

CURRENT RESEARCH

A POINT OF VIEW ON CHIRONOMID DEFORMITIES INVESTIGATION

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Since 1995, investigations connected with different aspects of chironomid ecology were started in Kazan State University, focusing in particular on influence of different pollutants on chironomid morphology in natural waterbodies as well as in laboratory conditions. Although chironomid deformities have been investigated for a long time already practically everywhere else in the world, Russia has not been much involved in this specific and very interesting study. There are only a very few Russian references briefly reporting the occurrence of chironomid deformities and I am sure they are absolutely unknown to foreign specialists (e.g. SKALSKAYA 1994; ZINTCHENKO et al. 1997).

But the time is really past for the mere description of a new (even very lovely) deformity. This is the time to seek out and try to understand the internal mechanisms involved; relationships between biochemistry and physiology of organisms are very important now. How do the pesticides, trace metals (acknowledged teratogens) and other chemicals, which are supposed to be teratogens „work“. What are their targets in metabolic processes, which of them exert an influence at the genetic level and is this influence reversible or not?... and so on. These are the kind of question available for specialists fascinated by this area of chironomid study. It is not possible to forget the valuable contribution of Dr. Warwick, who formulated basic approaches and methods of investigation in this area (WARWICK 1985, 1989, 1990, 1991 etc). Also well known are brilliant investigations of Canadian, Belgian and other specialists (VAN DE GUCHTE & VAN URK 1989; JANSSENS DE BISTHOVEN et al. 1992; MADDEN et al. 1992; VERMEULEN, JANSSENS DE BISTHOVEN et al. 1994; VERMEULEN 1995 etc.) - and we hope to be admitted to this society.

Our first steps were made traditionally: a study of deformities in natural water bodies

(NAZAROVA 1997, ZINTCHENKO, NAZAROVA 1997). As a next step the influence of Cu and polluted sediments on chironomid larvae in laboratory conditions were investigated (NAZAROVA, LATYPOVA, TUHVATULLINA 1999). Cu was chosen as it is one of the most important pollutants in all waterbodies in our region. Currently we are concentrating on analyses of teratogenic influences of some biochemical compounds (the newly created class of cholinesterase inhibitors) in combination with their harmful influence on karyotype of laboratory chironomids in chronic experiments over a few generations. Our experiments have revealed that in the second generation there appeared even more morphological abnormalities than in the first one, in spite of the fact that the second generation was growing up in clean water. Changes in normal chromosome structure were found in both generations. So at present we believe that cholinesterase inhibitors (compounds which are expected to be used in pharmacology and perhaps as a base for some pesticides) with their influence on a chironomid's metabolic processes can cause morphological and chromosomal abnormalities which persist into the next generation. Of course this study is just in its early stages, but we hope that its development will help us to understand better the diversity of relationships between living and nonliving nature and the role of anthropogenic factors in it.

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