A CHECKLIST OF FISHES FROM THE CAVALLI ISLANDS, NORTHLAND, NEW ZEALAND

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ABSTRACT

During the course of 80 scuba dives over 10 days, 74 species of fish belonging to 33 families were observed around the Cavalli Islands off the north-east coast of New Zealand. These numbers exceed those given in checklists from other species-rich areas mainly because of the intensity of the survey.

INTRODUCTION

The Cavalli Islands are situated approximately 2km off the eastern coast of Northland, New Zealand, closer to the coast but further north than the Poor Knights Islands (Fig. 1). Their location makes them an interesting area to use when comparing the coastal fish population structure with the more diverse population, effected as it is by migrants from tropical seas, found in the off-shore islands of the Poor Knights group.

In an earlier study (Willan et al. 1979) a large number of fish species were found in the Matai Bay area on the eastern side of the Karikari Peninsula, an area further north than the Cavalli Islands, but on the mainland coast. This survey indicated that an isolated island situation may not be necessary for large species numbers to be present.

The Cavalli Islands are separated from the coast and from each other by a series of passages of varying width. The topography of these islands lends itself to the formation of a wide variety of habitats. Some of these represent typical coastal underwater formations, while others, on the eastern side, are deep water drop-offs, more typical of the outer islands.

METHODS

Areas Surveyed — Eighteen separate areas were surveyed over a period of 10 days from 29 December 1978 to 7 January 1979 (Fig. 1). The areas varied from small, rocky reefs ending on the sandy bottom (areas 1 & 15) to steep underwater cliffs 30m and more in height (areas 7 & 10). Totals of species from all these areas are combined for the purposes of this checklist. Another paper is being compiled giving species and fish concentrations for each of these areas.
Fig. 1. Map of the Cavalli Islands showing the location of the 18 sites in the fish survey. Figures in brackets are the number of species seen at that site.
Survey Methods — Two types of survey dives were made, following the methods of Willan et al. 1979; (a) visual surveys in which all species seen were listed without regard to their relative abundance, and (b) census dives during which numbers and sizes of fish were recorded along a 50m transect. Data from both methods are combined here.

To facilitate a comparison between checklists by different authors (Russell 1969, 1971, 1977; A. Grace 1974, 1976; R. Grace 1971, 1972a, 1972b, 1973, 1975), it is necessary to exclude certain species. These include pelagic fish which are not usually encountered by divers but which may be seen during chance, random encounters, for example, whaler, blue, tiger and other sharks as well as tuna, sunfish, marlin and similar species. Often these are included in checklists on hearsay evidence which depends, among other things, on the intensity of the sport fishery of the area and on observations by local fishermen. Also excluded are species which live in habitats rarely visited by divers as the inclusion of these would give a bias to surveys such as this one which included areas of sand and inter-tidal pools for reasons other than the recording of fish. Species such as the stargazers, flounders, soles, gurnard and sanddarters are included in this category. A third grouping excluded for comparative purposes is that of the very cryptic fish, the sea horses, crested weed fish and cling fishes etc. as sightings of these are also a function of the divers' time available to search an area of complex habitat type. Further, fish in the last two categories are often closely related and positive identification would be difficult without capture of the species.

All fish recorded in this checklist were seen and positively identified during the course of the survey by the divers involved, Anne and Roger Grace, Richard Willan, Lin Roberts and the Author.

RESULTS

A total of 74 fish species from 33 families were recorded from the Cavalli Islands. These numbers, converted by the methods outlined above to allow comparison with checklists from other areas, become 66 species from 28 families.

