

NEWSLETTER OF CHIRONOMID RESEARCH

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April, 1994

WHAT HAPPENED DOWNUNDER

Canberra, January 1994.
Impressions of a participant.

Many of the fifty participants arrived in Canberra on the Friday, two days before the opening session. This proved to be a very sensible idea for those of us travelling long distances. Not only did we reset our biological clocks over this period but we also began to adapt the 5 a.m. pre-dawn cacophony of Australia's numerous birds. Some participants had been adapting to Australia since the previous Christmas and were already accustomed to wearing a linear smudge of yellow or even pink sunscreen across their nose and face.

A barbecue and all the beer you could drink soon broke down any lingering inhibitions participants may have had by Saturday evening. The informal, friendly atmosphere was a portent of what was to follow throughout the Symposium. It certainly provided me with my first opportunity, as a Pom, to whinge about the coldness of the beer.

Traditionally a day off for most people, Sunday exposed the participants to a wide-ranging bombardment of presentations; ecological, observational, morphological and genetical. Molecular biologists would impress us with black smudges lined up like bar charts while ecologists put up diagrams covered in black dots with arrows flying through them in all directions.

In Monday morning's Thienemann lecture, Richard Johnson advocated the use of power analysis as a routine step to interpreting data. He also provided a comprehensive review of biomonitoring methods. The southern hemisphere was the link for Monday's final session. I can recommend the session's Chairman, Terry Hillman, to anyone looking for a snappy title for their presentation, he introduced Ulrike Nolte's paper as "Welcome to the world, have a good week"!

 *continued on page 4*



**Focus on larval
feeding habits**

page 10



about CHIRONOMUS

Editorial

The observant reader has already noticed, that on the front page of CHIRONOMUS a new treasurer is given: **Trond Anderson** kindly assumed the newsletter's financial matters, when **Endre Willassen** withdrew due to his many other obligations. On behalf of all CHIRONOMUS readers, I would like to thank Dr Willassen for his cooperation during the initial phase of resurrecting the news-letter and his willingness to stay as the regional representative for Norway. With gratitude I have accepted the offer by Mr Anderson, who is versed in managing project budgets, to take care of the newsletter's finances. As Mr Anderson is also from the University of Bergen, the CHIRONOMUS bank account continues to be the same. On this occasion I also would like to thank Prof. Sæther for giving, again, consent so that one of his co-workers may devote time to working on the CHIRONOMUS newsletter.

After the newsletter's revival in 1991, the Canberra conference was the first get-together of chironomid people and, thus, the first opportunity to exchange ideas about the new CHIRONOMUS. I am glad to inform that there has been a very positive response for the newsletter, which is reflected in the international engagement making the newsletter colourful, diversified and interesting, as is seen from the present issue. I was also pleased that many of the participants of the Canberra meeting have shown their confidence in the newsletter's future, and paid subscription fees for the next three years (until the 13th conference).

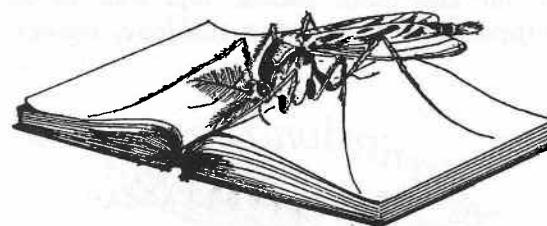
Concerning contributions for CHIRONOMUS, I would appreciate if contributors would send their text already in the format that they would like to see it published in the newsletter. Often I receive just raw in-

formation, hidden in polite letters with the implied expectation that the editor will put the final text together. This costs so much time that, unfortunately, I have to quit doing this any further. At times, merely the correspondence resulting from the editorial work together with the necessary "translation service" takes all my spare time. So, dear colleagues, please be so kind and send your contribution in a thoroughly prepared form (diskettes are appreciated along with a hard copy). Whenever you have a figure, logo or perhaps a cartoon that you find appropriate to accompany your contribution or break up too much "dry" text, don't hesitate to send it in. From time to time, on the other hand, scientific manuscripts are submitted which I return on the spot to enable the author(s) to submit it to a journal without too much delay. As a newsletter, CHIRONOMUS does not handle scientific papers, but all other information, that which usually does not appear in scientific journals, is greatly appreciated. The international response shows that there is a broad demand for such an informal forum among chironomid workers: meanwhile CHIRONOMUS is read in 42 countries.

Ulrike Nolte

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CHIRONOMUS ' Current Bibliography

The Current Bibliography is starting in this issue with publications from 1994 on (page 36). Chironomid workers are quite productive, and so I have compiled approximately 300 papers published merely in 1993. These are too many for the printing space available in this issue of CHIRONOMUS thus all papers published before 1994 will be still included in the new edition of the "Bibliography of the Chironomidae". At present, I am busy with importing, checking and emending all titles from the previous editions of the Bibliography (Fittkau, Reiss & Hoffrichter 1976, Hoffrichter & Reiss 1981) into a database. It is intended to complete this work during this year. The print version of the new edition should be available when the next newsletter is issued, so details will be given in CHIRONOMUS No. 7. The price for the book is roughly estimated to be US Dollar 100.- (subject to change).

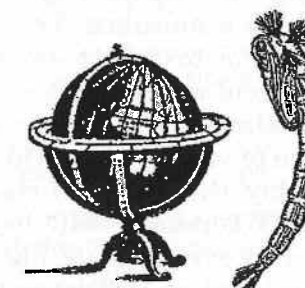
Literature cited:
Fittkau, Reiss & Hoffrichter 1976: Gunneria 26: 177 pp.
Hoffrichter & Reiss 1981: Gunneria 37: 68 pp.

Odwin Hoffrichter

Directory of chironomid workers

The international Directory is nearing completion and will be issued as a separate edition of CHIRONOMUS early in 1995. (So, this present issue does not include a Directory.) It will consist of an alphabetic ordering by name with addresses, FAX and E-mail numbers, and research interests, plus indices to country and research interests. To date, over 500 names from 42 countries have been submitted, however, information, especially in the area of research interests, is frequently incomplete. In order to produce a complete indexing of research interests we need more specific information than just broad categories such as taxonomy or ecology. When pertinent, taxonomic groups should be given. We urge all contributors to review and update their submissions and re-submit **before the end of September, 1994**. We also invite all those who have not done so, to submit a synopsis of their interests using the form on page 38 of this newsletter.

Don Oliver and Mary Dillon



Reports from chironomid meetings

(continued from page 1)

On free evenings, swarms of chironomid workers would collect around various ethnic restaurants in Canberra's city centre and this was when people got to know each other (isn't that what swarms are for?). Quite often conversation drifted to explanations of each nation's favourite sport. Confusing North Americans with the rules of cricket proved to be a popular amusement for both Aussies and Poms.

The consensus of opinion following the interruption by an all day excursion to a nature reserve on Tuesday was "what a great idea". Walking among eucalyptus trees looking for grey bums on branches was very popular and we even witnessed one koala bear walking along the ground. Following an excellent lunch, an impromptu cricket match began. This provided the opportunity for our North American friends to demonstrate that anyone brought up playing baseball was perfectly adapted for slugging a cricket ball beyond the boundary every time it was bowled, unfortunately there was no chance that rain would stop play. Clearly the rules of cricket were invented to prevent Americans from learning the game.

That evening everybody descended onto the same Portuguese Restaurant, which came highly recommended by Pete Cranston. By the time Pete arrived the restaurant was full and I guess that's the last time he'll be so generous with his knowledge.

After such an enjoyable day off from presentations, I was amused to find the first session on Wednesday considered chironomids as a nuisance. These sessions not only led me to reflect on how much other chironomid workers depend on systematics, but also what a lot of nice places they manage to visit in the world.

Presumably, the details of the business meeting on Wednesday will be reported elsewhere. However, I would like to record our gratitude to Odwin Hoffrichter for offering

to host the next symposium at Freiburg in Germany, probably in September 1997 (see page 16).

And so the academic part of the Symposium was already over, time really does fly when you are enjoying yourself. But we still had good times ahead, beginning with the conference meal at the National Aquarium. I was anticipating really fresh fish for the main course but was to be disappointed, but only in this one respect.



The food, wine and company were all excellent as the convivial atmosphere throughout the Symposium came to a crescendo. We did not, however, forget about chironomids. Daryl Nielsen, from the Murray-Darling Freshwater Research Centre, used two bottles of a revered Australian beer to demonstrate the location of thoracic horns on a pupa. My evening was made when our resident opera singer, Berthold Janecek, made me an honorary Austrian.

Before we could recover from this remarkable evening, we were rising with the dawn sun for Thursday's excursion to the Murray river, in the Snowy Mountains. Sensible participants opted to walk downstream but the rest of us thought we would prefer rafting, swimming and drowning. As a proponent of using chironomid pupal skins in biomonitoring I was pleased to see evidence supporting the assumption that

from chironomid meetings

drifting material in rivers does not go far before it becomes entrapped behind an obstacle. You could frequently see a dinghy full of people rocking back and forth like crazed fans of a heavy metal band, attempting to get their raft off its rocky perch. The rock band metaphor being accentuated by the colourful sunscreen "war paint" worn by many of the crews. The dehydrated land-based contingent walked down to the picnic site just as the hydrated rafters squelched up to it. We soon recovered from our contrasting experiences with plenty of good food and wonderful cold beer, how can anyone drink warm beer?

Travelling to this Symposium was obviously prohibitively expensive for many chironomid workers outside of Australia but then the reverse is true for Australians travelling to most other countries. Those of us fortunate enough to attend were well rewarded. Everything ran so smoothly while Pete Cranston and his helpers appeared to be relaxed and enjoying themselves. Maybe like the Australian Black Swan, while all appeared serene above water, the legs were flapping madly but out of view. On behalf of all participants thank you for a great Symposium.



Les Ruse

National Rivers Authority
Fobney Mead, Rose Kiln Lane
Reading, Berkshire RG2 0SF, U.K.



Presentations given at the Symposium which has been dedicated to Professor Lars Brundin

OPENING: E.J. Fittkau: A valediction for Lars Brundin

THIENEMANN LECTURE (sponsored by the Commonwealth Environment Protection Agency):
R.K. Johnson: The indicator concept and its use in biomonitoring.

Ali A.: Some aspects of ecological, behavioural and control studies of pestiferous Chironomidae of central Florida, U.S.A. [poster]

Ali A., Barbato L. et al.: Two possibilities of reducing some nuisance of *Chironomus salinarius* in Venice, Italy.

Anderson T. & Sæther O.A.: The first record of *Buchonomyia* Fittkau and the subfamily Buchonomyiinae from the New World. [poster]

Armitage P.D., Blackburn J.H. et al.: Chironomidae in freshwater habitats in Tenerife, Canary Islands.

Ashe P.: Description of a late-instar larva of *Buchonomyia thienemanni* Fittkau and further data on its ecology with diagnoses for the subfamily Buchonomyiinae and the genus *Buchonomyia*.

Barton D., Oliver D.R. et al.: A comparison of pupal exuviae and larval Chironomidae for biomonitoring of the impacts of agricultural practices on surface water quality.

Berg M.B.: The infestation of domestic water supplies by chironomids.

Boothroyd I.K.G.: Temporal and diel drift of Chironomidae larvae in a northern New Zealand stream.

Boothroyd I.K.G. & Cranston P.S.: Two Orthoclaadiinae genera common to New Zealand and Australia: *Matakiri* n.gen and *Eukiefferiella* Thienemann.

Butler M.G., Kiknadze I.I. et al.: Cytologically identified *Chironomus* species from lakes in North Dakota and Minnesota, U.S.A.

Case S.T.: A high molecular mass complex of *Chironomus* silk proteins.

Caspers N. & Heimbach F.: The chironomids of an experimental pond system. [poster]

Chen Z.Z., Fabb S.A., Martin J. et al.: Comparison of a gene for a possible sex-influenced protein in *Chironomus* and *Kiefferulus*.

