Wacław Skuratowicz

18-II-1915 - 27-III-1989

Professor Wacław Skuratowicz was born at Demaryna, in western Siberia, where both of his grandfathers had been deported because of their participation in the anti-Russian insurrection of 1863. He came to Poland in 1927 and completed his high school education in 1935. That same year he enrolled in the Faculty of Mathematical and Natural Sciences of Poznań University. His studies were interrupted in 1939 with the advent of the German invasion of Poland. During the early part of the war he was employed as a botanist in the Forestry Department of Zamoyki-Majorats at Zwierzyniec, in the province of Zamość, while covertly teaching children whose schools had been closed by the Nazis. In 1943 he was arrested and jailed for this activity, first by the Gestapo and subsequently placed in concentration camps at Zamość, and later Majdanek, near Lublin. He was subsequently released from the latter and settled in Łosnica, in the province of Siedlce, where he resumed his covert teaching activities until the liberation.

In August of 1939, Dr. Skuratowicz had been appointed to the position of assistant in the Department of Comparative Anatomy and Biology at Poznań University under Professor Antoni Jakubski, a position which he reassumed in April of 1945. Later that year, as a consequence of having earned the degree of Master of Philosophy in Zoology, he was appointed senior assistant in the Department of Systematic Zoology at the same University. By 1948 he had earned the Doctor of Philosophy degree and was made an assistant professor (docent) in 1955. Shortly thereafter, upon the passing of Professor Kazimierz Simm, Dr. Skuratowicz was appointed head of the Department of Systematic Zoology. He was promoted to associate professor in 1960 and became a full professor in 1971. From 1956 to 1960 he served as vice-dean of the Faculty of Biological and Earth Sciences as Director and Administrator of the Institute of Biology. Independent of his university duties he also served as Head of the Department of Field Rodent Research in the Plant Protection Institute.

Dr. Skuratowicz was a member of a number of Polish scientific societies including the Poznań Society of the Friends of Science, the Polish Zoological Society, the Polish Parasitological Society and the

December 1989
Polish Entomological Society, having been made an honorary member of the latter in 1974.

Dr. Skuratowicz had broad interests in the biological sciences and published in such diverse fields as Ornithology, Mammalogy, Parasitology and plant and animal protection. However, the bulk of his publications concerned the ectoparasites of birds and mammals, specifically fleas, lice and parasitic flies. A bibliography of his works on the Siphonaptera follows this obituary.

It was never our privilege to meet Dr. Skuratowicz personally, although our correspondence began in 1967. During that time we exchanged specimens, publications and stamps, and he became a sporadic contributor to the pages of Flea News. We are certain that his passing has brought much sadness to his family, friends and students, and wish to take this opportunity to extend our personal condolences.

(This obituary is based mainly upon information provided by Dr. Skuratowicz in a brief biographical sketch received around 1985. REL)

Siphonaptera Bibliography of
Dr. Waclaw Skuratowicz


1972a Present status of investigations on the fauna of fleas (Siphonaptera) in northern Poland. Wiad. parazyt. 18(4-6): 537-538.


1976b Fleas (Siphonaptera) collected in Mongolia. Polskie Pismo ent. 46: 25-27, fig. 1.

1977 On the investigations of Carnivora fleas in Poland. Wiad. paraszyt. 23(1-3): 221-222.


1985 Fleas (Siphonaptera) collected in Mongolia. II. Fragm. faun. 29(15): 299-302, map 1.


1982 with Bartkowska, K. & G. Batchvarov. Fleas (Siphonaptera) of small mammals and birds collected in Bulgaria. Fragm. faun. 27(9): 101-140.
As many of our readers know, Dr. Allen H. Benton spent many years studying the flea-fauna of eastern United States. Dr. Benton is now retired and submits the following as a summary of his later studies on the biology of the fleas infesting the Southern flying squirrel.

**Annual Cycles of Fleas of the Southern Flying Squirrel, Glaucymys volans volans (Linnaeus, 1758) in New York**

Allen H. Benton and Michael Surman

From 1975 to 1986, a group of nest boxes designed to house flying squirrels was maintained in a forest 3 km (2 mi.) south of Fredonia, Chautauqua County, New York. Many of the boxes were occupied during each winter, but only one summer nest with young was observed.

