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COMPENDIUM of marine species from New Caledonia

Edited by
CLAUDE E. PAYRI
Bertrand RICHER DE FORGES

IRD
Institut de recherche pour le développement

CENTRE DE NOUMÉA

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COMPENDIUM OF MARINE SPECIES FROM NEW CALEDONIA

Edited by
CLAUDE E. PAYRI, BERTRAND RICHER DE FORGES

Sommaire/*Summary*

PRÉFACE

La Nouvelle-Calédonie constitue un espace géographique, social, culturel, économique et politique au sein duquel la recherche pour le développement prend tout son sens et sa dimension. Elle représente en effet un des chemins pouvant contribuer à la structuration de la société pluriethnique néo-calédonienne, au cœur du Pacifique.

La recherche relève d'une compétence de l'Etat (Accord de Nouméa, 1998) dans un contexte géopolitique régional, européen et international. Toutefois, le Conseil Consultatif de la Recherche placé auprès du Congrès de la Nouvelle-Calédonie permet un dialogue et des échanges constants avec les collectivités territoriales. La compétence «Environnement» étant provinciale, la proximité est permanente avec les trois provinces.

Parmi de nombreux domaines de recherche, la connaissance et la gestion de la biodiversité marine constituent des thèmes d'intérêt pour la communauté scientifique nationale et internationale, de même que pour les collectivités publiques. L'identification des espèces, les associations au sein des récifs coralliens, les comportements des écosystèmes marins au regard des risques naturels et anthropogéniques, l'usage des récifs coralliens comme marqueurs des variations climatiques, la gestion des ressources liée à la quête des populations forment autant de domaines de recherches investigués par l'IRD et ses collaborateurs depuis plus de 60 ans. Ils correspondent à des axes thématiques qui placent la recherche finalisée comme un dispositif d'excellence à fort potentiel de rayonnement national et international, au moment où certains sites coralliens de la Nouvelle-Calédonie sont présentés pour une inscription au Patrimoine mondial de l'UNESCO. Cette classification espérée représente un des outils qui permettrait de soutenir la Nouvelle-Calédonie dans le développement des sociétés traditionnelles confrontées à une économie active et mondialisée.

Dans le cadre de cette stratégie de recherche, nous sommes fiers, avec nos collaborateurs, de publier cet ouvrage, un guide des plus complets dans la thématique des espèces marines à ce jour. Après la description des principales caractéristiques géologiques, climatiques et géomorphologiques de la Nouvelle-Calédonie, ce compendium propose la liste de 8783 espèces identifiées, le résultat d'efforts de recherche à long terme et d'un véritable engagement. Pour la première fois, ce document donne la liste des espèces de coraux de la Nouvelle-Calédonie.

Nous profitons de cette opportunité pour remercier le ministère de la recherche de nous avoir aidé à financer cette publication, ainsi que les autorités publiques pour leurs étroites collaborations dans les études sur les espèces marines de la Nouvelle-Calédonie. Ce compendium constitue une pierre angulaire pour alimenter les projets de bases de données internationales telles que Coml, EDIT, OBIS, etc. C'est un outil indispensable pour la protection, la valorisation et la gestion des écosystèmes coralliens, dans un esprit d'intérêt commun pour maintenir notre biodiversité comme un trésor inestimable pour le futur de l'humanité.

Fabrice COLIN
Directeur du Centre IRD de Nouméa
Délégué de l'IRD pour le Pacifique Sud

FOREWORD

New Caledonia is a geographical, social, cultural, economical and political area where the research for development fulfils all its meaning and expectations. Research represents indeed one of the paths contributing to the structuring of a pluri-ethnic Caledonian society, in the middle of the Pacific region.

Research comes under the responsibility of the French State (Noumea Agreement, 1998) in a regional, European and international geopolitical context. However, the Advisory Council of Research coordinated by the Congress of New Caledonia allows a constant dialog and continuing exchanges with local authorities. The competency 'Environment' being provincial, the linkage with the three Provinces is permanent.

Among many research fields, the knowledge and management of the marine biodiversity is one of interest for the national and international scientific community as well as for the public authorities. Identification of living species, coral reef associations, behaviours of marine ecosystems with regards to natural and anthropogenic hazards and risks, the use of coral reefs as tracers of climatic variations, management of resources related to the request of populations are research fields declined for more than 60 years by IRD and its collaborators. These constitute the main axes which place finalized research as a device of excellence with potentially high national and international influences, while the classification of some New Caledonian reef sites to the UNESCO World Heritage sites is under evaluation. This expected classification is one of the tools which may sustain New Caledonia in the development of traditional societies facing an active and world-wide economy.

Within this research strategy, we are proud with our collaborators and all the contributors to publish this volume, as a most completed guide in the thematic of New Caledonian marine species nowadays. This compendium, after giving the main geological, climatic, geomorphological features of New Caledonia, offers 8783 identified species as a result of a long-time research effort and a strong involvement. For the first time, it provides the list of coral species from New Caledonia.

We take the opportunity to thank the French Ministry of Research for helping us to finance this publication, as well as public authorities for close collaborations to study New Caledonian marine species. This compendium constitutes a key-work for feeding international data-base programmes such as Coml, EDIT, OBIS, etc. It is a useful indispensable tool for the protection, valorisation, and management of coral reef ecosystems in the spirit of a common interest for maintaining our biodiversity as an inestimable treasure for the future of the humanity.

Fabrice COLIN
Director of the IRD Nouméa Centre
IRD Representative for the South Pacific

Une vue d'ensemble
de la biodiversité marine de Nouvelle-Calédonie

Claude E. PAYRI & Bertrand RICHER de FORGES

Introduction

L'origine du matériel biologique de cet inventaire est multiple et date pour certains groupes de l'époque de la découverte de la Nouvelle-Calédonie par le Capitaine Cook en 1774.

Mais bien au-delà du contact européen, une grande connaissance des ressources marine de la Nouvelle-Calédonie a du exister si on se réfère aux abondants restes coquilliers et os de poissons laissés par l'homme il y a environ 3000 ans et qui témoignent de l'exploitation qu'il faisait du milieu marin. Il reste sans doute encore beaucoup à faire en ethnobiologie et taxonomie vernaculaire pour reconstituer les relations que ces insulaires ont entretenues avec leur environnement marin.

Avec l'arrivée des européens et la prise de possession de la Nouvelle-Calédonie débuteront les premières explorations naturalistes, donnant naissances aux premières collections et aux premiers écrits sur le monde marin et les récifs coralliens de Nouvelle-calédonie. On doit d'ailleurs à Charles Darwin une des premières représentations cartographiques des récifs de NC, et son extraordinaire précision pour l'époque mérite qu'elle soit reproduite ici (fig.1, page 10). Curieusement la Nouvelle-Calédonie n'a pas été visitée par les grandes expéditions qui ont sillonné les océans dans les années 1830-1840 à bord de l'« Astrolabe », du « Zélée » ou de l'« Uranie » et l'histoire naturelle de la Nouvelle-Calédonie peut être découpée en trois grandes époques.

La première, de 1850-1913, correspond à l'ère des missionnaires et des naturalistes amateurs ; Montrouzier, Balansa, Vieillard, autant de noms qui seront associés aux toutes premières collections naturalistes (p.ex. Mollusques, Algues) de la Nouvelle-Calédonie.

Puis, peu de choses se passeront dans le domaine avant la fin de la seconde guerre mondiale.

La seconde période 1946- 1990, débutera le 2 août 1946 avec la création du premier centre ORSTOM du Pacifique à Nouméa, sous l'appellation de l'Institut français d'Océanie (IFO). Suivra l'ouverture des premiers laboratoires dans la période 1947-1950 avec notamment les premiers travaux en océanographie biologique qui s'intéresseront au lagon et mers bordières. Les noms de M et M^me^ René Catala seront désormais associés à ces premiers travaux faisant état de listes d'organismes marins (Catala 1950).

L'affectation en 1965 au centre ORSTOM à Nouméa du N/O *Coriolis*, puis l'accroissement des moyens à la mer avec le *Vauban* en 1976, plus tard la *Santa Maria* et le *Dawa* en 1990 s'accompagneront d'une intensification des recherches et d'un renforcement des programmes scientifiques. Les travaux menés durant cette période conduiront à la publication de nombreuses cartes thématiques dont l'Atlas de la Nouvelle-Calédonie, en 1981 (réédition en 1985). Pour les inventaires biologiques, nous citerons les cartes de répartition des Foraminifères et des Mollusques du lagon sud-ouest de la Nouvelle-Calédonie par Debenay, réalisées entre 1978 et 1983. Les programmes de pharmacologie SNOM, puis SMIB, ainsi que les premières explorations de la faune marine de Nouvelle-Calédonie et de ses dépendances accumulèrent une grande quantité de matériel biologique. Les années 1960 furent également marquées par l'action du professeur Roger HEIM qui forma l'«Expédition Française pour les Récifs Coralliens de Nouvelle-Calédonie » (1960-1963), parrainée par la Fondation Singer-Polignac dont il était le Président. Il créa les « Cahiers du Pacifique » (1958-1978) qui deviendront « Cahiers de l'Indo-Pacifique » où furent publier jusqu'en 1980 un grand nombre d'articles scientifiques. Enfin il encouragera et favorisera la participation française aux travaux de la « Pacific Science Association ». La Fondation Singer-Polignac organisera en 1990 un colloque qu'elle dédiera aux trente ans de recherche scientifique française dans le Pacifique (1960-1990). Les actes qui en seront publiés, fournissent une précieuse synthèse bibliographique par thématique de recherche et par région (Doumenge et Doumenge, 1991).

La dernière période 1986-2006, sera marquée par l'intensification des travaux de l'ORSTOM devenu IRD depuis 1998 et l'arrivée du N/O *Alis*. Au cours de ces 20 années et pour la faune en particulier, un échantillonnage très important a été réalisé dans la zone économique de Nouvelle-Calédonie, qui couvre environ 1 400 000 km2 et comprend : la Grande Terre, les îles Loyauté, les récifs d'Entrecasteaux, les îles Matthew et Hunter, les îles Chesterfield et Bellona, les récifs Lansdowne et Fairway, les monts sous-marins des rides des Loyauté, de Norfolk et de Lord Howe (Fig. 1, Planche 1/1). Ces prélèvements ont été opérés entre la surface et 1500 m de profondeur, avec quelques prélèvements au-delà (Richer de Forges & Hoffschir, 2000 ; Richer de Forges *et al.,* 2005). Les échantillons triés ont été déposés au Muséum National d'Histoire Naturelle à Paris. Après un nouveau tri au niveau des familles, ils ont été enregistrés puis confiés pour étude à un réseau de taxonomistes. Les résultats de ces campagnes ont été en partie publiés dans les volumes de la série *Résultats des Campagnes MUSORSTOM*, devenue *Tropical Deep-Sea Benthos*. Certains groupes zoologiques, particulièrement importants pour les recherches sur les substances naturelles, ont fait l'objet d'études taxonomiques dont les résultats ont été diffusés dans des ouvrages illustrés de vulgarisation : Echinodermes (Guille *et al.,* 1986), Ascidies (Monniot *et al.,* 1991), Eponges (Lévi *et al.,* 1998), Gorgones (Grasshoff & Bargibant, 2001), Serpents marins (Ineich & Laboute, 2002). En outre, les principales informations sur la faune et flore des écosystèmes marins de Nouvelle-Calédonie pour ce qui concerne les fonds meubles sont réunies dans Richer de Forges (1991, 1998) et Garrigue (1985, 1995), et pour les fonds durs, les moins bien connus, dans Laboute & Richer de Forges (2004).

Un certain nombre de travaux ont été consacrés à l'écologie et au fonctionnement de l'écosystème corallien mais contribuent rarement aux inventaires, sauf exceptions comme le catalogue des algues marines de Garrigue et Tsuda (1988).

Ce sont les résultats publiés de l'ensemble de ces études qui sont à l'origine de la base de données « Océane » complétée par les données de la littérature antérieure. Dans cette même période, l'Université de la Nouvelle-Calédonie verra le jour, et les programmes de recherche dédiés au monde marin seront surtout centrés autour de questions halieutiques et d'écologie, et peu de travaux seront consacrés aux inventaires.

Le présent document tente de faire le point sur la biodiversité marine réellement (actuellement) connue de Nouvelle-Calédonie en 2006.

Méthode

Sont prises en considération dans cet ouvrage les espèces signalées dans la littérature et dont l'identification a été faite par un taxonomiste ou encore des espèces récemment récoltées, identifiées par un spécialiste et pour lesquels nous disposons de spécimens. Pour établir ces inventaires, les listes d'espèces de chaque groupe, extraites de la base de données « Océane », gérée par le Centre IRD de Nouméa, ont été envoyées aux spécialistes auteurs associés de l'ouvrage. Ces spécialistes ont vérifié l'origine des données extraites de la littérature taxonomique et mis à jour la nomenclature. Bien souvent, ils ont aussi rajouté de nombreuses espèces qui avaient été oubliées dans la base de données ou récemment récoltées et non encore publiées.

Selon les auteurs et les groupes, l'inventaire a été limité aux seules espèces côtières (de 0 à 100 m de profondeur), alors que d'autres ont considéré que du point de vue biogéographique il était préférable de traiter toutes les espèces de la ZEE, quelle que soit la profondeur. Le bilan présenté ici est donc un inventaire réduit ne comportant pas, par exemple, les brachiopodes ou les stomatopodes de profondeur supérieure à 100 m.

Contenu du Volume

Les chapitres sur l'environnement géologique, géomorphologique et hydroclimatique

Pour resituer ce catalogue des espèces dans son contexte trois chapitres introductifs décrivent les caractéristiques de la Nouvelle-Calédonie : un descriptif de l'histoire géologique de cette région du sud-ouest Pacifique, un bilan des connaissances hydroclimatiques, une description géomorphologique des milieux coralliens.

Les groupes biologiques

Pas moins de 50 taxonomistes ont été mis à contribution pour réaliser ce travail qui porte sur environ 43 grands groupes y compris les serpents, les oiseaux et les mammifères marins, la mangrove et les phanérogames marines. Ceci représente actuellement 1055 familles, 3274 genres et 8783 espèces (Tab. 1, page 13). La mangrove, qui constitue un écosystème important associé aux récifs coralliens, est pourtant insuffisamment étudiée. Seule la flore terrestre est traitée ici à travers les principales associations végétales. Beaucoup reste à faire notamment dans l'étude des communautés marines qui s'y sont développées.

A partir de ce catalogue de groupe et d'espèces, une image simplifiée de la répartition de la biodiversité est obtenue en regroupant les différents groupes de plantes à fleurs terrestres et marines, de cnidaires, de crustacés et de vertébrés (Tab. 2, page 14 ; Fig. 2 ; Planche 1/2).

Bien entendu, le présent inventaire ne représente que la diversité actuellement étudiée. De nombreuses espèces vivant en Nouvelle-Calédonie ne sont pas encore étudiées et ne possèdent donc pas de noms. De plus, les écosystèmes coralliens sont très riches et d'une architecture complexe. La faune des récifs coralliens et notamment des pentes externes et des débris coralliens est particulièrement sous étudiée. Or les travaux récents sur la flore marine ont montré que près d'un tiers des espèces récemment recensées sont nouvelles pour la Nouvelle-Calédonie et proviennent à 80% des zones situées au-delà de 40 m de profondeur sur les pentes externes. Par ailleurs, l'inexorable déclin de la taxonomie continue et pour plusieurs groupes zoologiques il n'existe pratiquement plus de spécialistes au monde capable d'identifier ou de décrire les espèces.

Ces résultats reflètent aussi l'effort de recherche variable sur chaque groupe. Par exemple, les espèces d'annélides polychètes sont très nombreuses mais très peu étudiées. Les groupes les plus abondants sont : les foraminifères (6,4%), les algues (5%), les mollusques (19%), les arthropodes (22,5%) et les vertébrés avec une grande majorité de poissons (20,4%). Ce dernier groupe est toujours invariablement le mieux connu des faunes quelle que soit la région concernée, et la Nouvelle-Calédonie en est une illustration.

Les parasites de poissons

Une étude sur les parasites de poissons a débuté en 2002 en Nouvelle-Calédonie. Ces parasites appartiennent à plusieurs groupes zoologiques, plathelminthes, nématodes, copépodes, isopodes... Chaque espèce de poisson ayant plusieurs espèces de parasites cela représente une très grande part de la diversité pratiquement inconnue. Les résultats de ces études sont présentées ici sous forme de deux listes contenant les parasites et leurs hôtes.

Ouvrages comparables à ce volume

Il y a peu de bons inventaires régionaux permettant des comparaisons biogéographiques dans le Pacifique :

- le travail de pionnier réalisé par Serène (1968) pour la faune du Sud-est asiatique et qui ne concernait malheureusement que les octocoralliaires et les crustacés brachyoures (2500 espèces) ;
- l'inventaire publié à l'occasion du Vème congrès des récifs coralliens à Tahiti (Richard, 1985) signale 416 familles, 1196 genres et 2876 espèces de Polynésie française ;
- le catalogue des espèces de l'atoll d'Enewetak (Devaney *et al.*, 1987) signale 902 familles, 2284 genres et 4671 espèces ;
- l'inventaire publié par Paulay (2003) signale 408 familles, 1064 genres et 2921 espèces à Guam et aux Mariannes.

Il n'existe aucun inventaire complet des espèces signalées de la Grande Barrière de corail australienne.

Conclusion

En dépit de l'effort de recherche réalisé au Centre IRD de Nouméa depuis 60 ans, la biodiversité marine demeure encore insuffisamment étudiée. Les mangroves sont mal échantillonnées mais également les fonds durs coralliens des récifs intermédiaires mais surtout des pentes externes. Le présent document donne, pour la première fois, un inventaire des espèces de scléractiniaires constructeurs qui constituent pourtant le cadre environnemental dominant qui conditionne l'existence même des autres écosystèmes (herbiers, mangroves). La liste des poissons avec une nomenclature valide était également très attendue. Le premier effet positif de la réalisation de ce document est une amélioration de la base de données « Océane » en qualité et en quantité.

Souhaitons que la parution de cet ouvrage, encourage les taxonomistes à compléter les inventaires en étudiant les vastes collections encore non étudiées et mettent en évidence les nombreuses lacunes d'échantillonnage qu'il faudrait combler pour approcher la connaissance de la biodiversité marine réelle.

Remerciements

Cet ouvrage n'aurait pas vu le jour sans la contribution de tous les auteurs impliqués. Qu'ils soient ici tous remerciés pour l'important travail fourni dans un délai parfois court. Nos remerciements vont aussi à tous les scientifiques, naturalistes amateurs, étudiants, techniciens qui ont sous une forme ou une autre, à un moment contribué à la connaissance compilée dans ce volume. Une mention particulière est faite aux plongeurs biologistes du centre IRD et aux équipages des N/O de l'IRD qui au cours des 30 dernières années n'ont ménagé ni leur temps, ni leur patience ni leurs efforts pour collecter, trier, photographier le formidable matériel biologique à l'origine des collections dont il est fait mention ici. Nous remercions l'équipe technique de l'UR 148 pour la construction de la base « OCEANE » et son entretien permanent.

Nos remerciements vont enfin au Service Information Scientifique et Communication du centre et au service plongée, pour la réalisation des planches photographiques, la réalisation de la couverture et l'édition du volume.

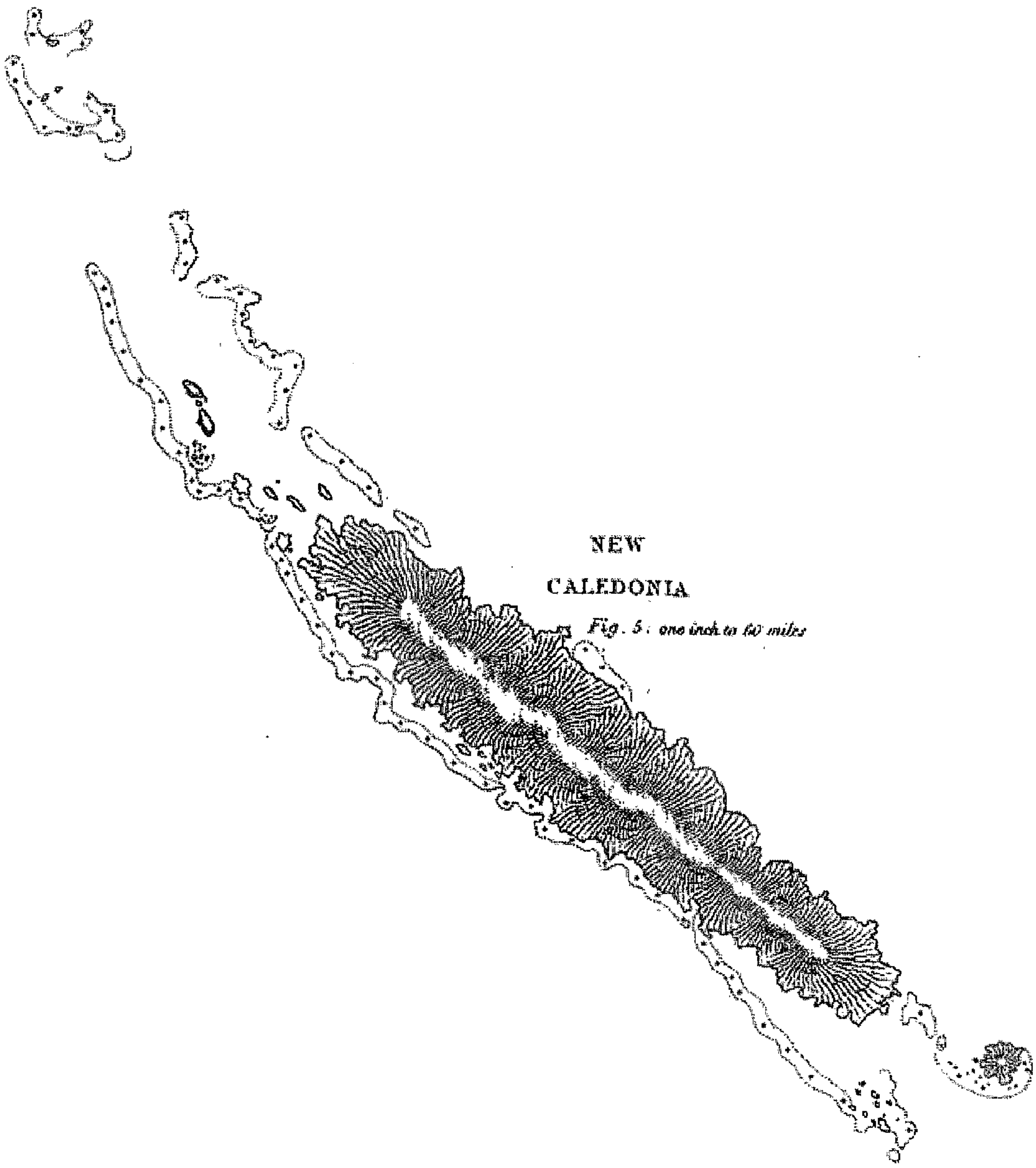

Figure 1. New Caledonia coral reef maps, from Darwin (1874)

Compendium of New Caledonian Marine species: overview

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Introduction

The sources of the biological material in this inventory are myriad and date, in some cases, from the discovery of New Caledonia by Captain Cook in 1774. But even before the arrival of the Europeans, considerable knowledge of marine resources must have already existed considering the abundant 3000 year old shellfish and fish bone middens that bear witness to mans early exploitation of marine resources. There still remains much to be done in ethnobiology and folk taxonomy before we will be able to completely understand the interactions between these ancient island communities and the marine environment.

The arrival of the Europeans and the colonisation of New Caledonia heralded the first naturalist expeditions, giving birth to the very first collections and written documents on the marine fauna and coral reefs of New Caledonia. Indeed, it was Charles Darwin who produced one of the first maps of the New Caledonian coral reefs and the extraordinary precision of this chart merits its hereafter (Fig. 1).

Curiously, New Caledonia was missed by the great circumnavigation expeditions of the 1830-40's aboard e.g., the "Astrolabe", the "Zélée" or the "Uranie" and the natural history of New Caledonia can be divided into three general eras.

The first, from 1850-1913 corresponds to the era of the missionaries and the amateur naturalists; Montrouzier, Balansa, Vieillard are the names that are now associated with the very first collections of New Caledonia flora and fauna (e.g. Molluscs, Algae.).

The inter-war period saw a halt in activity, and the second era from 1946-1990, began in August 2nd 1946, with the creation, in Nouméa, of the first ORSTOM centre in the Pacific, then called "Institut français d'Océanie (IFO)". The opening of the first laboratories between 1947 and 1950 led to the beginning of oceanographic research focussed on the lagoon and surrounding waters. The names of Mr and Mrs René Catala were associated with this ground breaking work and the first inventories of marine organisms (Catala 1950). The arrival of the R/V *Coriolis* in 1965 at the ORSTOM centre in Nouméa, with the addition of the R/V *Vauban* in 1976, the R/V *Santa Maria* and the R/V *Dawa* in 1990, coincided with a growth in scientific research programs focalised on the marine environment. The work conducted during this period led to the publication of numerous thematic charts, such as the Atlas of New Caledonia in 1981 (2nd edition in 1985). In terms of biological inventories, distribution maps of foraminifera and molluscs in the South-West lagoon of New Caledonia were produced by Debenay from 1978 to 1983. The pharmacology programs "SNOM" and "SMIB" and the start of programs focussed on the marine fauna of New Caledonia and dependencies brought a large amount of biological material. The 1960's also saw the "French Expedition to the Coral Reefs of New Caledonia" (1960-1963) initiated by the Professor Roger Heim, President of the Singer-Polignac Foundation which financed the expedition. He also started the "Cahiers du Pacifique" (1958-1978) that became the "Cahiers de l'Indo-Pacifique" within which a large number of scientific articles were published until 1980. He also encouraged and aided the participation of French researchers in the "Pacific Science Association". In 1990 the Singer-Polignac Foundation organised a conference dedicated to 30 years of French research in the Pacific (1960-1990). The conference acts are published and constitute an invaluable bibliographic compilation, organised by theme and geographic area (Doumenge & Doumenge, 1991).

The last period, extending from 1986 until today, is characterized by an intensification of the research activities of the ORSTOM, which changed its name to IRD in 1998, and the arrival of the R/V *Alis*. During the last 20 years, and regarding the fauna in particular, a large sampling effort has focussed on the EEZ of New Caledonia. The area covers around 1 400 000 km², and comprises : the Grande Terre, the Loyalty islands, the Entrecasteaux reef, the Matthew and Hunter islands, Chesterfield and Bellona islands, Lansdowne and Fairway islands, and the seamounts along the Loyalty, Norfolk and Lord Howe ridges (Plate1/1). The samples were collected from between the surface and 1500 m with a few others from deeper sites, sorted and then deposited at the Natural History National Museum in Paris. Following a second sorting to the family level, the samples were registered and sent to a network of taxonomists for examination and identification. The results from these campaigns have been published, in part, in the series "*Résultats des Campagnes MUSORSTOM*", which is now called "*Tropical Deep-Sea Benthos*". The taxonomy of certain zoological groups, in particular those important for natural substance research have been published in some illustrated general works: Echinoderms (Guille *et al.*, 1986), Ascidians (Monniot *et al.*, 1991), Sponges (Lévi *et al.*, 1998), Gorgonians (Grasshoff & Bargibant, 2001), Sea-snakes (Ineich & Laboute, 2002). Otherwise, the principal details of the flora and fauna of the New Caledonian marine ecosystem are compiled in Richer de Forges (1991, 1998) and Garrigue (1985, 1995) as regards the soft bottoms, and for the less studied hard bottoms, in Laboute & Richer de Forges (2004).

Among the numerous studies dedicated to the ecology and function of the coral reef ecosystem, few of them include inventories, with some exceptions such as the catalogue of marine algae by Garrigue & Tsuda (1988).

It is the published part of the above body of work that was compiled in the database "OCEANE". The database is now regularly updated with new data as it becomes available.

The last decade has seen the opening of the University of New Caledonia as well as the advent of research programs that are focussed on the ecology of the marine ecosystem and on fisheries sciences at the expense of inventories of biodiversity.

Method

Here we attempt to summarise our knowledge of marine biodiversity as it stands today in New Caledonia in 2006. For this inventory, only the specimens that are published after identification by a taxonomist or species that have been recently collected, identified by a specialist and for which we have a specimen, have been included. For the construction of the inventory, the species list for each group, extracted from the 'OCEANE' database at the Centre IRD in Nouméa, were sent to the contributing specialists and authors. They verified the data extracted from the taxonomic literature and updated the nomenclature. In many cases, they also added species that were missing from the database or had not yet been published.

Depending on the author, the inventory is limited to coastal species (0 to 100m depth), or considers all of the species of the EEZ regardless of the depth if they find it preferable from a biogeographical point of view. The census of marine biodiversity presented here is therefore a reduced version that does not include, for example, the brachiopods or the stomatopods from depths of more than 100 m.

Contents of the volume

The geological, geomorphological and hydroclimatic environment chapters

In order to place the species catalogue in context, three introductory chapters describe the characteristics of New Caledonia. The first is a description of the geological history of this region of the south west Pacific, the second, examines the geomorphology of the coral reef system, and the third gives an up to date inventory of the hydroclimate knowledge.

The biological groups

No less than 50 taxonomists contributed to this body of work that covers 43 broad groups, including the sea snakes, birds and marine mammals, the mangroves and the marine Angiosperms This represents 1054 families, 3264 genus and 8783 species (Tab. 1). Mangroves form an important ecosystem associated to coral reefs, and yet it remains very little studied. As a consequence, only the terrestrial flora is examined here via the principle associations between the plants. Much remains to be done, notably in the study of the associated marine communities.

Tab. 1. – Diversity of marine species from New Caledonia

Taxa	**Families**	**Genera**	**Species**	**Authors**
Mangroves flora	16	26	34	J. Munzinger & M. Lebigre
Foraminifera	99	226	564	J-P. Debenay & G. Cabioch
Algae & Marine angiosperms	64	190	446	C. Payri
Porifera	54	94	149	J. Hooper & M. Schlacher-Hoenlinger
Hydrozoa	16	34	109	N. Gravier-Bonnet
Actinia	2	10	13	D. Fautin
Ceriantha	2	2	5	T. Molodtsova
Antipatharia	5	8	21	T. Molodtsova
Stylasterida	1	12	49	A. Lindner
Zoantharia	3	7	11	F. Sinniger
Alcyonaria	8	20	173	L. Van Ofwegen
Gorgonacea	13	45	93	M. Grasshoff
Scleractinia	17	66	310	M. Pichon
Bryozoa	85	190	407	D. Gordon
Brachiopoda	3	3	4	A. Bittner
Phoronida	1	2	4	C. Emig
Fish parasites	28	70	130	J.L. Justine
Polychaeta	34	145	286	F. Pleijel
Mollusca	118	395	1652	P. Bouchet *et al.*
Pycnogonida	9	24	74	R. Bamber
Copepoda	45	119	313	G. Boxshall & R. Huys
Isopoda	16	54	83	N. Bruce
Ostracoda	5	5	7	L. Kornicker
Amphipoda	58	121	198	J. Lowry
Cirripedia	20	53	166	D. Jones
Caridea	13	70	154	T.Y. Chan & M. Mitsuhashi
Peneoidea	6	30	102	A. Crosnier
Macroura	2	7	12	T.Y. Chan
Thalassinidea	8	14	26	P. Worschak
Galatheoidea	2	24	141	E. MacPherson
Paguroidea	4	27	90	P. MacLaughlin
Brachyura	42	268	552	B. Richer de Forges & P. Ng
Stomatopoda	9	35	62	S. Ayhong
Echinodermata	61	135	257	N. Ameziane
Tunicata	12	86	290	F. Monniot
Fish	152	596	1695	R. Fricke & M. Kulbicki
Sea-Snakes	1	7	15	I. Ineich
Sea turtles	2	3	4	J-L d'Auzon
Sea birds	11	24	55	J. Spaggiari *et al.*
Sea mammals	7	17	24	C. Garrigue
TOTAL	**1054**	**3264**	**8783**	

Regrouping the different groups of cnidarians, crustaceans, vertebrates, marine and terrestrial Angiosperms in the above catalogue gives a simplified image of the biodiversity (Tab. 2 and Plate 1/2).

Tab. 2. – Relative composition of the New Caledonian species identified in this volume.

TAXA	Family	Genera	Species	% Species
Flora & Marine Angiosperms	18	32	45	0.51
Protozoa	99	226	564	6.42
Algae	62	184	438	4.99
Porifera	54	94	149	1.70
Cnidaria	67	204	784	8.93
Lophophorates	89	195	415	4.72
Molluscs	118	395	1652	18.81
Worms	62	215	416	4.74
Arthropoda	239	851	1980	22.54
Echinodermata	61	135	257	2.93
Tunicata	12	86	290	3.30
Vertebrata	173	647	1793	20.41
Total	**1054**	**3264**	**8783**	**100**

Obviously, the present inventory only represents the known diversity. Many of the species in New Caledonia have yet to be described and so rest unnamed for the moment. Moreover, coral reef systems are very rich and have a very complex architecture and the fauna of these reef systems and particularly that of the external reef slopes and debris is almost unknown. Recent work on the marine flora has shown that almost a third of the species recently identified were new records for New Caledonia and that over 80% of these new descriptions come from depths of over 40m on the outer reef slopes. Sadly, the continuing decline in the number of taxonomists means that for many zoological groups there is almost no specialist who can identify or describe these species.

The results reflect the varying research effort as a function of taxonomic group studied. For example, despite annelid polychaetes species are numerous, they are very little studied. The most numerous groups are: foraminifera (6.4 %), algae (5 %), molluscs (19 %), arthropods (22.5%) and the vertebrates, with the majority being fish (20.4 %). This last group is generally the most well known regardless of the region studied, as is the case in New Caledonia.

Fish parasites

The study of fish parasites in New Caledonia started in 2002. These parasites belong to several zoological groups including the platyhelminths, nematods, copepods, and isopods. Each fish species appears to have several species of parasites and it is therefore probable the parasites represent a large proportion of the diversity that is still unknown. The results of these studies are presented here in two lists presenting the parasites and their hosts.

Other works comparable to the volume

There are few rigorous regional inventories in the Pacific region that allow the biogeographic comparisons :

- The pioneering work of Serène (1968) on the fauna of South-East Asia: sadly, this work only covers the octocorals and the brachyurian crustaceans (2500 species);

- The inventory published with the 5th Coral Reef Conference in Tahiti (Richard, 1985) reports 416 families, 1196 genus, 2876 species in French Polynesia;

- The catalogue of species from the atoll of Enewetak (Devaney *et al.*, 1987) reports 902 families, 2284 genus and 4671 species ;

- The inventory published by Paulay (2003) reports 408 families, 1064 genus and 2921 species from Guam and the Marianas.

To date no complete inventory of the species found on the Great Barrier Reef in Australia exists.

Conclusion

Despite the research efforts conducted at the IRD centre in Nouméa over the past 60 years, much remains unknown of the marine biodiversity of the area. Mangroves have received very little attention to date, as have the intermediate hard bottom coral substrates and especially the outer reef slopes. This present document gives, for the first time, an inventory of the scleractinian reef building corals, which constitute the main environmental frame without which the other ecosystems (mangroves, algal beds) would not exist. Another long-expected development is the validated list of fish species. One of the most immediate implications of this work has been the amelioration of the database "OCEANE" both in terms of quality and quantity.
It is our wish that this compilation will encourage the taxonomists working on the vast collections still remaining unstudied to complete their work. Once this is done, we can then identify the large sampling holes to be filled to perfect our knowledge and perhaps finally approach a real estimate of marine biodiversity in New Caledonia.

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Geology of the New Caledonia region and its implications for the study of the New Caledonian biodiversity

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Introduction

The New Caledonian exclusive economic zone is located in the Southwest Pacific between Australia and the Vanuatu archipelago (formerly New Hebrides). It extends over 1200 km from north to south and 1800 km from west to east, from the Chesterfield Islands up to the Matthew and Hunter Islands at the southern tip of the Vanuatu archipelago (Figure 1). The main islands of New Caledonia are located on two parallel NW-SE trending ridges. The largest island (the 400 km-long and 50 km-wide Grande Terre) and subordinate islands including the Belep islands in the north and the Isle of Pines in the south are supported by the New Caledonia Ridge. The Loyalty Islands are supported by the Loyalty Ridge.

Geologically, the area is schematically composed of a series of NW-SE trending ridges and basins formed by i) stretching and spreading along the eastern margin of Australia during Late Cretaceous-Paleocene times and ii) Eocene convergence which was responsible for the emplacement of one of the largest ophiolitic complexes in the world: the New Caledonian ophiolitic nappe (a slice of oceanic lithospheric mantle) from which weathering formed one of the world's largest reservoirs of nickel. The ridges and basins are nowadays supported by the Australia plate that subducts beneath the Vanuatu active volcanic arc. The southernmost segment of the arc supports the active volcanic islands of Matthew and Hunter. These latter islands are thus on a plate (a micro-plate) that differs from the one supporting the main islands of New Caledonia territory.

After reviewing the different morphostructural units and discussing the geological history of the New Caledonia area, I will point out some facts that may be relevant in the study and understanding of New Caledonia biodiversity.

Geological of the morphostructural units of the New Caledonia region

From west to east, the main geological units between Australia and Vanuatu include the Tasman Sea Basin, the Lord How Rise with subordinate basins, ridges and chains, the New Caledonia Basin, the New Caledonia Ridge, the South Loyalty Basin, the Loyalty Ridge, the North Loyalty Basin and the Vanuatu Ridge (Missègue *et al.*, 1991; Smith and Sandwell, 1997; ZoNéCo 1998) (Fig. 1 plate 1/1 and Fig. 2 plate 2/1).

