Unexpected Rapid Destruction of Sperm in Captive Penaeid Shrimp

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Male penaeids typically become infertile in captivity. Experiments were conducted to examine the condition of the penaeid reproductive tract as a function of time in captivity. Penaeus setiferus sourced off Corpus Christi were introduced on day 1 into laboratory tanks. At 35 and 48 days after capture, the reproductive tracts of 5 males were compared microscopically to those of day 1 males. The ampoules at both 35 and 48 days lacked turgidity, were slightly brown and in general contained little secretory product. Experimental spermatophores exhibited darkening and progressive loss of the wing. The sperm cap, which forms a hemicylinder around the sperm mass of the day 1 spermatophore, was partially resorbed by day 35 and missing by day 48. The sperm mass of the spermatophore contained numerous bacteria by day 48. Only the glutinous mass of the spermatophore appeared normal at both experimental time points. The vas deferens in most males at 35 and 48 days appeared normal with the dissecting microscope. However, when examined with phase contrast microscopy, the sperm from segment 2B of 48 day males were grossly distorted, and the sperm mass contained numerous bacteria. These observations establish that bacteria proliferate in the sperm mass of captive male shrimp and that destruction of penaeid sperm is occurring in regions of the the vas deferens that appear normal with the dissecting microscope. Thus captive males become infertile prior to what would be expected based on external morphology of the vas deferens.

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