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THE ORDER HADROMERIDA
(PORIFERA:DEMOSPONGIAE),
TAXONOMY AND RELATIONSHIPS OF THE
MAJOR FAMILIES

by
Michelle Kelly-Borges

A thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy in Zoology at the University of Auckland, Auckland, New Zealand

University of Auckland, 1991
THE ORDER HADROMERIDA
(PORIFERA:DEMOSPONGIAE), TAXONOMY
AND RELATIONSHIPS OF THE MAJOR
FAMILIES

FRONTISPIECE: CLIONA CELATA (FAMILY CLIONIDAE)
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ABSTRACT

Despite advances of recent years no stable higher order classification of the Porifera has yet emerged. To address this problem, relationships at various taxonomic levels within the Order Hadromerida have been evaluated. Descriptions of new species of *Tethya*, *Aaptos* and *Polymastia* from northern New Zealand are given in conjunction with a review and redefinition of specific diagnostic characters for these genera. A range of species, genera and families within the Hadromerida have been subjected to 18S rRNA sequencing. Using morphological and molecular sequence data together in phylogenetic analysis, the existing familial groups of the Hadromerida are confirmed and some rearrangement of genera is indicated following sequence alignment and comparison. These data serve as a baseline for molecular approaches to resolving relationships between other sponge groups.
## ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-MCE</td>
<td>B-mercaptoethanol</td>
</tr>
<tr>
<td>DEPC</td>
<td>diethylpyrocarbonate</td>
</tr>
<tr>
<td>DNase</td>
<td>deoxyribonuclease</td>
</tr>
<tr>
<td>DNA</td>
<td>deoxyribonucleic acid</td>
</tr>
<tr>
<td>A</td>
<td>adenosine</td>
</tr>
<tr>
<td>T</td>
<td>thymine</td>
</tr>
<tr>
<td>G</td>
<td>guanine</td>
</tr>
<tr>
<td>C</td>
<td>cytosine</td>
</tr>
<tr>
<td>cDNA</td>
<td>complementary DNA</td>
</tr>
<tr>
<td>CTAB</td>
<td>cetyltrimethylammoniumbromide</td>
</tr>
<tr>
<td>dA/T/G/C/TP</td>
<td>deoxy A/T/G/C/ triphosphate</td>
</tr>
<tr>
<td>ddA/T/G/C/TP</td>
<td>dideoxy A/T/G/C/ triphosphate</td>
</tr>
<tr>
<td>DTT</td>
<td>dithiothreitol</td>
</tr>
<tr>
<td>EDTA</td>
<td>ethylenediamine-tetra-acetic acid</td>
</tr>
<tr>
<td>MOPS</td>
<td>3-(N-morpholino)propane-sulphonic acid</td>
</tr>
<tr>
<td>PAUP</td>
<td>phylogenetic analysis using parsimony</td>
</tr>
<tr>
<td>rRNA</td>
<td>ribosomal ribonucleic acid</td>
</tr>
<tr>
<td>Sarkosyl</td>
<td>N-lauroylsarcosine</td>
</tr>
<tr>
<td>SDS</td>
<td>sodium dodecyl sulphate</td>
</tr>
<tr>
<td>Taq</td>
<td><em>Thermus aquaticus</em> DNA (polymerase)</td>
</tr>
<tr>
<td>TBE</td>
<td>Tris/borate electrophoresis buffer</td>
</tr>
<tr>
<td>TE</td>
<td>Tris/EDTA (buffer)</td>
</tr>
<tr>
<td>TEMED</td>
<td><em>N</em>,<em>N</em>,<em>N</em>,<em>N</em>-tetramethylethylenediamine</td>
</tr>
<tr>
<td>Tris</td>
<td>tris(hydroxymethyl)aminomethane</td>
</tr>
<tr>
<td>UWGCG</td>
<td>University of Wisconsin Genetics Computer Group</td>
</tr>
</tbody>
</table>
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