The Tasman Sea Basin

To the southeast of Australia the Tasman Sea Basin is a wide (up to 2000 km) and deep (4000 m) basin floored with oceanic crust formed by spreading from the Cretaceous (85 Ma: Santonian to Early Campanian) to Earliest Eocene (52 Ma) (Hayes et Ringis, 1973; Weissel and Hayes 1977; Gaina *et al.*, 1998). In the central part of the basin, the N-S trending Tasmantid volcanic chain is an Oligocene to Late Miocene hot spot chain showing the northward drift of the Australia plate (Vogt and Conolly, 1971; Mc Dougall and Duncan, 1988).

The Lord Howe Rise

The Lord Howe Rise is a main bathymetric feature which averages 400 km in width and extends over 1600 km from the Challenger Plateau off New Zealand to the Chesterfied area. Water depths on the crest are 1200 to 750 m. In the north, at the latitude of New Caledonia, the Lord Howe Rise includes several basins, ridges and chains. They are from west to east: the Dampier Ridge, the Middleton basin, the Chesterfiel/Bellona Plateau, the Faust basin, the Lord Howe Rise crest, the Fairway Basin and the Fairway Ridge. The Lord Howe Rise is interpreted as a thinned fragment of continental crust split from Gondwana by Cretaceous rifting and subsequent spreading in Tasman Sea Basin, and it is

probably composed of Paleozoic basement overlain by rift basins with up to 4 km of Mesozoic and Cenozoic sediments (Willcox *et al.*, 2001; Van de Beuque *et al.*, 2003; Exon *et al.*, 2004). Stratigraphy also indicates an emergence and major unconformity from the Late Eocene to Early Oligocene (Burns *et al.*, 1973), which correlates with described compressive structures of that age (Lafoy *et al.*, 1994; Symonds *et al.*, 1999; Auzende *et al.*, 2000).
The Lord Howe rise has Cenozoic seamount chains as exemplified by N-S trending volcanic edifices on its crest (Van de Beuque *et al.*, 1998; Exon *et al.*, 2004) and the Oligocene-Miocene Lord Howe seamount chain on its western side. The Chesterfield/Bellona plateau is supported by five guyots that constitute the northern and oldest volcanoes (Late Oligocene ?) along the Lord Howe hotpsot chain (Missegue et Collot, 1987).
The 800 km long, 130 km wide and NW-SE to NNW-SSE trending and southward deepening (1000 to 3000 m) Fairway Basin, firstly interpreted as oceanic in nature (Ravenne *et al.*, 1977; Mignot, 1984; Eade, 1988; Uruski and Wood, 1991; Van de Beuque, 1999), is now considered to be floored by stretched-thinned continental crust based on the presence of salt diapirs derived from Cretaceous series (Auzende *et al.*, 2000), gravity modeling (Vially *et al.*, 2003) and extensional-type horst and graben structures of the crust (Lafoy *et al.*, 2005). It is proposed that the formation of the Fairway Basin took place during the Late Cretaceous (95-65 Ma) by continental stretching, at the same time as the stretching in the Middleton Basin (Lafoy *et al.*, 2005).
The 600 km-long and NW-SE trending Fairway Ridge, culminating in its northernmost part at the Lansdowne bank, thins and deepens southward. The origin of the ridge is still controversial. Previously interpreted as a ridge of oceanic nature (Ravenne *et al.*, 1977; Mignot, 1984) and as an oceanic piece of the New Caledonia basin crust overthrust along the Lord How Rise (Lafoy *et al.*, 1994; van de Beuque, 1999; Auzende *et al.*, 2000), it is now considered as thinned continental crust (Vially *et al.* 2003; Lafoy *et al*, 2005).

The New Caledonia Basin

The New Caledonia Basin extends from west of Northern New Zealand to west of New Caledonia, parallel to the Lord Howe Rise. The deepest (3600-3700 m) northern part (north of 22°30'S) strikes NW-SE while the central part (3000 m deep) strikes NNW-SSE. Origin of the basin is controversial from oceanic type (Shor *et al.*, 1971; Dubois *et al.*, 1974; Weissel et Hayes, 1977; Willcox *et al.*, 1980; Kroenke, 1984; Mignot, 1984 ; Sutherland, 1999 ; Auzende *et al.*, 2000) to thinned continental type (Etheridge *et al.*, 1989 ; Uruski et Wood, 1991 ; Sdrolias *et al.*, 2003 ; Vially *et al.*, 2003 ; Lafoy *et al.*, 2005). The horst and graben structure of the crust with westward tilted blocks and a sedimentary section up to 8 km thick suggests a thinned continental crust for the northern NW-SE segment. On this segment the crust dips to the east, toward the western margin of the New Caledonia ridge. At the base of this margin, buried deformation features interpreted as the result of compression have been recognized (Rigolot and Pelletier, 1988). In contrast to the northern segment, the central segment of the basin, with magnetic lineations and an axial ridge buried by a 4 km-thick sedimentary sequence, is interpreted as a segment floored with oceanic crust that formed during the Paleocene (possibly from 62 to 56 Ma) after Late Cretaceous–Earliest Paleocene stretching (Lafoy *et al.*, 2005).

The New Caledonia Ridge

The New Caledonia Ridge is the NW-SE trending northern segment of the 70-100 km-wide Norfolk Ridge which extends over 1500 km from the d'Entrecasteaux Reef to the northern tip of New Zealand. As for the Lord How Rise, the Norfolk ridge is interpreted to be a continental ribbon detached from Gondwana. Geology of the Grande Terre of New Caledonia (Lillie and Brothers, 1970; Paris, 1981; Picard, 1999) has great similarities with that of New Zealand. Main geologic features of the island have been tentatively extended along the submerged northward (Collot *et al.*, 1988) and southward (Rigolot, 1988) segments of the ridge.
The island is composed of a series of various terranes assembled during two tectonic events : a Late Jurassic to Early Cretaceous tectonic collage (Paris, 1981 ; Meffre 1995 ; Aitchison *et al.* 1998) and

a Late Eocene subduction/collision resulting in the emplacement at the Latest Eocene (38-34 Ma) of a large ophiolitic nappe (Avias 1967; Paris, 1981 ; Collot *et al.*, 1987 ; Aitchison *et al.*, 1995 ; Cluzel *et al.*, 1994, 2001).

The pre-Cretaceous terranes, mainly located in the central chain, are unconformably overlain by Upper Cenomanian (Late Cretaceous) to Upper Eocene sediments, and include disrupted Late Carboniferous ophiolite (Meffre *et al.*, 1996 ; Aitchison *et al.*, 1998), mid-Triassic to late Jurassic volcano-sedimentary arc terrane (Meffre *et al.*, 1996), Mid Permien to Late Jurassic volcano-sedimentary arc terrane (Campbell *et al.*, 1985), post-Liassic unit composed of oceanic crust and volcano-sedimentary distal deposits (Cluzel, 1996) and affected by a Late Jurassic high pressure metamorphism (150 Ma : Blake *et al.*, 1977).

The post-Early Cretaceous terranes also involved in the Late Eocene major event include:

- an unmetamorphosed Upper Cretaceous to Upper Eocene sedimentary pile well exposed along the western side of the Grande Terre. This pile is composed of two sequences separated by an unconformity (Paris, 1981; Cluzel *et al.*, 2001). The lower sequence includes an Upper Cretaceous fining-upward clastic series of conglomerates, sandstones, coaly siltstones and volcanic rocks, overlain by Paleocene to Middle Eocene pelagic limestones and cherts, indicative of a deepening of the deposit environment. The upper sequence is a Upper Eocene (Upper Bartonian to Priabonian) flysch formation (Nouméa-Bourail and Népoui flyschs), deposited after a short period of deformation and erosion and showing a coarsening upward sequence with (a) basal neritic limestones, (b) a «lower flysch» member of marls and calcareous sandy marls, (c) an «upper flysch» member composed of fine-grained calcareous turbidites interbedded with mafic breccias, and (d) a "wildflysch" member that incorporates blocks and olistoliths of siliceous shales, limestones, basalts and flysch, topped by an olistostrome recording the Late Eocene tectonic paroxism.
- a mafic unit of oceanic basalts interbedded with argillite and cherts (named basalt nappe or Poya unit) of Late Cretaceous (Campanian) to Late Paleocene-Earliest Eocene age (85-55 Ma), with back-arc or fore-arc affinities (Routhier, 1953; Espirat, 1963; Eissen *et al.*, 1998; Cluzel *et al.*, 1997, 2001). This unit, severely sheared and folded, is mainly exposed along the northern half part of the west coast but also outcrops along the east coast; it always underlies the ultramafic nappe and tectonically overlies the Upper Eocene sedimentary rocks.
- mafic high pressure-low temperature metamorphic units (Pouebo and Diahot units) located in the northeastern part of the Grande Terre (Brothers, 1974; Paris, 1981; Yokoyama *et al.*, 1986; Maurizot *et al.*, 1989; Black *et al.*, 1993; Clarke *et al.*, 1997; Cluzel *et al.*, 1995; Baldwyn *et al*, 1999; Carson *et al.*, 1999; Rawling and Lister, 2002; Fitzherbert *et al.*, 2004, Spandler *et al.*, 2005). The units and especially the Pouebo unit are interpreted to be the equivalent of the basalt nappe metamorphosed under blueschist to eclogitic facies conditions, the latter (20 kbar, 650°C) indicating an underthrusting equivalent to a depth of 60-70 km. Radiometric dating of the metamorphism peak is 44 Ma (Spandler *et al.*, 2005) while those from the cooling ages range from 40 to 34 Ma (Baldwyn *et al.*, 1999), indicating a rapid unroofing and exhumation of the metamorphic units in the north and a synchronism with the final emplacement of the ophiolitic nappe (38-34 Ma) in the west and south of the island.
- the ophiolitic nappe mainly composed of peridotites and well exposed in the southern part of the island (3 km thick in the southern massif), Belep and Pines islands and as a series of klippes along the western northern half of the island (Avias, 1967; Guillon et Routhier 1971; Guillon, 1975; Prinzoffer *et al.*, 1980). If the age of its emplacement is Late Eocene (Paris *et al.*, 1979), the age of these mantellic rocks is not accurate and considered to be Late Cretaceous or older from radiometric datings of associated mafic and felsic dikes yielded Late Cretaceous (100-80 Ma) and Eocene (42-52 Ma) ages (Paris, 1981; Prinzhoffer, 1981). The peridotites are mainly harburgites and are the mother rocks for the nickel of New Caledonia.

The Oligocene is characterised by a lack of marine sediments, and post-obduction granodiorite intrusions (St Louis and Koum) radiometrically dated from 32 to 24 Ma (Guillon, 1975) and interpreted as the result of short-lived convergence episode along the western margin of the New Caledonia ridge (Cluzel *et al.*, 2005). The peridotites have been extensively weathered under aerial conditions since Oligocene, leading to the development of thick Ni-rich lateritic mantles (Trescases, 1973, 1975; Latham, 1986) and relict lateritic landsurfaces (Chevillotte *et al.*, 2006). Brittle extensional deformation plays an important role in the post-obduction morphotectonic evolution of the island (Leguere, 1976; Lagabrielle *et al*, 2005; Chardon and Chevillotte, 2006). This extension which may initiated in the Oligocene is expressed in the Neogene by the disruption of land surface formed during Oligocene planation and in the outcrop at Nepoui of Lower-Middle Miocene fluvial conglomerates with shallow water marine limestones (Coudray, 1976). Neogene ridge-normal then ridge-parallel to oblique extensional tectonics are also responsible for the shape and subsidence of the New Caledonia ridge margins (Daniel *et al.*, 1976; Dugas and Debenay, 1978; Bitoun and Récy, 1982; Rigolot, 1989; Chardon and Chevillotte, 2005; Flamand 2006). The Grande Terre displays one of the largest barrier-reefs in the world, isolating a locally-wide lagoon. The barrier reef settled in the Early Pleistocene (Coudray, 1976). Vertical motions from the 125 Ka reef indicate different tectonic blocks and a general slow subsidence (0.03 to 0.16 mm/year) of the coast except in the southeastern part of the Grande Terre and Pines island where coasts are uplifted (Launay and Récy, 1972; Launay, 1985; Cabioch, 1988, Cabioch *et al.*, 1996) and where quaternary faults have been observed (Lafoy *et al.*, 2000; Lagabrielle *et al.*, 2005 ; Flamand, 2006) and seismicity occurs (Régnier *et al.*, 1999; Pillet and Pelletier, 2004).

The South Loyalty Basin

Parallel to the Norfolk/New Caledonia Ridge, the South Loyalty Basin (called also the West Loyalty Basin) is a 1300 km-long, narrow (45-65 km wide), and northward deepening (from 2000 to 3800 m) basin with oceanic crust dipping northwestward and filled with thick (up to 8 km) sediments which are considered to be mainly post Eocene in age (Bitoun and Recy, 1982 ; Pontoise *et al.*, 1982 ; Collot, *et al.*, 1987). Geophysical data suggests that the oceanic basement is the continuity of the ophiolitic nappe of the Grande Terre. The age of the crust is unknown but considered as pre Late Cretaceous (Collot *et al.*, 1987) or Late Cretaceous to Paleocene (Cluzel *et al.*, 2001).

The Loyalty Ridge

The loyalty ridge is a narrow ridge parallel to the South Loyalty Basin and Norfolk Ridge and more or less continuous from the Cook Fracture zone in the South to the d'Entrecasteaux zone in the north. It is composed of a series of seamounts and guyots and supports the Loyalty islands.

The geology of the ridge is poorly known and its origin and nature are unknown. Parallelism with other ridges bordering the Australian margin suggests an old and continental origin (Monzier, 1993). However, taking into account its possible link with the d'Entrecasteaux zone (an Eocene subduction zone) and for convenience in the understanding the geology of New Caledonia, the Loyalty Ridge is considered as an Eocene island arc in most of the reconstructions, (Maillet *et al.*, 1983; Kroenke, 1984; Eissen *et al.*, 1998 ; Cluzel *et al.*, 1994, 2001 ; Crawford *et al.*, 2003 ; Sdrolias *et al.*, 2003 ; Schellart *et al.*, 2006). Middle to Upper Oligocene non orogenic volcanism has been also proposed for the origin of the ridge (Rigolot, 1989; Monzier, 1993). Only few volcanic rocks have been recovered in two areas. Upper Miocene (9-11 Ma) alkalic basalts (Baubron *et al.*, 1976) outcrop on Mare island. Submersible dives off Mare along the eastern flank of the ridge (Monzier *et al.*, 1989) recovered volcanic breccias, Middle Oligocene (32 Ma) alkaline rhyolites, Middle Oligocene tuffaceous sandstones, Middle Upper Oligocene chalks, Upper Oligocene (27 Ma) alkalic basalts, Lower Miocene (20 Ma) back-arc basalts, and algae and reefal limestones with reworked Eocene-Oligocene and Mio-Pliocene fauna (Monzier, 1993). The ridge appears to be composed, at least partly, of non orogenic alkaline volcanics of Middle to Late Oligocene and Late Miocene age, the youngest being likely a part of a N-S trending hot spot track (Rigolot *et al.*, 1988). None of the recovered rocks argues for a volcanic arc origin, although this hypothesis, possible and attractive, is widely accepted in the literature.

The Loyalty islands are mainly composed of Late Miocene to Pleistocene uplifted reef formations covering the basement (Chevalier, 1968 ; Marshall et Launay, 1978 ; Bourrouilh, 1996; Carrière, 1987; Guyomard *et al.*, 1996). The varying altitude of the islands shows the bulge of the Australia plate in front of its subduction eastward beneath the Vanuatu arc (Dubois *et al.*, 1974, 1977, 1988). The islands diachronously emerged during the Pleistocene (possibly in the Latest Pliocene for Mare) and are still emerging and uplifting (as exemplified by Ouvea) except the ones which have passed the top of the bulge and are thus subsiding.

The North Loyalty Basin

The North Loyalty Basin (named also East Loyalty Basin) is a deep (3000 to 5000 m) basin floored with oceanic crust dated of pre Middle Eocene age in its northernmost part (Andrews *et al.*, 1975). Bounded northward by the d'Entrecasteaux zone, it is the remaining part of a larger basin which disappears eastward in the active Vanuatu subduction zone. Initially interpreted to have formed by spreading in Early Eocene and regarded as the old part of the South Fiji Basin (Lapouille, 1982; Weissel *et al.*, 1982), it is now considered to have formed in Late Eocene (44 to 35 Ma: Sdrolias *et al.*, 2003) as a back arc basin of the Loyalty arc (Maillet *et al.*, 1983; Cluzel *et al.*, 2001; Schellart *et al.*, 2006).

The Vanuatu Trench and Ridge, the North Fiji Basin and the Vitiaz Trench Lineament

The Vanuatu Ridge is a 1500 km-long active volcanic arc related to the subduction of the Australia plate since the Late Miocene (12-10 Ma). Oldest known arc volcanic rocks from the Vanuatu ridge are however Early Miocene in age (Mitchell and warden, 1971 ; Carney and MacFarlane, 1982) and related to the fossil west-dipping Vitiaz subduction zone along which Pacific plate subducted, Late Miocene subduction reversal and initiation of east-dipping Vanuatu subduction being due to collision of the Ontong Java Plateau and the Melanesian border plateau (Packham, 1973; Kroenke, 1984; Brocher, 1985; Pelletier and Auzende, 1996). The Vanuatu arc rotated clockwise leading to the formation of the active north Fiji back arc complex basin (Chase *et al.*, 1971 ; Falvey, 1975 ; Auzende *et al.*, 1988, 1995).

The Vanuatu Trench is a segment of the present-day Australia-Pacific converging plate boundary along which Australia plate dips eastward and is consumed. Relative motion of convergence at trench is ENE-WSW and rate of motion varies along the trench and is about 12 cm/year at the latitude of the Loyalty islands (Dubois *et al*, 1977; Louat et Pelletier 1989 ; Pelletier *et al*, 1998 ; Calmant *et al*, 1995, 2003). Near 22°S, the Loyalty Ridge enters the trench and subducts/collides with the Vanuatu arc since 300 ka (Monzier *et al.*, 1989) , reducing the convergence motion south of the impact point and forming sinistral E-W strike-slip motion across the arc and isolating a micro plate (Louat and Pelletier 1989 ; Calmant *et al.*, 2003) on which Mattew and Hunter islands are active volcanoes (Maillet *et al.*, 1986). This incipient collision is also supposed to have tectonic effects on the Loyalty Ridge (Lafoy *et al.*, 1996).

Tectonic evolution of the New Caledonia domain

Numerous Cretaceous to Cenozoic reconstructions of the Southwest Pacific and New Caledonia region have been proposed in the past years (Kroenke 1984 ; Yan and Kroenke, 1993; Veevers, 2000 ; Muller *et al.*, 2000 ; Cluzel *et al.*, 2001 ; Sutherland *et al.*, 2001 ; Hall, 2002 ; Crawford *et al.*, 2003 ; Sdrolias *et al.*, 2003 ; Schellart *et al.*, 2006). Tectonic evolution concerning the New Caledonia domain can be divided into 5 stages (Fig. 3, plate 2/2).

The pre-Late Cretaceous period

The Paleozoic to Early Cretaceous period is thought to be marked by a subduction zone along the eastern margin of Gondwana. It ended with a Late Jurassic to Early Cretaceous tectonic orogeny (correlated with the Rangitata orogeny in New Zealand) that resulted in a collage of different units. The various Late Carboniferous to Late Jurassic units found in New Caledonia assembled at that time to form the old core of New Caledonia (Paris, 1981 ; Meffre, 1995 ; Cluzel *et al.*, 2001).

The Early Late Cretaceous (120-100 Ma) to Earliest Eocene (55-50 Ma) period: marginal rifting and spreading along the east Gondwana margin

This extensional tectonics period is marked by dislocation of the east Gondwana margin by Late Cretaceous rifting and subsequent Latest Cretaceous to Latest Paleocene/Earliest Eocene spreading. This results in a series of at least two thinned fragments of continental crust (the Lord Howe Rise, the Norfolk Ridge and possibly the Loyalty Ridge ? and/or a ridge further to the east ?) and at least three main basins floored with oceanic crust (the Tasman Sea Basin (100-85 Ma stretching, 85/80-52 Ma spreading), the New Caledonia Basin (95-62 ? Ma stretching, 62-56 Ma ? spreading) and the South Loyalty Basin (100/80 ? or 85/80 -55 Ma ? spreading). Ages of the crust of the two latter basins still derive from interpretations.

The major problem in the reconstruction for this period is the nature of the plate boundary east of the area. Reconstructions have suggested this boundary is an east dipping subduction zone, a west-dipping subduction zone, a strike-slip boundary, or no boundary at all. The recent reconstructions (Cluzel *et al.*, 2001 ; Crawford *et al.*, 2003; Shellart *et al.*, 2006) propose a continous west-dipping subduction of the Pacific plate that rolled back eastward to accomodate the basins opening. However, this attractive model does not fit well with the « classic » formation of successive back-arc basins in which the closest basin to the trench is the youngest, because the basins are thought to be more or less similar in age (except if an older age -Early Cretaceous- for the South Loyalty Basin is chosen). Also, the associated volcanic arc accompanying this long term subduction is still largely undocumented, even if one may consider that it disappeared by erosion or it is hidden beneath younger volcanic arcs or sediments.

The Early Eocene (55-50 Ma) to Latest Eocene/Early Oligocene period: lithospheric shortening and the New Caledonian orogen

This period is marked by convergence inside the previously dismembered east Gondwana margin, by the partial closure of North Loyalty Basin and finally by the emplacement of the ophiolitic nappe in New Caledonia. Recent reconstructions (Cluzel *et al.*, 2001 ; Schellart *et al.*, 2006) propose a relatively long-lived intra-oceanic east-dipping subduction zone inside the South Loyalty Basin during Early to Middle Eocene. Subduction was locked in the Late Eocene (38-34 Ma) by the underthrusting of the Norfolk ridge, resulting in the thrusting over the New Caledonia block of mafic and ultramafic units with coeval (60-70 km) exhumation of metamorphic rocks by buoyancy-driven uplift. In the final stage, the convergence motion jumped westward along the west margin of the New Caledonia ridge, as suggested by compressive features at the toe of the western margin, the abandoned slab beneath southern New Caledonia (Régnier, 1988) and the post-orogenic Lower Oligocene intrusives. Compression also affected the Fairway Ridge and Lord How Rise.

In the above-mentioned model, a large portion of the oceanic lithosphere of the wide South Loyalty Basin would have been absorbed in subduction, and the subduction would be responsible for the development of the Loyalty Ridge arc and the North Loyalty back-arc basin. However, the fore arc of this subduction zone does not resemble classic fore arc domain, and volcanic rocks with arc affinity are still unknown in the Loyalty ridge, and the direction of spreading in the North Loyalty Basin, deduced from E-W trending magnetic anomaly lineations, is parallel -instead of normal- to the arc and the subduction zone. An alternative model proposed here is to consider a narrow original North Loyalty basin from which a small panel of lithosphere forming the foot of the New Caledonia Ridge's margin has been obducted, with no requirement of Eocene subduction to create the Loyalty Ridge.

The Oligocene to Late Miocene period : planation, extensional tectonics and subsidence, volcanism

This poorly-documented post orogenic period is marked by (low to moderate ?) uplift, erosion and planation of the New Caledonia ridge. Isostatic uplift is likely accompanied by ridge-normal extensional tectonics and subsidence of the margins, and could be due to the buoyancy force of the orogenic root thickened during collision, to loading by the overthrusted oceanic lithosphere and to erosion. Ni-rich lateritic mantles likely mainly developed during this period of extensive alteration of the peridotites.

This period is also marked by alkaline volcanism related to several hot spots that affect the Australia plate, as exemplified by the Tasmantid chain in the Tasman Sea Basin, the Lord Howe volcanic chain and the volcanic edifices along the Norfolk Ridge/Loyalty Ridge.

The Late Miocene (10 Ma) to Present period : extension, initiation of subduction, bulge-related deformations and arc-ridge subduction/collision

The Latest Miocene is marked, to the east of the New Caledonia domain, by the initiation of the east-dipping Vanuatu subduction zone. This zone of convergence, behind which the active North Fiji Basin opened and along which part of the North Loyalty Basin (and other basins and features ?) was consumed, appears to play a significant role in the Late Neogene evolution of New Caledonia and Loyalty Ridges, as shown by (1) Late Neogene ridge-parallel to oblique extensional tectonics that affected the ridges, (2) Quaternary faults, bulge-related Quaternary vertical motions of the Loyalty islands and southern part of the New Caledonia Ridge, (3) Loyalty Ridge-Vanuatu arc interaction-related deformation and (4) shallow seismicity of relatively low intensity in the Grande Terre (intense seismicity, however, occurs in the easternmost part of the Loyalty Ridge close to the active Vanuatu plate boundary).

Some geological aspects for the understanding of the New Caledonia biodiversity and endemism

The problem of lands for refuge of the Gondwanian flora and fauna

The geology of the Grande Terre of New Caledonia indicates that after the Cretaceous the Norfolk Ridge/New Caledonia Ridge was below sea level up to the Late Eocene (or possibly up to the Middle Eocene), thus for a period of about 20 Ma (from 65 to 45 Ma). Indeed, the Paleocene-Lower Eocene pelagic limestones and cherts following the Upper Cretaceous fining-upward clastic sequence indicate relatively deep water deposits. Presence of an island on the New Caledonia Ridge is established since the Late Eocene, the size of which was larger than today since the d'Entrecasteaux Reef area, the wide northern lagoon, the wide southern lagoon, as well as parts of the upper slope of the present-day margins were probably above sea level. Other islands likely existed in the Late Eocene-Early Oligocene, on the Lord Howe Rise, Fairway Ridge and Loyalty Ridge. Islands also existed in Late Oligocene on the Chesterfield/Bellona zone, and in Late Miocene on the Loyalty Ridge. Thus, one may infer that the Gondwanian fauna and flora were introduced in New Caledonia during or after the Middle to Late Eocene.

If New Caledonia was not a refuge for the Gondwanian biodiversity, did other land -except Australia - exist in the region before the Middle-Late Eocene ? This in turn poses the major question concerning the nature of the plate boundary east of Australia before 45-50 ma. If we consider (as proposed by Veevers *et al.*, 2000; Cluzel *et al.*, 2001; Crawford *et al.*, 2003; Schellart *et al.*, 2006) that a west dipping subduction continuously proceeded since that time during rifting and subsequent basin spreading, therefore a volcanic arc must have been always active. This provides the possibility for the building of an alignment of islands likely restricted in size east of the Norfolk-New Caledonia Ridge, such as the present-day islands of the active Tonga or Vanuatu arcs.

The influence of the New Caledonian ophiolite

It is well known that the nature of the ultra basic ophiolitic nappe of New Caledonia plays an important role in the floral endemism of the island. The peculiar speciation and diversification are driven by the unusual type of ultra basic rock-derived soils rich in metallic elements and depleted in mineral salts. Most of the flora living on lateritic soils is endemic. Today ultrabasic rocks and associated soils only cover about one third of the island. The ophiolitic nappe constituting the top of the tectonic pile of the Late Eocene orogen, it is likely that when it emerged the Grande Terre island was fully covered by the ophiolite, leading to species selection. However, the present-day ophiolitic nappe lacks a complete crustal sequence (sheeted dike complex and mafic rocks) and we do not know if the mafic crustal sequence existed on the top of the ultramafic rocks or if it has been removed by erosion.

An other point about the possible role of the ophiolitic nappe for the biodiversity is alkaline hydrothermalism resulting from reactions between water and upper mantle rocks (serpentinization). Recently (Pelletier *et al.*, 2006) an extensive active alkaline hydrothermal field has been revealed by 2004 and 2005 swath mapping and scuba diving in the floor of Prony Bay which developed in the large peridotitic massif at the southern tip of the Grande Terre, the "Prony aiguille" chimney was previously known (Launay and Fontes, 1985). Uncommon characteristics of this alkaline hydrothermal system are similar (same high pH, same deposits of CaCo3 and Mg hydroxyde and same peridotitic substratum) to those of the Lost City site recently discovered on the Mid-Atlantic Ridge (Kelley *et al.*, 2001) and which produces methane- and hydrogen-rich fluids serving as energy sources for archaeal and eubacterial communities (Kelley *et al.*, 2005). Such alkaline systems which derive from hydration of the outcropping ultramafic rocks is interesting because it may share several characteristics with hydrothermal environments at the beginning of life on Earth. The Prony Bay site is accessible by scuba diving and thus may be of wide interest. It is possible that such other active or recent hydrothermal sites exist in the present-day submerged portions of the remaining ophiolitic nappe (parts of southeastern and eastern lagoons of the Garnde Terre). Probably, such hydrothermal fields already existed in the past since the Late Eocene emplacement of the ophiolitic nappe, and may have played a first-order role in the evolution of the New Caledonian biodiversity.

Pleistocene sea level variation

The sea level has 100 Ka cyclic high and low stands since the last 0.9 Ma (Shackelton, 1987, 2000). Low stands were 120-130 m below present-day sea level and high stands were sometimes 5 to 10 m above present-day sea level. Such high amplitude and rapid variations may have significant effects on the distribution of the New Caledonia marine biodiversity. Taking into account the slow subsidence of the margins, the wide lagoon around the Grande Terre with depths much lower than 120 m has been largely emerged and submerged several times during the last million years. Detailed bathymetry of the lagoon however suggests that lakes with brackish water existed during sea falls in the deepest parts of the lagoon, the depths of the passes being generally shallower than that the lagoon itself (Dugas *et al.*, 1980; Chevillotte *et al.*, 2005). Lakes were likely in the relatively deep (60 m) and closed northern lagoon (Collot *et al.*, 1988), as well as in the southern lagoon as suggested by 25-35 m deep closed basins in front of the Pirogue river and east of the Mato Pass. The production of maps at different times during the last cycles, especially during the last glaciation/deglaciation period (last 125 ka), taking into account subsidence, sedimentation and detailed bathymetry of the lagoon, barrier reef and passes may be useful to locate possible refuges through Late Pleistocene for the species of the lagoon.

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The diversity of New Caledonia coral reef geomorphology and genetic processes: a synthesis from optical remote sensing, coring and acoustic multi-beam observations

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Introduction

The New-Caledonia (NC) exclusive economic zone (EEZ) includes a large variety of oceanic and continental coral reef formations. This geomorphological diversity provides a rich framework which itself supports a large diversity of shallow modern habitats and communities. As a background to the description of the marine check-lists published in this volume, we describe here for each of the main coral reef complexes (bank, atolls, uplifted reefs, drowned reefs, fringing reefs, barrier reefs, patch reefs), a review of their geomorphological diversity and genetic processes.

There is a long history of scientific research on the formations of NC coral reefs. First, datations from corals from a variety of locations in uplifted and subtidal positions provided a general idea of the intensity and timing of the dynamic processes that resulted in the modern morphology (Dubois *et al*. 1974; Collot *et al*., 1975, Coudray 1976; Debenay 1986; Carriere 1987). With the generalization of drilling programs and the possibility to assess the vertical structures of a reef (succession of episodes of reef growth), genetic processes have been locally refined (Coudray, 1976; Cabioch, 1988; Degaugue-Michalsky 1993; Castellaro; 1993), especially around Grande-Terre (Cabioch 2001, 2003). Drilling provided a huge mass of information relevant to establish models of reef settlement and development during the last interglacial ages in the Indo-Pacific region (Montaggioni, 2005). However, drilling provides only point data, spatially limited, and inferences must be made for larger spatial scales.

Synoptic data come with remote sensing observations, which include shipborne, airborne and space-borne data. Using Landsat satellite images, Grande-Terre, Ile des Pins, Entrecasteaux, Loyalty and Chesterfield reefs were recently mapped using the geomorphological typology proposed by Andréfouët *et al*. (2006). The resulting atlas provides a quasi- exhaustive detailed two-dimension (2D) view of modern NC reefs (Andréfouët & Torres-Pulliza, 2004) (Fig. 1, plate 3/1). Finally, multi-beam acoustic data were collected between -20/-40 to -1000 m along the New-Caledonia and the Loyalty Ridges using the EM1002 echosounder of the R/V Alis (Pelletier *et al*., 2004). Data were processed using the software CARAIBES TD (© IFREMER) (Flamand, 2006). Bathymetric multi-beam data provided a 2D/3D vision of the outer slopes of several NC reef complexes (Flamand *et al*., 2004). The internal structure provided by coring is not accessible, but marine terraces and faulting became visible with the fine-resolution bathymetric data. These features helped drawing the evolution of the Grande-Terre barrier reef system (Flamand, 2006).

In this review, we use the synoptic exhaustive description provided by optical satellite images as the primary guideline to describe the main NC reef complexes. In the Background section (next) we also briefly describe the main forcing oceanographic, tectonic and eustatic processes occurring in the region. Then, for each reef complexe, when the information is available by datations and coring, we provide the current interpretation of the local dynamics across times. As much as possible, given the existing data, we consider the 125 ka (1ka=1000 years)-Present time-period. This period includes the last interglacial period (125 ka, mean sea level 6 meters above present level), crosses the last glacial maximum (at 23-20 ka, lower sea stands at around -120m and beginning of the end of aerial exposure for interglacial reefs), and eventually crosses the postglacial periods of rising (~20-6 ka), quickly falling (~6-5.5 ka) and stable (~5.5 ka-Present) sea levels.

Forcing processes and their significance for reef and lagoon modern morphologies

The three main axes of reef complexes: Chesterfield-Bellona, Ile-des-Pins-Grande-Terre-Entrecasteaux and Loyalty Islands.

New Caledonia EEZ’s tectonic framework is made of a succession of basins and ridges (Fig. 2). From West to East, NC modern reefs have for foundation the Chesterfield/Bellona plateau, the Lord Howe Ridge, the Fairway Ridge, the Norfolk Ridge (or New Caledonia Ridge in its northern part) and the Loyalty Ridge. These ridges respectively support the Chesterfield banks, the -Fairway banks and drowned atolls, the Grande-Terre, Ile des Pins, and d’Entrecasteaux reef complexes, and the Loyalty uplifted-reefs and banks (Fig. 2). A prominent dynamic regional feature is the subduction zone between NC and Vanuatu, where the -Australian plate dips underneath the Vanuatu arc-North Fiji Basin microplates and Pacific plate Plate. The lithospheric deformation (bulge) before its dip explains the uplifted reefs of Grande-Terre, Ile des Pins and Loyalty islands (Dubois *et al*.; 1974).

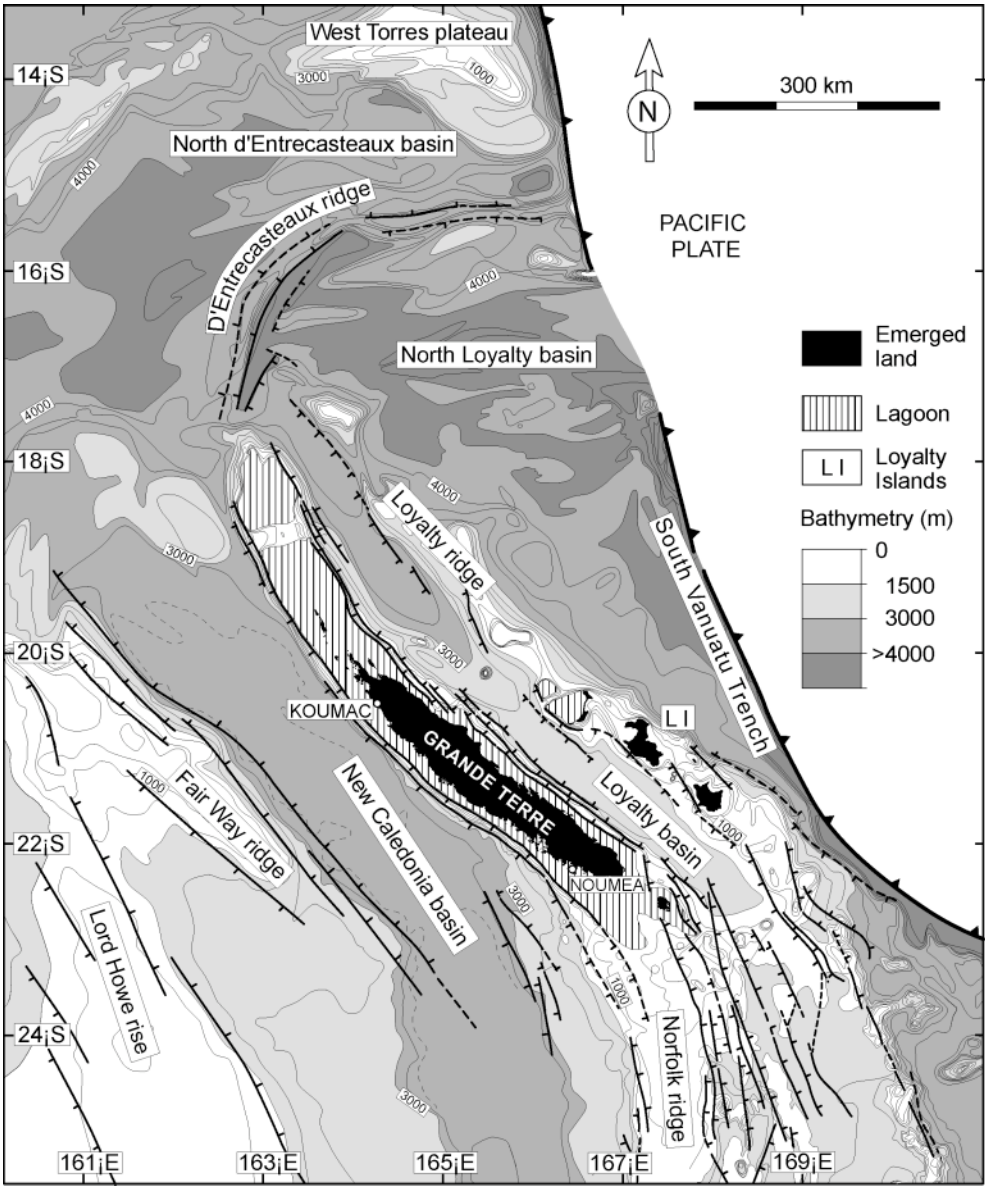

Figure 2: Morphology and main structures of the peri-caledonian domain. Modified from Flamand (2006). Data compiled by Chardon & Chevillotte (2006), from Maillet *et al.* (1983), Mignot (1984), Rigolot (1989), Lafoy *et al.* (1995) and Dupont *et al.* (1995).