Clark G.M.: Assessing stress using asymmetry: better than deformities?

Contreras-Lichtenberg R.: A contribution to the knowledge of the females of *Demeijerea rufipes* (L.). [poster]

Cranston P.S. & Kitching R.L.: The Chironomidae of Australian phytotelmata (plant-held waters). *Richea pandaniformis*. [poster]

Ferrington Jr. L.C.: Utilization of anterior headcapsule structures in locomotion by larvae of *Constempellina* sp.

Ferrington Jr. L.C. & Sæther O.A.: Two Afrotropical species of *Parakiefferiella* Thienemann, with a review of species with palpal projections.

Gardarsson A., Olafsson J.S. et al.: Monitoring chironomid numbers at Myvatn, Iceland: the first sixteen years.

Gislason G., Hrafnodottir T. et al.: Monitoring flight periods of midges (Chironomidae and Simuliidae) in R.Laxa, N-Iceland 1977-1992.

Grzybkowska M.: Impact of human-induced flow perturbation on the chironomid communities in the first order stream section (central Poland).

Hardwick R.A., Wright I.A. et al.: Rapid biological assessment of water quality using chironomidae.

Hillman T.J. & Nielsen D.L.: Chironomid assemblages of temporal and permanent water bodies in a floodplain forest. [poster]

Hirabayashi K., Nakazato R. et al.: A study on phototaxis for adult Chironomidae by artificial light in Lake Suwa, Japan.

Hoffman R.T. & Case S.T.: A special lobe-specific cDNA from *Chironomus riparius* (syn. *thummi*) salivary glands.

Int Panis L., Goddeeris B. et al.: On the relationship between oxygen microstratification in a pond and the spatial distribution of the benthic chironomid fauna.

Janacek B.F.U.: *Tanytarsus niger* Andersen and the chironomid community in Gebhardsteich, a carp pond in northern Austria.

Janssens de Bisthoven L., Huysmans C. et al.: The in situ relationship between sediment concentrations of micropollutants and morphological deformities in *Chironomus gr. thummi* larvae from lowland rivers (Belgium).

Kobayashi T.: *Eurycnemus* sp. larvae ectoparasitic on pupae of *Goera japonica* (Trichoptera: Limnephilidae).

Lindgaard C. & Brodersen K.P.: Distribution of Chironomidae in the river continuum

Madden C.P., Austin A.D. et al.: Pollution moni-

How to order
the Proceedings of the
Canberra Conference?
see page 19

toring using chironomid larvae: what designates a deformity?

Martin J.: A mutation in *Chironomus tentans* Fab. that leads to gynandromorph and mosaic formation.

Murray D.: A new species of Tanytopodinae from Sulawesi. [poster]

Nolte U.: From egg to imago in seven days: *Apedilum elachistum*.

de Oliveira S.J., Messias M.C., et al.: A new genus and a new species of neotropical Orthoclaadiinae.

Pettigrove V., Korth W. et al.: The impact of pesticides used in rice agriculture on larval chironomid morphology.

Postma J.F. & Davids C.: Induction of cadmium in a laboratory culture of *Chironomus riparius*.

Prat N. & Rodrigues-Capitulo A.: Population dynamics of Chironomidae associated with *Nuphar lutea* leaves in natural wells in the Ebro delta (NE Spain).

Rieradevall M.: Chironomidae of urban artificial ponds and fountains in Barcelona (Catalonia, Spain). [poster]

Rieradevall M., Garcia-Berthou E. et al.: Chironomids in the diet of fishes in Lake Banyoles (Catalonia, Spain).

Ruse L.P. & Wilson R.S.: Long-term assessment of water and sediment quality of the river Thames using chironomid pupal skins.

Saxena S.: Basic patterns in the chromosome evolution of the genus *Chironomus*. Polytene chromosomes of three Indian species, viz. *C. plumatsetigerus*, *C. calypterus* and *C. sp.*

Schreiber E.S.G.: Stream drift of Chironomidae: diel and seasonal patterns in the Acheron river, Victoria, Australia.

Smith M. & Cranston P.S.: "Recovery" of an acid mine-waste impacted tropical stream - the chironomid story.

Stevens M.M.: Biology and control of *Chironomus tepperi* Skuse, a pest of rice in New South Wales.

Sublette J.E. & Martin J.: Morphological Variation in secondary sexual characteristics of gynandromorphic *Chironomus tentans* Fab. [poster]

Suter P., Goonan P. et al.: The response of chironomid populations to flooding and drying in flood plain wetlands of the lower river Murray and south Australia.

Wotton R.S. & Armitage P.D.: Size of midges emerging from newly-filled ponds. [poster]

Deadline for the next CHIRONOMUS
1st of April
1996



YUSURIKA

Japanese group for the study of chironomids

ユスリカ研究会会報

In April 1990, the Japanese group of chironomid workers was established with the purpose to promote chironomid research and exchange related information. At present (April 1994), we have 34 members: 32 from Japan, and Dr Hang-II Ree from Korea and Dr E.A. Makarchenko from Russia. Our main activities are the organization of an annual meeting and the publication of our newsletter YUSURIKA (Japanese for chironomid). Next time we will meet in Yamanashi, in June 1994 (see also page 14). The 1st annual meeting was held in Kurobe City in April 1990, the 2nd meeting at the Suwa Hydrobiological Station, Shinshu University (Suwa City) in May 1992 with 17 participants. In July 1992, the 3rd annual meeting took place at the National Institute for Environmental Studies (Tsukuba City) and was attended by 21 participants. The following 13 papers were presented:

1. **Sasa M.:** Taxonomical problems of Japanese Chironomidae: an opening remark.
2. **Hirabayashi K. & Nakazato R.:** Resting behavior of *Tokunagayusurika akamusi* (Tokunaga) adults near Lake Suwa.
3. **Iwakuma T. & Ueno R.:** Feeding habits and growth of *Procladius* larvae in relation to prey chironomid population.
4. **Kikuchi M.:** Emergence of Chironomidae from the spring 'Ooido', Mito, Japan.
5. **Kobayashi T.:** Morphology of *Stempellinella tamaseptima* (Sasa).
6. **Kondo S.:** Habitat of *Hydrobaenus kondoi* Sæther in the middle reaches of the River Kiso with special reference to the grain size of the river bottom sediments.
7. **Murakami G. et al.:** Analysis of allergens from Japanese chironomids.
8. **Nakazato R. & Hirabayashi K.:** Population dynamics of chironomids in the littoral zone of Lake Suwa.
9. **Narita T.:** Temporal and spatial changes in the vertical distribution of *Tokunagayusurika akamusi* (Tokunaga) larvae in Lake Biwa bottom sediments.
10. **Nishino M. et al.:** Distribution of adult chironomids, *Tokunagayusurika akamusi* (Tokunaga) on the shore of Lake Biwa.

11. **Ohno M.:** Chironomidae of three artificial canals (Nobidome Canal, Tamagawa Canal, Senkawa Canal) originating from secondary treatment effluents.
12. **Sugaya Y.:** Susceptibility of several species of chironomid larvae to insecticides.
13. **Ueno R.:** Structure of the ventromental plates of several species of Chironominae.

The 4th annual meeting was held at the Lake Biwa Research Centre, Otsu City on June 19 1993, where the following nine papers were presented:

1. **Himeno M. et al.:** Effects of toxic protein from *Bacillus thuringiensis* on chironomid larvae.
2. **Hirabayashi K. et al.:** Distribution of chironomid larvae in Lake Kawaguchi.
3. **Iwakuma T.:** Growth and production of chironomids in a mire pool.
4. **Kobayashi T.:** The genus *Brillia* and related genera.
5. **Kondo S.:** Biology of *Hydrobaenus kiso-secundus* inhabiting the middle reaches of the Kiso river.
6. **Kondo S. & Oba M.:** Toxicity of *Bacillus thuringiensis* serovar. *israelensis* against chironomid larvae.
7. **Nishino M. et al.:** Number of adults of *Tokunagayusurika akamusi* along the shore of the south basin of Lake Biwa: results of 2 years.
8. **Ohno M. & Komeiji T.:** Effects of PAC and ozone treatments at a sewage treatment plant on downstream chironomid communities.
9. **Ueno R.:** Morphological features of larvae and pupae of *Biwatendipes* in comparison to some other Tanytarsini genera.

Toshio Iwakuma

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Short Communications

News on Podonominae and Diamesinae from China

The Podonominae and Diamesinae of China are poorly studied. Only a few records have been published by S. Wang & J. Wang (1991) and X. Wang & L. Zheng (1992), and the authors remarked that most of the species were identified by larvae, thus correction may be necessary in future.

In December 1993, we had a meeting in Vladivostok and looked at some microscope slides of pupae and imagoes of Podonominae and Diamesinae from China and identified six species. Since all of them were new for China, we decided to publish this short communication in *CHIRONOMUS*, hoping it will be of interest to many of the readers.

Podonominae:

- *Boreochlus thienemanni* Edwards, 1938. Male, Fengshan, Liaoning Prov. China, Sept. 1980, leg. Juncai Wang.

Diamesinae:

- *Diamesa aberrata* ? Lundbeck, 1898. Male, Mt. Emei, Sichuan Prov. China, May 18, 1986, leg. Xinhua Wang.
- *Diamesa pankratovae* Makarchenko et Bulgakov, 1986. Male Menyuan, Qinghai Prov. China, July 15, 1989, leg. Xinhua Wang.
- *Diamesa tsutsuii* Tokonaga, 1936. Male and pupa, Fengcheng, Liaoning Prov. China, April 23, 1992; male, Ditaitou, Liaoning Prov. China, May 1993, leg. Juncai Wang.
- *Pagastia orientalis* (Tshernovskij, 1949). Female and pupa, Qingyuan, Liaoning Prov. China, March 1985, leg. Juncai Wang.
- *Sympotthastia takatensis* (Tokunaga, 1936). Male, pupa and larva, Huanren, Liaoning Prov. China, date ?, leg. Juncai Wang.

We are indebted to Dr. Juncai Wang from the Central Station of Environmental Monitoring, Liaoning Province, Shenyang who made Diamesinae material from the Liaoning Province available to us.

Literature cited:

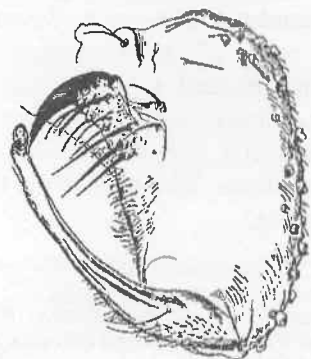
- Wang & Wang 1991: Acta Hydrob. Sinica 15: 35-44
Wang & Zheng 1992: Netherl. J. Aquat. Ecol. 26: 247-255

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**Update on a key to pupal exuviae of west Palaearctic Chironomidae**

The adults of *Parakiefferiella* sp.d. Wülker (page 138) have now been described and named *P. wülkeri* by J. Moubayed (Br. J. Ent. Nat. Hist. 7: 7-10).

The pupa of *Parachironomus acutus* (Goetghebuer) runs to *arcuatus*, from which it differs in having the lateral setae of segments I-III spine-like.

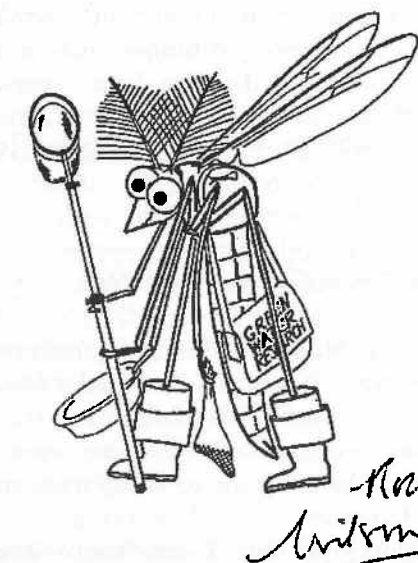
Peter H. Langton

Possible glacial relict population in the Scottish highlands.

