

flea

NEWS

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Department of Entomology

Iowa State University, Ames, Iowa 50011

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Announcement

It has now been 20 years since I took over the production of Flea News from the capable hands of F.G.A.M. Smit. Much has happened during that time to expedite the retrieval and dissemination of information, and resources are now available to the researcher that could only have been imagin-ed in 1980. This, coupled with the fact that the number of students of the Siphonaptera has seriously declined during this period and the cost of printing and postage has increased, has convinced me that the time has come to discontinue production of printed copies of Flea News. Electronic copies of the last 14 numbers are available

on the web and any future numbers, if any are forthcoming, will be added to them. Readers are urged to continue to send reprints and other material that may be of interest to pulicologists for inclusion therein. I wish to take this opportunity to thank the many colleagues who have cooperated in the past for their contributions and assistance in making Flea News a useful, if not particularly elegant, means of communicating with the scientific community.

R. E. Lewis

Obituary

Shortly after hearing of the death of Frans Smit I set about writing an obituary based upon information I had requested from him some 10 years ago. After completing it I was contacted by Julius, his eldest son, and provided with a copy of a document outlining Smit's life and career, evidently writ-ten by Smit himself. Though it is sim-ilar to the material presented in my original obituary I am substituting his account out of respect for a colleague and long-time friend. Any annota-tions by me are enclosed in brackets, i.e. []

**Franciscus Gerardus Albertus Maria
Smit**

7-June-1920 • 28-January-2000

"Franciscus G. A. M. Smit was born at Zutphen, The Netherlands, on 7 June 1920. Having only just survived a lengthy illness during his early teens, he subsequently managed to finish [his] secondary school education in Nijmegen. For health reasons and because of his intense interest in natural history, he was advised to attend a local horticultural college for two years. This was followed by working at a florist's as a volunteer for six months while another six months were spent at the office of an estate agent (the only employment available at the time). In March, 1940, however, the enthusiasm which Frans had displayed at the horticultural college for the subject of entomology resulted in an appointment by the Ministry of Agriculture, enabling him to embark upon a study of the life-cycle and control measures of the apple-blossom weevil (*Anthonomus pomorum* L.). That work had to be carried out at Geldermalsen in a fruit-growing region north of the river Waal. When, on 10 May, 1940, Germans invaded to occupy the country, the bridges over that river were blown up which made continual travel and further research impossible. Work was hard to come by in those days but Frans managed to earn a few guilders by gardening and teaching violin-playing. In 1941 he found employment at the office of a transport firm in Venlo. During that year he was given permission by his employer to spend one day a week attending entomology lectures at the Agricultural University of Wageningen (travelling there by bicycle in all weathers, three hours each direction). In 1942 he obtained a clerical position at the Government Coal Office in Nijmegen, thereby obviating the risk of being sent to Germany to work in a

factory. During these war years Smit was able to study garden architecture and successfully passed examinations in 1944.

"Having collected insects in general from boyhood onwards, Frans had started to specialize in beetles but when, in 1941, he realized that fleas and lice were totally neglected in his country he gropingly tried to find his way into the literature on those insects. He soon decided to leave the comparatively well-studied beetles alone and instead to pay attention to the smaller orders which, in any case, would be less costly and time-consuming as a pure hobby, which the pursuit was supposed to remain. When he had left the Coal Office in the autumn of 1946, Frans first spent two weeks at Tring, England, where he became utterly fascinated by the Rothschild flea collection housed in the Zoological Museum of the British Museum of Natural History. After returning home he failed to get started, as planned, in garden architecture and instead spent the winter writing a popular book in Dutch on fleas and lice (*Vlooien en Luizen*) which was finally published in 1951. In 1947 his luck turned and in September Frans was appointed entomologist at the Phyto-pathological Institute at Wageningen, a job he really cherished. Another holiday was spent at Tring in February [of] 1948. When, in the summer of that year, the Hon. Miriam Rothschild enquired whether he would be interested in coming over to work in the Flea Room at Tring as a temporary assistant with the possibility of succeeding Mr. F. Cox (who had been the assistant for some 50 years), Frans gratefully accepted the opportunity with both hands. So, he burned his boats and arrived at Tring on 2 January, 1949 carrying all his belongings: a microscope, a violin and a suitcase. When, in 1950, Mr. Cox did retire, Frans Smit became the Custodian of the

