



## CHIRONOMUS NEWSLETTER ON CHIRONOMIDAE RESEARCH

Co-Editors: Ruth CONTRERAS-LICHTENBERG

Naturhistorisches Museum Wien, Burgring 7, A-1014 WIEN, Austria

Peter H. LANGTON

5 Kylebeg Avenue, Mountsandel, Coleraine, Co.

Londonderry, Northern Ireland, BT52 1JN - Northern Ireland

Bibliography: Odwin HOFFRICHTER

Institut f. Biologie I, Albert-Ludwigs-Universität Freiburg, Hauptstrasse 1

D-79104, Germany

Treasurer: Trond ANDERSEN: Museum of Zoology,

University of Bergen, Museplass 3, N-5007 Bergen - Norway

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### XIV INTERNATIONAL SYMPOSIUM ON CHIRONOMIDAE RIO DE JANEIRO, BRAZIL

**Aug. 29-Sept. 2, 2000**

Memories of Rio flood the mind as I sit here typing at the word processor: the incessant, nose-to-tail traffic, day and night, in the main streets of Copacabana; the many excellent restaurants along the sea front, where groups of participants congregated in the evening to socialise and feast – at one of them, were there really 20 different kinds of meat served during the meal?...or was it more?...I lost count (not a place to take your vegetarian friends!!); the spells of sunshine which brought out large butterflies in the grounds of the Instituto Oswaldo Cruz/Fiocruz, where the symposium took place; the House of Oswaldo Cruz, a magnificent building housing the very modern Museum of Life; the plethora of plants around the buildings in Copacabana, watered by frequent deluges of warm rain (necessitating carrying a waterproof at all times), their size dwarfing other examples of the same plant species in my conservatory here in northern Ireland;...the

generosity and friendliness of our hosts, in particular Dr. Sebastião Oliveira, who, as President of the Organising Committee had made the event possible – and it was he, who also guided us through the programme with admirable efficiency.

The Symposium began on Tuesday the 29th of August. At 8 o'clock in the morning we were picked up from our hotels in Copacabana and transported to the Institute, an hour's journey through the patchwork of extremes of affluence and poverty that comprises Rio de Janeiro. Registration was followed by an introductory session presided over by the Director of the Oswaldo Cruz Institute, José Rodrigues Coura and culminated in a very special concert by the Fiocruz Choral, a highly talented and well-rehearsed group of singers. Then Peter Cranston gave an account of Dr. Frieder Reiss, colleague and exceptional chironomist, who tragically died a

year earlier. A deep sense of his loss affects many of us still today. After coffee Declan Murray delivered the Thienemann Lecture, 'Island Chironomidae (Diptera)' in which he emphasised the importance of publishing species lists as a record of global chironomid biodiversity. The afternoon session was entitled 'Physiological reactions and chironomid midges as nuisance'; three papers were presented (see the forthcoming Proceedings for details of these and other papers).

The Wednesday proceedings began with a comprehensive lecture by Prof. Fittkau 'Chironomid research in South America – a review and outlook for the future'. The three morning sessions were 'Systematics and new taxa' (two papers), 'Biogeography and regional studies' (two papers) and 'Palaeolimnological studies' (two papers). After lunch there was a single session 'Ecotoxicology and biomonitoring' (two papers).

Thursday began with a round table session, a celebration of 100 years of the Institute of Oswaldo Cruz, hosted by Sebastião José de Oliveira, José Jurberg (curator of collections) and Ernst Josef Fittkau. This was followed by two morning sessions on 'Ecology and behaviour of Chironomidae' (nine papers) and an afternoon poster session.

On Friday we were allowed to sleep in for an extra hour before the buses arrived! The morning was taken up with a poster session and a visual presentation on 'The lake flies (Chaoboridae) of Lake Victoria, Africa; their use as a human food resource and their potential as a source of protein for sustainable farming'. In the afternoon, after a tour of the buildings, we were dined and entertained by performances of Brazilian inspired music composed and played for us by a group of

very proficient string players (Has the CD been produced yet?!).

The venue for all the lectures was the 'Ciência em cena' theatre, a modern building which provided for all the speakers' needs and the comfort of the audience. One cannot but applaud the simultaneous translation provided by Vera and Patricia from Portuguese to English and vice versa, without which many papers would have been unintelligible to part of the audience.

On the Saturday a tour of the city had been arranged, which was interesting, but slow because of the heavy traffic associated with a football match at the new football stadium around which the tour was routed! The Sunday visit to the Tijuca National Park near the city allowed participants to appreciate a rain forest first hand: the weather provided the right conditions – it poured! After lunch in the restaurant, some of the more intrepid braved the deluge and followed the guide down the tarmac road to a path that led into the forest...at this point, some returned to the restaurant unwilling to brave the flooded, slippery track that led to the objective of the walk: two forest streams, now in spate and thick with suspended clay particles – not a place under the circumstances to find chironomid exuviae!!

The last tour (Monday/Tuesday) was to Arrial do Cabo City and Serra dos Órgãos National Park, but you will have to ask those who attended about it, because I had to leave for home on the Tuesday.

Finally, I must thank Dr. Oliveira, Dr. Messias, Arlindo Serpa-Filho, Ana Regina, Claudia, Fernanda, Danielle, Jaciona, Angélica and Adelaide for all the arrangements that made the Symposium such a success.

P.H.L

## PROCEEDINGS OF THE XIV INTERNATIONAL SYMPOSIUM ON CHIRONOMIDAE

The participants of the XIV International Symposium on Chironomidae (August 29-September 2, 2000 – Rio de Janeiro, RJ, Brazil) have already been informed that the entire text of the papers will be published in a Supplement of the 'Memórias do Instituto Oswaldo Cruz', official scientific journal of the Oswaldo Cruz Institute. The papers that were submitted to the Organising Committee have passed through the review process and possibly will be published by March 2002. The authors will be contacted if necessary additional information is required in the text.

The invited editor Dr. Sebastião José de Oliveira will be able to assist in further questions related to the subject:

Dr. Sebastião José de Oliveira,  
Coleção Entomológica do Instituto Oswaldo Cruz,  
Fundação Oswaldo Cruz/FIOCRUZ,  
Castelo Mourisco, sala 201,  
Av. Brasil, 4365 – Manguinhos,  
21045-900 Rio de Janeiro, RJ,  
Brasil

e.mail: sjolivei@ioc.fiocruz.br

## THE FIRST FOR RUSSIA

An International scientific conference "Small rivers: modern ecological state, actual problems" was organised on the initiative of the Institute of Volga Basin Ecology of the Russian Academy of Science (IVBE RAN) in collaboration with the Russian Hydrobiological Society and the Hydrological Department of Moscow State University.

The conference took place at the very beginning of the new millenium and for this significant reason it was named „The first“ and we hope it has laid the foundation for a tradition of conferences on the investigation of problems pertaining to small rivers.

More than 300 senior specialists from 39 places in Russia and other countries, dealing with different scientific aspects of hydrobiology and ecology were united to unify general approaches to rational treatment and use of territorial-aquatic complexes of small rivers through estimation of the ecological state and their peculiarities.