Tectonics processes

Local equilibrium and differential motions (or movements) between subsidence and uplift explain largely the modern reef morphology (Fig. 3). Differences in depth, or altitude, between 125 ka-old reefs and post-glacial reefs highlighted the differential vertical processes. In a general way, subsidence dominates around Grande Terre, although some parts (especially in southeast) have been subjected to uplift (Cabioch *et al*., 1996). For instance, Cabioch (2001) shows that Amédée Reef subsided at a rate of 0.14 $mm.y^{-1}$ at least, while the reefs close to Nouméa, on the coast, subsided at 0.07 $mm.y^{-1}$. Similarly, near Bourail, the subsidence is low (0.03 $mm.y^{-1}$) which explains the proximity to land of the outer reef flat in this section of coast. The highest subsidence rate offshore explains the formation of the vast and large Southwest and North lagoons. Therefore, offshore postglacial barrier reefs will be also much thicker than coastal ones. The antecedent topography is located much deeper and is more difficult to reach with coring techniques.

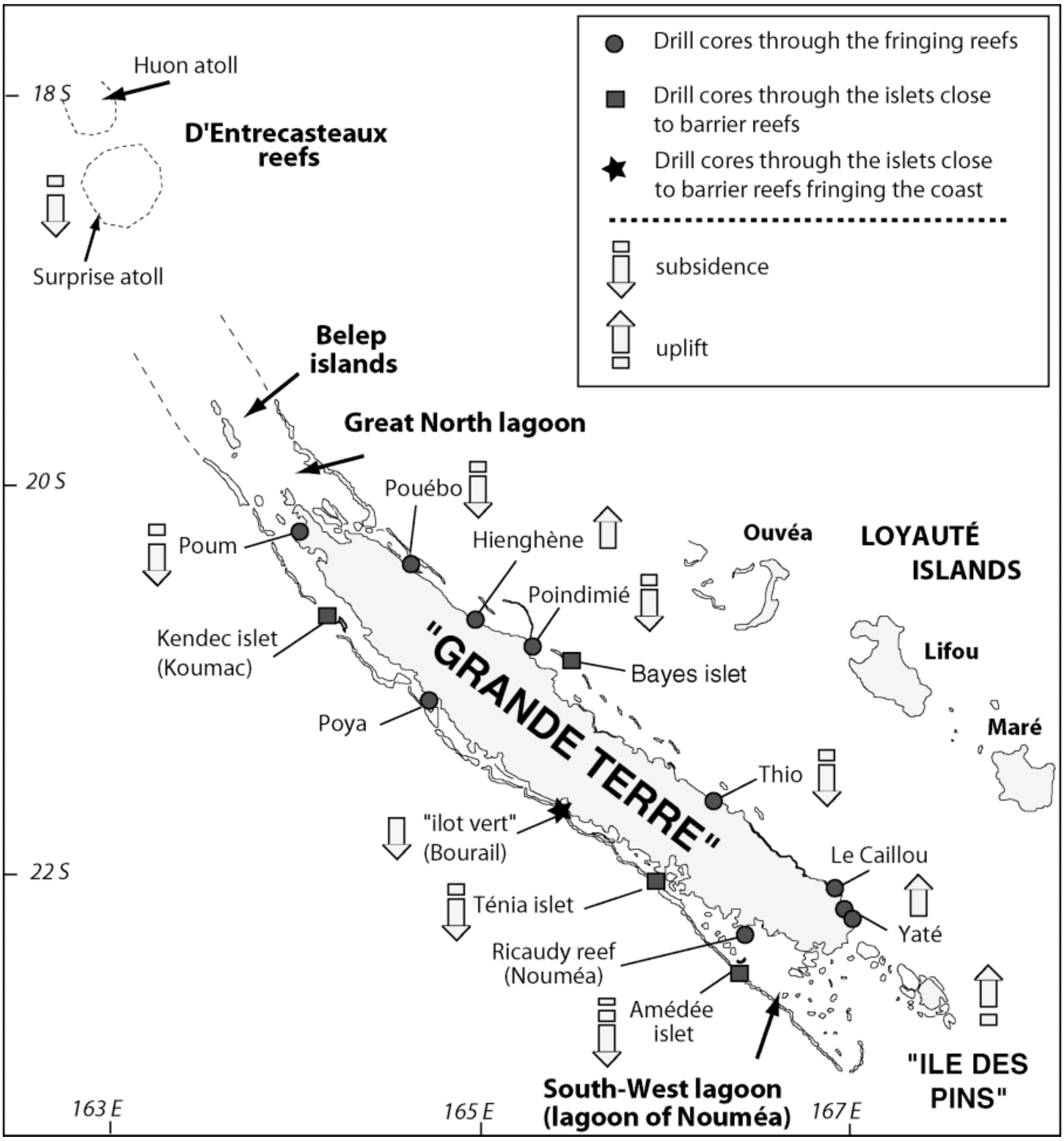

Figure 3: Locations of cores drilled through New Caledonia coral reefs and neotectonic behavior of Grande-Terre and Ile des Pins (modified from Cabioch *et al*. 1996, Cabioch 2003).

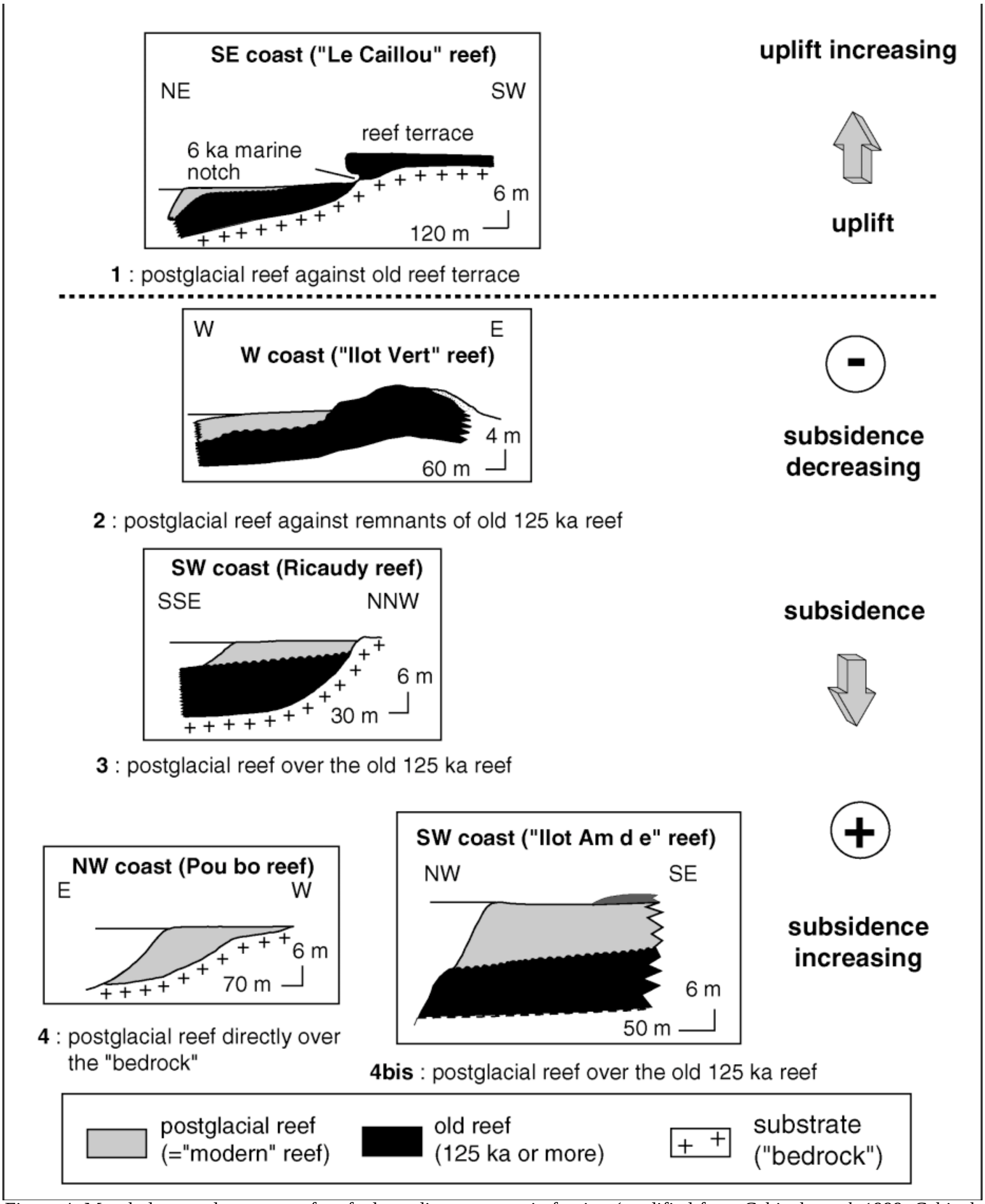

Figure 4: Morphology and structure of reefs depending on tectonic forcing (modified from Cabioch *et al*. 1999, Cabioch 2003).

Uplift occurred during the last 125 ka in the South of Grande-Terre, around Yate, providing terraces at an altitude of up to 10m. Thus, postglacial reefs are narrow in this region. They are also thin and developed above an antecedent platform (reef or continental) which is at short vertical distance from present sea-level (Fig. 4). Ile des Pins has also been uplifted in the same way. Simultaneously to the uplifting of the coast, the barrier reef of the south-east coast drowned (Dugas & Debenay 1978, Cabioch *et al*. 1996), creating a very open and deep lagoon from Yate up to about Port-Bouquet.

Yate and Ile des Pins uplifts reveal the beginning of the influence on Grande-Terre of the lithospher-

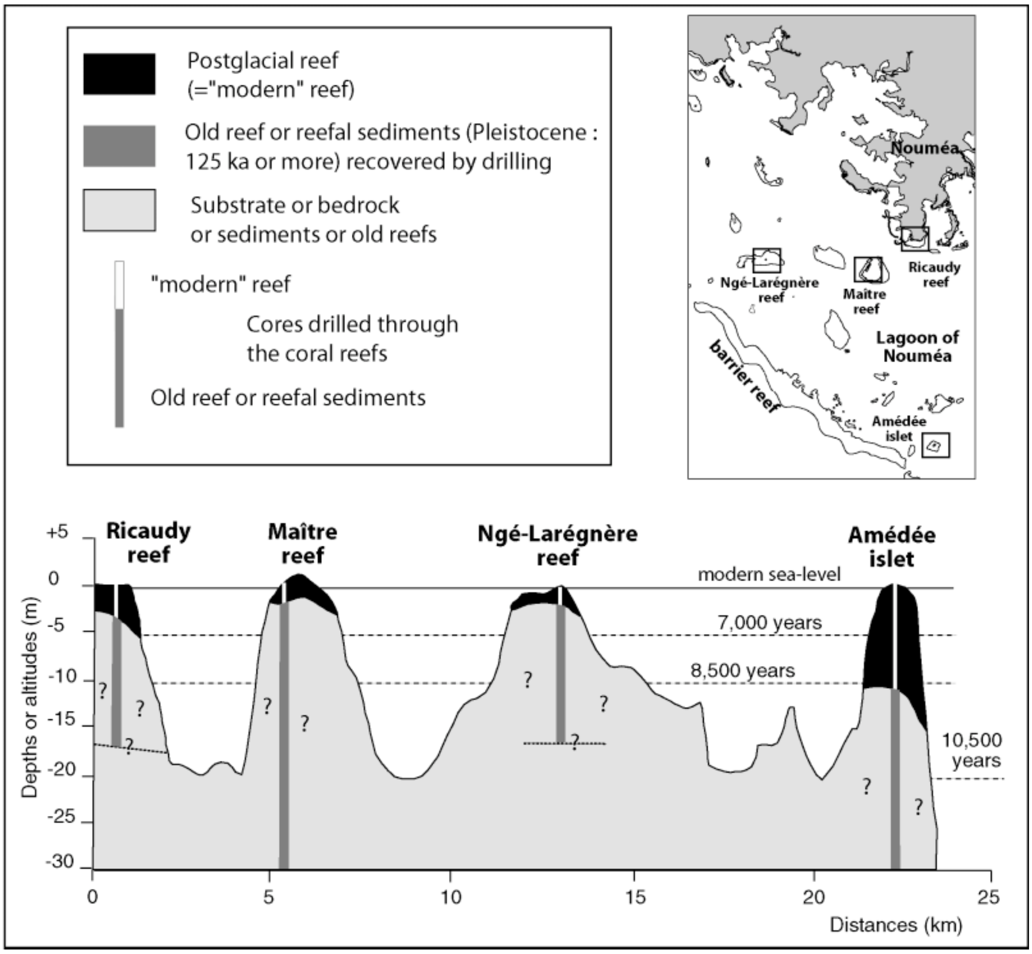

Figure 5: Relationships between the timing of the flooding and available substrates and age of the coral reef formations of the Noumea lagoon inferred from core data (modified from Castellaro *et al.* 1999, Cabioch *et al.* 1999 and unpublished data).

ic bulge of the Vanuatu subduction zone. Its influence had also strongly modeled the Loyalty Ridge reefs. From South to North, Maré (+138m) has just passed the top of the bulge, Lifou (+104m) is ascending the bulge, and Ouvéa and Beautemps-Beaupré are only partially uplifted, just starting the process. Uplifting rates vary from +0.12 to +0.17 mm.y^{-1} in the last 125 ka. In contrast, Walpole is now slowly drowning towards the subduction zone.
The amplitude of the hydro-isostatic readjustment induced by the sea-level rise of the last 23 ka following the last deglacial sea level rise depends on the underlying mantle viscosity. Consequently, raised beach-rocks, emerged marine notches and abraded reef flats from 0 up to 2±0.5 m dated of mid-Holocene characterize this process in New Caledonia (Cabioch *et al*., 1989).

Antecedent topography

The antecedent topography and the type of substrate is one of the factors that explains modern reef geomorphology (Purdy, 1974; Cabioch, 2003; Montaggioni, 2005). Small-scale erosional or depositional topographic features and hard surfaces (e.g. paleorivers, karstic basins, lava beds, previous reefs) are suitable for reef-builders settlements. NC cores reveal that reef growth started late in the past postglacial period, about around ~7.5-7 ka for the fringing reefs and 8.2 ka for Amédée Reef (Cabioch *et al*., 1995, 1996). This period was optimal in terms of temperature regimes and sea-level stabilization. In Grande-Terre, settlements occurred on the southwest and southeast coasts, over both karstified 125 ka old reef platform and over non-carbonated substratum. They occurred at different

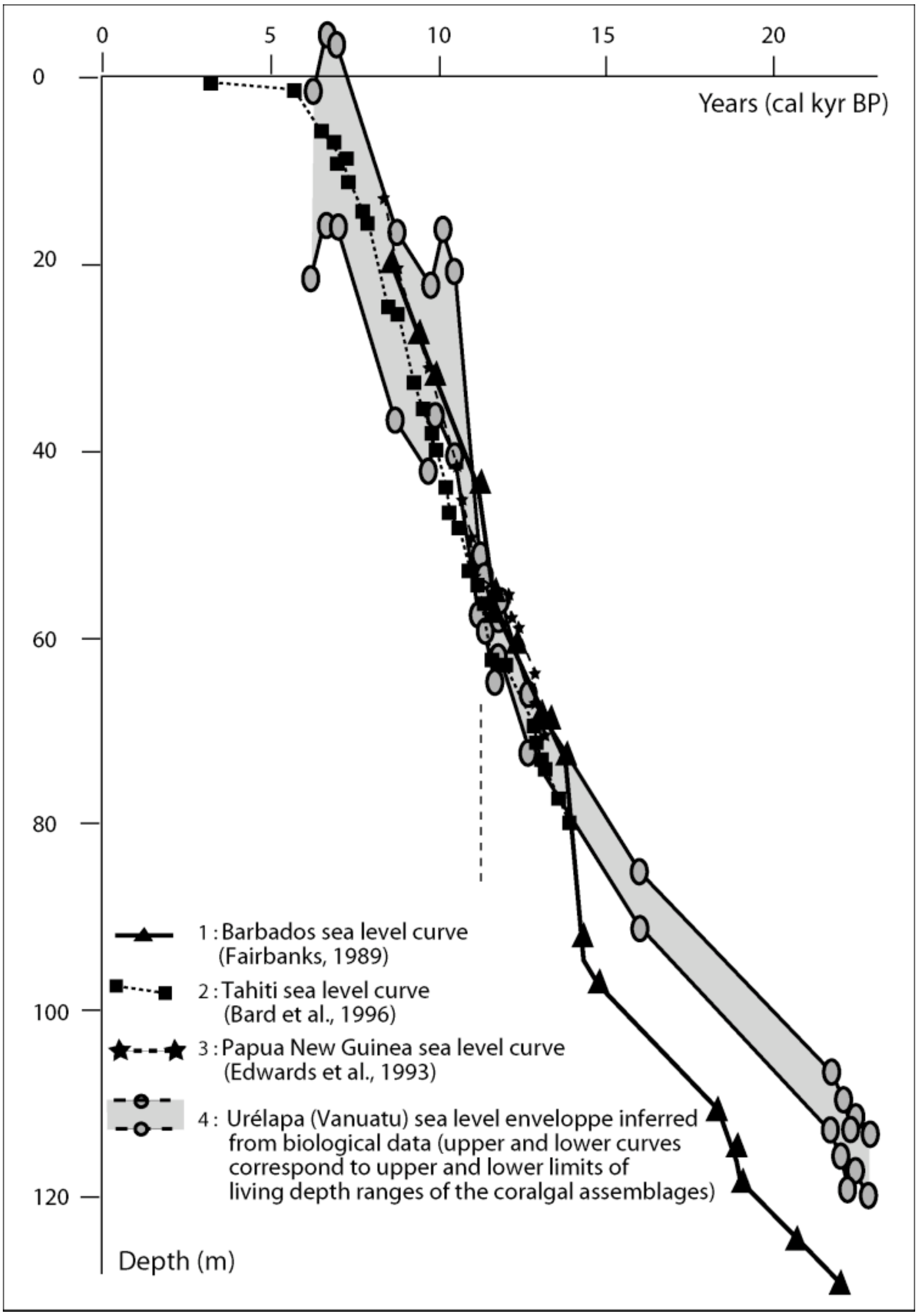

Figure 6: Deglacial sea-level curves for different reefs worldwide (modified from Cabioch, 2001).

depths likely favored by an energetic hydrodynamic regime. A variety of antecedent topographic forms (slopes, flat areas) were colonized as soon as the substrates were flooded (Fig. 5). The Loyalty islands reefs are developing above a substratum made of carbonate from Miocene to Quaternary, which were subsequently uplifted.

Sea-level variations

The postglacial rate of sea level variations is a key parameter to understand reef modern morphology. Obviously substratum need to be flooded before a reef can start growing, but after the initialization has started, the speed of the sea-level rise and the type of living communities (fast or slow growing) concur to provide a variety of reef-growth strategy (keep-up, catch-up or give-up, see Neumann & MacIntyre, 1985) which may result in different reef morphologies for the same antecedent substrate. The timing of the flooding and substrate availability explains the geometry and patterns of reef development (Fig. 5). Between 125 and 23 Ka, sea level variations followed cycles of glacial-interglacial periods. These dates correspond to maxima and minima respectively, with sea levels between +4 to +6m (125 ka) and around -120 m (20 / 23 ka) compared to present mean sea-level (Waelbroeck *et al*. 2002). In New Caledonia, highest levels, up to +2 m, were reached at 5.5 Ka (Fig. 6) due to the isostatic readjustment.

Paleo-oceanography

Sea Surface Temperatures (SST), salinity, nutrients, upwelling regimes, turbidity, atmospheric CO_2, circulation and hydrodynamic energy can contribute to explain the patterns of reef growth (Chappell, 1980; Davies & Montaggioni, 1985). Even though this is not completely demonstrated, the most obvious oceanographic factor that can explain the late (8.2 ka) formation of postglacial reefs in New Caledonia is SST (Cabioch, 2001). SST may not have been suitable for corals before that period. Paleo-SST before 8 ka were probably similar to today's SST at 30 degree South of latitude, which is the modern limit of significant reef development. Alternatively, lack of suitable substrates can also explain the youngest settlement of the New Caledonian reefs.

Specificity, diversity and extent of New Caledonia reef complexes

If we follow the typology of reef units proposed by Andréfouët *et al*. (2006) to map all reefs worldwide, New Caledonia presents a high diversity of structures. This typology will be referred hereafter as the "Millennium" typology, since it was designed for a remote-sensing based mapping project called "Millennium Coral Reef Mapping project".

The Millennium typology is a hierarchical scheme whose main nodes are provided Fig. 7 (plate 3/2). The Millennium classes were designed to reflect, not just geological processes, but principally habitat diversity for several applications. Thus, the terminology is specific to these applications (Andréfouët *et al*., 2006), and may not match perfectly the usual geodynamic and geologic definitions since it considers also hydrodynamic and biological factors. For instance, the word "drowned reef" refer to a deep reef location, in contrast with nearby subtidal formations of the same type (e.g. atoll, or barrier reef). The process involved (slow subsidence or quick tectonic event) is not known most of the time.

The Millennium typology proposes a frame allowing consistent interpretation for reefs worldwide. Generally, the interpretation, based only on remote sensing images, is clear and unambiguous. However, highly-complex reefs and environments can be interpreted in different ways and there may be more than one solution (see Balabio Island further). Grande-Terre was considered as a continent, and not a continental island. Conversely, Ile des Pins, Balabio, Yandé and Belep are classified as continental islands, since they are satellites of Grande-Terre. D'Entrecasteaux reefs were considered as oceanic islands even if their basement could be partly of continental origin ridge. Within the Millennium typology, since they don't have a lagoon, Mare, Lifou, Tiga and nearby platform reefs were considered as oceanic islands. In contrast, Ouvea, with its wide lagoon and uplifted rim and islets was considered as an oceanic uplifted atoll.

Grande-Terre, Ile des Pins, D'Entrecasteaux, Loyalty and Chesterfield reefs provide 161 Millennium classes (150 classes defined in Andréfouët & Torres-Pulliza 2004, plus 11 classes specific to Chesterfield banks and atolls). NC reefs include both oceanic (D'Entrecasteaux, Loyalty and Chesterfield) and continental reefs (Grande-Terre, Ile-des-Pins). In comparison, the continental eastern Papua New Guinea alone includes 180 classes. The oceanic French Polynesia includes 64 classes. In the Caribbean, the Meso-American Reef System which is the most developed and rich system, includes 100 continental and oceanic classes. Thus, NC is clearly an area of high complexity, a hotspot of reef diversity, though it is not the most complex area.

The prominent, almost emblematic, feature of NC is its barrier reef. If we include the deeper south-east section from Poindimie to Yate, it is a 1500 km long system. The subtidal domain is a 1300 km long system, from, clockwise, the "Corne Sud" till Poindimié. It is cut by deep passes though they are not numerous. This is the longest stretch of barrier reef worldwide, since the Great Barrier Reef (GBR) in Australia is for most of its length a dense, or diffuse, matrix of platform reefs of various sizes and shapes and not a linear barrier reef. Only the northern part of the GBR, the Ribbon Reefs, have a morphology similar to NC barrier reef (Hopley, 1982).

The Millennium typology provides two main types of barrier reefs: outer shelf and intra-shelf barrier, both are found in NC. Intra-shelf barrier are continuous lines of reefs making a barrier in the lagoon well separated from the outer shelf barrier, like the line of Bogota reefs north of Canala. These two types of barrier reefs can be broken as (regular) barrier, multiple-barrier, imbricated-barrier, coastal-barrier and fringing-barrier types. Except the later, all are found in New Caledonia. Multiple-barriers are made of series of parallel reef flats that are developed closed to each others and some times connect together (see Guilcher, 1988). An imbricated-barrier is a section of barrier which is turning around itself, thus changing completely the degree of exposure and the types of habitats, the outer side turning to the inner side when bending. This configuration marks the termination of the southern end of Récif de Cook, or the termination of Corne du Sud in the South lagoon. An imbricated-barrier can also be a barrier that terminates in the lagoon of a second separate barrier. This configuration also occurs in Hienghene according to Andréfouët & Torres-Pulliza (2004) interpretation. A coastal-barrier is an intermediate configuration between a (regular) barrier and a fringing reef, i.e. there is no deep lagoon, but a shallow sedimentary terrace that clearly separates outer reef flats habitats from fringing-like habitats. This configuration is found in Bourail on the central-west coast. A fringing-barrier is a section of barrier that harbors large islands, thus displaying fringing-type habitats in an outer barrier environment. This is not present in NC (but see the case of Balabio Island in the *Continental Reefs* section), but it occurs for instance in Palau, Mayotte and frequently in Papua New Guinea and Solomon Islands. Examples of these barrier reef types are provided Fig. 8 (plate 3/3)

In contrast with other wide Indo-Pacific continental areas (Eastern Australia, Indonesia but especially Eastern Papua New Guinea), or oceanic areas with large shallow shelves (Fiji), the spatial organization of Grande-Terre reefs is not very diverse since it provides a onshore-offshore sequential zonation of fringing-patch-barrier reefs for most of its perimeter. The wide south lagoon and the uplifted Ile des Pins provide some variations with more complex gradients of spatial organizations due to higher abundance of patch reefs and wide shallow lagoons.

Surface areas of the main reef complexes of New Caledonia are provided Table 1. The inventory shows that there are 8 times more lagoonal and sedimentary areas (~31300 km^2) than reef areas (~4500 km^2). Among the reef areas, 1/3 (1450 km^2) comes from the Chesterfield-Bellona reef complex. However, it is worth noting that most of this surface includes drowned atoll rims and banks, and not shallow areas of active biological construction. The lagoonal areas of Chesterfield-Bellona (~12200 km^2), which are completely open to the ocean for the most part, also account for more than 1/3 of the total non-reef area (~31300 km^2). Detailed assessment of reef surface, itemized per individual reef types are available in Andréfouët & Torres-Pulliza (2004) at the exception of Chesterfield-Bellona which were computed afterwards.

Table 1: Surface areas and number of reef classes (*sensu* Millennium Mapping Project) of the main reef complexes of New Caledonia. Barrier reefs include here, for simplification, atoll and bank peripheries. Total reef area including only hard-bottom areas (forereefs, reef flats, reticulated areas, etc..). Non-reef areas include lagoons (deep and shallow), terraces (deep and shallow), enclosed basins and passes. Land includes the main land, uplifted land and islets. Grande Terre statistics include Balabio, Yandé and Belep continental islands. The New Caledonia statistics include each reefs from each region, except Walpole, Banc de la Torche, Matthew and Hunter. The number of Millennium classes includes the land classes (mainland, islets, etc.).

	Barrier reefs reefs (km^2)	**Fringing reefs (km^2)**	**Patch reefs (km^2)**	**Total reef area (km^2)**	**Non-reef area (km^2)**	**Land (km^2)**	**Number of Millennium classes**
D'Entrecasteaux	154.00	0.00	11.60	165.59	812.29	0.68	16
Chesterfield	1324.01	0.00	133.92	1457.93	12241.64	2.31	20
Loyalty	126.15	147.68	0.50	274.33	1037.61	1962.41	27
Ile Des Pins	104.12	10.82	13.68	128.62	370.53	161.98	34
Grande Terre	1744.06	391.18	376.22	2511.47	16874.25	16641.77	108
New Caledonia	3452.34	549.68	535.93	4537.94	31336.32	18769.15	162

Oceanic reefs: islands, banks, atolls, uplifted atolls, drowned reefs

Introduction

Oceanic reefs in New Caledonia includes a large variety of reef structures encountered on oceanic islands (Maré, Lifou, Tiga, Nié, Dudun, Léliogat, Hua), banks (Beautemps-Beaupré, Astrolabe, Petrie, Portail), atolls (most of D'Entrecasteaux reefs, Chesterfield and Bellona), uplifted atoll (Ouvéa) and drowned reefs (between Chesterfield and Bellona atolls). The presence of a drowned rim along the eastern perimeter of the Chesterfield/Bellona platforms justified that they were classified as atolls and not banks in the Millennium typology.

Chesterfield and Bellona

The two very large Coral Sea systems of Chesterfield and Bellona include intertidal structures on their western and southern flanks. The deep patches that are at the limit of visibility in satellite images of the deep lagoons may not be high relief patches. Instead, they are probably the top of low relief mounds (Richer de Forges *et al*., 1988). High relief pinnacles occur in Chesterfield, interpreted as the possible signature of karstic processes by Degauge-Michalski (1993). The eastern drowned paleo-rim systems are well visible on remote sensing imagery, showing drowned reef flats cut by passes.

The Chesterfield/Bellona are supported by five guyots (drowned atolls) that constitute the northern and oldest volcanoes along the Lord Howe hotspot track (Missegue & Collot, 1987). Volcanic activities possibly took place in the Late Oligocene time (28 Ma) when the Australian plate and the western side of the Lord Howe ridge moved above a hot-spot. The thickness of the carbonate layers are 200-300 m. Drilling till -14 m on the inner slopes and -9 m on the reef flat, the limit between 125 ka-Pleistocene/Holocene reefs was still not reached. However seismic data suggest that this limit is 2 to 3 m below the lagoon floor (40 to 60 m depth), and 7 m along the shallower inner slope. The origin of the antecedent rim-like structure that support the Holocene reefs is not elucidated and the different scenario are discussed in Degauge-Michalski (1993, p.190 and 198). Holocene reef growth as interpreted from cores data reveal that vertical growth was initiated around 6 ka, and stopped around 3.5 ka. Horizontal growth started shortly after the definitive sea level stabilization around 3000-2500 years B.P. The sequences of postglacial reef formation is described by Degauge-Michalski (1993) from cores drilled in the south central part of Bellona, near the "Caye de l'Observatoire", in the southern tip of the Bellona atoll, and from the southern tip of Chesterfield atoll, around Loop islet. Subsidence rates were estimated at 0.1-0.15 mm.y^{-1}, slightly higher than d'Entrecasteaux and the west coast of Grande Terre.

Entrecasteaux

D'Entrecasteaux reefs supported by the northern extension of the NC ridge is the complex of reefs, including atolls and banks, separated from Grande-Terre by the 600-800 m deep "Grand Passage" (Collot *et al*., 1988a).
D'Entecasteaux reefs are arranged in three parallel ridges (Collot *et al*, 1988b). The main structures are Huon and Surprise which are two 60 m deep-lagoon atolls supported by a central NW-SE trending ridge of ultramafic rocks in the extension of the eastern ridge of the Grand Lagon Nord . East of Huon, the shallow atolls from the Guilbert's group are supported by the northern end of a ridge which may include ultramafic rocks and thin imbricate slices of oceanic crust. West of the Huon-Surprise-Pelotas ridge, the Portail atoll is supported by a small N140°E ridge. Postglacial reefs have established upon antecedent karstified atoll structure around 6 ka. Drillings were performed on Surprise and Huon atolls on the inner slopes and reef flats. On Huon atoll, the limit between 125 ka-Pleistocene/Holocene reefs is at -7.90 m. On Surprise, the limit was not reached, but neo-tectonic processes may have occurred, putting the actual limit deeper (Degauge-Michalski 1993 p. 191). For Huon, assuming a sea level at 5 m higher than present around 125 ka, this provides a subsidence rate of 0.1 $mm.y^{-1}$, which is comparable to Grande-Terre rates (Degauge-Michalski 1993) and slightly lower than Chesterfield and Bellona's atolls.

Loyalty

We include in the Loyalty reefs all the reefs supported by the Loyalty Ridge, from Maré up to Petrie Reef. The largest islands are the uplifted Pleistocene carbonate platforms of Lifou and Maré. Several small islands dot the ocean between Maré and Lifou (Nié, Dudune, Léliogat, Hua and Tiga). The largest of them is Tiga. The geomorphological diversity of these islands is low, since they mostly have fringing slopes and narrow fringing reef flats. Maré and Lifou also display small shallow lagoons. Northward, the complexity increases with Ouvea, a partially uplifted atoll, and the suite of banks that include Beautemps-Beaupré, Astrolabe and Petrie reefs.
Loyalty islands have been the focus of many geodynamic and geological studies. The Australian plate where are located the New Caledonian (a part of the Norfolk) and Loyalty ridges is subducting underneath the Pacific plate. This subduction induces a bulge of the Australian plate, that culminates in the Loyauté islands (Dubois *et al*., 1973, 1974). The various degree of uplift between islands and degree of terrace inclinations in Maré (Carriere,1987), due to the lithospheric flexure before the Vanuatu subduction zone provided an indirect way to measure and model the dynamics of this zone.

Walpole, Banc de la Torche, Matthew, Hunter

These four systems from the southern part of NC EEZ are presented together due to their extremely simple geomorphological structure, mapped with only one Millennium class. However their origins largely differ (uplifted reefal plateau, drowned atoll and active volcanoes).
Walpole island, located south of Maré and supported by the Loyalty ridge, is a 3 km-long and 200 to 500 m-wide reefal plateau which culminates at 70 m altitude and is surrounded by vertical cliffs cut by notches. A narrow reef terrace culminating between +4 and +8 m is located at the bottom (foot) of the cliffs. This island displays a succession of Pleistocene reef terraces due to the combination of eustatic sea level variations and tectonic movements induced by the bulge. The narrow reef terrace from +4 to +8 m is 125 ka-old while the surface of the plateau is probably older than 500 ka (dating by L.K. Ayliffe in Cabioch and Genthon, 2002). Multibeam bathymetric map, achieved in 2002 (Cabioch *et al*., 2003), reveals several submarine platforms, probably corresponding to low sea levels, and several landslides, probably induced by the location of the island on the bulge near the subduction zone.
The Banc de la Torche, located south of Ile des Pins, is a 120 m high and 5 km wide circular shoal. Its summit corresponds to a tabular plateau reaching 32 m depth, partly topped by a few meters high annular ring. Thus, it may be a drowned atoll (Flamand, 2006).

Matthew and Hunter are active volcanoes in the southernmost segment of the Vanuatu arc. They are located on the Pacific Plate.

Continental reefs: islands, fringing, barrier and patch reefs

Introduction

The continental reefs of New Caledonia offer the largest diversity of reef formations, explained by the diversity of environmental forcing. Following geomorphologic criteria, the Millennium typology separates the lagoons, and the fringing, barrier and patch reefs. Four islands (Ile des Pins, Balabio, Yandé and Belep) were considered separately due to their distance to the main land and respectable sizes. They were classified as continental islands, i.e. islands around the Grande-Terre “continent”.

Grande-Terre reef diversity is variable depending on the considered sector. Clockwise, these are the north, northeast, southeast, southwest, central-west and northwest sectors. Each has its own particularity. The North sector is characterized by a very wide lagoon (Grand Lagon Nord) bounded by a continuous barrier reef (split between the Récif des Français and Récif de Cook) but depleted from patch reefs. Balabio and Belep islands are found here. The northeast sector, from Amoss Pass down to Houailou Pass has a narrow lagoon bounded by an intertidal barrier reef. In the southeast sector, the barrier reef becomes progressively subtidal and drowned and the lagoon gets wider. The southwest sector includes Ile des Pins and the highly-complex and wide southwest lagoon with numerous fringing and patch reef systems with different hydrodynamic exposure. The Millennium typology separates the oceanic, intra-seas and lagoonal patch and fringing reefs. Thus, highest reef diversity is found in this southwest sector. The central-west sector is characterized by coastal barrier reefs without deep lagoons but with large sedimentary shallow terraces. North of Népoui, the northwestern sector provides deeper lagoons bounded by continuous barrier reefs with large enclosed basins, and large lagoonal fringing reefs and patch reefs.

Balabio, Yandé and Belep

These three islands are found in the north lagoon. Balabio displays the widest formations in the continuity of the bended, imbricated Cook Reef south section. The habitat zonations and navigation channels justify the classification of Balabio reefs as a coastal barrier reef. Another possible interpretation could have been to consider Balabio reefs as the prolongation of the south Cook Reef merging with the fringing system of Balabio. Thus, the Balabio area would be classified as an imbricated fringing-barrier structure. This interpretation was eventually discarded because of the presence of a deep channel east of Balabio. Balabio has very large sedimentary terraces dominated by seagrass beds. Narrower fringing reefs and coastal barriers are found on Belep on Yandé. Yandé has a reticulated terrace on its southwest side.