Rothschild Collection of Siphon-aptera, a position which he held until his retirement in 1980. During those years he published just over 200 books [201] and articles and described more than 200 [192] new forms of fleas. Mr. Smit was re-employed by the British Museum of Natural History as a part-timer to continue work on volume VII of the monumental Rothschild Flea Catalogue until 1983. After another two years of voluntary work to finish the Catalogue, Frans had to sever his links with flea-studies in 1985, much to his intense regret.

"During the years at Tring, Frans and his family had lived in a house rented from the museum but which he was obliged to vacate in 1985. He and his wife Tineke (whom he had married in October, 1949) then moved to Peterborough where, in retirement, he was fully occupied with research into Dutch-engraved glasses of the 17th and 18th centuries. Frans had embarked upon these studies as a spare-time interest in 1970 and had also taught himself to engrave glass (which, in 1984, he had to give up because of eye-trouble). In 1980 he was elected a Fellow of the Guild of Glass Engravers. He became known as an authority on Dutch-engraved glass and published over 50 papers and mono-graphs relating to that subject.

"Frans Smit filled his spare time with work or other useful pursuits. Disliking proper holidays, he only travelled in connection with his flea- or glass-studies, greatly enjoying such trips. A simple life-style quite suited Frans; for instance, he never wanted a car or a television-set. Listening to good music, especially the violin repertoire, was his intense pleasure.

"Being rather an individualist, Frans shunned the flock. One of his mottoes used to be 'Always try to do something that is not done by others'.

He certainly did: the study of fleas (a unique career) and of old Dutch-engraved glass."

[Fran's wife, Caroline Ernestine Smit died in November of 1999. He is survived by four children, Julius, Remy, Emile and Deborah.]

Taxa

Genera & Subgenera

Astivalius Smit, 1953
 Aetheca Smit, 1983
 Amaradix Smit, 1983
 Ayeshsapsylla Smit, 1987
 Baculomeris Smit, 1983
 Ceratophyllus (Celeophilus) Smit, 1983
 Ceratophyllus (Emmareus) Smit, 1983
 Ceratophyllus (Rosickyiana) Smit, 1972
 Dampfia Smit, 1954
 Dasypsyllus (Neornipsyllus) Smit, 1976
 Ectinorus (Ichyonus) Smit, 1987
 Ernestinia Smit, 1953
 Eumolpianus Smit, 1983
 Foxella (Afoxella) Smit, 1983
 Glaciopsyllus Smit & Dunnet, 1962
 Idilla Smit, 1957
 Igioffius Smit, 1983
 Margopsylla Smit, 1983
 Megabothris (Amegabothris) Smit, 1983
 Megabothris (Gebiella) Smit, 1983
 Megabothris (Kueichenlipsylla) Smit, 1983
 Neotunga Smit, 1962
 Nosopsyllus (Nosinius) Smit, 1960
 Opisodasys (Oxypsylla) Smit, 1983
 Oropsylla (Hubbardipsylla) Smit, 1983
 Pagipsylla Smit, 1979
 Plusaetis Smit, 1983

Pulicella Smit, 1964
 Rothschildiana Smit, 1952
 Serendipsylla Smit, 1975
 Tetrapsyllis (Phylliver) Smit, 1987
 Traubia Smit, 1953
 Zyx Smit, 1953

Species & Subspecies

1950

Echidnophaga inexpectata = Phacopsylla i.

