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DISEASES

New insight into the effects of the *Strigea robusta* parasite on abnormalities in amphibians

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Abstract

Various developmental abnormalities are common among amphibian populations. Some of them manifest themselves in the form of morphological deformations incompatible with life. One of the longest studied cases of amphibian polymorphic syndrome in Europe is anomaly P, caused by the trematode *Strigea robusta*. The anomaly P represents a unique instance of host-parasite interaction since the parasite's influence alters the strictly regulated complex morphogenesis of vertebrates. The effects of this parasite include symptoms such as polydactyly, brachymelia, and additional limbs. Such deformities often reduce the locomotor activity of amphibians in order to complete the life cycle of the parasite. Moreover, the *S. robusta* hyperinvasion can lead to mass mortality in amphibian populations.

In this paper, we present the results of our recent research devoted to this anomaly. Not all amphibian species exhibit deformations when exposed to trematodes. Experimental studies we conducted have shown that *S. robusta* does not induce abnormalities in *Dyscophus antongilii*, *Xenopus laevis*, *Rana temporaria*, and *R. arvalis* even at the highest doses of cercariae (48), whereas alterations in *Pelophylax* were noted at doses of 2-4 cercariae. We also recorded a slight divergence among the trematodes parasitizing different host mollusks (*Planorbis* and *Planorbarius* lineages). The different genetic lineages of the parasite had no differences in the effect on the deformations induction in amphibians. We discovered that it is a stage-dependent process; after specific limb formation stages, no abnormalities are observed among tadpoles exposed to trematodes. The range of this parasite and, as a result, the place of appearance of the anomaly is much wider than it was previously known: in recent studies, they were found in Europe and Penza and Middle Volga regions of Russia. Lately we have identified *S. robusta* in the Russian Far East and West Siberia, which makes the anomaly's area transcontinental.