Flea News Volume 46

Produced by R.E. Lewis, Department of Entomology, Iowa State University, Ames, Iowa 50011

FLEA NEWS is a biannual newsletter devoted to matters involving insects belonging to the order Siphonaptera. It is compiled and distributed free of charge by Robert E. and Joanne H. Lewis, with the support of the Department of Entomology at Iowa State University in Ames, IA and a grant in aid from the ZOËCON CORPORATION, a Sandoz Company based in Dallas, TX. It is mainly bibliographic in nature, but recipients are urged to check any citations given here before including them in publications. Many of our sources are abstracting journals and current literature sources such as Current Contents(R) and citations have not necessarily been checked for accuracy. Additional information will be provided upon written request. Further, recipients are urged to contribute items of interest to the profession for inclusion herein.

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MISCELLANEA

The Society for Vector Ecology will sponsor the First International Congress of Vector Ecology in San Diego at the Hanalei Hotel, October 3-8, 1993. The Congress will provide a unique forum to present recent advances in our knowledge dealing with the ecology and epidemiology of vector-borne diseases, host/pathogen interface and effective management of vectors and human pests. The Society for Vector Ecology is dedicated to promoting research, training and application of sound integrated management strategies in an ecological context for the control of
pest vectors and vector-borne diseases. The Congress will consist of oral and poster presentations as well as a variety of hosted social activities. For more information, contact the Society for Vector Ecology, P. O. Box 87, Santa Ana, CA 92702. Telephone (714) 971-2421, Fax (714) 971-3940.

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Congratulations are in order for Dr. Nancy C. Hinkle, who writes that she received the PhD degree from The University of Florida in December of 1992. Her dissertation was titled Biological factors and larval management strategies affecting cat flea (Ctenocephalides felis felis (Bouché) populations. She writes that a slide set featuring scanning electron photomicrographs of the various life stages of the cat flea is available from Dr. P.G. Koehler, Department of Entomology & Nematology, IFAS, University of Florida, P. O. Box 110620, Gainesville, FL 32611-0620 (phone 904 374-5903).

She also sent a copy of the Program of the Second International Symposium of Ectoparasites of Pets held in Lexington, KY on April 4-6, 1993. The following papers involving fleas were presented:

Rust, M.K. Status of insecticide resistance in fleas.

Dryden, M.W. Attacking the pupal window.

Campbell, W.R. Laboratory and field trials using Lufenuron (CGA-184699) for cat flea control on dogs.


Myers, T. Flea and tick management: a pest control industry perspective.

Olsen, A. Focusing on the substrates when evaluating the efficacy of flea products.


Georgi, J.R. & M.E. Georgi. Manipulation and quantification of conscious fleas.

Hinkle, N. Flea populations on cats and techniques for measuring them.

Koehler, P. Cat flea resistance to insecticides.

Hair, J.A. Methods for testing the efficacy of insecticides against fleas on dogs.

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Dr. A.I. Goncharov writes that he is willing to provide Russian publications and flea adults and larva in exchange for literature and specimens from other parts of the world. He may be contacted at the following address, or at his home address given in the changes and additions to the mailing list: Dr. A. I. Goncharov, Laboratoy of Ecology & Systematics, Sovietskaya 13, Stavropol' 355106, RUSSIA.

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Mr. R.L. Bossard asked that the following be included in this issue: "Dr. Robert E. Elbel, Research Professor, University of Utah, and I are attempting to find bat flea larvae. We are particularly interested in the fleas *Sternopsylla texana*, which is found on *Tadarida brasiliensis*, *Nycteridopsylla chapini*, usually on *Eptesicus fuscus*, and *Nycteridopsylla vancouverensis*, usually on *Myotis californicus*. The larvae, pupae and sometimes adults of these fleas live in the guano that accumulates below roosts of these bats, if the guano is moist enough to smell of nitrogen [=ammonia]. Guano and flea larvae of other bats are also of interest.

"We need an approximately 12" x 8" plastic bag of guano, fresh enough that an ammonia smell is noticeable. The collector may be able to see adult fleas in the guano. The guano should be shipped immediately so that we can collect live fleas and their larvae."

