II МЕЖДУНАРОДНАЯ КОНФЕРЕНЦИЯ

РАЗНООБРАЗИЕ БЕСПОЗВОНОЧНЫХ ЖИВОТНЫХ НА СЕВЕРЕ

17-22 марта 2003 г.,
Сыктывкар,
Республика Коми,
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II INTERNATIONAL CONFERENCE

INVERTEBRATE ANIMALS DIVERSITY IN THE NORTH

March 17-22, 2003,
Syktyvkar,
the Komi Republic,
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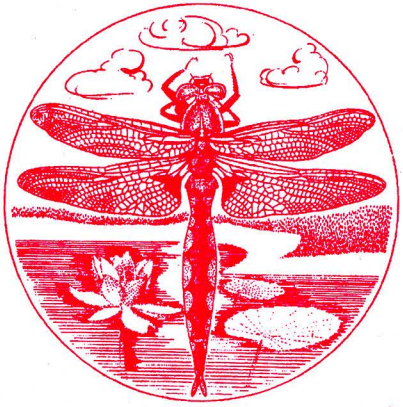

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II Международная конференция

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ТЕЗИСЫ ДОКЛАДОВ

ABSTRACTS

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INVERTEBRATE ANIMALS DIVERSITY IN THE NORTH

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Разнообразие беспозвоночных животных на Севере: Тезисы докладов II Международной конференции (Сыктывкар, Республика Коми, Россия, 17-22 марта 2003 г.) – Сыктывкар, 2003.

Представлены тезисы докладов II Международной конференции, посвященной разнообразию беспозвоночных животных естественных и антропогенных экосистем Севера. Рассматриваются вопросы, касающиеся фауны, зоогеографии, изменчивости беспозвоночных животных; структуры, динамики и антропогенной трансформации их сообществ; использования беспозвоночных в биоиндикации качества окружающей среды; их участия в переработке органических веществ; исследования паразитарных систем в природных и антропогенных биоценозах; регулирования и контроля численности вредителей лесного и сельского хозяйства; адаптаций беспозвоночных животных к условиям Севера.

Invertebrate animals diversity in the North: Abst. Second Inter. Conf. (Syktyvkar, the Komi Republic, Russia, March 17-22, 2003) – Syktyvkar, 2003.

The volume contains abstracts submitted to the international conference devoted to diversity of invertebrate animals of wild and anthropogenic landscapes. Fauna, zoogeography and variability; structure, dynamics and anthropogenic transformation of communities; using in bioindication of environment; participation in organic matter treatment; study of pest systems, adjustment and control of forest and agriculture pest; adaptation to the North conditions are under discussion.

Тезисы докладов опубликованы при финансовой поддержке Российского фонда фундаментальных исследований и Федеральной целевой программы «Государственная поддержка интеграции высшего образования и фундаментальной науки».

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Timofeev N.P. Number dynamics of wheel animalcules *(Rotatoria)* in biological water-purification system of cellulose-and-paper industrial complex / Invertebrate Animals Diversity in the North: Abstracts Second International Conference. Syktyvkar, Komi Scientific Center Ural Branch of RAS, 2001. – P. 147-148.

NUMBER DYNAMICS OF WHEEL ANIMALCULES (*ROTATORIA*) IN BIOLOGICAL WATER-PURIFICATION SYSTEM OF CELLULOSE-AND-PAPER INDUSTRIAL COMPLEX

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Sewage of cellulose-and-paper combine (CPC) containing a complex of various organic and chemical components (phenols, lignin sulphonic acids, synthetic surface-active substances, bleaches, mineral oil, sulphates, etc.) is one of difficultly degradated industrial wastes. After mixing they put into aerotank, where there is a biological oxidation by active silt, saturated with saprophytic zoogel-forming bacteria.

Because of unfavorable habitat the specific diversity of aerotank fluid dwellers is insignificant, the structure consists of the following basic groups (according to degree of their participation in decomposition): Ciliata, Rotatoria, Mastigophora and Suctoria, Sarcodina. Wheel animalcules make up alongside with protozoa the second trophic level in the structure of aerotanks biocenosis and keep up the number of dispergated bacteria at minimum level, preventing losses

of suspended matters from system. They serve also one of indication elements of oxidizing system and sewage disposal quality.