More than 270 applications for submission were sent to the organizing committee. A wide variety of investigations on 320 small rivers of Russia and other countries (Volga, Kama, Dnestr, Desna, Dnepr, Pripjat, Dvina, Amur rivers basins, Barentcev and White Seas, areas of montane and south Altai, Mongolia, Karelia, Komi etc.) were presented by conference participants. The only reason for rejecting of some submissions was their lack of correspondence with the main philosophy of the conference.

Among the more than 300 participants were specialists from 70 research, applied and study organisations.

The Volga river is the largest in Europe. The total area of its drainage basin is 1360 thousand km<sup>2</sup> (62.2% of the total area of the European part of Russia, or almost 13% of the total area of Europe and 8% of the area of Russia). It includes 40 administrative units. The population of this area is 41.3% of all the population of Russia. The Volga and its reservoirs have 2600 tributary rivers and 150000 small rivers and brooks. The total input of water into the Caspian sea is about 240 km<sup>3</sup> per year. Nowadays the Volga is a chain of reservoirs and passes through forest, forest-steppe, steppe and semidesert geographical zones.

Themes of the scientific sessions included:

- Biodiversity as an index of river systems' ecological state. - Bioindication and monitoring.
- Methodological aspects of river zonation. Hydroecological safety of small rivers.
- Terrestrial ecosystems of small rivers basins.

- Criteria and methods of estimation of anthropogenic load and water quality. Balanced approach to small rivers investigations.
- Biological resources of small rivers. Ecology of water organisms.
- Anthropogenic factors influence on structural-functional organisation of river systems.

As a result of participants' suggestions there was organised a chironomidologists' workshop: „Chironomidae as bioindicators of river ecosystems state“. In discussion were involved T. Zinchenko and L. Golovatuk (Togliatti), N. Petrova and E. Balushkina (St.-Petersburg), I. Kuzmina (Siktivkar), N. Polukonova and M. Ermohin (Saratov), students and PhD students from Astrahan, Kazan and elsewhere.

Specialists on ecology, ecological hydrobiology, hydrochemistry, ichthyology, botany, microbiology, toxicology and geomorphology took part in the conference Which allowed focus on complex approach to small rivers investigations which is of first importance in the treatment of the ecological state of larger river bodies.

The presentation reflected joint international and regional project investigations. Plenary presentations were devoted to a wide variety of general ecological problems. In the presentation of the scientific group "Ecology of small rivers" (Zinchenko T.) the main results of complex investigations of several laboratories of IVBE RAN. were discussed The group mostly concentrates on the estimation of water quality of the Samara region small rivers and in particular the Chapaevka- River, one of the most polluted in the Volga basin. In the report the data on water quality were presented, critical anthropogenic load criteria and methodological approaches to quantitative complex estimation of water quality. Together with classical investigations in the Institute some non-traditional bioindication methods based on water fungi, water ticks and chironomid larvae were used.

A data bank with maps of river water quality based on the complex investigations of more than 60 rivers in the Samara region was supplied. The prime necessity for the estimation of the ecological state of small rivers and streams was underlined and the newly developed approach of the IVBE recently tested on rivers of Samara and adjoining regions was suggested for use on other sites.

We'll be pleased to send the Conference materials.

Contacts:

Institute of Volga Basin Ecology  
Samara region, Togliatti,  
Komzina-str., 10  
445003 Russia  
Tel., fax: 007 8482 489504

Staff of organising committee:  
Prof. G.Rozenberg,  
Dr.T.D. Zinchenko

e-mail: [ecolog@attack.ru](mailto:ecolog@attack.ru)  
[stok@sinform.infopac.ru](mailto:stok@sinform.infopac.ru)  
[tdz@mailru.com](mailto:tdz@mailru.com)  
[Larisa.nazarova@ksu.ru](mailto:Larisa.nazarova@ksu.ru)

## ***CURRENT RESEARCH***

### **THE DIVERSITY OF CHIRONOMIDAE IN LOTHIC AND LENTHIC ECOSYSTEMS IN PRYBAIKALIYE**

**Kravtsova, L.S.**

Limnological Institute, Siberian Branch of the Russian Academy of Sciences, Ulan-Batorskaya st. 3,  
664033, Irkutsk, Russia., Fax (3952)460405, e-mail: [lk@sherb.lin.irk.ru](mailto:lk@sherb.lin.irk.ru).  
(Address for correspondence: 664033, Irkutsk-33, P.O. Box 4199).

#### **Abstract**

Taxonomic diversity of chironomid larvae in Prybaikaliye water bodies (creeks, rivers and lakes) have been studied. It is shown that Lake Baikal is a buffer zone between water catchment basin and water body. Habitat conditions in the Lake Baikal littoral promote formation of a limno-rheophilic complex of chironomid species.

#### **Introduction**

More than 300 rivers and creeks flow into Lake Baikal. Terrigenous material and allochthonous organic material, plants and animals flow into Lake Baikal via the inflow waters. The interaction of water catchment basin with the water body can be a mechanism for the formation of faunal diversity in aquatic ecosystems. From this point of view we believed that it would be reasonable to characterise taxonomic diversity of invertebrates, in particular of chironomid larvae inhabiting both stagnant (lakes), and flowing (creeks, rivers) pre-Baikalian waters.

#### **Materials and methods**

The samples used in this study were collected by researchers of Limnological Institute of RAS SB, Institute of Biology and Zoology chair of the Department for Biology and Soils of Irkutsk State University during 1975-2000. Species composition of chironomid larvae is determined in quantitative benthic samples from Lake Baikal (700 samples), in fish stomachs, in qualitative and

quantitative benthic and drift samples from rivers, creeks (260 samples) and lakes (100 samples) in Prybaikaliye. Fauna analysis is done taking into account original and published data (VERSHININ 1964, BAZIKALOVA 1971, ERBAEVA 1976, ERBAEVA et al. 1977, LINEVICH 1981, KLISHKO 1995, Lake Baikal... 1998, BUYANTUEV 1999, PROVIZ 2000, KRAVTSOVA 2000, KOZHOVA et al. 2000, TAKHTEEV et al. 2000, etc.) in 25 flowing waters, 41 pre-Baikalian lakes (including lakes Baikal and Khubsugul) and thermal springs of Prybaikaliye. To assess faunal similarity (by Sorensen factor) of different chironomid habitats in the „river-lake“ system, cluster analysis was used.

#### **Results**

More than 300 species and larvae of chironomids are recorded for pre-Baikalian water bodies including larvae identified up to species groups (Table).

#### **Discussion**

The Chironomidae fauna of Prybaikalie rivers, creeks and lakes is diverse. Larvae of 2 subfamilies, Chironominae and Orthocladiinae, dominate. Representatives of the subfamily Podonominae are not recorded for the lakes (see Table). 111 chironomid taxa are found both lacustrine and riverine ecosystems of Prybaikaliye.