Jane Atkins, whilst walking the Cairngorms with her husband, Roy, in summer '92 kindly collected exuviae for me from lenitic sites encountered. Three neighbouring lochans near the summit of Ben Macdui yielded series of *Tokunagaia tonollii* Rossaro and *Micropsectra radialis* Goetghebuer, both species new to the British list and not encountered by me over many years of collecting in the Scottish highlands. Other lakes and pools sampled on the same walk did not yield either of these species.

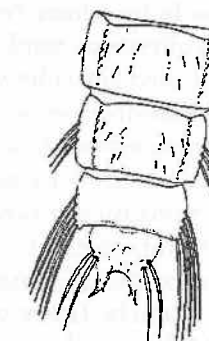
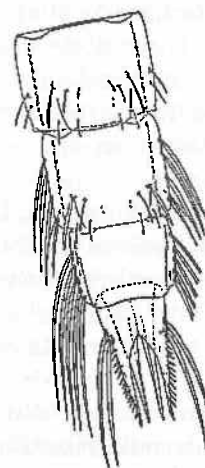
Peter H. Langton

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**If not "filaments", then what?**

Under this title in *CHIRONOMUS* No.4 I posed the problem of the misuse of the word "filament" for the broad flattened seta of pupal exuviae and invited suggestions for an accurate replacement term. Chironomists are notorious for not communicating and this was no exception! Therefore I have made a decision, which I have floated amongst a number of colleagues who have given their approval: **taenia** (plural: taeniae, adjective: taeniate).

Peter H. Langton





The University of Kansas

Lawrence, March 1994

Dear Fellow Chironomid Workers,

For my Master's thesis, I analyzed chironomid communities in streams impacted with chlordane. Knowing that chlordane binds to organics and settles out into depositional areas of streams, I hypothesized that chironomid taxa living in those areas and feeding on fine organics would be more severely affected by chlordane's presence in the aquatic system. As I began to categorize my chironomid taxa based on larval ecology, I ran into some barriers.

As you probably know, there are scattered reports and lists of larval ecology in the literature. Some of the more comprehensive are Beck (1977), Simpson and Bode (1980), Wiederholm (1983), Coffman and Ferrington (1984), Hudson et al. (1990), and Epler (1992). How could I combine the information from these works into one coherent system for my thesis? Do I use functional feeding groups as Coffman and Ferrington (1984) suggest? If I do, then *Chironomus* and *Tvetenia* would be placed in the same category under "collector-gatherer". If I add that one is a "sprawler" and another a "burrower" these taxa are distinguished, but this will begin to become confusing as I incorporate more taxa. And how do I use data from Beck (1977) in my functional feeding group strategy. If a taxon is "embenthic" and "omnivorous" to which functional feeding group does it belong?

I also considered using only microdistributional classifications to group my taxa, but then predators living on the silty sediments of depositional areas would be placed with collector-gatherers in the same microhabitat. This was not satisfactory because their diets could have a differential effect on their uptake of chlordane and, therefore, their role in the community analysis. How about using merely trophic levels? Then we would place the predators that occur more often in erosional/transitional zones with those in the silty depositional zones.

Clearly, there was a problem not only in organizing the data from previous literature, but also using the traditional functional feeding groups or other classical classification methods for chironomids. How could I categorize existing data into a useful standardized format that would also allow for future additions? Does larval ecology even fall into "groups" that we can describe and generalize or is this family just too diverse and each taxon has its own unique strategy?

What did I do for my thesis? I classified my taxa into the traditional functional feeding groups, which indirectly considers diet, but also added some microdistributional information to better suit chironomid ecology. This, I believe, worked sufficiently to analyze my thesis data, but subsequently I have thought that using the traditional functional feeding terminology will still mislead people into gross generalizations of larval chironomid ecology.

The diversity of the Chironomidae calls for greater resolution in their ecological analysis than is presently available. To avoid confusion and clarify the role of chironomid larvae in aquatic systems, I concluded that a new classification system would be beneficial; one that combined diet (trophic level/functional feeding strategy) and microdistribution. What follows (page 12) is my first attempt at creating such a system. I feel this classification system better describes the "types" of ecological partitioning that occur in different groups of larval chironomids than does other classification methods. This system should increase the relevance of chironomid ecology in biomonitoring studies and alleviate some confusion as to how to treat them in community analyses. The system may also become useful to systematists by allowing easier analysis of larval behavior across higher taxonomic levels.

I constructed this system after reviewing much literature (the works cited in this paper are just some of the larger ones) concerning the larval ecology of as many taxa as possible in the time I had available. I believe the most common species or genera may be reliably placed into the listed categories. Species or genera may share some characteristics of several categories, but I believe the appropriate category should be assigned based on preferential behavior (e.g. *Cricotopus bicinctus* larvae will build tubes on soft sediments, but usually occur in greater numbers on other surfaces in faster waters).

As more and more researchers strive to rear larvae to adults before describing new species, how much extra effort would it be to include the microdistributional information about the larvae and look into the guts of mounted larvae to make notes on the food ingested. This would be a priceless bit of knowledge for studies in aquatic ecology, would not require much more time commitment, and would further ensure that species are reared before described.

The real debate I feel will not come over this system itself, but the assignment of taxa to these ecotypes. We may find that many species or genera vary in their ecotypic behavior from region to region or that taxa just don't have one major ecotype, but until we compile this information we really are **guessing** much of the time. Many of the answers may be sitting out there in separate works waiting to be brought together.

In my ecotypic categories below, I've included some general taxonomic groups that fit each ecotype merely to illustrate my reasoning. **In the future, I would like to start a database of taxa with their ecotypic assignment based upon existing data or data yet to be collected.** I've already started this for the taxa present in my thesis study. I also believe that these ecotypic categories could be added to or changed to include lentic habitats and more specialized larval ecologies, but as of yet I have decided to wait for suggestions.

This system is in its extreme infancy and I am sure that I've missed some obscure references so anyone with knowledge of these, please make me aware of them. I will in the future also try to come up with a bibliography of papers and books dealing with larval ecology. I encourage you to analyze the system and make any comments, quips, or critiques of the ideas presented here.

Thank you

Chris Wright

e-mail: CAWRIGHT@UKANVM



Ecotypes of larval chironomids in lotic waters:

1. Occur preferentially in or on soft sediments in depositional zones, "static" tube-builders (stay in one place), collector-gatherers, detritivores: some Chironomini (*Chironomus*, *Glyptotendipes*).
2. Occur preferentially on substrates in depositional and/or transitional zones other than soft sediments (may on occasion occur in or on soft sediments), "semi-dynamic" tube builders (stay in original tubes but tubes may be extended over time), collector-gatherers/filterers/grazers, detritivore/algivore: some Chironomini (*Dicrotendipes*), most Tanytarsini.
3. Occur preferentially on substrates in erosional and/or transitional zones, may or may not build tubes (many are dynamic tube builders - move around and build new tubes when resources around are depleted), scraper-grazers, algivore/detritivore: many Orthocladiinae (*Cricotopus* (*C*) spp., *Orthocladius* (*O*) spp.).
4. Mine living and/or dead plant material, shredder/gouger, collector-filterer, herbivore/detritivore: *Stenochironomus*, *Cricotopus* (*I*) *sylvestris*, some *Glyptotendipes*.
- 5a. Free-living predator/omnivore occurring mostly in depositional zones: *Procladius*, *Ablabesmyia*.
- 5b. Free-living predator/omnivore occurring mostly in erosional/transitional zones: *Conchapelopia*, some *Cryptochironomus*, some *Rheocricotopus*.



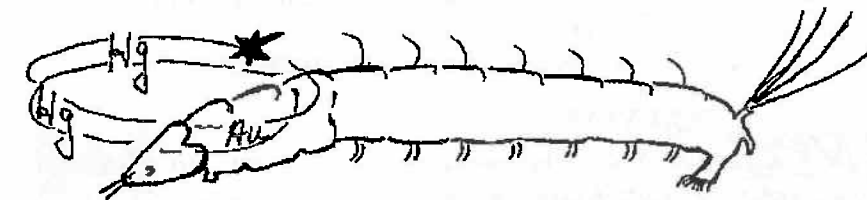
6. Larvae living in peculiar habitats or having unusual life histories (hyporheic zones, semi-terrestrial, parasitic on other animals, unknowns. These could later be made into individual categories?): some *Limnophyes*, *Chaetocladius*, *Pseudosmittia*, *Krenosmittia* etc.

Literature Cited:

- Beck Jr. 1977. U.S. Env. Prot. Agency, Cincinnati, OH. EPA-600/4-77-024. 261 pp.
 Coffman & Ferrington Jr. 1984. In Merritt & Cummins (eds.). An Introduction to the Aquatic Insects of North America. 2nd Ed.
 Epler 1992. Florida Dept. of Env. Reg. 304 pp.
 Hudson, Lenat & Caldwell 1990. Fish and Wildlife, No. 7. 46 pp.
 Simpson & Bode 1980. Bull. New York State Mus. No. 439. 105 pp.
 Wiederholm 1983 (ed.). Ent. Scand. Suppl. 28. 482 pp.

Chris Wright

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 2041 Constant Avenue
 Lawrence, Kansas, 66047-2906 (USA)

**Enjoying heavy metal downstream a gold mining area**

During the last few years, the communities of Cuiabá and Poconé, two towns at the northern edge of the Pantanal (South America's largest wetland area in mid-western Brazil) were repeatedly alarmed by reports of mercury-contaminated fish from the Pantanal posing a threat to the health of the consumers. These warnings refer to the fact, that since the 1980s approximately 130 gold mines were created within an area of only 7 km² near Poconé (area in 1990, P. Zeilhofer pers. comm.). Since then, an estimated 10 to 15 tons of mercury has been released into the environment.

Mercury is employed for amalgamation to separate gold from ore by means of specific weight, thus the huge tailings of contaminated waste cause a high mercury emission to the environment. During 1992/93, the first data series were taken on mercury deposition in the environment and the chemical speciation of the heavy metal passing the Hg-sources (mining sites) and flowing into the Pantanal. These pilot measurements on bioaccumulation showed that larvae of *Coelotanypus* sp., a large and abundant benthic chironomid, displayed unexpected low concentrations of total mercury, with a maximum of only 10.6 ± 0.7 ng Hg/g fresh weight (n = 3, digestion according to Nagase et al. 1980, analyzed by AFS, Brooks Rand Ltd., gut clearance time: 12 hours). This value was measured 2.6 km downstream from a gold mine's discharge of waste-water - no macro-benthos occurred closer to the

outflow. (Just to give a value for comparison: This is 50 times less than the WHO health advisory limit for Hg in food for human consumption.) Despite the few *Coelotanypus* samples taken, it was noted that Hg content of larvae was higher in older instars, and decreased with increasing distance from the Hg-source. In 1994, we plan to study mercury accumulation in chironomids (for these are the most numerous benthic insects in the river studied) in relation to ambient conditions, abiotic gradients, and biotic factors such as life cycles, max. size/biomass attained, and functional feeding groups. To our knowledge, these are the first studies on Hg-bioaccumulation by insects in the tropics (systems typified by short life histories, high water temperatures, low oxygen concentrations at the sediment/water interface), and we would appreciate an exchange of ideas, experiences and literature relevant to this topic.

Literature cited:

- Nagase, Ose, Sato, Ishikawa & Mitani, 1980. Int. J. Env. Anal. Chem. 7: 285-293

Wolf von Tümpling Jr.

present address:
 GKSS, Institut für Chemie
 Max-Planck-Straße
 21502 Geesthacht (Germany)

Ulrike Nolte

Box c.p. 3091
 78060-200 Cuiabá - MT (Brazil)

Notice - Board

In Response to CHIRONOMUS No. 5



EXUVIAE !

I did get the spelling right in my submission for CHIRONOMUS ! (see No. 5, page 22). Having shouted loud and long about the mis-spelling of exuviae (singular and plural, as in the words 'series' and 'species') (Langton 1981), it is highly embarrassing to find the mis-spelling in one of my submissionsI can already hear the roars of

laughter from some colleagues when they see it !!

