

BIOLOGICAL SCIENCE

УДК 504.064.36:579+597-12:579.852.13(262.5+262.54)

THE ROLE OF SULPHITE-REDUCING CLOSTRIDIA IN THE PATHOLOGY OF FISHES

© 2015 г. М.А. Морозова, И.А. Федоров

Morozova Marina Aleksandrovna – Researcher, Sector of Fish Diseases of Department of Aquaculture, Azov Scientific Research Institute of Fisheries, Beregovaya St., 21v, Rostov-on-Don, 344002, Russia, e-mail: morozova.q@mail.ru

Fedorov Yuri Aleksandrovich – Doctor of Geographical Science, Professor, Head of the Department of Physical Geography, Ecology and Environment, Institute of Earth Sciences of the Southern Federal University, Zorge St., 40, Rostov-on-Don, 344090, Russia, e-mail: fedorov@sfedu.ru

According to the analysis of books contains literary and materials of our own research shows the importance of sulphite-reducing clostridia (*Clostridium perfringens*, *C. sporogenes*) in the pathology of hydrobionts. Diseases of fish can have various clinical manifestations from bleeding and ulcers on the surface of the body to acute septicemia. *C. perfringens* involved in the wound process and it represents the problem as a secondary pathogen infection. Healthy fish were contaminated with gills and intestines spores of sulphite-reducing clostridia and manifestations had no clinical. From the theoretical and applied points of view it is also important proof of the possibility of formation of hydrogen sulfide with sulfite-reducing clostridia, which allows to rethink the metabolic cycle of hydrogen sulfide in the sulfide therapeutic mud and sediments of marine and freshwater ecosystems in the zone of human influence.

Keywords: sulphite-reducing clostridia, sanitary-indicatory microorganisms, pathology, fish, spores, strain, hydrogen sulfide, methane.

References

1. Lartseva L.V., Pivovarov Yu.P. *Ekologicheskaya epidemiologiya* [Environmental epidemiology]. Astrakhan, 2007, 187 p.
2. Dunn J.L. Bacterial and mycotic diseases of cetaceans and pinnipeds. *Handbook of marine mammals medicine: health, disease and rehabilitation*. Boca Raton, 1990, pp. 73-96.
3. Greenwood A.G., Taylor D.C. Clostridial myositis in marine mammals. *Veterinary Record*, 1978, vol. 103, no 3, pp. 54-55.
4. Buck J.D., Shepard L.L., Spotte S. *Clostridium perfringens* as the cause of death of a captive Atlantic bottlenosed dolphin (*Tursiops truncatus*). *J. Wildl. Dis.*, 1987, vol. 23, no 3, pp. 488-491.
5. *Rukovodstvo po meditsinskoj mikrobiologii. Obshchaya sanitarnaya mikrobiologiya* [Manual of medical microbiology. General sanitary microbiology]. Eds. A.S. Labinskaya, E.G. Volina. Moscow, 2008, 1108 p.
6. Tymchuk S.N., Larin V.E., Sokolov D.M. Naibolee znachimye sanitarno-mikrobiologicheskie pokazateli otsenki kachestva pit'evoi vody [The most important sanitary-microbiological indicators of drinking water quality]. *Vodosnabzhenie i sanitarnaya tekhnika*, 2013, no 11, pp. 8-15.
7. GOST 10444.9-88. *Produkty pishchevye. Metod opredeleniya Clostridium perfringens* [GOST 10444.9-88. Food products. Method for determination of *Clostridium perfringens*]. Moscow, 2010.
8. GOST 29185-91. *Produkty pishchevye. Metody vyyavleniya i opredeleniya kolichestva sulfiredutsiruyushchikh klostridii* [GOST 29185-91. Food products. Methods for detection and quantification of sulfite-reducing clostridia]. Moscow, 2010.
9. Morozova M.A., Lartseva L.V. Mikrobnye soobshchestva gidroekosistemy Nizhnego Dona i Taganrogskogo zaliva [Hydroecosystems microbial communities of the Lower Don and Taganrog Bay]. *Fundamental'nye i prikladnye issledovaniya. Estestvennye nauki*. 2012, no 2, pp. 50-56.
10. Simchuk G.V., Zubachenko V.L., Omel'chenko S.O. Otsenka mikrobnogo zagryazneniya morskoi vody i massovykh vidov ryb pribrezhnoi chasti Chernogo i Azovskogo morei [Evaluation of microbial contamination of sea water and mass fish species of the coastal part of the Black and Azov Seas]. *Vestnik Odesskogo natsional'nogo universiteta*, 2005, vol. 10, no 7, pp. 201-207.
11. Boiko N.E., Strizhakova T.V., Rudnitskaya O.A., Ruzhinskaya L.P., Morozova M.A. Materialy k kharakteristike funktsional'nogo sostoyaniya chernomorskogo kalkana *Scophthalmus maeoticus maeoticus* v nerestovyi period 2009-2010 gg. [Materials for the characterization of the functional state of the Black Sea turbot *Scophthalmus maeoticus maeoticus* during the spawning period of 2009-2010]. *Voprosy rybolovstva*, 2013, vol. 14, no 2 (54), pp. 272-282.
12. Giragosov V.E., Khanaichenko A.N., El'nikov D.V. Kharakter i prichiny izmenchivosti osnovnykh pokazatelei sostoyaniya nerestovoi populyatsii chernomorskoi kalkan na yugozapadnom shel'fe Kryma [Nature and causes of variability in the main indicators of the spawning population of the Black Sea turbot flatfish in the South-Western shelf of Crimea]. *Sovremen-*