**Table: Taxonomic composition of chironomids species in Prybaikaliye water bodies**

Pre-Baikal water bodies	1		2		3		4		5	
	genera	species	genera	species	genera	species	genera	species	genera	species
subfamilies										
Podonominae	2	3	0	0	0	0	0	0	0	0
Tanypodinae	10	13	8	12	5	7	7	11	5	7
Diamesinae	9	24	3	4	5	9	4	7	0	0
Prodiamesinae	3	4	1	1	2	2	1	1	0	0
Orthoclaadiinae	32	81	20	42	20	44	16	45	6	9
Chironominae	33	85	34	97	29	73	24	42	9	15
Total	89	210	64	156	61	135	52	106	20	31

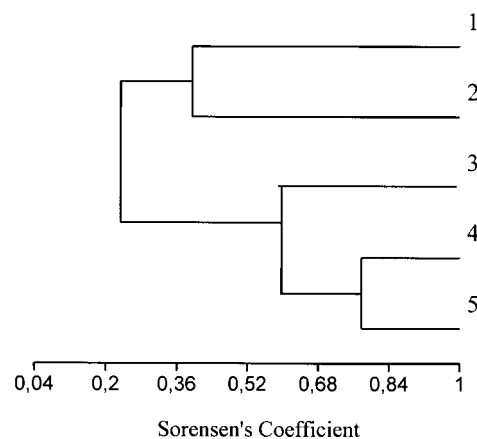
Notes. 1 - The Pre-Baikalian rivers, creeks including Angara R. and reservoirs; 2 - lakes of Baikalian rift zone; 3 - Lake Baikal; 4 - Lake Khubsugul; 5 - thermal springs of Prybaikaliya.

Analysis of the chironomid fauna in one of the largest lakes of the region studied, i.e. in Lake Baikal and in its largest tributary (contributing about 60 % of all the inflow volume), Selenga River, showed the following: 135 species and larval forms of chironomids are found in Lake Baikal, including 82 in the littoral of the lake (depths of 0-20 m) 12% of them endemics (PROVIZ 2000). The high species diversity of chironomids in Lake Baikal is due to the peculiar habitat conditions: heterogenous distribution of bottom sediments, high oxygen content and good light supply, promoting the development of such algae as *Ulothrix*, *Tetraspora*, *Draparnaldiellia*. The velocities of near-bottom currents in Lake Baikal at depths of 0.6 -1.2 m can reach 5 - 7

m/sec at a wave height of 0.5-1 m, at depths up to 5 m-1 m/sec (KARABANOV, KULISHENKO 1990). Active hydro- and lithodynamic processes in the Lake Baikal littoral create conditions close to rheophilic ones. The biological inflow (active and passive drift) through the system of rivers and creeks causes penetration of rheophilic Chironomidae into Lake Baikal.

69 species and larvae forms of chironomids are found in Selenga River. The diversity of chironomid fauna along the longitudinal river profile decreases with the decrease of the height above sea level. Faunistic similarity of chironomids (by Sorensen factor) of Selenga River on Mongolian and Russian territory is not high (Fig. 1).

Fig. 1. Faunistic similarity of chironomids



Notes: Selenga River on Mongolian territory - 1 and Russian one - 2; sors - 3; pre-delta zone - 4; open Baikal - 5.

Litho- and psammophilic species dominate in the chironomid fauna of Selenga River due to widely distributed sandy pebble substrata; boulders on silty substratum in the lower currents. Maximal number of species (6) is found in the genera *Eukiefferiella* (Orthoclaadiinae) and *Cryptochironomus* (Chironominae). Mouth and predelta zone are characterised by low species diversity (28 chironomid species). The outflow current of Selenga River, in particular its hydrological regime and sedimentation processes, creates the conditions different from the riverine ones and from the open Baikal waters, and close to lacustrine ones. There are sandy substrata, aleuritic silts with detritus. There are no typical rheophilic species of the Diamesinae or larvae of the Chironominae characteristic of high current flows. Faunistic similarity of the chironomids in these areas and in Selenga River is weakly expressed and is from 12-26 % (See Fig. 1). In the open Baikal (near the Selenga mouth) chironomid diversity (45 species) is a little less than in Selenga River. The similarity of chironomids in open Baikal is closer to the mouth and pre-delta zone of Selenga River (64-74 %) than in Selenga River itself (24-29 %). This is due to intensive water exchange of mouth and pre-delta zone with the open Baikal, through outcome and income phenomena caused by winds from different directions. In the bottom sediments of shallow depths (up to 20 m) of the open Baikal well grained sands and aleurite predominate, while stony substrata are widespread near the northern and southern boundaries of the Selenga area. In deep-water zones (over 100 m) there is clay, silt and small vegetable detritus. Among the chironomids here are representatives of all five subfamilies, both rheo- and limnobionts.

The study of chironomid diversity in the different habitats of the „river-lake” system of Selenga River. and Selenga area of Lake Baikal showed that in spatial distribution of chironomid larvae, an „edge effect” is observed in the littoral of the open Baikal out of the direct influence of the Selenga River outflow. In other sites of the open Baikal, the rheophilic fauna part is 33 % (SAMBUROVA 1982). Probably, the littoral of the open Baikal is not to be seen from the point of view of physical contact, but from one of interaction between lotic and lentic ecosystems, which can be called an ecotone or buffer system.

The results of the chironomid studies in Prybaikaliye flowing waters have changed a little existing opinion on the endemism of this fauna. The species *D. baicalensis* TSHERN., *Paratanytarsus baikalensis* (TSHERN.), *Neozavrelia minuta* (LINEV.), in our opinion are not Baikalian endemics as they are found outside it. Previously they were considered to be restricted to Lake Baikal but that was due to an insufficient knowledge of the input river systems' fauna. At

present, the first species is known also from the Amur River basin, the second from the lakes of Barguzin River basin as well as long the Selenga River and the last one from the Irkut River.

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**WHEN IS A NOMEN REALLY DUBIUM?**  
**TOWARD REAL STABILITY IN CHIRONOMID TAXONOMY**  
**THROUGH BETTER SYMBIOSIS WITH THE CLASSIC COLLECTIONS**

**By Martin Spies**

Munich, Germany (e-mail: [spies@zi.biologie.uni-muenchen.de](mailto:spies@zi.biologie.uni-muenchen.de))

*„One essential cause of the generally deplored synonymy confusion in all branches of entomology lies in the improper or often only very superficial use of the older sources in which earlier discoveries have been laid down.*

*This malady is not remedied if for any species quotations are given from ... any ... grandmasters of our discipline without first having verified exactly, whether these quotes are really correctly placed there. On the contrary, quotations that are merely copied from other works only cause new and great errors.*

*Of course, it cannot be asked of every entomologist to undertake the tedious and time-consuming comparisons with older sources; but then one should better refrain from citing authors one did not compare, or one should follow those entomologists who have made it their special task to critically review and evaluate the older sources. ... The complete appreciation and consideration of older sources, however, is an unavoidable necessity just because the results of thorough research from any time are not lost to posterity, and therefore ought to be preserved conscientiously so that one can continue to build on them. Yet another reason is the respect for the work of deserving earlier researchers who certainly did not record their results expecting that subsequent generations would completely ignore them any more than we would want our successors to ignore our own works.“*

Before you check from whom and what time I translated the above introduction (you will find the answer at the end of this article), consider how very much its essential points still apply to chironomid taxonomy today. Whether you do or don't agree so far, I sincerely hope we may all benefit from an earnest look at the following 'high'lights.

Ever since I started out in chironomid taxonomy it has repeatedly amazed and bothered me how constantly one runs into problems of nomenclature or similar historic obstacles, which have to be overcome - often slowly and tediously - before one can achieve even small-scale goals like the reliable identification of a single, common species (e.g. SPIES 1998, SPIES 2000).