Ile des Pins

Ile des Pins exhibits a large diversity of reefs, with gradients of exposure, distance to the shores and depth, with deep and shallow lagoons.
The system is dominated by two types of barrier reefs: an outer barrier reef system in the northwest (Jaré, Titia and Kuru Reefs), and two structurally contrasted coastal barrier reefs in the west and south sections. The Kangé Reef (west) has a wide shallow terrace dotted with numerous small patch and linear reefs. Large lagoonal patch reefs are found in the northwest lagoon. The vicinity of Ile des Pins includes several oceanic patch reef systems (e.g. Nokanhui, just north of the Banc de la Torche, and the Merlet reef system) as well. Finally, steep fringing slopes are on the oceanic east side.
The contrast between steep oceanic east slope and wide western terrace is an evidence of the influence of the lithospheric bulge on the island. The Pleistocene reef system was uplifted and tilted, but appears stable since 120 ka (Launay, 1985). Subsidence and uplift are in equilibrium in this part of

New Caledonia, but the subsidence dominates offshore southeastward (Cabioch *et al*., 1996). This explains the morphology of Nokanhui reefs, and the presence in this direction of a small 20 m-deep bank and then the Banc de la Torche.

Grande –Terre

The reefs surrounding Grande-Terre are the most extensive and are by far the most studied. We detail hereafter the barrier, fringing and patch reef complexes.

Barrier reefs

The outer barrier reef system is made of four different types of Millennium-type barrier reefs (regular, imbricated, coastal, multiple) (Fig. 8, plate 3/3). The barrier reef has been drilled in several locations around Grande-Terre (Fig. 3) (Cabioch *et al*., 2001, 2003). The deepest core reaches more than 220 m at Ténia (Coudray, 1976). More recently, cores were performed in Amédée Reef (south-west coast) and in Kendec reef (north-west reef) (Cabioch *et al*., 2004). Additional cores were recovered at Ténia (Cabioch *et al*., 2004). Data show that the barrier reef has been constructed layers by layers during the different episodes of reef accretion and sea level variations during Quaternary times.
Drowned terraces have been mapped all along the barrier reef slopes using multibeam data. Deep and wide marine terraces found along the slopes suggest reef flat formations (vertical catch-up growth followed by horizontal growth when sea level is reached) during high sea level stands anterior to the postglacial period (Flamand, 2006). Deepest terraces are interpreted as the oldest. Flamand (2006), in a detailed analysis of the slopes morphology, highlights five groups (T1 to T5) of few decameter width terraces. These five groups provide terraces in the -20 to -50 m, -50/-55 to -70/-75 m, -60/-70 to -85/-95 m, -95 to -105 m and -100 to -115/-120 m depth range (Fig. 9, plate 3/4). The vertical evolution of the largest terrace T3 (-60/-70 to -85/-95 m) reveals that the barrier reef is segmented, as previously observed in the fringing reefs (Cabioch, 1988), in blocks with independent vertical motions created by three groups faults striking N110°E, N-S, and N70ºE. The datation of these terraces and the correspondence with reef flat cores sequences is a work in progress that requires several hypotheses on subsidence rates, timing of high sea-levels, tectonic influences and homogeneity of reef growth rates (Flamand 2006). If the preliminary analysis is confirmed, it appears for instance that T3 was created around the marine isotopic stage 11 (~408) ka.
The modern shallow barrier reef is generally made of a high-energy outer reef flat that contrasts with a sedimentary back-reef terrace with or without presence of pinnacles on the inner slopes. This is the dominant facies of the southwest and north barrier reef. However, several reticulated terraces and basins probably from karstic origins (dissolution by aerial exposure of carbonate forms during period of low sea levels periods resulting in a rugose substrate) are adjacent to the reef flats and provide shallow segments of much higher structural complexity (for instance Tetembia, Gatope or Koumac Reefs). Variations occur along the barrier reef bounding the Grand Passage in the north which is drowned and partially imbricated, and fragmented on its eastern section. The north section of Cook Reef is fragmented, with numerous sections of subtidal reef flats. The tip of Grand Récif Sud, i.e. the most southern barrier reef, is also imbricated) and provides a specific inner-outer zonation with larger protected outer slopes. The largest extent of the south lagoon is due to faster subsidence rates. Subsidence rates in the far south is not exactly known but cores suggest a 0.14 mm.y^{-1} rate at Amédée Reef. Further south of Ile des Pins, in Nokanhui and Banc de la Torche area, subsidence rates might be higher.

The shallow central western coastal barrier reefs between Moindou and Kone are also rich in reticulated and linear intermediate formations. The absence of lagoon, and the short distance between the outer reef and the coastline in this part of New Caledonia is explained by a lowest (double) rate of subsidence (0.03 mm.y^{-1}). Slow subsidence also explains why 125 ka-Pleistocene reefs are still visible above sea level in the present days in this area (e.g. Vert Islet in Bourail: Degauge-Michalski 1993; Cabioch *et al*. 1996).

The eastern barrier reef is partly multiple (double), partly drowned. In addition, alignments of lagoonal patch reefs could be also interpreted as barrier reef formations if they were more continuous (St Laurent Reef, offshore Canala). Coudray (1976, Fig. 23) provides several explanations for the presence of intra-lagoon barrier (e.g. Bogota Reef) or multiple barrier reefs (e.g. outer barrier off Thio and Poindimié) that are parallel to the coastline. First, reef growth may occur on opposite directions due to strong hydrodynamic on both faces of the reefs. Inner spur-and-grooves systems are present on inner sides of barrier reefs offshore Port-Bouquet confirming partly this hypothesis (pers. obs.). However, due to the size of the parallel structures, other most likely scenarios present the inner reefs as older reefs. Installation of younger, outer reefs have occurred parallel to older reefs due to a combination of subsidence, sea level variations and local tectonics processes that have locally created new parallel substratum for coral colonization in a stepping stone fashion.

The south tip of the eastern barrier reef is drowned. Optical remote sensing does not provide details on these deep structures below twenty five meters, but acoustic multi-beam data allows analyzing its detailed morphology and how this part of the barrier reef as evolved under the local tectonics and morpho-structural constraints. From Ouinné Pass to La Havannah Pass, the submerged barrier reef strikes to the N150°E. The eastern barrier reef has been mapped continuously from the lagoon to the open ocean just north of La Havannah Pass and southeast of Goro. Multibeam data revealed the structure of a N150°E striking ridge between -20 m and -100 m depth called the Coëtlogon Bank (Fig. 10, plate 3/5). The western slope is wider than its eastern counterpart. Several escarpments and numerous terraces have been recognized along these slopes (Flamand, 2006). Five terraces occur on the eastern slope, and three on the west. Assuming these terraces are synchronous, this dissymmetry suggests a 5-10m-amplitude northeastward tilt of the structure (Fig. 10, plate 3/5). Even if this drowned ridge related structure has been only mapped locally, one can expect that it may extend northward.

Fringing reefs

The variety of coastal environments around Grande-Terre and Ile Ouen has provided a large number of fringing configurations. They are found in oceanic, intra-seas, lagoonal, bay and coastal barrier reef environment. High-energy fringing reefs are found on the southeast coast, exposed to the ocean. In Voh, Pam, Pouébo and La Foa they make very large low energy terraces dominated by seagrass beds and bordered by mangroves. In Néhoue Bay and Port-Bouquet Bay, satellite images reveal reticulations.

The fig. 4 summarizes the different morphologies and settlement-growth sequences observed in the various drilling sites around Grande Terre. The drilling sites around Yaté provided cores from uplifted areas. The foundation of Holocene reefs consists in 125 ka-reefs (Ricaudy Reef, near Nouméa) or non-carbonate substratum (Pouébo). The horizontal growth and type of facies (coral-coralline-sediment matrix) of the forereef depends on the degree of hydrodynamic energy of the sites (Cabioch, 1988; 2003 ; Cabioch *et al*., 1995).

Patch reefs

The patch reefs around Grande-Terre are found in oceanic, intra-seas and lagoonal environment. They vary widely in size and habitat zonations. The richest areas are the southwest lagoon, and between Ile des Pins and Grande-Terre. In the north and east lagoons, patch reefs are also abundant, especially between Kaala-Gomen and Koumac, and next to Borindy.

Patch reefs are often ellipsoids and organized as alignments parallel to barrier reefs (e.g. N130ºE directions near Noumea). However, in the south lagoon, the shapes and directions vary significantly. The subtidal topography visible in satellite images show that intertidal lagoonal path reefs are connected by large common foundations and rims. This suggests similar structures than the faroes visible in Maldives atoll lagoons, where subaerial exposure of antecedent platforms have created new karstic topography available for colonization and growth during the Holocene (Purdy & Bertram 1993). This interpretation is consistent with seismic reflection profiles collected in the south lagoon (Dugas *et al*. 1980) and with the timing of sea level variations. Sea-level variations amplitude during the last interglacial (125 ka), subsidence rates estimated in Amédée Reef and present average depth of the south lagoon (~20m) show that the submergence time of the lagoon was limited and aerial exposure frequent (Dugas *et al*., 1980, Chevillotte *et al*. 2005).

Lagoonal patch reefs have been drilled at Maitre, Larégnère and Mba islest near Nouméa. Cores performed in this reefs reveal that the modern reef (or Holocene reef) is particularly thin and cap the 125 ka reef. The old Pleistocene reefs are constituted by reefal sediments rich in molluscs, foraminifers and algae (Castellaro, 1999).

Conclusion

This review of New Caledonia reef structures is original since it comes from a unique synthesis of three different data sources. Remote sensing precisely shows, in a continuous 2D-field, the extent, diversity and complexity of reef geomorphological features. In addition, drilling and multi-beam data provide the 3D structure and help defining the dynamics of the system since the last interglacial, the time period we have considered here.

The review highlighted the high diversity of morphologies and processes that occur in New Caledonia EEZ waters. Considering the artificial nature of EEZ boundary, NC is not the most complex areas in the world in terms of reef diversity, but it is one of the most complex, and its paleodynamics is certainly one of the most studied worldwide.

Our goals were to present here the background of the rich biodiversity of New Caledonia coral reefs. We make here a first cut considering only the geomorphological units and their diversity in terms of structures and processes. But it would be necessary to also provide a description of the diversity of habitats found in the lagoons and reefs to finish the description of this background. This is a work in progress, also combining remote sensing and *in situ* data. Coral and algal communities are also an essential piece to solve the puzzle of reef formations in New Caledonia. Data on occurrences of paleo-communities, compared with modern communities, are essential for understanding the dynamics of the system. Further description of reef habitats and communities, both modern and fossil, and their comparisons are yet to be provided, but they will achieve in the future the description of the marine diversity described in this volume.

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Hydroclimatic conditions in the southwest Pacific Ocean

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Abstract

The southwest Pacific Ocean represents a unique region in the world due to the presence of the only intertropical atmospheric convergence zone in the southern hemisphere. Near the northwest boundary of Australia the effect of the monsoon regime is also felt and both the Coral and Solomon Seas are under its influence. Despite such a strong seasonal forcing the main signals at seasonal to interannual timescales are linked to the variability of the ENSO phenomenon. Since the time of the TOGA program, an observing system in the equatorial band of the Pacific Ocean has provided sufficient observations to allow models to predict ENSO events with certain accuracy and useful lead times. At longer time-scales the influence of the subtropical regions must be also considered because of their potential modulation of the equatorial mean state. Whatever their origin, extra-tropical events in the Southern Hemisphere must transit the southwest Pacific region to reach the equatorial belt. However the circulation of this region is less well understood than its northern counterpart due to its high variability in time and its strong interaction with the complex bathymetry of the region. The presence of several archipelagos represents indeed a specific feature of the southwest Pacific region. More precisely, the processes influencing the general conditions around New Caledonia, including meteorological forcing and regional ocean dynamics, are shortly presented and discussed. Finally, it is argued that ongoing efforts to enlarge the present observing strategy in the region will result in a better understanding of the variability of the southwest Pacific from large-scale ocean dynamics to small–scale near-island dynamics.

Introduction

Tropical Oceans strongly influence the Earth's climate due to their capacity to store locally and to export poleward the heat provided by the sun. Studies of several El Niño-Southern Oscillation events in the 1970s pointed out the great influence of the equatorial Pacific Ocean. It became evident that it would be necessary to monitor continuously the thermal state of the equatorial band in order to benefit from forecasts at seasonal time scales. This objective was almost achieved during the 1984-1994 decade by the international program Tropical Ocean-Global Atmosphere (TOGA). Understanding the importance of the ocean-atmosphere coupling over the Pacific in the context of short-term climate predictions enlarges our view not only toward the Atlantic and Indian tropical sectors but also toward the extratropical oceans.

This review deals with the southwest Pacific, a vast, largely oceanic, area extending from 150°E to the dateline and from 5°S to 30°S (~10 millions of km^2). Other authors have described other parts of the tropical Pacific. The hydroclimatic environment of the Tuamotu Archipelago of French Polynesia in the central Pacific has been reviewed by Rougerie & Rancher (1994). A more recent review, focusing on the eastern tropical Pacific, has been published in a special volume of Progress in Oceanography by Lavin *et al.* (2006). Here, with a much more modest ambition in mind, we propose a brief review of the hydroclimatic conditions that characterized the southwest Pacific. In the following, we do not intend to provide a full description of the whole oceanographic state; such a view is already available in general surveys published in books such as the ones by Pickard & Emery (1990) or by Tomczak & Godfrey (1994). Building on these descriptions of the mean ocean circulation the principal focus of this review is on the seasonal, interannual and longer time-scale variability of the main parameters involved in air-sea exchanges. This does not mean that we are concerned only with the ocean surface. For example, atmospheric winds drive the ocean circulation of the upper layers, typically down to depths of about 1000 m. Although there is a growing recognition of the importance of interconnections between climate variations in the southwest Pacific and parts of the globe well outside that region, we are adopting a more closely focused point of view in order to underline the major impacts, at the different scales of variability, of the atmospheric and oceanic circulations around the reef of New Caledonia.

The climate of the southwest Pacific region is controlled by its oceanic nature and large-scale extratropical atmospheric circulation features as shown in Fig. 1. These features include the trade wind regimes, the Hadley and Walker circulations, the seasonally varying tropical convergence zones, the semi-permanent subtropical high-pressure belt and the zonal westerly winds to the south. In January, the prominent feature is the trough of low pressure that extends eastward from the monsoonal low centred over northern Australia across the Pacific Ocean to a location near the equator and 170°W. In July, in contrast to January, there is a high pressure dome located over southern Australia. Following the strict definition of a monsoon regime (i.e., a 180° reversal in the wind direction), only the northern part of the present region of interest is under the influence of such a regime. However, the effect of the Australian summer low is felt west of 170°W throughout the Vanuatu archipelago and the northern part of New Caledonia. Another very important feature of the atmospheric circulation in this region is the South Pacific Convergence Zone (SPCZ) that extends from east of Papua New Guinea southeastward toward 120°W, 30°S. The SPCZ maintains one of the most expansive and persistent cloud bands on earth and plays a major role in the crossequatorial flow. Interactions between the SPCZ and the other locations occur on a variety of timescales from synoptic to interannual as reviewed by Vincent (1994). In the annual mean, the signature of the SPCZ must be seen not as a wind speed minimum but more as a convergence in wind direction. Completely calm conditions are encountered during not more than 30% of the time during the course of the year (Tomczak & Godfrey, 1994). South of 30°S the atmospheric circulation is characterized by the presence of an anticyclonic belt associated with the high pressure of the Kermadec islands.

The present paper is organized as follows. Section 2 reviews the climate conditions of the southwest Pacific region at timescales ranging from seasonal to long-term variations and trends. A brief summary of the meteorological impacts around New Caledonia is also included. Section 3 addresses more specifically the ocean circulation at both large and regional scales and concludes with a closer look at the circulation around New Caledonia. Some points on the ongoing activities from a physical oceanographic point of view within the southwest Pacific region are discussed in the last section.

Climate variability

Seasonal and interannual variations

Within the equatorial region, seasonal and interannual variations of the fundamental parameters involved in climate (including the surface wind stress, the sea surface temperature, rainfalls, solar radiation and turbulent heat fluxes) have been studied with the focus of understanding and forecasting the ENSO phenomenon (e.g., Delcroix, 1998). The southwest Pacific Ocean lies, however, in a transition zone between the equatorial band and the extra-tropical region. Using repeated tracks between New Zealand and Hawaii, Morris *et al.* (1996) documented the variability of the subtropical gyre in the southwest Pacific Ocean. Proceeding southward from 10°S the most important feature is the spreading and outcropping of the thermocline around the mean position of the 20°C isotherm that is located around 200 m near 18°S. At these extratropical latitudes, the thermocline exhibits some seasonal variations that are mainly confined to the upper 100 m column (Delcroix & Hénin, 1989). The most important seasonal variability in the regional ocean dynamics is linked to the displacement of the SPCZ which is more active in southern summer than at other periods of the year. The amplitude of the interannual signal is an order of magnitude less than the amplitude of the seasonal signal for SST and precipitation, whereas it is twice the amplitude of the seasonal signal for sea surface salinity (Gouriou & Delcroix, 2002).

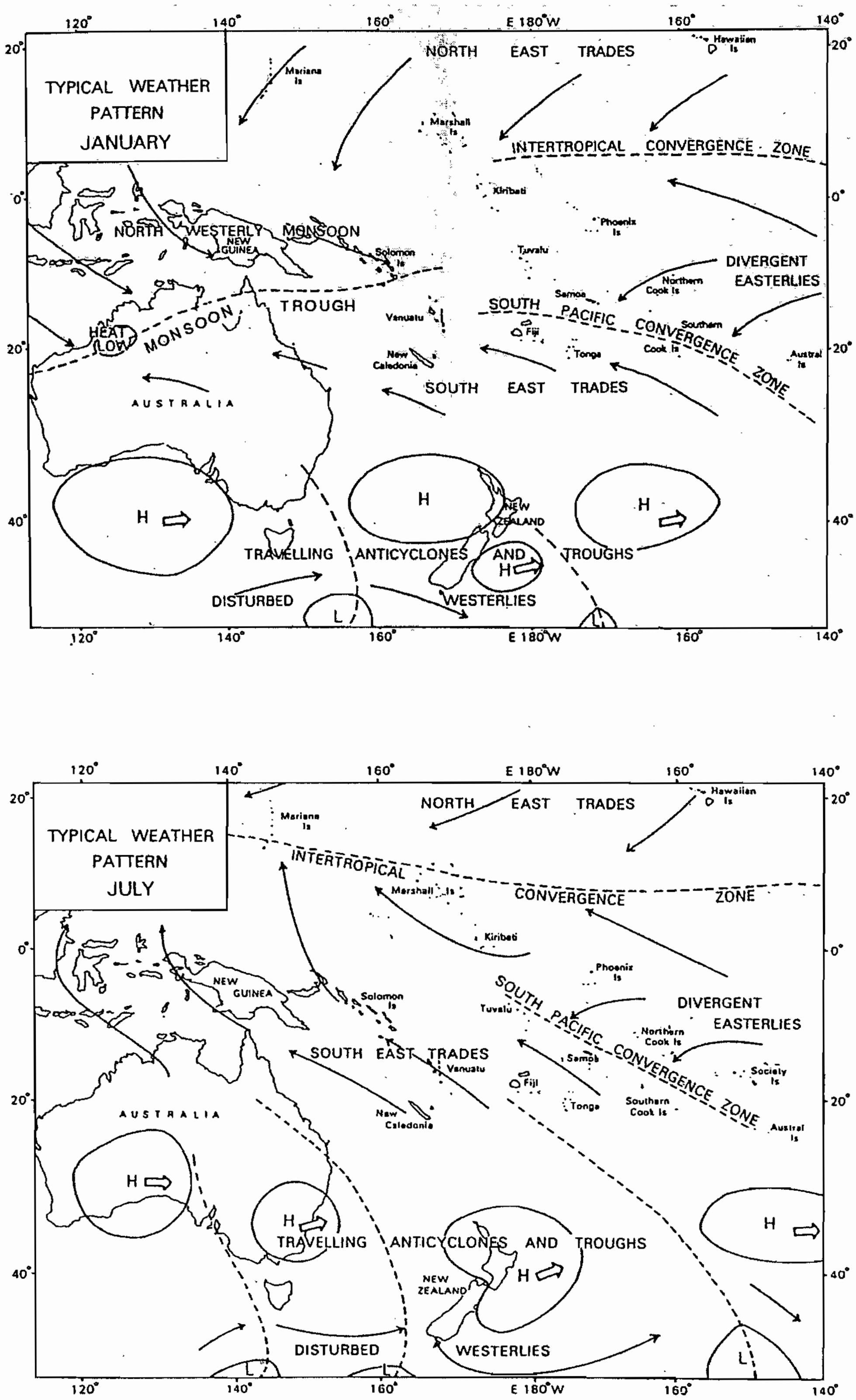

Figure 1. The southwest Pacific hydroclimatic conditions showing the main features of the seasonal atmospheric circulation in the region (extracted from Salinger *et al.*, 1995). In addition of the main pressure highs, the seasonal positions of the atmospheric convergence zones are represented by dashed lines. The figures are representatives for mean conditions in January (top) and in July (bottom).

In the western Pacific Ocean, the interannual variations are usually connected to the appearance of the El Niño phenomenon and, consequently, to the Southern Oscillation. Both processes are closely linked and could be indexed by the SST anomaly in the eastern equatorial Pacific and/or the atmospheric pressure difference between Tahiti and Darwin. There have been many attempts to list El Niño and La Niña years going back to the seminal papers by Quinn *et al.* (1987). The most recognized version using modern observations is described by Trenberth (1997). Classifying the years in terms of ENSO conditions is not a simple problem (Hanley *et al.*, 2003). In the last decade, several processes have been proposed to explain the observed variability in ENSO, ranging from the importance of high frequency disturbances to decadal variations and global warming (Federov & Philander, 2000). Another example of such difficulties, as applied to the southwest Pacific, is illustrated by the conjoint influence of the Indian Ocean Dipole (Saji *et al.*, 1999), IOD hereafter, with ENSO. Using a statistical approach Meyers *et al.* (2006) have recently shown that most of the El Niño years could be associated with a positive Indian dipole, and conversely, most of the La Niña years with a negative dipole (Table 1). Nevertheless, caution is required when multiyear data sets collected in a regional context are to be analyzed in terms of climate variability. For instance, composite maps of SST around New Caledonia averaged for June to November and calculated for the categories of pure IOD (no event in the Pacific Ocean) and of pure ENSO events (no event in the Indian Ocean) are shown in Fig. 2 (plate 4/1. Despite lower amplitude for the first category, the region is characterized by negative anomalies in SST that have resulted from two distinct type of remote variability. If the climatic consequences over New Caledonia during El Niño years are relatively well known (see below) the specific impacts of the pure IOD variability on global rainfall patterns and local climate remain to be explored.

Table 1. Classification of years when El Niño or La Niña and/or positive or negative Indian Ocean Dipole occurred. Bold print (normal print) indicates a higher (lower) level of certainty in the classification as discussed by Meyers *et al.* (2006). The top three boxes show all the El Niño years and when they occur with negative, positive, or no IOD-event. And so forth for the other rows. This classification shows that an approximately equal number of positive IOD events occurred during an El Niño event as without. Note also that a positive dipole with La Niña event never occurred, and a negative dipole with El Niño occurred only once.

	NEGATIVE IOD	NO EVENT	POSITIVE IOD
EL NINO	**1930** **1914** 1918 1925 **1940** 1941 **1965 1986 1987**	**1877 1888 1899 1911** 1957 **1963 1972 1982** **1991 1997**	**1896 1902 1905 1923**
NO EVENT	**1880** 1956 **1958 1968 1974** **1980 1985 1989 1992**	1881 **1882 1883 1884** **1890 1895 1898** 1900 **1901 1904 1907 1908** **1912** 1913 1915 1920 **1921 1927 1929** 1931 **1932 1934 1936 1937** **1939 1943 1947 1948** 1951 1952 **1953** 1959 1960 **1962 1966 1969** 1971 **1976 1979 1990** 1993 **1995**	**1885 1887 1891 1894** **1919 1926 1935 1944** **1945 1946 1961 1967** 1977 **1983** 1994
LA NINA	**1906 1909 1910** 1916 **1917 1928 1933 1942** **1950 1975** 1981	**1878** 1879 1886 1889 **1892 1893 1897 1903** 1922 1924 **1938 1949** 1954 1955 **1964** 1970 **1973** 1978 1984 **1988** 1996 1998	

Long term changes and global warming trends

Connections between the tropical and subtropical oceans through the wind-driven meridional overturning ocean circulation are believed to be of primary importance for decadal and longer temperature fluctuations in the Pacific Ocean (McPhaden & Zhang, 2002). Due to the north-south asymmetry in the amount of available data, most of the analyses of historical observations have focused on the North Pacific where this variability is called the Pacific Decadal Oscillation (Mantua *et al.*, 1997). In the South Pacific, this variability is known as the Interdecadal Pacific Oscillation (IPO) and is characterized by low frequency fluctuations with ~15- to ~30-year time-scales. During the 20th century three phases of the IPO have been identified: a positive phase (1922-1944), a negative phase (1946-1977) and another positive phase (1978-1998). Spatial patterns of these decadal trends are strongly affected by the SPCZ, especially the changes in the mid 1970s (Salinger *et al.*, 1995, 2001). According to Folland *et al.* (2002), the shifts in the position of the SPCZ are related to ENSO variability on interannual time-scales and to the IPO variability on decadal time-scales. The variations at the two time-scales appear to be of similar magnitude and are linearly independent. However, the physical processes implied in these different fluctuations are still the objects of an open debate as reviewed by Wang & Picaut (2002) that depends in part on the tropical or extratropical origin of the particular phenomenon. Among the different theories, the importance of the South Pacific in sustaining tropical decadal variability through the atmospheric circulation has been especially emphasised by Luo & Yamagata (2001). More recently, an increase at decadal time-scales in the circulation of the subtropical gyre, extending from the sea surface to mid-depth, has been described through direct observations by Roemmich *et al.* (2006).

Superimposed on the decadal variability that may be inferred from modern observations there is an acceleration of the warming trend over the last 50 years as illustrated for the ocean surface in Fig. 3; in the deep ocean such a warming tendency is also described by Bindoff & Church (1992). These climatic changes and their future projections over the next 50 years are very important to consider for coral reefs (Hughes *et al.*, 2003). Although it may be tempting to link this warming to the enhanced greenhouse effect (Barnett *et al.*, 2005), the response of the entire Pacific to El Niño - or La Nina-like conditions remains uncertain (Collins, 2005). Coupled models as well as historical reconstructions based on sparse observations such as those most often used for the SST field (e.g., Kaplan *et al.*, 1998) have their own flaws and caution is required in using them as evidence of the present climate variability. Similar conclusions have been drawn from the different paleoclimate proxies that describe the variability during the last millennia. A great advantage of these last data is that they facilitate separating the natural from the anthropogenic effects (Cobb *et al.*, 2003; Corrège *et al.*, 2004). Recently, Linsley *et al.* (2006) reported that expansion of the SPCZ implies a gradual change in the South Pacific to more La Niña-like conditions in the long term mean.

Sea level tendencies suffer from the same uncertainties as the surface temperature variations with regard to the possible influence of decadal fluctuations (e.g., Cazenave & Nerem, 2004). A recent detailed analysis of the sea-level rise at tropical Pacific and Indian Ocean islands may be found in Church *et al.* (2006). If there is some evidence that the sea level rise observed over the last decade is largely due to thermal expansion (Lombard *et al.*, 2005; Ishii *et al.*, 2006), present estimates are still sufficiently uncertain to exclude some contributions from other sources.

Meteorological impacts around New Caledonia

The manifestations of ENSO changes in the atmospheric circulation are felt throughout the tropics and the global atmosphere via the so-called teleconnections. The links between ENSO and large scale precipitation patterns have been thoroughly explored beginning with the pioneering work by Sir Gilbert Walker in the 1920s. In more recent studies, these relationships have been studied using data from meteorological stations (Ropelewski & Halpert, 1987) or a combination of *in situ* observations and satellite products (Dai & Wigley, 2000). A schematic diagram illustrating the underlying processes associated with the atmospheric bridge linking tropical SST anomalies to changes in the extra-

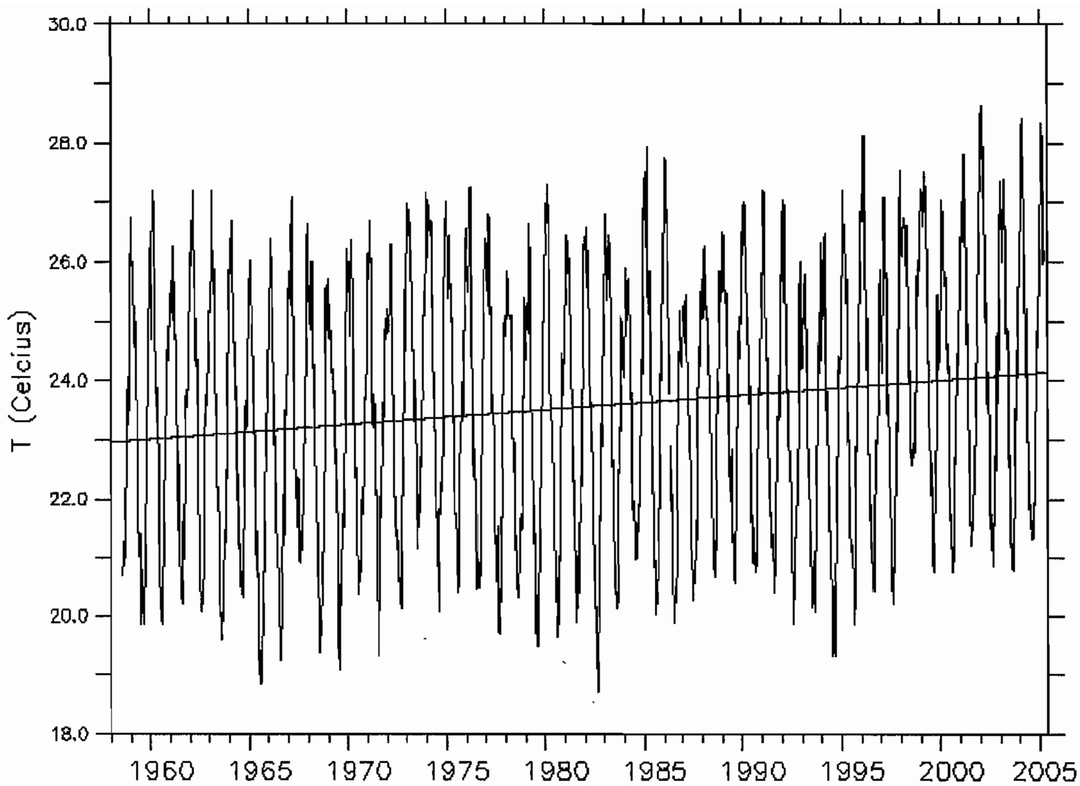

Figure 3. Timeseries of the sea surface temperature observed at the Anse Vata Bay in Nouméa, New Caledonia (IRD data source). A linear trend has been superimposed that roughly correspond to a warming of 2°C per century.

tropical oceans is discussed with some details by Trenberth *et al.* (1998). More specifically, the signature of El Niño events in the oceanic region around New Caledonia is characterized by cold temperature anomalies over the top 50 m (Delcroix & Lenormand, 1997), by a 20-50% decrease in precipitation (Nicet & Delcroix, 2000) associated with saltier-than-averaged anomalies in sea surface salinity. The latter effects result mainly from the equatorward displacement of the SPCZ in response to ENSO anomalies in the eastern Pacific. This relationship suggests that there is a potential for useful rainfall predictions over New Caledonia (Fischer *et al.*, 2004). Conversely, the signature of La Niña events is characterised by anomalies of same amplitude but of opposite sign. Some other examples of the ENSO signature within the Caledonian lagoon are analyzed by Ouillon *et al.* (2005). These different studies appear to be consistent with the robust relationship between El Niño strength and the spatial extent of droughts established by Lyon (2004).

Atmospheric and oceanic conditions in the southwest Pacific are nearly always favourable for intense tropical cyclone activity. Consequently, the relationship between ENSO and enhanced cyclone activity is weak, although the primary influence on tropical cyclone incidence has been associated with local SST conditions (Basher & Zheng, 1995). This point is also illustrated by the 2002-03 cyclone season that had a below average number of tropical cyclones just below the average and a shift toward the east of the activity, both points that are consistent and an eastward shift in the center of the cyclone activity, both points that are consistent with the prevailing moderate warm ENSO conditions (Courtney, 2005). A summary of each cyclonic season as well as climatic surveys of the South-west Pacific islands are available from the Island Climatic Update (www.niwascience.co.nz/ncc/icu/).

Regional ocean circulation

The equatorial band received most of the attention during the TOGA program, but more recently, attention has shifted to the southwest Pacific where the circulation represents a major pathway for water masses arriving in the equatorial band from the subtropics (Tsuchiya *et al.*, 1989; Fine *et al.*, 1994). The properties of these water masses have the potential to modulate the ENSO variability at decadal time scales (Gu & Philander, 1997). In addition to these climatic objectives there is an increasing interest in regional and coastal ocean circulation studies in response to societal demands.

Open ocean circulation of the southwest Pacific

An overview of the total geostrophic circulation of the Pacific Ocean from the surface to abyssal depths is reported by Reid (1997). A closer examination of geostrophic circulation patterns near the western boundary of the South Pacific is presented by Sokolov & Rintoul (2000). Only the upper part of the ocean under the influence of the wind and the subtropical southwest part of the basin will be considered here. The most prominent feature of the ocean circulation in the South Pacific is the subtropical gyre, consisting of the South Equatorial Current (SEC) at around 15°S, the East Australian Current, and the eastward return current and the Peru/Chile current in the eastern Pacific Ocean. Gouriou & Toole (1993) estimate the total transport of the SEC at 165°E as 25 to 41 Sv (1 Sv= 10^6 m^3/s) between 15°S and 3°N. Using indirect computations based on the thermal structure observed by XBT casts, Donguy & Meyers (1996) find a similar transport of 20 Sv that is confined to the top 400 db layer and is characterized by a weak seasonal variability. However, the traditional view of the SEC as a broad westward flow begins to break down with the advent of high resolution modelling studies (Webb, 2000). The presence of a shallow and complex topography associated with islands and reefs is conducive to the formation of narrow zonal jets at the southern and northern tips of the larger islands such as Fiji, Vanuatu and New Caledonia. Recent direct observations of these jets using an autonomous buoyancy-driven underwater glider reveal a narrower and more vigorous North Caledonian Jet (Fig. 4, plate 4/2) than was previously imagined, but whose characteristics are otherwise poorly understood. A more careful consideration of the influence of the topography in updated analyses based on historical hydrographic data sets has led to the recognition of these zonal structures in the ocean circulation of the southwest Pacific (Qu & Lindstrom, 2002; Ridgway & Dunn, 2003). The extension of such studies with numerical models has allowed a more complete explanation of dynamical processes such as the bifurcation of the SEC near the Great Barrier Reef (Kessler & Gourdeau, 2006b) and the nature of the zonal jets (Richards *et al.*, 2006; Kessler and Gourdeau, 2006a). Complementary studies on the variability of the surface circulation that may be deduced through satellite products such as sea level anomalies investigate the physical mechanisms at work at the scale of the entire Pacific basin (Qiu & Chen, 2004; Maharaj *et al.*, 2005). At depth, preliminary results from direct observations based on autonomous floats reveal a higher level of energy in the mean currents as compared to currents deduced from hydrological climatologies (Davis, 1998).

Upwelling and ocean dynamics around New Caledonia

In the ocean, upwelling represents a very important process that plays a major role in oceanic productivity. The equatorial upwelling represents the largest contribution by volume to the total global upwelled waters (Reverdin, 1995) but regions of coastal upwellings are also very important to consider. Near the main island of New Caledonia, trade winds are persistently favorable to upwelling because of their alignment with the coastline of the western barrier reef. It is quite surprising, however, that this process had not received much attention until only recently, in particular by Henin & Cresswell (2005). These authors describe strong seasonal wind-driven upwelling events that appear in SST and ocean colour satellite images. From a dynamical point of view, upwelling processes observed off New Caledonia are as intense as the events observed on the eastern boundary of ocean basins. The events are mostly located along the southern half of the western barrier reef, although they can occasionally extend to the north of the island. The strong seasonality of the upwelling has been related to the seasonal variability of the mixed layer depth and thermocline by Alory *et al.* (2006). The biological consequences of upwelling remains uncertain and to address further the upwelling-driven nutrient enrichment more observations and studies of the vertical reach of the upwelling cell and the vertical structure of the temperature and nutrient fields are required. An important aspect of the upwelling along New Caledonia is the strong interaction with the surrounding circulation related to the island wake effect. However, careful consideration must also be given to the processes that interfere in such relationships (Le Borgne *et al.,* 1985; Martinez & Maamaatuaiahutapu, 2004). Numerical simulations based on regional models show that the island effect controls the offshore extension of filaments and limits the spatial extention of the events to the southwest coast (Fig. 5, plate 4/1).

These recent studies emphasize the importance of satellite observations for investigating the variability at the ocean surface. In addition to upwelling, satellite-derived SST could be used to study variations in diurnal warming. For example, Stuart-Menteth *et al.* (2003) show that large regions in the tropics and midlatitudes are frequently characterized by a diurnal warming that is dictated by a combination of the wind and the solar insolation. The largest diurnal amplitude in SST is observed all around New Caledonia in December of each year, but a contrast between the eastern and western coasts exists in the duration of such warming as shown in Fig. 6 (plate 4/2). Such diurnal effects are important to consider, for example, in the computation of air-sea heat exchanges and air-sea gas fluxes. Another important variable that may be deduced from several satellite-derived observations are the surface currents following an approach similar to Lagerloef *et al.* (1999). An example of the surface ocean circulation that may be derived from wind stress and sea surface height observed from space is given in Fig. 7 (plate 4/3). Snapshots such as these mainly reveal cyclonic and anticyclonic eddies that are in quasi geostrophic equilibrium with the mass field. Across the domain, the mesoscale eddy activity appears stronger and more persistent south of 20°S. More detailed studies based on combined altimetry and currents are required to identify the north-south heat transport of such eddies activity following the methodology proposed by Morrow *et al.* (2004). Another application of such products for biological studies is illustrated by Girard *et al.* (2006). Finally, it should be noted that the spatial extension of these currents from the open ocean toward the coast is currently under investigation.

