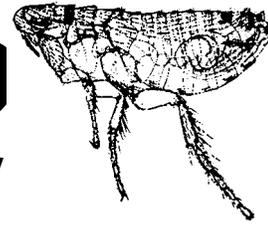


# *flea*

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# NEWS

# 52



Department of Entomology

Iowa State University, Ames, Iowa 50011

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**FLEA NEWS** is a biannual newsletter devoted to matters involving insects belonging to the order Siphonaptera (fleas) and related subjects. It is compiled and distributed free of charge by Robert E. Lewis (relewis@iastate.edu) with the support of the Department of Entomology at Iowa State University, Ames, IA, and a grant in aid from **Sandoz Animal Health**, based in Des Plaines, IL. It is mainly bibliographic in nature. Many of the sources are abstracting journals and title pages and not all citations have been checked for completeness or accuracy. Additional information will be provided upon written or e-mail request. Further, recipients are urged to contribute items of interest to the profession for inclusion herein.

This newsletter is now available in electronic format. The preferred method of accessing the electronic version is through the WorldWide Web at the following Universal Resource Locator: <<http://www.public.iastate.edu/~entomology/FleaNews/Ab>

outFleaNews.html> or through either Gopher or anonymous FTP: <[gopher.ent.iastate.edu](http://gopher.ent.iastate.edu)> in the "Publications" directory. Electronic versions are available for No. 46, July, 1993; No. 47, December, 1993; No. 48, July, 1994; No. 49, December, 1994; No. 50, June, 1995; No. 51, December, 1995 and this number.

The opinions and assertions contained herein are the private ones of the author and are not to be construed as official or as reflecting the views of the Department of Entomology, Iowa State University or Sandoz Animal Health.

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## Editorial

It has now been slightly over 22 years since Flea News was conceived by Mr. F.G.A.M. Smit, then Curator of fleas at the British Museum (Natural History). Prior to 1972 the combined Rothschild and British Museum collection of fleas resided in the small village of Tring, Hertfordshire, ~20 miles NW of London. During collection reorganization in 1972, the fleas were transferred to the main museum building on Cromwell Road, South Kensington, where they are currently housed.

From February of 1973 to June of 1980, Smit produced 20 issues of Flea News totalling 205 pages of text

and bibliographic information pertaining to fleas and related matters on a worldwide basis. In addition, in conjunction with his assistant he also sent out *A list of code numbers of species and subspecies of Siphonaptera* (1978a) and *A catalogue of primary type-specimens of Siphonaptera in the British Museum (Natural History)* (1978b) which were distributed as appendices to the newsletter. Since Smit's retirement in 1980, *Flea News* has been continued, in some-what modified form, from the Entomology Department here at Iowa State University.

In issue number 20 Smit indicated that during the years 1973 to early 1980 he had listed 1605 titles, for an average of 227 per annum. I have kept a tally of the numbers of papers cited in *Flea News* since its inception and, as of this issue, the number stands at 5939, an average of 258 per annum. Granted, this is not an accurate figure since it does not take into consideration works that have been overlooked during this period or the few cases where papers have been cited in more than one issue. However, in this type of endeavour there is no such thing as completeness and the numbers can only suggest a trend. A review of these citations indicates a diminution in taxonomic studies, with a few notable exceptions, and an increase in experimental and applied works. This is particularly the case with control measures such as insect growth regulators (IGRs) and systemics.

Does this mean that taxonomic and systematic studies of the Siphonaptera are nearing completion? Most assuredly not! Of the landmark series of catalogues published by the British Museum from 1953 to 1987, only the last volume can be considered current and the earliest volumes are badly in

need of revision. One of the major families, the Ceratophyllidae, has never been treated on a worldwide basis except by Traub et al. (1983) and Lewis (1990), neither of which went beyond a superficial listing of the extant taxa. Smit's key in Traub et al. laid the basis for a taxonomic revision of the family, but there are still many undescribed genera and species belonging to this family. Until these become a part of the literature a taxonomic revision of this important family will not be possible. Following are a few additional considerations involving the order that require study.

