The life and contributions of Prof Xin Jie-Liu (1909–1994)*

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Abstract

Prof Xin Jie-Liu (1909–1994) was an outstanding entomologist in China during the last century. He was one of the founders of acarology and stored product entomology in China. He was also a pioneer of forest entomology, insect pathology, insect physiology and soil zoology in China. This tribute is prepared to commemorate the centenary of his birth. An account of his life and career was given, along with analyses of his works and contributions to the development of acarology and entomology in China. A bibliography of his 133 papers and 42 books (including 17 translated books) was presented for the first time.

Key words: biography, bibliography, acarology, mites, stored grain, entomology, soil zoology, pest control, history of science, China

Introduction

The early development of many branches of biological sciences in China is closely associated with the first couple of generations of scientists, who studied overseas (mostly in Europe, USA, or Japan) and returned to China as pioneers and founders of various branches of biosciences in the early 1900s. Prof Xin Jie-Liu1 (1909–1994) was one of them and helped to establish acarology and several other branches of zoology in China. Here we review his life and contributions to commemorate the centenary of his birth.

There are only a few published accounts of Prof Xin’s life and contributions. In their historical review of acarology in China, Chen et al. (1982) included a couple of paragraphs on Prof Xin (pp. 67–68). This was updated by Chen and Ma (1992) in their book “Researches of Acarology in China”, with the addition of only a few sentences. A brief resume of Prof Xin was also published in the “China Agriculture Encyclopaedia Insect Volume” by Yang (1990). Similar entries were included in dictionaries and records of professors by Zhang D.-L. (1988), Wang Z.-F. (1992), Wu (2001) and Wang R.-H. (2007). Dong Hui-Qin also found a brief account of him from Fudan University personnel records. Shen (1995) and Zhang G.-L. (1995) published brief accounts of Prof Xin on the first anniversary of his death. All of these are very brief and within one page in length. He (1996) published a biographic sketch of Prof Xin, with a focus on his contributions in late years.

1. In Chinese 忚介六; also transliterated as Chiu Chu-Sieh or Shin Kai-Lo in early years
To compile Prof Xin’s bibliography, Zhang Zhi-Qiang consulted his own collected books and journals. He also visited the Fudan University Library and Shanghai Library to examine the books and journals in their collections. The online catalogue of the National Library of China was consulted and this is an important source of his early books. The Dacheng Full Text Database of Old Chinese Journals was consulted for his early papers. Another online database—Zhizhen Book Search—was also consulted. To find the missing links of his life, Zhang interviewed (by phone) Prof Li Long-Shu—an early student of his in the late 1930s and also Prof Wen Ting-Huan of Medical College of Fudan University. He visited Fudan University in December 2009 and talked with Profs Su De-Ming, Ding Ting-Zhong, Le Yun-Xian and Liang Lai-Rong. Dong Hui-Qin talked with Mrs Xin and obtained some old photographs of Prof Xin used in this paper.

Prof Xin—a brief resume

Prof Xin was born on 2 Nov. 1909 in Yin County (now Yinzhou District of Ningbo City), Zhejiang Province, China, where he spent his early years. In 1924, he went to study in Japan and graduated from Tokyo Higher Normal School in 1929. It was during this period that he developed an early interest in entomology. Later he majored in insect pathology at the Faculty of Agriculture of Kyoto University during 1929 to 1931. Then, he went to Germany for his graduate studies on the ecology of forest insects at Universität Rostock (Fig. 1). He graduated with PhD degree in 1935. In that year, he visited the Department of Entomology, The British Museum (Natural History) in London, where he conducted research on the taxonomy of sawflies for a few months. In 1935, he returned to China and held an entomologist position at the Agricultural Academy of Jiangxi Province, working on stored grain research and granary pest control. After the start of the Sino-Japanese War (1937–1945), many Chinese research institutions and universities moved to southwest China. In 1938, Prof Xin moved to Chengdu, Sichuan and took a position as professor and chair of Plant Protection in the Agricultural College, Sichuan University where he taught entomology for a couple of years. He then entered into public service for eight years and worked on the management of grain, grain storage and granary pest control in several government departments (Bureau of Agriculture, National Bureau for the Management of Grain, and Ministry of Grain) in Chongqing. After that, he returned to academia and took a position as a professor at Jiangnan University for a few years. In 1952, universities in China were re-organized and private universities were merged into public universities. During this re-organization, Prof Xin was transferred to the Department of Biology, Fudan University, where he was head of zoology teaching and research division for many years and held...
the position of professor for over three decades until retirement in the mid-1980s. After retirement, he continued to supervise graduate students but mostly concentrated on writing the last few books at his home in Xuhui, Shanghai, where spent rest of his life until the end of his life on 15 October, 1994.

FIGURE 1. Youthful Xin Jie-Liu when studying at Universität Rostock in Germany (early 1930s). Photo through the courtesy of Mrs Xin.

