ANIMAL PATHOLOGY REPORT

To: NATIONAL MARINE FISHERIES
75 VIRGINIA BEACH DRIVE
KEY BISCAYNE, FL 33149

Date Received: 05/25/2000
Owner: GRAND BAHAMA
Species: ZIPHIUS CAVIROSTRIS
Breed: CUVER'S BEAKED WHALE

Final Diagnosis and Comments:

TESTIS, AUTOLYSIS, SEVERE EYE, PENDING

MICROSCOPIC EVALUATION:
SECTIONS OF TESTICLE HAVE MARKED POST-MORTEM AUTOLYSIS AND ARCHITECTURAL DISRUPTION FROM BACTERIAL GAS PRODUCTION.
AN IN-DEPTH HISTOPATHOLOGIC ANALYSIS IS PRECLUDED BY THESE POST-MORTEM CHANGES.
THE SECTION OF EYE REQUIRES SPECIAL HISTOLOGIC PROCESSING TECHNIQUES AND RESULTS ARE PENDING.

RUTH E. WING, DVM

PATHOLOGIST

GREGORY BOSSARTE, VMD, PHD
Pathologist
ANIMAL PATHOLOGY REPORT

To: NATIONAL MARINE FISHERIES
    75 VIRGINIA BEACH DRIVE
    KEY BISCAYNE, FL 33149

Lab Number          CP00-1914
Account No.         X44461
Procedure           800909
Send via            FAXMAIL

Date Received:      05/25/2000
Owner:              GRAND BAHAMA
Species:            ZIPHIUS CAVIROSTRIS
Breed:              CUVER’S BEAKED WHALE

Date of Report:     05/26/2000
Identity            Z.C. 11
Sex                 M
Age                 UNK

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EYE, PENDING

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June 7, 2000

2729871 00
ANIMAL, CETACEAN WHALE
#11 T
TPL/DGD/JSE/mak

Dr. Ruth Ewing
National Marine Fisheries Service
75 Virginia Beach Drive
Miami, FL 33149

AFIP REPORT:

Zc 11 Testis, eye and periocular skeletal muscle (per contributor): No significant findings, Cuvier’s beaked whale (*Ziphius cavirostris*), cetacean.

COMMENT: The cause of this animal’s death is not evident from histologic examination of the submitted specimens. Severe postmortem autolysis and bacterial overgrowth are features present in all of the tissues.

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LTC, VC, USA
Chief, Division of Veterinary Pathology

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Final Report on Stranded Beaked Whale Stomach Contents


I. General description of the samples: Three animals were sampled. These were the frozen contents from the stomachs of two Cuvier's beaked whales, *Ziphius cavirostris*, (Zc- #10 female; Zc- #11 male) and one intact frozen stomach from a Blainville's beaked whale, *Mesoplodon densirostris*, (Md- #12 male).

II. Sample preparation and methodology: Upon thawing, the intact stomach of Md- #12 was systematically opened beginning at the esophagus. The contents were removed through careful rinsing of the mucosal lining of all stomach chambers into a 5-liter dissecting pan. In order to separate stomach content components, each of the stomach content samples were independently flushed through a series of three interlocking stainless steel screens. The screen mesh sizes from top to bottom were 2.0 mm, 1.0 mm and 0.355 mm. All stomach content remains recovered from these screens were preserved in 50% ethanol for later microscopic examination at 6 to 10X magnification.

III. Results:

1) **Md- #12, male**: The stomach of this whale contained no prey remains. Non-prey items found included 14 small anisakid nematode worms (probably *Anisakis simplex*) ranging in length from 10-24 mm. One approx. 10 x 120mm marine plant fragment (*Zostera* sp.) and approximately 8 cc of beach matrix consisting mainly of tiny coral fragments and Foraminifera. The mucosal lining of the stomach contained no visible lesions or ulcerations. No anthropogenic material was found.