1951

Leptopsylla algira tuggertensis
 Leptopsylla aethiopica nakuruensis
 Dinopsyllus brachypecten

1952

Ischnopsyllus delectabilis
 Chimaeropsylla haddowi
 Ancistropsylla siamensis Smit & Toumanoff
 Delotelis hollandi

1953

Nosopsyllus ceylonensis
 Dorcadia ioffi
 Chaetopsylla caucasica
 Cleopsylla monticola
 Plocopsylla phyllisae
 Megarthroglossus jamesoni
 Palaeopsylla similis peusi
 Sigmactenus toxopeusi
 Ernestinia eximia
 Traubia egregia
 Astivalius microphthalmus
 Zyx notabilis
 Acanthopsylla richardsoni
 Acanthopsylla guba
 Acanthopsylla divergens = enderleini
 Acanthopsylla bella

1954

Dampfia grahami equatoris
 Thaumapsylla breviceps orientalis = breviceps

1955

Ceratopsyllus farreni chaoi Smit & Allan
 Ctenophthalmus congener honshuensis
 =congeneroides
 Ctenophthalmus congener hokkaidensis
 =congeneroides
 Ctenophthalmus apertus allani
 Ctenoparia jordani
 Tetrapsyllus rhombus
 Ctenophthalmus nobilis vulgaris
 Ceratophyllus styx jordani
 Leptopsylla algira costai

1956

Parapulex echinatus
 Xenopsylla graingeri
 Xenopsylla cornigera
 Ctenophthalmus bisoctodentatus occidentalis
 =heselhausi
 Hystrichopsylla talpae orientalis

1957

Lagaropsylla idae
 Lagaropsylla consularis
 Lagaropsylla obliqua
 Lagaropsylla lipsi
 Lagaropsylla hoogstraali
 Rhadinopsylla dolomydis
 Ctenophthalmus nifetodes martinorum
 Ctenophthalmus dolomydis
 Lagaropsylla anciauxi

Lagaropsylla leleupi
 Notiopsylla enciari
 Idilla caelebs
 Rhadinopsylla mesoides
 Rhadinopsylla isacantha continentalis
 =isacantha
 Rhadinopsylla strouhali
 Rhadinopsylla orama
 Rhadinopsylla arborea
 Rhadinopsylla media
 Rhadinopsylla difficilis
 Rhadinopsylla linta
 Xenopsylla cunicularis
 Xenopsylla blanci

1958

Libyastis proximus
 Libyastis cognatus
 Xenopsylla moucheti
 Ceratophyllus affinis neglectus
 Stivalius alienus =Lentistivalius a.
 Stivalius curtiductus =Afristivalius c.
 Stivalius parilis=Afristivalius p.
 Stivalius fallaciosus=Afristivalius f.
 Stivalius pirloti=Afristivalius p.
 Stivalius cacuminis =afer
 Polygenis vulcanius =vazquezi
 Polygenis odiosus
 Kohlsia felteni
 Hoogstraalia vandiemeni
 Araeopsylla lumareti
 Araeopsylla immanis
 Lagaropsylla turba

1959

Ctenophthalmus ominosus
 Dinopsyllus dirus

1960

Ctenophthalmus andorrensis
 Ctenocephalides arabis multispinosus
 =arabis
 Xenopsylla dipodilli
 Ctenophthalmus congener tenuistigmaticus
 Ctenophthalmus iranensis persicus
 Ophthalmopsylla volgensis palestina
 Nosopsyllus sarinus aryanus
 Nosopsyllus sarinus parthius
 Nosopsyllus sinaiensis
 Nosopsyllus iranensis attenuatus
 Nosopsyllus henleyi israelicus
 Nosopsyllus theodori
 Nosopsyllus pumilionis
 Palaeopsylla miranda
 Palaeopsylla soricis rosickyi
 Ctenophthalmus bifidatus
 Ctenophthalmus capriciosus