Prof Xin’s works and contributions

An overview of Prof Xin’s scientific publications

Prof Xin was a true scholar of the last century and had a passion for knowledge, reading and writing. He is well versed in several foreign languages (Japanese, German & English) and also reads French and Russian; this broad knowledge of foreign languages enabled him to gain access a wider range of literature than many of his peers and also made it possible for him to translate many books into Chinese at a time when reference books on various branches of entomology were not available or very rare. Prof Xin was very efficient in writing. He composed his writing in his mind and his first draft was often nearly publishable. His colleagues regard him as “his works equalling his height”.

14. In Chinese 著作等身 (when his books are piled, they are as high as his body)
FIGURE 2. Covers of Shin & Hsu (1965) Progress in Acarology (left, photo through the courtesy of Chen Jun), Xin et al. (1983) The Mites of Stored Food and Houses (middle) and internally published Acarology Reference Material No 7 compiled under the leadership of Prof Xin by the Entomology Teaching and Research Group, Department of Biology, Fudan University in December 1982 (right, with signature by Xin Jie-Liu when given to Prof Teng; photo through the courtesy of Chen Jun).


FIGURE 4. **Top:** Xin Jie-Liu writing at home in 1980. **Bottom:** Group photo in 1983 during a workshop on acarology. From left to right: Yang Qing-Shuang, Liang Lai-Rong, Hans Mori (Japan), Le Yun-Xian, Ding Ting-Zhong, Dong Hui-Qin & Xin Jie-Liu. Photo through the courtesy of Mrs Xin.
FIGURE 5. Prof Xin Jie-Liu and attendants of the 1983 Workshop on Mites at Fudan University, Shanghai (top) and attendants of the 3rd National Congress of Acarology, 30 Aug. 1983, Lushan (bottom).
FIGURE 6. Top: Prof Xin Jie-Liu writing at home in 1983; bottom: Prof Xin Jie-Liu (middle) with Dong Hui-Qin (left) and Ke Li-Sheng (Right) in 1981 at Fudan University, Shanghai.
A bibliography of his scientific publications (133 papers and 42 books) is presented in the appendix and summarized in Table 1. This is the first bibliography of its kind (including 17 translated books, but excluding papers in newspapers or non-officially published proceedings and others, and also entries he wrote for dictionaries and encyclopaedias). No doubt, there will be some missing ones, especially from his early years. It should be noted that a couple of books were also attributed to him by some colleagues, although these two were published anonymously: Anonymous (1975) “Guide to the Families of Mites” and Anonymous (1982) “Names and Terms of Acarina.” The former was mainly translated by him (but during the Great Cultural Revolution, many books are published anonymously) and the latter one was mainly based on an unpublished list prepared by him and later updated by many acarologists before publication. These two are not listed in his bibliography here.

Prof Xin’s publishing activities were interrupted three times: (1) a few years during his graduate studies in Germany, (2) the last couple of years during the Sino-Japanese War and a few years during and after the civil war in China and (3) nearly a decade during the Great Cultural Revolution. Thus his publishing history can be summarized into four periods using these three gaps.

Period 1. Pre-career years (1928–1932). Prof Xin started to publish very early. While still a college student in Tokyo, he published his first paper on anthropogenesis in a widely circulated popular magazine published in Shanghai (Xin, 1928; see Fig. 7). While a student of Kyoto University, he published five more papers on a wide range of subjects—from the anatomy of the silkworm to the sociality of the forest. It is not difficult to see from his early papers why he later did this Ph.D. thesis on forest entomology.


15. For example, he wrote 15 entries on mites for the 1978 edition of *China Encyclopaedia (Biology volume).*
TABLE 1. A summary of the number of papers and books by Prof Xin (3 books with unknown page numbers).

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Period 2. Early career years before new China (1935–1944). He published 26 papers, 5 books and 1 translated book during this period, mostly on stored grain management and its pest control. The majority of these were written before the Sino-Japanese War.

Period 3. Mid-career years before the Great Cultural Revolution (1951–1965). Inspired by the promise of the new China, Prof Xin began to write diligently and had three books published in 1951 summarizing his works on stored grain management and stored grain pests. This productive period of this career was unfortunately cut short by the Great Cultural Revolution (1966–1975), but he published 43 papers, 8 books and 11 translated books on a wide range of subjects including stored grain entomology, pest management, insect physiology/pathology and stored grain acarology.

Period 4. Late career years after the Great Cultural Revolution. This is the most productive period of his career. Despite the advanced age, Prof Xin published 58 papers, 12 books and 5 translated books on a variety of subjects ranging from soil zoology to general entomology. Most of these, however, are on mites of agricultural importance.