<table>
<thead>
<tr>
<th>Family</th>
<th>Species Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congridae</td>
<td>Myliobatus tenuicaudatus Hector</td>
<td>Eagle ray</td>
</tr>
<tr>
<td>Dasyatidae</td>
<td>Dasyatis brevicaudata (Hutton)</td>
<td>Stingray</td>
</tr>
<tr>
<td>Muraenidae</td>
<td>Gymnothorax prasinus (Richardson)</td>
<td>Yellow moray</td>
</tr>
<tr>
<td></td>
<td>G. nubilus (Richardson)</td>
<td>Grey moray</td>
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<tr>
<td></td>
<td>G. prionodon (Ogilby)</td>
<td>Mottled moray</td>
</tr>
<tr>
<td></td>
<td>G. ramosus (Griffin)</td>
<td>Mosaic moray</td>
</tr>
<tr>
<td>Congridae</td>
<td>Conger wilsoni (Bloch &amp; Schneider)</td>
<td>Northern conger eel</td>
</tr>
<tr>
<td>Hemiramphidae</td>
<td>Rephorhamphus ihi (Phillipps)</td>
<td>Piper</td>
</tr>
<tr>
<td>Gadidae</td>
<td>Lotiella rhacinus (Richardson)</td>
<td>Rock cod</td>
</tr>
</tbody>
</table>

135
Berycidae          *Trachichthodes affinis* (Gunter)
Trachichthyidae    *Optulus elongatus* (Gunter)
Zeidae             *Zeus australis* Richardson
Rhombosoleidae     *Peltorhamphus novaezeelandiae* Gunther
Exocoetidae        *Cypselurus lineatus*
                     *Cypselurus sp.*
Mugilidae          *Aldrichetta forsteri* (Cuvier and Valenciennes)
Serranidae         *Caprodon longimanus* (Gunter)
                     *Caepiopectra leptoptera* (Bloch & Schneider)
                     *Ellerhokia hounti* (Hector)
                     *Callanthias allporti* Gunther
                     *Acanthistius cinctus* Gunther
Carangidae         *Caranx georgianus* (James & Stephenson)
                     *Decapterus kohoru* (Hector)
                     *Seriola grandis* Castelnau
                     *Trachurus sp.*
Arripididae        *Arripis trutta* (Blok & Schneider)
Mullidae           *Upeneichthys porosus* (Cuvier & Valenciennes)
Sparidae           *Chromis dispilus* (Griffin)
                     *C. hypsilepis* (Gunter)
                     *Parma alboscapularis* Allen and Hoese
Cheilodactylidae   *Aplodactylus arctidens* Richardson
                     *A. etheridgii* Waite
                     *Cheliodactylus spectabilis* Hutton
                     *Nemadactylus douglasii* (Hector)
Chironemidae       *Chironemus marmoratus* Gunther
Pomacentridae      *Cromis dispilus* Griffin
                     *C. hypsilepis* (Gunter)
                     *Parma alboscapularis* Allen and Hoese
Odacidae           *Odax pullus* (Blok and Schneider)
Mugiloidae         *Parapercis colias* (Blok and Schneider)
Labridae           *Pseudolabrus miles* (Blok and Schneider)
                     *P. celidotus* (Blok and Schneider)
                     *P. luculentus* (Richardson)
                     *P. inscriptus* (Richardson)
                     *P. fucicola* (Richardson)
                     *Pseudolabrus n.sp.*
                     *Coris sandagersi* (Hector)
                     *Verrea oxycephalus* (Bleeker)
Blenniidae         *Blennius latilculus* Griffin
Blennidae          *Cristiceps aurantiius* Castelnau
Clinidae           *Giltoblenius tripius* (Blok and Schneider)
                     *Hecogremma medium* (Gunter)
Tripterygidae      *Tripterygion bucknilli* Griffin
                     *T. capito* (Jenyns)
                     *T. varium* Bloch and Schneider
                     *T. nsp. 1* (Doak 1972)
                     *T. nsp. 2* (Doak 1972)
                     *T. nsp. 3* (Doak 1972)
                     *T. nsp. 4* (Doak 1972)
                     *T. nsp. 5* (Doak 1972)
Golden snapper
Slender roughy
John Dory
Sole
Longfinned flyingfish
Shortfinned flyingfish
Yellow-eyed mullet
Pink maomao
Butterfly perch
Redbanded perch
Splendid perch
Yellow-banded perch
Trevally
Kohuru
Kingfish
Jack Mackerel
Kahawai
Red mullet
Snapper
Silver drummer
Blue maomao
Mado
Parore
Bluefish
Bigeye
Marblefish
Notch-headed marblefish
Red moki
Porae
Kelpfish
Demoiselle
Singlespot demoiselle
Black angelfish
Butterfish
Blue cod
Scarlet parrotfish
Paketi
Orange parrotfish
Green parrotfish
Banded parrotfish
Crimson cleanerfish
Sandagers parrotfish
Red pigfish
Crested blenny
Crested weedfish
Spectacled blenny
Twister blenny
Banded blenny
Lined blenny
Mottled blenny
Yaldwyn's blenny
Yellow/black blenny
Red-blotched blenny
Scaly-headed blenny
Blue-dot blenny
As can be seen in the graph of cumulative new species sightings against dive number (Fig. 2), the discovery of previously unseen species became progressively less. This was especially so of species conforming with the criteria required for inclusion in the comparative checklist. Notable absences from the list were Blue Moki (*Latridopsis cilaris*); Spotted Black Groper (*Epinephelus damellii*); and the Rainbow Parrotfish (*Suezichthys n.sp.*). Their absence during this particularly intense survey could be due to
seasonal influences, but may point to a real absence. Further observations are needed to resolve this question.

