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EXPERIMENTAL VERIFICATION OF THE WATER TEMPERATURE EFFECT ON THE MICROPOPULATION GROWTH OF GYRODACTYLUS RUTILENSIS GLÄSER, 1974 (MONOGENEA)

This paper presents the results of experimental verification of the water temperature effect on the micropopulation growth of *Gyrodactylus rutilensis*. The parasites used in the present study were from experimental micropopulation that was obtained by reproduction of two gyrodactylids originally parasitizing fry of rough fish caught in the river Malše (within the area of the town České Budějovice, South Bohemia) in spring 1984. Within the course of the experiments parasites were bred on the host fish of the species *Leuciscus leuciscus* (L.), lab-reared, age 1 year, length 3—4 cm. Detailed procedures for experimental infection as well as an equipment for simulation of controlled environmental conditions have been described in a previous study (Gelnar M., 1987: Folia parasitol. 34: 19—23).

At 20 °C after initial slow increase of number of *G. rutilensis*, a rapid increase of parasite numbers reproducing on invaded fish was recorded in four experimental micropopulations (Fig. 1.A). Mean maximum number of 75 parasites/host (p/h) from four experimental micropopulations was reached at day 16 post infection then apparent decrease of parasite numbers followed.

At 24 °C three experimental micropopulations of the parasites were observed and mean number of 114 p/h was obtained at day 15 post infection, i.e. one day sooner (Fig. 1.B). Similarly as in the previous case also in this case the apparent decrease of number of *G. rutilensis* parasitizing experimental fish was recorded.

The experimental results presented above suggest that intensity of reproduction increases in correlation with increase of water temperature within interval 20—24 °C. The similar temperature dependence was reported in *G. katharineri* parasitizing fry of carp (Gelnar M., 1987: Folia parasitol. 34: 19—23), where at 12, 14 and 18 °C reproductive intensity of parasite gradually increased. The fact that water temperature can have quite contradictory effect is proved by data obtained during observation of temperature dependent micropopulation growth of *C. gobiensis* (Gelnar M., 1984: The effect of some environmental factors on the life cycles of viviparous monogeneans of the genus *Gyrodactylus* Nordmann, 1832 (Monogenea), Ph.D. thesis, Inst. Parasitol., Czech. Acad. Sci., České Budějovice, in Czech). In addition, Ogawa (Ogawa K., 1986: Bull. Jap. Soc. Sci. Fish. 52: 947—950) reported no apparent changes in the number of observed parasites of the species *G. masu* in spite of the considerable variation of water temperature ranging within

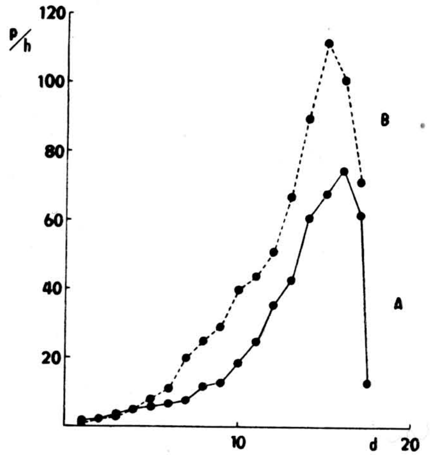

Fig. 1. Comparison of average abundance in four experimental micropopulations of *G. rutilensis* Gläser, 1974 parasiting on *L. leuciscus* (L.) at 20 °C (A) and in three experimental micropopulations of the parasite species at 24 °C (B).
(x — time in days, y — number of parasites in a host fish)

the interval 6—19. 4 C. On the contrary Daniarov (Daniarov M. R., 1975: Parazitologiya 9: 312—314) found that there are apparent changes in the number of *G. katharineri* parasitizing fish living in the conditions of springs with round-the-year constant water temperature. The maximum intensity of infection with this parasite in host fish was reported by Daniarov in summer months; but in this period Hanzelová and Žitňan (Hanzelová V., Žitňan R., 1982: Helminthologia 19: 257—265) reported minimum intensity of infection in carps *G. katharineri* in ponds in East Slovakia, Czechoslovakia. In spite of these rather contradictory data it is necessary to emphasize that temperature of water environment is one of decisive factors influencing the course of the monogenean life-cycles (after Bychowsky B. E., 1957: Monogenetic trematode, their systematics and phylogeny. Zool. inst. Akad. nauk SSSR, Moscow—Leningrad, 509 pp, in Russan), *Gyrodactylus* species not excluding; that was proved not only by a lot of field observations (for example, Srivastava L. P., James B. L., 1967: J. Nat. Hist. 4: 481—489; MacKenzie K., 1970: J. Fish Biol. 2: 23—34; Rawson M. W., Rogers W. A., 1973: J. Wildlife Dis. 9: 174—177; Barkman L. L., James H. A., 1979: Iowa State J. Res. 54: 77—81; Harris P. D., 1982: Parasitol. 72: 125—129; Ogawa K., Hioki M., 1986: Jap. Fish Pathol. 21: 89—94); but also in laboratory experiments (for example, Lester R. J. G., Adams R. J., 1974: Can. J. Zool 52: 817—833; Scott M. E., Nokes D. J., 1984: Parasitology 89: 221—227).

The fact that parasites of the species *G. rutilensis* were bred on the host fish of the species *L. leuciscus* within the course of experiments and not on the typical host that is considered to be the roach *Rutilus rutilus* (L.) — is deserving of further experimental work.

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