Lesions of morbillivirus infection in a fin whale (*Balaenoptera physalus*) stranded along the Belgian coast

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with allopurinol, so that the xanthine urolithiasis was probably due to a defect in the enzyme itself. The fact that the concentrations of xanthine in blood and urine were about 10 times higher than the corresponding concentrations of hypoxanthine indicates that there was no absolute lack of xanthine oxidase. Most of the hypoxanthine was presumably transformed to xanthine by the xanthine oxidase, the same enzyme which catalyses the transformation of xanthine to uric acid. It is likely, as postulated by Ayvazian and Skupp (1965) for human beings, that there was a partial defect in the enzyme molecule. Because there are different binding sites on the molecule, the xanthine oxidase might have transformed hypoxanthine normally but xanthine only to a limited extent (Bergmann and Dickstein 1956). This possibility is supported by the fact that in human beings with hereditary xanthinuria the plasma concentration of xanthine increases much more than the concentration of hypoxanthine (Strauven and others 1989), as was the case in this dachshund. Kucera and others (1997) have suggested that a congential xanthinuria may occur in dachshunds.

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Short Communications

Lesions of morbillivirus infection in a fin whale (*Balaenoptera physalus*) stranded along the Belgian coast

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MORBILLIVIRUS epizootics were found to be responsible for the deaths of many thousands of marine mammals in various species of pinnipeds (Kennedy and others 1988, Osterhaus and Vedder 1988, Duignan and others 1993) and toothed cetaceans (Domingo and others 1990, Kennedy and others 1992, Van Bressem and others 1993, Lipscomb and others 1994, 1996). The occurrence of morbillivirus-associated diseases in large cetaceans, and particularly in baleen whales, does not appear to have been documented. This report describes a case of morbilliviral infection in a fin whale, *Balaenoptera physalus*.

The whale, a 13 m long, immature female, estimated to be about one year of age, was found stranded along the Belgian coast, on November 1, 1997. Necropsy indicated emaciation and severe parasitic lesions. For histopathology, tissues (skin, lung, urinary bladder, intestine, liver, heart, kidney, uterus horn, mesenteric and mammary gland lymph nodes and pancreas) were collected, fixed in 10 per cent buffered formalin, embedded in paraffin and 5 µm sections were stained with haematoxylin and eosin. On all collected samples, immunoperoxidase techniques (Domingo and others 1992) were applied with two monoclonal antibodies, one directed against canine distemper virus (CDV) and one against phocine distemper virus (PDV) (Trudgett and others

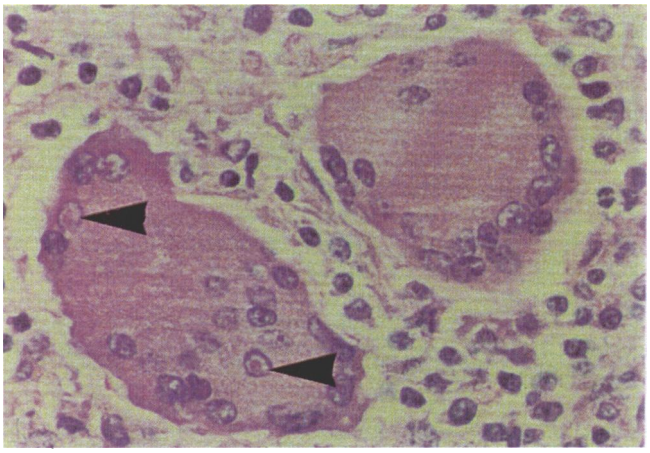

FIG 1: Multinucleated syncytia in a lymph node with intranuclear inclusion bodies (arrow heads). Haematoxylin and eosin x 400

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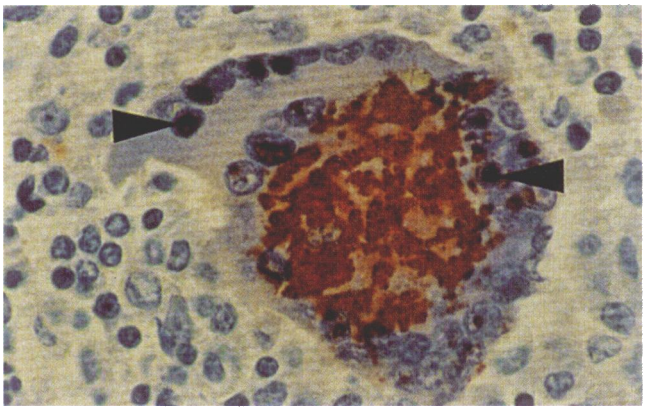