Ctenophthalmus tertius
Ctenophthalmus arcanus
Xiphopsylla levis
Xiphopsylla daemonicola
Xiphopsylla tumida
Listropsylla basilewskyi
Ctenophthalmus blandulus
Ctenophthalmus verutus
1962
Tunga libis
Neotunga euloidea
Lagaropsylla tauffliebi
Ctenophthalmus nyikensis
Ctenophthalmus allisoni
Glaciopsyllus antarcticus Smit & Dunnet
1963
Ctenophthalmus nivalis helveticus
Ctenoparia topali
1964
Frontopsylla setigera
Ctenophthalmus taiwanus
Dinopsyllus hanneyi
Ctenophthalmus flagellatus
Pulicella macrotheca
1965
Palaeopsylla soricis scobina Smit & Rosicky
Ctenophthalmus uncinatus angustus Smit &
Rosicky =*C. u. koshanini*
Ctenophthalmus assimilis erectus Smit &
Rosicky
Parapsyllus nestoris
Parapsyllus jacksoni
Parapsyllus lynnae
Pagipsylla galliralli
Lagaropsylla taeniola
Ornithophaga mikulini Rosicky & Smit
Ornithophaga sinaia Rosicky & Smit
1967
Echidnophaga tiscadaea
Ophthalmopsylla praefecta lenta
Ctenophthalmus nivalis rhaeticus
1968
Dinopsyllus foedus
Ectinorus splendidus
1970
Parapsyllus cedei
1971
Ptilopsylla leptina stubbei
1972
Ectinorus onychius angularis Smit & Rosicky
1973
Neopsylla heckeli Smit & Rosicky
Rhadinopsylla alticolae Smit & Rosicky
Callopsylla danieli Smit & Rosicky
= *C. streeti* Lewis
1975
Smitipsylla prodigiosa
Serendipsylla marshalli
Ctenophthalmus cophurus prolapsus
Ctenophthalmus chrysochloridis
Ctenophthalmus evidens convexus
Ctenophthalmus pilosus
Ctenophthalmus wranghami
Hystrihopsylla synaptica
Neopsylla secura separata
Rhadinopsylla dahurica vicinoides
Stenischia rhadinopsylloides
Stenischia lewisi
Frontopsylla spadix ghurka =*spadix*
Paradoxopsyllus dictosus
Ctenophyllus martensi =*Aconothobius m.*
Ctenophyllus lacertosus =*Geusibia l.*
Vermipsylla perplexa
Sigmactenus cavifrons
Aconothobius anthobius
Palaeopsylla soricis vesperis
1976
Ctenophthalmus audax anarcus
Ctenophthalmus audax szaboi
Dasypsyllus plumosissimus
Ceratophyllus phrillinae
Doratopsylla coreana araea Smit & Rosicky
Palaeopsylla aporema Smit & Rosicky
Palaeopsylla danieli Smit & Rosicky
Callopsylla dolabella Smit & Rosicky
1977
Lagaropsylla alloides =*Allopsylla a.*
Amphipsylla phaiomydis limonea
Rhadinopsylla rhigalea
1978
Ceratophyllus titicacensis
1979
Parapsyllus lynnae alynnae
Parapsyllus lynnae mariae
Parapsyllus nestoris antichthones
Parapsyllus mangerensis
Parapsyllus struthophilus
Parapsyllus valedictus
Notiopsylla corynetes
Notiopsylla enciari regula
Notiopsylla kerguelensis tenuata
Notiopsylla peregrinus
Hoogstraalia imberbis
Pygiopsylla phiola
1980
Mesopsylla hebes clara
1984
Parapsyllus magellanicus largificus

1987

Ectinorus nomisis
Ectinorus onychius deplexus
Parapsyllus ambrosius
Tiamastus deflatus
Polygenis klagesi rangeli
Polygenis trapedoi mendezi

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Vlooien. *Natura*, Amst. 45(6) [540]: 122-127, figs 1-4.

1947

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1948

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1949

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Monstrosities in Siphonaptera. II. Duplication of the receptaculum seminis in *Xenopsylla cheopis* Roths. *Ent. Ber.*, Amst. 12(293): 436-437, 1 fig.

1950

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1951

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1968

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of the fleas of Sweden. Entomol. Scand. 2(4):
269-286, figs. 1-13.

1972

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Mission G. F. de Witte 72(4): 115-116.

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via and notes on intersexuality and castration
in *Amphipsylla sibirica* Wagn. Entomol.
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figs. 1-16.

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NachrBl., Wein 19(3): 130.

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Ent. Ber., Amst. 34(5): 94-95, fig. 1.

A find of the east Asian flea *Monopsyllus*
anisus (Rothschild) (Siphonaptera:
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Flea News 3: 8 pp.

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Flea News 6: 6 pp.

