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NEOPLASIA IN *MYTILUS CHILENSIS* CULTIVATED IN CHILOE ISLAND (CHILE)

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Abstract

The present paper describes a proliferative condition in *Mytilus chilensis.* This condition was characterised by infiltration and replacement by enlarged, atypical, mitotically-active, basophilic cells apparently of haemocytic origin. The aetiology of *Mytilus chilensis* neoplasia remains uncertain.

Introduction

Several authors have reported a disease known as hematopoietic neoplasia (also called haemocytic neoplasia) in bivalve molluscs (Peters, 1988). This pathological condition involves uncontrolled cellular growth which replaces normal tissue. In Mytilidae, the geographical distribution of the disease has been mainly established in European and North American natural and aquacultural populations (Farley, 1969; Lowe and Moore, 1978; Green and Alderman, 1983).

Until now, the disease had not been reported in South American mussel populations. In this paper, the disease is described for *Mytilus chilensis,* and its geographical distribution in various aquacultural zones of Calbuco and Chiloe (in Chile) are presented.

Materials and Methods

Between June of 1996 and January of 1997 a total of 572 specimens were sampled from fifteen sites located in the areas of Calbuco, Ancud, Castro and Quellón (Fig. 1). The tissue samples were fixed in phosphate buffered formaldehyde. They were dehydrated in a battery of incremental alcohol concentrations, bleached in xylene and embedded in paraffin. Five µm slices were obtained and stained with eosin-haematoxylin.

Results

The neoplastic condition was found in 2.4% of the analysed specimens. These came most frequently from the zones of Ancud, Castro and Quellón. There were no positive cases in the Calbuco area. Table 1 details the number of neoplastic cases and the sample sites.

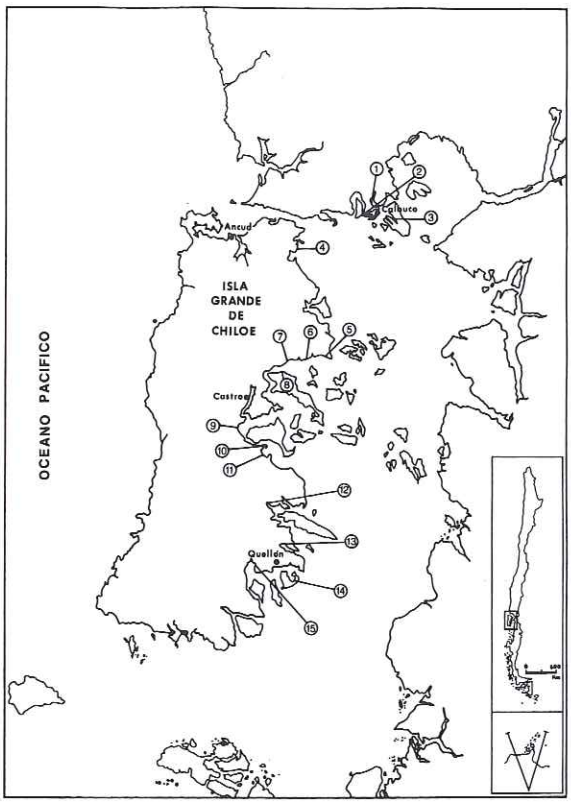
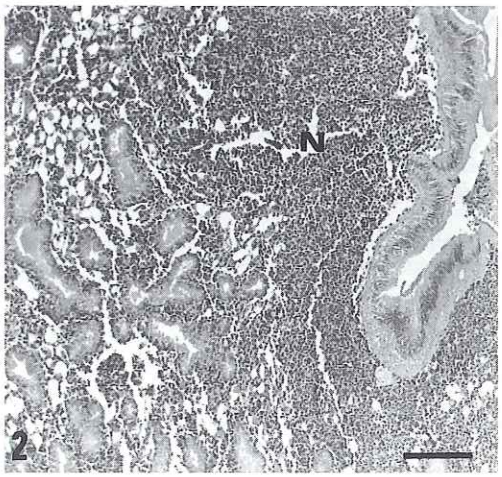
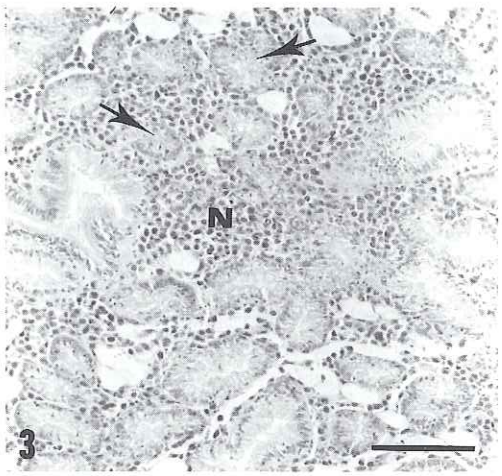