At the end of 1995 there were 3011 named taxa in the literature at the species or sub-species level. Of these, 2565 were considered valid and 798, or 31% of these were treated as subspecies. The remaining 446 names are either junior synonyms or of questionable status. I know of no other group of organisms, with the possible exception of pocket gophers, where such a high percentage of subspecies has been erected. A dozen of the worst examples of subspecies inflation are the following genera:

<i>Typhloceras</i>	100%
<i>Pariodontis</i>	80.0%
<i>Thrassis</i>	80.0%
<i>Foxella</i>	78.5%
<i>Mesopsylla</i>	76.4%
<i>Ophthalmopsylla</i>	66.6%
<i>Orchopeas</i>	65.0%
<i>Leptopsylla</i>	63.3%
<i>Frontopsylla</i>	57.5%
<i>Ctenophthalmus</i>	57.5%
<i>Hystrichopsylla</i>	56.2%
<i>Peromyscopsylla</i>	54.8%

There are many additional genera with 40% or higher. At a glance it would appear that our knowledge of the order is so advanced that population analysis is possible in a very detailed manner. This could explain how the *Ctenophthalmus agyrtes* complex could

contain 23 subspecies in what is generally treated as western Europe, or the *Stenoponia tripectinata* complex could have 14 subspecies in northern Africa and the eastern Mediterranean, or that *Foxella ignota* could contain 11 subspecies in roughly the western half of North America. While that is one interpretation, it is really quite misleading. From a technical point of view, a subspecies is a race of a species that is assigned its own Latin name in much the same way that species are assigned names. However, there are no clear rules for identifying subspecies except that they must be geographically distinct populations, not merely morphs, and that they must differ to some extent from other geographic segments of the total population. Since they are all supposed to belong to the same species they should be able to interbreed and produce hybrids where the populations impinge upon each other. There are very few cases where this sort of evidence is available, and most subspecies are named with little regard for comparative data. In other words, recognition and description of subspecies is a rather arbitrary procedure and may be driven by forces other than scientific precision. Until these trinomials can be examined and validated by the scientific community their legitimacy must remain a matter of speculation.

On a more positive note, there are more tools available to taxonomists today to explore the ordinal and infraordinal relationships of organisms than ever before. The ancestors of the order Siphonaptera are difficult to determine beyond speculation due to the high degree of morphological modification imposed by an ectoparasitic life style. Most workers have been relatively comfortable in deriving the order from some mecopteroid stock

and associating fleas as close relatives of the Diptera, or two winged flies. This arrangement may be supported by recent studies of 18S and 28S rDNA sequences, but the details are only now in the process of being published. At this point I know of no studies using techniques such as the Polymerase Chain Reaction (PCR), nuclear RNA gene sequencing or mitochondrial DNA sequencing that have been developed relatively recently. Perhaps the time will come in the not-too-distant future when techniques such as these will be applied to the mystery of flea phylogeny both within and beyond the ordinal level

On the fossil front, there are only a few fossils that are unarguably fleas in the modern definition. So far these seem to be restricted to deposits of Baltic and Dominican amber. The two that have been described from Baltic amber belong to a recognizable modern genus, *Palaeopsylla*, assigned to the hystrihopsyllid family Ctenophthalmidae. Those in Dominican amber, though as yet undescribed, appear to be rhopalopsyllids or pulicids. Though there is much to be learned from these fossils it is unlikely that they will contribute much to phylogenetic theory within the order.

Although the world fauna is better known than might be expected, there are still large areas that should be sampled. This is particularly true of Central and South America, but even parts of western United States are still in need of intensive collecting. In fact, much collecting has been done but the records remain unpublished and are thus inaccessible to the scientific community.

In summary, there are still many opportunities for researches into fleas at many different levels and much alpha taxonomy remains to be done

before the world fauna is properly understood and elucidated.



## MISCELLANEA

### Meetings.

The **American Society of Mam-malogists** have scheduled their annual meeting for 15-19 June 1996 at the University of North Dakota, Grand Forks, SD. The following two titles may be of interest to recipients of this newsletter.

**Owen, R.D., M.R. Willig & D. Gettinger.** Small mammals and their ectoparasites from Paraguay - Status of a long-term project.

**Gompper, M.E.** Effects of coati social structure on ectoparasite presence, abundance and costs.

The **Society for Vector Ecology** have scheduled their annual meeting for 6-9 October 1996 at Berkeley, CA. The European branch of the Society will meet in Strasbourg, France, 2-6 September 1996 and the **2nd International Congress of Vector Ecology** is scheduled for 19-24 October 1997 in Orlando, FL

Volume 27(1) of the **Vector Ecology Newsletter** contains a résumé of worldwide plague surveillance by the United States Centers for Disease Control and Prevention (CDC), as well as federal, state and local agencies since the last summary was published in April of 1994. Although too extensive to include here copies should be available from the Society at P.O.Box 87, Santa Ana, CA 92702, USA.