Prof Xin—a founder of stored grain research and stored product entomology in China

While at the Agricultural Academy of Jiangxi Province, Prof Xin surveyed stored grain houses and their pests in western Jiangxi Province and found the alarming high rates of loss due to pest damage (as high as 30–45%). The results of research were summarized in the first book of its kind—“Report on Control of Stored Grain Pests in 37 Counties of Jiangxi” (Xin & Zhong 1937). This pioneering book provides both the practical and theoretical foundation of stored grain entomology in China. In the 1930s, there was a lack of references on the subject; so Prof Xin also translated a Japanese book by Mantaro Kondo on the “Theory and Practice for Storing Rice and Grain” (Xin, 1937). He worked on various aspects of stored grain research and stored product entomology for a decade and half, resulting in three monographs in 1951: “Principles and Methods for Building Stored Grain Houses” (Xin, 1951a: 78 pages), “Scientific Management of Stored Grain” (Xin, 1951b: 96 pages), and “Stored Grain Pests in China” (Xin, 1951c: 138 pages). These important books covered a wide range of topics and laid a firm foundation for stored grain research and stored product entomology in China.

Prof Xin—a pioneer of forest entomology in China

Although Prof Xin did not publish his PhD work on forest entomology during 1932 to 1935 due to a switch of research focus right after graduation, he managed, after the founding of new China in 1949, to find time and wrote “Forest Entomology” (Xin, 1953), which is the first major text of its kind on this subject in China. In 1952, forest entomology was introduced into the curriculum of agriculture/forestry colleges in China and Prof Xin’s book “Forest Entomology” was used as a textbook (Shen & Li 2002) for a new generation of forest entomologists in China.

Prof Xin—a founding member of the Entomological Society of China

During the Sino-Japanese War, a large number of entomologists were active in Chongqing. Due to the need to enhance communication and exchange, several entomologists in Chongqing (i.e. Wu Fuzhen16, Zou Zhongling17, Xin Jie-Liu) contacted entomologists throughout China, and with the permission of the 50 or so members they acted as founders submitting an application to the National Government in May 1944 (Wu & Yue 1986). After approval, they started to prepare the first meeting of the society in October 1944. Prof Xin was also a very prominent member of the society after the

16. In Chinese 吴福桢
17. In Chinese 邹钟琳
founding of People’s Republic of China and was the Vice President of the society for many years until his retirement in 1984. Prof Xin also served as the President of Shanghai Entomological Society until retirement. He remained as an honorary fellow of the Entomological Society of China and also Shanghai Entomological Society.

**Prof Xin—a pioneer of and facilitator to the development of insect pathology in China**

Prof Xin first became interested in insect pathology because of its role in agriculture and forestry production practice (Xin, 1956a). He translated E.A. Steinhaus “Principles of Insect Pathology” into Chinese (published in two volumes in Chinese: Xin, 1956c, 1957), which served as a major reference book for the first generation of students of insect pathology in China. His early research in insect pathology is on mycosis of aphids in Shanghai (Xin & Su, 1963). He helped the development of an insect pathology group at Fudan University led by Prof Su. This group later made significant contribution to the development of insect virus research in China.

**Prof Xin—a contributor to insect physiology in China**

Prof Xin’s interest in insect physiology started with using artificial diet to rear insects (Xin 1956b, 1976). Later he published two volumes on “Artificial Diet for Insects, Mites and Spiders” (Xin & Su, 1979; Xin & Qiu, 1986), which are major reference books in this subject area. Another book is “Boreworm Physiology and Ecology” (Xin, 1964). However, his main contributions are the translated texts of the R. Chauvin’s book Insect Physiology (published in two volumes in Chinese: Xin & Luo, 1956; Xin 1959), and V. B. Wigglesworth’s “The Physiology of Insect Metamorphosis” (Xin, 1963b). These books were important references for students of insect physiology in China. Many students of insect physiology from Fudan University later played important roles in the development of this branch of entomology in China (e.g. Prof Cao Mei-Xun of the Shanghai Institute of Entomology, Chinese Academy of Sciences).

**Prof Xin—a founder of acarology in China**

Prof Xin’s most important contributions were made towards the development of acarology, especially agricultural acarology in China. He was aware of the mite pests in stored grain in his early career when working on stored grain pests (Xin, 1951c). Later he pioneered the research on stored grain mites in China (Shin & Shen, 1963, 1964). He led the translation of A.M. Hughes’ book “The Mites of Stored Food and Houses” (Xin et al., 1983; Fig. 2 middle), which is a useful reference for research on stored product mites and house dust mites in China. His early students of acarology (Wang Xiao-Zhu, Ma En-Pei and Yuan Yi-Lan, in addition to Shen) are all key acarologists contributing to the early development of acarology in China.

Together with Prof Hsu Y.-C. and others, Prof Xin organized the first “National Congress of Acarology” held in Changchun in 1963, the proceedings of which were published in a milestone book “Progress in Acarology” (Shin & Hsu, 1965; Fig. 2 left). This book marks the beginning of acarology as a branch of biology in China.

