

*The following supplement accompanies the article*

## **Cephalopod fauna of South Pacific waters: new information from breeding New Zealand wandering albatrosses**

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**Supplement.** Beak measurements from the cephalopod component of the diet of wandering albatrosses studied in Antipodes and Auckland Islands in 2001 and the importance of cephalopods in the diets of wandering albatrosses across the Southern Ocean



Table S2. Composition by mass (%) and number (%) of cephalopods in the chick diet of wandering albatrosses *Diomedea* spp. breeding in New Zealand islands. Includes only those cephalopod species with >5% by number or by mass. np: species not present

| Cephalopod species                                       | <i>Diomedea antipodensis antipodensis</i><br>Antipodes (49°S, 178°E) |             |              |             | <i>Diomedea antipodensis gibsoni</i><br>Auckland (51°S, 166°E) |             |              |              |
|--|--|-------------|--------------|-------------|--|-------------|--------------|--------------|
|  | Present study  |             | Imber (1992) |             | Present study  |             | Imber (1992) |              |
|  | Mass (%)   | Number (%)  | Mass (%)     | Number (%)  | Mass (%)   | Number (%)  | Mass (%)     | Number (%)   |
| <b>HISTIOTEUTHIDAE</b>                                   | <b>20.5</b>  | <b>41.9</b> | <b>17.2</b>  | <b>45.7</b> | <b>18.3</b>  | <b>41.3</b> | <b>19.6</b>  | <b>52.5</b>  |
| <i>Histioteuthis atlantica</i>                           | 12.3   | 22.9        | 6.5          | 20.3        | 13.6   | 30.2        | 8.1          | 29.6         |
| <i>Histioteuthis eltaninae</i>                           | 2.4  | 13.1        | 2.6          | 16.3        | 0.2  | 1.6         | <1           | 4.6          |
| <i>Histioteuthis corporuscula</i>                        | 0.6  | 0.8         | 1.5          | 3.0         | 2.0  | 4.1         | 2.5          | 6.7          |
| <i>Histioteuthis miranda</i>                             | 0.9  | 0.5         | 2.8          | 1.9         | 1.8  | 2.1         | 7.4          | 6.0          |
| <i>Histioteuthis macrohista</i>                          | 0.6  | 1.9         | 0.4          | 1.7         | 0.5  | 2.5         | 0.8          | 4.6          |
| <b>ONYCHOTEUTHIDAE</b>                                   | <b>43.3</b>  | <b>14.2</b> | <b>56.2</b>  | <b>16.5</b> | <b>33.4</b>  | <b>8.7</b>  | <b>45.7</b>  | <b>7.4</b>   |
| <i>Kondakovia longimana</i>                              | 11.2   | 1.7         | 19.6         | 2.6         | 0.7  | 0.3         | 7.1          | <1           |
| <i>Moroteuthis knipovitchi</i>                           | 11.6   | 9.4         | 10.4         | 7.8         | 0.8  | 0.9         | 1.2          | 1.1          |
| <i>Moroteuthis robsoni</i>                               | 14.7   | 0.9         | 11.3         | 2.6         | 20.3   | 1.8         | 4.0          | 1.1          |
| <i>Moroteuthis ingens</i>                                | 5.4  | 1.3         | np           | np          | 11.3   | 4.4         | np           | np           |
| <b>CRANCHIIDAE</b>                                       | <b>9.2</b>   | <b>23.9</b> | <b>10.4</b>  | <b>26.1</b> | <b>21.1</b>  | <b>19.4</b> | <b>7.7</b>   | <b>21.5</b>  |
| <i>Galiteuthis glacialis</i>                             | 2.7  | 13.3        | 3.1          | 13.4        | 1.2  | 8.7         | 1.0          | 5.6          |
| <i>Taonius</i> sp./ <i>T.</i> sp. B (Voss)               | 6.0  | 8.6         | 6.8          | 10.6        | 3.4  | 7.7         | 6.0          | 12.7         |
| <b>OCTOPOTEUTHIDAE</b>                                   | <b>16.3</b>  | <b>2.5</b>  | <b>1.6</b>   | <b>1.1</b>  | <b>10.8</b>  | <b>3.6</b>  | <b>12.6</b>  | <b>3.2</b>   |
| <i>Octopoteuthis</i> sp./ <i>O.</i> cf. <i>megaptera</i> | 11.9   | 2.1         | 12.8         | 1.0         | 9.5  | 3.6         | 1.9          | 2.5          |
| <b>NEOTEUTHIDAE</b>                                      | <b>3.5</b>   | <b>5.9</b>  | <b>2.7</b>   | <b>2.4</b>  | <b>0.4</b>   | <b>1.3</b>  | <b>&lt;1</b> | <b>&lt;1</b> |
| <i>Alluroteuthis antarcticus</i>                         | 3.2  | 2.8         | 2.7          | 2.4         | 0.4  | 0.6         | <1           | <1           |
| <b>CHIROTEUTHIDAE</b>                                    | <b>0.5</b>   | <b>1.5</b>  | <b>2.0</b>   | <b>2.4</b>  | <b>0.8</b>   | <b>4.5</b>  | <b>5.7</b>   | <b>7.8</b>   |
| <i>Chiroteuthis veranyi</i>                              | 0.5  | 1.3         | 1.2          | 1.2         | 0.8  | 4.1         | 5.1          | 7.0          |