Somewhere in the editorial there could be somebody with macabre sense of humour I suppose (!!)



Peter H. Langton

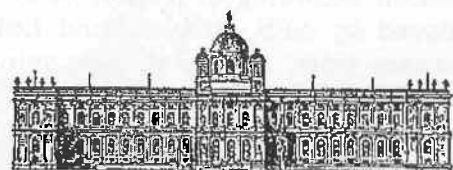
3 St. Felix Road, Ramsey Forty Foot
Huntingdon, Cambridgeshire, PE17 1YH (U.K.)

Meetings

- (1) June 1994.....5th annual meeting of Japanese chironomid workers
- (2) July 1994.....1st workshop of Austrian chironomid workers
- (3) August 1994.....3rd International Congress of Dipterology in Canada
- (4) July 1995.....SIL Conference in Sao Paulo, Brazil
- (5) End of 1995.....Workshop on chironomids from the Far-East in Russia
- (6) September 1997.....13th International Symposium on Chironomidae in Germany

(1) The 5th annual meeting of Japanese chironomid workers will be held on 4th of June 1994 in the Prefecture of Yamanashi, west of Tokyo. Until now (01/04/94) 12 contributions have been submitted, five of which are related to ecology, three to taxonomy and biogeography, three to midges as pest organisms, and one to data processing. For further information please contact: Dr **T. Iwakuma**, National Institute for Environmental Studies, Onogawa 16-2, Tsukuba, Ibaraki 305 (Japan).

(2) The 1st workshop of Austrian chironomid workers is planned to be held in July 1994 at the Museum of Natural History of Vienna. This time it will be an informal meeting for exchanging ideas and experiences with the aim to coordinate chironomid research in Austria for facilitating

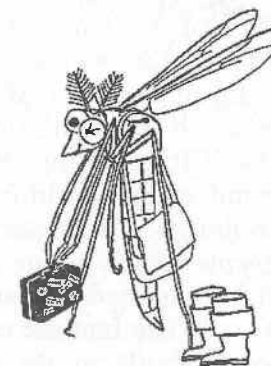


cooperation and joint projects. For further information please contact: Dr **R. Contreras-Lichtenberg**, Naturhistorisches Museum Wien, Box 417, 1014 Vienna (Austria).



(3) The 3rd International Congress of Dipterology will be held from August 15th to 19th 1994, Guelph - Ontario (Canada). For details see CHIRONOMUS 4, p. 21. Contact address: Dr **I. R. Walker**, Biology Dept., Okanagan College, Kelowna, B.C., Canada V1Y 4X8. Fax: [604] 862-4910, E-Mail: iwalker@admin.okanagan.bc.ca.

(4) BraSIL (touring tip): In the 1st circular for the SIL Conference, the northern Pantanal (Cuiabá) is listed among the destinations for a post-conference tour. The beauty of these wetlands are indeed unique, not in the least because they are as yet touristically little exploited.



Chironomid workers who will attend the SIL conference may think such a tour will be a nice occasion, facilitated by the fact that I (Ulrike) live in Cuiabá. Unfortunately, I am not able to organize any tour linked with the SIL conference, since my contract at the University of Cuiabá, where I am presently employed as guest-lecturer, will end in July 95. Otherwise I would have loved to offer to chironomid people a few-days excursion to the northern Pantanal as well as to the Chapada - a tableland 60 km north of Cuiabá with beautiful streams and waterfalls. I do regret that this won't be possible, but just then I'll be packing up my bags.

Anyhow, among the seven options listed in the SIL circular, I can recommend a tour to the Pantanal. Late July is in the dry season in the northern Pantanal and there are still midges around but no mosquitoes (!). Thousands of birds, caimans, capybaras and other wild life will aggregate near the shrinking water bodies, and, as it will be early spring time, with some luck one will catch the big bang flowering of the *Tabebuia* trees displaying a pink and yellow splendour.

Ulrike Nolte

(5) **Far-Eastern Chironomid Workers:** Let us unite! From the 16th to 22nd of December 1993, we had a meeting in Vladivostok where we discussed a future joint project on "Biosystematic studies on the subfamilies Podonominae, Diamesinae and Prodiamesinae from China". This project should include a cooperation of all scientists from the Far East who study the fauna, taxonomy, and systematics of Chironomidae. Chironomids from our region have to be revised, and a future aim of this joint project is to prepare a monograph (or monographs) and identification books. We feel that many chironomid workers in the world are waiting for information on taxonomy and distribution of far-eastern species because our region is very interesting and important for understanding of zoogeography. Depending on financial supports by the Academies of Sciences of Russia and China, we hope to be able to start this project in April 1994.

One result of our recent discussion is the idea to invite chironomid workers from China, Japan, Korea and Russia and other places who are interested in studies on far-eastern Chironomidae. Our preliminary plan is to organize such a meeting in October or November 1995, that may take place in Vladivostok (Russia) or Tianjin (China). In February 1994, Dr E.A. Makarchenko was in Japan to discuss this joint project with Japanese colleagues. Certainly,

the meeting will be open for everybody interested in this subject, and we shall be very grateful for any logistic and financial support for our meeting.

Please, send your opinions and comments about our idea to Dr E.A. Makarchenko, E-mail: dvo@stv.sovam.com fax: [4232] 310193; phones [4232] 310194 (office) or [4232] 317208 (home).

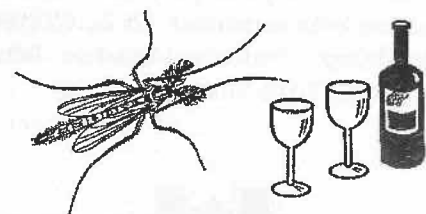
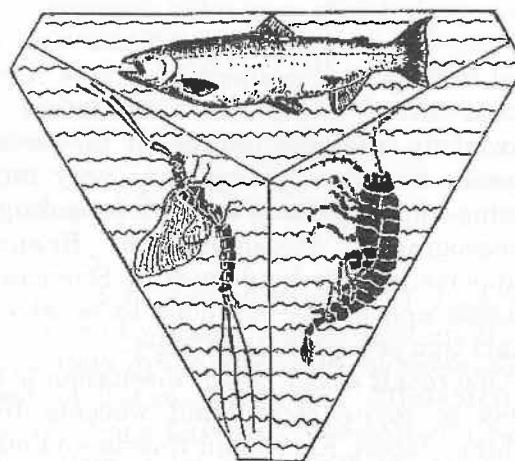
E.A. Makarchenko

Institute of Biology and Pedology,
Russian Academy of Sciences
690022 Vladivostok (Russia).

Xinhua Wang

Biology Department, Nankai University
Tianjin, 300071 (China)

**Laboratory of Hydrobiology
Vladivostok**



(6) Freiburg im Breisgau, the meeting-place in 1997: In Canberra, it was decided to hold the next International Symposium on Chironomidae at the University of Freiburg in Germany. September appears to be the best month for the meeting, and we hope it won't conflict with other conferences.

Freiburg lies close to the French and Swiss border and is blessed with the most pleasant climate, Germany has to offer. (Don't confuse our Freiburg, the capital of the Schwarzwald (Black Forest) with the -bilingual - Freiburg or Fribourg in Switzerland.) Due to the warm climate of the upper valley of the river Rhine, excellent wine is grown in Breisgau, the district of Freiburg. The "City of Wine, Forest and Gothic" is proud of its world-famous cathedral, the Freiburger Münster, with its unique steeple which is one of the few structures that remained undamaged during World War II. The historic centre of Freiburg has been rebuilt in its authentic look being provided with modern facilities. Next year, the 200,000 citizens will celebrate the town's 875th anniversary. Freiburg is a pretty green city and thus "a place to have conferences, where others spend their holidays".

The closest international airport is the EuroAirport Basel/Mulhouse/ Freiburg, from where a shuttle bus goes to Freiburg several times a day. The city is connected to the federal railway system, and express trains arrive every hour, providing convenient access from Frankfurt and Zürich airports.

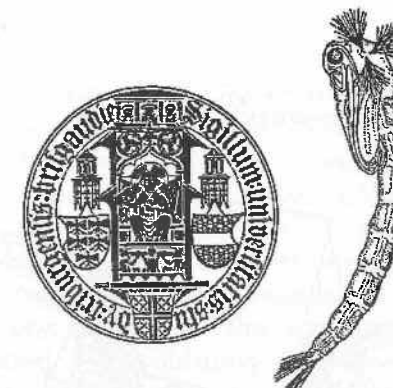
There are many hotels (from luxury to economy category), apartments, private rooms to rent (B&B), one youth hostel and a few camp sites. There are also some fly & rail and rail & hotel programs. Accom-

modation may also be taken in the many villages close to Freiburg. Our suggestion is that you make your reservation through the municipal tourist office (details will be given in the next *CHIRONOMUS*). If you wish to combine the symposium with holidays in or near Freiburg, there are a variety of programs available through the office.

Our university is approximately 540 years old, teaching at present 25,000 students. The Institute of Biology I (Zoology) is still located in the university complex of Natural and Biomedical Sciences, but will move to a new building, which might be already inaugurated in 1997. This new institute is near the botanical garden in the vicinity of other institutes of biology (plant sciences, genetics, molecular biology etc.) in close walking distance to the downtown area. Both localities offer appropriate space to hold the 13th International Conference on Chironomidae.

Odwin Hoffrichter

Institut für Biologie I, Albertstraße 21a
D-79104 Freiburg (Germany)



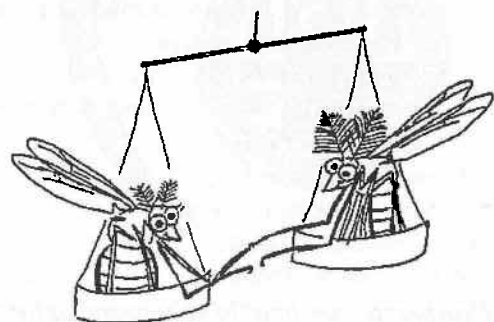
In Canberra, we briefly discussed where the 14th Symposium could take place in order to prepare and facilitate the decision that has to be made in Freiburg. Having in mind that it should be a centrally located place, allowing an inexpensive access for most of us, the following places were offered (listed in alphabetical order): Barcelona (Catalan, Spain) offered by Dr Narcis Prat and Dr Maria Rieradevall, Lawrence (Kansas, U.S.A.) offered by Dr Leonard C. Ferrington Jr., Uppsala (Sweden) offered by Dr Richard K. Johnson, and Vienna (Austria) offered by Dr Ruth Contreras-Lichtenberg.

Deadline for the Directory

Have you reviewed your submission for the directory yet? Please complete the form on page 38 and re-submit it before the end of September 1994 to Don Oliver and Mary Dillon *

Research Requests

Sex-specific weight?



I am interested in sexual weight dimorphism in chironomids, and have considerable intraspecific data on sex-specific dry weights of *Chironomus cucini* as mature larvae and pupae. I would like to compare the degree of dimorphism to that seen in other *Chironomus* species or other chironomid taxa, but I find little sex-specific biomass data in the literature. If anyone has, or knows of, such data and would willing to share it, I would be happy to hear from them.