We attempted to study the annual cycles of the four species of fleas commonly found in these boxes. They were, in order of abundance, Orchopeas howardi howardi (Baker, 1895), Opisodasys pseudoractomys (Baker, 1904), Epitedia faceta (Rothschild, 1915) and Conorhinopsylla stanfordi Stewart, 1930.

Both field and laboratory observations were utilized during the study. At approximately monthly periods an active nest was removed, if available, and the box was then refilled with absorbent cotton or dacron filler. The squirrels added leaves and grass, but utilized the artificial material readily. In the laboratory, adult and larval fleas were removed by hand or in a Berlése funnel. Nest material was then sifted through two screens, one of 1/4 inch hardware cloth and one of 1/18 inch house screen. Pupal cases were collected from the house screen, while most adults, larvae and eggs were found in the dust and small debris under the finer screen.

Adults were maintained in small vials in order to secure eggs of known date for rearing. Rearing took place in a container maintained at 68° F (20° C) and 95% relative humidity.

Removing nest material from a different box each month has an inherent flaw which we recognized but could not overcome. While we gained an accurate understanding of the flea populations in that nest at that time, we changed the future events by nest removal. Use of a nest from another box
at the next collection date introduced a variable, since nests had different heights, exposures, and other environmental conditions.

In earlier papers, Day and Benton (1980) reported on the life histories and population changes in these fleas. Other details of their ecology were noted by Benton, Krinsky and Surman (1979) and Benton and Surman (1979). The present paper is concerned with the annual cycles of these fleas, as revealed by our studies.

*Orchopeas h. howardi* is commonly found on the bodies of squirrels and is likely to be found in the adult stage during any month of the year. The other three species are primarily nest fleas, and are seldom taken from squirrels outside the nest, other than isolated individuals.

The eggs of *O. howardi* are white and oval without obvious surficial markings. In the laboratory, these eggs hatched in 3-5 days (mean 3.7 for 26 eggs). The larval stage lasted 9-11 days (mean 9.7 for 19 individuals), while the pupal stage lasted 7-9 days (mean 8.1 for 18 individuals). Thus, under apparently optimum conditions, the life cycle might be completed in 18-25 days. Siikes (1931) reported that at 80% relative humidity and 16-22° C the comparable figures were: egg stage, 8-10 days (mean 7); larval stage, 17-37 days (mean 27); and pupal stage 10-16 (mean 12), a total about twice as long as in our experiments. Possibly either lower humidity or variable temperatures may have affected the time of development.

Study of winter nests shows that this species overwinters in the adult stage, and produces eggs sometime in late winter. From these eggs a large spring generation emerges in May. This would indicate a time from egg to adult of about 70-90 days, roughly three times that observed in the laboratory. A possible mechanism for this delayed emergence was described by Teplych, Yurgenson and Lilp (1989 [1988]). They found that three species of fleas in gerbil burrows underwent an extended pre-imaginal diapause when adults of the previous generation were exposed to cold weather for a month or more. The conditions of our study seem comparable, since both the gerbil burrows and our squirrel boxes were regularly occupied by hosts only during the winter months. Nest fleas especially would require some mechanism for survival during the long period when no hosts were available. While we have no direct evidence for such pre-imaginal diapause in any of the species we studied, this phenomenon would explain the long period between generations, especially noticeable in *E. faceta* and *C. stenfordi*, which are seldom found in the adult stage between May and September, implying a diapause of some 100 to 150 days during the summer.

Adults of *Orchopeas howardi* are present throughout the summer, but
population peaks are not well defined, or we have not collected enough individuals to define them. There are quite certainly at least two generations during this period. In November there is a well defined emergence of adults which provide the overwintering population. Thus the number of generations per year is at least five, with the possibility, if optimum rate of development is achieved during the summer, of six or seven generations.

