CHIRONOMUS

NEWSLETTER OF CHIRONOMID RESEARCH

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Nordic Benthological Meeting 1995

by R.K. Johnson

On May 15 and 16 the Department of Environmental Assessment at the University of Agricultural Sciences in Uppsala, Sweden organised the first Nordic Benthological Meeting. Registration was on Sunday, May 14, followed by an informal get together. I could not help comparing and reflecting on noticeable contrast between the informal get together held in Uppsala and the barbecue following registration at the last Chironomidae meeting in Canberra. We had planned to have beer and sandwiches in the garden behind the institute. Unfortunately, we were not able to plan the weather - the middle of May is usually quite predictable, nice weather - on Sunday we were confronted with winds of storm class and lots of snow!!

However, in spite of the poor weather, some 95 participants, from 11 countries - I thought there were only 5 Nordic countries? - showed up for the meeting. The theme of this meeting was "The use of macroinvertebrates in surveillance and monitoring of aquatic biodiversity". In the stream session, Björn **Söderbäck** (Dept. of Environmental Assessment) opened the meeting with a short, historical review of the use of macroinvertebrates as ecological indicators of aquatic habitat integrity. This lecture was followed by a number of invited speakers: John **Wright** (Institute of Freshwater Ecology) presented a paper on the development and use of RIVPACS in the UK, Günter **Friedrich** (Landesumweltamt Nordrhein-Westfalen) lectured on the use of the Saprobien index and new approaches for ecological assessment of rivers in Germany, and Steven **Ormerod** (University of Wales) spoke of challenges to the use of benthic organisms in surveillance and monitoring. In the afternoon, lake biodiversity session, Peter **Dall**

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about *CHIRONOMUS*

This issue was produced with the support of the Entomological Division of the CSIRO, to which I am very grateful. In particular the communication systems CSIRO made available to the newsletter, made it possible to me to accomplish the editorial work, despite having been on the move from Brazil to Australia via Germany. I thank especially Dr **Peter Cranston** who looked after improving English texts of non-native writers on many occasions, and kept cool when *CHIRONOMUS* matters caused congestion in his e-mail server. I would like to thank also Dr **Ebbe Nielsen**, Program Leader of "Natural Resources and Biodiversity", for his generous hospitality.

This time, my editor job was also easier than in the previous four years, because most contributions were carefully prepared and submitted well in time. I take this as a good sign that *CHIRONOMUS* is re-established and that the 1st of April becomes a fixed date in the mind of chironomid workers.

Positive developments might even increase by the fact that the newsletter now has an **ISSN number 0172-1941**. Strictly speaking, *CHIRONOMUS* has had this international register since 1979 (when edited by E. J. Fittkau, F. Reiss & J. E. Sublette), but it vanished somehow in the time when publication ceased. Thanks to inquiries made by Dr **Odwin Hoffrichter**, the ISSN emerged from the files and has been confirmed to be valid by the proper authority.

For the present we shall stay with publishing the newsletter in its traditional form once a year. However, it would be as well if things like contact addresses, publication lists, etc. were updated more frequently. Thus, I would like to draw your attention to the chironomid homepage on the world wide web, which has been established and is maintained by Dr **Luc Int Panis** since 1995: **http://www.uia.ac.be/u/intpanis/Index.html**.

Last but not least, I want you to notice that the address of the *CHIRONOMUS'* editorial office remains at the Entomological Division of the CSIRO in Canberra until I have a permanent address again.

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Our bank has changed localities.
The new address is:
Union Bank, P. O. Box 653
N-5001 Bergen, Norway
Account No. remains: 8225.40.82518

(continued from page 1).

(University of Copenhagen) spoke about factors affecting the composition of littoral, surf-zone communities, Göran **Milbrink** (Uppsala University) gave a lecture on the use of oligochaete communities in pollution biology, and I finished off the day (trying my best not to put too many to sleep) with a lecture on how spatio-temporal variability of temperate lake macroinvertebrate communities affects the detection of impact, effect size and statistical power.

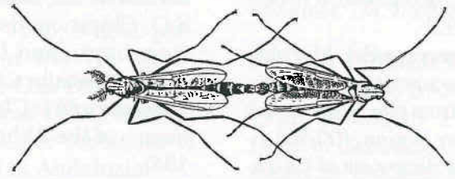
On Monday evening, the conference banquet consisted of a lake cruise and dinner aboard Kung Carl Gustaf. We even managed to see the sun between snow and hale storms! After the cruise, a number of conference participants wandered over to a nearby Irish pub - topping-off the first days activities with a Guinness is a highly recommended way of relaxing and shaking-off the "chills" of the Uppsala spring.

The second day of the meeting consisted of speakers from the five Nordic countries presenting examples on the use of macroinvertebrates in Nordic monitoring and surveillance programs. During the morning coffee/tea break there was a 2h poster session. Poster contributions were highly diverse, covering virtually all aspects of benthic communities. After lunch, Torben **Moth Iversen** (Danish National Environmental Research Institute) presented the results of a project funded by the Nordic

Council of Ministers; "Methods for biological monitoring of streams in the Nordic countries based on macroinvertebrates".

Finally, the last session of the meeting consisted of a discussion of the need for a Nordic Benthological Society. Concluding that there was a need for a such a society; to facilitate the exchange of information and provide focus and continuity in our environmental work both within and among the Nordic countries and within the European community, the participants agreed that the first board of officers should consist of: Torgny Wiederholm as president, Claus Lindegaard as treasurer, and Kaare Aagaard as secretary. The meeting was adjourned, and we hope to meet again in two years with members from the Danish National Environmental Research Institute in Silkeborg acting as our hosts.

Richard K. Johnson



Deadline for the next *CHIRONOMUS* is the 1st of April 1997

X РОССИЙСКИЙ СИМПОЗИУМ ПО ХИРОНОМИДАМ

by N. Shobanov

The 10th Russian Symposium on Chironomidae

was held in from the 10th to 13th of October 1995 at the Institute of Biology of Inland Waters of the Russian Academy of Sciences at Borok, Yaroslavl region. The meeting was not exactly crowded. Unfortunately, due to the financial problems of many of the scientific institutions of the former republics of the USSR, not all colleagues who wished to give a lecture could participate in the meeting. Nine guests from Russia and two from Germany came to Borok. Altogether 19 lectures by researchers from Russia, Germany, Kazakhstan and Bulgaria were presented in five sessions. The last day of the symposium was devoted to discussions on organisational questions of the Russian Association of Chironomidologists, and the joint projects on "The *Chironomus* species of the *plumosus* group" and "The genus *Glyptotendipes*".

The proceedings will be published as a monograph in May 1996 (in Russian): Ecology, Evolution and Systematics of Chironomids (Proceedings of the 10th Russian Symposium on Chironomidae). Contents [pages]:

For more details on the proceedings please contact: Dr. Tatiana D. Zinchenko, Institute of Ecology of the Volga River Basin, R A S, 10 Komzinastr., Togliatti, 445003 Russia. e-mail: kvi@us.tlt.ru; fax: ++8 846 9489504

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Balbani Ring Workshop in Córdoba

The readers of *CHIRONOMUS* know about the periodic international symposia on Chironomidae, but not all might be aware of anoher series of regular meetings: the Balbani Ring Workshops. Discovered by E. Balbani in 1881, these prominent structures of polytene chromosomes of Chironomidae (and other Nematocera) have stimulated cytological and molecular research in many different ways. Since 1982, when the first Balbani Ring Workshop took place in Novosibirsk (USSR), the conferences have been held every two years (1983 Gatersleben (GDR), 1985 Stockholm (S), 1987 Zürich (CH), 1991 Mainz (D), 1993 Jackson (USA), 1995 Córdoba (E)).