FIG 2: Immunoperoxidase staining of morbillivirus antigen in cytoplasm and in nuclei (arrow heads) of syncytia in a lymph node using monoclonal antibody against PDV. x 400

1991), tissues from healthy and morbillivirus infected striped dolphins (*Stenella coeruleoalba*) were used as negative and positive controls, respectively. Test sections on which first layer antibody was omitted served as negative controls. Blood samples were collected and a virus neutralisation test (Appel and Robson 1973) slightly modified for immunofluorescence was carried out using CDV. For electron microscopy, formalin-fixed tissues were transferred to 2·5 per cent glutaraldehyde, postfixed with osmium tetroxide, and embedded in epoxy resin.

Histopathology showed mesenteric and mammary gland lymph nodes which contained clusters of multinucleated syncytial cells containing up to 50 nuclei with occasional large eosinophilic intranuclear inclusion bodies (Fig 1). Syncytia were also present around parasites in the subcutis and in the kidney. By immunohistochemistry, there was a specific intracytoplasmic and intranuclear staining with both monoclonal antibodies in multinucleated syncytia (Fig 2). Staining was seen as a diffuse or finely granular cytoplasmic reaction while nuclear inclusions were heavily stained. Anti-CDV neutralising antibodies were detected at a titre of 1:64. By transmission electron microscopy, nuclei of syncytial cells from a lymph node contained large aggregates of viral material, comparable to morbillivirus nucleocapsids.

The authors suggest that these observations are sufficient evidence of lesions associated with a morbillivirus infection in a baleen whale. To the authors' knowledge, it is the first report of specific lesions and antigen presence of morbillivirus infection in a baleen whale and more particularly in a fin whale. Neutralising antibodies against dolphin morbillivirus (DMV) (but not against CDV) have been previously reported in serum samples of fin whales (Blixenkrone-Møller and others 1996).

Emaciation and severe parasitism are common findings in morbillivirus infected animals and may be considered as additional evidence of a debilitating disease leading to the death of this whale.

Morbillivirus infections are potential threats to baleen whales, given the frequent association of these viruses with severe epizootics in marine mammals.

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Salmonella typhimurium phage type DT104 in Belgian livestock

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THE General Bacteriology Laboratory of the Veterinary and Agrochemical Research Centre (VAR) is the Belgian *Salmonella* reference laboratory for animal health. As such, all *Salmonella* strains isolated from poultry monitored under an official hygiene programme are examined in this laboratory. Since 1993 the Veterinary Services section of the Ministry of Small Enterprises and Agriculture has monitored all hatcheries and breeder flocks. Although no official monitoring or surveillance programme exists for *Salmonella* in other species of livestock, about 100 to 200 *Salmonella* strains isolated from cattle and pigs are sent to the VAR each year. All animal *Salmonella* isolates (about 1300 to 2000 strains every year since 1992) are serotyped and their resistance to 15 antimicrobial drugs is checked by means of agar diffusion disks on Muller Hinton plates. The agents used are the following (all disks from Diagnostics Pasteur, except for apramycin [Rosco] and enrofloxacin [Oxoid]): amoxicillin/clavulanic acid (20 µg+10 µg); ampicillin (Ap) (10 µg); apramycin (Apr) (40 µg); cephalothin (30 µg); cefotaxime (30 µg); chloramphenicol (Cm) (30 µg); enrofloxacin (Enr) (5 µg); gentamicin (Gm) (10 iu); kanamycin (Km) (30 iu); minocycline (My) (30 iu); nalidixic acid (Nal) (30 µg); polymyxin B (50 µg); spectinomycin (Sp) (100 µg); tetracycline (Tc) (30 iu); and trimethoprim/sulphonamides (Tsu) (1·25 µg+23·75 µg).

A study of the number of *Salmonella* serotypes sent to the VAR for characterisation shows that between 1992 and 1997, *S typhimurium* was the most prevalent serotype among the bovine *Salmonella* isolates, although the frequency with which it was isolated decreased between 1994 and 1997 to about 50 to 60 per cent compared with more than 75 per cent between 1992 and 1993 (Pohl and others 1997). On the contrary, relatively more *S dublin*

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