The **4th International Symposium on Ectoparasites of Pets**, sponsored by the University of California, is scheduled for 6-8 April 1997 at the Mission Inn, Riverside, CA. January 3, 1997 is the deadline for

submission of paper titles. February 28th is the cut-off for hotel reservations and preregistration (\$100 full, \$50 student and \$150 on-site). Titles and 250 word abstracts should be submitted to Dr. Nancy Hinkle, Department of Entomology, University of California, Riverside, CA 92521, or sent by e-mail to <nihinkle@citrus.UCR.edu>. Reservations may be made at the Mission Inn by calling (800) 843 7755 or (909) 784 0300. For further information contact Ms. Hinkle or Terrie Love at (909) 787 3718. See page 611 for additional information.

### New Products

Following are a few listings of products or services that may be of interest to some recipients. Additional information will be provided upon request.

Entomation  
2742 Beacon Hill  
Ann Arbor, MI 48104-6502  
Phone (313) 971 6033  
E-mail <entomation@aol.com>

This organization specializes in computer software related to the biological sciences, especially entomology. I have used the Entoprint program to generate labels and find it most useful. Other products, such as Insect Clip Art and Bug Art, etc. are listed in a 1 page catalogue, available upon request at the above address.

Specialist Science Books  
P.O.Box 1553  
Exbury Way  
Andover, Hampshire  
SP10 3XS United Kingdom  
<ssb@pember.demon.co.uk>  
Fax. (44) 1264 334751 (International)  
01264334715 (Domestic)

Beginning in mid-May this bookselling service entered the Internet. It is an electronic booksellers catalogue. Under Entomology it lists the following categories: **Taxonomic**; Insect Catalogues/Identification Guides, Lepidoptera, Coleoptera, Diptera, Hymenoptera, Small Orders, Spiders & Parasitic Insects. **Applied**: Biological Control/Pest Management, Insect Ecology/Conservation, Insect Biochemistry/Genetics, Food/Crop Preservation & Protection, General Entomology Books. There are also sections labeled **Announcements, New Publications, Featured Books & Special Offers**. Individual listings include the Title, Author(s), Bibliographic information, Reference Number, Price in £ and Annotations. At present the following general categories are treated: Biotechnology, Botany, Entomology, Food Science, Geology, Natural History, Water & Water Treatment and Zoology and over 2,000 titles are listed.

Entomological Information Services  
P.O.Box 4350  
Rockville, MD 20849-4350 USA  
(800) 879 4214  
E.mail <eis@ix.netcom.com>  
<http://www.idsonline.com/eis/nomina.htm>

A recent mailing advertises **Nomina Insecta Nearctica**, a checklist of all the species and genus-group names applied to insects of North America (USA, Canada & Greenland). Includes senior and junior synonyms, junior homonyms, emendations, and unavailable names as determined by the International Code of Zoological Nomenclature. To be issued in four volumes and a CD within the next year. Volume 1 [published in May] deals with the Coleoptera and Strepsiptera and is \$79.95. Other volumes are scheduled

for summer, fall and winter of this year as is the CD. The WWW site provides additional information, but nothing about the participants, so I have no idea how authoritative the finished product really is.

### Personal Comments

**Dr Allen H. Benton** writes that he wishes to dispose of his extensive collection of books, pamphlets and reprints on Siphonaptera. Anyone interested should write, indicating their areas of interest or special needs. The address is: 292 Water Street, Fredonia, NY 14063.

Following is a communication from **Ms. Nancy Adams**, Smithsonian Institution, concerning the Siphonaptera collection there.