Responses should be sent to:

Mr. Robert L. Bossard, Department of Biology, 201 Biology Building, Salt Lake City, UT 84112.

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**In Memorium**

Arthur Smith

The name Arthur Smith may not be familiar to most recipients of this newsletter, but he figured prominently as a scientific illustrator at the British Museum (Natural History) from 1940 until his retirement in 1973. During this period he estimated that he completed between 15 and 20K illustrations of insects and other animals. Many of his works were for the Hopkins and Rothschild catalogues I to V, 1953-1971. A detailed obituary was published in *Ent. mon. Mag.* 128: 173 (1992).

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**Mailing List Alterations**

Periodically we include an analysis of the geographic distribution and addresses of recipients of *Flea News*. Between these we carry a tally of address changes and additions to the mailing list. Following are changes and additions since *Flea News* 45:

- **Liam H. Davis**, 3989 Richmond Street, #101, San Diego, CA 92103
- **Brian Gerber**, 185 West End Avenue, Apt 6H, New York, NY 10023
- **Dr. A. I. Goncharov**, Dzerzhinskogo, 231, kv. 50, Stavropol', 355003 Russia
- **Dr. Karel Hurka**, Department of Zoology, Charles University, Vinicna 7, 128 44 Praha 2, Czech Republic
- **James Kucera**, 4655 S. Locust Lane #17, Salt Lake City, UT 84117
- **Dr. Thomas H. Kunz**, Department of Biology, Boston University, 2 Cummingston Street, Boston, MA 02215
- **Dr. Andrew J. Main**, 22 Sunset Road, East Haven, CT 06512
- **Dr. Roger W. Meola**, Department of Entomology, Texas A & M University, College Station, TX 77843-2475
- **Dr. Byron L. Reid**, Center for Urban & Industrial Pest Management, Purdue University, 1158 Entomolgy Hall, West Lafayette, IN 47907-1158

**Recently Published**


Although the title is the same as the 1982 volume edited by Honacki et al., this is more than a simple update. After brief Preface and Acknowledgment sections, the 21 contributors and their addresses are listed. The 12 page Introduction includes a tabular comparison of the number of genera and species cited in the first and second editions. This is followed by a short section dealing with the organization of the volume. Included here are short discussions of the taxonomic arrangement, scientific names and authorities, type localities, distribution, status, synonyms, comments, appendices, bibliographic treatment and index. The following 827 pages list 4,629 species (up 459 from the 4,170 listed in the first edition) placed in 136 families and 86 orders. One hundred and seventy-two of these have been described since the first edition. The classification is essentially identical to that in the first edition except that the old Marsupialia has been divided into seven separate orders. Each species account is arranged with the genus, species, authority and description citation as the header, followed by short paragraphs describing the type locality, distribution, status (abundant, vulnerable, endangered), synonyms (actual junior synonyms and subspecies), and comments. Appendix I includes remarks on the bibliography and publication dates, including commentary of É. Geoffroy Saint-Hilaire (1803) and C.J. Temminck (ed.) (1839-1847). Its short bibliography clarifies the publication dates of a number of earlier works dealing with mammals that have frequently confused and frustrated mammalian systematists. Appendix II is a cumulative index of Mammalian Species, numbers 1-402, a series published by the American Society of Mammalogists. Each of these accounts reviews a single species, providing information on synonymy, distribution, habitat, ecology, morphology and reproduction. The Literature Cited section extends from page 843 to 999 and contains approximately 4700 citations. The remaining 205 pages make up the Index.

I have had occasion to use this work rather extensively while updating host names in a primary type catalogue, and find it extremely useful and remarkably free of errors. During a recent conversation with the senior editor I was informed than an electronic, updated version of the volume was planned for the near future.

The scientific community that is likely to use this volume in the years to come owes the editors and contributors a sizeable debt of gratitude for their devotion to their profession. REL

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**Beethoven's 'Flea' pops up**

"The eight-page manuscript of Beethoven's Song of the Flea, lost to scholars since 1929, has been taken to one of Sotheby's Continental offices by a man in aware of what it was.

