

## OCCURRENCE OF PARASITES OF THE GENUS *PERKINSUS* IN FRANCE

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The Perkinsea are major pathogens of molluscs of commercial importance and *Perkinsus marinus* is listed by the Office International des Epizooties (OIE) as a communicable disease of socio-economic importance which is significant in international trade of shellfish (Kinkelin, Hastein, Kracek, Chen & Hill, 1990). *Perkinsus atlanticus* kills Portuguese clams (Azevedo, 1989) and *P. marinus* destroys commercial oyster stocks in America (Perkins, 1988). *Perkinsus olseni* causes pustules in the flesh of black lip abalone, *Haliotis ruber*, in Australia (Lester & Davis, 1981) and *P. karlssoni* has recently been described from clams, *Argopecten irradians*, in Canada (McGladdery, Cawthorn & Bradford, 1991). To date, *Perkinsus* has not been reported from bivalves in France. However, parasites of the genus *Perkinsus* have been found in bivalves from Italy, Spain and Greece (Da Ros & Canzonier, 1985). I conducted a survey of bivalves to determine the extent of these parasites in France.

Parasites of the genus *Perkinsus* have been isolated from a wide range of bivalves (Lauckner, 1983, Goggin & Lester, 1987) but the exact number of species involved has not been determined. The parasites found in this

study are very similar to *P. atlanticus* but their specific identification is not certain. Therefore, I have given a generic identification only to the parasites isolated in this work. Eight hundred and eighty two bivalves were collected from 10 sites on the coast of France between November and December, 1990 (Table 1). The tissue was incubated in fluid thioglycollate medium (FTM) for 5 days (Ray, 1966). The level of infection with *Perkinsus* was assessed after removal of the tissue from FTM, blotting, teasing apart and flooding with Lugol's iodine, which stained the parasites blue-black. Ninety one of 882 bivalves were found infected with parasites of the genus *Perkinsus* (Table 1). Only 4 species of bivalve were infected; *Ruditapes decussatus*, *Tapes philippinarum*, *Venus aureus* and *Pecten maximus*. The highest level and prevalence of infection was found in *R. decussatus* from

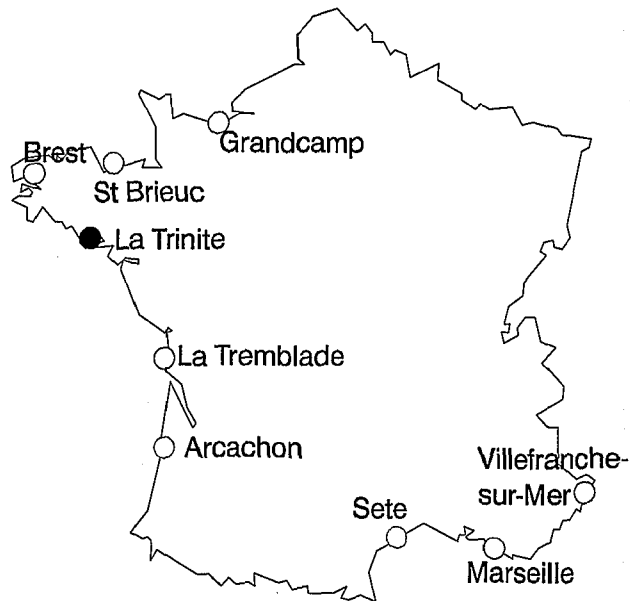


Figure 1. Sites of collection of bivalves in France and levels of infection with parasites of the genus *Perkinsus*. ● = Heavy infection, ○ = Light infection, ○ = Zero infection

La Trinité-sur-mer. However, infections were also found, at low levels at Sète, Arcachon and St Briec (Fig 1).

The distribution of parasites of the genus *Perkinsus* in bivalves in France is highly localised as recorded for *P. marinus* (Craig, Powell, Fay & Brooks 1989) and *P. olsenii* (Lester, Goggin & Sewell, 1990).