#### NMNH SIPHONAPTERA COLLECTION

The United States National Siphonaptera Collection housed at the Smithsonian Institution's, National Museum of Natural History, Museum Support Center in Suitland, MD, is open for business. The collection has been undergoing growth and facility changes to allow for expansion, organization and to enhance its accessibility. In an insect collection as large as the holdings of the NMNH there are never enough hands to keep the collection in good shape and we must rely on our friends and colleagues to help out. For many years Dr. Robert Traub was that friend. He donated duplicates from his personal collection, depositing much of his type material with us and encouraging his colleagues to do the same. As well, he was the watchdog of Government Siphonaptera collections, noting when it looked like material was going to be abandoned and seeing to it that it got a safe home in the National Collections. I dare say the NMNH

would probably have fewer than 100 slide boxes of material had it not been for the tireless efforts of Bob Traub. Because of his love for these wee beasties and his tireless efforts in the clearing and mounting of fleas, the collection now holds about 1,400 slide boxes of fleas from around the world, including over 400 primary types. The collection contains the non-USA material from Brigham Young University through Vernon Tipton, the material that the late Allen Barnes and others worked on from the Centers for Disease Control, Ft. Collins, Colorado, most of the W. L. Jellison and Phyllis T. Johnson material, also significant gifts from C. A. Hubbard, R. E. Lewis and many others. I admit, you may be more familiar with the collection than I am, because I have only recently taken over the collection manager position for the Siphonaptera collection. I am not a flea taxonomist but am the collection manager for the neuropteroid orders and the lice and flea collections and thus the contact person for any information, loans or gifts for those portions of the NMNH collections. I am sorry to say that I have not had the chance to inventory the holdings, but that is in the plans for the future and when it is prepared I will put an announcement in Flea News. One of the slowdowns in organizing the collection was the necessity of labeling about 40,000 slides from the SI/US Army Survey of African Mammals. They were beautifully mounted and most identified to genus or species but had no locality or host labels and sometimes no appropriate determination labels. With help from a few volunteers and a short-term contract worker, that chore has been completed. Surprisingly, while working on the labelling, one of the original workers on the Africa flea project, Michael Hastriter, contacted me to let me know

he was ready to work on some of the material again. What a thrill! There are still about 10,000 specimens that are unidentified from that project so I can really use the help.

The collection is now arranged in alphabetical order by family, genus and species so even though the inventory has yet to be made I can still look for specimens that you may want to borrow for study or identification. The NMNH Department of Entomology loan policy is as follows: 3 years for non-type material with extensions possible and 6 months for primary types. This can be negotiated depending on your project. The Department also has a policy for material retention for identification services, a "kept for names" system that we can discuss if you are interested in helping with this task.

I still have a large supply of excess reprints which I advertised in an earlier Flea News. Some from that listing may no longer be available because I did have about 30 requests. But if you look back on that list and see something that you or a student/colleague might need, please let me know.

Thank you all for keeping the NMNH, through me, on your reprint mailing list. Having as complete a literature base as possible for current and future workers is exceedingly important.

I would also like to extend an invitation to any of you who would like to visit the collection; you are more than welcome. Often the Washington, DC area is a spring-board to other world destinations. So, if coming to this area is in your travel plans and you would like to spend some time in the collection or retrieving material for a loan, please let me know. The research facilities at the Museum Support Center are fairly new and

quite good. It will be easy to get you set up near the specimen and reprint collection.

I have probably not answered all your questions concerning the collection, so if you have other questions you can reach me by phone: (202) 357 1897, Fax: (202) 786 2894, E-mail: MNHEN049@SIVM.SI.EDU, or snail mail: Nancy Adams, Smithsonian Institution, National Museum of Natural History, MCR-105, Washington, DC 20560.

Please let me know how I can facilitate your research. N.E.A.

○\*○\*○\*○

### New Species

#### 1994

- australiaca* Beaucournu & Kock  
*Lagaropsylla mera*  
*bursiforma* Wu, Cai & Li *Callopsylla*  
(*Geminopsylla*)  
*changi* Wu, Zhao & Li *Wagnerina*  
*heishuiensis* Li & Liu *Hystrihopsylla*  
*hubeiensis* Liu, Wang & Yang *Doratopsylla*  
*coreana*  
*iberica* Ribeiro, Lucientes, Osacar & Calvete  
*Echidnophaga*  
*intermedium* Guo, Liu & Wu  
*Paradoxopsyllus*  
*liae* Guo, Liu & Hu *Paradoxopsyllus*  
*liui* Guo Liu & Wu *Frontopsylla*  
*malayana* Beaucournu & Kock  
*Lagaropsylla*  
*mengdaensis* Cai & Wu *Hystrihopsylla*  
*muyuensis* Liu & Wang *Macrostylophora*  
*peninsularis* Lewis *Thrassis*  
*polyspina* Liu Wu & Li *Amphipsylla*  
*wushanensis* Liu & Wang *Palaeopsylla*