Few adults of *Opisodasys pseudarctomys* are found during January, but if a nest collected at that time is kept in the laboratory for 7-14 days, large numbers of adults emerge. This would seem to indicate that the nests contain large numbers of pupae at that time. In nature, the first large population of adults appears in February and early March, so presumably the cold conditions of the nest induce a long diapause. A second adult generation emerges in late April and early May, and a third generation in June. After that adults are few in number until late autumn. There may be another generation of adults in late summer, but the numbers in our sample were small during this period because utilization of our artificial nests was low in winter. A large emergence of adults occurs in November, and offspring of this generation provide the overwintering pupae.

Eggs of this species are somewhat larger than those of *O. howardi*, are finely striated on the surface, and are sticky, as are those of many nest fleas. They often are found attached to grass blades in the nest, but only by careful and painstaking investigation. Sifting the nest material will allow larvae and unattached eggs to be located, but eggs which are attached to vegetation will, of course, not be found in this manner.

In the laboratory, we observed 15 eggs which hatched in 3-5 (mean 3.9) days. Eleven larvae survived to pupate, with larval stages of 7-11 (mean 9.4) days. These eleven pupae had pupal stages of 6-10 (mean 8.4) days, to make a total of 16-26 days from egg to adult.

Pupae, like the eggs, often are attached to the nest material, so they are difficult to find. Two larvae of this species pupated in the laboratory without spinning a cocoon, but whether or not this occurs in nature is not known to us.

Eggs of *Epitedia faceta* are easy to recognize, being small and urn-shaped. We have found viable eggs in nests from January through March, but have been unable to secure eggs from adults kept in the laboratory, so we have no firm figure for the duration of the egg stage. We believe that most of the winter is spent in the egg stage. An adult emergence occurs in late February and March, after which adults are almost entirely lacking until
October. At that time, a large generation of adults emerges, giving rise to another generation in December. These adults lay the eggs which eventually will produce the late winter generation. It appears that these three generations are the only ones produced, and that there is a long diapause from March to October. It seems unlikely that any large adult emergence occurs in summer, but possibly there is one. The previously noted pre-imaginal diapause for offspring of adults which lived through the cold weather of late February and March could explain the long absence of adults.

*Conorhinopsylla stanfordi* is the least abundant of the four species in the nests that we have examined. Even the population highs are relatively small. The eggs of this species are beautifully sculptured in a reticulated pattern which makes them easily recognized. The duration of the egg stage in 8 eggs was 3-7 (mean 4.3) days. Five larvae which pupated did so in 9-12 (mean 10.4) days. None of these emerged as adults, possibly having entered diapause, so the duration of the pupal period is not known.

From January to October, only an occasional adult has been found. Overwintering larvae occur in nests throughout the winter, and we have kept such larvae, collected in January and February, for periods of up to 60 days under outdoor conditions without pupation. Obviously events in nature are quite different from those obtained under laboratory conditions.

Adults are rare from January to October, leading us to suspect an unusually long diapause. If additional generations occur during this time the emergence is so diffuse or the adult stage is so short that we have been unable to detect them.

**Literature Cited**


* * * * * * * * * *

Flea Numbers by Family - an Inventory.
In connection with compiling data for A Catalogue of Invalid or Questionable Genus-Group and Species-Group names in the Siphonaptera (Insecta) and A Catalogue of Valid Genus-Group and Species-Group names in the Ceratophyllidae (Siphonaptera), both of which are nearing completion, we have examined the composition of all of the families belonging to the order. Let us assume that there are 2275 named species and subspecies that are considered valid, or at least have not been formally synonymized. Following the conventional family groupings that have evolved during the last 40-50 years and which are reflected in the Hopkins & Rothschild Catalogues, the distribution of species-group taxa is as follows.