The number of 'classic' type specimens still preserved as standards for the scientific names at the roots of all our fields of study is surprisingly and fortunately large. However, the status of revision of these collections is a rather illogical, random patchwork, the combined effect of the too low number of specialists and their personal preferences and logistic constraints. As a result, some chironomid names are now being widely used although no type material or other objective basis exists for them (e.g. *Chironomus plumosus* LINNÉ), for others the current interpretation has never been compared to the preserved type material or even clearly disagrees with it (several Meigen species; personal observation). A third group contains names officially out of use as being 'dubious' although well-preserved type material has been available all along.

Apart from the more theoretical problem that such a system hardly meets the requirements of the scientific method (e.g. that results must be objectively verifiable by others, and systems consistently organized), the situation, in my opinion, has long been impeding real progress within our field and in relation to others. I personally know of several capable colleagues who ended up turning away from chironomid taxonomy in part because they felt the nomenclatorial confusion would never be overcome. We are all aware of the scores of ecological studies still omitting the Chironomidae even though their information content would be at least as high as in the groups enumerated instead. And who would bet a penny on the durability of a tree whose roots and stem are largely hollow, consisting of species concepts not stabilized by comprehensive, type-based revisions?

Scientific taxonomy in general and of the Chironomidae in particular began in Europe, and for most of the nearly 250 years since Linné this region has enjoyed the highest density of active workers. Therefore, let us take the latest catalog of Palaearctic taxa (ASHE & CRANSTON 1990) as a model to estimate how chironomid species are distributed among the categories 'recognized' by current practice versus 'dubious' or otherwise out of use. For this test I chose the subfamily Tanypodinae, because it is large but easier to count than the Chironominae and Orthocladiinae, and because I have looked into it the most in recent months with regard to the topics relevant here. My count from the catalog is that **out of 370**

**species-level Palaearctic Tanypodinae 135 (a shocking 36.5 %) are considered nomina dubia or worse by ASHE & CRANSTON (1990).** Even if this subfamily were not fully representative for some reason, the Chironomidae as a whole can hardly be expected to be in very much better shape.

The situation would be bad enough if the ‘dubious’ category was made up mostly of names for which it has been proven that reliable information for their interpretation no longer exists. For practical taxonomy all such permanently dubious names could be ignored and laid to rest only in catalogs. Unfortunately, just a little scratching at the surface of the available information brings to light the ugly reality that **for a large number of supposedly dubious species irrefutable type material in sufficient condition is still preserved in musea across Europe.**

In CHIRONOMUS 13 I briefly reported on how insufficiently the current use of names by J. W. Meigen is based on his collection and original illustrations, both kept in Paris (MNHN) since 1840. Much more significantly, this case is apparently paralleled by those of the two most prolific chironomid describers at least of Europe:

J. J. Kieffer and M. Goetghebuer. Again using the Tanypodinae in the Palaearctic catalog as an example, I have produced a ranking of authors by number of original species descriptions published. The result shows one undisputed champion probably for all times to come, with **46 % (170 out of 370) of all Palaearctic Tanypodinae names, and even 51 % of the ‘dubious’ ones, going back to Kieffer.** Goetghebuer is a distant second with around 10 % shares in either category and the total. The three leaders in the overall ranking (Kieffer, Goetghebuer, Meigen) together account for almost 2/3 of all Tanypodinae names registered in the Palaearctic catalog (ASHE & CRANSTON 1990).

The point here is that the Goetghebuer (IRSNB, Brussels) and Meigen collections, although they do not contain material on all their authors’ species, still have much more to offer than has been put to use so far. The same can be said for several other important workers, e.g. Zetterstedt (SÄWEDAL 1974a, b) or even Fabricius (ZIMSEN 1964). To those we should finally also add Kieffer, with some restrictions, for the following reasons (see Figure):

**Figure:** Excerpt from an original specimen determination list exchanged by letter between A. Thienemann (more flowing handwriting, e.g. column headings) and J. J. Kieffer (more angular handwriting, e.g. most entries in right column).

Numm.	Ort	Kategorie	Name	Dr. de Siefel 1912
1				
2	7. III 12	am Wiefelder Meer Rind	<i>Procladius barbatitarsis</i> n. sp.	
3	4. III 12	auf dem Jeminder Meer Rind	<i>Procladius nigricollis</i> n. sp. <i>Procladius schmidti</i> n. sp.	
4	7. III 12	Darm. Spl. sammelnd	<i>Trichotanytus capellii</i> n. sp. <i>Dactylocladius (Luscha)</i>	
5	2. III 12	am Moosau Meer	<i>Camptocladius curvus</i> n. sp. 1 ♀ <i>Criotopus variflorus</i> n. sp. 1 ♂	
6	4. III 12	auf dem Iackbender Meer	<i>Chironomus (vittimontii)</i> <i>Calopsectra ornaticornis</i> n. sp. <del><i>Trichotanytus f. f. f.</i></del> <i>Tanytarsus (Luscha)</i> <i>Tanytarsus (Luscha)</i> <i>Tanytarsus (Luscha)</i>	
7	5. III 12	Kolman, Rind	<i>Criotopus limnophilus</i> n. sp.	
8	7. III 12	Darm. Quelle	<i>Camptocladius pentasema</i> n. sp.	
9	Alfbach in Moos	Wald = Moosau-Byssau	<i>Gomphonema heteronema</i> n. sp. <i>allobria</i> n. var. <i>Trichotanytus foliatus</i> n. sp.	
10	Sillenfeld	Wald = Moosau-Byssau	<i>Brachocladius bryophilus</i> n. sp.	
11	Fauler See	am Kolman 5. III 12	<i>Metriocnemus longicornis</i> n. sp. <i>Metriocnemus brevispinis</i> n. sp. 1 ♀ <i>Camptocladius foeniculaga</i> n. sp. 3 ♂	
12	N. 6		<i>Trichotanytus foliatus</i> n. sp. (nach A. Thienemann)	

Years ago, the late F. Reiss showed me a file folder with dozens of original, handwritten items from the correspondence between A. Thienemann and Kieffer, and also some similar letters between F. Lenz and Kieffer, covering the period from 1908 to Kieffer’s death in 1925. E. J. Fittkau and Reiss had rescued these from being destroyed at Plön after Thienemann’s death. During their long and intensive collaboration, Thienemann had sent Kieffer determination sheets (see Figure) along

with specimens in alcohol to be determined, listing for each sample the date and source („Herkunft“, middle column in Figure) or at least a descriptive designation („Bezeichnung“, left column; e.g. in line 9: „Alfbach in Moos“). Kieffer usually returned the sheets after entering the results of his determinations from each vial, often including number, sex and condition of specimens seen, and frequently more or less extensive comments. Occasionally, first



identifications were altered, either by Kieffer before return of the letter, or afterwards by Thienemann (see line 13, bottom of right column).

Reiss, lamentably, never found the time or a helper to process the numerous sheets, letters and postcards in detail. But in the spirit of our discussions about them I have recently excerpted all taxonomically relevant information into an electronic file containing some 2800 individual species- or genus-level records.