Towards the end of the Great Cultural Revolution, Prof Xin led the translation of “Guide to the Families of Mites” by E.W. Baker and J.H. Camin (Anonymous 1975), which served as a useful identification guide in China when few such books were available.

After the Great Cultural Revolution, research and teaching resumed in universities in China. Prof Xin sparked the rapid development of agricultural acarology in China in the early 1980s. At the request of the Ministry of Agriculture, he organized a series of short courses in agricultural acarology (Fig. 5), which trained a generation of acarologists, who are still the backbone of acarology in China today. Prof Xin was among the first at Fudan University to seek international
collaboration to develop Chinese science. During the 1983 short course, he invited Prof Hans Mori18 (Hokkaido University, Japan) to teach at the short course (Fig. 4 bottom). Due to lack of reference material in Chinese, Prof Xin lead the compilation of a series of Acarology Reference Material (see Fig. 2 right) on various topics of acarology for use at the course and also in research.

Prof Xin led a series of research projects on major groups of mites important in agriculture at Fudan University and supervised associates and students in the study of the Tarsonomiidae (Ding Ting-Zhong, Yang Qing-Shuang), Eriophoidea (Ding Ting-Zhong, Dong Hui-Qin—Fig. 6), Phytoseiidae (Liang Lai-Rong and Ke Li-Sheng—Fig. 6), Stigmaeidae (Hu Chen-Ye), Oribatida and Bdellidae (Prof Xin, later published in the name of Wu Lan), Cunaxidae (Liang Guo-Wei), Pyemotidae and Pygmeophoridae associated with mushrooms (Yu Hong) and Trombidioidea (Fan Xiao-Xian, Zhang Zhi-Qiang). A list of new mite species by Prof Xin and his co-authors is presented in Table 2. A list of new taxa named in honour of Prof Xin is presented in Table 3.

Prof Xin also led research projects on biological control of spider mites on vegetables, watermelon and cotton using predatory mites (project members including Liang Lai-Rong, Wu Qian-Hong, Yang Yan-Yun and Jin Zuo-Qin). The success of the project was made into a film “Using Mites to Control Mites” for educating the general public. He presented the work on using phytoseiids at the 6th International Congress of Acarology held in England in 1982 (Xin et al., 1984) and also at the “The Chinese Academy of Sciences - United States National Academy of Sciences Joint Symposium on Biological Control of Insects (September, 1982, Beijing, China)” (Xin, 1984a). These accomplishments won the recognition of his research in the world and promoted the international exchange with overseas acarologists.

He also supervised research by graduate students on the mass-production of phytoseiids (Zhou Hong) and resistance of phytoseiids to acaricides (Ke Li-Sheng and Zhu Ke-Yan). At a time when few Chinese entomologists published in overseas journals, he and his students published a series of papers in major international journals of acarology (Xin, Liang & Ke, 1981, 1985; Xin & Dong, 1982, 1983; Lan, Xin & Aoki, 1986; Zhang & Xin, 1989a, 1992; Zhu, Ke & Xin, 1996).

Prof Xin authored three major books in acarology towards the end of his career: “An Outline of Acarology” (Xin, 1984b; Fig. 2 left), “Agricultural Acarology” (Xin, 1988) and Applied Acarology (Xin 1989; Fig. 3 right). He also co-authored the book “An Outline of Acari in China” (Deng et al., 1989).

Prof Xin—contributions to other areas of zoology and entomology

Prof Xin was interested in pest control in his early career and worked mostly on the control of granary pests using chemicals through scientific management and design of stored houses. He later become interested in biological control and integrated pest management, and made significant contribution to biological control of mites in China (see review above). His other contributions to the areas are through the papers and books he published and translated (see the Appendix for list of papers). He published several monographs, including: Boreworm Chemical Control (Xin, 1963a); Augmentation & Mechanized Rearing of Natural Enemies of Insect and Mite Pests (Xin & Lu, 1988; Fig. 3 middle), and Predatory Mites Their Biology and Roles in Biological Control (Xin, Lu, & Zhang, Z.-Q., 1998). He also translated several books on this subject: Pest Control Methods for Stored Grain (Xin, 1955); How to Prevent Grain from Pest Infection (Xin & Zhang Y.-F., 1957); Forecast of Outbreaks of Striped Riceborer (Xin, 1958); Integrated Control (Xin & Liang, 1980) and Guide to Design and Development of Pesticides (Xin, 1988).

18. In Japanese/Chinese 北海道大学農学部 森 樊須
19. In Chinese 以螨治螨
**Table 2.** New mite species described by Prof Xin Jie-Liu and co-authors.