Table I

<table>
<thead>
<tr>
<th>Family</th>
<th>Taxa</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancistropsyllidae (C)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ceratophyllidae (C)</td>
<td>513</td>
<td>22.55 %</td>
</tr>
<tr>
<td>Chimaeropsyllidae (H)</td>
<td>28</td>
<td>1.23 %</td>
</tr>
<tr>
<td>Coptopsyllidae (H)</td>
<td>23</td>
<td>1.01 %</td>
</tr>
<tr>
<td>Hystrichopsyllidae (H)</td>
<td>760</td>
<td>33.41 %</td>
</tr>
<tr>
<td>Ischnopsyllidae (C)</td>
<td>130</td>
<td>5.71 %</td>
</tr>
<tr>
<td>Leptopsyllidae (C)</td>
<td>294</td>
<td>12.92 %</td>
</tr>
<tr>
<td>Macropsyllidae (H)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Malacopsyllidae (M)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Pulicidae (P)</td>
<td>180</td>
<td>7.91 %</td>
</tr>
<tr>
<td>Pygicopsyllidae (H)</td>
<td>183</td>
<td>8.04 %</td>
</tr>
<tr>
<td>Rhopalopsyllidae (M)</td>
<td>71</td>
<td>3.12 %</td>
</tr>
<tr>
<td>Stephanocircidae (H)</td>
<td>40</td>
<td>1.75 %</td>
</tr>
<tr>
<td>Vermipsyllidae (V)</td>
<td>38</td>
<td>1.67 %</td>
</tr>
<tr>
<td>Xiphiopepsyllidae (C)</td>
<td>5</td>
<td>0.35 %</td>
</tr>
</tbody>
</table>

(C) Ceratophyllidea
(H) Hystrichopsyllidea
(M) Malacopsyllidea
(P) Pulicoidea
(V) Vermipsyllidea

In contrast, if one follows the classification proposed by Smit (1982), the families break down in the following manner.
### Table II

<table>
<thead>
<tr>
<th>Family</th>
<th>Taxa</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancistropsyllidae (C)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ceratophyllidae (C)</td>
<td>807</td>
<td>35.47%</td>
</tr>
<tr>
<td>Chimaeropsyllidae (H)</td>
<td>26</td>
<td>1.23%</td>
</tr>
<tr>
<td>Coptopsyllidae (H)</td>
<td>23</td>
<td>1.01%</td>
</tr>
<tr>
<td>Ctenophthalmidae (H)</td>
<td>711</td>
<td>31.25%</td>
</tr>
<tr>
<td>Hystrichopsyllidae (H)</td>
<td>51</td>
<td>2.24%</td>
</tr>
<tr>
<td>Ischnopsyllidae (C)</td>
<td>130</td>
<td>5.71%</td>
</tr>
<tr>
<td>Malacopsyllidae (M)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Pulicidae (P)</td>
<td>171</td>
<td>7.51%</td>
</tr>
<tr>
<td>Pygiopsyllidae (H)</td>
<td>183</td>
<td>8.64%</td>
</tr>
<tr>
<td>Rhopalopsyllidae (M)</td>
<td>71</td>
<td>3.12%</td>
</tr>
<tr>
<td>Stephanocircidae (H)</td>
<td>40</td>
<td>1.75%</td>
</tr>
<tr>
<td>Tungidae (P)</td>
<td>9</td>
<td>0.35%</td>
</tr>
<tr>
<td>Vermipsyllidae (V)</td>
<td>38</td>
<td>1.67%</td>
</tr>
<tr>
<td>Xiphiosyllidae (C)</td>
<td>8</td>
<td>0.35%</td>
</tr>
</tbody>
</table>

Whether either of these classifications is superior to the other may be a matter for debate, but both listings clearly show the dominance of the hystrichopsyllid families with 1036 (45.53%) taxa, and the ceratophyllid families with 948 (41.67%) taxa. Depending on the classification, the superfamily Malacopsylloidea is bitypic at the family level with 73 (3.22%) taxa or, following Smit (1982), the superfamily Pulicoidea is also bitypic at the family level in both systems with 180 (7.91%) taxa. The superfamily Vermipsylloidea is monotypic at the family level with 38 (1.67%) taxa. We know of a number of new ceratophyllid genera and species yet to be described and the disparity between the Hystrichopsylloidea and the Ceratophyllloidea is likely to diminish considerably in the future. REL

---

**The Society for Vector Ecology** held its 21st annual conference at the University of Oklahoma, Norman, OK November 12-15, 1989. Presented papers of interest to pulicologists include:

**Barnes, A. M.** Global update on plague.

**Thomas, R. E.** Physicochemical analysis of the plague capsular antigen (F1) and its implication for rapid purification.