#### 1995

- andersoni* George & Beaucournu  
*Orthopsylloides*  
*baiyerensis* George & Beaucournu  
*Orthopsylloides abacetus*  
*grenieri* Beaucournu & Rodhain  
*Ctenocephalides*  
*lui* Li *Syngenopsyllus*  
*liae* Zhang, Wu & Li *Monopsyllus*  
*subulispina* Cai, Wu & Li *Wagnerina*

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### Announcement

**It is my intention to retire from Iowa State University effective 31-Dec-ember-1996. However, I intend to continue my work with the Siphonaptera and will continue to produce Flea News as long as there is financial support for it. As of 1 January 1997 my mailing address will be: 3906 Stone Brooke Circle, Ames, IA 50010-4174 USA. Phone (515) 232 7714 A new e-mail address will be provided later, probably in the December issue.**

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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. No particular effort has been made to search the medical and veterinary literature and the emphasis here is on the taxonomy, systematics and general biology of members of the order.

#### 1991 List 11)

**Easton, E.R.** Annotated list of insects of Macau observed during 1989. *Entomological News* 102(2): 105-111.

**GAO, Z.-I. & MA L.-m.** A new species of the genus *Brevictenidia* from Xizang, China (Siphonaptera: Ceratophyllidae). *Acta Zootaxonomica Sinica* 16(4): 487-489.

**GE L. & MA L.-m.** Description of female of the flea *Paradoxopsyllus aculeolatus* (Siphonaptera: Leptopsyllidae). *Acta Zootaxonomica Sinica* 16(4): 500-502.

**LI S.-j. et al.** The blood-sucking ability of *Nosopsyllus laeviceps kuzenkovi* and the experiment of biting humans. *Chinese*

Journal of Vector Biology and Control 2(2): 95-99.

**Nayak, M.K., S.S. Sehgal & V. Baweja.** Flea-host relationships of associated *Rattus* and native wild rodents in selected biotopes of two erstwhile plague endemic areas in India. Indian Journal of Entomology 53(4): 564-573.

### 1992 (List 9)

**Flowerdew, J.R., R.C. Trout & J. Ross.** Myxomatosis: population dynamics of rabbits (*Oryctolagus cuniculus* Linnaeus, 1758) and ecological effects in the United Kingdom. Revue Scientifique et Technique - Office International des Epizooties 11(4): 1109-1113.

**LIU J.-y. & LI X.-m.** The vectorial position and effect of *Nosopsyllus laeviceps kuzen-kovi* in the natural plague foci of gerbils. Endemic Diseases Bulletin 7(4): 40-44.

**MA L.-m.** Life duration of adult *Neopsylla bidentatiformis* and *Citellophilus tesquorum sungaris* in relation to temperature and humidity. Endemic Diseases Bulletin 7(4): 89-91.

**QIAN C.-n. et al.** A device for feeding the flea and observing infection of *Pulex irritans* with *Yersinia pestis*. Endemic Diseases Bulletin 7(3): 43-45.

**WANG Z.-j.** Ecological observation of *Marmota himalayana* during hibernation. Endemic Diseases Bulletin 7(4): 51-55.

**ZHANG X.-x. et al.** A study on the plague mass formation of the flea *Pulex irritans* canine strain from Yunnan and Jilin. Endemic Diseases Bulletin 7(4): 92-93.

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**CHEN J.-I. & WANG D.-q.** An approach to the extraction of flea genomic DNA. Endemic Diseases Bulletin 8(1): 56-60.

**CHEN J.-I & WANG D.-q.** Scanning electron microscopy of the chorion surface of three

species of domestic rat fleas in south China (Siphonaptera). Endemic Diseases Bulletin 8(2): 17-19.

**CHEN J.-I. & WANG D.-q.** Preliminary studies on restriction enzymatic analysis of genomic DNA in *Leptopsylla segnis* and *Monopsyllus anisus*. Acta Parasitologica et Medica Entomologica Sinica 1: 66-68.

**CHI Y.-I. et al.** Labelling *Citellophilus tesquorum sungaris* with 125I and observations on the physiological effects. Endemic Diseases Bulletin 8(1): 68-70.

**DONG X.-q. et al.** Diagnosis, treatment and analysis of 8 cases of bubonic plague in Yunnan County. Endemic Diseases Bulletin 8(1): 87-89.