The Thienemann and Lenz collections at the Zoologische Staatssammlung Munich (ZSM) contain many original slides, alcohol vials and field notebooks with handwritten records that can be matched to entries on the correspondence documents. By comparing these data to those in their authors' publications on the corresponding taxa, a number of specimens have already been identified as undoubtedly constituting type material, and many more are hoped to still follow. For additional information on the background, and on practical problems to respect in such attempts, see SPIES (1998). The latter paper also makes it likely that additional sources of type specimens (in that case the Zavrel collection in Brno, Czech Republic) could be easily located if we started looking.

This brings up the point that major improvements will only be achieved in close symbiosis with the musea harboring the relevant collections. Since many of us are not ourselves employed at such institutions, we will need their help with the continued preservation and availability of specimens and data on them, for example the commendable presentation of type specimen lists on the Chironomid Home Page. In return, through our constant attention to the classic and recent treasures gathered at these musea, we can fulfil our duty to support them in justifying their existence against political and economic pressures.

If we combine approaches like the above with the long overdue examinations of those 'classic' type specimens already known to exist but not yet revised, we can realistically expect to substantially increase the number of solidly type-based and therefore really and meaningfully stable names. Obviously, through the achievements of the past decades we have already reached a certain degree of stability with a set of names in current use. However, given the extent of the problem outlined above and how much of it is virtual, i.e.

could be solved, we must be prepared for quite a number of changes. But there is no good reason why the status quo of today - an arbitrary point in time - should be largely frozen solid just to have stability for stability's (or rather rigidity's) sake. It does not make sense, for example, to use the Meigen name for a species that has been recently revised, but permanently exclude the Meigen name for the species next to the first one in the same museum box simply for the historic accident that nobody has yet managed to revise the group the second species belongs in. Instead, let us now take the missing steps toward a better stability consistently based on names verifiable through type material.

In summary, here are some **proposals for how to proceed in the future**, which I would seriously urge you to consider, discuss in public (e.g. over the Chironomidae-L e-mail listserver), and yes - follow in practice as applicable to your own work:

1. Please do not just keep adding more and more new species ornaments to the top of the family tree while the roots and the stem are slowly rotting away (pinned midges don't last forever, much has already been lost). Imagine how long an overburdened but hollow tree can stand and bear fruit. Instead, with at least some of your descriptive work join a hopefully concerted effort to stabilize the basis of our system by locating, revising and identifying unattended type specimens at any institution within your reach.

2. If you are not exclusively working in taxonomy, logistical reasons may keep you from ever seeing type material for most species you write about. Instead you are probably relying upon the identifications, keys etc. in the works of others. If so, have you been paying attention to what steps the authors of these references took to ensure that the names they are propagating are rooted in the proper type material? In the future, when identifying and reporting on species please try to use sources directly or indirectly based on the study of types. Do not uncritically copy names from works without such links to verifiable scientific facts. **Always cite the references with which you identified your species.** This way, if the name of such a species is later changed, it will be much easier afterwards to still trace back which species you had.

3. Send me your thoughts, and I'll try to coordinate and report to the community what developments there may be.

*„To whomever the above results do not appear satisfactory I would like to say that I myself regard them as of only minor importance. Their purpose, however, is to stimulate other dipterists to express their views and opinions ... , so that ... a definite result can finally be achieved, and thus our archives may be purified of the thousand dubious things which are disturbingly and paralyzingly obstructing any steady and thorough progress. In my opinion, the revision of earlier authors has to be undertaken in all seriousness. We must finally definitely know, which results by one or another may and should be accepted and preserved, and*

which discarded as forever indecipherable. The dragging along of unclear terms and unjustified names is damaging our science more than anything.

If I may rely among my colleagues upon the very peculiarity of mankind - I mean the one that they most readily speak if they can speak against something - then I hope to see all my intentions soon fulfilled."

J. R. SCHINER (1856 !!), translations and omissions from the Austrian original by M. Spies.

## References

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**Deadline for CHIRONOMUS 15 is the  
1<sup>st</sup> of July 2002**

## *THESIS*

### **Comparative ecology of chironomid populations (Diptera) from potamal zones of the Garonne and Loire rivers (France)**

#### **HETEROGENEITY OF LARGE RIVERS AND BIODIVERSITY**

**By Xavier-François Garcia**

Laboratoire d'Hydrobiologie, Université Paul Sabatier, 118, route de Narbonne, F-31.062, Toulouse Cedex, France.  
Tel/Fax: (33) 05 61 81 04 34. Email: xfgarcia@wanadoo.fr

#### **Abstract**

The biodiversity of a potamal section (<1km) of two French rivers - the middle Loire and the Garonne in its overflowing part - was studied and compared according to its three components identified on hydrosystem level : structural, functional and compositional components. The first two relate to the spatio-temporal heterogeneity of the river and the third to specific diversity.

Collection of chironomids was carried out using two different complementary sampling methods and on two different spatial scales, namely, collection of pupal exuviae with a drift net (site scale) and collection of pupae with a Surber net (micro-habitat scale). This enabled 187 species to be recorded, 144 on the Loire and 137 on the Garonne. Amongst these, 23 mostly potamophilous, are new to the latest list of French Chironomidae (Diptera) published by LAVILLE & SERRA-TOSIO (1996). Such a wide faunistic richness highlights the taxonomic interest of sampling the potamal zones of large European rivers.

The spatio-temporal dynamics of the environmental parameters and chironomid communities of the two rivers were studied separately in order to identify the characteristics of each river, as much ecologically as faunistically.

The fluvial dynamics associated with the degree of submersion of side zones (duration and frequency) are the driving force behind the structural and functional biodiversity of the hydrosystems. The heterogeneity of the river results from the synergy between these two biodiversity components. This synergy is expressed on all time and space scales (section, site and micro-habitat).

The compositional biodiversity or specific diversity of chironomids is undoubtedly conditioned by the heterogeneity of the river but shows varied and complex patterns of expression which are dependent on the scale

considered. These patterns are subject to the geomorphological particularities of each hydrosystem as we have seen in the comparison carried out between the Loire and the Garonne. The high specific diversities observed in the sections studied both in the Loire and in the Garonne result from different mechanisms which are not necessarily exclusive :

in the Loire, specific diversity is generated by the dynamics of the connection between the main channel and the side channels. Specific diversity is thus mostly generated by the functional biodiversity of the hydrosystem

in the Garonne, specific diversity is generated by the juxtaposition of habitats with marked typological characteristics. Specific diversity is thus mostly generated by the structural biodiversity of the hydrosystem.

These differences, at section level, can equally be observed on site and at micro-habitat level.

The study of chironomid communities on a micro-habitat scale highlights the ability of most potamophilous chironomid larvae to use the vast range of environmental resources, as well as their ability to adapt to particular situations such as sudden variations in discharge.

**Defense :** September 23, 2001, P. Sabatier University, Toulouse, France.

**Examiners :** **P. Auriol** (University of Toulouse), **JP. Berton** (Univ. of Tours), **WP. Coffman** (Univ. of Pittsburg), **P. Langton** (University Museum of Cambridge), **H. Laville** (Univ. of Toulouse), **N. Prat** (Univ. of Barcelonne), **B. Rossaro** (Univ. of Milan), **JN. Tourenq** (Univ. of Toulouse).