From 16 - 19 September 1995, over 30 participants were received at the 7th Workshop by the host Prof. José-Luis Diez (Centro de Investigaciones Biológicas/CSIC, Madrid) in the charming, hot-summer ambience of Córdoba, an unique town in Andalusia.

Altogether 33 papers were presented in six sessions as follows [number of presentations]:

- Balbani rings: genes and products [7]
- Chromosome structure, centromeres and telomeres in *Chironomus* [5]
- Gene families in *Chironomus*: repetitive elements, and haemoglobins [6]
- Evolution of chromosomes in *Chironomus* and related Diptera [3]
- Gene control by heat-shock and hormones in *Chironomus* [6]
- Other non-chironomid systems [6]

The titles are listed in the section Current Bibliography of this issue. Proceedings will not be published, but for further details on this Workshop you may contact: Dr. Luisa-Maria Botella, CIB/CSIC, Velázquez, 144, E-28006 Madrid.

The **8th Balbani Ring Workshop** will be held in Sweden from 30 August - 4 September 1997, hosted by Prof. Jan-Erik Edström, Dept. of Genetics, University of Lund, Sölvegatan 29, S-22362 Lund.

Odwin Hoffrichter

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13th International Symposium on Chironomidae in Freiburg, Germany

Dear Colleague,

The organising committee, consisting of Odwin Hoffrichter and Wolfgang Wülker, invite you to attend the 13th International Symposium. At the last conference in Australia it was decided to meet this time in Germany because of its central location in the heart of Europe, thus access is easier and less expensive for most colleagues. So, we anticipate a good participation from many different countries. To keep the registration fee as low as possible, we intend to apply for financial support. To do so, we need information on the approximate number of participants, and thus request early registrations: If you intend to participate in the conference in 1997, please tell us now on the registration form you find in this issue.

For **information on** the beautiful town of **Freiburg** and its university, please note *CHIRONOMUS* No.6: 16-17, and on internet http://www.ise.fhg.de/Freiburg/Freiburg_Info.html and http.//www.uni-freiburg.de/univ/homeneweng.html.

Location: The venue of the symposium will be at the University of Freiburg, whose Institute of Biology I will have a new building at this time.

Price: Registration costs are currently estimated at 300 DEM for employed scientists, with reductions for appropriate cases under consideration. Included are: get-together, refreshments, excursion, farewell dinner. The post-conference tour is not included in the registration fee.

Dates: From Thursday, the 5th of September 1997 (arrival) to Wednesday, the 10th of September 1997 (departure). The dates are chosen to harmonize with the 8th Balbani Ring Workshop. **Final registration** has to be done by **31 January 1997**, and **abstracts** have to be submitted by **31 March 1997**. The proceedings are planned as a special volume of HYDROBIOLOGIA.

Accommodation: Please make your own arrangements via: Freiburg Information, Freiburg Wirtschaft und Touristik GmbH, Postfach 1549, D-79015 Freiburg, Phone ++49 761 368 9090: Fax ++49 761 37003.

The **programme** will run without parallel sessions. In addition to the conventional themes from previous meetings, we propose the following focal points for the symposium, that hopefully will attract further chironomidologists who hitherto did not feel at home at the International Chironomid Symposia: a) biogeography, b) developmental biology, c) ecotoxicology, d) karyosystematics, e) molecular biology, f) parasitology.

Post-conference tour: Organised by E. J. Fittkau, the tour is made by bus from Freiburg to Munich, accomodation (4 nights) at Starnberg. Preliminary programme: 11 September: Bodensee - Allgäu, 12 September: prealpine moorlands and alpine lakes, 13 September Chiemsee, 14 September Zoologische Staatssammlung München. Price: ca. 250-300 DEM.

Further details on the conference, such as how to pay and information of the social programme, will be given in *CHIRONOMUS* No.10.

We shall do our very best to prepare an interesting symposium for all of us.

With kind regards,

O. Hoffrichter W. Wülker

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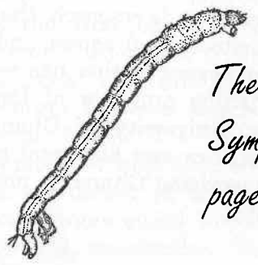


The registration form for the 13th International Symposium on Chironomidae is found on the last page of this issue.

Professor Ole Anton Sæther 60 years

Professor Sæther will celebrate his 60th birthday this winter. For *CHIRONOMUS* this is an occasion to congratulate a highly esteemed colleague who has contributed significantly to the knowledge of chironomid systematics, phylogeny, morphology and ecology.

Professor Sæther was born in Kristiansand on the southern coast of Norway the 9th of December 1936, and came to the University of Oslo in 1955. He obtained his first academic degree in 1960 and from 1961 on Sæther was employed as Scientific Assistant at the Department of Limnology. During the next years he studied the general biology and limnology of a culturally eutrophicated lake in the suburbs of Oslo and in 1963 he obtained the degree cand. real. Shortly afterwards he was promoted to University Lecturer, a position he held until 1969.

At that time Sæther had already made his first research visit to North America and from 1967 on he joined the Freshwater Institute of the Fisheries Research Board in Winnipeg, Canada, initially as a visiting scientist. In 1969 he was employed as a Research Scientist in the Eutrophication Section to do basic research on benthic communities. In Canada Sæther obviously benefited from a fertile scientific environment at the institute and several large monographs appeared during the next years, most of them concerned with systematic revisions of ecologically important chironomid taxa.

In 1977 Sæther was appointed Professor at the Museum of Zoology, University of Bergen, a position he still holds. Sæther has maintained a high productivity and the list of publications presented below numbers more than 150, amounting to about 3000 printed pages. Most of these are concerned with descriptive and analytic systematics, and consequently numerous genera have been revised, numerous species redescribed, genera redefined or emended, and new synonyms and combination given. Sæthers' descriptions usually include immature stages and both sexes of adult midges. To date he has authored or co-authored about 300 species, 47 genera and 3 subfamilies mainly chironomids, but also including water mites, chaoborids, a chalcid fly, an ephyrid, and a caddis fly. Most of these descriptions are parts of full revisions of genera or generic groups.

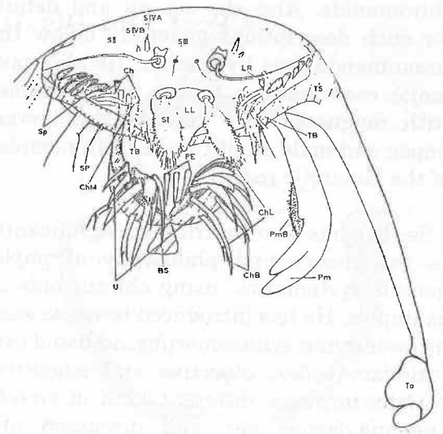
Except for material from Canada, Sæther previously based his revisions and descriptions on material lent from other museums or material sent to him for identification. As a response to the report from the World Commission on Environment and Development: 'Our common future' printed in 1987, Sæther, together with the author, initiated the establishment of a research group, "the Biodiversity group", at the museum. The main idea is to participate more directly in mapping and describing the biodiversity of the tropical rain forests, and since 1990 the group has arranged expeditions and excursions to 'hot spot' areas in several tropical countries. The largest ongoing project is located to the coastal rain forests of Ghana. Beside research, the project also has an educational aspect and during the last three years Sæther has every autumn been visiting professor at Department of Zoology, University of Ghana, lecturing phylogenetics and historical biogeography and supervising Ghanaian master and dr. students.