Perspectives and ongoing activities

A growing interest in the western tropical Pacific as a focal point for understanding the dynamics of low frequency modulation of the equatorial band and of the associated ENSO phenomena, has spurred research into the ocean circulation in the southwest Pacific as part of the subtropical-tropical interaction. A careful consideration of the complex topography of the region leads to a description of a more complex relationship between the subtropical gyre of the South Pacific and its exchanges with the equatorial and high-latitude oceans. However, there are many issues that are still under debate regarding, for example, long term changes and these need to be further investigated. In order to increase our knowledge, and potentially to improve our ability to predict such changes, an international research program called South PacIfic Ocean Circulation Experiment, SPICE, at the horizon of the 2008-2010 time period is presently underway (www.ird.nc/UR65/SPICE/). The ambition of this project is to encompass all the components from the large-scale of the southwest Pacific down to the island coastal dynamics.

To understand the ocean dynamics and its role in climate, weather and ocean atmosphere interactions, observations on a basin-wide scale with adequate time and space resolution are required. The combined use of satellite-derived and *in situ* observations will provide some answers and will allow, in addition, a focus on more regional and coastal scales. The ongoing studies devoted to the upwelling and the island wake effect along the coasts of New Caledonia represent two good examples. Two other areas of high potential are observations of large scale ocean circulation and water masses from autonomous floats deployed in the context of the Argo program (www.argo.ucsd.edu) and ocean state estimates based on numerical models devoted to operational applications. Both programs are part of the French national effort in the context of the Coriolis and Mercator projects (www.coriolis.eu.org/; www.mercator-ocean.fr/), respectively. A similar synergy occurs in the operational ocean prediction systems that have been developed in Australia around the Bluelink project (www.marine.csiro.au/bluelink/). The synergy that will arise from these different but complementary efforts will certainly result in the progress of our understanding of the southwest Pacific Ocean.

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The flora of the neo-caledonian mangrove swamps

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Important mangal[1] surfaces along the shore of Pouébo were observed by two german naturalists, Johann Reinhold Forster and Georg Forster (Forster, 1786), during James Cooks visit of the North-East coast of the Grande-Terre aboard HMS Resolution's in 1774. Archaeological findings at Tiouandé (Sand, 2001) to the south suggest that these mangals have been used by autochthonous populations for the past 3000 years.

Multiple uses of mangroves were listed: fire wood, timber, medicine, and food (Virot, 1956; Rollet, 1975). For example, generations of oral tradition indicate that young plantlets of Rhizophoraceae were used as food during times of scarcity

Mangroves received little attention from the early botanists who investigated the Territory after preliminary inventories. One reason is probably the higher interest of other habitats, such as *maquis minier* (a characteristic low, sclerophyllous, evergreen, heath-like formation, largely restricted to ultramafic substrates at various altitudes on Grande Terre (Lowry, 1998)) or rain forest. Both habitats possess a very high endemism, respectively ca. 89% and 82%, and a very rich flora, respectively ca. 1 144 and 2 013 species (Jaffré *et al.*, 2001; Lowry *et al.*, 2004).

Rhizophora lamarckii Montrouz. was considered for a long time to be endemic to the North-East of the main island, which would have been exceptional for a mangrove. However, the distribution of this species is now also known to include the Queensland, the Solomon Islands and Papua-New Guinea.

The first botanical inventories were done during the 19th century and more recently by a geochemist, Frédéric Baltzer (1965 and 1969), who studied the coastal swamps of the Dumbéa river estuary and the Teremba peninsula, on the west coast of the main island. An important step was the worldwide treatment of P. B. Tomlinson (1986), who provided a list of the mangroves of New Caledonia.

Some taxonomic questions appear to be still open, for example, only *Avicennia marina* var. *resinifera* (Forst.) Bakh. is reported by Tomlinson in New Caledonia, writing that one of the distinguishable character of this variety is « *the ovary hairy only in the upper half* ». This appears surprising as several specimens in NOU show a completely hairy ovary and fruits (these specimens were identified as *A. eucalyptifolia* by some collectors). Tomlinson specifies « the uncertainty of these designations {c.i.e. *A. marina* varieties} and suggested the inclusion of New Caledonia in the range of both the typical form and var. *resinifera*».

Xylocarpus moluccensis M. Roem. is recorded in New Caledonia by Ellison (1995: 70). However, the author doesn't cite any reference for this, and no material of that species is identified in NOU, this record remains doubtful.

The question of the *Suaeda* species is also of interest. All the material identified in NOU is under *S. australis* Mor. This latest would be the synonym of *Suaeda maritima* (L.) Dumort., a name found in the checklist of the native flora of New Caledonia (Jaffré *et al.*, 2001). But *Suaeda australis* is considered as a weed in the "*Global Compendium of Weeds*" (http://www.hear.org/gcw). Thus, the native status of this species might be questionable. In any case, the lack of a good revision of the New Caledonian Chenopodiaceae appears crucial.

Only two species of *Sonneratia* are supposed to occur in New Caledonia, *S. alba* and *S. caseolaris*. These species are known to hybrid in Australia (Hewson, 1990). The hybrid is described as *Sonneratia* X *gulngai* N. Duke. No report of this taxa exists in New Caledonia but research in areas where both species exist might reveal its presence.

The number of mangrove species in New Caledonia varies between M. Schmid (1981) estimations « *ca. fifteen species of trees or shrubs* », and Ellison (1995) who indicated 16 species. But the definition of mangroves is always questionable. The genera *Rhizophora, Bruguiera, Ceriops, Avicennia, Sonneratia, Lumnitzera* are definitively restricted to coastal tropical swamps[2], contrarily to others genera such *Xylocarpus* and *Acanthus* which are not. However, the species *Xylocarpus granatum* and *Acanthus ilicifolius* must be considered as associated to the slightly salted areas of the mangals.

P.B. Tomlinson, like many other botanists, classifies *Excoecaria agallocha* and *Heritiera littoralis* as mangroves, though this should be reviewed. *Excoecaria agallocha* appears to have its optimal ecology on the littoral while *Heritiera littoralis* colonizes the slopes and river banks in some tropical regions, sometimes fairly inland as in Seychelles Islands where the tree is found one kilometre from the sea. Some individuals even grow on rocks (Friedmann, 1994). The remaining species occur in the mangal undergrowth, on salt marshes or *tannes*[3] and in swampy grassland and forests at the rear of mangals. More species are found in these areas, in particular if epiphytes, bacteria, seaweed and fungi are included.

Based on Ellison (1995) list of mangrove species, New Caledonia would be the third richest pacific island (excluding Australia) for mangrove species with 17 taxa, after Papua New Guinea (35 spp.) and Salomon Islands (22 spp.) if we exclude *Xylocarpus moluccensis* and add *Sonneratia caseolaris* along with *Lumnitzera littorea*,

The salt pans support numerous small halophytes and tall herbaceaous non ligneous succulents. The Chenopodiaceae family is well represented, as well as many grasses (Poaceae) and the Aizoaceae *Sesuvium portulacastrum*.

Acrostichum aureum ferns and several Cyperaceae dominate the undergrowth of mangals and swampy grassland. Niaouli (*Melaleuca quinquenervia*, Myrtaceae) are found in swampy forests, sometimes among mangroves on unsalted or poorly salted substrate. All these species were noted on previous reports and are not endemics.

New Caledonian mangals have been mainly impacted by urbanisation. This impact is the product of a negative image people have of mangals as well as speculation associated with property development. The conversion of mangrove swamps through land reclamation into residential and industrial settlements is an established reality in Nouméa, notably at Doniambo. Furthermore, invasive species such as *Bryophyllum pinnatum* (Lam.) Kurtz. (Crassulaceae), *Schinus terebinthifolius* Raddi (Anacardiaceae) and *Pluchea odorata* (L.) Cass. (Asteraceae) have established inner areas of the swamps. In recent years, aquaculture prawn farms established behind the mangals have increased the area of salt marsh. The main mangal areas (27 000 ha) using for crab fishing *Scylla serrata* by villagers are relatively undisturbed despite scattered garbage dumps. Nickel mining is more responsible for mangal expansion through sedimentary build up than lethal pollution. Environmental awareness of mangals has been on the increase in recent years, in particular among the young people. No reserve actually includes mangals, despite remarkable sites such the Rivière Salée mangal in Nouméa. This mangal should be protected and fitted out as an educational and resting area.

The following list is a compilation of material deposited at IRD's centre herbarium (NOU) in Nouméa and / or given in bibliographic references. Species were retained when collectors wrote the plant to be collected in a mangal or behind mangal swamps. It is also based on personal observations of the authors. More investigations, at the territory scale, might add taxa in this kind of vegetation.

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[1] We use the word "mangal" to designate the mangrove vegetation (Saenger *et al.*, 1977), "mangrove" attributed to the trees living in the mangal.

[2] The coastal swamps are areas of loose sediments subjected to the oscillation of tides, drained by channels of tides. Under tropics, these swamps are partially colonized by mangals.

[3] "*tanne*" are bare areas or areas covered in an often intermittent way with halophytes of small size which occur at the back of the mangrove swamp or include within it. They formed at the cost of this last one and are subjected to negative or positive drives governed by the climatic, sedimentary and maritime level fluctuations.

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List of plant sorted by family

ACANTHACEAE

Acanthus ilicifolius L. *Schmid 1970*, Dumbéa, 15/03/1967 (NOU); det.: H. Heine, in herb., 24/07/1984 and Heine, 1976, *Fl. Nouv.-Cal. & Dép.* **7**: 8.

ADIANTACEAE

Acrostichum aureum L. *Blanchon 1526*, Ouvéa, 24/03/1965 (NOU); det.: G. Brownlie, in herb., sept. 1965 and Brownlie, 1969, *Fl. Nouv.-Cal. & Dép.* **3**: 158.

AIZOACEAE

Sesuvium portulacastrum L. *Hoff 48*, Teremba, 31/01/1979 (NOU); without determinavit.

APOCYNACEAE

Melodinus scandens J.R.Forst. & G.Forst. *Hoff 41*, Moindou: Teremba, arrière mangrove, 31/01/1979 (NOU); without determinavit.

AVICENNIACEAE

Avicennia marina (Forsk.) Vierh. var. *resinifera* Fide Tomlinson (1986) the only taxa in New Caledonia, but he didn't annotated any specimen in NOU. *Webster 19310*, Oundjo, 14/12/1973 (NOU), det. as *A. officinalis* L. by G. Webster, in herb., 1973. MacKee 35723, Oubatche, 14/09/1978 (NOU); det as *A. eucalyptifolia* Zipp. ex Moldenke by J.-M. Veillon, in herb., 21/5/1980.

BIGNONIACEAE

Dolichandrone spathacea K.Schum. *Suprin 511*, Houailou, arbre d'arrière mangrove, 26/02/1980 (NOU); without determinavit.

CASUARINACEAE

Casuarina equisetifolia L. *Veillon 20,* Anse Vata, 7/01/1965 (NOU); without determinavit.

CHENOPODIACEAE

Atriplex jubata S.Moore *MacKee 32911*, Népoui: presqu'île Pindian, 10/03/1977 (NOU); without determinavit.

Kochia hirsuta L. *Virot 972,* Isle des Pins, 3/03/1943 (NOU); without determinavit.

Salsola kali L. *MacKee 21690,* Tontouta: Tonghouin, mars 1970 (NOU); without determinavit.

Sarcocornia quinqueflora (Bunge ex Ung.-Sternb.) A.J.Scott Syn.: *Salicornia australis* Benth

Schmid 2300, Ouvéa, Baie de Lekin, 01/09/1967 (NOU); as *Salicornia australis*, without determina vit; also cited by Baltzer, 1969, *Cah. ORSTOM, sér. Géol.* **1:** 59.

Suaeda maritima (L.) Dumort Syn.: *Suaeda australis* Mor. *Schmid 2300*, Ouvéa, baie de Lékin, 1/09/1967 (NOU), as *S. australis*, without determinavit. No species identification of *S. maritima* in herb. The name is given in Jaffré & al., 2004, IRD: Doc. Sci. & Tech. **II4**: 58.

COMBRETACEAE

Lumnitzera littorea (Jack) Voigt *Veillon 530,* Riv. Ouinnée en arrière mangrove, 25/11/1965 (NOU); without determinavit.

Lumnitzera racemosa Willd. *Munzinger & Jourdan 2668*, Gadji, 23/02/2005 (NOU); det.: J. Munzinger, in herb., also cited by Baltzer, 1969, *Cah. ORSTOM, sér. Géol.* **1:** 59.

CYPERACEAE

Baumea juncea (R.Br.) Palla *Musselman 5340*, baie des Pirogues, 23/05/1977 (NOU); det.: K. Wilson, in herb., 23/3/1987.

Fimbristylis cymosa R. Br. *MacKee 25449*, Maré, 04/5/1972 (NOU); det.: J. Raynal, in herb., 18/01/1972.

Fimbristylis ferruginea Vahl *Veillon 93*, Saint Louis, 2/4/1965 (NOU); det.: J. Raynal, in herb., 1/12/1972.

Fimbristylis polytrichoides (Retz.) R.Br. *MacKee 24746,* Embouchure de la Tontouta, 25/12/1971 (NOU); det.: J. Raynal, in herb., 18/10/1972.

Mariscus javanicus (Houtt.) Merr. *MacKee 26114*, Néhoué, déc. 1972 (NOU); det.: J. Raynal, in herb., 2/05/1974.

Rhynchospora corymbosa (L.) Britt. *Blanchon 1618*, Nakety, 25/11/1965 (NOU); det.: J. Raynal, in herb., 1/12/1972.

Schoenoplectus littoralis subsp. *littoralis* (Trab.) S.S.Hooper, Syn.: *Scirpus subulatus* Vahl *Schmid 3417*, Nouméa, 19/09/1970 (NOU); det.: J. Raynal, in herb., 1/12/1972 (*Scirpus subulatus* Vahl).
Schoenoplectus mucronatus (L.) Palla Syn.: *Scirpus mucronatus* L. *MacKee 24417*, Basse Tipindjé, 9/10/1971 (NOU); det.: J. Raynal, in herb., 18/10/1972 (*Scirpus mucronatus* L.).

Schoenoplectus validus (Vahl) AZ.D.Löve *MacKee (leg. Cherrier) 44564*, Nakéty, 29/08/1989 (NOU); without determinavit.

EUPHORBIACEAE

Excoecaria agallocha L. *Hoff 967*, Moindou, 15/06/1979 (NOU); det.: G. McPherson, in herb., 1987 and McPherson & Tirel, 1987, *Fl. Nouv.-Cal. & Dép.* **14***:* 32.

JUNCAGINACEAE

Triglochin striatum Ruiz & Pavon *MacKee 24256,* Koutio-Kouéta, 25/09/1971 (NOU), no species identification in herb. *Triglochin striatum* name is given in Jaffré & al., 2004, IRD: Doc. Sci. & Tech. **II4**: 46.

MALVACEAE

Hibiscus tiliaceus L. *Hoff 2253*, Port Boisé, 6/10/1980 (NOU); without determinavit. *Thespesia populnea* (L.) Sol. *MacKee 16899*, Néhoué, 18/06/1967 (NOU); det.: P.S. Green, in herb., 12/04/1977.

MELIACEAE

Xylocarpus granatum Koenig *Veillon 4795*, Neuménie, 18/12/1981 (NOU); det.: D. Mabberley, in herb., 16/09/1984 and Mabberley, 1988, *Fl. Nouv.-Cal. & Dép.* **15** : 82.

Xylocarpus moluccensis M.Roem. No specimen identified in NOU, but the species would be in New Caledonia fide Ellison (1995).

MORACEAE

Malaisia scandens (Lour.) Planch. *Webster 19311*, Oundjo, in trees behind mangrove, 14/12/1973 (NOU); det.: G.L. Webster in herb. (as *M. tortuosa* Blanco).

MYOPORACEAE

Myoporum tenuifolium G.Forst. *Hoff 902,* Nouméa, baie Tina, arrière mangrove, 18/05/1979 (NOU); det.: B. Chinnock in herb. 23/11/1987.

MYRTACEAE

Melaleuca quinquinervia Blake Dawson, 1992, *Fl. Nouv.-Cal. & Dép.* **18**: 217.

OLACACEAE

Ximenia americana L. *Musselman 5341,* Riv. des Pirogues in higher portions of Mangrove swamps, 23/05/1977 (NOU); without determinavit.

PLUMBAGINACEAE

Limonium tetragonum (Thunb.) Bullock *MacKee 14051,* Ile des Pins, Baie de Gadji, marais saumâtre, 17/12/1965 (NOU); det.: J. R. Edmondson in herb. and 1983, *Fl. Nouv.-Cal. & Dép.* **12**: 135.

PANDANACEAE

Pandanus tectorius Parkinson *Veillon 866,* Port Bouquet, 17/08/1966 (NOU); det.: B.C. Stone, in herb., 1981.

PAPILIONACEAE

Cynometra iripa Kostel. *Veillon 3143,* Embouchure de la Tiwaka, arrière mangrove, sept. 1974 (NOU); without determinavit.

Dalbergia candenatensis (Dennst.) Prain *Schmid 3448,* Pouébo, lisière de mangrove, 19/10/1970 (NOU); without determinavit.

Derris trifoliata Lour. *MacKee 39774,* Poya, 20/10/1981 (NOU); det.: I. Nielsen, in herb., 28/01/1988.

POACEAE

Cynodon dactylon (L.) Pers. *Toutain 3646,* Lifou, 06/09/1982 (NOU); det.: Ph. Morat, in herb., 03/1985.

Sporobolus virginicus (L.) Kunth *Suprin 2429,* Ilot Bailly, 28/07/1994 (NOU); det.: Ph. Morat, in herb., 04/05/1998.

RHAMNACEAE

Colubrina asiatica var. *asiatica* (L.) Brongn. *Schmid 2348,* Ouvéa-Lekin, arrière mangrove +/- rocheuse, 29/08/1967 (NOU); without determinavit.

RHIZOPHORACEAE

Rhizophora apiculata Blume *Schmid 2981,* Tipindjé, 10/09/1964 (NOU); det.: P.B. Tomlinson, in herb., 21/07/1977.

Rhizophora X lamarkii Montrouz. *MacKee 26178,* Touho, 02/01/1973 (NOU); det.: P.B. Tomlinson, in herb., 21/07/1977.

Rhizophora samoensis (Hochr.) Salv. Syn.: *R. mangle* Guppy *Tomlinson & al. s.n.,* Teremba, 18/07/1977 (NOU), det.: P.B. Tomlinson, in herb., 21/07/1977.

Rhizophora X selala (Salv.) Toml. *MacKee 11844,* Nouméa, 20/12/1964 (NOU); det.: P.B. Tomlinson, in herb., 21/07/1977.

Rhizophora stylosa Griff. *MacKee 19430,* Ile Art, 30/08/1968 (NOU); det.: P.B. Tomlinson, in herb., 21/07/1977.

Bruguiera sexangula (Lour.) Poir. Syn.: *B. eriopetala* Wight & Arn. *Hoff 2261,* Port Boisé, 10/06/1980 (NOU); without determinavit.

Bruguiera gymnorrhiza (L.) Lam. *MacKee 24725,* Nouméa: Baie Tina, 6/12/1971 (NOU); without determinavit.

Ceriops tagal Robin *Schmid 1594,* Diahot en mangrove, 21/09/1966 (NOU); without determinavit.

RUBIACEAE

Scyphiphora hydrophyllacea Gardner *Schmid 5046,* around Burundi, 11/09/1974 (NOU); without determinavit.

Guettarda speciosa L. *Musselman 5354,* Riv. des Pirogues, 23/05/1977 (NOU); without determinavit.

SONNERATIACEAE

Sonneratia alba J. Smith *MacKee 12552,* Nakety, St Pol, 8/5/1965 (NOU); without determinavit. Species cited in New Caledonia by Hewson 1990, *Fl. of Australia* **18**: 89.

Sonneratia caseolaris (L.) Engl. *Veillon 3264,* Bord de l'Amoa, 19/07/1977 (NOU); without determinavit.

STERCULIACEAE

Heritiera littoralis Dryander subsp. *littoralis MacKee 25715,* Nouméa, Baie Tina, 1/11/1972 (NOU); without determinavit.

Recent and Quaternary foraminifera collected around New Caledonia

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Abstract
The compilation of the works carried out on Recent and Quaternary foraminifera collected in the waters surrounding New Caledonia allowed us to identify 574 species. These species are listed according to the classification of Loeblish & Tappan (1988), updated for the Recent species by Debenay *et al.* (1996). Their affinity with microfaunas from other regions is briefly discussed.

Résumé
La compilation des travaux sur les foraminifères actuels et quaternaires récoltés dans les eaux entourant la Nouvelle-Calédonie nous a permis de répertorier 574 espèces. Ces espèces sont présentées selon la classification de Loeblish & Tappan (1988), mise à jour pour les espèces actuelles par Debenay *et al.* (1996). Leur affinité avec les microfaunes d'autres régions est discutée brièvement.

Introduction
The first study about foraminifera from the southwestern Pacific near New Caledonia was carried out by Brady (1884) during the voyage of H.M.S. Challenger (1873-1876), updated by Barker (1960), The nearest station was station 177, near Vanuatu (16°45'S-168°5'E). However, studies concerning directly New Caledonia began much later, with partial and local inventories in coastal samples (Gambini,1958, 1959; Renaud-Debyser, 1965; Toulouse, 1965, 1966). Samples of recent and fossil sediments collected during the Singer-Polignac mission (1960-1965) were further used for several studies of foraminiferal assemblages (Coudray & Margerel, 1974; Coudray, 1976; Margerel, 1981). These samples allowed Margerel (1984) to make the first detailed inventory of the foraminifera of the Baie de Saint-Vincent (southwest of New Caledonia). This inventory, unfortunately still unpublished, describe 289 species from the bay. On the occasion of a sedimentological study carried out by the IRD in the southwestern lagoon of New Caledonia, more than 800 surface sediment samples were collected. The allowed the first exhaustive study of large foraminifera (> 0.5 mm), with the description of 168 species. Most of them are deposited at the Museum d'Histoire Naturelle de Genève (Debenay & Decrouez, 1989). Several papers were published (Debenay, 1985a, 1985b, 1986, 1988a, 1988b, 1988c). During the same period, the foraminifera of Quaternary recifal paleoenvironments were studied (Cabioch *et al.*, 1986; Cabioch, 1988), as well as the benthic (Vincent, 1986; Vincent & Laurin, 1988; Vincent *et al.*, 1991) and planktonic (Lambert *et al.*, 1991) foraminifera of the Loyalty basin. Two PhD theses also provided inventories of foraminifera from New Caledonia and Polynesia (Adjas, 1988), and from New Caledonia and Chesterfield islands (Degauche-Michalski, 1993). Samples have been collected in coastal marshes and mangrove swamps for a more comprehensive study about the foraminifera of paralic environments (Debenay & Guillou, 2002). Finally, an illustrated catalogue of part of the species from the Baie de Saint-Vincent has been prepared by Margerel and is available on the web site of the University of Provence:
http://194.57.197.66/Collection/Index.htm.

All the works reported above were used to prepare the following inventory of the foraminifera species that live in the waters surrounding New Caledonia. The 574 species identified are presented according to the classification of Loeblish & Tappan (1988), updated for the Recent species by Debenay *et al.* (1996). Most of the species reported were collected in the shallow lagoonal waters where calcareous species are dominant, with mainly the suborder Miliolina. Marshes and mangrove swamps microfaunas include a greater variety of agglutinated species belonging to the suborders Haplophragmiina, Trochamminina and textulariina. Species collected in these environments are marked with "°" in the inventory. Agglutinated species are also well represented in the deeper areas of the Loyalty basin, together with calcareous species (suborder Rotaliina) and planktonic species (suborder Globigerinina), which were reported in noticeable quantity only in this environment. Species collected only in the Loyalty basin are marked with "+" in the inventory. Species from Quaternary reefal environments of New Caledonia may be found in Recent sediments from other areas. They are marked with "*" in the inventory.

The following inventory was made taking into account synonymies, as much as possible. Some species were reported under two or three different names owing to taxonomical changes. For example, *Varidentella neostriatula* (THALMANN) was also reported as *Quinqueloculina neostriatulata* and *Triloculinella (Scutuloris) neostriatula*. Moreover, the interpretation of some species by different authors may be very confusing. It is the case for the genus *Ammonia*, for example. These uncertainties should be removed during further updating of the inventories.

Foraminiferal assemblages of New Caledonia have noticeable similarities with assemblages reported from other areas in western and central Pacific such as the Great Barrier of Australia (Collins, 1958; Baccaert, 1987; Horton *et al.*, 2003), New Guinea (Haig, 1988; Langer & Lipps, 2003), Solomon Islands (Hughes, 1977), and Society Islands (Le Calvez et Salvat, 1980, Venec-Peyré et Salvat, 1981). Affinities with the Indian Ocean are also noticeable, particularly with the lagoon of Mayotte (Le Calvez *in* Guilcher *et al.*, 1965), the Glorioso islands (Battistini *et al.*, 1976), the Maldives (Hottinger, 1980), the Mascarene archipelago (Montaggioni, 1981), and the coasts of Kenya (Levy *et al.*, 1982).

Some species collected in New Caledonia are typical of Pacific and Indopacific provinces. They are: *Textularia foliacea, Clavulina difformis, Quinqueloculina kerimbatica, Pyrgo striolata, Alveolinella quoyi, Schlumbergerina alveoliniformis, Epistomaroides polystomelloides, Amphistegina lessonii, Planorbulinella larvata, Cymbaloporetta bradyi, Cymbaloporella tabellaeformis* and *Anomalinella rostrata*. Other may be found in other geographical provinces: *Marginopora vertebralis, Sorites marginalis, Amphisorus hemprichii, Peneroplis pertusus* and *Planorbulina acervalis*. Some of them may also live in temperate waters: *Triloculina tricarinata, Triloculina trigonula, Eponides repandus* and *Lobatula lobatulus*.

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LIST OF THE TAXA

Ordre Foraminiferida Eichwald, 1830

Suborder ALLOGROMIINA Loeblich & Tappan, 1961,

Family ALLOGROMIIDAE Rhumbler, 1904

Subfamily ARGILLOTUBINAE Avnimelech, 1952

Nodellum Rhumbler, 1913

+*Nodellum membranaceum* (Brady)

Suborder ASTRORHIZINA Jivorec, 1953,

Superfamily ASTRORHIZACEA Brady, 1881

Family RHABDAMMINIDAE Brady, 1884

Subfamily RHABDAMMININAE Brady, 1884

Oculosiphon Avnimelech, 1952

+*Oculosiphon linearis* (Brady)

Rhabdammina Sars, 1869

+*Rhabdammina abyssorum* (Sars)

Family PSAMMOSPHAERIDAE Haeckel, 1894

Subfamily PSAMMOSPHAERINAE Haeckel, 1894

Psammosphaera Schulze, 1875

Psammosphaera sp.

Family SACCAMMINIDAE Brady, 1884

Subfamily SACCAMMININAE Brady, 1884

Saccammina Carpenter, 1869

+*Saccammina sphaerica* (Sars)

Superfamily HIPPOCREPINACEA Rhumbler, 1895

Family HIPPOCREPINIDAE Rhumbler, 1895

Subfamily HYPERAMMININAE Eimer & Fickert, 1899

Hyperammina Brady, 1878

+*Hyperammina elongata* (Brady)

Saccorhiza Eimer & Fickert, 1899

+*Saccorhiza ramosa* (Brady)

Suborder HAPLOPHRAGMIINA Wedekind, 1937,

Superfamily AMMODISCACEA Reuss, 1862

Family AMMODISCIDAE Reuss, 1862

Subfamily AMMODISCINAE Reuss, 1862

Ammodiscus Reuss, 1862

°*Ammodiscus* sp.

Subfamily TOLYPAMMININAE Cushman, 1928

Ammolagena Eimer & Fickert, 1899

+*Ammolagena clavata* (Parker & Jones)

Subfamily AMMOVERTELLININAE Saidova, 1981

Glomospira Rzehak, 1885

+*Glomospira charoides* (Jones & Parker)

Superfamily HORMOSINACEA Haeckel, 1894

Family HORMOSINIDAE Haeckel, 1894

Subfamily *Reophacinae* Cushman, 1910

Reophax de Monfort, 1808

Reophax agglutinans Cushman

+*Reophax ampullacea* (Brady)

+*Reophax distans* (Brady)

+*Reophax fusiformis* (Williamson)

Reophax irregularis Parker

+*Reophax nodulosus* (Brady)

Reophax scorpiurus de Montfort

+*Reophax spiculifer* (Brady)

Subfamily *Hormosininae* Haeckel , 1894

Reophanus Saidova, 1970

Reophanus (Hormosina) ovicula (Brady)

Superfamily LITUOLACEA de Blainville, 1827

Family HAPLOPHRAGMOIDIDAE Maync, 1952

Haplophragmoides Cushman, 1910

Haplophragmoides canariensis (d'Orbigny)

°*Haplophragmoides wilberti* Andersen

Family DISCAMMINIDAE Mikhalevich, 1980

Ammoscalaria Höglund, 1947

+*Ammoscalaria pseudospiralis* (Williamson)

Family LITUOTUBIDAE Loeblich & Tappan, 1984

Lituotuba Rhumbler, 1895

+*Lituotuba lituiformis* (Brady)

Family LITUOLIDAE de Blainville, 1827

Subfamily AMMOMARGINULININAE Podobina 1978

Ammobaculites Cushman, 1910

+*Ammobaculites agglutinans* (d'Orbigny)

+*Ammobaculites calcareus* (Brady)

°*Ammobaculites exiguus* Cushman & Bronnimann

Ammobaculites reophaciformis Cushman

°*Ammobaculites* sp.

Ammotium Loeblich & Tappan, 1953

°*Ammotium cassis* (Parker)

°*Ammotium salsum* (Cushman & Bronnimann)

Family PLACOPSILINIDAE Rhumbler, 1913

Subfamily PLACOPSILININAE Rhumbler, 1913

Placopsilina d'Orbigny, 1850

Placopsilina bradyi Cushman et MC Culloch

Superfamily HAPLOPHRAGMIACEA Eimer & Fickert, 1899

Family AMMOSPHAEROIDINIDAE Cushman, 1927

Subfamily AMMOSPHAEROIDININAE Cushman, 1927

Cystammina Neumayr, 1889

+*Cystammina galeata* (Brady)

Superfamily LOFTUSIACEA Brady, 1884

Family CYCLAMMINIDAE Marie, 1941

Subfamily ALVEOLOPHRAGMIINAE Saidova, 1981

Alveolophragmium Shchedrina, 1936

+*Alveolophragmium subglobosum* (Sars)

+*Alveolophragmium zealandicum* (Vella)

Subfamily CYCLAMMININAE Marie, 1941

Cyclammina Brady, 1879

+*Cyclammina cancellata* (Brady)

+*Cyclammina trullissatz* (Brady)

Superfamily SPIROPLECTAMMINACEA Cushman, 1927

Family SPIROPLECTAMMINIDAE Cushman, 1927

Subfamily SPIROTEXTULARIINAE Saidova, 1975

Spirotextularia Saidova, 1975

Spirotextularia fistulosa (Brady)

Family NOURIIDAE Chapman & Parr, 1936

Nouria Heron-Allen & Earland, 1914

Nouria polymorphinoides Heron-Allen et Earland

Superfamily VERNEUILINACEA Cushman, 1911

Family VERNEUILINIDAE Cuhsman, 1911

Subfamily VERNEUILININAE Cushman, 1911

Gaudryina d'Orbigny, 1839

Gaudryina (Pseudogaudryina) concava Collins

°*Gaudryina exilis* Cushman & Bronnimann

Gaudryina quadrangularis Bagg

+*Gaudryina robusta* (Cushman)

+*Gaudryina rudis* (Wright)

Siphogaudryina Cushman, 1935

Siphogaudryina rugulosa (Cushman)

+*Siphogaudryina siphonifera* (Brady)

Superfamily ATAXOPHRAGMIACEA Schwager, 1877

Family GLOBOTEXTULARIIDAE Cushman, 1927

Subfamily LIEBUSELLINAE Saidova, 1981

Liebusella Cushman, 1933

+*Liebusella soldanii* (Jones & Parker)

Suborder TROCHAMMININA Schwager, 1877

Family TROCHAMMINIDAE Schwager, 1877

Subfamily TROCHAMMININAE Schwager, 1877

Trochammina Parker & Jones, 1859

°*Trochammina inflata* (Montagu)

Subfamily ROTALIAMMININAE Saidova, 1981

Siphotrochammina Saunders, 1957

°*Siphotrochammina lobata* Saunders

Subfamily JADAMMININAE Saidova, 1981

Jadammina Bartenstein & Brand, 1938

°*Jadammina macrescens* (Brady)

Subfamily ARENOPARRELLINAE Saidova, 1981

Arenoparrella Andersen, 1951

°*Arenoparrella mexicana* (Kornfeld)

Suborder TEXTULARIINA Delage et Herouard, 1986

Superfamily TEXTULARIACEA Ehrenberg, 1838

Family EGGERELLIDAE Cushman, 1937

Subfamily DOROTHIINAE Balakhmatova, 1972

Dorothia Plummer, 1931

+*Dorothia scabra* (Brady)

Subfamily EGGERELLINAE Cushman, 1937

Eggerella Cushman, 1935

+*Eggerella bradyi* (Cushman)

+*Eggerella ghumboldttii* (Todd & Bronnimann)

Karreriella Cushman, 1933

+*Karreriella bradyi* (Cushman)

Martinottiella Cushman, 1933

+*Martinottiella bradyana* (Cushman)

+*Martinottiella nodulosa* (Cushman)

Family TEXTULARIIDAE Ehrenberg, 1838

Subfamily TEXTULARIINAE Ehrenberg, 1838

Bigenerina d'Orbigny, 1826

+*Bigenerina nodosaria* (d'Orbigny)

Sahulia Loeblich & Tappan, 1985

Sahulia barkeri (Hofker)

Sahulia conica (d'Orbigny)

Sahulia kerimbaensis (Said)

Textularia Defrance, 1824

Textularia agglutinans d'Orbigny

Textularia barettii Jones and Parker

Textularia candeiana d'Orbigny

Textularia conica d'Orbigny

**Textularia* aff. *conica corrugata* Heron-Allen et Earland

Textularia fistulosa Brady

Textularia foliacea Heron-Allen & Earland *foliacea* Heron-Allen & Earland

Textularia foliacea Heron-Allen & Earland *occidentalis* Cushman

Textularia foliacea Heron-Allen et Earland *oceanica* Cushman

Textularia goesii Cushman

Textularia kerimbaensis Said

**Textularia lateralis* Lalicker

Textularia orbica Lalicker et Mc Culloch

Textularia pseudogramen Chapman et Parr

**Textularia pseudoturris* Cushman

Textularia rugulosa Cushman

Textularia semialata Cushman

Subfamily SIPHOTEXTULARIINAE Loeblich & Tappan, 1985
Siphotextularia Finlay, 1939
Siphotextularia heterostoma (Brady)
Siphotextularia sp.
Subfamily *Planctostomatinae* L. & Tappan, 1984
Planctostoma Loeblich & Tappan, 1955
Planctostoma luculenta (Brady)
Subfamily SEPTOTEXTULARIINAE Loeblich & Tappan, 1985
Septotextularia Cheng & Zheng, 1978
Septotextularia rugosa Cheng & Zheng
Family PSEUDOGAUDRYINIDAE Loeblich & Tappan, 1985
Subfamily SIPHONIFEROIDINAE Loeblich & Tappan, 1985
Plotnikovina Mikhalevich, 1981
Plotnikovina transversaria (Brady)
Siphoniferoides Saidova, 1981
Siphoniferoides siphoniferus (Brady)
Family VALVULINIDAE Berthelin, 1880
Subfamily VALVULININAE Berthelin, 1880
Clavulina d'Orbigny, 1826
Clavulina difformis Brady
Clavulina multicamerata Chapman
Clavulina nodosaria d'Orbigny
Clavulina pacifica Cushman
Clavulina tricarinata d'Orbigny
Cylindroclavulina Bermudez & Key, 1952
+*Cylindroclavulina bradyi* (Cushman)
Suborder INVOLUTININA Hohenegger & Piller, 1977
Family INVOLUTINIDAE Bütschli, 1880
Subfamily INVOLUTININAE Bütschli, 1880
Involutina Terquem, 1862
+*Involutina tenuis* (Brady)
Suborder SPIRILLININA Hohenegger & Piller, 1975
Family SPIRILLINIDAE Reuss & Fritsch,1861
Mychostomina Berthelin, 1881
Mychostomina revertens (Rhumbler)
Spirillina Ehrenberg, 1843
Spirillina denticulata Brady
**Spirillina inaequalis* Brady
Spirillina spinigera Chapman
+*Spirillina tuberculata* (Brady)
Spirillina vivipara Ehrenberg
Family PATELLINIDAE Rhumbler, 1906
Subfamily PATELLININAE Rhumbler, 1906
Patellina Williamson, 1858
Patellina advena Cushman *altiformis* Cushman
Patellina corrugata Williamson
Suborder CARTERININA Loeblich & Tappan, 1981
Family CARTERINIDAE Loeblich & Tappan, 1955
Carterina Brady, 1884

Carterina spiculotesta (Carter)