<table>
<thead>
<tr>
<th>Category</th>
<th>Species Name</th>
<th>Authors</th>
<th>Year</th>
<th>Family</th>
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<tbody>
<tr>
<td><strong>Mesostigmata</strong> (14 species)</td>
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<tr>
<td></td>
<td><em>Amblyseius pseudolongispinosus</em> Xin, Liang &amp; Ke, 1981—Phytoseiidae</td>
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<td></td>
<td><em>Phytoseius huaxiensis</em> Xin, Liang &amp; Ke, 1982—Phytoseiidae</td>
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<td></td>
<td><em>Phytoseius mori</em> Xin, Liang &amp; Ke, 1983—Phytoseiidae</td>
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<td></td>
<td><em>Phytoseius rubii</em> Xin, Liang &amp; Ke, 1982—Phytoseiidae</td>
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<td></td>
<td><em>Phytoseius scabiosus</em> Xin, Liang &amp; Ke, 1983—Phytoseiidae</td>
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<td></td>
<td><em>Phytoseius shanghaiensis</em> Xin, Liang &amp; Ke, 1983—Phytoseiidae</td>
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<td></td>
<td><em>Phytoseius wuxianensis</em> Xin, Liang &amp; Ke, 1983—Phytoseiidae</td>
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<td></td>
<td><em>Typhlodromus acacia</em> Xin, Liang &amp; Ke, 1980—Phytoseiidae</td>
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<td></td>
<td><em>Typhlodromus cannabis</em> Ke &amp; Xin, 1983—Phytoseiidae</td>
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<td></td>
<td><em>Typhlodromus macrurn</em> Ke &amp; Xin, 1983—Phytoseiidae</td>
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<td></td>
<td><em>Typhlodromus platycladus</em> Xin, Liang &amp; Ke, 1980—Phytoseiidae</td>
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<td></td>
<td><em>Typhlodromus ribei</em> Ke &amp; Xin, 1983—Phytoseiidae</td>
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<td></td>
<td><em>Typhlodromus trimediosetus</em> Xin, Liang &amp; Ke, 1980—Phytoseiidae</td>
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</tbody>
</table>

**Junior synonym of Phytoseius shanghaiensis** Xin, 1983—Phytoseiidae

<table>
<thead>
<tr>
<th>Category</th>
<th>Species Name</th>
<th>Authors</th>
<th>Year</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oribatida</strong> (2 species)</td>
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<tr>
<td></td>
<td><em>Dometorina praedatoria</em> Wu, Xin &amp; Aoki, 1986—Oribatulidae</td>
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<tr>
<td></td>
<td><em>Scheloribates oryzae</em> Wu, Xin &amp; Aoki, 1986—Scheloribatidae</td>
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</tbody>
</table>

**Prostigmata** (15 species)

<table>
<thead>
<tr>
<th>Category</th>
<th>Species Name</th>
<th>Authors</th>
<th>Year</th>
<th>Family</th>
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<tbody>
<tr>
<td></td>
<td><em>Abacarus fujianensis</em> Xin &amp; Ding, 1982—Eriophyidae</td>
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<td></td>
<td><em>Aceria milli</em> Xin &amp; Dong, 1982—Eriophyidae</td>
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<td></td>
<td><em>Aculops sachouensis</em> Xin &amp; Ding, 1982—Eriophyidae</td>
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<td></td>
<td><em>Aceria paratulipae</em> Xin &amp; Dong, 1982—Eriophyidae</td>
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<td></td>
<td><em>Allothrombium ovatum</em> Zhang &amp; Xin, 1992—Trombidiidae</td>
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<tr>
<td></td>
<td><em>Eriophyes meliae</em> Dong &amp; Xin, 1984—Eriophyidae</td>
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<tr>
<td></td>
<td><em>Eriophyes neosalicina</em> Dong &amp; Xin, 1984—Eriophyidae</td>
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<td></td>
<td><em>Eriophyes quadrimarginis</em> Dong &amp; Xin, 1984</td>
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<td></td>
<td><em>Diptacus gigantorubra</em> Xin &amp; Dong, 1983</td>
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<td></td>
<td><em>Diptiloplatus sacchari</em> Xin &amp; Dong, 1983—Diptilomiopidae</td>
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<tr>
<td></td>
<td><em>Eriophyes artemisia</em> Xin &amp; Dong, 1982—Eriophyidae</td>
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<tr>
<td></td>
<td><em>Eriophyes meliae</em> Dong &amp; Xin, 1984—Eriophyidae</td>
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<tr>
<td></td>
<td><em>Eriophyes neosalicina</em> Dong &amp; Xin, 1984—Eriophyidae</td>
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<tr>
<td></td>
<td><em>Rhyncaphytopus jiangsuensis</em> Xin &amp; Dong, 1981—Diptilomiopidae</td>
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</tbody>
</table>
TABLE 3. New mite taxa named in honour of Prof Xin Jie-Liu.