Table S3. Composition by mass (%) and number (%) of cephalopods in the chick diet of wandering albatrosses *Diomedea* spp. from various breeding sites. Includes only those cephalopod species with >5% by number or by mass. na: data not available; np: species not present

| Cephalopod species                          | Diomedea exulans     |              |                            |              |                      |             |                     |                      |                     |                          |                    |              | Diomedea dabbenena |  |
|---|----------------------|--------------|----------------------------|--------------|----------------------|-------------|---------------------|----------------------|---------------------|--------------------------|--------------------|--------------|--------------------|--|
|   | Clarke et al. (1981) |              | South Georgia (54°S, 38°W) |              | Diomedea exulans     |             | Marion (46°S, 37°E) |                      | Crozet (46°S, 51°E) |                          | Gough (40°S, 10°W) |              |                    |  |
|   | Mass (%)             | Number (%)   | Mass (%)                   | Number (%)   | Xavier et al. (2003) | Mass (%)    | Number (%)          | Cooper et al. (1992) | Mass (%)            | Number (%)               | Imber (1992)       | Mass (%)     | Number (%)         |  |
| <b>HISTIOTEUTHIDAE</b>                      | <b>1.1</b>           | <b>15.2</b>  | <b>4.1</b>                 | <b>21.2</b>  | <b>2.6</b>           | <b>21.6</b> | <b>27.3</b>         | <b>5.9</b>           | <b>2.0</b>          | <b>21.4</b>              | <b>27.4</b>        | <b>63.9</b>  |                    |  |
| <i>Histioteuthis</i> sp. A                  | <1                   | <1           | <1                         | <1           | 2.1                  | np          | np                  | 1.0                  | 6.8                 | np                       | np                 |              |                    |  |
| <i>Histioteuthis atlantica</i>              | <1                   | 5.9          | 1.6                        | 5.1          | na                   | na          | 1.3                 | 3.9                  | np                  | np                       | 16.4               | 54           |                    |  |
| <i>Histioteuthis</i> sp. B                  | np                   | np           | np                         | np           | 2.6                  | 19.5        | np                  | np                   | np                  | np                       | np                 | np           |                    |  |
| <i>Histioteuthis eltaninae</i>              | <1                   | 8.7          | 2.0                        | 14           | np                   | np          | 2.4                 | 18.1                 | 1.0                 | 14.6                     | np                 | np           |                    |  |
| <i>Histioteuthis corpuscula</i>             | np                   | np           | np                         | np           | na                   | na          | np                  | np                   | np                  | np                       | <1                 | 1.1          |                    |  |
| <i>Histioteuthis miranda</i>                | np                   | np           | np                         | np           | na                   | na          | 2.0                 | 4.5                  | np                  | np                       | 2.4                | 1.8          |                    |  |
| <b>ONYCHOTEUTHIDAE</b>                      | <b>83.2</b>          | <b>42.7</b>  | <b>65.6</b>                | <b>12.9</b>  | <b>83.2</b>          | <b>25.2</b> | <b>81.9</b>         | <b>35.1</b>          | <b>74.0</b>         | <b>59.7</b>              | <b>25.3</b>        | <b>6.4</b>   |                    |  |
| <i>Kondakovia longimana</i>                 | 81.1                 | 40           | 58.6                       | 10.0         | 79.7                 | 21.5        | 50.1                | 16.2                 | 57.0                | 50.9 (10.3) <sup>a</sup> | 1.2                | <1           |                    |  |