"One of his most famous songs, it was written in 1809 and is valued at up to [[sterling]] 200,000. It will be in a sale of manuscripts on May 28." (The Daily Telegraph (42884) 10 May 1993 :p. 4.
F.G.A.M.Smit)

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**SIPHONAPTERA LITERATURE**
Although it may not be obvious from the titles, citations included here pertain to fleas and the zoonoses associated with them. Additional information is available upon request.

1981 (List 15)


1987 (List 12)


1988 (List 11)


1989 (List 9)


1990 (List 6)


Medvedev, S.G. Structure of the thorax in fleas (Siphonaptera). *Entomologicheskoе Obozrenie* 69(3): 514-533. (in Russian)


1991 (List 5)


Medvedev, S.G. Structure of the thorax in fleas (Siphonaptera). II. *Entomologicheskoe Obozrenie* 70(2): 330-344. (in Russian)

Medvedev, S.G. Structure of the thorax in fleas (Siphonaptera). III. *Entomologicheskoe Obozrenie* 70(4): 774-784. (in Russian)


Roberts, M. Parasitological evidence for the presence of other rodent species on "kiore only" islands. *Journal of the Royal Society of New Zealand* 21(4): 349-356. (kiore = *Rattus exulans*)


1992 (List 3)


Davidson, D.L. 'Superfleas' bounce back? Veterinary Record 131(10): 223.

Dawson, P. More than a flea killer? Veterinary Record 131(14): 323.


Dudich, A. Fleas (Siphonaptera) of small mammals of Slovakia. Slovenská Akadémia Vied Vedecké Kolégium pre Biologicko - Ekologické Vedy. 35 pp.


Shimada, T. Distribution of split 5.8S ribosomal RNA in Diptera. *Insect Molecular Biology* 1(1): 45-48. (*Ctenocephalides felis* has a single RNA of about 154 nucleotides.)


1993 (List 1)


Williams, B. Reproductive success of cat flea, Ctenocephalides felis on calves as unusual hosts. Medical and Veterinary Entomology 7(1): 94-98.


**DAFFYNITIONS**

In addition to the commonly encountered Types (i.e. Holotype, Allotype, Paratype, Lectotype and Syntype) a number of other kinds of types have been named. Following are a few:

**Aeolotype.** The type of a new species described from memory after the specimen has blown out of an open window.

**Anonymotype.** The specimen that would have been the holotype had the author who designated it in mentioning "holotype and 300 paratypes with identical data" bothered to distinguish it with a label.

**Atype.** A specimen labeled as the type of a nominal species by a museum curator despite it not being a member of the original author's type series.

**Confiscatotype.** A type that has been deliberately destroyed in order to facilitate the work of later researchers.

**Dipsotype.** Type specimen that fell into a glass of water subsequent to its description and was imbibed by its author.

**Duplicitype.** A specimen that is the type of two different species.

**Dyslexotype.** A type with its name misspelt on the label.

**Enigmatype.** A specimen bearing the label 'Type' but no name.

**Inaccessotype.** Type deposited in an institution that does not loan type material or reply to correspondence.

**Sperotype.** A specimen labelled as type of a name that the author intended to publish but never did. The type of a "manuscript species".
An annotated bibliography of publications on flea larval morphology in Chinese periodicals, 1956-1992 (July)

R.L.C. Pilgrim

Department of Zoology, University of Canterbury, Christchurch, New Zealand

Over the past several decades, scientists in the People's Republic of China have been publishing the results of their researches on flea larvae. These include morphology, life-history and conditions affecting development, pupation, as well as some keys for the identification of smaller or larger groups of larvae.

Regrettably, most of these publications have been overlooked by workers outside China. To some extent this is no doubt due to the relative inaccessibility of the periodicals in which the papers are published; many seem to have had very limited distribution outside the country of origin. Not all of them are monitored by the standard abstracting journals in the western hemisphere.

I am very fortunate in having obtained, thanks to the kind co-operation of a number of Chinese colleagues, what is believed to be a full representation of these papers, particularly with respect to larval morphology.