nye problemy ekologii Azovo-Chernomorskogo regiona: materialy III Mezhdunar. konf. Kerch, 2008, pp. 3-9.

13. Fedorov Yu.A., Tambieva N.S., Gar'kusha D.N., Khoroshevskaya V.O., Kizitskii P.M. Teoreticheskie aspekty svyazi metanogeneza s zagryazneniem vody i donnykh otlozhenii veshchestvami neorganicheskoi i organicheskoi prirody [Theoretical aspects of communication methanogenesis water pollution and sediment inorganic and organic nature]. *Izv. vuzov. Sev.-Kavk. region. Estestv. nauki*, 2000, no 4, pp. 68-73.

14. Gar'kusha D.N., Fedorov Yu.A. *Metan v ust'evoi oblasti reki Don* [Methane in the mouth area of the river Don]. Rostov-on-Don; Moscow, 2010, 181 p.

15. Fedorov Yu.A. *Stabil'nye izotopy i evolyutsiya gidrosfery* [Stable isotopes and the evolution of the hydrosphere]. Moscow, 1999, 370 p.

16. Garkusha D.N., Fedorov Y.A. Methane in the water and bottom sediments of the mouth area of the Severnaya Dvina River during the winter time. *Oceanology*, 2014, vol. 54, no 2, pp. 160-169.

17. Fedorov Yu.A., Gar'kusha D.N., Dotsenko I.V., Afanas'ev K.A. Metan i serovodorod v lechebnykh sul'fidnykh gryazyakh (na primere ozera Bol'shoi Tambukan) [Methane and hydrogen sulfide in the sulfide mud treatment (for example, Great Lakes Tambukan)]. *Izv. vuzov. Sev.-Kavk. region. Estestv. nauki*, 2014, no 3, pp. 102-109.

Поступила в редакцию

15 января 2015 г.

УДК 581.91 (471.61)

ON NEW FINDINGS *GALIUM VOLHYNICUM* POBED. AND *CYMBOCHASMA BORYSTHENICA* (PALL. EX SCHLECHT.) KLOK. & ZOZ IN THE ROSTOV REGION

© 2015 г. A.N. Shmaraeva, Zh.N. Shishlova, V.V. Fedyaeva

Shmaraeva Antonina Nikolaevna – Researcher, Botanical Garden of the Southern Federal University, Botanical Descent, 7, Rostov-on-Don, 344041, Russia, e-mail: an-shmaraeva@sfnu.ru

Shishlova Zhanna Nikolaevna – Senior Researcher, Botanical Garden of the Southern Federal University, Botanical Descent, 7, Rostov-on-Don, 344041, Russia, e-mail: shishlova@sfnu.ru

Fedyaeva Valentina Vasilievna – Candidate of Biological Science, Associate Professor, Head of Department of Botany, Ivanovsky Academy of Biology and Biotechnology of the Southern Federal University, Bolshaya Sadovaya St., 105/42, Rostov-on-Don, 344006, Russia, e-mail: vfedyaeva@gmail.com

New data on distribution in the Rostov Region of two endemic plant species – Galium volhynicum Pobed. and Cymbopachasma borysthenica (Pall. ex Schlecht.) Klok. & Zoz. are presented. New locations of cenopopulations of these species, conditions of their dwelling, number, area, age structure and etc. are specified. Galium volhynicum – new species for the Russian Federation, referred earlier only for Ukraine and Moldova. It was registered for the first time in 2012 on the territory of a nature sanctuary «Steppe Forb Rescue Feather Glass» in Zernograd District. Cymbopachasma borysthenica is a protected species of the Rostov Region and the Russian Federation, which new location revealed on the northern coast of Mius estuary.

