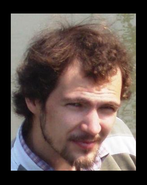
Experimental transmission of crayfish plague from *Orconectes limosus*: does the pathogen wait for the moult or death of its host?



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Intro and aim

- It has been reported that infective units (zoospores) of *Aphanomyces astaci* are released during moult, and before and after death of infected crayfish.
- Little is known about transmission in other situation.
- **Can *Aphanomyces astaci* infect another crayfish when the disease carrier is apparently healthy and not moulting?**

Orconectes limosus

Methods

- Vector (source) of the pathogen: infected *Orconectes limosus*.
- Recipients: non-infected *Astacus astacus*. non-infected *O. limosus.*
- 20 aquaria as shown below + 4 control aquaria with *A. astacus* only.
- Services: feeding, cleaning, removal of cadavers and exuviae. Cadavers and exuviae of vectors were left in the aquaria for longer time.
- Experiment terminated after three months.
- Detection of the pathogen: species-specific amplification of the pathogen DNA, semi-nested PCR (Oidtmann et al. 2006, Dis Aquat Org).
- Tested material: mixed DNA isolate from eye stalk, soft abdominal cuticle, melanised parts of cuticle and telson of each individual.

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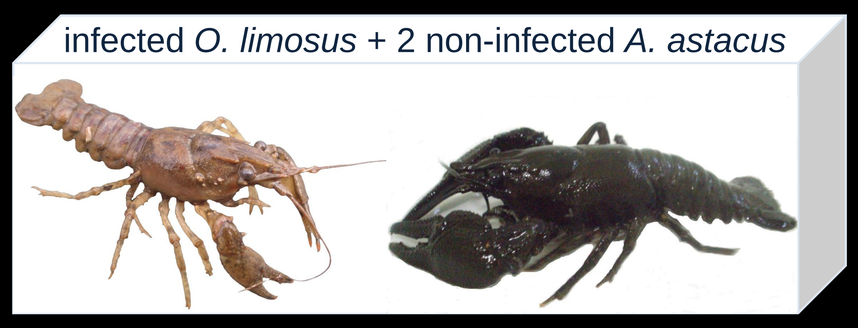

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Results and discussion

aquarium	crayfish	day of death	day of moult	transmission
1	vector			-
	recipient	46.		
	recipient	72.		
2	vector			-
	recipient	3.		
	recipient	3.		
3	vector	68.		yes
	recipient	70.		
	recipient	70.		
4	vector			yes
	recipient	10.		
	recipient	12.		
5	vector	69.	6.	-
	recipient			
	recipient			
6	vector	35.		-
	recipient	9.		
	recipient	7.		
7	vector			-
	recipient			
	recipient			
8	vector			-
	recipient			
	recipient	29.		
9	vector	70.		yes
	recipient	63.		
	recipient	68.		
10	vector			-
	recipient	71.		
	recipient	68.		

aquarium	crayfish	day of death	day of moult	transmission
1	vector	36.		-
	recipient	14.		
2	vector	60.	8.	-
	recipient	5.		
3	vector			-
	recipient	6.		
4	vector	68.		-
	recipient	9.		
5	vector	4.		-
	recipient	20.		
6	vector	71.	6.	yes
	recipient	56.		
7	vector			-
	recipient	30.		
8	vector			-
	recipient	7.		
9	vector	72.		-
	recipient	58.		
10	vector	68.		-
	recipient	86.		

Key: transmission - Aphanomyces astaci *was detected in tissues of originally non-infected crayfish*
yellow colour highlights aquaria where the vector died or moulted in the presence of recipients

- Crayfish plague transmitted in three aquaria - in two of these, the vector had neither died nor moulted.
- In all three cases of transmission both recipients were infected.

- Crayfish plague transmitted in one aquarium where the vector had moulted.

- Transmission to recipients sometimes did not occur although the vector had moulted or died.
- It seems that transmission between *Orconectes* individuals is less frequent than between *Orconectes* and *Astacus*. This is in accordance with higher resistance of *Orconectes* to the pathogen.
- *Aphanomyces astaci* was not detected in any crayfish from the control aquaria used as a control of pathogen transmission among aquaria.

Conclusion

***Aphanomyces astaci* can infect another crayfish even if its host is apparently healthy and not moulting.**

Plans for future

- Further experiments to quantify patterns of pathogen zoospore release from infected crayfish.

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