However, the parasite can now be found in areas of the Gulf of Morbihan (near La Trinité) where it was not found 4 or 5 years ago (J. Mazurie, pers. comm.). Hatchery spat and 1-year-old wild *R. decussatus* from the Gulf of Morbihan are sent throughout France, primarily to Brittany and the Char-ente regions.

**Table 1** Occurrence of parasites of the genus *Perkinsus* in bivalves from France (#infected/#sampled). Sites were : 1=Grandcamp, 2=St Briec, 3=Brest, 4=Bourgneuf, 5=La Trinité (Ile d'Arz, Golfe du Morbihan), 6=La Trinité, all other sites including Golfe du Morbihan, Baie du Quiberon), 7=La Tremblade, 8=Arcachon, 9=Villefranche, 10=Marseille, 11=Sète.

Species	COLLECTION SITE										
	North Coast			West Coast					Mediterranean		
	1	2	3	4	5	6	7	8	9	10	11
<i>Ruditapes phillipinarum</i>			0/21	0/37	16/20	0/40	0/20	29/56			
<i>R. decussatus</i>	0/20		0/32	0/20	30/40	0/14		2/5		0/20	11/20
<i>R. pullastra</i>			0/1								
<i>R. aureus</i>			0/1								2/20
<i>Venus verrucosa</i>						0/20					
<i>Mytilus edulis</i>	0/10		0/21				0/13	0/60			
<i>M. galloprovincialis</i>									0/16	0/20	0/20
<i>Crassostrea gigas</i>	0/5		0/20		0/10	0/20	0/9	0/50			0/10
<i>Ostrea edulis</i>						0/10	0/20			0/10	
<i>Pecten maximus</i>		0/19									
<i>Chlamys</i> sp.	0/1										
<i>Cardium edule</i>	0/20		0/20	0/20	0/20						
<i>Scorbicularia plana</i>							0/1				
<i>Donax vittatus</i>											0/20
<i>Mya arenaria</i>			0/20								
<i>Mercenaria mercenaria</i>						0/10					

Infections with *Perkinsus* species are difficult to detect in juvenile bivalves. *Perkinsus karlssoni* has been found in hatchery spat of *Argopecten irradians*, in Canada, but was not detected by incubation of tissues in FTM (McGladdery, et al., 1991). Similarly, juvenile oysters, *Crassostrea virginica*, in America are not usually found infected (Ray, 1954). This may be a result of the diagnostic technique rather than a lack of in

fection in young molluscs. It is disquieting to realise that juvenile molluscs, assumed to be uninfected, may carry the parasite. Therefore, transfer of spat could contribute to an increased spread of the parasite throughout France.

#### Summary

Parasites of the genus *Perkinsus* were found in 91 of 882 bivalves inspected from 10 sampling sites on the coast of France. This is the first published account of infection with these parasites in France.

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### Acknowledgements

This work was undertaken while at IFREMER, La Tremblade, France and I am grateful to everyone there for their generous help and hospitality. For help with collection of molluscs in the field, I thank especially Mr S. Claude (IFREMER, La Trinité) and Mr P. Miner (IFREMER, Brest). Also, I thank all those people from IFREMER stations throughout France who eased access to sites: Dr Jean Claude Dao (Brest), Mr J. Kopp, Mr J-P. Joly (Oustreham), Dr J-P. Baud (Bourgneuf-en-Retz), Dr J. Mazurie (La Trinité-sur-mer), Dr R. Robert (Arcachon), Dr M. Comps (Sète), Mr J. Console, Mme C. Zeitoun and Mr T. Carreras (Marseilles). I also thank Dr C. Thiriot-Quievreux from the Université P. and M. Curie, Villefranche-sur-mer. This project was funded by a French Government Scientific Scholarship and a Winifred Cullis Award from the International Federation of University Women.

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