Malcolm G. Butler
 Zoology Department
 North Dakota State University
 Fargo, N.D. 58105 (USA)

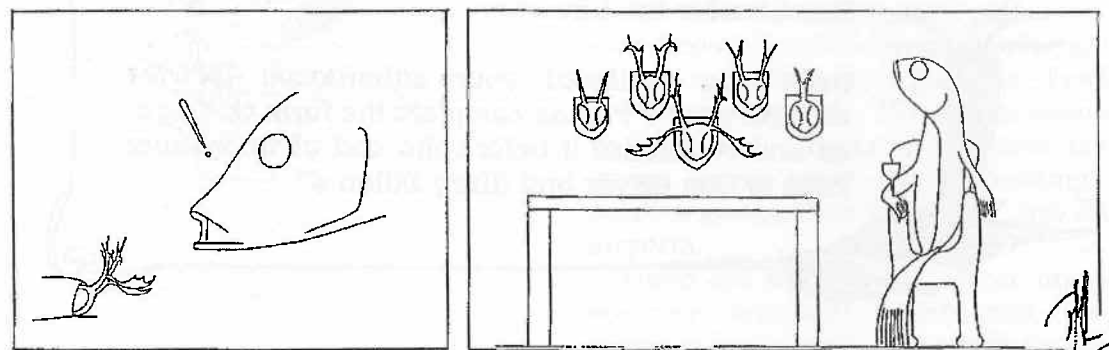
How to rear chironomid larvae in mass culture ?

In order to meet the needs of aqua culture in China, we are going to start a research project on artificial mass culture of chironomid larvae. As we have little experience in this area, we are requesting information from the international community of chironomid workers on the following topics:

1. Techniques, bibliographic data, and information on any experience with indoor mass culture of chironomid larvae (please, unpublished information also).
2. Addresses of companies with a commercial production on a national or the international market.

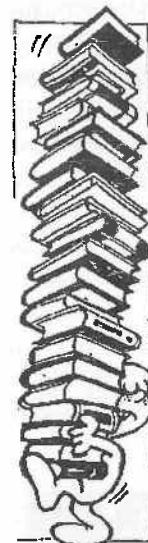
Thank you in advance for your cooperation, which will contribute to the success of our project. Any information is welcome, please address contributions to:

Xinhua Wang
 Dept. of Biology, Nankai University
 Tianjin, 300071 (P.R. China)



Books of Interest

Chironomidae. Biology and ecology of non-biting midges. Edited by P. Armitage, P.S. Cranston and L.C.V. Pinder. Chapman & Hall, 2-6 Boundary Row, London, SE1 8HN, U.K., fax: +44 71-522 9623



- provides information useful for research in water quality assessment and monitoring
- the most up-to-date comprehensive account of the ecology of Chironomidae since 1954 - provides you with current information all in one place
- contains useful information for work in the field of human allergenic responses

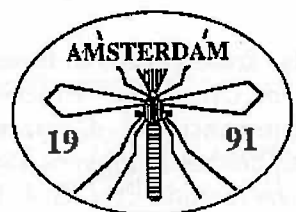
Contents: Introduction. Part 1: Morphology of all life stages, taxonomy and phylogeny of the group and biogeographical aspects - P. S. Cranston. Part 2: Biology and ecology; egg and first instars, larval habitats - L. C. V. Pinder. Larval food and feeding - M. B. Berg. The pupa and events leading eclosion - P. H. Langton. Emergence, dispersal and reproductive behaviour of adults - P. D. Armitage. Life-cycles, population dynamics and productivity, community structure and species interaction - M. Tokeshi. Part 3: Interactions with mankind, nuisance swarms, occurrence and control - A. Ali. Medical aspects - P. S. Cranston. Classification of water bodies and pollution - C. Lindegaard. Historical indicators of pollution - I. R. Walker. Chironomidae as food - P. D. Armitage. Conclusion - W. Coffman. Index. November 1994: c. 400 pp., 50 line illus., 30 halftone illus. Hardback: 0-412-45260-X: c. £ 60.00

Chironomids - from Genes to Ecosystems. Edited by P. S. Cranston. Proceedings of the 12th International Conference on Chironomidae held in Canberra 1994.

Contributions include Prof. E. J. Fittkau's valediction to Prof. Lars Brundin who died at the age of 86 on November 18th last year, and to whom the conference was dedicated. The obituary includes a full bibliography. The Thienemann lecture was given by Dr. R. K. Johnson on "The indicator concept in freshwater biomonitoring", and an appreciable cross-section of contemporary Australian chironomid research is included.

CSIRO Publications have set a date of December 1994 for the publication, at a price of \$Aus 70.-. Australians please add \$ 9.- for postage; for non-Australians please add "Economy Air" postage of \$Aus 20.-. This price takes account of a page charge subsidy volunteered by many of the contributors. The publication may be ordered now from the following sources: **CSIRO Publications**, attention: Paul Reekie, CSIRO Information Service Unit, Albert Street, East Melbourne, VIC 3002 (Australia) Fax: +61 3 4194096 - or - **ANIC Bookshop**, attention: Ray McInness, CSIRO Entomology, GPO Box 1700, Canberra, ACT 2601 (Australia) Fax: +61 6 246 4000.





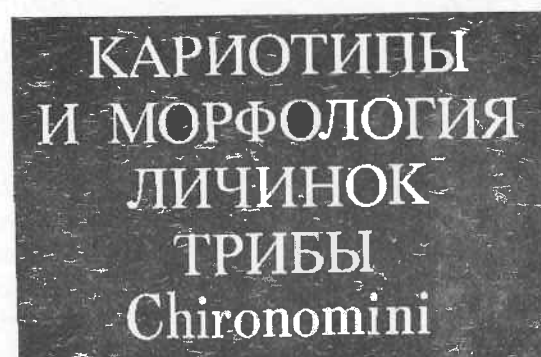
Proceedings of the 11th International Symposium on Chironomidae, edited by W. J. van de Bund and M. H. S Kraak, are still available. Published as Vol. 26, Nr. 2-4 of the Netherlands Journal of Aquatic Ecology. They cost DFL 100.- (ca. US\$ 65.-) and may be ordered from **Wouter van de Bund**, Aquatic Ecotoxicology, University of Amsterdam, Kruislaan 320, NL-1098 SM Amsterdam.

Karyotypes and morphology of larvae of the tribe Chironomini. Atlas, by Kiknadze I., Shilova A., Kerkis I., Shobanov M., Zelentsov N., Grebenjuk L., Istomina A. and W. Prasolov Nauka, Siberian Branch, Novosibirsk, 1991, 115 pp.; with 49 figures and 46 photographs. (in Russian)

In this monograph, data on karyotypes and morphology of 46 chironomid species are compiled. Eleven genera of Chironomini are included, all of them occurring in Russia, in particular West Siberia. In chapter 1 and 2, the tribe Chironomini is presented via photo maps of polytene chromosomes and figures of the larval morphology. The *Chironomus plumosus* group, a set of numerous closely related species within the genus *Chironomus*, is described in detail for the first time. Karyotype analysis is considered to be a tool decisive in the taxonomic identification of sibling species.

The karyotypes are represented by sets of polytene chromosomes of the salivary glands, as well as mitotic or meiotic plates,

There are some 20 copies of the **Proceedings of the 10th International Symposium on Chironomidae**, held in 1988 in Debrecen/Hungary, left for sale (2 vols. each). Interested persons should send a cheque of US\$ 60.00 (no eurocheques) or the equivalent in convertible European currency (eurocheques accepted) to **Odwin Hoffrichter** (address see page 38). The 2 volumes will be sent directly from Debrecen, together with a receipt or invoice, if ordered.



and for most of the species photo maps are given. In mapping karyotypes of the genus *Chironomus*, the system established by Keyl (1962) was mainly followed which permits the analyses of banding patterns in the chromosome arms A, E, and F. In mapping the *C. plumosus* group, the system elaborated by Maximova (1976) was also applied, with which the banding patterns in arms B, C, D and G were analyzed in addition. (The system used is indicated in the maps referring to the *C. plumosus* group) Karyotype characterization is given along with the polymorphism level for most of the species, and regions of fixed and fluctuated inversions are indicated.

In characterizing karyotypes, the localization of the nucleoli (N) and Balbiani rings (BR) is emphasized since understood to be a species specific feature. Some species, however, show intraorganic variations in their sets of BRs, so, for instance, in the cells of a special lobe of the salivary gland where additional BR encodes the synthesis of a specific secretion protein.

The final chapter of the atlas gives an introduction on how to handle chironomid larvae and prepare the material for karyotype analysis.

Some copies of this atlas are still available. Orders should be sent to Prof. **Dr. I. Kiknadze**, Institute of Cytology and Genetics of the Russian Academy of Sciences (Siberian Branch), Academician Lavrentiev avenue 10, 630090 Novosibirsk (Russia).

Literature cited:

Keyl, 1962: Chromosoma 13: 464-514.

Maximova, 1976: Tsitologiya 18: 1264-1269 (Russia)

Iya Kiknadze

Institute of Cytology and Genetics
630090 Novosibirsk (Russia)



The chironomid fauna of the state of West Bengal (India), by P. K. Chaudhuri. Published by the Zoological Survey of India (Government of India). For details contact Dr **P.K. Chaudhuri**, Dept. of Zoology, University of Burdwan, Burdwan 713104, W.B. (India) Fax: +91 342 2640

PROVINCIE



Macrofauna Atlas of North-Holland

by Harry A. Steenberg

Haarlem, Dienst Ruimte en Groen, NL, 651 pp., 1993. ISBN 90-72624-41-6.

This elaborate book provides distribution maps for 595 aquatic invertebrates along with tables of their responses to 20 environmental factors. The 125 Diptera recorded from surface waters in the province of North-Holland include 98 taxa of Chironomidae. The ecological valence of each taxon can be assessed by the so-called Response Tables in which 12 chemical parameters, 5 physical and 3 biotic factors are related with the relative occurrence of a respective taxon. This main body of the atlas is led by general introductions (presented in both languages, Dutch and English) about aims, target groups, the concept of the survey, and the methods used.

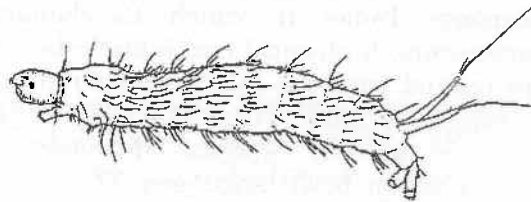
Since 1979, occurrence and distribution patterns of the aquatic macrofauna of North-Holland has been studied, and a total of 2774 individual samples from some 1140 sampling sites were evaluated. The information presented can serve as a basis for the establishment of indicators and the development of a biological method of assessment for routine investigations of water quality, so the atlas will prove to be a useful source of information for everyone who is involved in nature or water management or ecological research. The atlas can be ordered from: **Dienst Ruimte en Groen**, P.O. Box 6090; 2001 HB Haarlem, The Netherlands. Price: Dfl. 65,- (excl. postage)

The immature stages of the Australian Chironomidae, by Peter S. Cranston, I. Keys, II. Figures. Produced by MDFRC, 338 pp., 1994.

In February 1994, Dr Peter Cranston gave a chironomid identification work-shop at the Murray-Darling Freshwater Research Centre N.S.W., and the MDFRC has made copies of the Workshop Guide, making it available for sale, at cost, that is \$ 35,- within Australia, \$ 45,- for overseas (postage included). The Workshop Notes are available from

John H. Hawking

Murray-Darling Freshwater Res. Centre (MDFRC)
P.O. Box 921, Albury N.S.W. 2640 (Australia)



Spixiana Supplement 20 (1994) Contents:
Sublette J. A. & M. Sasa: Chironomidae collected in Onchocerciasis endemic areas of Guatemala, p. 1-60. Spies M., Fittkau E.J. & F. Reiss: The adult males of *Parachironomus* Lenz, 1921, from the Neotropical fauna region, p. 61-98. Harrison A. D.: *Nanocladius* (N.) Kieffer from Africa south of the Sahara, with two new species and key, p. 99-114. Kiknadze I.I., Siirin M. T. and W. Wülker: Siberian species of the *riihimakiensis*-group in the genus *Chironomus*. 2. Inversion polymorphism and cytophylogeny, p. 115-125.