MAIN CONTRIBUTIONS TO CHIRONOMIDOLOGY

Educated as a limnologist, Sæther began by studying physical-chemical conditions of lakes and streams and general biology of many freshwater groups, not only invertebrates, but even fish, mammals and birds. However, Chironomidae played an important role in the early development of limnology and his interest for this group was early aroused. In his first paper, published in 1962, he described the overwintering cocoons in the genus *Endochironomus*.

Studying the phenology and life cycle of insects in high mountain streams at Finse in Norway and in Colorado, Sæther was the first to show that generation time varies between closely situated localities within the same stream depending on temperature and duration of ice cover. The Colorado study also was one of the first to change the classification of Nearctic chironomids from an old-fashioned adult-based nomenclature with few genera to a modern concept integrating all stages.

Sæther revised several genera and species important as members of indicator communities, showing the relationship between environmental parameters and erecting a scheme for use of these as water quality indicators valid for both Nearctic and Palaearctic communities. The lake typology scheme was the first one for Nearctic chironomid communities and it was also the first to show the validity of the vicariance concept between the Nearctic and Palaearctic fauna. The chironomid indicator communities also were shown to be useful in evaluation of acid precipitation and of contamination by oil spill, heavy metals and insecticides. The last two primarily shown by an increased incidence of abnormalities in the larval stage.



By the above mentioned revisions he was among the first to bring the Nearctic and Palaearctic species together in the same revision. Previously, the Nearctic species were a priori regarded as different from the Palaearctic just because they were found on different continents.

Among the most important scientific contributions is his work on comparative morphology and terminology of the larval mouthparts and the male and female genitalia. He showed, for instance, that the main mouthpart of *Culicomorpha* should be termed the mentum and consisted of a double plate, the dorsomentum carrying the teeth, and the ventromentum, sometimes extended laterally into ventromental plates. The studies on the female genitalia led to the first generic keys to females and to the first complete phylogeny of chironomids. Several structures in the female genitalia were homologized and given new terms. The influence of parasitation by mermithids on male and female chironomids compared with the morphology of gynandromorphs were also studied, leading to interesting homologies between male and female genitalia.

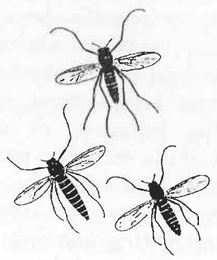
A glossary of chironomid morphology terminology was publishes in 1980, and we all use it as a standard text when describing

chironomids. Also the set up and details for such descriptions generally follow the recommendations by Sæther. He also gave major contributions to the three volumes with diagnoses and keys to the larvae, pupae and male adults of the Chironomidae of the Holarctic region.

Sæther has also contributed significantly to the theory and philosophy of phylogenetic systematics, using chironomids as examples. He has introduced concepts such as underlying synapomorphy, adjusted evolutionary index, objective and subjective synapomorphies, different kind of trends, tree topologies etc. and discussed and criticised different cladistic methods in general. He has erected nearly 25 synapomorphic diagrams (cladograms) for different revised subfamilies, genus groups and genera of chironomids, and his work has thus had vital importance of our understanding of chironomid systematics today.

In 1979 he was the editor of a supplement volume of Entomologica scandinavica devoted to chironomids, as a tribute to Professor Lars Brundin on his 70 years birthday. Professor Sæther has participated in all the international chironomid symposiums since the IVth in Ottawa in 1970, and has given many talks and chaired many sessions. In 1985 he organised and chaired the IXth symposium in Bergen, and edited the proceedings.

Occupied with tropical fauna and the challenge from the biodiversity crisis Sæther is more productive than ever, and we are all looking forward to his coming contributions.

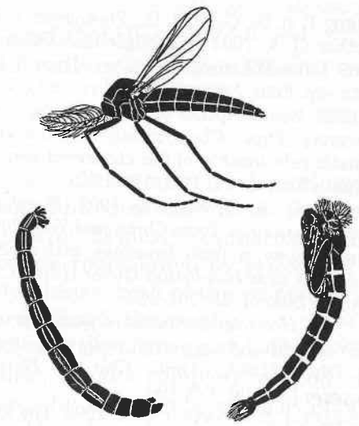


LIST OF PUBLICATIONS 1986 - 1995

A list of Professor Sæther's publications up to 1985/86 was printed when he celebrated his 50th birthday (Willassen, E. 1987. Professor Ole A. Sæther 50 years. - Fauna norv. Ser B 34: 1-6). Below is a list of his publications covering the last decade. The complete list is available on the www chironomid homepage. [To save space, here, Diptera was replaced by Dipt., and Chironomidae by Chir.]

91. ––1986. Fjærmygg, opportunister og livskunstnere. - Bergens Jæger- og Fiskerforening. Jubileumsårbok, 1984-85: 37-43.
92. Cranston P. S. & Sæther O. A. 1986. *Rheosmittia* (Dipt.: Chir.): a generic validation and revision of the western Palaearctic species. - J. nat. Hist. 20: 31-51.
93. —1986. The myth of objectivity - post-Hennigian deviations. - Cladistics 2: 1-13.
94. —1986. On the systematic positions of *Dolichoprymna*, *Amblycladius* and *Kloosia* (Dipt.: Chir.). - First int. Congr. Dipterology, 17.-24. Aug. 1986, Budapest, Hungrary. Abstract (ISBN 963 7251 62 6): 215.
95. —1986. Professor fil. dr. Hans Kauri 80. - Rahvuslik Kontakt 2 (110): 29-35.
96. —1986. The pupae of Buchonomyiinae (Dipt.: Chir.) of the Holarctic region - Keys and diagnoses. In: T. Wiederholm (ed.): Chironomidae of the Holarctic region. Keys and diagnoses. Part 2. Pupae. - Ent. scand., Suppl. 28: 115-117.
97. —1986. The pupae of Prodiamesinae (Dipt.: Chir.) of the Holarctic region - Keys and diagnoses. In: T. Wiederholm (ed.): Chironomidae of the Holarctic region. Keys and diagnoses. Part 2. Pupae. - Ent. scand., Suppl. 28: 139-145.
98. Coffman W. P., Cranston P. S., Oliver D. R., & Sæther O. A. 1986. The pupae of Orthocladiinae (Dipt.: Chir.) of the Holarctic region - Keys and diagnoses. In: T. Wiederholm (ed.): Chironomidae of the Holarctic region. Keys and diagnoses. Part 2. Pupae. - Ent. scand., Suppl. 28: 147-296.
99. —1986. Fylogenetikk. - Naturen 1986 (3): 88-95.
100. —1986. Gir neodarwinismen en tilfredsstillende forklaring på evolusjonen? - Naturen 1986 (6): 221-226.
101. —(ed.). 1987. A conspectus of contemporary studies in Chironomidae (Dipt.). Contributions from the IXth Symposium on Chironomidae, Bergen, Norway. - Ent. scand., Suppl. 29: 393 pp.