<table>
<thead>
<tr>
<th>Name</th>
<th>Authors</th>
<th>Year</th>
<th>Order</th>
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<tbody>
<tr>
<td><em>Cenopalpus</em> <em>xini</em></td>
<td>Ma &amp; Li, 1984</td>
<td>1984</td>
<td>Prostigmata</td>
</tr>
<tr>
<td><em>Gamasellus</em> <em>xini</em></td>
<td>Liang &amp; Ishikawa, 1989</td>
<td>1989</td>
<td>Mesostigmata</td>
</tr>
<tr>
<td><em>Typhlodromus</em> (<em>Anthoseius</em>) <em>xini</em></td>
<td>Wu, 1983</td>
<td>1983</td>
<td>Mesostigmata</td>
</tr>
<tr>
<td><em>Xinella</em> <em>Ma &amp; Wang</em></td>
<td>1991</td>
<td>1991</td>
<td>Prostigmata</td>
</tr>
</tbody>
</table>

Prof Xin is an early proponent of soil zoology in China. In the early 1980s, he recognized the need to pay attention to research on soil zoology in China (Xin, 1984). He initiated soil mite research at Fudan University and built international collaboration with colleagues in Japan (e.g. Lan, Xin & Aoki, 1986). Later, he published an introductory text “Soil Animal Knowledge” (Xin, 1986)—the first of its kind in China. He worked with Prof Yin Wen-Ying (Chinese Academy of Sciences) in organizing the first workshop on soil zoology in China. His student Prof Liang continued to participate in the national project on soil animals of subtropical China, which was led by Prof Yin with international collaboration with Japanese zoologists.

Prof Xin was interested in nomenclature of insects. His reference work “English-Chinese Insect Common Names and Terms” (Xin & Xia, 1978) is widely used in China. He also made important contributions to the reference book “Names and Terms of Acarina” (Anonymous 1982).

While teaching insect taxonomy and morphology at Fudan University, Prof Xin prepared a manual for student use. This manual was later published as “Insect Morphology & Taxonomy” (Xin, Yang & Hu, 1985), which is still a key reference book for students of insect taxonomy and morphology today. *Entomological Laboratory Techniques* (Guo & Xin, 1988) is also a widely used reference book for students of experimental entomology in China. Two translated general text books—*An Outline of Entomology* (Xin & Liu, 1982) and *Imms’ General Textbook of Entomology* (Xin, 1987)—remain as reference books for entomology course in China today.

Prof Xin’s greatest contribution to Chinese entomology is probably his founding the entomology specialization within the zoology division at Fudan University in the 1950s. This enabled the enrolment of entomology students every other year and thus he was able to train hundreds of entomology students. Several generations of entomology graduates from Fudan Universities moved to many universities, and research or governmental institutions throughout China and played important roles in the development of entomology in China.

Prof Xin—personal memories and reflections

*Zhang Zhi-Qiang*

I first met Prof Xin during the welcoming ceremony for new students of the Department of Biology of Fudan University in the summer of 1981. All professors were sitting in the front row. When Prof Xin was introduced, he stood up, turned back towards the crowd, waved and smiled to new students. My first impression was that he was very tall and handsome, with the demeanor of a great scholar. He also looked much younger than his age. During the next four undergraduate years, I had little interaction with him as he did not teach any course. The only place where I often saw him was the department library. He did not know me then, and I looked up at him with respect when he passed by my desk in the reading room—his steps were strong and forceful on the old wooden floors of the library.

During my fourth year at Fudan University, I developed an interest in mites. In the summer of 1985, I started my graduate studies, along with Zhu Keyan, under Prof Xin’s supervision. In 1987, I
become his last Ph.D. student. It was only during my graduate studies that I started to have regular interaction with him. He never came to the university after 1985. So I went to his home near Shanghai Stadium in Xuhui to discuss my research with him on a regular basis. I still remember the long bicycle rides from the university on the eastern edge of the city to his home on the western side, sometimes under the hot sun, in the rain or among heavy traffic. The reward each time was an hour or so of mentoring by Prof Xin, from whom I learned much more than most students would expect from a professor.

Prof Xin was a true gentleman. He was kind, amicable, considerate and supportive to students and colleagues. Perhaps because of this, he had no enemies during the Great Cultural Revolution and he did not suffer from physical abuse and harsh treatments that many other experts and professors received from “red guards” and “revolutionary revolters”.

Prof Xin had a passion for books and new information. He was a master of languages, an accomplished writer and a great synthesizer of literature. This is evident in many books he wrote and translated. I learned from him every early in my career to “read and learn through writing”. The first few papers of mine were so much improved after editing and re-writing by him. I later developed my own passion for writing and editing.

Prof Xin was a scientist with foresight. That is why he was a pioneer and founder of several branches of entomology in China. When he was 80 years old, he wrote to me that he wanted to establish a biocontrol company. This vision was ahead of time in the 1980s where the socio-economic condition was not ready. I nevertheless kept his wishes in my heart and later helped introduce natural enemies and mass-production technology into China in the 1990s—assisting the group of Zhang Yanxuan and Lin Jianzhen (Fujian Academy of Agricultural Sciences) in building the first biocontrol company producing predatory mites in China.