The following list is presented to draw their attention to workers in all countries who are interested in research on flea larvae. This survey was completed up to the end of July, 1992 (following the XIX International Congress of Entomology, Beijing). Publications since then may be monitored through successive issues of Flea News. The list includes only those publications specifically including descriptive (external) morphology of larvae and/or keys for their identification. If there is sufficient interest, a complementary list of papers referring to other aspects of developmental biology and immature stages of fleas will be offered.

Explanation of the arrangement

1. CHINESE personal names are given here with the family name placed first, entirely in capitals, in accordance with the proposal made earlier (Pilgrim, 1992. Flea News 45: 474).

2. THE names of the authors are in Pinyin transliteration as they appear in the publication (usually together with the English summary/abstract). Where no summary was provided, the names have been rendered into Pinyin for the purpose of this bibliography.

In a few instances (papers published before ca 1960) authors' names are shown transliterated according to the Wade-Giles system used at that time. Thus: WANG Dwen-ching (1956) is the same as WANG Dun-qing of later references.

3. PERIODICAL titles are similarly rendered into Pinyin and/or English to assist bibliographic searching. [But note: the Library of Congress retains the Wade-Giles system; see HUANG Han-
chu and HSU David H.G. (1988) where there are included tables cross referenced to and from Pinyin.

4. COMMENTS in [ ] following the full reference are my notes on the content of the paper, with lists of the species examined where the data are not evident from the paper title. No attempt is made to resolve problems of synonymy and no opinion is offered on the validity of the published information.

All of the following texts were published in Chinese characters; some include a summary/abstract in English.

**FEI Rong-zhong, XU Bao-juan, SHI Gao, XU Shun & LIU Quan.** 1986. [Morphological observations on the larvae of *Citellophilus tesquorum sungaris* and their comparison with the larve of two other forms of *Citellophilus.*] *Acta Entomologica Sinica* 29(1): 81-84. [In Chinese; English Summary] [Diagnostic table to distinguish *C. t. sungaris*, *C. t. tesquorum* and *C. trispinus balkhaschensis.*]


**LIU Chi-ying & CHU Fong-i.** 1957. [Fleas from Shanghai, with descriptions of a new subspecies of *Rhadinopsylla dives* Jordan, 1929 and notes on the morphology and immature stages of *Stenoponia sidimi* Marikowsky, 1935.] *Journal of the Chinese People’s Liberation Army Military Academy of Medical Science* 1(3): 64-75. [In Chinese; English summary.]

**SHI Gao, FEI Rong-zhong, ZHAO Qi-fu, LI Jing-yuan & ZHOU Jian-hong.** 1988. [Some morphological descriptions on the larvae of *Ophthalmopsylla kukuschkini* (Siphonaptera: Leptopsyllidae).] *Endemic Diseases Bulletin* 3(2): 70-74. [In Chinese; English summary.] [Diagnostic table for *O. kukuschkini*, *O. jettmari*, *O. p. praefecta* and *O. v. volgensis*; and illustrations of their egg bursters.]


Sun Chang-shiu. 1965. [Descriptive morphology of the larvae of three species of fleas (Siphonaptera).] Acta Parasitologica Sinica 2(3): 310-313. [In Chinese] [Includes Neopsylla bidentatiformis, Ceratophyllus laeviceps kuzenkovi and C. gallinae tribulus.]

Wang Dwen-ching. 1956. [Comparative morphology of some common flea larvae (Siphonaptera).] Acta Entomologica Sinica 6(3): 311-321 + Table 1. [In Chinese; English abstract] [Includes Pulex irritans, Xenopsylla cheopis, Ctenocephalides felis, Leptopsylla segnis, Monopsyllus anisus, Nosopsyllus nicanus and Ischnopsyllus indicus. Descriptions and a key, together with an extensive table of characters.]


Wang Dun-qing & Xiao Bai-lin. 1987. [Larval morphology of three flea species from the Alaschan ground squirrel (Citellus alaschanicus).] Acta Entomologica Sinica 30(1): 102-105. [In Chinese; English summary] [Includes Citellophilus tesquorum mongolicus, Frontopsylla elatoides longa and Neopsylla abagaitui. Some generalizations on higher taxonomy, based on charaters of 18 known (but unspecified) spp.]