Suborder MILIOLINA Delage & Herouard, 1896,

Superfamily CORNUSPIRACEA Schultze, 1854

Family CORNUSPIRIDAE Schultze, 1854

Subfamily CORNUSPIRINAE Schultze, 1854

Cornuspira Schultze, 1854

**Cornuspira involvens* (Reuss)

Cornuspira planorbis Schultze

Family FISCHERINIDAE Millett, 1898

Subfamily FISCHERININAE Millett, 1898

Planispirinella Wiesner, 1931

Planispirinella exigua (Brady)

Subfamily FISCHERINELLINAE Saidova, 1981

Fischerinella Loeblich & Tappan, 1962

Fisherinella pellucida (Millet)

Subfamily NODOBACULARIELLINAE Bogdanovich, 1981

Nodobaculariella Cushman & Hanzawa, 1937

**Nodobaculariella convexiuscula* (Brady)

Nodobaculariella japonica Cushman & Ozawa

Nodobaculariella rustica Cushman et Todd

Vertebralina d'Orbigny, 1826

Vertebralina insignis Brady

Vertebralina striata d'Orbigny

Wiesnerella Cushman, 1933

Wiesnerella auriculata (Egger)

Family NUBECULARIIDAE Jones, 1875

Subfamily NODOPHTHALMIDIINAE Cushman, 1940

Nodophthalmidium Macfadyen, 1939

Nodophthalmidium antillarum (Cushman)

Subfamily NODOBACULARIINAE Cushman, 1927

Nodobacularia Rhumbler, 1895

Nodobacularia antillarum Cushman var.pacifica Cushman, 1932

Nodobacularia sageninaeformis Hofker, 1976

Nubeculina Cushman, 1924

Nubeculina divaricata (Brady) var. *advena* Cushman

Subfamily NUBECULARIINAE Jones, 1875

Nubecularia Defrance, 1825

Nubecularia lucifuga Defrance

Family OPHTHALMIDIIDAE Wiesner, 1920

Cornuloculina Burbach, 1886

+*Cornuloculina (Hauerinella) inconstans* (Brady)

Edentostomina Collins, 1958

Edenstomina cultrata (Brady)

Superfamily MILIOLACEA Ehrenberg, 1839

Family SPIROLOCULINIDAE Wiesner, 1920

Inaequalina Luckzkowska, 1971

Inaequalina affixa (Terquem)

Spiroloculina d'Orbigny, 1826

Spiroloculina acescata Cushman

Spiroloculina angulata Cushman
Spiroloculina antillarum d'Orbigny
Spiroloculina caduca Cushman
Spiroloculina clara Cushman
Spiroloculina communis Cushman et Todd
Spiroloculina convexa Said
Spiroloculina corrugata Cushman et Todd
**Spiroloculina depressa* d'Orbigny
Spiroloculina disparilis Terquem
Spiroluculina fovealata Egger
Spiroloculina nummiformis Said
Spiroloculina ornata d'Orbigny
Spiroloculina samoensis Cushman
**Spiroloculina scita* Cushman et Todd

Family HAUERINIDAE Schwager, 1876

Subfamily SIPHONAPERTINAE Saidova, 1975

Ammomassilina Cushman, 1933
Ammomassilina alveoliniformis (Millett)
Schlumbergerina Munier-Chalmas, 1882
Schlumbergerina alveoliniformis (Brady)
Siphonaperta Vella, 1957
Siphonaperta agglutinans (d'Orbigny)
Siphonaperta anguina (Terquem) arenata (Said)
Siphonaperta distorqueata (Cushman)
Siphonaperta enoplostoma (d'Orbigny)
Siphonaperta pittensis (Albani)

Subfamily HAUERININAE Schwager, 1876

Cycloforina Luczkowska, 1972
Cycloforina crassicarinata (Collins)
Cycloforina ? littoralis (Collins)
Cycloforina philippinensis (Cushman)
Cycloforina quinquecarinata (Collins)
Cycloforina sulcata (d'Orbigny)
Hauerina d'Orbigny, 1839
**Hauerina bradyi* Cushman
Hauerina diversa Cushman
**Hauerina involuta* Cushman
Hauerina ornatissima (Karrer)
Hauerina pacifica Cushman
Lachlanella Vella, 1957
Lachlanella bidentata (d'Orbigny)
Lachlanella parkeri (Brady)
Lachlanella subpolygona (Parr)
Lachlanella subrugosa (Collins)
Massilina Schlumberger, 1893
Massilina crenata (Karrer)
Massilina inaequalis Cushman
Quinqueloculina d'Orbigny, 1826
Quinqueloculina agglutinans d'Orbigny

Quinqueloculina anguina Terquem var. arenata Said
Quinqueloculina barnardi Rasheed
Quinqueloculina cf. *berthelotiana* d'Orbigny
Quinqueloculina bicarinata d'Orbigny
Quinqueloculina bicostata d'Orbigny
Quinqueloculina bidentata d'Orbigny
Quinqueloculina bosciana d'Orbigny
+*Quinqueloculina* cf *bradyana* (Barker)
Quinqueloculina crassa Heron-Allen et Earland
Quinqueloculina crassicarinata Collins
**Quinqueloculina crenulata* Cushman
Quinqueloculina cuvieriarana d'Orbigny var. queenslandica Collins
Quinqueloculina disparilis d'Orbigny var. curta Cushman
Quinqueloculina funafutiensis (Chapman)
Quinqueloculina granulocostata Germeraad
Quinqueloculina hadaii Rasheed
Quinqueloculina cf. *irregularis* d'Orbigny
Quinqueloculina kerimbatica Heron-Allen et Earland var. philippinensis Cushman
Quinqueloculina lamarckiana d'Orbigny in de la Sagra
+*Quinqueloculina limbata* (d'Orbigny)
Quinqueloculina milletti (Weisner)
Quinqueloculina oblonga (Montagu)
Quinqueloculina parkeri (Brady)
Quinqueloculina pittensis Albani
Quinqueloculina polygona d'Orbigny
Quinqueloculina pseudoreticulata Parr
Quinqueloculina samoaensis Cushman
°*Quinqueloculina seminula* (Linné)
Quinqueloculina striatula Cushman
+*Quinqueloculina subcuneata* (Cushman)
Quinqueloculina sulcata d'Orbigny
Quinqueloculina tropicalis Cushman,
Quinqueloculina tubus Todd
**Quinqueloculina variolata* d'Orbigny

Subfamily MILIOLINELLINAE Vella, 1957

Affinetrina Luczkowska, 1972
Affinetrina bicarinata (d'Orbigny)
Affinetrina quadrilateralis (d'Orbigny)

Flintina Cushman, 1921
Flintina bradyana Cushman

Flintinoides Cherif, 1970
Flintinoides labiosa (d'Orbigny)

Miliolinella Wiesner, 1931
Miliolinella albatrossi Baccaert
Miliolinella australis (Parr)
Miliolinella baragwanathi (Parr)
+*Miliolinella subrotunda* (Montagu)
**Miliolinella webbiana* (d'Orbigny)

Pseudomassilina Lacroix, 1938

Pseudomassilina australis (Cushman)
Pseudomassilina macilenta (Brady)
Pseudomassilina pacificensis Cushman
Pseudotriloculina Cherif, 1970
Pseudotriloculina ? eburnea (d'Orbigny)
Pseudotriloculina linneiana (d'Orbigny)
Pseudotriloculina subgranulata (Cushman)
Pyrgo Defrance, 1824
Pyrgo denticulata (Brady)
+*Pyrgo depressa* (d'Orbigny)
+*Pyrgo lucernula* (Schwager)
+*Pyrgo murrhyna* (Schwager)
Pyrgo oblonga (d'Orbigny)
+*Pyrgo serrata* (Bailey)
Pyrgo striolata (Brady)
Pyrgo subglobulus Parr
+*Pyrgo vespertilio* (Schlumberger)
Triloculina d'Orbigny, 1826
Triloculina austriaca d'Orbigny
Triloculina bassensis Parr
Triloculina bertheliniana (Brady)
Triloculina cuneata Karrer
Triloculina earlandi Cushman, Todd & Post
Triloculina fichteliana d'Orbigny
Triloculina cf. *gracilis* d'Orbigny
+*Triloculina irregularis* (d'Orbigny)
Triloculina labiosa d'Orbigny
Triloculina laevigata d'Orbigny
**Triloculina linneiana* d'Orbigny
Triloculina linneiana d'Orbigny var. gomis Bandy
Triloculina littoralis Collins
Triloculina marshallana Todd
Triloculina oblonga (Montagu)
Triloculina oceanica Cushman
Triloculina planciana d'Orbigny in de la Sagra
Triloculina reticulata d'Orbigny var. sagra (d'Orbigny)
Triloculina rotunda d'Orbigny
Triloculina sabulosa Collins
Triloculina terquemiana (Brady)
Triloculina transversestriata Brady
Triloculina tricarinata d'Orbigny
Triloculina trigonula (Lamarck)
Triloculinella Riccio, 1950
Triloculinella (Scutuloris) baragwanathi (Parr)
**Triloculinella (Scutuloris) circularis* (Bornemann)
Varidentella Luczkowska, 1972
Varidentella neostriatula (Thalmann)
Subfamily SIGMOILINITINAE Luczkowska, 1974
Nummoloculina Steinmann, 1881

+*Nummoloculina contraria* (d'Orbigny)
Sigmoilina Schlumberger , 1887
+*Sigmoilina carinata* (Hofker)
**Sigmoilina* cf. *porcellana* Germeraad
Spirosigmoilina Parr, 1942
Spirosigmoilina bradyi Collins
Spirosigmoilina parri Collins
Subfamily SIGMOILOPSINAE Vella, 1957
Sigmoilopsis Finlay, 1947
+*Sigmoilopsis schlumbergeri* (Silvestri)
Subfamily TUBINELLINAE Rhumbler, 1906
Articulina d'Orbigny, 1826
Articulina alticostata Cushman
Articulina mucronata (d'Orbigny)
Articulina pacifica Cushman
Articulina sagra d'Orbigny
Articulina scrobiculata (Brady)
Parrina Cushman, 1931
Parrina bradyi (Millett)
Tubinella Rhumbler, 1906
Tubinella funalis (Brady)
Family RIVEROINIDAE Saidova, 1981
Pseudohauerina Ponder, 1972
Pseudohauerina occidentalis var.*involuta* (Cushman)
Pseudohauerina orientalis (Cushman)
Superfamily ALVEOLINACEA Ehrenberg, 1839
Family ALVEOLINIDAE Ehrenberg, 1839
Alveolinella Douvillé, 1907
Alveolinella boscii Defrance
Alveolinella quoyi (d'Orbigny)
Borelis de Monfort, 1808
Borelis pulchra d'Orbigny
Superfamily SORITACEA Ehrenberg, 1839
Family *Peneroplidae* Schultze, 1854
Monalysidium Chapman, 1900
Monalysidium acicularis (Batsch)
Monalysidium politum Chapman
Peneroplis de Monfort, 1808
Peneroplis pertusus (Forskal)
Peneroplis planatus (Fichtel et Moll)
Spirolina Lamarck, 1804
Spirolina arietina (Batsch)
Family SORITIDAE Ehrenberg, 1839
Subfamily SORITINAE Ehrenberg, 1839
Amphisorus Ehrenberg, 1839
Amphisorus hemprichii Ehrenberg
Marginopora Quoy & Gaimard, 1830
Marginopora vertebralis Quoy et Gaimard
Sorites Ehrenberg, 1839

Sorites marginalis (Lamarck)
Sorites orbitolitoides (Hofker)
Suborder LAGENINA Delage & Herouard, 1896
Superfamily NODOSARIACEA Ehrenberg, 1838
Family NODOSARIIDAE Ehrenberg, 1838
Subfamily NODOSARIINAE Ehrenberg, 1838
Dentalina Risso, 1826
+*Dentalina communis* (d'Orbigny)
Dentalina filiformis (d'Orbigny)
+*Dentalina guttifera* (d'Orbigny)
Laevidentalina Loeblich & Tappan, 1986
Laevidentalina sp.
Nodosaria Lamarck, 1812
Nodosaria proxima Silvestri
Pyramidulina Fornasini, 1894
Pyramidulina catesbyi (d'Orbigny)
Subfamily LINGULININAE Loeblich & Tappan, 1961
Lingulina d'Orbigny, 1826
Lingulina carinata d'Orbigny
Family VAGINULINIDAE Reuss, 1860
Subfamily LENTICULININAE Chapman, Parr & Collins, 1934
Lenticulina Lamarck, 1804
+*Lenticulina asterizans* (Parr)
+*Lenticulina calcar* (Linné)
Lenticulina gibba (d'Orbigny)
+*Lenticulina subconvergens* (Saidova)
Lenticulina vortex (Fichtel et Moll)
Subfamily PALMULININAE Saidova 1981
Frondovaginulina Schubert, 1912
Frondovaginulina ? robusta (Brady)
Subfamily MARGINULININAE Wedekind, 1937
Amphicoryna Schlumberger, 1881
+*Amphicoryna hirsuta* (d'Orbigny)
+*Amphicoryna scalaris* (Batsch)
Amphicoryna separans (Brady)
Astacolus de Monfort, 1808
+*Astacolus crepidulus* (Fichtel & Moll)
Vaginulinopsis Silvestri, 1904
+*Vaginulopsis pacifica* (Cushman & Ozawa)
Family LAGENIDAE Reuss, 1862
Lagena Walker & Jacob, 1798
Lagena desmophora Rymer-Jones
Lagena gracilis Williamson
+*Lagena hispida* (Reuss)
Lagena laevis (Montagu)
Lagena perlucida (Montagu)
Lagena spiralis Brady
Lagena striata d'Orbigny
Lagena strumosa REUSS

Lagena sulcata Walker & Jacob var. *spicata* Cushman et Mc Culloch

Family POLYMORPHINIDAE d'Orbigny, 1839

Subfamily POLYMORPHININAE d'Orbigny, 1839

Globulina d'Orbigny, 1839

Globulina gibba tuberculata d'Orbigny

Guttulina d'Orbigny, 1839

Guttulina problema d'Orbigny

Guttulina regina (Brady,Parker et Jones)

Pseudopolymorphina Cushman & Ozawa, 1928

**Pseudopolymorphina ligua* (Roemer)

Pseudopolymorphina ovalis Cushman et Ozawa

Subfamily RAMULININAE Brady, 1884

Ramulina Jones, 1875

+*Ramulina globulifera* (Brady)

Family ELLIPSOLAGENIDAE Silvestri, 1923

Subfamily OOLININAE Loeblich & Tappan, 1961

Favulina Patterson & Richardson, 1987

Favulina hexagona (Williamson)

Favulina squamosa (Montagu)

Oolina d'Orbigny, 1839

**Oolina globosa* (Montagu)

Subfamily ELLIPSOLAGENINAE Silvestri, 1923

Fissurina Reuss, 1850

Fissurina circularis Todd

Fissurina clathrata (Brady)

+*Fissurina kerguelenensis* (Parr)

Fissurina lacunata (Burrows & Holland)

Fissurina lagenoides (Williamson)

°*Fissurina lucida (Williamson)*

Fissurina milletti Todd

Fissurina perforata (Möbius)

Fissurina radiato-marginata (Parker et Jones)

**Fissurina squamoso-marginata* (Parker et Jones)

Family GLANDULINIDAE Reuss, 1860

Subfamily GLANDULININAE Reuss, 1860

Glandulina d'Orbigny, 1839

Glandulina laevigata d'Orbigny

Suborder ROBERTININA Loeblich & Tappan, 1984

Superfamily CERATOBULIMINACEA Cushman, 1927

Family CERATOBULIMINIDAE Cushman, 1927

Subfamily CERATOBULIMININAE Cushman, 1927

Ceratobulimina Toula, 1915

+*Ceratobulimina pacifica* (Cushman & Harris)

Lamarckina Berthelin, 1881

Lamarckina scabra (Brady)

Family EPISTOMINIDAE Wedekind, 1937

Subfamily EPISTOMININAE Wedekind, 1937

Hoeglundina Brotzen, 1948

+*Hoeglundina elegans* (d'Orbigny)

Superfamily ROBERTINACEA Reuss, 1850

Family ROBERTINIDAE Reuss, 1850

Subfamily ALLIATININAE McGowran, 1966

Alliatina Troelsen, 1954

Alliatina transluscens (Cushman)

Geminospira Makiyama & Nakagawa, 1941

Geminospira brady (Williamson)

Geminospira sp.

Suborder GLOBIGERININA Delage & Hérouard, 1896,

Superfamily GLOBOROTALIACEA Cush., 1927

Family GLOBOROTALIIDAE Cushman, 1927

Globorotalia Cushman, 1927

Globorotalia anfracta Parker

Globorotalia bermudezi Rogl & Bolli

Globorotalia cavernula Bé

Globorotalia crassaformis (Galloway)

Globorotalia ? erinacea (Heron Allen & Earland)

Globorotalia hirsuta (d'Orbigny)

Globorotalia inflata d'Orbigny

Globorotalia menardii (Parker, Jones & Brady)

Globorotalia scitula (Brady)

Globorotalia theyeri Fleisher

Globorotalia truncatulinoides (d'Orbigny)

Globorotalia tumida (Brady)

Globorotalia ungulata Bermudez

Neogloboquadrina Bandy, Frerichs & Vincent, 1967

Neogloboquadrina dutertrei (d'Orbigny)

Neogloboquadrina pachyderma (Ehrenberg)

Turborotalia Cushman & Bermudez, 1949

Turborotalia cristata Heron-Allen & Earland

Turborotalia humilis (Brady)

Family PULLENIATINIDAE Cushman, 1927

Pulleniatina Cushman, 1927

Pulleniatina obliquiloculata (Parker & Jones)

Family CANDEINIDAE Cushman, 1927

Subfamily GLOBIGERINITINAE Bermudez, 1961

Globigerinita Brönnimann, 1951

Globigerinita glutinata (Egger)

Globigerinita parkerae (Bermudez)

Globigerinita uvula (Ehrenberg)

Subfamily CANDEININAE Cushman, 1927

Candeina d'Orbigny, 1839

Candeina nitida d'Orbigny

Family CATAPSYDRACIDAE Boli, Loeblich & Tappan, 1957

Globorotaloides Bolli, 1957

Globorotaloides hexagona (Natland)

Superfamily GLOBIGERINACEA Carpenter, Parker & Jones, 1862

Family GLOBIGERINIDAE Carpenter, Parker & Jones, 1862

Subfamily GLOBIGERININAE Carpenter, Parker & Jones, 1862

Beella Banner & Blow, 1960

Beella digitata (Brady)

Globigerina d'Orbigny, 1826

Globigerina bulloides d'Orbigny

Globigerina eggeri Rhumbler

Globigerina falconensis Blow

Globigerina rubescens Hofker

Globigerina tricamerata Tolmachchoff

Globigerinella Cushman, 1927

Globigerinella aequilateralis (Brady)

Globigerinella calida (Parker)

Globigerinella obesa (Bolli)

Globigerinoides Cushman, 1927

Globigerinoides conglobatus (Brady)

Globigerinoides ruber (d'Orbigny)

Globigerinoides sacculifer (Brady)

Globigerinoides tenelus Parker

Globigerinoides trilobus (Reuss)

Sphaeroidinella Cushman, 1927

Sphaeroidinella dehiscens (Parker & Jones)

Subfamily ORBULININAE Schultze, 1854

Orbulina d'Orbigny, 1839

Orbulina bilobata d'Orbigny

Orbulina suturalis Bronnimann

Orbulina universa d'Orbigny

Family HASTIGERINIDAE Bolli, L. & Tappan, 1957

Hastigerina Thomson, 1876

Hastigerina pelagica d'Orbigny

Suborder ROTALIINA Delage & Hérouard, 1896

Superfamily BOLIVINACEA Glaessner, 1937

Family BOLIVINIDAE Glaessner, 1937

Bolivina d'Orbigny, 1839

Bolivina abbreviata Heron Allen & Earland

Bolivina (Loxostoma) amygdalaeformis (Brady)

Bolivina compacta Sidebottom

Bolivina (Loxostoma) convallarium (Millett)

Bolivina (Loxostoma) durrandii (Millett)

+*Bolivina hantkeniana* (Brady)

Bolivina (Loxostoma) karrerianum (Brady)

Bolivina (Loxostoma) limbatum (Brady) var. *costulatum* (Cushman)

Bolivina rhomboidalis (Millett)

Bolivina robusta Brady

**Bolivina semi-costata* Cushman

Bolivina spinea Cushman

Bolivina (Loxostoma) strigosum (Brady)

Bolivina subangularis Brady

Bolivina subtenuis Cushman

Bolivina vadescens Cushman

Bolivina (Loxostoma) cf *vertebralis* (Cushman)

Brizalina Costa, 1856
Brizalina convallaria durandii (Millet)
°*Brizalina* cf. *pacifica* (Cushman & McCulloch)
°*Brizalina striatula* (Cushman)
Superfamily LOXOSTOMATACEA L. & Tappan, 1962
Family BOLIVINELLIDAE Hayward, 1980
Bolivinella Cushman, 1927
Bolivinella elegans Parr
Bolivinella folia (Parker & Jones) var. *ornata* Cushman
Bolivinella margaritacea Cushman
Superfamily CASSIDULINACEA d'Orbigny, 1839
Family CASSIDULINIDAE d'Orbigny, 1839
Subfamily CASSIDULININAE d'Orbigny, 1839
Cassidulina d'Orbigny, 1826
+*Cassidulina angulosa* (Cushman)
+*Cassidulina degaus* (Sidebottom)
Cassidulina minuta Cushman
+*Cassidulina subglobosa* (Brady)
Favocassidulina Loeblich & Tappan, 1957
+*Favocassidulina favus* (Brady)
Subfamily EHRENBERGININAE Cushman, 1927
Ehrenbergina Reuss, 1850
+*Ehrenbergina pacifica* (Cushman)
+*Ehrenbergina trigona* (Goes)
Reissia Loeblich & Tappan, 1964
+*Reissia histric* (Brady)
Superfamily BULIMINACEA Jones, 1875
Family SIPHOGENERINOIDIDAE Saidova, 1981
Subfamily SIPHOGENERINOIDINAE Saidova, 1981
Rectobolivina Cushman, 1927
Rectobolivina barkeri Margerel
+*Rectobolivina dimorpha* (
+*Rectobolivina raphana* (Parker & Jones)
Subfamily TUBULOGENERININAE Saidova, 1981
Siphogenerina Schlumberger, 1882
Siphogenerina columellaris (Brady)
Siphogenerina raphana (Parker & Jones)
Siphogenerina raphana (Parker & Jones) var. *tropicalis* Cushman
Siphogenerina virgula (Brady)
Family BULIMINIDAE Jones, 1875
Globobulimina Cushman, 1927
Globobulimina australiensis Collins
Family BULIMINELLIDAE Hofker, 1951
Buliminella Cushman, 1911
Buliminella latissima Collins
Buliminella milletti Cushman
Buliminella spicata Cushman & Parker
Family UVIGERINIDAE Haeckel, 1894
Subfamily UVIGERININAE Haeckel, 1894

Neouvigerina Thalmann, 1952
+*Neouvigerina porrecta* (Brady)
Siphouvigerina Parr, 1950
Siphouvigerina proboscidea (Schwager)
Uvigerina d'Orbigny, 1826
+*Uvigerina bradyana* (Fornasi)
Uvigerina porrecta Brady
Uvigerina porrecta Brady *fimbriata* Sideb
Family REUSSELLIDAE Cushman, 1933
Chrysalidinella Schubert, 1908
Chrysalidinella fijiensis Cushman
Fijiella Loeblich & Tappan, 1962
Fijiella simplex (Cushman)
Reussella Galloway, 1933
Reussella aculeata Cushman
Reussella spinulosa (Reuss)
Valvobifarina Hofker, 1951
Valvobifarina mackinnoni (Millett)
Family TRIMOSINIDAE Saidova, 1981
Mimosina Millett, 1900
Mimosina affinis Millett
Mimosina hystrix Millett
Mimosina pacifica Cushman
Family PAVONINIDAE Eimer & Fickert, 1899
Pavonina d'Orbigny, 1826
Pavonina flabelliformis d'Orbigny
Family MILLETTIIDAE Saidova, 1981
Millettia Schubert, 1911
Millettia limbata (Brady)
Superfamily FURSENKOINACEA Loeblich & Tappan, 1961
Family FURSENKOINIDAE Loeblich & Tappan, 1961
Coryphostoma Loeblich & Tappan, 1962
Coryphostoma limbata (Brady)
Fursenkoina Loeblich & Tappan, 1961
Fursenkoina (Virgulina) earlandi Cushman
Fursenkoina (Virgulina) pauciloculata Brady
Sigmavirgulina Loeblich & Tappan, 1957
Sigmavirgulina tortuosa (Brady)
Superfamily DISCORBACEA Ehrenberg, 1838,
Family PLACENTULINIDAE Kasimova, Poroshina & Geodakchan,1980
Subfamily ASHBROOKIINAE Loeblich & Tappan, 1984
Patellinella Cushman, 1928
Patellinella carinata Collins
Patellinella jugosa (Brady)
Patellinella nitida (Hofker)
Family BAGGINIDAE Cushman, 1927
Subfamily BAGGININAE Cushman, 1927
Baggina Cushman, 1926
Baggina indica (Cushman)

Cancris de Monfort, 1808

Cancris auriculus (Fichtel & Moll)

Cancris indicus (Cushman)

Cancris sagra d'Orbigny

Physalidia Heron-Allen & Earland, 1928

Physalidia reniformis (Heron Allen & Earland)

Rugidia Heron-Allen & Earland, 1928

Rugidia corticata (Heron Allen & Earland)

Family EPONIDIDAE Hofker, 1951

Subfamily EPONIDINAE Hofker, 1951

Eponides de Monfort, 1808

Eponides repandus (Fichtel et Moll)

Poroeponides Cushman, 1944

Poroeponides cribrorepandus Asano et Uchio

Poroeponides lateralis Cushman

Family HELENINIDAE Loeblich & Tappan, 1988

Helenina Saunders, 1961

°*Helenina anderseni* (Warren)

Familly MISSISSIPPINIDAE Saidova, 1981

Subfamily STOMATORBININAE Saidova, 1981

Stomatorbina Doreen, 1948

Stomatorbina concentrica (Parker & Jones)

Subfamily MISSISSIPPININAE Saidova, 1981

Mississippina Howe, 1930

Mississipina pacifica Parr

Family PEGIDIIDAE Heron-Allen & Earland, 1928

Pegidia Heron-Allen & Earland, 1928

Pegidia dubia d'Orbigny

Family DISCORBIDAE Ehrenberg, 1838

Discorbis Lamarck, 1804

Discorbis mirus Cushman

Neoeponides Reiss, 1960

Neoeponides procera (Brady)

Family ROSALINIDAE Reiss, 1963

Gavelinopsis Hofker, 1951

Gavelinopsis praegeri (Heron Allen & Earland)

Gavelinopsis sp. aff. *lobatulus* (Parr)

Neoconorbina Hofker, 1951

Neoconorbina crustata (Cushman)

Neoconorbina orbicularis (Terquem)

Neoconorbina pacifica Hofker

Neoconorbina terquemi (Rzehak)

Neoconorbina tuberocapitata (Chapman)

Rosalina d'Orbigny, 1826

°*Rosalina bradyi* Cushman

Rosalina floridana (Cushman)

Rosalina globularis d'Orbigny

Rosalina rugosa d'Orbigny

Tretomphalus Möbius, 1880

Tretomphalus bulloides d'Orbigny
Tretomphalus concinnus (Brady)
Tretomphalus grandis Cushman
Tretomphalus miletti (Heron-Allen et Earland)
+*Tretomphalus planus* (Cushman)

Family BRONNIMANNIIDAE Loeblich & Tappan, 1984

Bronnimannia Bermudez, 1952
Bronnimannia haliotis (Heron Allen & Earland)

Superfamily GLABRATELLACEA Loeblich & Tappan, 1964

Family GLABRATELLIDAE Loeblich & Tappan, 1964

Glabratella Dorreen, 1948
**Glabratella patelliformis* (Brady)
Glabratella patelliformis (Brady) var. *erecta* (Sidebottom)
Glabratella pulvinata (Brady)
Glabratella pyramidalis (Heron Allen & Earland)
Glabratella quadrangularis (Uchio)
Glabratella tabernacularis (Brady)
Glabratella wiesneri (Parr)

Family HERONALLENIIDAE Loeblich & Tappan, 1986

Heronallenia Chapman & Parr, 1931
Heronalenia otukai Uchio

Family BULIMINOIDIDAE Seiglie, 1970

Buliminoides Cushman, 1911
Buliminoides williamsonianus (Brady)

Superfamily SIPHONINACEA Cushman, 1927

Family SIPHONINIDAE Cushman , 1927

Subfamily SIPHONININAE Cushman , 1927
Siphonina Reuss, 1850
Siphonina tubulosa Cushman

Subfamily SIPHONINOIDINAE Loeblich & Tappan, 1984
Siphoninoides Cushman, 1927
Siphoninoides echinatus (Brady)
Siphoninoides glabrus (Heron Allen & Earland)

Superfamily DISCORBINELLACEA Sigal, 1952

Family PSEUDOPARRELLIDAE Voloshinova, 1952

Subfamily PSEUDOPARRELLINAE Voloshinova, 1952
Epistominella Husezima & Maruhasi, 1944
Epistominella pulchra (Cushman)

Family DISCORBINELLIDAE Sigal, 1952

Subfamily DISCORBINELLINAE Sigal, 1952
Discorbinella Cushman & Martin, 1935
Discorbinella bertheloti (d'Orbigny)
Laticarinina Galloway & Wissler, 1927
+*Laticarinina pamperata* (Parker & Jones)

Superfamily PLANORBULINACEA Schwager, 1877

Family PLANULINIDAE Bermudez, 1952

Planulina d'Orbigny, 1826
Planulina ornata (d'Orbigny)

Family CIBICIDIDAE Cushman, 1927

Subfamily CIBICIDINAE Cushman, 1927

Cibicides de Monfort, 1808

Cibicides advenum (d'Orbigny)

+*Cibicides bradyi* (Trauth)

Cibicides cicatricosus (Schwager)

Cibicides mayori (Cushman)

+*Cibicides refulgens* de Montfort

+*Cibicides rovertsonianus* (Brady)

+*Cibicides subhaidingeri* (Parr)

Fontbotia Gonalez-Donoso & Linares, 1970

+*Fontbotia (Cibicides) wuellestorfi* (Schwager, 1866)

Lobatula Fleming, 1828

Lobatula lobatula (Walker et Jacob)

Subfamily STICHOCIBICIDINAE Saidova, 1981

Dyocibicides Cushman & Valentine, 1930

Dyocibicides biserialis Cushman et Valentine

Family PLANORBULINIDAE Schwager, 1877

Subfamily CARIBEANELLINAE Saidova, 1981

Caribeanella Bermudez, 1952

Caribeanella katasensis (Ujiie)

Subfamily PLANORBULININAE Schwager, 1877

Cibicidella Cushman, 1927

Cibicidella variabilis (d'Orbigny)

Cibicidella sp.

Planorbulina d'Orbigny, 1826

Planorbulina acervalis Brady

Planorbulina mediterranensis d'Orbigny

Planorbulinella Cushman, 1927

Planorbulinella larvata (Parker et Jones)

Family CYMBALOPORIDAE Cushman, 1927

Subfamily CYMBALOPORINAE Cushman, 1927

Cymbaloporella Cushman, 1927

Cymbaloporella tabellaeformis (Brady)

Cymbaloporetta Cushman, 1928

Cymbaloporetta bradyi (Cushman)

Cymbaloporetta squammosa (d'Orbigny)

Family VICTORIELLIDAE Chapman & Crespin, 1930

Subfamily CARPENTERIINAE Saidova, 1981

Carpenteria Gray, 1858

Carpenteria balaniformis Gray, var. *proteiformis* Goës

Carpenteria monticularis Carter

Superfamily ACERVULINACEA Schultze, 1854

Family ACERVULINIDAE Schultze, 1854

Acervulina Schultze, 1854

Acervulina inhaerens Schultze

Gypsina Carter, 1877

Gypsina fimbriata (Chapman)

Gypsina vesicularis (Parker et Jones)

Sphaerogypsina Galloway, 1933
Sphaerogypsina globula (Reuss)
Family HOMOTREMATIDAE Cushman, 1927
Homotrema Hickson, 1911
Homotrema rubra (Lamarck)
Miniacina Galloway, 1933
Miniacina miniacea (Pallas)
Superfamily ASTERIGERINACEA d'Orbigny, 1839
Family ALFREDINIDAE Singh & Kalia, 1972
Epistomaroides Uchio, 1952
Epistomaroides polystomelloides (Parker et Jones)
Family AMPHISTEGINIDAE Cushman, 1927
Amphistegina d'Orbigny, 1826
Amphistegina bicirculata Larsen
Amphistegina lessonii d'Orbigny
Amphistegina lobifera Larsen
Amphistegina papillosa Said
Amphistegina quoyi d'Orbigny
Amphistegina radiata (Fichtel et Moll)
Superfamily NONIONACEA Schultze, 1854
Family NONIONIDAE Schultze, 1854
Subfamily NONIONINAE Schultze, 1854
Nonion de Monfort, 1808
Nonion cf. *asterizans* (Fichtell & Moll)
Nonion grateloupi (d'Orbigny)
+*Nonion pacificum* (Cushman)
Nonion subturgidum (Cushman)
Nonionella Cushman, 1926
Nonionella bradii Chapman
Pseudononion Asano, 1936
+*Pseudononion japanicum* (Asano)
Subfamily PULLENIINAE Schwager, 1877
Melonis de Monfort, 1808
+*Melonis pompiloides* (Fichtel & Moll)
Pullenia Parker & Jones, 1862
+*Pullenia bulloides* (d'Orbigny)
+*Pullenia subcarinata* (d'Orbigny)
Family ALMAENIDAE Myatlyuk, 1959
Subfamily ANOMALINELLINAE Saidova, 1981
Anomalinella Cushman, 1927
Anomalinella rostrata (Brady)
Superfamily CHILOSTOMELLACEA Brady, 1881
Family ALABAMINIDAE Hofker, 1951
Svratkina Pokorny, 1956
Svratkina australiensis (Chapman, Parr & Collins)
Svratkina tubulifera (Heron Allen & Earland)
Family ORIDORSALIDAE Loeblich & Tappan, 1984
Oridorsalis Andersen, 1961
+*Oridorsalis umbonatus* (Reuss)

Family HETEROLEPIDAE Gonzales-Donoso, 1969

Heterolepa Franzenau, 1884

Heterolepa coudrayi Margerel

Heterolepa praecincta (Karrer)

+*Heterolepa pseudoungeriana (Cushman)*

Heterolepa subhaidingeri (Parr)

Family GAVELINELLIDAE Hofker, 1956

Subfamily GAVELINELLINAE Hofker, 1956

Gyroidina d'Orbigny, 1826

+*Gyroidina broekhiana* (Karrer)

+*Gyroidina neosoldanii* (Brotzen)

Gyroidinopsis McCulloch, 1977

Gyroidinoides soldanii (d'Orbigny)

Hanzawaia Asano, 1944

+*Hanzawaia* sp. Présentée comme *Anomalina colligera* (Chapman & Parr)

Family TRICHOHYALIDAE Saidova, 1981

Buccella Andersen, 1952

Buccella sp

Superfamily ROTALIACEA Ehrenberg, 1839

Family ROTALIIDAE Ehrenberg, 1839

Subfamily PARAROTALIINAE Reiss, 1963

Pararotalia Le Calvez, 1949

Pararotalia ozawai (Asano)

Subfamily AMMONIINAE Saidova, 1981

Ammonia Brünnich, 1772

Ammonia beccarii (Linné)

Ammonia convexa (Collins)

Ammonia parkinsoniana d'Orbigny

Ammonia tepida (Cushman)

Ammonia sp.

Family CALCARINIDAE Schwager, 1876

Baculogypsina Sacco, 1893

Baculogypsina sphaerulata (Parker et Jones)

Baculogypsinoides Yabe & Hanzawa, 1930

+*Baculogypsinoides spinosus* (Yabe & Hanzawa)

Calcarina d'Orbigny, 1826

Calcarina calcar d'Orbigny

Calcarina defrancii d'Orbigny

Calcarina hispida Brady

Calcarina hispida pulchella Chapman

Calcarina spengleri (Gmelin) *mayori* Cushman

Calcarina venusta (Brady)

Family ELPHIDIIDAE Galloway, 1933

Subfamily ELPHIDIINAE Galloway, 1933

Cribroelphidium Cushman & Brönnimann, 1948

°*Cribroelphidium* cf. *excavatum* (Terquem)

°*Cribroelphidium* cf. *gunteri* (Cole)

°*Cribroelphidium poeyanum* (d'Orbigny)

°*Cribroelphidium* cf *williamsoni* (Haynes)

Elphidium de Monfort, 1808
**Elphidium aculeatum* (Silvestri)
°Elphidium advenum (Cushman)
Elphidium cf. *articulatum* (d'Orbigny)
Elphidium craticulatum (Fichtel et Moll)
+Elphidium crispum (Linné)
**Elphidium* cf. *earlandi* Cushman
Elphidium jenseni (Cushman)
°Elphidium limbatum (Chapman)
+Elphidium macellum (Fichtel & Moll)
Elphidium milletti (Heron-Allen & Earland)
Elphidium pacificum Collins
Elphidium reticulosum Cushman
°Elphidium simplex Cushman
Ozawaia Cushman, 1931
Ozawaia tongaensis Cushman
Subfamily NOTOROTALIINAE Hornibrook, 1961
Parrellina Thalmann, 1951
Parrellina hispida (Cushman)
Superfamily NUMMULITACEA de Blainville, 1827
Family NUMMULITIDAE de Blainville, 1827
Cycloclypeus Carpenter, 1856
Cycloclypeus carpenteri Brady
Heterostegina d'Orbigny, 1826
Heterostegina curva Moebius
Heterostegina depressa d'Orbigny
Heterostegina operculinoides Hofker
+Heterostegina suborbicularis (d'Orbigny)
Nummulites Lamark, 1801
Nummulites (Operculinella) cumingii (Carpenter, 1859)
Operculina d'Orbigny, 1826
Operculina ammonoides (Gronovius)
Operculina bartschi Cushman
Operculina gaimardi d'Orbigny
Operculina mayottana Le Calvez

Revised checklist of marine algae (Chlorophyta, Rhodophyta and Ochrophyta) and seagrasses (Marine Angiosperma) of New Caledonia

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Abstract : The marine algae and seagrasses of New Caledonia are reviewed based on literature records and new surveys. 438 macroalgae species (Cyanobacteria excluded) representing 62 families, and 184 genera and 11 marine Angiosperms from reefs, lagoon and coastal environments are listed. Among these, 103 species are new records for the area, including a new genus, since the first comprehensive catalogue. This figure is likely to fall short of the actual total, as it does not include the majority of a rich, recently sampled, collection still remaining to be examined.