Prof Xin was a scientist with extraordinary diligence and perseverance. Despite setbacks for a couple of decades during the Sino-Japanese War, civil war, and the Great Cultural Revolution, he still managed to produce 42 books and 133 papers—much more than most of his peers.

Dong Hui-Qin

In 1978, I became one of the first graduate students of Prof Xin after the Great Cultural Revolution. My memories of him are his burly figure, dignified dress, pleasant smile, and his demeanor of a gentleman and scholar. He was not only a leading authority in our science, but a kind farther-like mentor. I had the great fortune to study and work under his guidance for 16 years after becoming his student.

I remember the first words he spoke to me when I first met him: “Learn English well. A command of language is the basis for scientific research.” Then he taught me the first thing: he took me to the department library and showed me how to find information in journals such as “Science” and “Nature”. The first advice he gave me: “Improve your skills in oral English as soon as possible”. He not only gave me the advice, but he himself found me an English teacher. His first encouragement to me was to ask me to communicate in English with a visiting professor from Japan in Shanghai Science Hall. That was also a breakthrough for me in learning English. The first paper that he edited and revised for me is on the eriophyid mites published in the international journal “Acarologia” in 1982.

In the early 1980s, I joined the faculty of Fudan University. With the reform and opening of

20. In Chinese 红卫兵
21. In Chinese 革命造反派
22. It is only when you start to write to convey to others that you can read and learn most efficiently.
China to the outside world, I was fortunate to win state funding to study overseas. Prof Xin wrote me the first letter of recommendation. Later, I visited the University of Toronto and worked in Dr Don Chant’s laboratory for a year. The first letter I received from him: he recycled a used envelope. His memo to me was always written on scrap such as sheets from an old calendar. It was his way of showing to us the importance of conservation and minimized carbon output.

Prof Xin was a scientist who holds libraries a special place in his life. He was a frequent visitor to almost all the science libraries he had access. The information he passed to his students is the most recent and his ideas are often cutting edge and creative in China at that time. He was well-versed in several languages and extremely well-read. That is why he was able to write and publish so many papers and books. It is worth mentioning that he always signed modestly as “Jie-Liu” when communicating with students and colleagues, even though he was a renowned senior professor.

Every Spring Festival, he invited us (Su De-Ming, Le Yun-Xian, Yang Qing-Shuang, Cao Kai-Ming, Ma En-pei, Yuan Yi-Lan and me) to gather at his home, with a wonderful New Year’s meal prepared by Mrs Xin. We talked and shared our achievements in the past year and aspirations for the new year. It was happy time. Prof Xin was relatively quiet, listening to us with smile. We felt like we belonged to a special big family and Prof Xin was our head of the family. The memories of those years are unforgettable.

Prof Xin had a profound influence on me through details of his words and deeds. My memories of him are still vivid so many years after his passing. It is my great honour and fortune to have met a fatherly teacher when I was young.

Acknowledgements

We are grateful to colleagues who shared with us information about Prof Xin, esp. Profs Li Long-Shu, Su De-Ming, Ding Ting-Zhong, Le Yun-Xian, Liang Lai-Rong and Wen Ting-Huan. We also thank Dr Xue Xiaofeng (Nanjing Agricultural University, Nanjing, China) who kindly helped with copying of some papers in China. We greatly appreciate the review of this manuscript and comments by Dr Hong Xiaoyue (Nanjing Agricultural University), Dr Lin Jianzhen (Fujian Academy of Agricultural Sciences) and Dr Zhu Keyan (now Keyan Salzman of Texas A&M University, USA). Dr Lin, Dr Xue, and Dr Chen Jun (Institute of Zoology, Chinese Academy of Sciences, Beijing, China) provided photos used in this paper. While this paper was prepared, Zhang was supported by Foundation for Research, Science and Technology, New Zealand.

References cited

China. 170 pp + 15 plates.


23. In Chinese 贺锡廉，暮秋之色更美——复旦大学哲介六教授记略


LIFE AND CONTRIBUTIONS OF PROF XIN JIE-LIU (1909–1994)


Appendix:
Bibliography of Prof Xin Jie-Liu’s scientific publications (also as Chiu Chu-Sieh or Shin Kai-Lo)

All publications are listed by year and sorted into two parts: (1) papers and books authored or edited by Prof Xin, and (2) books translated by Prof Xin. For early papers and books published in China without English abstract, the original Chinese titles are given in footnotes, as it is not possible to translate back into Chinese exactly.