102. Sæther O. A., Willassen E. & Halvorsen G. A. 1987. The IXth International Symposium on Chironomidae, Bergen, Norway, 1985. - Ent. scand., Suppl. 29: 5-7.
103. Sæther O. A. & Willassen E. 1987. Four new species of Diamesa Meigen, 1835 (Dipt.: Chir.) from the glaciers of Nepal. - Ent. scand., Suppl. 29: 189-203.
104. Halvorsen G. A. & Sæther O. A. 1987. Redefinition and revision of the genus *Tokunagaia* Sæther, 1973 (Dipt.: Chir.). - Ent. scand., Suppl. 29: 173-188.
105. —1987. Nye ideer innen evolusjonsteori. - Naturen 1987 (4): 138-144.
106. Ferrington L. C. jr. & Sæther O. A. 1987. Male, female, pupa and biology of *Oliverida hugginsi* n. sp. (Chir.: Dipt.) from Kansas. - J. Kansas ent. Soc. 60: 451-461.
107. —1988. *Diplosmittia recisus* spec. nov. from Peru (Dipt., Chir.). - Spixiana, Suppl. 14: 45-47.
108. Schnell Ø. A. & Sæther O. A. 1988. *Vivacricotopus*, a new genus of Orthocladiinae from Norway (Dipt., Chir.). - Spixiana, Suppl. 14: 49-55.
109. Sæther O. A. & Schnell Ø. A. 1988. *Heterotrissocladius brundini* spec. nov. from Norway (Dipt., Chir.). - Spixiana, Suppl. 14: 57-64.
110. Sæther O. A. & Schnell Ø. A. 1988. Two new species of the *Rheocricotopus* (*R.*) *effusus* group (Dipt., Chir.). - Spixiana, Suppl. 14: 65-74.
111. Sæther O. A. & Willassen E. 1988. A review of *Lappodiamesa* Serra-Tosio, with the description of *L . boltoni* spec. nov. from Ohio, USA (Dipt., Chir.). - Spixiana, Suppl. 14: 75-84.
112. —1988. On the limitations of parsimony in phylogenetic analysis. - Qaest. Ent. 24: 45-50.
113. —1989. *Metriocnemus* van der Wulp: a new species and a revision of species described by Meigen, Zetterstedt, Stæger, Holmgren, Lundström and Strenzke (Dipt.: Chir.). - Ent. scand. 19: 393-430.
114. —1989. Two new species of *Hydrobaenus* Fries from Massachusetts, U.S.A., and Japan (Dipt.: Chir.). - Ent. scand. 20: 55-63.
115. —1989. The adult males of *Buchonomyiinae* (Dipt.: Chir.) of the Holarctic region - Diagnoses. In: T. Wiederholm (ed.): Chir. of the Holarctic Region. Keys and diagnoses. Part 3. Adult males. - Ent. scand., Suppl. 34: 125-127.
116. —1989. The adult males of Prodiamesinae (Dipt.: Chir.) of the Holarctic region - Keys and diagnoses. In: T. Wiederholm (ed.): Chironomidae of the Holarctic region. Keys and diagnoses. Part 3. Adult males. - Ent. scand., Suppl. 34: 155-163.
117. Cranston P. S., Oliver D. R. & Sæther O. A. 1989. The adult males of Orthocladiinae (Dipt.: Chir.) of the Holarctic region - Keys and diagnoses. In: T. Wiederholm (ed.): Chironomidae of the Holarctic region. Keys and diagnoses. Part 3. Adult males. - Ent. scand., Suppl. 34: 165-352.



118. —1990. Redescription of *Chaetocladius glacialis* (Lundström, 1915) comb. nov. - Aquatic Insects 12: 61-64.
119. —1990. Midges and the electronic Ouija board. The phylogeny of the *Hydrobaenus* group (Chir., Dipt.) revised. - Z. zool. Syst. Evolut. - forsch. 28: 107-136.
120. —1990. A review of the genus *Limnophyes* Eaton from the Holarctic and Afrotropical regions (Dipt.: Chir., Orthocladiinae). - Ent. scand., Suppl. 35: 1-139.
121. —1990. A revision of the Neotropical types described as *Spaniotoma* (*Limnophyes*) by Edwards 1931, with the description of *Edwardsidia* gen. n. (Dipt.: Chir.). - Ent. scand. 21: 305-319.
122. —1990. Phylogenetic trends and their evaluation in chironomids with special reference to orthoclads. - Acta. biol. Debr. oecol. Hung. 2: 53-75.
123. —1990. De naturhistoriske universitetsmuseene som kunnskapsprodusenter og informanter. - Museum 90: 158-162.
124. —1991. McAlpine, J. F. (ed.). Manual of Nearctic Diptera. Vol. 2. (Book review). - Entomol. gener. 16: 38.
125. —1991. McAlpine, J. F. (ed.) & Wood, D. M. Manual of Nearctic Diptera. Vol. 3. (Book review). - Entomol. gener. 16: 310-311.
126. —1992. Ferris, J. M., et al. (eds). Biology of the Vestfold Hills, Antarctica. (Book review). - Entomol. gener. 17: 80.
127. —1992. First Palaearctic record of the orthoclad genus *Plhudsonia* Sæther (Dipt.: Chir.). - Ent. scand. 22: 379-384.
128. —1992. First Nearctic record of the orthoclad genus *Tavastia* Tuiskunen (Dipt.: Chir.). - Ent. scand. 22: 385-388
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Trond Andersen

Neotropical Bibliography and Catalog: Announcement of work in progress and call for contributions

by Martin Spies

At the Zoologische Staatssammlung, Munich, Dr. F. **Reiss** and I are presently producing the first catalog of Chironomidae for the entire Neotropical region. Since any database on taxonomic and distributional information can only be as good as the underlying bibliography, I have been working to update and integrate the three previous reference lists (Reiss 1977, 1981, 1982; citations see list below) published separately for the Neotropical subregions.

The first of the following two lists contains verified references to Caribbean, Central, and South American Chironomidae not available in Reiss (op. cit.). In addition, emended citations are given for the few cases where Reiss's information was found to be erroneous or incomplete. Due to the obvious space limitations associated with this newsletter, only a selection of the full bibliography is given below. Omitted are, for example, all theses and "grey" literature, as well as most ecological studies treating Chironomidae at no lower than family level. Logically connected series of papers are represented by references offering syntheses, both of the respective work and preceding bibliography.

With the help of Dr. Luc **Int Panis** (Hove, Belgium), a more complete version of the bibliography will soon be made available on his world wide web chironomid homepage (http://www.uia.ac.be/u/intpanis/index.html).

The second list below gives a number of publications possibly containing further relevant information, which - in spite of considerable efforts - we have so far not managed to see. **!!** ***We would be extremely grateful to any of You willing and able to send copies of such papers or help determine their relevance / irrelevance for our bibliography*** **!!**

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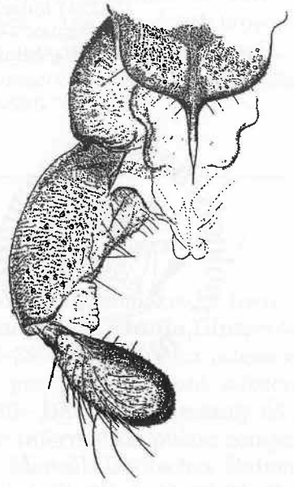

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If You have any **questions, corrections, suggestions, or additions (especially new or unlisted publications of Your own)**, please, do not hesitate to **contact me**. We are specifically interested in all taxonomically or ecologically oriented publications containing Neotropical chironomid taxa determined at least to genus.

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zoologische staatssammlung münchen

Notice - Board

Update on
Key to Pupal Exuviae of West Palaearctic Chironomidae by Peter H. Langton. 1991.