| <i>Moroteuthis knipovitchi</i>              | <1                   | <1           | 2.3                        | 1.8          | 2.6                  | 3.2         | 14.6                | 14.4                 | 3.0                 | 3.4 (2.3) <sup>a</sup>   | 2.1                | 1.8          |                    |  |
| <i>Moroteuthis robsoni</i>                  | 2.0                  | 1.9          | <1                         | <1           | <1                   | <1          | 2.6                 | 1.4                  | <1                  | <1                       | 6.4                | 1.6          |                    |  |
| <i>Moroteuthis ingens</i>                   | np                   | np           | 4.0                        | <1           | <1                   | <1          | 14.6                | 3.1                  | 13.0                | 4.7 (40.9) <sup>a</sup>  | np                 | np           |                    |  |
| <b>CRANCHIIDAE</b>                          | <b>4.3</b>           | <b>25.1</b>  | <b>2.7</b>                 | <b>20.9</b>  | <b>6.5</b>           | <b>25.1</b> | <b>4.3</b>          | <b>17.4</b>          | <b>na</b>           | <b>6.1</b>               | <b>5.2</b>         | <b>10.7</b>  |                    |  |
| <i>Galiteuthis glacialis</i>                | <1                   | 4.0          | 1.7                        | 18.5         | <1                   | 4.5         | 2.2                 | 14                   | 1.0                 | 4.7                      | <1                 | 1.1          |                    |  |
| <i>Taonius</i> sp. / <i>T.</i> sp. B (Voss) | 3.4                  | 16.8         | <1                         | 1.7          | 5.4                  | 20.4        | <1                  | 2.2                  | na                  | 1.2                      | 4.4                | 7.3          |                    |  |
| <b>OMMASTREPHIDAE</b>                       | <b>&lt;1</b>         | <b>&lt;1</b> | <b>15.2</b>                | <b>27.3</b>  | <b>1.6</b>           | <b>4.1</b>  | <b>np</b>           | <b>np</b>            | <b>np</b>           | <b>np</b>                | <b>np</b>          | <b>np</b>    |                    |  |
| <i>Illex</i> sp./ <i>argentinus</i>         | np                   | np           | 13.1                       | 23.8         | <1                   | 2.3         | np                  | np                   | np                  | np                       | np                 | np           |                    |  |
| <b>GONATIDAE</b>                            | <b>1.0</b>           | <b>5.7</b>   | <b>1.1</b>                 | <b>2.5</b>   | <b>1.3</b>           | <b>5.8</b>  | <b>1.4</b>          | <b>3.2</b>           | <b>&lt;1</b>        | <b>1.9</b>               | <b>&lt;1</b>       | <b>&lt;1</b> |                    |  |
| <i>Gonatus antarcticus</i>                  | <1                   | 3.6          | 1.1                        | 2.5          | 1.3                  | 5.8         | 1.4                 | 3.2                  | <1                  | 1.9                      | <1                 | <1           |                    |  |
| <b>NEOTEUTHIDAE</b>                         | <b>na</b>            | <b>na</b>    | <b>3.2</b>                 | <b>4.8</b>   | <b>2.3</b>           | <b>5.6</b>  | <b>4.1</b>          | <b>6.6</b>           | <b>&lt;1</b>        | <b>1.6</b>               | <b>&lt;1</b>       | <b>&lt;1</b> |                    |  |
| <i>Alluroteuthis antarcticus</i>            | na                   | na           | 3.2                        | 4.8          | 2.3                  | 5.6         | 4.1                 | 6.6                  | <1                  | 1.6                      | <1                 | <1           |                    |  |
| <b>CHIROTEUTHIDAE</b>                       | <b>&lt;1</b>         | <b>1.0</b>   | <b>&lt;1</b>               | <b>&lt;1</b> | <b>&lt;1</b>         | <b>3.3</b>  | <b>&lt;1</b>        | <b>5.2</b>           | <b>na</b>           | <b>1.1</b>               | <b>1.0</b>         | <b>1.8</b>   |                    |  |
| <i>Chiroteuthis</i> sp.                     | <1                   | 1.0          | <1                         | <1           | <1                   | 3.3         | <1                  | 5.2                  | na                  | <1                       | 1.1                | <1           |                    |  |

<sup>a</sup> Values in parentheses are from Cherel & Weimerskirch (1999)

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