**Simpson, W. J.** The cloning and expression of the plague capsular antigen (F1) in *Escherichia coli* and its potential use in serodiagnosis and vaccine development.
Azad, A. F. Ecology of flea and louse-borne typhus.


Radovsky, F. J. The arthropods alternative to molting.

+++ +++++

Plague and Typhus Updates. The following updates are reprinted from Technical Information Bulletins for July-August and September-October, 1989. This periodical is produced by the Armed Forces Pest Management Board of the Defense Pest Management Information Analysis Center. References for the data are the Global Disease Surveillance Reports for June, July and August, 1989.

Tanzania - Recently published summary data for 1988 indicate that reported plague cases nearly doubled (647 cases, 33 fatal) compared with 1987 (356 cases, 34 fatal). If accurate, the 5-percent case fatality in 1988 indicates that, in general, proper medical treatment was available. Geographic distribution for the cases was not provided, but the WHO considers Tanga Region, where outbreaks occurred in 1987, to be plague infected. According to WHO statistics, major outbreaks of human plague have been occurring in Tanzania since 1983, likely reflecting inadequate measures to detect and eliminate epidemic foci.

Burma - The Sagaing Division of Sagaing State has reported that 33 cases (2 fatal) of plague occurred from 1 January to 12 April 1989. Although this is the first official report of plague from Burma in more than 10 years, plague presumably has been present during this hiatus.

Nepal - Recently, physicians at a clinic in Kathmandu reported that a case of scrub typhus (mite-borne typhus caused by Rickettsia tsutsugamushi) and a case of murine typhus (flea-borne typhus caused by R. typhi) had been diagnosed in two resident foreigners...

+++ ++++

NOTES

In response to our inquiry Dr. Bernd Hauser of the Museum d'Histoire Naturelle de Genève has confirmed that the Siphonaptera collection of the late Professor Fritz Peus has indeed been deposited in this institution. Dr. Volker Mahnert is currently preparing a primary type inventory of the collection, and he informs us that material is available for loan.


Reprints and other literature have been received from the following colleagues since Flea News 38: Amr, Z. A., Beard, M. L., Beaucournu, J. C., Daroskaya, N. F., Galloway, T. D., George, R. S., Haas, G., Kiefer, M., Kissileff, A., Larson, O. R., Pfaffenerberger, G. S., Ponce-Ulloa, H. E., Qi Y.-m., Stead, N. H. and Xie B.-q. Thank you for your continued cooperation!

**Some observations concerning the geographical distribution of Flea News recipients.**

Frans Smit first made a geographical arrangement of recipients in Flea News 2, 25-May-1974. In F. N. 21, December-1980, we printed the mailing list as it was when the editorship was passed on to us. In 1974 F. N. was distributed to 76 individuals in 30 countries and territories; in 1980 it was sent to 127 persons in 39 countries and territories. Having revised the mailing list this year, we thought it would be interesting to compare it with the two previous distributions. At the end of 1989 F. N. goes to 173 names and institutions in 36 countries (Puerto Rico and West Indies are included with the USA and the Canal Zone with Panamá for convenience).

Following is a geographically arranged listing of persons/institutions currently on the Flea News mailing list. The numbers in parentheses ( ) after the name of the country represent the numbers receiving Flea News in 1974, 1980 and 1989, respectively. JHL

**Argentina** (0), (0), (1) M. Cardonatto  
**Australia** (0), (2), (2) F. Bartholomaeus, R. Shepherd  
**Belgium** (1), (1), (0)  
**Brazil** (1), (2), (3) L. Guimerães, P. Linardi, J. Rafael  
**Bulgaria** (1), (1), (0)  
**Burkina Faso** (0), (0), (1) J. M. Klein  
**Burma** (0), (1), (0)  
**Canada** (1), (1), (1) T. Galloway  
**Chile** (0), (0), (1) J. Artigas

Czechoslovakia (4), (6), (8) V. Cerny, D. Cyprich, A. Dadich, K. Hurka, M. Kiefer, J. Máca, J. Ryba, M. Stanko