Corrections and addition to the update on the genus *Chironomus* (1995)

- Wherever the diameter of tracheae is given in the form 0.3 µm it should read 3 µm.
- In couplet 64h the correct spelling is *riihimakiensis*.
- Prof. Hirvenoja has very kindly provided me with specimens of *Chironomus obtusidens*. The pupal exuviae run to annularius in couplet 64c. They can be distinguished as follows:

Thoracic granulation anteriorly with great contrast between the large crowded granules towards the suture and the small granules further laterad. Anal lobes with brown colour confined posteriorly to the flattened margin.
** *Chironomus* (s.str.) *obtusidens* Goetghebuer (*clarus* Michailova & Hirvenoja 1995, ?nec *clarus* Hirvenoja 1962.)

Thoracic granulation with little difference in size between granules at suture and further laterad. Anal lobes with brown colour posteriorly spreading onto tergite IX.
** *Chironomus* (s.str.) *annularius* (Degeer) address !!!!!!!!!!!!!

New Journal

The Deutsches Entomologische Institut has launched the journal **Studia Dipterologica**. ISSN 0945-3954. Two to four issues will be published per year. Annual subscription costs are 80.- DM (approximately 55 US$). For further information please contact:
Dr. Frank Menzel, Deutsches Entomologisches Institut, Postfach 10 02 38, D-16202 Eberswalde. Fax: +49 3334 21 23 79.

DEPARTMENT OF ENVIRONMENTAL PROTECTION
FLORIDA

John Epler wishes to inform that a 1995 **revised edition** of his

Identification Manual for the Larval Chironomidae (Diptera) of Florida

has been completed. The manual is "free". You can obtain the manual by sending an pre-addressed envelope (next size to A4, people from the USA are kindly asked to pre-stamp it, with $3 priority postage) to:

Bureau of Surface Water Management
FL Dept. of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400
U.S.A.

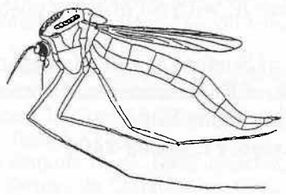
Please note that Dr Epler cannot send out copies of this Manual - It must be ordered from the above address !!!!!!!!!!!!!

Erratum:

In the advertisement about "Change in terminology" the term **taeniae** was misspelled in the last edition (No.7, p.14).
The error was made in the editorial office; we apologize.

The 1996 edition of **An Introduction to the aquatic insects of North America**, edited by R.W. Merritt and K. W. Cummins, contains a comprehensive and updated chapter on **Chironomidae** (pages 635- 754) by W.P. **Coffman** and L.C. **Ferrington** Jr. The "Introduction" is followed by a chapter on the "External Morphology" of larvae, pupae and adults, including glossaries of morphological tems. The "Keys" are accompanied by almost 800 figures, and the entire chapter is rounded off by the handy and proven "Table" in which ecological (habitat, habit, trophic relationships) and distributional data (N. America) are summarized along with references.

The book costs approximately 95 US$ outside and somewhat less in the USA.



Sasa M. and **Kikuchi** M. 1995.
Chironomidae [Diptera] of Japan.
University of Tokyo Press, 333 pp.
ISBN 4-13-067103-0

Contents
Introduction; Part I: List of Chironomidae of Japan; Part II: Key to Identification of adult male chironomids recorded from Japan (Chironominae, Orthocladiinae, Diamesinae, Podonominae, Tanypodinae); 96 plates with hypopygia; References; Index of genera and species.

The book costs 12 000 yen (approxomately 95 US$) and can be ordered from University of Tokyo Press, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113, Japan. Fax: +81 3 3811 0964 (Prepayment is requested by yen check.)

The book has recently been reviewed by P.S. Cranston (1996) in SYSTEMATIC ENTOMOLOGY 21: 77-78.

Fauna Aquatica Austriaca
edited by O. **Moog** 1996.
published by Bundesministerium für Land- und Forstwirtschaft, Wien.
ISBN 3-85 174-001-7

Contributors for subfamilies of Chironomidae are as follows:
Podonominae: **Janecek** & **Moog**
Buchonomyinae: **Janecek** & **Moog**
Tanypodinae: **Janecek**, **Moog** & **Orendt**
Diamesinae: **Janecek**, **Moritz** & **Saxl**
Prodimaesinae: **Janecek** & **Moog**
Orthocladiinae:
Janecek, **Moog**, **Moritz** & **Saxl**
Chironominae:
Janecek & **Contreras-Lichtenberg**

The book costs 340.- ÖS (approximately 30 US$) and can be ordered from Bundesministerium für Land- und Forstwirtschaft - Wasserwirtschaftskataster, Marxergasse 2, 1030 Wien, Austria. Fax: +43 1 714 09 50 30. (Payment is requested by Austrian Schilling check.)

2nd Brazilian Meeting on Taxonomy and Ecology of Chironomidae
will be held on November 28 and 29 1996, at the Universidade Federal de of Sao Carlos (Sao Carlos, SP). It will be supported by the universities Post-Graduate Program in celebration of the 20th aniversary of the Brazilian Limnology Society; Instituto Oswaldo Cruz/FIOCRUZ. Contributions are likely to be published in the journal *Acta Limnologica Brasiliensia*. For further information please contact:

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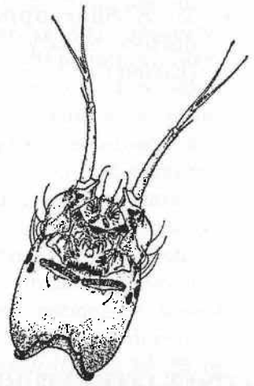
Presentation of Current Research and Working Groups

News from INDIA

(1) University of Burdwan



Following a period which was primarily centered on biosystematics of Chironomidae, my (P.K **Chaudhuri**) working group has focused its research interests now on the assessment of water quality of the Damodar River in the Burdwan district, West Bengal, using chironomid communities as indicators. This study is funded by the Department of Science & Technology and Non-conventional Energy, Government of West Bengal. Various physical parameters, such as current, depth, water and air temperature, pH, DO, vegetation and soil characteristics are measured, as well as heavy metal concentrations of both sediment and water. Preliminary findings indicate large among-station variability. Morphological deformities in larvae of Chironominae, Orthocladiinae and Tanypodinae have been scored and recorded, together with more traditional measures of community composition (species level), diversity and similarity index. The observed deformities are correlated with contaminant levels. Results of this study will be published in the near future.

We are also busy with another project, studying the "Diversity and ecology of chironomids of the Darjeeling-Sikkim Himalayas". This study was started in June of 1995, and is financed by the Department of Science & Technology, Government of India. Comments, suggestions and relevant literature pertaining to the study of species diversity is greatly appreciated.

During past few years progress has been made in the Cytogenetics Laboratory, under the guidance of Prof. J.P. **Gupta**. Studies have concentrated on mitotic and polytene chromosomes, localisation of constitutive centromeric heterochromatin in polytene chromosomes, nucleolar organizer region and naturally occurring chromosomal polymorphism. Dr. Ajai **Kumar** examined the two species *Chironomus circumdatus* Kieffer and *C. striatipennis* Kieffer in respect to chromosomal structures of natural populations (Kumar & Gupta 1990, Genetica 82: 157-163; Gupta & Kumar 1991, Zool. Sci. 8: 959-965). Mr. Abhijit **De** studies *Chironomus incertipennis* Chaudhuri, *C. fortistylus* Chaudhuri et al. and *Kiefferulus calligaster* (Kieffer) (De & Gupta 1994, Cytobios 80: 55-62).