Figure 1 Map showing the position of sites sampled





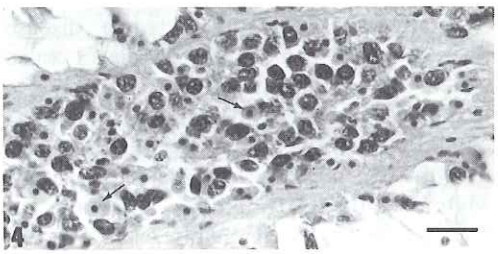


Figure 2 Infiltration of connective tissue of the digestive gland by neoplastic cells (N). Scale bar= 250 µm

Figure 3. Section showing severe infiltration of connective tissue by neoplastic cells (N) with associated necrotic digestive tubules (Arrows). Scale bar= 150 µm

Figure 4. Hemolymph sinus with neoplastic cells and some normal hemocytes (Arrows). Scale bar= 20 µm

Neoplastic individuals presented no recognisable external signs of the disease, but an histopathological analysis in the majority of the affected specimens showed proliferative tissue amply distributed in the digestive system (Fig. 2). This tissue is characterised by being composed of atypical cells exhibiting large diameters between 8 to 11µm (in contrast to normal haemocytes having diameters between 6 and 9µm) with basophilic nuclei ranging in diameter from 8 to 10µm (normal haemocytes have nuclei of about 4µm in diameter) and having very little cytoplasm. These atypical cell are mitotically active.

The neoplastic cells mainly infiltrated the digestive gland in the positive cases; only one case showed abnormality in the mantle. Additionally, this condition is accompanied by the destruction of normal tissue in the case of digestive tubules (Fig.3). It was possible to see these transformed cells along with a few normal haemocytes in haemolymphatic vessels (Fig.4).

Discussion

This type of neoplasia is widely distributed in Chiloe Island, while in the continental zone (Calbuco), the pathological condition was not found. Until now, there had been no

Table 1. Sampled sites and number of neoplastic cases in *Mytilus chilensis.*

Sampled localities	zone	N°. sampled	Neoplasia positives %
1. Estero Huito	Calbuco	24	0
2. Canal Quihua	Calbuco	23	0
3. Isla Puluqui	Calbuco	57	0
4. Bahia Hueihue	Ancud	22	1
5. Punta San Juan	Castro	47	1
6. Bahia San Juan	Castro	12	2
7. Bahia Quetalco	Castro	29	0
8. Isla Quinchao	Castro	16	0
9. Vilipulli	Castro	37	0
10. Teupa	Castro	20	0
11. Bahia Yal	Castro	21	I
12. Estero Compu	Quellón	59	3
I 3. Bahia Huildad	Quellón	90	4
14. Isla Cailin	Quellón	34	0
15. Bahia Yaldad	Quellón	81	2

reports of the existence of this disease in Chilean Mytilidae, nevertheless, Mix and Breese (1980) identified cases of neoplasia in *Ostrea chilensis (Tiostrea chilensis)* which came from Chiloe Island, but they did not describe them nor the sampling sites.

Apparently, this disease would be a neoplasia of haemocytic origin, as it is possible to find cells in the interior of some haemolymphatic vessels along with normal haemocytes. This condition is similar that found in *Mytilus edulis* (Farley, 1969), *Mytilus galloprovincialis* (Figueras *et al.,* 1991). However, in the latter, the affected tissue corresponds to the mantle.

In the present study, it was not possible to associate the pathological condition to some known pathogenic agent The origin of this disease still remains uncertain due to the fact that some researchers have correlated it with the presence of a retrovirus while others have associated it to chemical contaminants derived from crude oil (Cheng, 1993). Although the waters in the studied zones are considered among the least altered environments in the world, the results of investigations on the contamination of sediments by chlorinated hydrocarbons (Bonert, 1996) indicate points of accumulation of DDT and DDD. Among these points is the zone of Castro in which neoplasia was detected; thus in this case, it is not possible to discard carcinogenic compounds as a triggering factor in this disease. Finally, it is not possible to discard the suggestion of Peters (1988) of the possible implication of oncogenes in the development of neoplastic diseases in invertebrates.

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