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A new subspecies of shrew-flea, with a Lusitanian distribution. *Entomologist's Gaz.* 26(4): 274-276, figs. 1-3.

1976

Order XXIX: Siphonaptera. In: G. S. Kloet & W. D. Hincks (Eds.)- A check list of British Insects. (2) (5). *Handbk. Ident. Brit. Insects* 11(5): 121-123.

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A new South American ceratophyllid bird-flea. *Ent. Ber., Amst.* 36(5): 65-67, figs. 1-3.

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Flea News 9: 4 pp.

Smit, F.G.A.M. & B. Rosicky. Siphonaptera collected by Dr. M. Daniel in Nepal. *Folia Parasit.* 23(2): 135-159, figs. 1-37.

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Flea News 10: 16 pp.

An unusual form of the stick-tight flea *Echidnophaga gallinacea*. *Revue Zool. Afr.* 91(1): 198-199, figs. 1-2.

A new bat-flea from Nigeria (Siphonaptera: Ischnopsyllidae). *Beaufortia* 26(330): 39-42, figs. 1-5.

Flea News 11: 14 pp.

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Flea News 12: 12 pp.

Notes on a collection of Siphonaptera from Nepal. *J. Nat. Hist.* 11(6): 693-702, figs. 1-13.

1978

Flea News 13: 16 pp.

A new bird-flea from Peru. *Zool. J. Linn. Soc.* 62(2): 189-192, figs. 1-2.

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1979

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The fleas of New Zealand (Siphonaptera). J. R. Soc. N. Z. 9(2): 143-232, figs. 1-177.

Fleas from some Western Australian mammals. Rec. West. Aust. Mus. 7(3): 325-327.

Flea News 16: 8 pp.

Flea News 17: 5 pp.

1980

Flea News 18: 8 pp.

Flea News 19: 4 pp.

Some recent collections of Siphonaptera from Mongolia. Results of the Mongolian - German biological expeditions since 1962. No. 82. Mitt. Zool. Mus. Berl. 56(1): 73-84, figs. 1-5.

Flea News 20: 17 pp.

Missing and floating genitalia in male fleas. In: R. Traub & H. Starcke (eds.) - Proceedings International Conference on fleas, Ashton, England, June 1977. Rotterdam (A.A.Balkema): 351-356, figs. 1-10.

1981

A case of tarsal trichotomy in Siphonaptera. Ent. Ber., Amst. 41: 14-15.

The song of the flea - a stridulating mechanism in Siphonaptera? Ent. Scand. Suppl. 15: 171-172, figs. 1-4.

1982

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1983

Ceratophyllidae. Key to the genera and subgenera. In: R. Traub, M. Rothschild & J. Haddow - The Rothschild Collection of fleas. The Ceratophyllidae: zoogeography and key to the genera Cambridge University Press. pp. 1-36, figs. 1-205.

1984

Parapsyllus magellanicus largificus, a new flea from the Bounty Islands. N. Z. J. Zool. 11(1): 13-16, figs. 1-7.

1987

An illustrated catalogue of the Rothschild collection of fleas (Siphonaptera) in the British Museum (Natural History). With keys for the identification of families, genera, species and subspecies of the order. VII. Malacopsylloidea (Malacopsyllidae & Rhopalopsyllidae). London (Brit. Mus. Nat. Hist.) 380 pp, pls. I-V, figs. 1-710.

1996

Flea-Bits - A selection of flea drawings by F.G.A.M. Smit. Fisherprint, Peterborough, England. 44 pp. (Published privately).



MISCELLANEA

Journal Renamed

As of January 2000 the name of the Journal of the Helminthological Society of Washington was changed to Comparative Parasitology. The change was made to better reflect the types of papers published in the journal. Parasite diversity is enormous and extends beyond the helminths. The journal is international in scope and reaches libraries in many countries. The editors invite manuscripts describing new taxa of fleas, flea life cycle studies, flea surveys, flea physiology, behaviour, biochemistry, etc. Not only works on fleas, but other groups of ectoparasites as well are welcome. Manuscripts may be sent to the editor, Willis A Reid, Jr., 6210 Hollins Drive, Bethesda, MD 20817. Society membership dues are \$25.00 domestic, \$28.00 foreign. See the home page for more information. <<http://www.gettysburg.edu/~shendrix/helmsoc.html>> (Ralph Eckerlin).