The Supplement can be ordered from: Verlag Dr. **Friedrich Pfeil**, P.O. Box 650086, D-81214 München, Germany. fax: (+49) 89 186871. ISSN 0177-7424. Paperback 128 pp., price: DM 80,- (excl. postage)

Presentation of Current Research and Working Groups

Chironomid research at the University of Burdwan (India)

Since 1976, studies on various aspects of Indian chironomids have been conducted at the Entomology Research Unit, Department of Zoology of the University of Burdwan (West Bengal). Many projects were (and are) funded by the Governments of India and West Bengal. At present, there are three Ph.D. students involved in studies on chironomids: Mr. **Abhijit Mazumdar** is about to finish his thesis on faunistic and ecological aspects of chironomid communities of the Sunderban biosphere reserve,

which is the worlds largest block of tidal, halophytic mangrove forest. The study is concerned with biotopes like tidal rivers, creeks and canals, and low-lying islands. During the four years survey, 64 species from 21 genera out of three subfamilies of Chironomidae have been identified. A species list of chironomids from the mangrove ecosystem is in preparation, and descriptions of 28 imagos as well as life stages of 10 species will be included in the thesis, along with ecological remarks. The fauna, so far examined, appear to resemble those of East Asian and Micronesian islands. Mr. **Dipak K. Som** is working on

the morphology and biology of abundant orthoclads from the Himalaya of West Bengal, and Mr. **Tapan K. Dutta** has recently finished his thesis about adults of Chironomini from the eastern Himalayas with special reference to the Duars of West Bengal.

A new research project, entitled "Bio-monitoring of the water quality of the Damodar river (Burdwan District, West Bengal) by means of chironomid communities", will start in near future. Suggestions and advice on literature relevant to this topic will be gratefully acknowledged.

Dr **P.K. Chaudhuri** has started to write the chapter on Chironomidae of the "Fauna of India", a venture sponsored by the Zoological Survey Division of the Indian government. Assistance in this regard will be helpful to scope with this tough job.

P.K. Chaudhuri

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Burdwan 713104, W.B. (India)

Activities at other Indian institutions

School of Studies in Zoology, Jiwaji University, Gwalior-474 011 (India): Studies on the chromosomes of the salivary gland of chironomids are in progress. So far, studies on *Chironomus javanus* revealed that this species possesses three large and on small fourth chromosome lying freely in its salivary gland polytene nucleus, without showing any chromocentric connection. The cytological map of polytene chromosomes indicate certain notable features, and detailed cytological maps have been prepared.

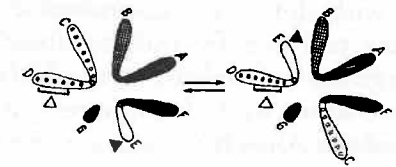
P.K. Tiwari

Department of Zoology, University of Poona, Pune 411 007 (India): The group of Prof. **S.C. Lakhota** and Dr **B. Nath** works on cytogenetics, and at present a review is in preparation on the Current status of research on cytogenetics, molecular, developmental and other biological aspects of the genus *Chironomus*.

B. Nath

Environmental Research Unit, Department of Zoology, Gulbarga University, Gulbarga 585 106 (India): Several students of Dr **K. Vijaykumar** works on chironomid communities in reservoirs as well as on ecotoxicological aspects.

K. Vijaykumar



Cytogenetic Research in West Siberia (Russia)

In West Siberia, chironomid research is conducted by the Institute of Cytology and Genetics of the Russian Academy of Sciences (Siberian Department). A group of eleven researchers of the Laboratory of Cell Biology, which is headed by Prof. Dr **Iya Kiknadze**, is mainly interested in the chromosomal evolution in Chironomidae.

The chironomid fauna of Ural, West Siberia, Altai and Tuva is being studied in using morphological analyses together with cytological, electrophoretical and molecular-genetical methods. Caryotypes and chromosome banding patterns of more than one hundred species have been analyzed so far, and the types of chromosome aber-

rations (mainly inversions), variations in their set and frequencies present in natural populations were studied. Genetic structures of natural populations have been described also.

To study the molecular-cytological organization of chironomid genomes, a number of DNA clones have been used which were derived by micro-cloning of the region A1-2 of chromosome IV of *Chironomus riparius* (junior synonym: *C. thummi*) being isolated microsurgically, and by genomic clones of *C. riparius*. Balbani Ring homology in *Chironomus* genera was analyzed by in situ cross-hybridization of DNA clones. Three new chironomid mobile elements MEC, TEC and NLR have been described.

While searching a cytoecological basis of adaptation in chironomids, secretory proteins of the salivary gland were studied in several species of the tribe Chironomini by means of electrophoretic and immunochemical analyses.

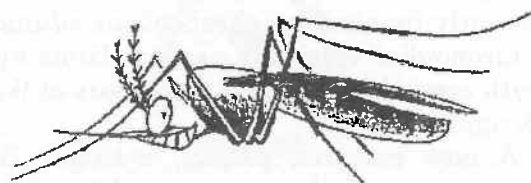
Applied cytogenetical research of chironomids was done in regions of Siberia which are polluted by radionuclides. Our working group is involved in the UNESCO program "Man and Biosphere", in the projects of the Altai International Scientific Center, and in some ecological studies about the effects of water pollutants.

In 1991, the monograph "Karyotypes and morphology of larvae of the tribe Chironomini. Atlas." by **Kiknadze I.**, **Shilova A.**, **Kerkis I.**, **Schobanov M.**, **Zelentsov N.**, **Grebjenjuk L.**, **Istomina A.** and **Prasolov W.** was published. (For details about this atlas see page 20.)

Larissa I. Gunderina

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30090 Novosibirsk (Russia)

Ha Ha Ha ... at the wrong party?...really! hee hee



Chironomid Research in Finland

Earlier research has been concentrated on taxonomic and faunistic studies performed by 'university workers'. But since the '60s, when pollution turned out to be a problem in Finland, monitoring studies became more common, widening research activities to other public and private research institutes. This yielded numerous informal reports and university theses, all written in Finnish and thus little circulated.

The large Finnish lakes cover different trophic conditions and reach up to sub-arctic climates. Their chironomid fauna is pretty well known due to studies done by **Kansanen**, **Luotonen**, **Mankki**, **Meriläinen**, **Paasivirta** and **Särkkä**. Regulated lakes are studied by **Palomäki** and **Tikkanen**. In 1989, **Partanen** has started large lake monitoring in 24 lakes, and **Koskenniemi** has commenced integrated monitoring studies in four lakes.

Among the numerous small lakes in Finland, **Paasivirta** has focussed his studies on forest lakes and bog pools, **Hynynen** and **Meriläinen** on the problem of acidification, and **Koskenniemi** on polyhumic reservoirs.

If you are interested in reports, theses or articles concerning Finnish chironomids, you are welcome to send request to me.

Esa Koskenniemi

National Board of Waters
Box 262
65101 Vaasa (Finland)

mDNA News from the Dept. of Entomology, University of Kansas, (U.S.A.)

- working group of Dr L.C. Ferrington Jr. -

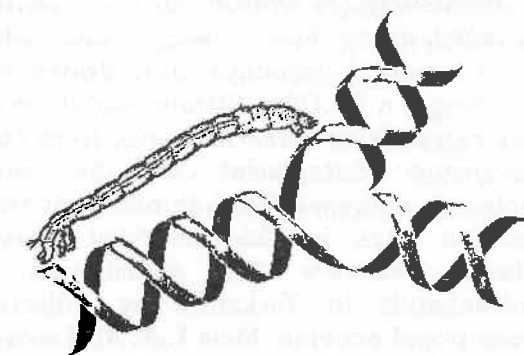
Mitochondrial DNA sequences from two populations of *Chironomus riparius* Meigen (Chironomidae), studied by **B. L. Hayford**, **D. R. Smith**, **B. Hagen**, and **L. C. Ferrington Jr.**: Behavior, ecology, and mtDNA sequences were studied for two populations of *Chironomus riparius* Meigen living in pollution impacted waters. One *C. riparius* population was collected from the organically enriched water below a waste water treatment plant effluent in Johnson County, Kansas, the other population was collected from waters influenced by both organic enrichment and heavy metal deposition in Cherokee County, Kansas. Populations were reared and specimens from individual egg masses were analyzed for their mDNA sequences. DNA was extracted and portions of the cytochrome b gene were amplified using PCR and sequenced to yield the first look at chironomid mtDNA.

Barbara Hayford, Ph.D. Student: Thermophilic organisms withstand a wide range of temperatures and ion concentrations. Many thermophiles display behaviors that differ significantly from their close cold water relatives. These behaviors include changes in phenology, thermal and chemical tolerances, mating and oviposition schemes. I am interested in the evolution of these behaviors and plan to study chironomid populations from a variety of hot springs as well as some cold springs, asking the question: Is there an observable difference in specific behaviors between individuals from different spring types? One of the tools I will use is mitochondrial DNA (mtDNA) sequencing. Sequences of both the highly conserved and variable regions of the mitochondrial genome can be used to measure the degree of variation between related individuals. In order to learn this technique I have been studying mtDNA sequences in a population of *Chironomus riparius* that live in an organically enriched

stream. So far, I have extracted DNA and amplified a portion of the mtDNA cytochrome b gene using the Polymerase chain reaction (PCR). This portion was sequenced and will be compared to the cytochrome b sequences of other *C. riparius*.

Paul Michael Bardunias, Ph.D. student: **Deborah Smith** and I are currently conducting an evaluation of the effects of collection and preservation techniques on DNA subsequently extracted. I am using chironomids as one of my test subjects. I have extracted DNA from chironomids of various ages and storage conditions, and have successfully amplified a fragment of the cytochrome b region of mitochondrial DNA via PCR. I will be amplifying sections of the COI and COII region of mitochondrial DNA as well as a site in the nuclear genome. To test the fidelity of DNA samples I will be sequencing portions of these regions. Copies of these sequences and those of our primers will be made available upon request.

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Chironomid studies in Britain

Dr **Patrick Armitage** at the Institute of Freshwater Ecology River Laboratory is concerned with biomonitoring, Chironomidae of small habitats, colonization processes and island fauna. **Stephen Brooks** at The Natural History Museum, London, covers chironomid taxonomy, systematics, palaeoecology, indicators of water quality and classification of aquatic systems. Dr **Clare Carter** at the University of Ulster, Coleraine, is picking up her work on lake chironomid ecology. **Peter Convey** at the British Arctic Survey works on the behavioural ecology and life-history strategy of Antarctic species. **Ian Fozzard**, Biologist with the Forth River Purification Board, Scotland, is concerned with chironomids and water quality, particularly eutrophication and acidification. **Tony Gower** at the University of Plymouth researches macroinvertebrate communities in relation to heavy metals and other environmental variables. **Jan Jones** has just begun a Ph.D. at Birmingham University researching climatic change from Late devensian Lateglacial to the early Holocene using subfossil chironomids from various sites in the Hebrides. **David Maude** surveys the distribution of chironomids in Yorkshire by collecting their pupal exuviae. Miss **L.A. McLarnon** is studying the chironomids of Lough Neagh at the Freshwater Laboratory, University of Ulster, Tread Point. **Neil Radford**, a Ph.D. student at the University of Leicester, investigates the effect of

ferric sulphate on chironomids. **Patrick Roper** is coordinator of the Chironomid Study Group of Britain and is editor of **THE EDWARDSIAN**, newsletter of the group. **Les Ruse**, Biologist with the National River Authority, England, uses chironomids for water quality monitoring and researches larval microdistribution. Dr **Jon Sadler** at the Department of Archaeology and Prehistory, Uni-

versity of Sheffield, is interested in chironomid ecology, biogeography and palaeoecology. Dr **M. Tokeshi** has moved to Queen Mary and Westfield College, London, where he continues his investigations on population and community ecology of Chironomidae. Dr **Ronald Wilson**, Honorary Research Fellow of Bristol University, continues his environmental assessment of rivers, canals and lakes using pupal exuviae. Dr **Peter Langton** pursues the identification of pupal exuviae remorselessly: a key to Nearctic forms in collaboration with Dr Bill Coffman of Pittsburgh and Dr Don Oliver of Ottawa is now well advanced, a key to African forms is not far behind, a key to Oriental taxa is in its infancy, awaiting further material, and the West Palaearctic key is being continually updated to include new material (the expansion of this last key to include the whole of the Palaearctic could be undertaken, were material from the East Palaearctic made available).