Citellus alaschanicus nests. Duration of egg, larval and pupal stages; morphology of larvae; comparisons with larvae of Callopsylla dolabris, Oropsylla silantiewi, Citellophilus tesquorum mongolicus and Neopsylla compar.]


Pl. IX: "Morphology of the egg bursters of first instar flea larvae", comprises photomicrographs (reproduced from YE and YU, 1986) of Amphipsylla primar is (whole larva), and (heads only) of Ctenocephalides f. felis, Pulex irritans, Xenopsylla cheopis, Neopsylla mana, Leptopsylla segnis, Citellophilus tesquorum dzetysuensis, Amphipsylla primar is beigiangensis, Ceratophyllus eneđei tjaschani, C. gallinae tribulus, Citellophilus tesquorum altaicus (recte dzetysuensis), C. trispinus, Callopsylla caspius, Nosopsyllus consimilis, N. l. laeviceps, Oropsylla silantiewi, Pulex irritans, Xenopsylla cheopis, Ctenocephalides f. felis, Ctenopthalmus arvalis, Leptopsylla segnis and Oropsylla silantiewi.]

YE Rui-yu & YU Xin. 1986. [Studies on the shape of egg burster of first instar larvae of flea and its taxonomic significance.] Di fang bing tong bao [Endemic Diseases Bulletin] 1(2): 107-111. Plates I-VIII. [In Chinese; English abstract] [Drawings (Fig.1) of egg bursters, and/or photomicrographs (Plates I-VIII) of head or of egg bursters of: Chaetopsylla lasia, Neopsylla democritica, N. mana, N. pleskei orientalis, Amphipsylla anceps anceps, A. primar is beigiangensis, Frontopsylla e. elatoides, Mesopsylla eucta shikho, Ophthalomopsylla v. volgensis, Ceratophyllus eneđei tjaschani, C. gallinae tribulus, Citellophilus tesquorum altaicus (recte dzetysuensis), C. trispinus, Callopsylla caspius, Nosopsyllus consimilis, N. l. laeviceps, Oropsylla silantiewi, Pulex irritans, Xenopsylla cheopis, Ctenocephalides f. felis, Ctenopthalmus arvalis, Leptopsylla segnis and L. lauta.]

YE Rui-yu, YU Xin & WANG Dun-qing. 1982. [Comparative morphology of fifteen species of flea larvae known in China, in addition with four new descriptions and studies on their spiracles.] Acta Entomologica Sinica 25(2): 209-216. [In Chinese; English summary] [External morphology of larvae of: Neopsylla pleskei, Ctenopthalmus (Euct.) arvalis, Leptopsylla (P.) lauta and Citellophilus trispinus balkhaschensis. Characters of these taxa tabulated in Table 1, together with parallel data for: Pulex irritans, Xenopsylla cheopis, Ctenocephalides felis, Neopsylla bidentatiformis, Stenoponia shanghaiensis, Leptopsylla segnis, Ischnopsyllus indicus, Nosopsyllus nicanus, N. (G.) laeviceps kuzenkovi, Monopsyllus anisus and Ceratophyllus gallinae tribulus. Fig. 25 illustrates egg bursters of all these taxa.]
YU Yi-hsin. 1957. [A study of the morphology of the larva of *Ceratophyllus gallinae tribulus*.] *Chinese Journal of Zoology* 1(2): 119-120. [In Chinese]

**Acknowledgment**

It is a pleasure to thank Professor YE Rui-yu, Ürümqi, People's Republic of China, for providing copies of many of the above publications as well as kindly checking (and improving) a draft of this submission.

**Reference**


It will be understood that - although their titles are given in English in these lists - papers in Russian or Chinese periodicals, or books published in Russia or China, are in Russian or Chinese (but often with summaries in English or some other language).

"The placid natives of Aitutaku, observing that the little creatures [fleas] were constantly restless and inquisitive, and even at times irritating, drew the reasonable conclusion that they were the souls of deceased white men." Buxton with Hopkins, 1927, *Researches in Polynesia and Melanesia*, parts I-IV, p. 55.