Résumé : Les algues et les Phanérogames marines de Nouvelle-Calédonie sont révisées à partir de la littérature et de nouvelles récoltes. Sont listées 438 espèces d'algues (Cyanobacteria exclues) représentant 62 familles, et 184 genres ainsi que 11 espèces d'Angiopsermes marines provenant des récifs, lagons et zones littorales. Parmi celles-ci, 103 espèces sont nouvelles pour la région dont 1 genre nouveau pour la science depuis la publication de la première liste. Ce qui est une vision partielle de la réalité puisque n'est pas incluse dans sa totalité l'importante collection récemment consitutée et qui reste à étudier.

Introduction

New Caledonia was discovered by Capitain Cook in 1774 but remained untouched by the trans-pacific voyages of discovery and the scientific explorations of 1800 - 1890. The first phycological collections from New Caledonia were composed during the years 1855-1860 and 1862-1867 by Eugéne Vieillard, while he was posted as a naval surgeon at four bases in Balade, Wagap, Canala and Gatope. He sent back to France his extensive collections of both terrestrial plants and marine algae and these were distributed to botanists and museums throughout Europe by his friend Lenormand, an amateur French botanist. The phycological collections are housed in Leiden (L), Paris (PC) and Caen (CN; Valet 1968), with one small collection in Michigan (Millar & Payri, 2006). Part of Vieillard's collection was studied by Friedrich Kützing who described 66 new species from New Caledonia in the 20 volumes of *Tabulae Phycologicae* (1863b, 1864-1869). Millar & Prud'homme van Reine (2005) have re-examined those collections and proposed many name changes and new combinations. During 1869-1872, Benjamin Balansa, a naturalist from France, collected in several areas and his material was published with other amateur collections by Sauvageau (1901). Grunow appears to have been the first phycologist to have collected, in 1884, in New Caledonia and the material on green algae was later published by Murray & Boodle (1888) and by Kuckuck (1929) as regards the brown algae. Grunow's collection has not been re-examined because it was thought to have been lost during the WWII bombing of Berlin (Garrigue & Tsuda 1988). In fact the collection is housed in Vienna (W) and the *Sargassum* specimens are currently being re-examined by L. Mattio (in prep.).

During the following decades and until the early 1950s, little changed and only a small amount of New Caledonian material was published in occasional monograph studies (e.g. Weber van Bosse, 1898; Gepp 1922, Olsen-Stojkovich, 1985). In the early 1950s Mrs R. Catala, who was the co-founder of the aquarium in Nouméa, put together a large collection of 478 specimens from the lagoons and reefs of the Grande-Terre. Her collection was sent to Valerie May at 'The Marine Biological Laboratory, Division of Fisheries' in Cronulla (Australia), who identified 122 species in two separate papers (May 1953, 1966). This collection has been recently located at the National Herbarium of New South Wales in the Royal Botanic Gardens in Sydney, Australia. However, the specimens are poorly preserved and many of the records which needed to be re-examined remain unverifiable (Millar Pers.com). Before May's publication, Mr R. Catala (Catala, 1950), published the first list of 42 species of macroalgae identified by V. May and G.F. Papenfuss as well as 4 seagrasses.

In the following decades, new phycological material was collected with the « French expedition to the coral reefs of New Caledonia », supported by the Singer-Polignac Foundation during 1960-1963. The new genus *Riquetophycus polypus* Denizot and 3 new species *Bellotia simplex* Denizot, *Chlorodesmis penicillata* Farghali and *Rhipiliopsis novae-caledoniae* Farghaly & Denizot were described (Farghali & Denizot, 1979; Denizot 1965, 1968). But, unfortunately, the new species' (except for *Riquetophycus polypus*) cannot be recognized because they were not validly published as the authors did not provide Type vouchers and thus failed to satisfy the International Code of Botanical Nomenclature. Later, in the mid-1970s, Valet's work continued to contribute to the present knowledge of marine green algae of New Caledonia with the addition of *Halimeda melanesica* Valet and his work on Dasycladales (Valet 1966, 1968, 1969, 1976).

The period from 1976 to 1990, with the IRD's (ex. ORSTOM) programs in pharmacology (SNOM, SMIB) and the beginning of the explorations of the marine fauna of New Caledonia and dependencies brought a large amount of biological material. But, unfortunately, algae have been poorly studied taxonomically due to the lack of phycological resources. However, and thanks to the biologist-divers at IRD, all the specimens were vouchered by means of permanent formalin specimens (labelled AL#.), and underwater photographic records. In addition, relevant information about location, habitat, depth range, and substratum are stored in the database LAGPLON at IRD Nouméa and which will be soon available online. Finally, the most complete compilation of New Caledonian algal records to date is by Garrigue and Tsuda (1988), which lists 335 species and includes species from Claire Garrigue's thesis and some AL# specimens (Garrigue, 1985). After Garrigue's activity, work on algae returned to an occasional sampling by the IRD's divers.

In 2004, phycological activities recommenced with the arrival of the author at IRD Nouméa. Since then, the shallow and deep-water habitats of the coral reefs and lagoonal environments of New Caledonia including Grande-Terre, Loyalty Islands and Ile des Pins, have been the subject of an intensive sampling effort of macroalgae and marine Angiosperms. Several graduate students are involved in this census of marine algae and in the development of a program of phylogenetic taxonomy for 3 major groups, e.g., Fucales, Dictyotales and Corallinales. Similarly, the coralline algae of Quaternary reef environments have received attention and this has subsequently increased taxonomic information on both modern and actual species (Payri & Cabioch, 2004). The most recent floristic additions are the 41 new records by Millar & Payri (2006), the new genus *Pinnatiphycus menouii* N'Yeurt, Payri & Gabrielson (N'Yeurt *et al.* 2006) and new species of *Struvea thoracica* Kraft & Millar (2005) from the Lagon Sud-Ouest of Nouméa. As a result, the algal flora is vouchered in an extensive phycological herbarium housed at IRD Nouméa.

This recent activity in phycology has heralded a new era which generates new knowledge on the taxonomic identity of the marine flora of New Caledonia as well as on its composition and its biogeographic affinities. The sampling of deep-water flora on the outer slope of the reefs and the recent collections from the southern part of the Ile des Pins, revealed a number of species collected for the first time; part of them are cool-temperate species already known from Japanese waters, Lord Howe and southern Australia, while others are still unidentified.

The following checklist is based on literature records and new collections mostly undertaken by the author and housed at the IRD Phycological Herbarium. Many of the species recorded in Garrigue & Tsuda (1988), were re-documented with new samples and their taxonomy has been updated. However, the species which have not been re-sampled by the author were not re-evaluated but the nomenclature has been updated. The Fucales and, in particular, the taxonomy of *Sargassum* has been completely revisited by Lydiane Mattio during her PhD research. Thanks to Grunow's collection and Agardh's Type specimens, 10 taxa are now recognized compared to the 26 previously recorded (Mattio, Pers. Comm). The 13 records of Catala (1950) and May (1953), have not been resampled, and are be regarded as doubtful species as the sampling sites have been investigated several times. Unfortunately, these records will remain unverifiable because of the poorly preserved sample condition of Catala's collection as noted above.

In contrast, the intensive sampling of Dictyotales has increased twofold the number of species recorded and revealed at least one new genus, and 5 potentially new species, which are currently being described. The study of the IRD collection undertaken by the author has resulted in a significant number of new records. A detailed annotated checklist of all New Caledonian macroalgae species including distribution data, voucher and literature references is in preparation by the author. The present checklist includes all records which are verified either by specimen collection or by confirmation by revising authors. In both cases, "voucher" are mentioned.

The present checklist includes 438 macroalgae species (Cyanobacteria excluded) representing 62 families, and 184 genera and 11 marine Angiosperms from reefs, lagoon and coastal environments. Among these, 103 species are new records for the area since the Garrigue & Tsuda (1988) catalogue. This figure is likely to fall short of the actual total, since it does not include much of the crustose Corallinaceae, Peyssonneliacea nor the Liagoraceae that are being studied separately.

Further increases in the number of macroalgae will mostly come from the deep part of fore-reef habitats (60 m and below) which are currently being investigated as well as from both the remote and isolated area of Chesterfield and Bellona plateau in the western part, Entrecasteaux reefs in the northern part and Côte Oubliée in the eastern part of the Grande-Terre, areas which have been poorly sampled.

The list is arranged alphabetically for the families, genera and species. Subfamilies and subgenera have not been specified. New records are boldface marked, * indicates species with New Caledonia Type locality. Records identified only to the genus level have not been included. Names from the earlier lists that are now regarded as synonymous are in (brackets) others synonymies have been omitted. Type vouchers when known are indicated by the citation of herbarium abbreviations assigned by the International Association for Plant Taxonomy (Holmgren *et al.* 1990) mostly (NSW) and (PC). Each taxon citation is referenced by a publication. All the species listed in the Garrigue & Tsuda (1988) compilation are referenced to this work without distinction of the original citation. The nomenclatural and arrangement into families and orders follows that of Silva *et al.* (1996 and online updates). Spellings, authorities and synonymies have been also check on the "AlgaeBase" website [http://www.algaebase.org/].

The list of the marine Angiosperms is based on the recent collection of the author, but earlier records by Den Hartog (1970) are indicated in the reference part of the list. Taxonomic arrangement follows nomenclature of Les *et al.* (1997).

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Appendix 1: ALGAE from New Caledonia

1: Garrigue & Tsuda (1988); 2: Millar & Payri (2006); 3: Payri Collection housed at IRD, 4: Millar & Prud'homme van Reine (2005); 5: Kraft & Millar (2005); 6: Farghaly (1980); 7: Millar & Freshwater (2005); 8: De Clerck (2003), 9: Payri & Cabioch (2004); *: New Caledonia type locality, **bold** : new records

CHLOROPHYTA		
BRYOPSIDALES		
BRYOPSIDACEAE		
Bryopsis harveyana J. Agardh	1	
Bryopsis pennata Lamouroux	1, 3	
Bryopsis plumosa C.Agardh	1, 3	
Bryopsis ramulosa Montagne	1	
Trichosolen myura J. Agardh	1	
CAULERPACEAE		
Caulerpella ambigua (Okamura) Prud'homme van Reine & Lokhorst (as *Caulerpa ambigua* Okamura)	1, 3	
Caulerpa annulata Lucas	1, 3	
Caulerpa bikinensis Taylor	1	
Caulerpa biserrulata Sonder	1, 3	
Caulerpa brachypus Harvey	1, 3	
Caulerpa cupressoides (Vahl) C. Agardh	1, 3	
Caulerpa cupressoides* (Vahl) C. Agardh var. *lycopodium Weber-van-bosse	3	
Caulerpa falcifolia Bailey & Harvey	1	
Caulerpa fastigiata Montagne	1, 3	
Caulerpa fergusonii Murray	1, 3	
Caulerpa filicoides Yamada	1, 3	
Caulerpa lentillifera J. Agardh (= **Chauvinia microphysa* Kützing)	1, 3, 4	*Type: L 937,337-749 (barcode L 0194018)
Caulerpa lessoni Bory	1	
Caulerpa mexicana Sonder ex Kützing (as *C. crassifolia* (C. Agardh J. Agardh)	1	
Caulerpa microphysa (Weber van Bosse) J. Feldman	1, 3	
Caulerpa nummularia Harvey ex J. Agardh	1, 3	
Caulerpa okamurae Weber-van Bosse	1	
Caulerpa peltata Lamouroux	1, 3	
Caulerpa peltata Lamouroux var. *macrodisca* (Decaisne) Weber-van Bosse (as *C. macrodisca* Decaisne)	1, 3	
Caulerpa racemosa (Forskål) J. Agardh	1, 3	
Caulerpa racemosa (Forskål) J. Agardh var. *corynephora* (Montagne) Weber van Bosse	1, 3	
Caulerpa racemosa (Forskål) J. Agardh var. *lamourouxii* (Turner) Weber van Bosse	1, 3	
Caulerpa racemosa (Forskål) J. Agardh var. *macrophysa* (Sonder ex Kützing) W.R. Taylor	1, 3	

Caulerpa racemosa* (Forskål) J. Agardh var. *turbinata		
(J. Agardh) Eubank	3	
Caulerpa sedoides C. Agardh	1, 3	
Caulerpa sedoides f. *crassicaulis* (J. Agardh) Weber-van Bosse	1	
Caulerpa serrulata (Forskål) J. Agardh (=* *C. vieillardii* Kützing)	1, 3, 4	*Holotype: L 937,336-456 (barcode L 0194017)
Caulerpa sertularioides (Gmelin) Howe	1, 3	
Caulerpa taxifolia (Vahl) C. Agardh	1, 3	
Caulerpa taxifolia (Vahl) C. Agardh f. *tristichophylla* Svedelius	3	
Caulerpa urvilliana Montagne	1, 3	
Caulerpa verticillata J. Agardh	1, 3	
Caulerpa webbiana Montagne	1, 3	
CODIACEAE		
Codium arabicum Kützing	1, 3	
Codium foveolatum Howe [doubtfull record]	1	
Codium geppiorum O.C. Schmidt		
(=*C. bulbopilum* Setchell,= *C. divaricatum* Gepp nom. illeg.)	1, 3	
Codium mamillosum Harvey	1, 3	
Codium spongiosum Harvey	1, 3	
***Codium saccatum* Okamura**	**3**	
Halimeda borneensis W. R. Taylor		
(as *H. incrassata* (Ellis) and as *H. simulans* Howe)	1, 3	
Halimeda cylindracea Decaisne	1, 3	
Halimeda discoidea Decaisne	1, 3	
Halimeda distorta (Yamada) Hillis		
(as *H. copiosa* Goreau & Graham)	1, 3	
Halimeda fragilis Taylor	1	
Halimeda gigas Taylor	1, 3	
Halimeda gracilis Harvey	1, 3	
***Halimeda heteromorpha* N'Yeurt**	**3**	
Halimeda lacunalis WR Taylor f. *lata* (WRTaylor) Hillis	1, 3	
Halimeda macroloba Decaisne	1, 3	
Halimeda macrophysa Askenasy	1, 3	
Halimeda magnidisca Noble	1, 3	
Halimeda melanesica Valet	1, 3	
Halimeda micronesica Yamada	1, 3	
Halimeda minima (WR Taylor) Colinvaux	1, 3	
Halimeda opuntia (Linnaeus) Lamouroux	1, 3	
Halimeda taenicola WR Taylor	1, 3	
Halimeda tuna (Ellis & Solander) Lamouroux	1	
Halimeda velasquezii WR Taylor	1	
UDOTEACEA		
Avrainvillea asarifolia Børgesen	1	
Avrainvillea erecta (Berkeley) A. Gepp & E. Gepp	1, 3	
Avrainvillea lacerata Harvey ex J. Agardh	1, 3	
Avrainvillea mazei Murray & Boodle	1	
Avrainvillea nigricans Decaisne	1, 3	
Avrainvillea obscura (C.Agardh) J. Agardh	1, 3	
Avrainvillea ridleyi Gepp & Gepp	1	
Chlorodesmis caespitosa J. Agardh	1	
Chlorodesmis fastigiata (C. Agardh) Ducker	1, 3	
Rhipidosiphon javensis (Montagne)		
(as *Udotea javensis* (Montagne) Gepp & Gepp)	1, 3	
Rhipilia pusilla (Womersley) Ducker	1	
***Rhipilia sinuosa* Gilbert**	**6**	

Rhipilia tenaculosa Gepp & Gepp	1, 3	NC05-009
***Rhipilia penicilloides* N'Yeurt & Keats**	**2, 3**	NSW 611762, NSW 611749
Rhipiliopsis novae-caledoniae Farghaly & Denizot	1	
Tydemania expeditionis Weber van Bosse	1, 3	
***Udotea argentea* Zanardini**	**3**	
Udotea flabellum (Ellis & Solander)	1	
Udotea geppiorum Yamada	1, 3	
Udotea orientalis Yamada	1, 3	
CLADOPHORALES		
ANADYOMENACEAE		
***Anadyomene wrightii* Gray**	**3**	
Microdictyon japonicum Setchell	1	
Chaetomorpha linum (O.F.Müller) Kützing	1, 3	
Chaetomorpha natalensis Hering	1	
Cladophora feredayi Harvey	1	
Cladophora mamillata Leliaert (as *Valonia cladophora* Kützing)	1, 4	Holotype: Vieillard # 1975 (barcode L 0054999)
Cladophora socialis Kützing	1	
Rhizoclonium africanum Kützing *(as Rhizoclonium hookeri* Kützing)	1	
Rhizoclonium riparium (Roth) Harvey *(as Rhizoclonium implexum* (Dillwyn) Kützing)	1	
SIPHONOCLADACEAE		
Apjohnia laetevirens Harvey (=*Apjohnia scoparia* Valet as **Struvea scoparia* Kützing)	1, 3, 4	Holotype: L 937,183-105 (barcode L 0062221)
Boodlea coacta (Dickie)	1	
Boodlea composita (Harvey) Brand (as **Cladophora physarthra* Kützing)	1, 3, 4	
**Phyllodictyon anastomosans* (Harvey) Kraft & M.J. Wynne *(as Struvea deliculata* Kützing)	1, 3, 4	Holotype: Vieillard # 2111 (barcode L 0237969)
Boergesenia forbesii (Harvey) J. Feldmann	1, 3	
Chamaedoris orientalis Okamura & Higashi	3	
Dictyosphaeria cavernosa (Forskål) Børgesen	1, 3	
**Dictyosphaeria ulvacea* Kützing	1, 4	Type: Vieillard # 1978 (barcode L 0055026)
Dictyosphaeria versluysii W.v. Bosse	1, 3	
Cladophoropsis herpestica (Montagne) Howe	1, 3	
Cladophoropsis membranacea (Hofman Bang ex. C.Agardh) Børgesen	1, 3	
Cladophoropsis vaucheriaeformis (Areschoug) Papenfuss (as *Spongocladia vaucheriaeformis* Areschoug, (as **S. neocaledonica* Grunow ex G. Murray & Boodle) [according to Leilart 2004]	1, 3, 4	*Holotype : Grunow 3558, 9.x.1884, W
Cladophoropsis javanica (Kützing) P.C. Silva (as *Cladophoropsis zollingeri* (Kützing) Reinbold)	1	
***Siphonocladus tropicus* (P.L. Crouan & H.M. Crouan) J. Agardh**	**3**	
***Struvea thoracica* Kraft & A.J.K. Millar**	**3, 5**	
Ventricaria ventricosa (J.Agardh) Olsen & J. West	1, 3	
VALONIACEAE		
Ernodesmis verticillata (Kützing) Børgesen	1, 3	
***Valonia aegagropila* C. Agardh**	**3**	
Valonia fastigiata Harvey	1, 3	
***Valonia macrophysa* Kützing**	**3**	
Valoniopsis pachynema (G.Martens) Børgesen	1, 3	

CODIOLALES		
ACROSIPHONIACEAE		
Acrosiphonia arcta (Dillwyn) Gain		
(as **Cladophora radians* Kützing)	1, 4	Lectotype : Vieillard # 2006 (barcode L 0194019)
DASYCLADALES		
DASYCLADACEAE		
Bornetella capitata (Harvey) J. Agardh	1	
Bornetella nitida Sonder	1, 3	
Bornetella oligospora Solms-Laubach	1, 3	
Bornetella sphaerica Zanardini	1, 3	
Chloroclados australasicus Sonder		
(as *Dasycladus australasicus* (Sonder) W.R. Taylor)	1	
***Dasycladus densus* Womersley**	**6, 3**	
Halicoryne spicata (Kützing) Solms-Laubach		
(=**Polyphysa spicata* Kützing)	1, 3, 4	*Holotype: L 937,183-066 (barcode L 0054969)
Neomeris annulata Dickie	1, 3	
Neomeris bilimbata Koster	1	
Neomeris mucosa Howe	1	
Neomeris stipitata Howe	1	
Neomeris van-bosseae Howe	1, 3	
***Penicillus nodulosus* (Lamouroux) Blainville**	**3**	
POLYPHYSACEAE		
Acetabularia dentata Solms-Laubach	1	
Acetabularia kilneri Agardh J.	1	
***Acetabularia major* G. Martens**	**3**	
Acetabularia peniculus (R. Brown ex Turner) Solms-Laubach	1	
Parvocaulis clavata (Yamada) Berger *et alii*		
(as *Acetabularia clavata* Yamada)	1, 3	
Parvocaulis exigua (Solms-Laubach) Berger *et alii*		
(as *Acetabularia exigua* Solms-Laubach)	1, 3	
PHAEOPHILALES		
PHAEOPHILACEAE		
Phaeophila dendroides (P. Crouan & H. Crouan)	1	
ULVALES		
ULVACEAE		
Ulva compressa Linnaeus		
(as *Enteromorpha compressa* (Linnaeus) Nees)	1	
Ulva intestinalis Linnaeus		
(as *Enteromorpha intestinalis* (Linnaeus) Nees)	1	
Ulva paradoxa C. Agardh (*as Enteromorpha plumosa* Kützing)	1	
Ulva fasciata Delile	1	
Ulva lactuca Linnaeus	1	
RHODOPHYTA		
RHODOPHYCEAE		
BANGIOPHYCIDAE		
PORPHYRIDIALES		
PORPHYRIDIACEAE		
Stylonema alsidii (Zanardini)	1	

FLORIDEOPHYCIDAE		
BONNEMAISONIALES		
BONNEMAISONIACEAE		
Asparagopsis armata Harvey	1, 3	
Asparagopsis taxiformis (Delile) Trevisan	1, 3	
Delisea pulchra **(Greville) Montagne**	**3**	**NC06-010**
CERAMIALES		
CERAMIACEAE		
Antithamnion delicatulum **(Harvey) De Toni**	**2**	**NSW Slide 29-3**
Antithamnion pectinatum **(Montagne) Brauner in Athanasiadis & Tittley**	**2**	**NSW Slide 29-4**
Antithamnionella ternifolia **(Hooker & Harvey) Lyle**	**2**	**NSW Slide 29-6**
**Callithamnion vieillardi* Kützing	1, 4	*Type: L935, 92-234 (barcode L 0055703)
Campylaephora crassa (Okamura) Nakamura	1, 3	
Centroceras clavulatum (C.Agardh)	1	
Ceramium borneense **Weber-van Bosse**	**4**	**NSW Slide 29-24**
Ceramium flaccidum (Kützing) (=*C. kuetzingianum* Grunow = **Gongroceras subtile* Kützing)	1, 4	*Type: L938, 303-191 (barcode L 0193965)
Dasyphila plumarioides **Yendo**	**2, 3**	**NSW Slide 29-9**
Dotyella hawaiiensis **(Doty & Wainwright) Womersley & Shepley**	**2**	**NSW 611777**
Euptilota articulata **(J.Agardh) Schmitz**	**2, 3**	**NSW 611773**
Griffithsia heteromorpha Kützing	1, 4	Type: L941, 61-42 (barcode L 0055921) Vieillard #1906
Haloplegma duperreyi **Montagne**	**2, 3**	**NSW611813 ; NSW 611820**
Mesothamnion caribaeum Børgesen	1	
Ptilocladia yuenii **Abbott in Abbott & Norris**	**2**	**NSW 29-17**
Ptilothamnion schmitzii **Heydrich**	**2**	**NSW 29-18**
Spyridia filamentosa (Wulfen) Harvey	1, 3	
Wrangelia argus Montagne	1	
DASYACEAE		
Dasya anastomosans **(as *D. pilosa* (Weber-van Bosse) Millar)**	**2, 3**	**NSW 611747**
Dasya naccarioides **Harvey**	**2**	**NSW 611911**
Dasya roslyniae **Millar & Chidgey**	**3**	
Heterosiphonia crassipes **(Harvey) Falkenberg**	**2**	**NSW 611812, NSW 611812**
Thuretia australasica **(Sonder) Parson**	**3**	**NC04 1023, NC04 194**
Thuretia **nov.sp**	**3**	
DELESSERIACEAE		
Apoglossum unguiculescens **Millar**	**2**	**NSW Slide 29-5**
Caloglossa bombayensis Børgesen	1	
Caloglossa vieillardi (Kützing) Setchell (as **Hypoglossum vieillardii* Kützing)	1, 4	*Type : L 935, 329-1 (barcode L 0055716)
Hypoglossum simulans **Wynne, Price & Balantine**	**2**	**NSW 611908**
Martensia flabelliformis Harvey	1, 3	
Martensia fragilis Harvey (as *Martensia elegans* Hering)	1, 2	NSW Slide 29-16
WVanvoorstia spectabilis Harvey	2, 3	NSW 611737
RHODOMELACEAE		
Acanthophora pacifica (Setchell) Kraft	1, 3	
Acanthophora spicifera (Vahl) Børgesen	1, 3	
Amansia rhodantha **(Harvey) J.Agardh**	**3**	
Aneurianna lorentzii **(Weber-van Bosse) L.E. Phillips** (as *Lenormandiopsis lorentzii*(Weber-van Bosse) Papenfuss	2, 3	NSW 611804
Bostrychia binderi Harvey	1	

Bostrychia moritziana (Sonder) J. Agardh (as **Polysiphonia pauperula* Kützing)	1, 4	*Type: L941, 253-168 (barcode L 0056093)
Bostrychia radicans Montagne	1	
Bostrychia tenella (Lamouroux) J.Agardh (= ****B. vieillardii*** (Kützing) and **B. vieillardii* var. *pectinata* (Kützing))	1, 4	*Type: L935, 329-10 (barcode L 0055696) *Type: L935, 329-13 (barcode L 0055694)
Bostrychia vaga Hooker & Harvey	1	
Chondria armata (Kützing) Okamura (as **Lophura armata* Kützing)	1, 2	*Type: L 940, 284-299 (barcode L 0055801)
Chondria dasyphylla (Wooward)		
***Chondria simpliciuscula* Weber-van Bosse**	**2**	**NSW Slide 29-15**
***Chondria ryukyuensis* Yamada**	**3**	
***Chondria viticulosa* Millar & Wynne**	**2**	**NSW Slide 29-12, NSW Slide 29-13**
Chondrophycus perforata (Bory) Nam (as *L. perforata* (Bory) Nam =**Laurencia vaga* Kützing)	1, 3	*Type : L 941, 119-132 (barcode L 0055999)
Chondrophycus thuyoides (Kützing) Furnari (as *L. paniculata* (C.Agardh) J. Agardh =**Laurencia thuyoides* Kützing)	1, 4	*Type : L 941, 149-178 (barcode L 0055999)
Digenea simplex (Wulfen) C.Agardh (= **D. vieillardii* Kützing)	1, 4	Type : L 940, 347-120 (barcode L 0194029)
**Laurencia calliptera* Kützing (as *L. brongniartii* J. Agardh)	4, 1	* Type : L 941, 119-53 (barcode L 0194035)
**Laurencia decumbens* Kützing	1, 4	* Type: L 941, 119-50 (barcode L 0055982)
Laurencia kuetzingii (Kützing) Millar (as **L. flagellifera* Kützing)	1, 4	*Type : L 943, 263-8 (barcode L 0055983)
Laurencia obtusa (Hudson) Lamouroux (=*L. dendroidea* J. Agardh)	1	
Laurencia glandulifera (Kützing) Kützing (as *L. paniculata* (C. Agardh) J. Agardh)	1	
Laurencia perforata (Bory) Montagne	1	
**Laurencia vieillardii* Kützing (as *L. dendroidea* J Agardh)	1, 4	*Type : L 941, 119-51 (barcode L 0194037)
Leveillea jungermannioides (Hering & G. Martens) Harvey	1, 3	
Lophosiphonia prostrata (Harvey) Falkenberg	2	NSW Slide 29-11
***Melanamansia glomerata* (C. Agardh) R.E. Norris (as *Amansia glomerata* Agardh C (as *A. fasciculata* Kützing)**	**1, 3, 4**	***Type: L938, 19-61 (barcode L 0194026)**
***Melanamansia serrata* (Harvey) Norris**	**3**	
Neurymenia fraxinifolia (Mertens ex Turner) J.Agardh	1, 3	
Odonthalia floccosa (Esper) Falkenberg	1	
***Osmundea spectabilis* (Postels & Ruprecht) Nam**	**2, 3**	**NSW 611816**
**Polysiphonia polyphysa* Kützing	1, 4	Type: L 941, 253-167 (barcode L 0056094)
Tolypiocladia calodictyon (Harvey ex Kützing) P. Silva	1	
Tolypiocladia condensata (Weber-van Bosse) P. Silva	1	
Tolypiocladia glomerulata (C. Agardh) Schmitz	1, 3	
Osmundaria fimbriata (Lamouroux) R.E. Norris (as *Vidalia fimbriata* (Lamouroux) J. Agardh	1	

CORALLINALES

CORALLINACEAE

Amphiroa anceps (Lamarck) Decaisne	1	
***Amphiroa crassa* Lamouroux**	**3**	
***Amphiroa ephedraea* (Lamarck) Decaisne**	**3**	
Amphiroa foliacea Lamouroux	1, 3	
Amphiroa fragilissima (Linnaeus) Lamouroux	1, 3	
***Amphiroa tribulus* (Ellis & Solander) Lamouroux**	**3**	
Amphiroa vanbossae Lemoine	1	
Cheilosporum cultratum (Harvey) Areschoug	1	
Cheilosporum spectabile Harvey	1, 3	
Hydrolithon farinosum (Lamouroux) Penrose & Chamberlain (as *Fosliella farinosa* (Lamouroux))	1, 3	
***Hydrolithon onkodes* (Heydrich) Penrose & Chamberlain**	**3, 9**	
***Hydrolithon reinboldii* (Weber-van Bosse & Foslie) Foslie**	**3, 9**	
Jania adhaerens Lamouroux	1	
Jania decussatodichotoma (Yendo) Yendo	1	
***Lithophyllum flavescens* Keats**	**3**	
***Lithophyllum insipidium* Adey, Townsend & Boykins**	**3**	
***Lithophyllum kotschyanum* Unger**	**3, 9**	
***Lithoporella melobesioides* (Foslie) Foslie**	**9**	
***Lithothamnion proliferum* Foslie**	**3**	
Mastophora rosea (C. Agardh) Setchell	1, 3	
Neogoniolithon fosliei (Heydrich)	1, 3	
Neogoniolithon frutescens (Foslie) Setchell & Mason	1, 3	
***Pneophyllum conicum* (Dawson) Keats, Chamberlain & Baba**	**3**	
GELIDIALES		
GELIDIACEAE		
Gelidium crinale (Turner) Caillon (*as Gelidium deliculatum* (Kützing) Crouan & Crouan as **Acrocarpus delicatulus* (Kützing))	1, 4	*Type : L941-11-103 (barcode L 0194025)
***Gelidium isabelae* Taylor**	**7**	
Pterocladiella caerulescens (Kützing) Santelices & Hommersand (=*Pterocladia caerulescens* (Kützing) Santelices =**Gelidium caerulescens* Kützing)	1, 4	Type: L941-11-91 (barcode L 0056117)
Pterocladiella capillacea (S. G. Gmelin) Santelices & Hommersand *(as Pterocladia capillacea* (Gmelin) Bornet)	1	
GELIDIELLACEAE		
Gelidiella acerosa (Forsskål) (=**Gelidium ramelliferum* Kützing, = **Echinocaulon ramelliferum* (Kützing) Kützing)	1, 4	*Type : L941-11-63 (barcode L 0055886)
GIGARTINALES		
ACROSYMPHYTACEAE		
***Acrosymphyton taylorii* Abbott 1962**	**2, 3**	
ARESCHOUGIACEAE		
Betaphycus speciosum (Sonder) Doty ex P.C. Silva (as *Eucheuma speciosum* (Sonder) J. Agardh)	1, 3	
***Callophycus densus* (Sonder) Kraft**	**2, 3**	**NSW 611780**
Callophycus serratus (Harvey & Kützing)	1, 3	
Erythroclonium muelleri Sonder	1, 3	
***Eucheuma arnoldii* Weber-van Bosse**	**3**	**NC06-075**
Eucheuma denticulatum (Burman) Collins & Hervey (=**Grateloupia opposita* Kützing)	1, 4	*Type: L938, 92-311 (barcode L 0194032)

Eucheuma edule (Kützing) Weber-van Bosse (as **Chondrus edulis* (Kützing)	1, 4	*Type: L938, 92-309 (barcode L 0055877)
Meristotheca polychotoma (Kützing) Millar (as **Euhymenia polychotoma* Kützing)	4, 1	*Type: L 941, 11-2 (barcode L 0194030)
***Meristotheca procumbens* Gabrielson & Kraft**	**2, 3**	**NSW 611944**
***Solieria anastomosa* Gabrielson & Kraft 1984**	**2, 3**	**NSW 611809**
Solieria mollis (Kylin) Harvey	1	
***Solieria robusta* (Greville) Kylin 1932**	**2**	**NSW 611821**
CAULACANTHACEAE		
Catenella caespitose (Withering) L. Irvine (= C. *opuntia* (Goodenough & Woodward) Greville	1	
CORYNOCYSTACEAE		
***Corynocystis prostrata* Kraft**	**2, 3**	**NSW 611752**
DICRANEMATACEAE		
***Pinnatiphycus menouii* N'Yeurt, Payri & Gabrielson**	**3**	***HOLOTYPE : IRD** 0028/ PC 0062760
DUMONTIACEAE		
***Gibsmithia dotyii* Kraft & Ricker**	**3**	
Gibsmithia hawaiiensis Doty	1, 3	
***Gibsmithia womersleyi* Kraft & Ricker**	**3**	**NC04-37**
***Dudresnaya capricornica* Robins & Kraft**	**2, 3**	**NSW 611727, NSW 611784**
***Dudresnaya australis* J.Agardh ex Setchell**	**2, 3**	**NSW 611815**
GIGARTINACEAE		
Gigartina nana (C.Agardh) J.Agardh	1	
HYPNEACEAE		
Hypnea borgesenii Tanaka (as **Hypnea aspera* Kützing)	4	*Type: 941,97-186 (barcode L 0055947)
Hypnea cenomyce J. Agardh	1	
Hypnea cervicornis J. Agardh	1	
Hypnea esperi Bory	1	
Hypnea pannosa J. Agardh	1	
Hypnea saidana Holmes (as **Sphaerococcus spinuoslus* Kützing)	1, 4	*Type: 941, 51 -61 (barcode L 0056140)
**Hypnea vaga* Kützing	1, 4	*Type: 941, 61-133 (barcode L 0055957)
Hypnea valentiae (Turner) Montagne	1	
KALLYMENIACEAE		
Kallymenia perforata J. Agardh	3	
SCHIZYMENIACEAE		
Titanophora pikeana (Dickie) Feldmann	1, 3	
Titanophora weberae Børgesen	1, 3	
PEYSSONNELIACEAE		
Cruoriella dezwaanii (W.v. Bosse)	1	
Ethelia biradiata W.v. Bosse	1, 3	
Peyssonnelia capensis Montagne	1, 3	
**Peyssonnelia neocaledonica* Kützing	1, 4, 3	*Type : L 941, 181-434 (barcode L0061144)
PHACELOCARPACEAE		
***Phacelocarpus apodus* J.Agardh**	**3**	
***Phacelocarpus neurymenioides* N'Yeurt, Keats & Norris**	**3**	
PHYLLOPHORACEAE		