(2) University of Poona

Dr. B. **Nath** and his colleagues have established a strain of *Chironomus ramosus* Chaudhuri et al. and have also been able to maintain both *C. circumdatus* and *C. striatipennis*. They have been able to distinguish three species on the basis of number and position of nucleolar organizer region and banding pattern of salivary gland polytene chromosomes. A band map was prepared of salivary gland polytene chromosomes of *C. ramosus*. Ongoing projects on this subject include:

- Studies on the puff induction in polytene chromosomes of *Chironomus* using intracytoplasmic and internuclear microinjection technology. (Drs. N.N. **Godbole** and B. **Nath**, Department of Zoology, University of Poona, Ganeshkhind, Pune, 411 007, India).
- Studies on the stress response in *C. ramosus*: Identification of genetic loci and stress induced protein. (B. **Nath**).

- *Chironomus* as a model system for the studies on developmental genetics. (B. **Nath**).
- Cytogenetic studies on two sibling species of *Chironomus*. (S.R. **Krishan** and B. **Nath**).
- Stress response in *C. ramosus*. (S.A. **Ghandhi** and B. **Nath**).
- Life history and morphometry of *C. ramosus*. (D. **Chothave** and B. **Nath**).

(3) Gulbarga University

Dr. K. **Vijaykumar** and his co-workers study the "Use of morphological deformities for monitoring biological effects", with funding provided by the Department of Biotechnology, Government of India:

- Mr. Ramakrishna **Reddy** is working on the effects of metal toxicity on Chironomidae.
- Mr. K. Vasanth **Kumar** is about to finish his Ph.D. thesis on "Physiological effects of metals and various salts on Chironomidae".
- Mr. S. **Sharanppa** studies the "Reproductive biology of *Tanypus bilobatus* (Kieffer)".

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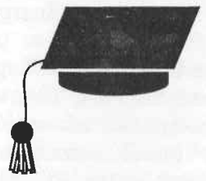
THESES AND OTHER GREY LITERATURE

Dinsmore, W.P. 1995. Impact of hypolimnetic oxygenation on profundal macroinvertebrates in a eutrophic lake in central Alberta. Doctoral thesis, University of Alberta. 284 p. Supervised by Dr. Ellie Prepas, Department of Biological Sciences. Relevant publications: Dinsmore & Prepas. Can. J. Fish. Aquat. Sci. (In press a, b) - Dinsmore & Prepas (1993) Verh. Internat.Verein. Limnol. 25: 302-306.



ABSTRACT - Many deep eutrophic lakes in western Canada exhibit periodic hypolimnetic anoxia (dissolved oxygen (DO) concentrations < 1 mg/l), which severely restricts profundal macroinvertebrate and fisheries habitat. Hypolimnetic oxygenation was implemented in eutrophic Amisk Lake, Alberta, as a non-toxic, inexpensive means of reducing primary productivity and increasing hypolimnetic DO concentrations. I hypothesized that hypolimnetic oxygenation in the north basin of this double-basined lake would result in increased macroinvertebrate abundance, biomass and diversity relative to the reference south basin of Amisk Lake and the south basin of nearby Baptiste Lake. I also examined species-specific responses of *Chironomus* spp., the dominant macroinvertebrate taxon in Amisk Lake. Finally, I empirically investigated the relationship between profundal macroinvertebrate biomass (PMB) and DO concentrations in Alberta lakes through regressional analyses.

Hypolimnetic oxygenation from 1988 to 1991 in the north basin of Amisk Lake increased mean summer (June-August) dissolved oxygen concentrations in the deep hypolimnion (25 m) from < 0.4 mg/l during pre-treatment years (1980-1987) to 2.7 mg/l during treatment. Epilimnetic whole-lake chlorophyll a and total phosphorus concentrations decreased by 55 and 13%, respectively, relative to pre-treatment levels. Mean summer hypolimnetic temperatures at 25 m also increased from 6.3°C (pre-treatment) to 8.1°C (treatment), but thermal stratification was preserved throughout the summer. Hypolimnetic DO concentrations also increased in the south basin of Amisk Lake, due to an unanticipated transfer of oxygenated water between basins, but DO concentrations in the south basin were consistently lower relative to the treated north basin throughout the study period.

Profundal (15-25 m depth) macroinvertebrate responses to hypolimnetic oxygenation in Amisk Lake were dominated by *Chironomus* spp. Densities of other macroinvertebrate taxa remained low throughout the study period and diversity (Shannon) decreased as oxygenation progressed, in contrast to aeration studies in smaller, single-basined water bodies. *Chironomus* spp. responses to elevated hypolimnetic DO concentrations in Amisk Lake were species-specific. Mean densities and biomasses of *C. anthracinus* at 25 m increased 55- and 109-fold, respectively, in the treated basin, but major changes in abundance were not apparent until 2 yr after treatment commenced. Densities of *C. anthracinus* increased similarly in the reference basin, but mean larval weights and biomasses were significantly lower relative to the treated basin (paired *t*-test, $P < 0.001$). Anoxic conditions, rather than low temperatures, appeared to limit profundal *C. anthracinus* distribution in Amisk Lake. Densities and biomasses of *C. cucini* were higher in the reference basin than in the treated basin of Amisk Lake. Densities of *C. decorus* and *C. plumosus* group increased in the treated basin but remained of minor importance. In comparison, densities of *C. cucini* and *C. plumosus* group in reference Baptiste Lake declined over the study period. Increased *Chironomus* spp. abundance in Amisk Lake suggested an increase in fish food, but fish foraging below 15 m was restricted by low DO concentrations and water temperatures.

Estimates of PMB from 32 Alberta lakes of moderate to high primary productivity (mean summer total phosphorus concentration 57 ± 9 mg/l) were regressed against DO concentrations and additional trophic, morphometric, and water chemistry variables. Minimum open-water DO concentrations explained 38% of the variance in PMB at sites where minimum DO was < 4 mg/l, but accounted for no detectable variation when minimum DO was > 4 mg/l. Bottom slope (12%) and specific conductivity (4%) increased to 55% the amount of variance explained for PMB at sites where minimum DO was < 4 mg/l. Variables indicative of phytoplankton biomass (chlorophyll a, total phosphorus, Secchi transparency) were nonsignificant in Alberta lakes, suggesting that food was non-limiting for profundal macroinvertebrates in these predominantly eutrophic lakes. These results suggest that DO concentrations hold potential as a predictor of PMB in eutrophic lakes.

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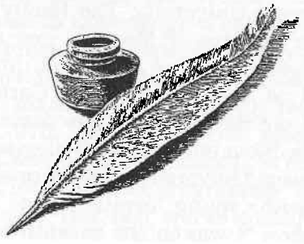
PERSONALIA



The addresses given below either changed or were not included in the Directory (*CHIRONOMUS* No. 8) and the respective colleagues asked for updating in this issue. Many further updating is needed, and is already done or will be done on the chironomid homepage: **http://www.uia.ac.be/u/intpanis/index.html** So, if you wish us to update anything in the Directory, please contact Dr L. Int Panis (intpanis@uia.ua.ac.be).

Supplement to the Directory

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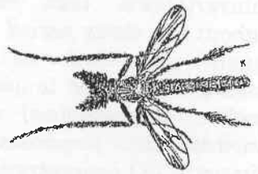

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Obituary Notice

In the Memory of Nina Jurievna Sokolova (26 May 1916 - 12 August 1995)

The distinguished hydrobiologist and zoologist N.Ju.Sokolova (Ninochka Jurievna to all her friends) died on the 12th of August 1995 in Moscow. She left this world being full of plans and ideas, fighting courageously with incurable cancer. "I shall get over", - she repeated as invocation. It was hard to believe that Nina Jurievna was almost eighty - being full of energy she looked considerably younger. Although already seriously ill, she continued to work reviewing diploma papers and preparing the talk for XXVI Congress of SIL.

