carmine spider mite (*Tetranychus cinnabarinus*) resistance to insecticides. *Acta Agriculturae Boreali-Sinica*, 5(2): 117-123.
- Wu, Q. H.** (1990a) Study on the hibernation of *Tetranychus cinnabarinus*. *Journal of Ecology*, 9(6): 16-19.
- Wu, Q. H.** (1990b) The mating behavior of the carmine spider mite, *Tetranychus cinnabarinus* (Boisduval). *Entomological Knowledge*, 27(6): 344-346.
- Wu, Q. H.** & Ding, Z. R. (1985) Influence of light on the growth and development of *Tetranychus cinnabarinus*. *Journal of Ecology*, 17(3): 22-26.
- Wu, Q. H.** & Jing, Z. Q. (1993) Study on the induction of diapause in the carmine spider mite, *Tetranychus cinnabarinus* (Boisduval). *Entomological Knowledge*, 30(6): 335-337.
- Wu, Q. H.** & Wu, S. L. (1988) Studies on occurrence of carmine spider mite (*Tetranychus cinnabarinus*) (Acarina: Tetranychidae) in spring. *Acta Agriculturae Shanghai*, 4(3): 47-45.
- Wu, Q. H.**, Zhong, J. & Xu, Y. M. (1988) Combined effects of temperature and light on the experimental population of the carmine spider mite, *Tetranychus cinnabarinus* (Acarina: Tetranychidae). *Acta Ecologica Sinica*, 8(1): 66-77.
- Wu, Q. H.**, Yang, G. P., Jing, Z. Q., Qian, J. & Wang, H. B. (1996) Grey relation ordering of natural enemies to *Tetranychus cinnabarinus* in eggplant field. *Journal of Fudan University (Natural Science)*, 35(2): 170-175.
- Wu, Y. Q.**, Liu, Q. X., Gao, Z. R. & Zhong, C. Z. (1996) A study on resistance mechanism in cotton cultivar to *Tetranychus cinnabarinus*. *Scientia Agricultura Sinica*, 29(3): 1-7.
- Yang, G. P.**, Wu, Q. H. & Jing, Z. Q. (1996) Studies on the fuzzy division of meteorologic factors affecting on the natural population dynamics of carmine spider mite. *Acta Phytophylacica Sinica*, 22(2): 153-158.
- Yang, J. S.**, Shu, Z. L., Yang, L. P. & Pan, Y. P. (1990) Occurrence and control strategy of *Tetranychus cinnabarinus* on strawberries. *Jiangsu Agricultural Sciences*, No. 6: 45-7, 55.
- Yuan, D.** (1982) Investigation on the dynamics of the cotton spider mite on the winter and spring hosts. *Entomological Knowledge*, 19(5): 23-25.
- Zhang, J. F.**, Sun, J. Z., Wu, Z. B. & Liu, J. L. (1992) Genetic analysis of cotton resistance to the spider mite *Tetranychus cinnabarinus*. *Journal of Huazhong Agricultural University*, 11(2): 127-133.
- Zhang, J. F.**, Sun, J. Z., Wu, Z. B. & Liu, J. L. (1993) Identification of cotton varieties resistant to carmine spider mite and exploration of resistance mechanism. *Acta Phytophylacica Sinica*, 20(2): 155-161.
- Zhang, N. X.** & Kong, J. A. (1986) Studies on the feeding habit of *Amblyseius fallacis*. *Chinese Journal of Biological Control*, 2: 10-3.
- Zhao Z. M.**, Liu Y. H. & Zhang, C. L. (1994) Studies on the insect community structures in vegetable fields adopting different cropping systems in the suburbs of Chongqing City. *Acta Phytophylacica Sinica*, 21(1): 39-45.
- Zhou, W.** & Wang, R. (1989) Rearing of *Orius sauteri* (Hem.: Anthororidae) with natural and artificial diets. *Chinese Journal of Biological Control*, 5(1): 9-12.
- Zou, P.**, Gao, J. R. & Ma, E. P. (1986) A study of food preference and predatory capacity of *Amblyseius pseudolongispinosus*. *Natural Enemies of Insects*, 8(3): 137-141.

Current contents of acarological journals

Experimental & Applied Acarology

Vol. 20, No. 5., May 1996

Aguila, H.G., Tanigoshi, L.K. & Lumpkin, T.A. Evaluation of *Vigna angularis* (Willd.) Ohwi and Ohashi accessions for resistance to *Tetranychus urticae* Koch (Acari: Tetranychidae). 237-247.

Morris, M.A., Croft, B.A. & Berry, R.E. Overwintering and effects of autumn habitat manipulation and carbofuran on *Neoseiulus fallacis* and *Tetranychus urticae* in peppermint. 249-258.

Nwile, F.E. & Nachman, G. Functional response of *Iphiseius degenerans* and *Neoseiulus teke* (Acari: Phytoseiidae) to changes in the density of the cassava green mite, *Mononychellus tanajoa* (Acari: Tetranychidae). 259-271.

Nwile, F.E. & Nachman, G. Reproductive responses of *Iphiseius degenerans* and *Neoseiulus teke* (Acari: Phytoseiidae) to changes in the density of the cassava green mite, *Mononychellus tanajoa* (Acari: Tetranychidae). 273-282.