Keywords: flora, Rostov Region, Red Book, new location, endemic, *Galium volhynicum* Pobed., *Cymbopachasma borysthenica* (Pall. ex Schlecht.) Klok. & Zoz, cenopopulation, nature sanctuary, Mius estuary.

References

1. Fedyaeva V.V., Burkina T.M., Shmaraeva A.N., Shishlova Zh.N., Sidorova O.M. Novye materialy k flore Nizhnego Dona [New materials to the flora of the Lower Don]. *Izv. vuzov. Sev.-Kavk. region. Estestv. nauki*, 1998, no 4, pp. 78-81.

2. Shmaraeva A.N., Shishlova Zh.N., Dorofeev V.I., Burkina T.M. Novye materialy k flore Nizhnego Dona [New materials to

the flora of the Lower Don]. *Bot. zhurn.*, 2002, vol. 87, no 7, pp. 118-123.

3. Shmaraeva A.N., Fedyaeva V.V., Dorofeev V.I., Shishlova Zh.N. Floristicheskie nakhodki v Rostovskoi oblasti [Floristic findings in the Rostov Region]. *Izv. vuzov. Sev.-Kavk. region. Estestv. nauki*, 2009, no 2, pp. 101-105.

4. Fedyaeva V.V., Shishlova Zh.N., Shmaraeva A.N. O rasprostranении nekotorykh redkikh i ischezayushchikh vidov rastenii Rostovskoi oblasti [On the propagation of some rare and

- endangered species of plants of the Rostov Region]. *Izv. vuzov. Sev.-Kavk. region. Estestv. nauki*, 2010, no 1, pp. 74-78.
5. Fedyayeva V.V., Dzigunova Yu.V. Orkhidnye Rostovskoi oblasti: rasprostranenie i problemy okhrany [Orchids of the Rostov Region: distribution and conservation problems]. *Izv. vuzov. Sev.-Kavk. region. Estestv. nauki*, 2013, no 1, pp. 55-59.
6. *Flora Nizhnego Dona* [Flora of the Lower Don]. Eds. G.M. Zozulin, V.V. Fedyayeva. Rostov-on-Don, 1984, Ch. 1; 1985, Ch. 2.
7. *Flora Evropeiskoi chasti SSSR* [Flora of the European part of the USSR]. Leningrad, 1978, vol. 3, p. 111.
8. Ančev M., Krendl F. Galium sect. Leiogalium (Rubiaceae) in the Bulgarian flora. *Phytologia Balcanica*, 2011, no 17(3), pp. 291-314.
9. *Krasnaya kniga Donetskoi oblasti: rastitel'nyi mir* [The Red Book of the Donetsk region: flora]. Ed. V.M. Ostapko. Donetsk, 2009, 432 p.
10. Available at: www.ecoternopil.gov.ua (accessed 11.10.2014).
11. *Krasnaya kniga Priazovskogo regiona. Sosudistye rasteniya* [The Red Book of Azov Region. Vascular plants]. Eds. V.M. Ostapko, V.P. Kolomiichuk. Kiev, 2012, 276 p.
12. Balash A.P. Zapolosnaya step' (v Rostovskoi oblasti) [Zapolosnaya steppe (Rostov Region)]. *Rastitel'nost' i fauna Dona i Severnogo Kavkaza v sisteme zonal'nykh biologicheskikh i nauchno-proizvodstvennykh razrabotok*. Rostov-on-Don, 1971, pp 5-17.
13. *Krasnaya kniga Rostovskoi oblasti. Rasteniya i griby* [The Red Book of the Rostov region. Plants and fungi]. Edition 2. Vol. 2. Eds. V.V. Fedyayeva. Rostov-on-Don, 2014, 344 p.
14. *Krasnaya kniga Rossiiskoi Federatsii (rasteniya i griby)* [Red Data Book of the Russian Federation (plants and fungi)]. Moscow, 2008, 855 p.
15. *Krasnaya kniga Ukrainy. Rastitel'nyi mir* [The Red Book of Ukraine. Flora]. Eds. Ya.P. Didukh. Kiev, 2009, 912 p.