2) **Zc- #10, female**: The stomach contents provided contained small quantities of cephalopod and crustacean remains. No fish remains were found. All prey remains were in the form of isolated squid beaks, squid eye lenses and portions of crustacean exoskeletons. No fleshy portions of prey remains were present. Non-prey items encountered were 23 anisakid nematodes (probably *Anisakis simplex*) ranging in length from 10 to 30 mm and a small quantity (<1 cc) of typical beach matrix. No anthropogenic material was found. The prey remains from this sample are identified as follows:

- **Cephalopoda**
  - **Histiotethidae**
    - *Histiotethis hoyleri* - one pair of beaks representing a single individual.
  - **Chiroteuthidae**
    - *Chiroteuthis* sp. - one pair of beaks representing a single individual.
  - **Cranchiidae**
    - *Megalocranchia* sp. - one lower beak representing one individual.

- **Crustacea**
  - **Oplophoridae**
    - *Acanthephyra* sp. cf. *A. curtirostris* - The number of antennulae indicates a
minimum of 11 individuals are represented.

3) **Zc- #11, male:** The prey remains from this sample were represented by only one cephalopod beak, two squid eye lenses and portions of a crustacean exoskeleton. No fish remains were found. No fleshy remains of prey remains were present. Non-prey items encountered were 5 fragments of a marine plant (probably *Sargassum* sp.) the largest of which was approx. 10 x 25 mm. No parasitic nematodes were present. No anthropogenic was found. The prey remains from this sample are identified as follows:

- **Cephalopoda**
  - **Histiotethidae**
    - *Histiotethis hoylei* – one lower beak representing one individual.
- **Crustacea**
  - **Oplophoridae**
    - *Acanthephyra* sp. cf. *A. curtirostris* – carapace portions from one individual.

**IV. Discussion:** The only prey remains recovered were from the two Cuvier’s beaked whales (Zc-#10 and Zc- #11). Though the numbers of prey recovered were few, the cephalopod families represented are typical for those described for many species of beaked whales (Clarke 1996). The genera represented, *Histiotethis hoylei*, *Chiroteuthis* sp. and *Megalocranchia* sp. are known prey of Cuvier’s beaked whale in both the Atlantic and Pacific Oceans (Mead and Walker unpublished data). While larval stages and juveniles are found throughout the water column, adult squid of the families Histiotethidae, Chiroteuthidae and Cranchiidae are primarily inhabitants of the meso-bathypelagic and benthic zones (Nesis 1987).

Members of the deepwater shrimp family Oplophoridae are found in the Caribbean region and are abundant at depths below 500 meters (Chace 1940). The peaked shrimp, *Acanthephyra curtirostris*, has a bathypelagic distribution, is most abundant at 1000-1250 meters, and is not reported to undergo any pronounced diel migration in the water column (Foxton 1972). Occurrence of crustacean remains in *Ziphius* stomach contents is not uncommon. An unidentified species of deepwater shrimp is known to occur in Cuvier’s beaked whales stranded on the east coast of North America (Mead and Walker unpublished data).

In summary, the prey found in the stomach of the two Cuvier’s beaked whales were typical deepwater species and consistent with those previously found in stomachs of this species of cetacean.

**Literature Cited**


Foxton, P. 1972. Observations on the vertical distribution of the genus *Acanthephyra* (Crustacea: Decapoda) in the eastern north Atlantic, with particular reference to

Preliminary Report on Stranded Beaked Whale Stomach Contents


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Acanthephyra sp. - The number of antennulae indicates a minimum of 11 individuals are represented.

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known to occur in Cuvier's beaked whales stranded on the east coast of North America (Mead and Walker unpublished data).

To date, work on species identification of the cephalopod beaks and the deepwater shrimp is still in progress. In order to refine identification the specimens still need more detailed comparison with available reference material and literature. A final report on these findings will be provided by June 8, 2000.

Literature Cited


Table 2A: Sample information for tissues analyzed for dioxin-like PCBs and other selected PCBs and pesticides by HPLC/PDA.