**Authored/edited books and papers**


24. In Chinese 人类的化成
25. In Chinese 生殖素维他命 E 之解释
26. In Chinese 会体的解剖
27. In Chinese 伴侣婚姻
28. In Chinese 妻生虫之采集处理及保存法
29. In Chinese 森林之社会性
30. In Chinese 仓库熏蒸剂与气体浓度的变化
31. In Chinese 赣西各县积谷害虫问题之严重性及其根本解决之办法
32. In Chinese 中国虫害问题之严重性及中外除虫的业绩
33. In Chinese 改进之白蚁饲养器
34. Chu-Sieh Chiu was given in this paper as the transliterated name for Xin Jie-Liu


Xin, J.-L. (1937) Sealed storage of rice and grain\textsuperscript{42}. *Jiangxi Agricultural News*, 3(14), 1–3 [in Chinese].


Xin, J.-L. (1938) Research and discussion on the scientific management of storing military rice from Six Counties in Pingxiang\textsuperscript{47}. Agricultural Academy of Jiangxi Province, Entomology Group Special Bulletin], 1, 3–8 [in Chinese].


Xin, J.-L. (1938) A draft for implementing scientific management of stored grain in the whole Province\textsuperscript{50}. Agricultural Academy of Jiangxi Province, Entomology Group Special Bulletin], 1, 18–22 [in Chinese].

Xin, J.-L. (1938) The problem of granary pests in China\textsuperscript{51}. *New Bulletin of Agriculture and Forestry*, 16(12–14) [in Chinese].

Xin, J.-L. (1938) Introducing a newly established agricultural organization in Jiangxi—Scientific Management of Stored Grain\textsuperscript{52}. *New Bulletin of Agriculture and Forestry*, 16(17–19) [in Chinese].

Xin, J.-L. (1939) Rational renovation of old-style grain storage houses and rational management of stored grain\textsuperscript{53}. Agricultural Academy of Jiangxi Province, Special Bulletin 3 [in Chinese]


40. In Chinese 农用药剂之最新趋势
41. In Chinese 持久抗战中之粮食贮藏问题
42. In Chinese 米谷之密封贮藏法
43. In Chinese 防治稻作害虫之二新法
44. In Chinese 天气及气候与昆虫之关系
45. In Chinese 江西三十七县积谷害虫防治报告：南昌，江西省农学院
46. In Chinese 积谷之科学管理
47. In Chinese 江西六县积谷害虫管理之研讨
48. In Chinese 旧式积谷之合理改造法
49. In Chinese 积谷贮藏之合理管理
50. In Chinese 实施全省积谷科学管理章案
51. In Chinese 中国积谷害虫问题
52. In Chinese 介绍江西省新创的一种农事机构 — 积谷科学管理
53. In Chinese 旧式积谷之合理改造与积谷贮藏之合理管理
54. In Chinese 我国天蚕丝事业之前途；the giant silkworm species discussed in the paper is *Eriogyna pyretorum* Westwood.
55. In Chinese 抗战中贮粮损耗问题
56. In Chinese 积谷如何防虫


1952 Xin, J.-L. Pest problems in applications of agricultural chemicals. *China Agricultural Sciences*, 1952(10), 8–10 [in Chinese].


57. In Chinese 抗战时期中之白蜡虫事业
58. In Chinese 我国现今粮种方法之错误及其今後应有之改进
59. In Chinese 论田赋征发后粮食损耗之防止
60. In Chinese 粮食征发与储备
61. In Chinese 食米精馏程度测定法之研究
62. In Chinese 粮仓修建之理论与方法：上海，商务印书馆
63. In Chinese 粮食贮藏的科学管理：上海，新华书店
64. In Chinese 中国粮食害虫学：上海，商务印书馆
65. In Chinese 内吸杀虫剂的介绍
66. In Chinese 杀虫药剂最新使用法 — 烟雾法的介绍
68. In Chinese 农业药剂使用上的害虫问题
69. In Chinese 森林昆虫学：上海，新农出版社
70. In Chinese 海珊先生的最后三年；Hai-Shan（海珊）是nick name of Zhang Jin-Ou（张景欧），a former professor of Entomology, Fudan University, Shanghai, China
71. In Chinese 今我国粮食贮藏上存在着的問題和今後進行研究工作的方向
72. In Chinese 昆虫病理学的发展及其在农林生产实践上的作用
73. In Chinese 消灭老鼠和麻雀
74. In Chinese 利用原子能的最新害虫防治法


75. In Chinese 昆虫的人工饲料培养法
76. In Chinese 稻谷含水量与稻谷安全贮藏
77. In Chinese 虫害的防治及其近年来研究情况
78. In Chinese 虫害的防治及其近年来研究情况（续）
79. In Chinese 世界的“昆虫生理学杂志”创刊
80. In Chinese 关于“自然保护”
81. In Chinese 粮食贮藏问题的展望
82. In Chinese 二化螟的学名
83. In Chinese 内吸杀虫剂的介绍
84. In Chinese 仓库害虫的饲养
85. In Chinese 病虫害：上海科学技术出版社
86. In Chinese 鳞翅目昆虫卵的形态学（book review）
87. In Chinese 答郑本儒同志
88. In Chinese 竹长蠹化学防治的研究
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