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Book Review

Sifonapteros do Brasil. Pedro Marcois Linardi & Lindolpho Rocha Guimaraes. Sao Paulo, Museu de Zoologia USP/FAPESP, 2000. 291 pp.

The following is paraphrased copy of the English abstract:

"Brazil consists of several biomes, centers of origin or dispersal, and refugia of mammalian species, with large unexplored areas in which the fauna is poorly known, including the fleas (Siphonaptera) with which these animals are associated.

"This volume represents an attempt to summarize our knowledge of the Brazilian flea fauna and is divided into two parts. Part one is a general account of the Siphonaptera in the light of recent discoveries. It consists of seven chapters and deals

with their parasitological importance, methods of study, host-parasite relationships, life history and biology, control, morphology and systematics. It is hoped that this will serve as a general introduction to the study of fleas.

"Part two deals with taxonomy and reviews the synonymies, differential characters, geographical distribution and hosts of the Brazilian species. It also includes comments on flea biology, ecology and pathogens. Illustrated keys for genera, species and subspecies are included. Check lists of geographical distribution by state and host-flea relationships are provided in the appendices.

"To date eight families, 20 genera and 59 species and subspecies have been reported from Brazil. Approximately 15% of the genera and 29% of the species are endemic, with 31 species originally described from Brazilian localities. Several new state records of species, and one new species record for Brazil are present-ed. Approximately 200 host species are known to harbor fleas in Brazil and new host records are also given.

"Finally, some trends and perspectives in pulicology are discussed with a view to stimulating future research by Brazilian students."

Interested parties may contact the senior author at the Departamento de Parasitologia ICB, Universidade Federal de Minas Gerais, Caixa Postal 486, 30.161-970, Belo Horizonte, Minas Gerais, BRASIL, or by e-mail at: <linardi@mono.icb.ufmg.br>. The price of the volume is U.S. \$34.00 plus postage.

Flea Species

In Flea News 55 (January, 1998) I listed all of the new species of fleas known to me at the time that had been described between the 1994 (December) issue and the end of 1997. Following is a list of taxa that have since come to my attention to date.

1994

hubeiensis LIU, WANG & YANG. *Doratopsylla coreana*. Acta Zootaxonomica Sinica 19(2): 243-245. Ex. *Sorex cylindricauda*, China, NW Hubei Province, Shennongjia Forest Area, 31.15-57N 109-110.56-58E, 7.IX. 1989. Holotype male, in Institute of Parasitic Diseases, Hubei Academy of Medical Sciences, Wuhan.

mujuensis LIU & WANG. *Macrostylophora* (*Songshupsylla*). Acta Zootaxonomica Sinica 19(2): 238-242. Ex. *Petaurista clarkei*, China, NW Hubei Province, Shennongjia Forest Area, 31.15-57N 109-110.56-58E, 1000-1700 m, V.1989. Holotype male, allo-type female in Institute of Parasitic Diseases, Hubei Academy of Medical Sciences, Wuhan.

wushanensis LIU & WANG. *Palaeopsylla*. Acta Zootaxonomica Sinica 19(3): 367-369. Ex. *Anourosorex squamipes*, China, NW Hubei Province, Shennongjia Forest Area, 31.15-57N 109-110.56-58E, 1500 m, 24.IV.1990. Holotype male, allotype female in Institute of Parasitic Diseases, Hubei Academy of Medical Sciences, Wuhan.

1995

bashanensis LIU & WANG. *Typhlo-myopsyllus*. Acta Zootaxonomica Sinica 20(2): 243-245. Ex. *Typhlomys cinereus*, China, NW Hubei Province, Shennongjia Forest Area, 31.15-57N 109-110.56-58E, 1000-1700 m, V.1989. Holotype male, allotype fem-

ale in Laboratory of Medical Entomology, Fujian Medical College, Fuzhou.