**FEI R.-z et al.** A study of the extent of dispersal of *Citellophilus tesquorum sungaris* on *Citellus* using the 125I labelling method. Endemic Diseases Bulletin 8(1): 65-67.

**Fox, M.T.** Ectoparasites and vectors of veterinary importance. Parasitology Today 9(12): 437-438.

**Gállego, M., M.S. Gómez, M. Portús & J. Gállego.** Ectoparasitological study (Acarina, Insecta) of insectivores in Catalonia. Boletim da Sociedade Portuguesa de Entomologia (1992) Suplemento No. 3, 1, 385-394.

**Ivanov, V.P.** Electron microscope study of the pygidial receptor organ in the flea *Xenopsylla cheopis* Roths., 1903 (Siphonaptera). Entomologicheskoe Obozrenie 72(3): 507-518.

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**LI C.-s. et al.** A surveillance report of plague epizootic in Ulan County. Endemic Diseases Bulletin 8(1): 94-98.

**LI Z.-I. & XIO B.-I.** Observations on the breeding and biological characteristics of *Leptopsylla segnis*. Endemic Diseases Bulletin 8(2): 26-28.

**LIAO H.-r. & LIN D.-h.** Laboratory observations on some biological characters of two rat fleas in south China. Endemic Diseases Bulletin 8(1): 61-64.

**LIU J.-y & LIU J.** The distribution and epidemiological significance of main species of flea in various types of plague foci in Inner Mongolia. *Endemic Diseases Bulletin* 8(1): 26-29.

**MA L.-m.** Resistance of the fleas *Neopsylla bidentatiformis* and *Citellophilus tesquorum sungaris* to low temperature. *Endemic Diseases Bulletin* 8(1): 71-73.

**MacKichen, J.J. & W.F. Hink.** High-performance liquid chromatographic determination of CGA-184699 (Lufenuron) in dog and cat blood. *Journal of Liquid Chromatography* 16(12): 2595-2604.

**Meola, R.W., S. Ready & S. Meola.** Physiological effects of the juvenoid pyriproxyfen on adults, eggs and larvae of the cat flea. Proceedings of the 1st International Conference on Insect Pests in the Urban Environment. pp. 221-228.

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**Osacar-Jimenez, J.J., J. Lucientes-Curdi, C. Calvete-Margolles & R. Villafuerte-Fernandez.** Notes on the ecology of rabbit fleas (Siphonaptera) parasitizing wild rabbits (*Oryctolagus cuniculus* ) in Ebro's middle valley. Proceedings of the 1st International Conference on Insect Pests in the Urban Environment. 481 (abstract)

**PENG H.-b. et al.** Confirmation and analysis of human plague in Menghai County, Yunnan. *Endemic Diseases Bulletin* 8(4): 42-44.

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**Rodríguez-Rodríguez, J.A., R. Martín-Hernández, F. Valcárcel-Sancho & A.S. Ilmeda-García.** Intraspecific variation in the genal and pronotal chaetotaxy of *Spil-opsyllus cuniculi* (Dale, 1878) (Siphonaptera: Pulicidae). *Boletim da Sociedade Portuguesa*

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**Sangvaranond, A.** Studies on prevalence and outbreak of ectoparasites in native chickens in the central part of Thailand. *Kaset-sart Journal, Natural Sciences* 27(2): 194-202.

**Saxena, V.K. & A. Miyata.** An unusual morphological type of *Trypanosoma (Herpetosoma) lewisi* Kent, 1880 detected in the blood of *Rattus norvegicus* in India. *Journal of Communicable Diseases* 25(1): 15-17.

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**WANG S.-q, LIAO J. & WU H.-y.** Comparative studies of composition and content of amino acids in subspecies of *Citellophilus tesquorum*. *Endemic Diseases Bulletin* 8(4): 18-22.

**WANG S.-r & LIU X.-q.** Castrated males in the genus *Neopsylla* from China and a discussion of *Neopsylla monodentatiformis*. *Acta Entomologica Sinica* 36(2) 225-230.

**Wildey, K.B. & W.H. Robinson.** (Eds.) Proceedings of the 1st International Confer-

ence on Insect Pests in the Urban Environment. Cambridge, UK xii-498 pp. ISBN 0-9521824-0-8. Central Science Laboratory, Ministry of Agriculture, Fisheries and Food, London Road, Slough SL3 7HJ, UK.

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Wishing you all a happy and prosperous summer!

R. E. Lewis