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**Related papers**


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- [1] GARCIA XF, LAVILLE H. 2000 - First inventory and faunistic particularities of the Chironomid population from a 6<sup>th</sup> order section of the sandy River Loire (France). *Arch. Hydrobiol.*, 147(4) : 465-484.
- [2] LANGTON P, GARCIA XF. 2000 - A review of *Cladotanytarsus conversus* (Johannsen) with first records from Europe. *Spixiana*, 23(2) : 199-206.
- [3] GARCIA XF, LAVILLE H. 2001 - The importance of floodplain waters for the conservation of chironomid biodiversity in a 6<sup>th</sup> order section of the Garonne River. *Annls. Limnol.*, 37(1) : 37-45.
- [4] GARCIA XF, LAVILLE H. 2001 - Spatio-temporal distribution of the chironomid populations in the lower part of a large river : the Middle Loire (France). *Verh. Internat. Verein. Limnol.* (in press).
- [5] GARCIA XF, LAVILLE H. 2001 - Chironomid populations, biodiversity and channel connectivity on a large river system, the Garonne river, France. *Regul. Rivers : Res. Mgmt.* (in press).

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**SHORT – COMMUNICATIONS**

**A REVIEW OF *BETHBILBECKIA* FITTKAU, 1988 (DIPTERA: CHIRONOMIDAE)**

(Abstract for a poster presentation displayed at the NABS meeting in La Crosse, WI, June 3-8, 2001. Paper in preparation.)

**Charles N. Watson, Jr.**

1564 Wessels Dr., 6 Fort Wright, K.Y. 41011

The genus *Bethbilbeckia* belongs to the tribe Macropelopiini of the subfamily Tanyptodinae. The genus was erected by Fittkau in 1988. Currently it contains a single species, *B. floridensis* Fittkau. The diagnostic characters are reviewed and corrections made to the original description. The larva has 4 antennal segments, not 5 as originally reported. The previously unknown females of *B. floridensis* have numerous sensilla chaetica on the first tarsal segment of the meso- and metathoracic legs. The distribution is reviewed and the species is reported from Virginia for the first time. *B. floridensis* larvae occur in cold seeps, springs and small streams. *B. floridensis* appears most closely related to *Macropelopia* in all life stages. Unique pupal characters justify maintaining *Bethbilbeckia* as a separate genus for the time being. A better knowledge of the Neotropical and Australasian Macropelopiini should clarify relationships and generic limits among the tribe.

## WHAT IS A FRONTAL WART?

On the frontal apotome of chironomid pupal exuviae there may be paired projections. Where they bear apical, or subapical setae (the frontal setae), there is no problem in calling them cephalic tubercles. However, the position of the frontal setae is variable, in some *Cricotopus* species being situated far ventral on the praefrons. Though paired projections are not found on the praefrons, the cephalic tubercles do not occupy a precise position on the frontal apotome even when bearing a seta.

When there are two pairs of projections on the frontal apotome, the more dorsal (which never bears a seta) are referred to as frontal warts. By definition (Sæther, 1980) frontal warts are 'wart-like tubercles on the frontal apotome in addition to cephalic tubercles' (*my emphasis*). This neatly eliminates the problem of making a decision as to whether a paired projection on the frontal apotome is a cephalic tubercle or wart: if there is one pair only, they are cephalic tubercles, if two, then the more dorsal pair are frontal warts.

Peter H. Langton

### Reference:

SÆTHER, O.A., 1980. Glossary of chironomid morphology terminology (Diptera: Chironomidae).-Entomologica Scandinavica Supplement No.14.

## FORTHCOMING PUBLICATION

### A KEY TO ADULT MALES OF BRITISH AND IRISH CHIRONOMIDAE

By P.H.Langton & L.C.V.Pinder

This is a revised version of Pinder's (1978) Freshwater Biological Association key, including many additions to the British and Irish fauna since 1978. Some of the keys have been entirely rewritten in an attempt to facilitate accurate identification, where problems arose in the use of the earlier key. Publication is expected early 2002.

## PUBLICATION RECEIVED

### BIOLOGÍA Y CONTROL DE *CHIRONOMUS PLUMOSUS*

H.Quiroz Martinez & A. Rodriguez Castro

Universidad Autonoma de Nuevo Leon, Facultad de Ciencias Biologicas, Departamento de Zoologia de Invertebrados, Laboratorio de Entomologia y Artropodos, San Nicolás de los Garza, N.L., Mexico, Sept. 13, 2000.

This is a well produced pamphlet of 16 pages, the result of a three year program to control *Chironomus plumosus* in a wastewater treatment plant in Monterrey, Nuevo León, Mexico. There is a section on the biology and life cycle of *Chironomus plumosus* followed by strategies for control and how effective they were. Five colour plates enhance the attractiveness of the pamphlet. Those with a knowledge of Spanish and an interest in the control of excessive swarms of *Chironomus* should obtain for themselves a copy from the authors.

P.H.L.

## PROFESSORS ANDERSEN'S AND SAETHER'S VISIT TO BRAZIL

Invited by Dr. Claudio Froehlich, Sao Paulo University, Brazil, and supported by Sao Paulo Research Founding (FAPESP) and the Norwegian Research Council (NFR)

By Humberto Fonseca Mendes

**Professor Trond Andersen** (Bergen, Norway) visited Brazil last year for the International Symposium on Chironomidae (Rio de Janeiro, Brazil) and was invited to go to Sao Paulo University, Ribeirco Preto, to carry out the descriptions of Brazilian *Antillocladius* Saether, 1981, and run a course entitled: "Chironomidae: Systematics, Biogeography and Ecology (Emphasis on Orthoclaadiinae)".

September 18th to 22nd, the week-long course, carried out by Dr Trond Andersen, that had a contribution by Prof. Ole Saether, a lecture entitled: On phylogeny of Culicomorpha and on Chironomidae subfamilies. And some notes on Systematics, Biogeography and Ecology of the Neotropical Chironomidae with notes on descriptions and identification of the Neotropical material. September 23rd to October 7th, Dr Trond Andersen and I worked on the Brazilian Orthoclaadiinae with special attention to *Antillocladius*, and related genera; the descriptions of the Brazilian species may come soon.

**Professor Ole A. Saether** (Bergen, Norway) visited Brazil last year for the International Symposium on Chironomidae and went to University of Sao Paulo (USP) and University of Sao Carlos (UFSCar) from September 14th to 21st. During his visit he delivered a lecture for the students of Andersen's Course and sat in on Brazilian Chironomidae identification of the USP and UFSCar collections. He provided us with many certain identifications that will now be used as reference material for forthcoming studies on Chironomidae in Brazil.

## NOTICE – BOARD

### SHORT COURSE

#### CHIRONOMIDS: WATER QUALITY AND CLIMATE CHANGE

Jan. 21-25, 2001 at University College, London.

S.J. Brooks (British Museum) & L.P.Ruse (Environment Agency)

Fee £ 270. Full details at [www.geog.ucl/ecrc/teaching.stm](http://www.geog.ucl/ecrc/teaching.stm) or from Gail Crick, ECRC, Dept.of Geograhly, University College London, 26, Bedford Way, London WC1H OAP  
(Part of a series entitled „Short courses in environmental palaeoecology for MSc and PhD students 2001/2001

### REQUEST FOR MATERIAL

I am presently working on a world wide revision of the orthoclad genus *Bryophaenocladus* with the collaboration of Profs. O. A. Sæther and T. Andersen (Bergen). In order to complete this work we need additional material. Reared or otherwise associated material is especially welcome. Thank you in advance.