Denmark (0), (3), (2) A. Olsen, B. Nielsen

Egypt (1), (2), (1) A. Main


Finland (1), (1), (0)

France (1), (2), (1) J. Beaucaudre

French Polynesia (0), (1), (0)

Germany (East) (0), (0), (1) J. Müller

Germany (West) (2), (0), (4) W. Dorow, G. Hesse, H. Krampitz, H. Strümpl

Hungary (1), (1), (1) I. Szabó

India (0), (3), (2) S. Kulkarni, R. Prasad

Indonesia (0), (0), (1) T. Hadi

Ireland (0), (1), (2) J. Fairley, P. Sleeman

Italy (0), (0), (1) R. Constantini

Japan (1), (2), (1) K. Uchikawa

Macau (0), (0), (1) E. Easton

Mexico (1), (1), (1) H. Ponce-Ulloa

Nepal (0), (1), (0)

Netherlands (1), (2), (2) Bibliothek Nederlandse Entomologische Vereniging, J. v. Bronswijk

New Zealand (1), (1), (1) R. Pigrim

Norway (1), (2), (2) L. Fiske, R. Mehl

Panama (1), (1), (2) B. Gray, E. Méndez

Philippines (0), (1), (0)

Poland (4), (5), (3) K. Bartkowska, R. Huttlinger, Z. Wegner

Portugal (1), (2), (1) H. Ribeiro

Puerto Rico - see USA

Romania (1), (1), (1) M. Suciu

Scotland (2), (4), (4) G. Dunnet, D. Marden, A. Marshall, A. Shepherd

Senegal (1), (0), (0)

South Africa (0), (1), (1) J. Segerman

Spain (0), (1), (1) M. Gómez

Sweden (2), (2), (0)

Switzerland (3), (6), (4) A. Aeschlimann, W. Büttiker, N. Gratza, V. Mahnert


Venezuela (1), (1), (1) Centro de Investigación EMSA - OPS/OMS
West Indies - see USA
Yugoslavia (1), (1), (0)

************

MAILING LIST

ADDITIONS

Biol. Hugo E. Ponce-Ulloa, Curator of Ectoparasites, Museo de Zoología, Apdo. Postal 70-399, Mexico, D.F., 04510 Mexico

CHANGES

Dr. J. E. M. H. v. Bronswijk, Laboratorium voor Ectoparasitologie, Postbus 85500, Kamer G. 02. 630, 3508 GA Utrecht, The Netherlands

Beverly Dale, PARAVAX, 3181 Porter Drive, Palo Alto, California 94304

Dr. Emmett R. Easton, University of East Asia, %JCO, Room A402, Taipa Drive, P.O. Box 3001, Macau

Ing. Baltazar Gray, Facultad de Ciencias Agropecuarias, Centro de Enseñanzas e Investigaciones, Universidad de Panamá, Ciudad Universitaria Octavio Mendez Pereira, Panamá, Republica de Panamá

REINSTATE

Dr. J. M. Klein, Centre ORSTOM, B. P. 182, Ouagadougou, Burkina Faso

************
ADDENDA

We call your attention to three new taxa described in 1987 that were omitted from the list in Flea News 38: 317-318. To this list for 1987 please add

98724 angustus Beaucournu & Launay Nosopsyllus (Gerbillophilus) mauros

98725 garamanticus Beaucournu & Launay Nosopsyllus (Gerbillophilus)

98726 incisus Beaucournu & Torres-Mura Delostichus

PROVISIONAL LIST OF TAXA DESCRIBED IN 1988

Amphipsylla apiciflata Liu, Xu & Li
Paradoxopsyllus aculeolatus Ge & Ma
Amphipsylla yadongensis Wang & Wang
Plocopsylla lewisi Beaucournu & Gallardo
Ctenoparia propinqua Beaucournu & Gallardo
Nycteridopsylla liui Wu, Chen & Liu
Callopsylla arcuata Ge, Wang & Ma
Metastivalius novaebiberniae Beaucournu & Mahnert
Mesopsylla sagitta Yu, Ye & Liu
Ichnopsyllus (Hexactenopsylla) infratentus Wu, Wang & Liu
Pulicella aenigma Lewis & Cheetham
Plocopsylla kasogonaga Schramm & Lewis
Macrostylophora angustihamula Li, Zhang & Zeng
Ctenophthalmus longiprojiciens Chen, Li & Wei
Coptopsylla lamellifera formozovi Darskaya