Her long and interesting life contained both happiness and grief. She was born on the 26th May 1916 in Moscow. Her father, Jury Sokolov, was a professor of philology at Moscow University. The family lived in the very centre of Moscow, just near the Red Square. In her childhood, little Nina played at the steps of the Cathedral of Christ the Saviour that was demolished in the 30s. Nina entered the biological faculty of Moscow University, and there she fell in love with young ornithologist Vladimir Modestov. "I was in the seventh heaven", -

she described her feelings. But fate soon separated them, and her husband fell in battle just at the start of war. She lost her second husband, the outstanding zoologist and palaeontologist Veniamin I. Zalkin, when she was only fifty-three. In the early 80s, the hard period of Brezhnev "stagnation", she endured the last parting - her single daughter and grand-daughter emigrated (it seemed for ever) from Russia.

But optimism and an iron will helped Nina to survive, to maintain the ability to work hard, being always cheerful and beautiful. She constantly took care of her friends and these feelings were reciprocated.

In 1940 Nina graduated in biology from Moscow University (Department of Invertebrate Zoology), and received an assistantship at the same department. During the war she became a fighter of the fire brigade of Moscow anti-aircraft defence and threw incendiaries from the roof of the University. In 1945, Nina Jurievna began her investigations of macrobenthos of the Ucha Reservoir, situated not far from Moscow. She gave special attention to different aspects of chironomid biology, to the study of their life cycles, production and functional role in fresh-water ecosystems. In 1973, she received the scientific degree of Doctor of Science after successfully presenting her thesis "Ecology of the bottom invertebrates of Moscow region reservoirs". Nina Jurievna throughout her life actively worked in the field, without rest, without week-ends, independently of weather, and demanded the same from her collaborators. She led the investigations of freshwater fauna in the framework of university programme "Scientific fundamentals of water management and fisheries in small reservoirs of European part of the USSR". She was interested in the ecology of common species of macrobenthos (especially chironomids), their role in fish feeding and utilisation of organic matter in water supply reservoirs. Since 1975, Nina Jurievna studied the midge *Chironomus plumosus* L. in the framework of international programme "Man and Biosphere". Her last works concerned the study of streams and the role of chironomids in the processes of water treatment. Special attention was given to the macrobenthos of Moskwa River, close to the city of Moscow, as an indicator of its sanitary condition.

Nina Jurievna published more than a hundred scientific papers and was the editor and co-author of four books. N. Sokolova was the member of International Association of Limnology (SIL) and she participated in many international congresses and symposiums. All chironomid workers of the world knew her. She could not (because of her illness) attend the last XXVI congress of SIL in Brazil in July 1995, though two of her reports were accepted.

Nina Jurievna was a gifted organiser ("velvet dictator", as her colleagues called her). She was the member of organising committees of many conferences, always doing the hard work. It is difficult to enumerate her numerous public duties, but we would like to mention one of them. In 1964, the highly influential Russian zoologist and oceanographer, a member of Academy of Sciences, Professor L. A. Zenkevich asked her to become the Scientific Secretary of the All-Union Hydrobiological Society (VGBO as it is known in the abbreviated form of the Russian title). Nina's extraordinary activity contributed significantly to the complete revival of this society, which began to play an important role in the life of hydrobiologists of our country. It supported certain investigations, organised conferences and "schools" for young scientists, helped to publish periodicals and books, and, most importantly, provided the basis for personal contacts of people working in different organisations and different spheres of hydrobiology. Six congresses of VGBO became real festivals of aquatic sciences.

Nina lectured in some courses at the University, led practical work with students in the field. Under her guidance more than 60 student papers and 12 theses for doctor (candidate of biological sciences) degree were prepared.

Kind memory and high esteem for Nina Jurievna Sokolova will long be cherished by her friends and pupils.

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Publications by N. Ju. Sokolova

Dr Evelina Izvekova, who has been with Prof. Sokolova for many years at Moskow University, provided the editorial team of *CHIRONOMUS* with a complete publication list by Sokolova, translated into English. This long list is likely to be the only complete version in English, thus making Sokolova's work accessible amongst wider circles of chironomid workers. Unfortunately, the list is too long to publish in full in the newsletter, and I have instead selected 10 titles that seem to be representative of Sokolova's extensive scientific work (although, not being able to read Russian, I made this selection based solely on the titles).

The complete list contains 106 titles, among which 2 are theses, 57 are local reports mostly published at Moscow University and Institutes of the Russian Academy of Sciences, 31 are papers published in Russian journals, and 14 are contributions to international symposia (mostly SIL, and the International Symposia on Chironomidae). In addition, there is her chapter on the production of chironomids in the well-known IBP-handbook edited by Winberg (1968) and a monography on *Chironomus plumosus* edited by Sokolova (1983). Copies of the complete publication list are available from the editorial office (CSIRO, Canberra), and this list will also be made available on the chironomid homepage.

Ulrike Nolte

10 selected Titles In brackets [ ] English translation of papers published in Russian

1959 [Tendipedidae of the Ucha Reservoir and their seasonal dynamics]. *Trudy VI soveshchaniya po problemam biologii vnutrennikh vod.* AN SSSR: 287-292.

1968 [Production of Chironomids in the Ucha Reservoir.] pp 226-239. In Winberg, G.G. [Methods for the estimation of production of aquatic animals]. Minsk.

1983 editor [*Chironomus plumosus* L. (Systematics, morphology, ecology, production)]. "Nauka". 309 pp.

1985 [The significance of chironomids in benthos formation in freshly flooded reservoirs in mid USSR]. *Evolyutsia, vidoobrazovaniye i systematika khironomid.* "Nauka". Novosibirsk.

1985 [Macrobenthos of Moskva River reservoirs]. *Vodokhranilishcha Moskvoretskoy vodnoy systemy. Kompleksnyie issledovaniya vodokhranilishch* 6: 185-209 Moscow University . (co-authored by **E.V. Pastukhova**).

1989 Influence of water level fluctuations in reservoirs on abundance and biomass of chironomid larvae. *Acta biologica Debrecena, suppl. Oecologica Hungarica* 3: 311-314 (co-authored by **E.I. Izvekova**).

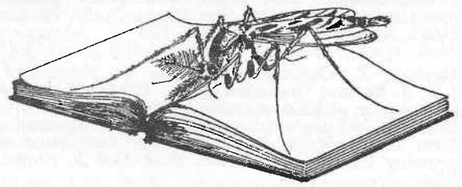
1990 [Abundance and biomass dynamics of *Chironomus* in the Mozhaisk reservoir from long-term observations]. *Vid v areale, biologiya, ekologiya i produktivnost vodnykh bespozvonochnykh.* "Navuka i tekhnika": 97-102. Minsk (co-authored by **E.I. Izvekova**).

1991 [Peculiarities of the biology of *Chironomus piger* Str. (Dipt., Chir.) and its role in self-purification]. *VI syezd Vsesoyusnogo hydrobiologicheskogo obshchestva, tezisy dokladov* 1: 158-159. Murmansk (co-authored by **E.I. Izvekova** and **A. V. Paliy**).

1992 [Freshwater communities and their role for water quality of near Moscow reservoirs]. *Ekologicheskiye issledovaniya v g.Moskve i Moskovskoy oblasti. Sostoyaniye vodnykh ekosystem.* 31-38 Moscow: (co-authored by **S.L. Belova**, **E.I. Izvekova** et al.).