**Xinhua WANG**, Dept. of Biology, Nankai University, 94 Weijin Road  
Tianjin, 30071. - **P. R. CHINA** Fax: +86 22 344853 E-mail:  
[xhwang@nankai.edu.cn](mailto:xhwang@nankai.edu.cn)

## **REGIONAL REPRESENTATIVES 2001**

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### **AFRICA:**

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#### **South Africa:**

Arthur HARRISON, 111 A Berg Road, Fish Hoek 7975, South Africa.

#### **West Afrika:**

Josef S. AMAKYE, Institute of Aquatic Biology (C.S.I.R.), P.O.Box 38, Achimota - Accra, Ghana.

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### **AMERICAS:**

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#### **Argentina :**

Julieta MASAFERRO, Department of Entomology, Natural History Museum, Cromwell Road, London SW7 5BD, U.K.  
Tel: +44 (0) 207 942 5198. Fax: +44 (0) 207 942 5229. Email: [J.Massafarro@nhm.ac.uk](mailto:J.Massafarro@nhm.ac.uk)

#### **Brazil:**

Marcos CALLISTO, Universidade Federal de Minas Gerais, ICB, Depto. Biologia Geral, Lab. Limnologia/Ecologia de Bentos, CP. 486, CEP. 30.161-970, Belo Horizonte, MG, Brazil.  
Tel: +55 31 499 25 95. Fax: +55 31 499 25 67.  
Email : [callisto@mono.icb.ufmg.br](mailto:callisto@mono.icb.ufmg.br)

#### **Canada:**

Ian R. WALKER, Departments of Biology, and Earth and Environmental Sciences, North Kelowna Campus, Okanagan University College, 3333 College Way, Kelowna, BC, V1V 1V7, Canada.  
Tel: (250) 762-5445 ext. 7559. Fax:(250) 470-6004. Email: [iwalker@ouc.bc.ca](mailto:iwalker@ouc.bc.ca)

#### **Central America:**

Carlos DE LA ROSA, Brooker Creek Preserve, Pinellas Co. Environmental Mgmt. Dept., 1001 Lora Lane, Tarpon Springs, Florida 34689, U.S.  
Tel.: (727) 943-4004. Cell Phone: (727) 580-2573. Fax: (727) 943-4002. Email: [cdelaros@co.pinellas.fl.us](mailto:cdelaros@co.pinellas.fl.us)

#### **Mexico:**

Javier ALCOCER, UNAM Campus Iztacala, Limnology Lab, Environmental Conservation & Improvement Project, Universidad Nacional Autonoma de Mexico, Calle 15, #51 San Pedro de los Pinos, Mexico City, D.F. 03800, Mexico.

Fax: (525) 277-1829. Email:

[jalcocer@unamvml.dgsca.unam.mx](mailto:jalcocer@unamvml.dgsca.unam.mx)

#### **Suriname:**

Arnoldine BURGOS, Bureau voor Openbare Gezondheidszorg, Centraal laboratorium, Rode Kruislaan 13 Postbus 1911, Paramaribo, Suriname.

#### **U.S.A.:**

L.C. FERRINGTON Jr., Department of Entomology, Hodson Hall, 1980 Folwell Avenue, University of Minnesota, St. Paul, MN 55108, U.S.

Tel.: (612) 624-3265. Email:

[ferri016@umn.edu](mailto:ferri016@umn.edu)

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### **ASIA:**

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#### **P. R. of China:**

WANG, Xinhua, Biology Dept., Nankai University, Tianjin, 300071, China.  
Fax: +86 22 344853. Email: [xhwang@sun.nankai.edu.cn](mailto:xhwang@sun.nankai.edu.cn)

#### **India:**

P.K. CHAUDHURI, Dept of Zoology, University of Burdwan, Burdwan 713 104, W.B., India.  
Fax: +91 342 64452

#### **Iran:**

Seyed Karim MOUSAYI, Dept. of Freshwater Biology, The Norwegian College of Fishery Science, N-9037 Tromsø, Norway.  
Tel:+4777644505. Fax:+4777646020. Email: [karim@nfh.uit.no](mailto:karim@nfh.uit.no)

#### **Israel:**

Jehoshua KUGLER, Dept of Zoology, Tel-Aviv University, Tel-Aviv 69978, Israel.

#### **Japan:**

Toshio IWAKUMA, Hokkaido University, Kita-Jujo-Nishi 5, Kita-ku, Sapporo, Hokkaido, 060 Japan.  
Email: [iwakuma@ees.hokudai.ac.jp](mailto:iwakuma@ees.hokudai.ac.jp)

#### **Malaysia:**

A.R. ISMAIL, Jabatan Biologie, University Pertanian Malaysia, 43400 UPM Serdang, Selangor, Malaysia.

**Far East of Russia:**

Eugenyi A. MAKARCHENKO, Laboratory of Freshwater Hydrobiology, Institute of Biology and Soil Sciences, Far Eastern Branch of the Russian Academy of Sciences, 690022 Vladivostok - 22, Russia.

Fax: +7 (4232) 310193. Email:

[emakar@mail.ru](mailto:emakar@mail.ru) (home) and [zoology@eastnet.febras.ru](mailto:zoology@eastnet.febras.ru) (work)

Lake Baikal and River Angara, South Siberia:

Engelsina ERBAEVA, Institute of Biology, Irkutsk State University, P.O. Box 24, Lenin street 3, 664033 Irkutsk, Russia.

**South Korea:**

Youn BYEONG-JIN, Pusan National University, Department of Biology, #30 Changeon-dong Kumjeong-Ku, Pusan 609-735, South Korea.

**EUROPE****Austria:**

Ruth CONTRERAS, Naturhistorisches Museum, 2. Zoologische Abt., Burgring 7 (Box 417), A-1014 Wien, Austria.  
Tel: ++43 01 521 77/317. Fax: ++43 01 523 52 54. Email: [ruth.contreras@nhm-wien.ac.at](mailto:ruth.contreras@nhm-wien.ac.at)

**Belgium:**

Boudewijn GODDEERIS, Koninklijk Belgisch Instituut voor Natuurwetenschappen, Afdeling Zoetwaterbiologie, Vautierstraat 29, B-1040 Brussel, Belgium.  
Tel: ++32 2 627 43 14. Fax: ++ 32 2 646 44 33. Email: [goddeeri@kbinirsnb.be](mailto:goddeeri@kbinirsnb.be)

**Bulgaria:**

Paraskeva MICHAILOVA, Institute of Zoology, boul. Rouski 1, Bulgarian Academy of Sciences, Institute of Zoology, Sofia 1000, Bulgaria.  
Email: [parmich@mail.bol.bg](mailto:parmich@mail.bol.bg)

**Czech Republic:**

Pavel CHVOJKA, National Museum, Department of Entomology, Kunratice 1, 14800 Praha, Czechia.