PROVISIONAL LIST OF TAXA DESCRIBED IN 1989

Palaeopsylla laxidigita Xie & Gong
Palaeopsylla polyspina Xie & Gong
Palaeopsylla medimina Xie & Gong
Ctenophthalmus (Palaeoctenophthalmus) harputus Aktaş
Xenopsylla guancha Beaucournu, Alcover & Launay
Stenischia chini Xie & Lin
Stenischia liaei Xie & Lin
Stenischia liui Xie & Lin
Stenischia wui Xie & Lin
Jellisonia amadoi Ponce-Ulloa
Jellisenia mexicana Ponce-Ulloa

**********
LITERATURE ON SIPHONAP'TERA

1984 (List 11)


1985 (List 9)


1986 (List 7)


*Hooi, C. W. Division of Medical Entomology. In: Annual Report 1985, Institute for Medical Research, Kuala Lumpur, Malaysia, pp. 80-86

Jell, P. A. & P. M. Duncan. Invertebrates, mainly insects, from the freshwater, Lower Cretaceous, Koonwarra Fossil Bed (Korumburra


Madsen, M. En oversigt over nogle parasitter hos kanin. Nordisk Veterinaermedicin 38(6): 333-351


1987 (List 5)


**Soboleva, R. G., (Editor).** *Insects, ticks and mites of medical and veterinary importance in the Soviet Far East.* Nauka, Leningrad. 311 pp. [Siphonaptera section by T. P. Romashova]


1988 (List 4)


*Beavis, I. C. Insects and other invertebrates in classical antiquity. University of Exeter, United Kingdom. 269 pp.*


Cao Li-ping & He Ling. Air-drying slide technique for flea chromosome preparation. *Kunchong Zhishi* 25(4): 250-251, figs. 4-6. [In Chinese, no English summary]


Lopatin, N. V., B. P. Tsybin, L. V. Bryukhanova, E. A. Lunina & S. P.


Ponce-Ulloa, H. E. Descripcion de *Jellisonia amadoy* sp. nov. y *J. mexicana* sp. nov. del estado de Guerrero, Mexico. (Siphonaptera: Ceratophyllidae) *Folia ent. Mex.* 76: 177-185, figs. 1a-c, 2a-c, 3.

Renapurkar, D. M. Distribution and susceptibility of *Xenopsylla astia* to


1989 (List 2)


Anonymous. Off to a good start. A new IGR has entered the marketplace in the wake of ambitious flea control claims. Several PCOs like what they see...so far. Pest Control 57(7)(sic 6): 32-34.


Bennett, J. No flea lunch. [An account of controlling fleas on pets using the Fleamaster comb.] *Harrow Smith Number* 87, Volume XIV: 3, p. 17.


Cui Xiang et al. The determination of toxicant efficacy of deltamethrin on different developmental stages of the ground squirrel flea [Cieillophilus tesquorum sungaris]. *Kunchong Zhiishi* 26(3): 159-162, 5 tables. [In Chinese, no English summary]


Darskaya, N. F. & B. K. Kotty. The use of artificial shelters in forests for shrews with the aim of studying the mode of life of their fleas. *Parazitologiya* 23(4): 328-.


Fain, A. & J. C. Beaucaire. A new hypopus, Psylloglyphus (Tetrapsyllopus) chilienis sp. n. (Acari, Astigmata) phoretic upon fleas from Chili. Acarologia 30(2): 139-.


Haitlinger, R. Arthropod communities occurring on small mammals from non-wooded areas of urban agglomeration of Wroclaw. Acta Parasit. Polonica 34(1): 45-66. 1 fig, tables I-X.


Steinbrink, H. Flohbefallsfeststellungen im DDR-Bezirk Rostock. *Angew.*


SEASONS GREETINGS! SEASONS GREETINGS! SEASONS GREETINGS!