1993 [Long-term changes of benthos in small reservoirs of Upper-Volga basin as indicators of their eutrophication]. *Tezisy dokladov mezhdunarodnoy konferentsii po ekologicheskim problemam basseynov krupnykh rek.* Togliatti. (co-authored by **E.I. Izvekova**, **A. Lvova**).

CURRENT BIBLIOGRAPHY



Current Bibliography: 1 Jan. 1995 - 31 Dec. 1995
by **Odwin Hoffrichter**

Preface. The early deadline of the Newsletter makes an incomplete listing of the previous year's publications inevitable. This can be seen below from the supplementary list for 1994, which contains a few corrections and quite a number of additions.

Supplement to 1994 Current Bibliography

a) corrected titles

Ali, A., Ceretti, G., Barbato, L., Marchese, G., D'Andrea, F. and Stanley, B.1994a. Attraction of *Chironomus salinarius* (Diptera, Chironomidae) to artificial light on an island in the saltwater lagoon of Venice, Italy.- *J. Am. Mosquito Control Ass. 10*: 35-41.

Evrard, M. 1994a. Évolution journalière de la dérive des exuvies nymphales de Chironomidae (Diptera) dans une rivière salmonicole (le Samson, Belgique).- *Belg. J. Zool. 124*: 115-126.

Fan, M. and Li, Z. 1994a.. Two new pathogens of dipteran insects.- *Mycotaxon 50*: 307-314.

Hare, L., Carignan, R. and Huerta-Diaz, M. A. 1994a. A field study of metal toxicity and accumulation by benthic invertebrates; implications for the acid-volatile sulfide (AVS) model.- *Limnol. Oceanogr. 39*: 1653-1668.

Jackson, J. K. and Sweeney, B. W. 1994a. Egg and larval development times for 17 species of tropical stream insects from Costa Rica.- *Bull. N. Am. benthol. Soc. 11*: 118.

Kohring, R. 1994a. Eine Chironomiden-Larve (Insecta: Diptera) aus der Fur-Formation (Paleozän, ? Unter-Eozän, NW-Dänemark).- *Palaeont. Z. 68*: 411-418.

Moog, O., Konar, M. and Humpesch, U. H. 1994a. The macrozoobenthos of the River Danube in Austria.- *Lauterbornia 15*: 25-51.

Il'inskaya, N. B. 1994a. Sezonnye izmeneniya politennykh khromosom u khironomid. (Seasonal variations in polytene chromosomes of chironomids.)- *Tsitologiya 35*: 605-623.

Verschuren, D. 1994a. Sensitivity of tropical-African aquatic invertebrates to short-term trends in lake level and salinity: a paleolimnological test at Lake Oloiden, Kenya.- *J. Paleolimnol. 10*: 253-263.

Xue, R. D. and Ali, A. 1994a. Relationship between wing length and fecundity of a pestiferous midge, *Glyptotendipes paripes* (Diptera, Chironomidae).- *J. Am. Mosquito Control Ass. 10*: 29-34.

Xue, R. D., Ali, A. and Lobinske, R. J. 1994a. Oviposition, hatching, and age composition of a pestiferous midge, *Glyptotendipes paripes* (Diptera, Chironomidae).- *J. Am. Mosquito Control Ass. 10*: 24-28.

Yiallouros, M., Storch, V., Thiery, I. and Becker, N. 1994a. Efficacy of *Clostridium bifermentans* serovar *malaysia* on target and nontarget organisms.- *J. Am. Mosquito Control Ass. 10*: 51-55.

b) additional titles

Akiyama, K., Fukuda, M., Kobayashi ,N., Matsuoka, A. and Shikama, K. 1994a. The pH-dependent swinging-out of the distal histidine residue in ferric hemoglobin of a midge (*Tokunagayusurika akamusi*).- *Biochim. biophys. Acta 1208*: 306-309.

Bănărescu, A. and Nalbant, T. T. 1994a. Benthal and phytophillous fauna from the Danube Delta (I).-*Trav. Mus. Hist. nat. Grigore Antipa 34*: 419-434.

Bowmer, K., Korth, W., Thomas, M. and McCorkelle,G. 1994a. River pollution with agricultural chemicals.- In: Roberts, J. and Oliver, R. (eds.).: *The Murrumbidgee: Past and present; pp.* 7-19. CSIRO Publs, East Melbourne.

Brink, F. W. B. van den, Beljaards, M. J., Boots, N. C. A. and Velde, G. van der 1994a. Macrozoobenthos abundance and community composition in three Lower Rhine floodplain lakes with varying inundation regimes.- *Regul. Rivers Res. Mgmt 9*: 279-293.

Büchner, S. 1994a. Extensivierung im Ackerbau: III. Auswirkung auf Dipteren.- *Mitt. dt. Ges. allg. angew. Ent. 9*: 157-160.

Camargo, J. A. 1994a. The importance of biological monitoring for the ecological risk assessment of freshwater pollution: a case study.- *Envir. int. 20*: 229-238.

Chalar, G. 1994a. Composición y abundancia del zoobentos del Arroyo Toledo (Uruguay) y su relación con la calidad de agua.- *Revta chil. Hist. nat. 67*: 129-141.

Chen, T. et al. 1994a. (Acute toxicity of organotin compounds to benthos.)- *Huanjing Kexue 15, 5*: 63-64.

Chang, P. S. S., Cobb, D. G., Flannagan, J. F. and Sæther, O. A. 1994a. Light trap collections of may-

flies, caddisflies and chironomids from Lake Winnipeg during 1969 and 1971.- *Can. Data Rep. Fish. aquat. Sci. 2223*: iv + 27 pp.

Christman, V. D., Voshell, J. R. Jr., Jenkins, D. G., Rosenzweig, M. S., Layton, R. J. and Buikema, A. L. Jr. 1994a. Ecological development and biometry of untreated pond mesocosms.- In: Graney, R. L., Kennedy, J. H. and Rodgers, J. H. (eds.): *Aquatic mesocosm studies in ecological risk assessment, pp.* 105-127. Lewis Publs, Boca Raton, Ann Arbor, Lond., Tokyo.

Claus, P., Thies, G. and Wis;niewski, J. R. 1994a. Insect protein homologous to mammalian high mobility group protein I: Characterization and DNA-binding properties.- *Biol. Chemy Hoppe-Seyler 375, Spec. Suppl. 1*: S39.

Colangelo, M. A. and Ceccherelli, V. U. 1994a. Meiofaunal recolonization of azoic sediment in a Po Delta lagoon (Sacca di Goro).- *Boll. Zool. 61*: 335-342.

Contreras-Lichtenberg, R. 1994a. Beitrag zur Kenntnis der Gattung *Dicrotendipes* KIEFFER in Chile (Insecta: Diptera: Chironomidae).- *Annln naturhist. Mus. Wien 96 B*: 591-598.

Cranston, P. S. 1994a. *The immature stages of the Australian Chironomidae*.- Murray-Darling Freshwat. Res. Centre, Albury. 380 pp.

Daniels, R. A. and Wisniewski, S. J. 1994a. Feeding ecology of redside dace, *Clinostomus elongatus*.- *Ecol. Freshwat. Fish 3*: 176-183.

Davies, P. E. and Nelson, M. 1994a. Relationships between riparian buffer widths and the effects of logging on stream habitat, invertebrate community composition and fish abundance.- *Aust. J. mar. Freshwat. Res. 45*: 1289-1305.

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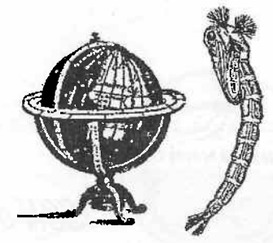

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