**Denmark:**

Claus LINDEGAARD, Freshwater Biological Laboratory, University of Copenhagen, 51 Helsingorsgade, DK-3400, Hillerød, Denmark.  
Fax: +45 48241476. Email: [clindegaard@zi.ku.dk](mailto:clindegaard@zi.ku.dk)

**Estonia:**

Andu & Kulli KANGUR, Vorstjarv Limnological station, EE2454 Rannu, Estonia. Fax: +372 343 3472. Email: [andu@lim.tartu.ee](mailto:andu@lim.tartu.ee)

**Finland:**

Esa KOSKENNIEMI, West Finland Regional Environment Centre, P.O. Box 262, SF-65101 Vaasa, Finland.

Tel: + 358-6-3256609. Fax: + 358-6-3256611. Email: [Esa.Koskenniemi@vyh.fi](mailto:Esa.Koskenniemi@vyh.fi)

**France:**

Yannick R. DELETTRE, C.N.R.S. (U.M.R. 6553 "ECOBIO") - Universite de Rennes I, Station Biologique, F-35380 Paimpont, France. Tel: (+33) 02.99.61.81.73. Fax: (+33) 02.99.61.81.87 (from abroad don't dial the zero). Email: [yannick.Delettre@univ-rennes1.fr](mailto:yannick.Delettre@univ-rennes1.fr)

**Germany:**

SPIES, Martin, Schraemelstr. 151, D-81247 München, Germany.  
Fax : + 49 89 8107 300. Email: [spies@zi.biologie.uni-muenchen.de](mailto:spies@zi.biologie.uni-muenchen.de)

**Hungary:**

György DÉVAI, L. Kossuth University, Ecological Institute, H-4010 Debrecen, Hungary.

**Iceland:**

Jon Sigurdur OLAFSSON, University of Iceland, Institute of Biology, Grensasveg 12, 108 Reykjavik, Iceland. Email: [jsol@rhi.hi.is](mailto:jsol@rhi.hi.is)

**Italy:**

Bruno ROSSARO, Univ. of Milano, Dept. of Biology, Sect. Ecology, via Celoria 26, I-20133 Milano, Italy  
Fax: +39 2 26604361. Email: [rossaro@mailserver.unimi.it](mailto:rossaro@mailserver.unimi.it)

**Ireland:**

Declan MURRAY, Dept of Zoology, University College Dublin, Belfield, Stillorgan Road, Dublin 4, Ireland.  
Tel: +353-1-706-2336. Fax: +353-1-7061152. Email: [declan.murray@ucd.ie](mailto:declan.murray@ucd.ie)

**The Netherlands:**

Heather A.LESLIE, Department of Aquatic Ecology and Ecotoxicology, IBED, Faculty of Science, University of Amsterdam, Kruislaan 320, P.O. Box 94084, 1090 GB, Amsterdam, The Netherlands



Tel. +31 (0)20 525-7712. Fax: +31 (0)20 525-7716. Email: [leslie@science.uva.nl](mailto:leslie@science.uva.nl)

**Norway:**

Endre WILLASSEN, University of Bergen, Institute of Zoology, Museum of Zoology, Muséplass 3, N-5007 Bergen, Norway. Phone: +47 55582901. Fax: +47 55589677. Email: [Endre.Willassen@zmb.uib.no](mailto:Endre.Willassen@zmb.uib.no)

**Poland:**

Andrzej KOWNACKI, Institute of Freshwater Biology, Academy of Sciences, Ul. Slawkowska 17, PL-31016 Krakow, Poland.. Tel: +48 12 222115

**Romania:**

Maria-Monica TUDORANCEA, Dept.of Ecology-Genetics, Faculty of Biology and Geology, "Babes-Bolyai" University, 1 M. Kogalniceanu Str., Cluj-Napoca, 3400 ROMANIA. Fax: (40) (64) 191906 or 40 64 431858. Email: [mtudor@biolog.ubbcluj.ro](mailto:mtudor@biolog.ubbcluj.ro)

**Togliatti:**

Tatiana ZINCHENCO, Institute of Ecology of the Volga River Basin, Russian Academy of Sciences, Togliatti 445003, Russia.

**Slovakia :**

Peter BITUSIK, Faculty of Ecology and Environmental Sciences, Technical University, Masarykova 24, SK-960 53 Zvolen, Slovakia. Email: [bitusik@vsld.tuzvo.sk](mailto:bitusik@vsld.tuzvo.sk)

**Spain:**

Narcis PRAT, Dept Ecologia, Diagonal, 645 Universitat de Barcelona, ES-08028 Barcelona, Spain. Fax: (3)4111438. Email: [narcis@porthos.bio.ub.es](mailto:narcis@porthos.bio.ub.es)

**Sweden:**

Richard K. JOHNSON, University of Agricultural Sciences, Box 7050, S 75007 Uppsala, Sweden. Fax: +46 18 673156. Email: [Richard.Johnson@ma.slu.se](mailto:Richard.Johnson@ma.slu.se)

**Switzerland:**

Brigitte LODS-CROZET, Laboratoire d'Ecologie et de Biologie Aquatiques, 18 chemin des Clochettes, University of Geneva, CH-1206 Geneva, Switzerland. Tel: (+41 22) 705 71 00; Fax (+41 22) 789 49 89; Email: [brigitte.lods@leba.unige.ch](mailto:brigitte.lods@leba.unige.ch)

**UK:**

Peter H. LANGTON, 5 Kylebeg Avenue, Mountsandel, Coleraine, Co. Londonderry, Northern Ireland, BT52 1JN - Northern Ireland Email: [106375.1453@compuserve.com](mailto:106375.1453@compuserve.com)

---

**PACIFIC**

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**Australia:**

Peter S. CRANSTON,, Department of Entomology, University of California, One Shields Avenue, Davis, CA 95616, US Email: [pscranston@ucdavis.edu](mailto:pscranston@ucdavis.edu)

**New Zealand:**

Ian K.G. BOOTHROYD, Kingett Mitchell & Associates, Level 2, ASDA Plaza, 4 Fred Thomas Drive, P.O. Box 33849, Takapuna, Auckland, New Zealand Phone: ++64 9 4885033. Fax: ++64 9 4868072. Email: (work) [i Boothroyd@kma.co.nz](mailto:i Boothroyd@kma.co.nz) (home) [Ian.b@xtra.co.nz](mailto:Ian.b@xtra.co.nz)

**Philippines:**

Zenaida Batac CATALAN, Institute of Environmental Science and Management, The University of the Philippines at Los Baños, College, Laguna, Philippines.

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Current Bibliography: 1 Jan. 2000 - 31 Dec. 2000

by Odwin Hoffrichter

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This listing is compiled, as usual, from many sources: databases, tables of contents of journals, references and citations of papers, autopsy of many periodicals, lists provided by authors (thanks to you!). One important source is always the Zoological Record (ZR). During the last years, Chironomidae references from the ZR volumes invariably yielded between 200-300 records, about one tenth of which used to be new, i.e. they had not been retrieved by other means. Nevertheless, not all titles of a particular year can be reported the following year, therefore, the current titles are preceded by supplementary of the earlier year (2 years at most). For older titles, go to the chironomid home page (<http://www.ouc.bc.ca/fwsc/iwalker/intpanis/>). As before, only printed titles are reported here. Online publications alone, electronic delivery must be retrieved differently, in particular, again check the chironomid home page for eventual references.

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