Comparative corrected data from other New Zealand sites shows the Cavalli Islands to possess a richer species diversity than any similar area (Table 1).

**Table 1. Standardised species and family data from nine New Zealand sites.**

<table>
<thead>
<tr>
<th></th>
<th>Whangateau Harbour</th>
<th>Tairua</th>
<th>Red Mercury Island</th>
<th>Goat Island</th>
<th>Leigh</th>
<th>Russell</th>
<th>1969</th>
<th>White Island</th>
<th>Alderman Island</th>
<th>Maud Island</th>
<th>Knights Island</th>
<th>Willan 1971</th>
<th>Poor 1971</th>
<th>Cavalli Islands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species</td>
<td>33</td>
<td>38</td>
<td>42</td>
<td>47</td>
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<td>53</td>
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<td>Families</td>
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<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
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</tr>
</tbody>
</table>

In part this is due to the intensity of the survey and it is unfortunate that a rate of discovery graph has not been included in other papers. This would allow a more comparative estimate to be made linking search time with the number of species seen. Observations using this survey technique in other areas highlights this problem.

The area yielding the most species observations on the Cavalli Islands was a drop-off on the eastern side of Motuharakeke Island. Here 33 species were recorded in two dives of a scuba tank each. This number is fewer than the 46 species seen during three dives at Pihakoa Point on Karikari Peninsula and far fewer than the 41 species seen in a similar situation at the Poor Knights Islands by the Author and a companion during two dives of a scuba tank each in May 1979.

Undoubtedly the Cavallis do possess a widely varied fish fauna, a diversity related to a large degree to the presence of several deep, clear water areas around the islands and pinnacles of the eastern side of the group. This suggests water quality and habitat type are the important factors in increasing diversity rather than geographical isolation and oceanic current influence.

The sand darter, *Limnichthys polyactis* was collected and identification is based on Nelson's (1978) work. The specimen is now deposited in the Auckland Institute and Museum.

**ACKNOWLEDGEMENTS**

I have pleasure in thanking Anne and Roger Grace, Lin Roberts and Richard Willan for their assistance with data collection and Richard for his help with this manuscript. To the detriment of his own work Roger also acted as an invaluable ferry operator and Dr W.J. Ballantine, by making available the Leigh Marine Laboratory portable compressor, made it possible to complete so many dives.
REFERENCES