Peter H. Langton

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(England)

Chironomid studies in Brazil

The most traditional place of chironomid research in Brazil is the Oswaldo Cruz Institute in Rio de Janeiro where, since 1941, taxonomic research is bound up with the activities of Dr **Sebastiao J. de Oliveira**, the curator of the Entomological Collection. (For details on his work see page 32.)

At the Federal University of Sao Carlos (state of Sao Paulo), Dr **Susana Trivinho Strixino** and Dr **Giovanni Strixino** have been working on benthic chironomids of the region of Sao Paulo since 1978. Present research is focussed on feeding habits of chironomids and their community composition in relation to the phenology of aquatic macrophytes in lagoons. Another aspect under study is the effect of water level fluctuations on benthos. In this group Dr **Alaide A. Fonseca Gessner** has recently started with taxonomic work on chironomids, based on reared material.

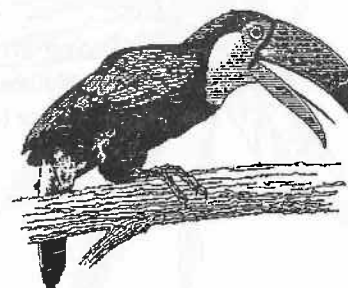
At the State University of Maring (state of Paraná), **Alice Michiyo Takeda** studies benthic communities from the floodplains of the upper Paran river. As chironomids are a dominant benthic element, Alice intends to come to Cuiabá this year to work together with **Ulrike Nolte** and her group for a few weeks.

At the Federal University in Cuiabá (state of Mato Grosso), a group has been working with chironomids since 1992, when Dr **Ulrike Nolte** was appointed

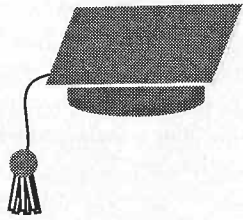
guest lecturer at the Laboratory of Entomology. The group studies midge communities of an intermittent tropical lowland river which drains into the Pantanal wetlands. **Andréa Regina Netto** and **Rosane da Silveira Tietböhl** are interested in the upper reaches of the river, comparing community composition and their trophic relationships in permanent and temporary waters of various types (rheocrenes, helocrenes, rock pools) located in open savannah land or in dense forest. **Elisabeth Stur**, who is working on her Ph.D. thesis, studies chironomid communities along the entire course of the river during one year (rainy and dry season). To evaluate whether the distribution of chironomids follows a longitudinal zonation, Elisabeth is studying (besides the overall present benthic) the significance of specific habitats such as moss, litter, wood debris, macrophytes etc. The work of **Maria José de Oliveira** is focussed on mayflies and midges associated with floating leaf and wood litter which is a prominent habitat in the rhithral. **Simone R.C. Moreira da Silva** has started to study benthic chironomids of the potamal, comparing lotic reaches with lentic sites close to where the river forms its inland delta being part of the Pantanal. Wherever new and interesting chironomids appear, either in significant densities or specific habitats, **Mirian A. da Silva Serrano** is on their track, taking them to the lab for rearings to study their morphology and describe them, while **Ulrike Nolte** is interested in autecological as well as synecological aspects of Chironomidae.

Ulrike Nolte

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THESES AND OTHER GREY LITERATURE

AUSTRIA:**Wolfram, G. 1993. A study on the benthic community of Lake Neusiedl**

(Untersuchung der benthischen Lebensgemeinschaft des Neusiedler Sees) Diplomarbeit (Masters thesis), University of Vienna, 99 pp. (in German). Supervised by Univ. Doz. Dr. Alois Herzig, Biologische Station Neusiedler See, A-7142 Illmitz (Austria).

Abstract - Lake Neusiedl is one of the largest shallow lakes in central Europe (321 km², maximum depth 1,8 m). More than 50 % of the lake is covered by a reed belt. The open water is characterized by high conductivity (up to 2800 µS) and, due to strong wind action, inorganic turbidity.

From July 1990 to July 1991, the benthic community of the open lake was studied. Numerically it was dominated by crustaceans and in terms of biomass chironomids prevailed. Only 15 species of chironomids inhabited the sediment, dominated by *Tanytus punctipennis*, *Procladius* cf. *choreus*, *Microchironomus tener*, *Cladotanytarsus* gr. *mancus*, *Harnischia* cf. *curtilamellata*, *Cladopelma* cf. *virescens* and *Stempellina* cf. *almi*. The two tanytid species accounted for 99 % of the standing stock of the macrozoobenthos near the reed belt.

Chironomids - as well as other benthic invertebrates - showed a distinct horizontal distribution, with the highest number of species and maximum abundance on muddy and organic rich substrates near the reed belt. Here chironomids occurred in densities of up to 54,000 ind./m² and a biomass of up to 2.0 g DW/m². Sediments

of the open lake and the eastern part of Lake Neusiedl were composed of compact clay and sand as a result of erosion of fine material due to strong waves and currents, and here the densities of the macrobenthos was much lower.

The production was roughly estimated for the most dominant species, *T. punctipennis*, by the Allan curve method, and for the remaining species by an empirically derived multiple regression (Plante & Downing 1989). Near the reed belt mean annual production of chironomids exceeded 6 g DW/m², but in the open lake it was only 0.06 g DW/m², values that are rather low compared with other lakes. This is explained to be a consequence of unfavourable sediment conditions due to wave action and physiological stress due to the water chemistry.

A comparison with studies on the zoobenthos of Lake Neusiedl in the early 70ies, revealed changes in species composition, abundance, and horizontal distribution. These changes were mainly attributed to eutrophication during the 70ies, a decline in the macrophyte belt (caused by herbivore grass carp), and subsequent changes in sediment structure and chemistry, as well as changes in predator pressure and competition as a result of the factors mentioned above.

Georg Wolfram

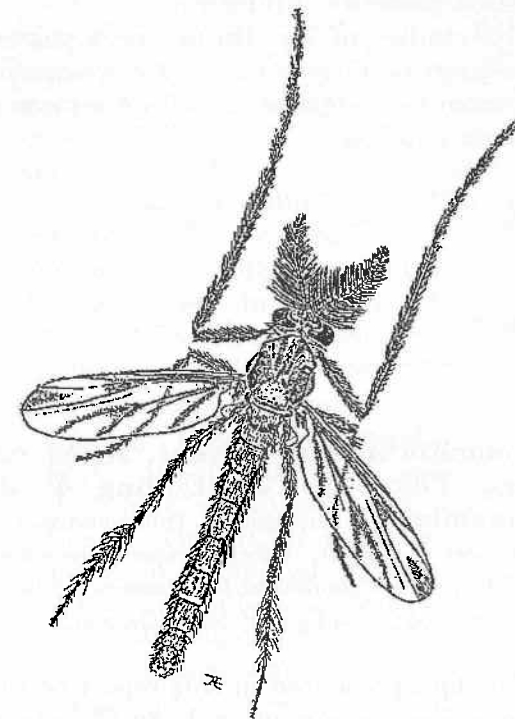
Biologische Station Neusiedler See
A-7142 Illmitz (Austria)

BRAZIL:**Callisto d.F.P., M. 1994. Benthic macro-invertebrates of two Amazonian lakes: Lago Batata (an impacted ecosystem by bauxite tailing) and Lago Mussurá.**

Master thesis, Federal University of Rio de Janeiro (written in Portuguese). Supervised by Prof. Dr. F. A. d. Esteves, Dept. of Ecology, Institute for Biology, UFRJ - Bloco A; 21910-240 Rio de Janeiro RJ. For further information see *CHIRONOMUS* No. 5, p. 15.

GERMANY:**Ospina Torres, R. 1992. The chironomid fauna of woodland streams in central Amazonia.**

(Die Chironomidenfauna Zentral-Amazonischer Waldbäche). Doktorarbeit (Ph.D.thesis) University of Munich (Germany). Vol.1: 357 pp, Vol.2 (Figures): 221 pp. (in German). Supervised by Prof. Dr. E.J. Fittkau, Zoologische Staatssammlung München.)



Orendt, C. 1993. On the ecology of Chironomidae from the littoral and benthic zone and other Diptera (Ceratopogonidae, Chaoboridae) in northern prealpine lakes (Germany). With a contribution on the suitability and application of chironomids for trophic indication. (Vergleichende Untersuchungen zur Ökologie littoraler, benthischer Chironomidae und anderer Dipteren (Ceratopogonidae, Chaoboridae) in Seen des nördlichen Alpenvorlandes. Mit einem Beitrag zur Eignung und Verwendung von Chironomiden als Trophie-Indikatoren) Doktorarbeit (Ph.D. thesis) University of Munich (Germany) 314 pp. (in German). Supervised by Prof. Dr. E.J. Fittkau, Zoologische Staatssammlung München.)

Abstract - From 1988 to 1991, dipteran communities were studied in the littoral and benthic zones of nine Bavarian lakes. In particular, the suitability of Chironomidae as indicators of the trophic situation of the lake sites, which ranged from oligo- to eutrophic, was assessed. To appreciate the importance of sediment characters to the occurrence of dipterans (apart from ambient parameters such as trophic), grain size composition and organic matter were determined. Larvae were counted according to genera. For species identification, imagoes were obtained by mass rearings (lab) and submerged funnel traps (field).

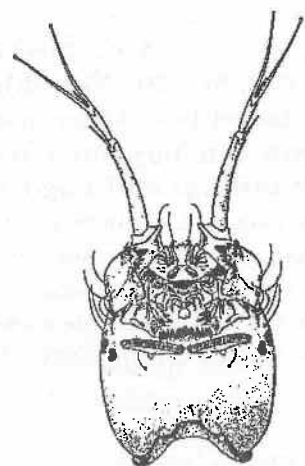
In 1988 and 89, all sites were dominated by eurytopic taxa, and only four taxa were correlated to trophic (but not to grain size) such as *Heterotrissocladius marcidus* (negatively) and *Dicortendipes nervosus* (positively correlated). During 1990 and 1991, 139 chironomid species were recorded, 21 from which were apparently restricted to soft sediments. Studies on the phenology of dominant taxa revealed that some eurytopic species produced significantly more generations per year at eutrophic than oligotrophic sites (*Tanytarsus chinensis*, *Cladotanytarsus lepidocalcar*, *Parakiefferiella bathophila*, *Microtendipes pedellus*, *Ablabesmyia longistyla*). However, *Stempellinella bausei* showed the contrary effect. Also of note is the observation that in some species the sex ratio varied in the course of the year (*Para-*

kiefferiella bathophila, *Tanytarsus chin-yensis*). The highest number of species emerged from June to August. Emergence started with cold-adapted species such as *Microtendipes chloris*, followed by species which have their optimum at higher temperatures (e.g. *Tanytarsus signatus*). Facultatively cold-adapted species (e.g. *Parakiefferiella bathophila*, *Procladius choreus*) produced a second generation towards the end of the year.

Data of the dipteran communities were adequate for characterizing the 25 sites. Among the 139 chironomid species recorded, 76 species were correlated to trophic (and not to other parameters measured). These species ("trophic indicators") were assessed by a species-specific index concluded from the data presented, and which was applied for calculating a trophic-index for each of the sites. Calculated appreciation based on these data was applied to lakes described in the literature, resulting in a congruency with the state of trophic reported for these lakes. Apart from Chironomidae, some Ceratopogonidae are also good indicator organisms.

Claus Orendt

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INDIA:

De, A. 1993. Chironomids associated with aquatic macrophytes in ponds on the Burdwan University campus (West Bengal). Master thesis, University of Burdwan. Supervised by Dr. P.K. Chaudhuri, Dept. Zoology - Entomology, University of Burdwan, Burdwan 713 104, WB.

Dutta, T.K. 1994. The adults of the Chironomini midges of the eastern Himalayan, with special reference to the Duars of West Bengal, India. Ph.D. thesis, University of Burdwan.