Hillesheim, E., Ritter, W. & Bassand, D. First data on resistance mechanisms of *Varroa jacobsoni* (Oud.) against tau-fluvalinate. 283-296.

Vol. 20, No. 6., June 1996

Kocan, K.M., Blouin, E.F., Palmer, G.H., Eriks, I.S., Edwards, W.L. & Claypool, P.L. Preliminary studies on the effect of *Anaplasma marginale* antibodies ingested by *Dermacentor andersoni* ticks (Acari: Ixodidae) with their blood meal on infections in salivary glands. 297-311.

Danka, R.G. & Villa, J.D. Influence of resistant honey bee hosts on the life history of the parasite *Acarapis woodi*. 313-322.

Bell, P.J. The life history and transmission biology of *Sternostoma tracheacolum* Lawrence (Acari: Rhyntonysidae) associated with the Gouldian finch *Erythrura gouldiae*. 323-334.

Palevsky, E., Oppenheim, D., Reuveny, H. & Gerson, U. Impact of European red mite on Golden Delicious and Oregon Spur apples in Israel. 343-354.

Brown, S.K. A lack of influence of permethrin treatments of wool carpet on habitation by house dust mites. 355-357.

Vol. 20, No. 7., July 1996

L'Hostis, M., et al. Seasonal incidence of *Ixodes ricinus* ticks (Acari: Ixodidae) on rodents in western France. 359-368.

Phillips, J.S. & Adeyeye, O.A. Reproductive bionomics of the soft tick, *Ornithodoros turicata* (Acari: Argasidae). 137-142.

Rijpkema, S. & Bruinink, H. Detection of *Borrelia burgdorferi sensu lato* by PCR in questing *Ixodes ricinus* larvae from the Dutch North Sea island of Ameland. 381-385.

Martin, S. & Cook, C. Effects of host brood type on the number of offspring laid by the honeybee parasite *Vorroa jacobsoni*. 387-390.

Bancroft, J.S. & Margolies, D.C. Allocating time between feeding, resting and moving by the two-spotted spider mite, *Tetranychus urticae* and its predator *Phytoseiulus persimilis*. 391-404.

Toko, M., O'Neil, R.J. & Yaninek, J.S. Development, reproduction and survival of *Mononychellus tanajoa* (Bondar) (Acari: Tetranychidae) on cassava grown under soils of different levels of nitrogen. 405-419.

Vol. 20, No. 8. August 1996.

Breeuwer, J.A.J & Jacobs, G. *Wolbachia*: Intracellular manipulators of mite reproduction. 421-434.

Croft, B.A. et al. Intra- and interspecific predation on four life stage groups by the adult females of *Metaseiulus occidentalis*, *Typhlodromus pyri*, *Neoseiulus fallacis* and *Amblyseius andersoni*. 435-444.

Baker, G.T. Chemoreception in four species of water mites (Acari: Hydrachnida): behavioural and morphological evidence. 445-455.

Estrada-Peña, A. et al. Variability in cuticular hydrocarbons and phenotypic discrimination of *Ixodes ricinus* populations (Acarina: Ixodidae) from Europe. 457-467.

Tälleklint, L. Lyme borreliosis spirochetes in *Ixodes ricinus* and *Haemaphysalis punctata* ticks (Acari: Ixodidae) on three islands in the Baltic Sea. 467-476.

Fourie, L.J. et al. Sex ratio characteristics in *Ixodes rubicundus* (Acari: Ixodidae), the Karoo paralysis tick. 477-481.

Systematic & Applied Acarology Society

Application for membership

Systematic and Applied Acarology Society (SAAS) aims at promoting the development of acarology in China and fostering cooperation among acarologists in China and other parts of the world. Anyone interested in the study of mites and ticks is welcome to join SAAS. There is no membership fee for 1996. A voluntary contribution of £6/\$10 is welcome. Members receive free of charge the newsletter of the Society (*Acarology Bulletin*) and can publish free of charge in *Systematic and Applied Acarology* (SAA). Members are, however, obliged to subscribe to SAA.

Name: _____ Title (Prof / Dr / Mr / Mrs / Miss /Ms) _____

Address: _____

Telephone: Business: _____ Home: _____

FAX : _____ E-mail: _____

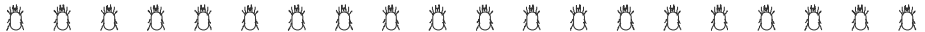
Degrees:	Institution	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____

Research Interest: _____

Please send the completed application form to :

Dr. Zhi-Qiang Zhang
International Institute of Entomology
c/o The Natural History Museum
London SW7 5BD
United Kingdom

or
Xin Jie-Liu Acarology Laboratory
Dept. of Environmental & Resources Biology
Fudan University
Shanghai 200433, CHINA



ACAROLOGY BULLETIN (ISSN 1361-8091) is a newsletter of the Systematic and Applied Acarology Society (SAAS). It is published in four issues in 1996 (January, April, July and October) and is distributed free to members of SAAS. All correspondence regarding the *Acarology Bulletin* should be sent to Dr. Zhi-Qiang Zhang, International Institute of Entomology, c/o The Natural History Museum, London SW7 5BD, UK. Non-members who want to subscribe should order from Panda Books Society (P.O. Box 8773, London SW7 4ZF, UK). Subscription rate for volume 1 in 1996 is £6 or \$10.

© 1996 Systematic & Applied Acarology Society. Printed in England.