1996

wui WANG & LIU. *Ceratophyllus*. Acta Entomologica Sinica 39(1): 90-93. Ex. *Collocalia brevirostris*. No locality given other than Hubei Province. Holotype male, allotype female deposited in the Institute of Microbiology and Epidemiology, presumably in Fujian Medical College, Fuzhou.

1997

bana Beaucournu & Sountsov. *Neopsylla*. Bulletin de la Societe Entomologique de France 102(3): 205-209. Ex. *Mus caroli*. South Vietnam Oplateau de Tay Nguyen, Buon Loi, 14.10N 108.40E, 11.V.1993. Holotype male in collection of the senior author.

caiae ZHENG & WU. *Rhadinopsylla* (*Actenophthalmus*). Acta Zootaxonomica Sinica 22(3): 317-320. Ex. *Microtus oconomus*. China, Qinghai Province, Guinan County, 35.05N 100.07E, 2400 m, IX.1985. Holotype male in RIED.

opacusa GONG & FENG. *Palaeopsylla*. Acta Zootaxonomica Sinica 22(2): 209-214. Ex. *Nasillus gracilis*. China, Yunnan Province, Dali City, 25.13N 100.00E, Mt. Cangshan, 3200 m. Holotype male in the Institute of Epidemiology of Yunnan.

qinghaiensis WANG, LI & CAI. *Callopsylla* (*Callopsylla*). Endemic Diseases Bulletin. 12(3): 62-63. Ex. *Ochotona gloveri*. China, Jiegu, Jie-long & Yushu Counties, Qinghai Province. No other data.

ulangensis CAI & WU. *Rhadinopsylla* (*Actenophthalmus*). Acta Zootaxonomica Sinica 22(2): 215-218. Ex. *Lagurus luteus*. China, West

Qinghai, Ulan, 3000 m, IX.1977.
Holotype male in RIED.

wangi LIU. *Chaetopsylla* (*Chaetopsylla*). Acta Zootaxonomica Sinica 41(1): 82-85. Ex. *Vulpes vulpes*. China, NW Hubei Province, Shennongjia Forest Area, 31.15-57N 109-110.56-58E, 1400 m, no date. Holotype male in Institute of Parasitic Diseases, Hubei Academy of Medical Sciences.

xizangensis CAL, LI & ZHENG. *Rhadinopsylla* (*Actenophthalmus*). Acta Zootaxonomica Sinica 22(2): 215-218. Ex. *Ochotona macrotis*. China, north Xizang, Nagou, 4500 m, IX.1976, no other data. Holotype male in RIED.

1998

apapillus LIU, LI & SHI. *Aviostivalius*. Acta Zootaxonomica Sinica 23(4): 428-431. Ex. *Apodemus chevrieri*. China, Hubei Province, Yiching County, 30.07N 111.03E, Dalauing tree farm, 11.VIII.1991. Holotype male in Academy of Military Medical Sciences, Beijing.

brevis GONG. *Stenischia*. Acta Entomologica Sinica 41(2): 194-196. Ex. *Eothenomys custos*. China, Yunnan Province, Weixi County, Mt. Yunling, 27.02N 99.04E. Holotype in Institute of Epidemiology of Yunnan Province.

djaensis Beaucournu & Colyn. *Dinopsyllus*. Annales de la Societe de Entomologique de France (n. s.) 34(3): 301-308. Ex. *Hybomys univittatus*. Cameroun, Djomedo, Reserve de Faune de Dja, 03.05N 13.36E, X.19945. Holotype male, allotype female in collection of the senior author.

illinoiensis Lewis. *Orchopeas*. Journal of Medical Entomology 35(4):

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1520 m. Holotype male allotype
female, USNM

SIPHONAPTERA LITERATURE

Although it may not be obvious from
the titles, citations included here per-
tain to fleas and the zoonoses associ-
ated with them. No particular effort
has been made to search the medical
and veterinary literature and the em-
phasis here is on the taxonomy, sys-
tematics and general biology of the
order.

It should be understood that all
Russian and Chinese citations listed
here are in Russian or Chinese, alth-
ough they may have summaries or
abstracts in English or some other
language. Additional information is
available upon request (including e-
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