<table>
<thead>
<tr>
<th>Tissue Type</th>
<th>Field Number</th>
<th>Tissue Type</th>
<th>Sex</th>
<th>Age</th>
<th>Sample Wt (g)</th>
<th>%Lipid</th>
<th>Total PCBs (ng/g wet wt)</th>
<th>Total CB TEQ (pg/g wet wt)</th>
<th>Total DDTs (ng/g wet wt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Md 03/16/00</td>
<td>Blubber</td>
<td></td>
<td></td>
<td></td>
<td>0.31</td>
<td>42.00</td>
<td>11300</td>
<td>132.45</td>
<td>11040</td>
</tr>
<tr>
<td>ZC 03/17/00</td>
<td>Blubber</td>
<td></td>
<td></td>
<td></td>
<td>0.29</td>
<td>5.00</td>
<td>17800</td>
<td>220.16</td>
<td>25500</td>
</tr>
<tr>
<td>ZC-M 03/16/00</td>
<td>Blubber</td>
<td>M</td>
<td></td>
<td></td>
<td>0.33</td>
<td>1.60</td>
<td>3170</td>
<td>42.36</td>
<td>3210</td>
</tr>
<tr>
<td>ZC-F 03/16/00</td>
<td>Blubber</td>
<td>F</td>
<td></td>
<td></td>
<td>0.32</td>
<td>2.50</td>
<td>808</td>
<td>6.77</td>
<td>1007</td>
</tr>
</tbody>
</table>

TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin

Data from the Environmental Conservation Division, Northwest Fisheries Science Center
For personnel use, not to be distributed.
Table 2B: Concentrations (ng/g, wet weight) of dioxin-like PCBs* in samples analyzed by HPLC/PDA.

<table>
<thead>
<tr>
<th>Field Number</th>
<th>77</th>
<th>105</th>
<th>118</th>
<th>129</th>
<th>156</th>
<th>167</th>
<th>169</th>
<th>170</th>
<th>180</th>
<th>189</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM0654 Md</td>
<td>&lt;0.68</td>
<td>140</td>
<td>770</td>
<td>&lt;0.65</td>
<td>76</td>
<td>19</td>
<td>&lt;0.84</td>
<td>330</td>
<td>810</td>
<td>5.4</td>
</tr>
<tr>
<td>MM0651 ZC</td>
<td>&lt;1</td>
<td>160</td>
<td>1300</td>
<td>&lt;0.98</td>
<td>130</td>
<td>36</td>
<td>&lt;1.3</td>
<td>510</td>
<td>1200</td>
<td>12</td>
</tr>
<tr>
<td>MM0652 ZC-M</td>
<td>&lt;0.91</td>
<td>50</td>
<td>270</td>
<td>&lt;0.86</td>
<td>16</td>
<td>5.6</td>
<td>&lt;1.1</td>
<td>140</td>
<td>310</td>
<td>2.8</td>
</tr>
<tr>
<td>MM0653 ZC-F</td>
<td>&lt;0.91</td>
<td>1.5</td>
<td>41</td>
<td>&lt;0.86</td>
<td>5.8</td>
<td>&lt;0.56</td>
<td>&lt;1.1</td>
<td>45</td>
<td>96</td>
<td>&lt;0.56</td>
</tr>
</tbody>
</table>

*The dioxin-like PCB congeners (shown in this table) have minimal interferences from co-eluting compounds which generally contribute <10% to the total concentration.

Data from the Environmental Conservation Division, Northwest Fisheries Science Center
For personnel use, not to be distributed.
Table 2C: Concentrations (ng/g, wet weight) of selected nondioxin-like PCBs* and pesticides in tissue samples analyzed by HPLC/PDA.

<table>
<thead>
<tr>
<th>Field Number</th>
<th>Nondioxin-like CB Congeners</th>
<th>Selected Pesticides</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>101</td>
<td>128</td>
</tr>
<tr>
<td>Md 03/16/00</td>
<td>2000</td>
<td>310</td>
</tr>
<tr>
<td>ZC 03/17/00</td>
<td>3400</td>
<td>400</td>
</tr>
<tr>
<td>ZC-M</td>
<td>670</td>
<td>110</td>
</tr>
</tbody>
</table>
| ZC-F 03/19/00| 100  | 13  | 91   | 180  | 1.6 | 7.4   | 110   | 890    | 1     | < 1.8| 5.1 |}

HCB = hexachlorobenzene
$ = ppDDE analyzed at 266 nm; all other analytes analyzed at 220 nm
* The nondioxin-like PCB congeners (shown in this table) generally co-elute with other PCBs, therefore we report the PCB congener that is usually present in the greatest proportion.
$1 = The DDT could not be quantitated due to analytical interference with a co-eluting PCB congener or the PCB could not be quantitated due to analytical interference with a co-eluting DDT.

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