The studies of Mr. Dutta encompasses recordings of 17 genera and 62 species of chironomine midges along with brief notes on their habitats.

Grey Literature

Remember to send your
contributions to
CHIRONOMUS before



Biomonitoring in littoral zones of lakes. Edited by **M. Colling & J. Schaumburg.** (Biologische Trophieindikation im Litoral von Seen). Informal report, December 1992. Bayrisches Landesamt für Wasserwirtschaft, Heft 7/92, 184 pp. 56 fig. (written in German).

The data presented in this report result from a 5-years survey on Lake Chiemsee and from 3-years studies on eight other

lakes in south Germany. The project, headed by Prof. Dr. **E.J. Fittkau** (Zoologische Staatssammlung München) and **M. Colling** (Unterschleißheim), was financed by the Water Management Authority of Bavaria (Germany). The studies were focussed on Lake Chiemsee which is the largest lake in Bavaria (surface area: 80 km², max. depth: 73 m, 518 m a.s.l., 47° 54'N 12° 29'E) and an important tourist attraction. Its littoral zones are heterogeneous in structure, and the carbonate-rich water (41-46 mg Ca⁺⁺/l) is of mesotrophic to eutrophic quality.

The report contains seven main chapters on biota of the littoral zone (Diatomeae, Turbellaria, Oligochaeta, Mollusca and Insecta) and includes three chapters on Chironomidae: The epiphytic chironomid communities (by **H.W. Riss**), chironomids from drift samples (by **N. Reiff**), and benthic chironomids (by **C. Orendt**). The detailed data base provides interesting information on these three components of chironomid communities obtained simultaneously over several years. Of particular value are the extensive species lists, since detailed information on chironomid communities are rare in studies concerned with biomonitoring. A total of 84 periphytic species, 99 benthic species, and 290 species from drift samples were identified among which 44, 76 and 53, respectively, were assigned to be indicator species.

The indicator value of a given species was assessed according to its ecological optimum (i.e. indicating the trophic status of the water) in conjunction with its ecological valence (showing the indicator significance of the species). With this, all three authors concluded that species indicating oligotrophic conditions were easy to distinguish while indicators for mesotrophic conditions were hardest to define. C. Orendt, at least, points to the importance of spatial habitat structures which may interfere with the above mentioned evaluation of indicator organisms, and all authors state that not the simple presence of a species but its relative abundance is significant for water quality assessment.

There are some weak points in the report, such as circle arguments (p.54, p.109) or the inaccurate use of terms (e.g. "succession" is confused with "production", p.76) which makes it sometimes hard to follow the discussion. So, I wonder whether it is reasonable to assign indicator species (i.e. species of narrow ecological amplitude) for oligotrophic conditions in lake water which contains a total of 30 µg P/l or more.

The discussions of the individual chapters are somewhat diverging, and it would have helped the reader if at least the discussions about chironomids had merged into some general conclusions highlighting the principal results in the light of currents theories on biomonitoring.

Anyhow, the detailed results are valuable for workers interested in faunistic surveys from central Europe, in particular from lakes at the northern foothills of the Alps. On the whole, the report is addressed rather to local researchers than to an international forum, as can be seen from the literature incorporated consisting to one third of theses, informal reports, and papers published in local journals.

The report can be obtained from: Bayrisches Landesamt für Wasserwirtschaft, Lazarettstr. 67, 80636 München (Germany).

Ulrike Nolte



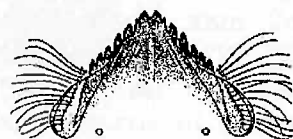
Lake Chiemsee is drained by the River Alz, a 87 km long river which forms part of the Danube system. Initiated by a expert opinion ordered by the Chiemsee Water-treatment Council in 1981, the macrozoobenthos of the River Alz was studied until 1988 by the University of Innsbruck (Austria) and the Polish Academy of Sciences conducted by Dr. M. Margreiter-Kownacka (Vienna). The results of these studies are now published:

M. Margreiter-Kownacka (ed.) **The macrozoobenthos communities of the upper River Alz, an inventory.** (Die Makrozoobenthosgemeinschaften der Oberen Alz, Bestandsaufnahme). Wydawnictwo i Drukarnia Secesja, Krakow, 1993, 36 pp. (written in German).

From the Contents - Oligochaeta by E. Dumnicka, Ephemeroptera and Plecoptera by R. Sowa & M. Margreiter-Kownacka, Trichoptera by B. Szczesny, **Chironomidae** by A. Kownacki & M. Margreiter-Kownacka,

benthos: summarizing aspects by M. Margreiter-Kownacka.

The booklet can be obtained from: Dr. M. Margreiter-Kownacka; Institut für Ökometrie, Vivenotgasse 46, 1120 Wien (Austria).



MINISTÉRIO DA SAÚDE
FUNDAÇÃO OSWALDO CRUZ
INSTITUTO OSWALDO CRUZ
COLEÇÃO ENTOMOLÓGICA

Dr **Sebastiao José de Oliveira** from the Oswaldo Cruz Institute in Rio de Janeiro is the most active taxonomist for Chironomidae in Brazil, if not in South America. Since 1940 he has published 45 papers, the most recent one in Canberra, in January this year. From the early 70ies on, his research was ceased by political activities, but 15 years later he was back on the scientific stage. Eighteen of his contributions are focussed on midges, mostly descriptions of new taxa such as the widely distributed new world genus *Lopescladius*. As access to Brazilian journals is difficult outside South America, the following list gives exact bibliographic data on de Oliveira's papers concerned with Chironomidae that may be helpful for library orders and requests. All but three of them are written in Portuguese, and all deal exclusively with imagos. Where the genus or species names do not appear in the title, they are added in parenthesis at the end of the reference.

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- de Oliveira S.J. 1946: Sobre um novo Orthocladiinae neotrópico (Dipt: Chir.) Livro de Homenagem a R.F. d'Almeida 31: 279-282. [*Spaniotoma (Stictocladius) almeidai* n.sp.]
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Ulrike Nolte

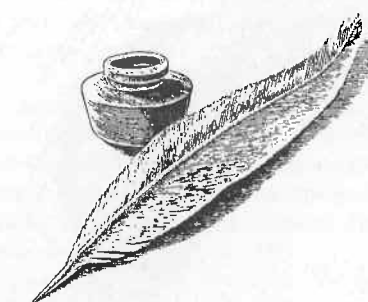
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Obituary Notices

Prof. Dr Lars Z. Brundin

30.05.1907 - 18.11.1993

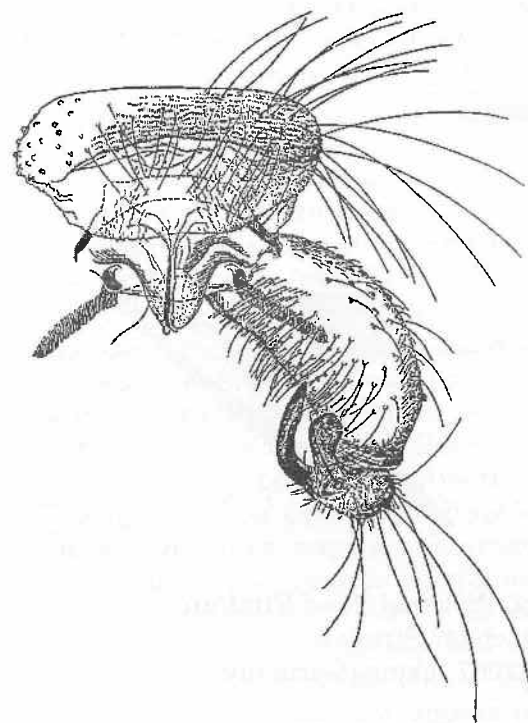
Lars Brundin commenced to study Chironomidae not before the age of 38, at that time a famous specialist of Coleoptera. Already four years later, in 1949, he published his significant and over 900 pages big monograph on "Chironomiden und andere Bodentiere der südschwedischen Urgebirgsseen", where he incorporated chironomids to an exceptional large extent and with grand reliability into the concept of lake typology. At that time, the systematics of chironomids was still desperately confused because stages of metamorphoses had not yet been considered adequately.

Brundin's most creative and active working period coincided with a fundamental change-over in natural sciences, when in the 50ies and 60ies Hennig's publications on phylogenetics stimulated a fresh look at Systema Naturae and Wegener's theory on the continental drift took the field in scientific discussions. During these years, Brundin ventured upon numerous expeditions to South and North America, the Australian region and southern Africa to collect Chironomidae. In 1963, 1965 and 1966 he then published his brilliant works on the "Transantarctic relationships and their significance, as evidenced by chironomid midges". With this, Brundin had become interpreter of Hennig's theory realizing the significance of apomorphic characters for systematics. He furthermore demonstrated that a consequent application of the methods intrinsic to Hennig's theory to holometabolous aquatic insects results in stronger arguments for the interpretation of circum-antarctic distribution patterns than those provided so far by botanists and vertebrate researchers.

Lars Brundin has resolutely and unremittingly looked for new ground in science, and all who are engaged in chironomid research are thankful to him for having paved the way. We are deeply grateful for his scientific work that will make him unforgettable.

[after: **Fittkau** E.J. (1979) Ent. scand. Suppl. 10: 7-13]

Brundin's full bibliography will be published in the Proceedings of the 12th International Symposium (see page 19).

**Prof. Dr Jan Lellák**

16.01.1926 - 31.07.1993

Dr Jan Lellák was Professor at the Charles University Prague (Slovakia) since 1966, where he had graduated in 1952. He studied population dynamics and species composition of benthic macroinvertebrates, especially of Chironomidae. Food supply as a regulating factor was one of his particular interests and, consequently, taxonomy and ecology of larvae and pupae of Chironomidae. He published some 100 scientific papers, textbooks and manuals in hydrobiology and ecology.

Jan Lellák was a joint founder of the very active group of chironomid workers, that organized the 1st International Sym-

posium on Chironomidae in Plön (Germany) and started the *CHIRONOMUS* newsletter. The 6th Symposium, held in Prague in 1976, was organized by him.

Dr Lellák has built up a large collection of chironomids, which is kept at the Faculty of Sciences of the Charles University. It comprises material mainly collected in Czechoslovakia, and includes developmental stages preserved in alcohol or formalin as well as some 10,000 specimens mounted on slides.

[after **Chvála** M. (1987) Acta Entomol. Bohemoslov. 84: 233-235]

Dr Henry K. Townes

20.01.1913 - 02.05.1990

Henry Townes was widely known for his work on Hymenoptera, particularly ichneumonid taxonomy. He was best known to chironomid workers for his study of Nearctic Chironominae (Townes 1945). In this work, as elsewhere, the rule of priority was strictly applied. Consequently the family name Tendipedidae was used for many years in Nearctic literature. He refused to accept rulings by the International Code of Zoological Nomenclature, and continued to oppose the use of *Chironomus*, etc (Townes 1970). Although his nomenclature is not accepted the revision remains the primary work on the taxonomy of Nearctic Chironominae. Also it was one of the first chironomid revisions to extensively use the study of types.

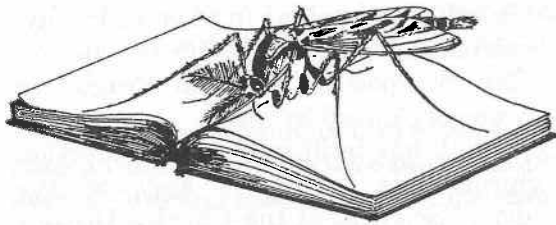
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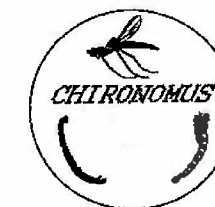
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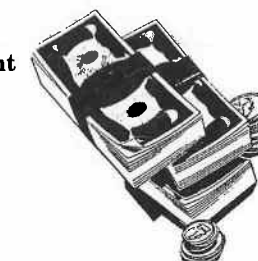
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