The crayfish plague pathogen, *Aphanomyces astaci*, is one of the most serious threats to European indigenous crayfish species, e.g., the noble crayfish (*Astacus astacus*). The only way to protect susceptible crayfish species from the disease is to prevent the dispersion of the pathogen to their populations. One of the most important sources of the crayfish plague pathogen in Central Europe is the spiny-cheek crayfish (*Orconectes limosus*), a species of North American origin, which can carry the parasite in its cuticle for years. Some literature sources claimed that the pathogen dispersion from the American vectors is restricted to periods of moulting or to the time before and after the crayfish death. However, experimental evidence for such hypotheses was lacking. The main aim of my thesis was to test these predictions, and the alternative scenario that the crayfish plague pathogen can be transmitted from the infected spiny-cheek crayfish also in other periods. For this purpose, experiments were set up to investigate *A. astaci* transmission from infected spiny-cheek crayfish to non-infected spiny-cheek or noble crayfish. As expected, the pathogen was transmitted to noble crayfish much more easily than to the uninfected American host. Nevertheless, we succeeded in the pathogen transmission also among spiny-cheek crayfish, probably for the first time under experimental conditions. The experiments provided a clear evidence that *A. astaci* can be transmitted to susceptible crayfish even if the American host is neither moulting nor dying. I quantified the amount of spores present in the aquarium water by filtering defined volume through filters. The results show that the concentrations of the pathogen spores released from the spiny-cheek crayfish substantially changed during the experiments. The results support the hypothesis that more spores are released during moulting of the host. On the contrary, the effect of the pathogen amount detected in the host tissues was not significant. A new method for *A. astaci* spore detection and quantification was introduced to laboratories of Charles University of Prague and it was confirmed as an approach that can be an addition to infection experiments. The thesis also highlights possible topics for future research.