In the conditions of stable loads and the stability of industrial sewage structure, the changes in Rotatoria number are minimal (1.2-1.3 times). Interruption of flocculation and sedimentation properties of active slime lead to changes of their quantity (1.5 times). Growth of Infusoria number increase in 3-15 times if active slime is diffused. In this case various feed niches are used. If Ciliata feeding first of all is determined by presence of some bacteria, not connecting with silt flakes, but Rotatoria use old and dead part of zooglea

Constant observations show, that significant changes of Rotatoria number are connected with seasonal dynamics of ambient temperature, strong changes of coming industrial sewage quantity and consequences of technological adjustments. The high temperature in summer months (38-40°C), which is combined with decrease of oxygen contents in aerotanks, affects negatively on their presence, so they disappear from system. They reappear in former quantity only at temperature 32-34°C. The further temperature decrease up to 22-24°C does not exert negative influence upon them.

Sharp changes in sewage volumes (from 0.36 up to 0.52 million m^3/day), connected with start-up of departments and factories productions after longstop on overhaul, cause hydro impacts, broken the work of secondary settling tanks. As the results about 50% of Rotatoria is taken out with a hydro wave from clearing system. Similar carrying out is registered after technological operations connected with adjustment of regeneration regime. For example, at transition from 25 up to 50% regeneration, there is disturbance of old and dead silt with the increase of filamentous bacteria and benthos amoebas number connected with these ecological niches As consequence, at the beginning number of Rotatoria grows, and then they are taken out from the system with other protozoa because of infringement of silt falling out.

PHENOLOGY OF DEVELOPMENT OF DOMINANT CARABID SPECIES IN WOODS OF SOUTHERN TAIGA

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In 1993-1994 seasonal dynamics of activity and demographic structure of populations of 16 carabid species in 25 wood biotopes is investigated in conditions of southern taiga of the Northeast of the European part of Russia.

About 17 thousand beetles of dominant carabid species were collected the method of soil Barber's trap (Barber, 1931). The analysis of the sex and age structure of adult populations is carried out by Wallin's technique (Wallin, 1987).

The main part of investigated species have one-year life cycle of development. Species *Carabus glabratus* Pk. and *C. schoenherri* F.-W. develop in area of research during two years and their larvae and imago of all age can hibernate. By the end of summer only larvae developed from eggs, which laid by beetles after winter, and these larvae have no time to reach the last age stages. Larvae of mentioned species need a long-term stimulation by cold for pupation (Hurka, 1973), therefore larvae became pupae only after winter diapause. Young beetles occur at the end of season of activity (August) and hibernate at stage of immature imago. After overwinter they become sexual mature and breed in June - July.

Monovoltine and bivoltine species were marked among carabid beetles with one-year cycle of development. In conditions of southern taiga *Notiophilus biguttatus* (Pk.) and *Amara brunnea* Gyll. have two generation during a season that confirms by the data of other authors (Turin, 2000). These species hibernate in stages of adult and larvae. Beetles, which hibernate in adult stage, are reproducing from May to June. In second half of summer (August-September) new young beetles developed from eggs.

Monovoltine species differed by hibernating stage. «Spring» species *Pterostichus nigrita* (Pk.), *P. strenuus* Panz., *Agonum fuliginosum* Panz. hibernate in imago stage only. *Leistus terminatus* H. in P. is monovoltine species with wintering larvae, which reproduction was observed from August to September. At the majority of other species can hibernate during larvae and imago. Among these species *Elaphrus cupreus* (Duft.), *Loricera pilicornis* (F.), *Pterostichus oblongopunctatus* (F.), *Platynus assimile* (Pk.) are concerning to «spring» according to S. Larsson (1939). *Apaphius rivularis* Gyll., *E. secalis* Pk, *Leistus terminatus* (Hell) are «autumn» species. In conditions of southern taiga some autumn species are breed from June to July in more favorable period by temperature conditions, humidity and a feed *(Harpalus quadripunctatus* Dej, *Pterostichus niger* (Schall)).

Calathus micropterus (Duft.) and *Pterostichus melanarius* (Ill.) with interpopulation differentiation have multiseasonal reproduction. Wintering immature adults submit one part of their population and breed from June to July. Wintering postgenerative adults form other part of population with reproduction in June. By the end of a season these two groups give new generation, which are hibernate in immature ages The third part of population of this species hibernate as larvae, in this case, the beetles are breed from July to August. Earlier such polyvariety for populations of *C. misropterus* (Duft.) was marked by Sharova and Denisova (1995).

Polyvariant species with wintering adults and larvae are the most adapted to climatic conditions of a taiga are. Dominant carabid species have ecological differentiation according to time of reproduction.