***Schottera angustifolia* (Kützing) Millar (as *Spaherococcus angustifolius* Kützing)**	4	Holotype: Vieillard; L 941, 311-34 (barcode L 0194039)
POLYIDEACEAE		
Rhodopeltis borealis Yamada	1, 3	
***Stenopeltis liagoroides* (Yamada) Itono & Yoshizaki**	**3**	
RHIZOPHYLLIDACEAE		
Carpopeltis maillardii (Montagne & Millardet) Chiang (= **Gelidium multicorne* Kützing, = *Carpopeltis multicornis* (Kützing) de Toni = *Cryptonemia multicornis* (Kützing) Sonder = **Nothogenia livida* Kützing)	1, 4	*Type: L941, 11-92 (barcode L 0055897) *Type: L938, 303-141 (barcode L 0194038)
Portieria hornemannii (Lyngbye) P. C. Silva (=*Chondrococus spinulosum* (Kützing) = *Portieria spinulosa* (Kützing) P. C. Silva.)	1, 3, 4	*Type: L940, 284-248 (barcode L 0194028)
SARCODIACEAE		
***Sarcodia marginalis* (Kützing) Millar**	**4**	***Type : L 941, 149-56** (barcode L 0056014)
GRACILARIALES		
GRACILARIACEAE		
Ceratodictyon spongiosum Zanardini	1	
Gracilaria arcuata Zanardini	1	
Gracilaria canaliculata Sonder (as *G. obtusa* (Greville) J. Agardh	1	
(= **Sphaerococcus canaliculatus* Kützing)	1, 3 , 4	*Type: L 941, 61-93 (barcode L 0194040)
***Gracilaria chondracantha* (Kützing) Millar (as **Sphaerococcus chondracanthus* Kützing)**	**4, 3**	***Type: L 941, 61-74 (barcode L 0194042)**
***Gracilaria corniculata* (R. Brown) J. Agardh (as **Sphaerococccus spinulosus* Kützing)**	**4**	***Type: L 941, 51-61 (barcode L 0056140)**
Gracilaria salicornia (C. Agardh) Dawson	1	
Gracilaria verrucosa (Hudson) Papenfuss	1	
Gracilaria vieillardii Silva (as **Sphaerococcus denticulatus* Kützing, as *Gracilaria denticulata* (Kützing) Weber-van Bosse)	4, 1	*Type: L 938, 92-252 (barcode L 0055699)
Hydropuntia edulis (S.G. Gmelin) Gurgel & Fredericq (as *Gracilaria spinescens* (Kützing) as *G. edulis* (Gmelin) Silva (as **Sphaerococcus lemania* Kützing, = *S. setaceus* Kützing,= *S. spinescens* Kützing)	1, 4	*Type: L 941, 61-61 (barcode L 0194043)
* *Melanthalia fastigiata* Kützing (as *M. concinna* J. Agardh)	4, 1	*Type: L 941, 149-79 (barcode L 0194083)
Melanthalia obtusata (Labillardiere) J.Agardh (as **M. vieillardii* Kützing)	1, 4	*Type: L 941, 149-80 (barcode L 0056017)
HALYMENIALES		
CORYNOMORPHACEAE		
***Corynomorpha prismatica* (J. Agardh) C. Agardh**	**2, 3**	**NSW 611917**
HALYMENIACEAE		
***Cryptonemia crenulata* (J. Agardh) J. Agardh**	**2, 3**	NSW 611 910
***Halymenia durvillei* Bory**	**3**	
***Halymenia floresia* (Clemente y Rubio) C. Agardh**	**3**	

***Halymenia kuetzingii* (Kützing) Millar (as **Iridea fimbriata* Kützing)**	**4**	*Type: 941,119-10 (barcode L 0194034)
Polyopes emarginatus (Kützing) Millar (= **Grateloupia emarginata* Kützing = **Chondrus coccineus* Kützing, as *Eucheuma gelatinae* (Esp.) J. Agardh)	1, 4	*Type: L 938, 92-310 (barcode L 0194031) *Type: L 940, 284-245 (barcode L 055804)
Polyopes ligulatus (Harvey ex Kützing) De Toni	1	
Prionitis obtusata Sonder (as *Zanardinula obtusa* (Sonder) May)	1	
SEBDENIACEAE		
***Sebdenia flabellata* (J. Agardh) Berthold**	**3**	
NEMALIALES		
LIAGORACEAE		
Ganonema farinosum (Lamouroux) Fan & Wang (=*Liagora farinosa* Lamouroux, as ¤*L. pressii* Kützing)	1, 3	¤PC0107882 ; ¤PC0107883 ; IRD 327
***Ganonema pinnatum* (Harvey) Huisman**	**3**	**IRD 387, IRD 405, IRD 426**
Ganonema samaense (Tseng) Huisman (as **Nemalion filicoides* Kützing)	1, 3	IRD
Liagora annulata J. Agardh	1	
Liagora boergesenii Yamada	1	
Liagora ceranoides Lamouroux	1, 3	IRD 367, IRD 369
Liagora rugosa Zanardini	1	
Liagora tomentosa Kützing	1	
Liagora valida Harvey	1, 3	IRD 350, IRD349, IRD 435, IRD 434
Yamadaella caenomyce (Descaine) Abbott	1, 3	
GALAXAURACEAE		
Actinotrichia fragilis (Forskål) Børgesen	1, 3	
Galaxaura divaricata (Linnaeus) Huisman & Townsend (as *Galaxaura fasciculata* Kjellman, *as *G. cohaerens* Kjellman)	1	
Galaxaura rugosa (Ellis & Solander) Lamouroux (including *G. subverticillata* Kjellman, *G. elongata* J. Agardh, *G. rudis* Kjellman, *G. lapidescens* (Solander) Lamouroux)	1, 3	
Dichotomaria australis (Sonder) Huisman, Harper et Saunders (as *Galaxaura hystrix* Kjellman, as *G. ventricosa* Kjellman)	1, 2, 3	NSW 611738
Dichotomaria obtusata (J.Ellis & Solander) Lamouroux (as *G. obtusata* (J.Ellis & Solander) Lamouroux)	1, 3	
***Tricleocarpa cylindrica* (Ellis & Solander) Huisman & Borowitzka**	**3**	
Tricleocarpa fragilis (Linnaeus) Huisman & Townsend (as *G. oblongata* (J. Ellis & Solander) Lamouroux)	1, 3	
SCINAIACEAE		
***Scinaia aborealis* Huisman**	**3**	
***Scinaia tsinglanensis* Tseng**	**2, 3**	**NSW 611734**
***Gloiophloea* (?) *articulata* Weber-van Bosse**	**2, 3**	**NSW 611800, NSW611913**
NEMASTOMATALES		
NEMASTOMATACEAE		
***Platoma cyclocolpum* (Montagne) Schmitz**	**3**	
***Predaea weldii* Kraft & Abbott**	**3, 4**	**NSW 611 724**
***Predaea laciniosa* Kraft**	**3, 4**	**NSW 611788**
PLOCAMIALES		
PLOCAMIACEAE		
Plocamium angustum (J. Agardh) J.D. Hooker & Harvey		

(as**P. botryoides* Kützing)	1, 4	Type : L 941, 240-49 (barcode L 0056037)
Plocamium leptophyllum Kützing (as *P. cartilagineum* var. *leptophyllum* (Kützing) V. J. Chapman)	1	
Plocamium hamatum J. Agardh	1, 3	
RHODYMENIALES		
CHAMPIACEAE		
Champia parvula (C. Agardh) Harvey	1	
Champia expansa Yendo	1	
**Champia vieillardii* Kützing	1, 3, 4	Type: L938, 303-132 (barcode L 0055786)
FAUCHEACEAE		
Gloiocladia halymenioides (Harvey) Norris	3	
LEPTOFAUCHEACEAE		
Leptofauchea anastomosans (Weber-van Bosse) R.E. Norris & Aken	3	NC04-137
RHODYMENIACEAE		
***Asteromenia peltata* (Taylor) Huisman & Millar**	**2**	**NSW 611 799**
Gelidiopsis intricata (C. Agardh) Vickers (=* *Acrocarpa capitatus* Kützing)	1, 3, 4	Type: L941-104 (barcode L 0194024)
Gelidiopsis repens (Kützing) Weber-van Bosse (as **Gelidium repens* Kützing = *Gelidiopsis acrocarpa* (Harvey ex Kützing) de Toni)	1, 4	*Type: L941, 11-84 (barcode L 0055781)
***Rhodymenia caulescens* (Kützing) Millar (= *Sphaerococcus caulescens* Kützing)**	**4**	**Type: L 941, 311-36 (barcode L 0194041)**
Gloiosaccion brownii Harvey (as *Botryocladia brownii* (Harvey) P.C. Silva ex Nelson & Adams)	1	
Botryocladia leptopoda (J.Agardh) Kylin	1, 3	
Botryocladia occidentalis (Børgesen)Kylin	1	
***Chameobotrys boergesenii* (Weber-van Bosse) Huisman**	**3**	
***Chrysymenia kaernbachii* Grunow**	**3**	
***Chrysymenia* cf *littleriana* J. N. Norris & D. L. Ballantine**	**3**	**AL 537a**
***Chrysymenia ornata* Kylin**	**2**	**NSW611803**
Chrysymenia polyglandulosa Okamura	1	
Coelarthrum cliftonii (Harvey) Kylin (*as C. albertisii* (Piccone) Børgesen)	1	
***Halichrysis irregularis* (Kützing) Millar (= *Iridae irregularis* Kützing)**	**4, 3**	***Type : L 941, 119-12 (barcode L 0055963)**
RHODOGORGONALES		
RHODOGORGONACEAE		
Renouxia antillana Fredericq & J. N. Norris	3	
OCHROPHYTA		
PHAEOPHYCEAE		
CUTLERIALES		
CUTLERIACEAE		
***Cutleria mollis* Allender & Kraft**	**2, 3**	**NSW 611823**
DICTYOTALES		
DICTYOTACEAE		
**Dictyota vieillardi* Kützing (*Vaughaniella* stage of an unidentified species of *Padina*)	4	*Type: L936, 291-5 (barcode L 0194020)
**Dictyota vieillardi* var. *B. filiformis* Kützing		

(*Vaughaniella* stage of an unidentified species of *Padina*)	4	*Type: L936, 291-4 (barcode L 0194023)
Dictyopteris acrostichoides (J.Agardh) Bornet	1	
Dictyopteris australis (Sonder) Askenasy	1, 3	IRD 310
***Dictyopteris crassinervia* (Zanardini) O.C.Schmidt**	**3**	**IRD 305**
***Dictyopteris delicatula* Lamouroux**	**3**	**IRD 446**
Dictyopteris plagiogramma (Montagne) Vickers	1	
***Dictyopteris repens* (Okamura) Børgesen**	**3**	
Dictyota acutiloba J. Agardh	1	
***Dictyota adnata* Zanardini**	**3, 8**	**L 936.291-7; (Vieillard, L937.117-12C); (L 937.117-86)**
Dictyota bartayresiana Lamouroux	1	
***Dictyota cervicornis* Kützing**	**3**	
***Dictyota ceylanica* Kützing**	**3**	
Dictyota dichotoma (Hudson) Lamouroux	1	
(According to de Clerck *D. dichotoma* is restricted to the North Atlantic; the Pacific species cited as *D. dichotoma* should bear another name)		
Dictyota furcellata (C.Agardh) Greveille	1	
***Dictyota grossedentata* De Clerck & Coppejans**	**3**	
***Dictyota moniliformis* (J. Agardh) Hörnig, Schnetter & Prud'homme van Reine**	**3**	
***Distromium decumbens* (Okamura) Levring**	**3**	**IRD 247**
***Distromium didymothrix* Allender & Kraft**	**3**	**IRD 320**
***Distromium flabellatum* Womersley**	**3**	
***Homeostrichus flabellatus* Okamura**	**3**	**IRD 242, IRD 273, IRD 444**
***Lobophora papenfusii* (W.R. Taylor) Farghaly**	**3**	**IRD 259**
Lobophora variegata (Lamouroux) Womersley ex Oliveira	1, 3	IRD 276
***Padina australis* Hauck**	**3**	**IRD 158, IRD 172, IRD233, IRD 241**
Padina boryana Thivy in Taylor (as *P. tenuis* (C. Agardh) Bory)	1	
***Padina gymnospora* (Kutzing) Sonder**	**3**	**IRD 150, IRD 162**
***Padina jonesii* Tsuda**	**3**	**IRD 165, IRD 199**
***Padina melemele* Abbott & Magruder**	**3**	**IRD 219**
***Padina minor* Yamada**	**3**	**IRD 173, IRD 166**
Padina pavonica (Linnaeus) Thivy	1	(subject to any verification)
***Padina sanctae-crucis* Børgesen**	**3**	**IRD 207**
***Padina stipitata* Tanaka & Nozawa**	**3**	**IRD 152, IRD 155, IRD 154 IRD 217**
Spatoglossum asperum J. Agardh	1, 3	IRD 293, IRD 294, IRD 295, IRD 296
***Stypopodium australisacum* (Zanardini) Allender & Kraft**	**3**	**IRD 289**
***Stypopodium flabellatum* Weber-van Bosse**	**3**	**IRD 285**
Stypopodium zonale (Lamouroux) Papenfuss	1	subject to any verification
***Taonia australasica* J. Agardh**	**3**	
***Zonaria stipitata* Tanaka & K. Nozawa**	**3**	**IRD 260, IRD 263, IRD 267**
ECTOCARPALES		
ACINETOSPORACEAE		
Feldmannia irregularis (Kützing) Hame	1	
Hincksia indica (Sonder) J. Tanaka (as *Feldmannia indica* (Sonder) Womersley & Bailey)	1	
CHORDARIACEAE		
**Cladosiphon novae-caledoniae* Kylin	1, 3	
Spermatochnus paradoxus Kützing	1	

SPHACELARIACEAE		
**Sphacelaria cornuta* Sauvageau	1	Type locality: Canala, New Caledonia Type: PC
**Sphacelaria novae-caledoniae* Sauvageau	1	Type locality: Noumea, New Caledonia Type: PC
Sphacelaria rigidula Kützing	1	
Sphacelaria tribuloides Meneghini	1	
FUCALES		
CYSTOSEIRACEAE		
Cystoseira trinodis (Forsskal) C. Agardh (as *Cystophyllum muricatum* (Turner) J. Agardh	1, 3	
Hormophysa cuneiformis (Gmelin) Silva (as *H. triquetra* (C. Agardh) Kutzing)	1, 3	
SARGASSACEAE		
Sargassum albermarlense Taylor	1	[subject to any verification]
Sargassum carpophyllum J. Agardh	1, 3	NC05-1016, NC05-1165
Sargassum cinctum J. Agardh	1	[subject to any verification]
Sargassum coriifolium J. Agardh	1	[subject to any verification]
Sargassum crassifolium J. Agardh	1, 3	NC05-1000, NC05-1097
Sargassum (Phyllotrichia) decurrens (Brown ex Turner) C. Agardh (as *S. boryi* C. Agardh, and as *S. scabripes* J. Agardh)	1, 3	NC05-1051, NC05-1027
Sargassum desvauxii (Mertens) C.Agardh	1	[subject to any verification]
Sargassum cristaefolium C. Agardh (as *S. duplicatum* J. Agardh)	1, 3	IDP05-309, NC05-1161
Sargassum echinocarpum J. Agardh	1, 3	NC06-027, IDP05-1010
Sargassum filifolium C. Agardh	1	[subject to any verification]
Sargassum fissifolium (Mertens) C. Agardh	1	[subject to any verification]
Sargassum flavicans (Mertens) C. Agardh	1	[subject to any verification]
Sargassum ilicifolium (Turner) C. Agardh	1, 3	NC02-34, NC05-998
Sargassum linearifolium (Turner) C. Agardh	1	[subject to any verification]
Sargassum lophocarpum J. Agardh	1	[subject to any verification]
Sargassum myriocystum J. Agardh	1	[subject to any verification]
Sargassum oligocystum Montagne	1	[subject to any verification]
Sargassum polyacanthum J. Agardh	1	[subject to any verification]
Sargassum polycystum C. Agardh	1, 3	NC05-1061, NC05-1167
Sargassum spathulaefolium J. Agardh	1	[subject to any verification]
Sargassum spinuligerum Sonder	1, 3	NC06-044, NC05-973
***Sargassum spinuligerum* var. *crispata* (Sonder) J. Agardh**	**3**	**NC05-999, NC05-1060**
Sargassum stenophyllum J. Agardh	1	[subject to any verification]
Sargassum torvum J. Agardh	1	[subject to any verification]
**Sargassum turbinarioides* Grunow	1, 3	IDP05-1056
Sargassum verruculosum (Mertens) C. Agardh	1	[subject to any verification]
Turbinaria ornata (Turner) J. Agardh	1, 3	
***Turbinaria conoides* (J.Agardh) Kutzing**	**3**	
SCYTOTHAMNALES		
SCYTOTHAMNACEAE		
***Asteronema breviarticulatus* (J. Agardh) Ouriques & Bouzon**	**3**	
SCYTOSIPHONALES		
CHNOOSPORACEAE		
Chnoospora implexa J. Agardh	1, 3	
SCYTOSIPHONACEAE		
Colpomenia sinuosa (Mertens ex Roth) Derbès & Solier	1, 3	
***Colpomenia ecuticulata* Parson**	**3**	
Hydroclathrus clathratus (C.Agardh) Howe	1, 3	
***Hydroclathrus tenuis* CK Tseng & Lu**	**3**	

Rosenvingea intricata (J.Agardh) Børgesen	1, 3	
***Rosenvingea nhatrangensis* Dawson**	**3**	

SPOROCHNALES

SPOROCHNACEAE

Bellotia simplex Denizot	1, 3	
***Nereia intricata* Yamada**	**3**	
***Sporochnus* sp 1**	**3**	
***Sporochnus* sp 2**	**3**	

Appendix 2: seagrasses (Marine Angiosperms) from New Caledonia

3: Payri Collection housed at IRD, 10: Den Hartog (1970) ; 11: Larkum (1995);

SPERMATOPHYTA

ALISMATALES

CYMODOCEAE

Cymodocea rotondata Ehrenberg & Hemprich ex Ascherson	10, 3	Balansa 3103 (PC); Cribs 208 (PC)
Cymodocea serrulata (R. Brown) Ascherson & Magnus	10, 3	Balansa, 1527 (PC); Catala 19 (NSW)
Halodule uninervis (Forskål) Ascherson	10, 3	Balansa, 1528, 1529 (PC)
Halodule pinifolia (Miki) den Hartog	10, 3	McKee 7891 (US)
Syringodium isoetifolium (Ascherson) Dandy	10, 3	Balansa, 1526 (PC)

HYDROCHARITACEAE

Enhalus acoroides (Lf.) Royle	10, 3	Vieillard, 1412 (CN) ; Balansa, 3162 (PC)
Halophila capricorni Larkum	11, 3	Garrigue, NSW S153; Larkum NSW S122-124
Halophila decipiens Ostenfeld	10, 3	Vieillard, 1368 (CN, PC)
Halophila minor (Zolinger) den Hartog (as *H. ovata* Gaud.)	10, 3	Balansa, 1525 (PC)
Halophila ovalis (R. Brown) Hook.	10, 3	Balansa, 1525 (PC)
Thalassia humprechii (Ehrenberg) Ascherson	10, 3	Balansa, 3103, 3161 (PC)

Porifera of New Caledonia. Remarks on the check list of shallow water species

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Prior to a concerted taxonomic program on the New Caledonian shallow-water sponge fauna, Claude Lévi suggested (presumably from existing collections he had available to him at that time), that 157 species of sponges inhabited the New Caledonian Lagoon and shelf region (Lévi, 1979). He further predicted that most were probably 'widely distributed' tropical Indo-west Pacific species, with only a minor endemic component in this fauna (less than 20% of the fauna). This contrasted greatly with the (at that time) better-known deeper-water sponge fauna which was found to have levels of endemism around 75%. Further details on the biogeography and affinities of the New Caledonian sponge fauna can be found in Hooper & Lévi (1994).

Since Lévi's 1979 predictions the published New Caledonian shallow water sponge fauna (0-100m depth) now consists of 149 species in 94 genera, 54 families, 10 orders and two classes (Demospongiae and Calcarea), and a much higher level of endemism than previously recognised. Of course, this diversity represents only a small proportion of species actually living in the region, as evidenced by the huge collections made during the SMIB and other research programs of IRD (ORSTOM), but unfortunately taxonomic resources are not available to complete a full faunal inventory, including description of potentially many more new species. Remarkably 60 of these 149 species, or 40%, are either indigenous to New Caledonia (the majority of these), or were first described from New Caledonia and subsequently recorded from the northeast coast of Australia (so far only several Microcionidae species). Of the species that have more extensive distributions outside of the New Caledonian EEZ, eight are recorded elsewhere in the western Pacific islands (e.g. Fiji, Micronesia), 35 are also found in Australian waters (mostly the Great Barrier Reef), nine also occur in the Indo-Malay Archipelago, 26 are more widely distributed in the western Indian Ocean (e.g. Sri Lanka to the Red Sea), and seven are allegedly 'cosmopolitan' (e.g. Mediterranean, Caribbean) but these are also possible misidentifications or cryptic sibling species that cannot be differentiated using morphological criteria. Surprisingly the fauna has very little overlap (one species) with the New Zealand fauna.

Several highly speciose families are so far very under-represented in the New Caledonian sponge inventory (e.g. Chalinidae, Mycalidae, Halichondriidae, Irciniidae, Niphatidae), indicating that much taxonomic work still remains to be done. Conversely, several of the rare, highly ecologically specialised families are well represented in this inventory (e.g. Minchinellidae, some of the cryptic coral-dwelling calcareans), but this moreso reflects a particular taxonomic expertise available at the time rather than any major peculiarities in the sponge fauna. Finally, the Porifera research community is indeed fortunate to have benefited from the resources of IRD (ORSTOM), CNRS and the MNHN Paris that enabled a concerted international taxonomic effort to be applied to the New Caledonian sponge fauna, particularly during the 1990s, and which culminated in the publication of the popular field guide 'Sponges of the New Caledonian Lagoon' (Lévi *et al.*, 1998).

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LÉVI, C., LABOUTE, P., BARGIBANT, G. & MENOU, J. 1998. Sponges of the New Caledonian Lagoon. Vol. (Orstom: Paris, France).

List of the PORIFERA of New Caledonia (0-100 m)

(Following the name of each species, the locality of the first description)

ACANTHOCHAETETIDAE Fischer, 1970
Acanthochaetetes wellsi Hartman & Goreau, 1975 (Marianas)
ACARNIDAE Dendy, 1922
Acarnus caledoniensis Hooper & Lévi, 1993 (New Caledonia)
AGELASIDAE Verrill, 1907
Agelas ceylonica Dendy, 1905 (Gulf of Manaar)
Agelas mauritiana (Carter, 1883) (Mauritius)
ANCORINIDAE Schmidt, 1870
Asteropus simplex (Dendy, 1905) (Western Australia)
Ecionemia acervus Bowerbank, 1864 (Fiji)
Jaspis splendens (de Laubenfels, 1954) (Micronesia)
Rhabdastrella globostellata (Carter, 1879) (Sri Lanka)
APLYSINELLIDAE Bergquist, 1980
Porphyria flintae Bergquist, 1995 (New Caledonia)
Suberea creba Bergquist, 1995 (New Caledonia)
Suberea laboutei Bergquist, 1995 (New Caledonia)
ASTROCLERIDAE Lister, 1900
Astroclera willeyana Lister, 1900 (Christmas Island)
Stromatospongia micronesica Hartman & Goreau, 1976 (Micronesia)
AXINELLIDAE Ridley & Dendy, 1887
Cymbastela cantharella (Lévi, 1983) (New Caledonia)
Cymbastela concentrica (Lendenfeld, 1887) (East Australia)
Phakellia stipitata (Carter, 1881) (Bass Strait)
Dragmacidon debitusae (Hooper & Lévi, 1993) (New Caledonia)
Ptilocaulis epakros Hooper & Lévi, 1993 (New Caledonia)
Ptilocaulis fusiformis Lévi, 1967 (New Caledonia)
Phycopsiss papillatus (Hooper & Lévi, 1993) (New Caledonia)
Reniochalina condylia Hooper & Lévi, 1993 (New Caledonia)
CALLYSPONGIIDAE de Laubenfels, 1936
Callyspongia aerizusa Desqueyroux-Faundez, 1984 (New Caledonia)
Callyspongia azurea Fromont, 1995 (GBR)
Callyspongia bullata (Lamarck, 1813) (Aust.)
Callyspongia (Cladochalina) diffusa (Ridley, 1884) (Northern Australia)
Callyspongia flammea Desqueyroux-Faundez, 1984 (New Caledonia)
Callyspongia fruticosa Desqueyroux-Faundez, 1984 (New Caledonia)
Callyspongia hispidoconulosa Desqueyroux-Faundez, 1984 (New Caledonia)
Callyspongia (Cladochalina) subarmigera (Ridley, 1884) (N. Aust.)
CHALINIDAE Gray, 1867
Haliclona (Gellius) cymaeformis (Esper, 1794) (Sri Lanka)
Haliclona olivacea Fromont, 1995 (Great Barrier Reef)
Haliclona sanguinea Fromont, 1995 (GBR)
Haliclona tyria Fromont, 1995 (GBR)
CHONDRILLIDAE Gray, 1872
Chondrilla australiensis Carter, 1873 (Australia
CLATHRINIDAE Minchin, 1900
Clathrina chrysea Borojevic & Klautau, 2000 (New Caledonia)
CLIONAIDAE d'Orbigny, 1851
Cliona orientalis Thiele, 1900 (Ternate)
Cliona jullieni Topsent, 1891 (La Réunion)
COELOSPHAERIDAE Hentschel, 1923
Lissodendoryx (Waldoschmittia) schmidti (Ridley, 1884) (New South Wales)

CRELLIDAE Hentschel, 1923
Crella (Grayella) papillata (Lévi, 1958) (Red Sea)
Crella (Yvesia) spinulata (Hentschel, 1911) (WA)
DARWINELLIDAE Merejkowsky, 1879
Chelonaplysilla aurea Bergquist, 1995 (New Caledonia)
Dendrilla rosea Lendenfeld, 1883 (S. Aust.)
DESMACELLIDAE Ridley & Dendy, 1886
Neofibularia hartmani Hooper & Lévi, 1993 (New Caledonia)
DESMOXYIDAE Hallmann, 1917
Higginsia anfractuosa Hooper & Lévi, 1993 (New Caledonia)
Higginsia massalis Carter, 1885 (South Africa)
Higginsia tanekea Hooper & Lévi, 1993 (New Caledonia)
Myrmekioderma granulatum (Esper, 1794) (Indonesia)
DICTYODENDRILLIDAE Bergquist, 1980
Acanthodendrilla australis Bergquist, 1995 (New Caledonia)
Dendrilla elegans Lendenfeld, 1888 (Aust.)
DICTYONELLIDAE Van Soest, Diaz & Pomponi, 1990
Acanthella pulcherrima Ridley & Dendy, 1886 (N Aust.)
Liosina paradoxa Thiele, 1899 (Sulawesi)
Rhaphoxya systremma Hooper & Lévi, 1993 (New Caledonia)
Stylissa carteri (Dendy, 1889) (India)
Stylissa flabelliformis (Hentschel, 1912) (Aru Island)
Stylissa massa (Carter, 1887) (Mergui)
DYSIDEIDAE Gray, 1867
Citronia vasiformis Bergquist, 1995 (New Caledonia)
Dysidea arenaria Bergquist, 1965 (Palau)
Dysidea frondosa Bergquist, 1995 (New Caledonia)
Dysidea nigrescens Bergquist, 1995 (New Caledonia)
Euryspongia delicatula Bergquist, 1995 (New Caledonia)
Lamellodysidea herbacea (Keller, 1889) (Eritrea)
HALICHONDRIIDAE Vosmaer, 1887
Axinyssa aplysinoides (Dendy, 1921) (Carajos)
HETEROPIIDAE Dendy, 1892
Syconessa syconiformis (Borojevic, 1967) (New Caledonia)
Sycettusa tenuis Borojevic & Klautau, 2000 (New Caledonia)
Vosmaeropsis hozawai Borojevic & Klautau, 2000 (Brazil)
HYMEDESMIIDAE Topsent, 1928
Hamigera strongylata (Burton, 1934) (GBR)
IANTHELLIDAE Hyatt, 1875
Anomoianthella rubra Bergquist, 1995 (New Caledonia)
Ianthella basta (Pallas, 1766) (Indian Ocean)
IOTROCHOTIDAE Dendy, 1922
Iotrochota baculifera Ridley, 1884 (N. Aust.)
IRCINIIDAE Gray, 1867
Ircinia irregularis (Poléjaeff, 1884) (Irian Jaya)
Psammocinia bulbosa Bergquist, 1995 (New Caledonia)
JENKINIDAE Borojevic, Boury-Esnault & Vacelet, 2000
Anamixilla torresi (Poléjaeff, 1883) (N. Aust.)
Leucascandra caveolata Borojevic & Klautau, 1998 (New Caledonia)
LELAPIELLIDAE Borojevic, Boury-Esnault & Vacelet, 1990
Lelapiella incrustans Vacelet, 1977 (Madagascar)
LEPIDOLEUCONIDAE Vacelet, 1967
Lepidoleucon inflatum Vacelet, 1967 (Madagascar)
LEUCALTIDAE Dendy & Row, 1913
Leucaltis clathria Haeckel, 1872 (Florida) [doubtful ID]

LEUCASCIDAE Dendy, 1892

Leucascus neocaledonicus Borojevic & Klautau, 2000 (New Caledonia)

LEUCETTIDAE de Laubenfels, 1936

Leucetta chagosensis Dendy, 1913 (Seychelles)
Leucetta grisea (Dendy & Frederick, 1924) (WA)
Leucetta microraphis Haeckel, 1872 (Medit.)
Pericharax heteroraphis Poléjaeff, 1883 (Tristan de Cunha)

MERLIIDAE Kirkpatrick, 1908

Merlia deficiens Vacelet, 1980 (Medit.)
Merlia normani Kirkpatrick, 1908 (Madiera)

MICROCIONIDAE Carter, 1875

Clathria (Clathria) bulbosa Hooper & Lévi, 1993 (New Caledonia)
Clathria (Clathria) kylista Hooper & Lévi, 1993 (New Caledonia)
Clathria (Clathria) menoui Hooper & Lévi, 1993 (New Caledonia)
Clathria (Thalysias) araiosa Hooper & Lévi, 1993 (New Caledonia)
Clathria (Thalysias) corneolia Hooper & Lévi, 1993 (New Caledonia)
Clathria (Thalysias) flabellifera Hooper & Lévi, 1993 (New Caledonia)
Clathria (Thalysias) hirsuta Hooper & Lévi, 1993 (New Caledonia & GBR)
Clathria (Thalysias) vulpina (Lamarck, 1814) (Aust.)
Clathria (Wilsonella) australiensis Carter, 1885 (Port Philip)
Clathria (Wilsonella) litos Hooper & Lévi, 1993 (New Caledonia)
Clathria (Wilsonella) rugosa Hooper & Lévi, 1993 (New Caledonia)
Echinochalina (Echinochalina) intermedia (Whitelegge, 1902) (E. Aust.)
Echinochalina (Protophlitaspongia) bargibanti Hooper & Lévi, 1993 (New Caledonia)
Echinochalina (Protophlitaspongia) laboutei Hooper & Lévi, 1993 (New Caledonia)

MINCHINELLIDAE Dendy & Row, 1913

Minchinella kirkpatricki Vacelet, 1981 (New Caledonia)
Plectroninia hindei Kirkpatrick, 1900 (Funafuti)
Plectroninia lepidophora Vacelet, 1981 (New Caledonia)
Plectroninia microstyla Vacelet, 1981 (New Caledonia)
Plectroninia minima Vacelet, 1967 (Madagascar)
Plectroninia novaecaledoniense Vacelet, 1981 (New Caledonia)
Plectroninia tecta Vacelet, 1967 (Madagascar)
Plectroninia tetractinosa Vacelet, 1981 (New Caledonia)
Plectroninia vasseuri Vacelet, 1967 (Madagascar)
Tulearinia stylifera Vacelet, 1977 (Madagascar)

MURRAYONIDAE Dendy & Row, 1913

Murrayona phanolepis Kirkpatrick, 1910 (Christmas I.)

MYCALIDAE Lundbeck, 1905

Mycale (Zygomycale) parishi (Bowerbank, 1875) (Malaysia)

NIPHATIDAE van Soest, 1980

Amphimedon compressa Duchassaing & Michelotti, 1864 (Caribbean) [doubtful ID]
Gelliodes carnosa Dendy, 1889 (India)
Gelliodes fibulata (Carter, 1881) (Bass Strait)
Gelliodes persica Fromont, 1995 (GBR)
Niphates erecta Duchassaing & Michelotti, 1864 (Caribb.) [doubtful ID]

PARAMURRAYONIDAE Vacelet, 1967

Paramurrayona corticata Vacelet, 1967 (Madagascar)

PETROSIIDAE van Soest, 1980

Petrosia (Petrosia) capsa Desqueyroux-Faundez, 1987 (New Caledonia)
Xestospongia bergquistia Fromont, 1995 (GBR)
Neopetrosia exigua (Kirkpatrick, 1900) (Christmas I)

PHLOEODICTYIDAE Carter, 1882

Oceanapia tenuis Desqueyroux-Faundez, 1987 (New Caledonia)

PODOSPONGIIDAE de Laubenfels, 1936

Diacarnus levii Kelly-Borges & Vacelet, 1996 (New Caledonia)
POLYMASTIIDAE Gray, 1867
Polymastia tropicalis Lévi, 1967 (New Caledonia)
PSEUDOCERATINIDAE Carter, 1885
Pseudoceratina verrucosa Bergquist, 1995 (New Caledonia)
RASPAILIIDAE Hentschel, 1923
Ceratopsion clavatum (Thiele, 1898) (Japan)
Ceratopsion expansa (Thiele, 1898) (Japan)
Ceratopsion palmatum Hooper, 1991 (N. Aust.)
Rapailia (Raspaxilla) clathrioides (Lévi, 1967) (New Caledonia)
Raspailia (Raspailia) wilkinsoni Hooper, 1991 (N. Aust.)
SPIRASTRELLIDAE Ridley & Dendy, 1886
Spheciospongia inconstans (Dendy, 1887) (India)
Spheciospongia vagabunda (Ridley, 1884) (N. Aust.)
SPONGIIDAE Gray, 1867
Carteriospongia delicata Pulitzer-Finali, 1982 (GBR)
Coscinoderma mathewsi (Lendenfeld, 1886) (Micronesia)
Leiosella ramosa Bergquist, 1995 (New Caledonia)
Phyllospongia papyracea (Esper, 1794) (Indian O.)
Spongia (Spongia) australis Bergquist, 1995 (New Caledonia)
SPONGILLIDAE Van Soest, 1980
Pachyrotula raceki (Rutzler, 1968) (New Caledonia)
SYCETTIDAE Dendy, 1892
Sycon gelatinosum (Blainville, 1847) (Aust.)
TETHYIDAE Gray, 1848
Tethya japonica Sollas, 1888 (Philippines)
Tethya sollasi Bergquist & Kelly-Borges , 1991 (NZ)
Tethya topsenti Sara, Bavestrello & Calcinai, 2000 (New Caledonia)
TETILLIDAE Sollas, 1886
Cinachyrella schulzei (Keller, 1891) (Aden)
Cinachyrella tenuiviolacea (Pulitzer-Finali, 1982) (GBR)
THORECTIDAE Bergquist, 1978
Fascaplysinopsis reticulata (Hentschel, 1912) (Aru I)
Hyrtios erectus (Keller, 1889) (Eritrea)
Hyrtios reticulatus (Thiele, 1899) (Indonesia)
Luffariella caliculata Bergquist, 1995 (New Caledonia)
Luffariella cylindrica Bergquist, 1995 (New Caledonia)
Petrosaspongia nigra Bergquist, 1995 (New Caledonia)
TRACHYCLADIDAE Hallmann, 1917
Trachycladus digitatus Lendenfeld, 1887 (E. Aust.)
VERTICILLITIDAE Steinmann, 1882
Vaceletia crypta (Vacelet, 1977) (Madagascar)

Hydroids of New Caledonia from literature study

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Introduction

From a brief survey of the literature, it appears that until now only two articles were published during the last century by specialists that are dealing with New Caledonian hydroids. The first was by Redier (1966). From samples collected by Yves Plessis, he described 25 species (including 5 varieties), all already known. Most of them were from the littoral zone and were collected at low tide; a few were from deeper waters (to 40 m depth). The second article was published later on by Vervoort (1993) who studied representatives of the family Sertulariidae in several collections of the Natural History Museum of Paris. The specimens mostly originated from the following oceanographic cruises: Biocal (1985), Lagon (1984, 1985 and 1989), Musorstom 4 (1985), Chalcal 2 (1986), Biogeocal (1988), Smib 2 (1986), 4 and 5 (1989) and 6 (1990), with two additional sites, a station of the "Vauban" (1978) and a dive of H. Zibrowius (1989). Vervoort recorded 57 species of which 39 were new to Science. Most of the biological material from these cruises came from deep water: only 6 stations were from depths between 28 and 57m, and 77 were from a greater depth (125-860m).

More recently, Laboute & Richer de Forges (2004) published a book illustrating the high biodiversity of New Caledonia with many *in situ* photographs of marine plants and animals. This book includes several pages of beautiful photographs of hydroid colonies, exhibiting part of the macroscopic hydroid fauna observable underwater. It presents interesting illustrations of these animals that are usually little known with divers. Besides, pictures of several species of hydrocorals like milleporids and stylasterids, of pelagic hydroid colonies (*Velella* and *Porpita* spp) and of a hydromedusa (*Aequorea*) are also found in this book.

From these three publications and from an additional provisional list sent by Bertrand Richer de Forges, the aim for the author was to establish a reliable list of species and to comment on it bearing in mind well known data on hydroids. According to the time dedicated to this project it was not possible to study the entire literature to integrate scattered records from New Caledonia or to discuss additional data related to Pacific hydroids. Moreover, the author never personally studied the New Caledonian hydroid fauna or revised specimens in museum collections: she therefore does not feel responsible of misidentifications that could be found in the list.

Results

The documents cited below are very different regarding type and contents, even the first two taxonomic works, except for giving more or less precise data on where samples or pictures were taken. Redier (1966) gave a brief diagnosis and discussion of the species but he illustrated only some specimens in the collection by photographs, giving references of drawings by others. Vervoort (1993), on the contrary, did drawings of specimens for all species checked, and especially for new species described. Laboute & Richer de Forges (2004) gave colour photographs of specimens *in situ* but they did not discuss the species.

In the absence of time to revise specimens in collections, species checked by the hydroid specialists Redier and Vervoort are recorded here largely as cited by the authors except in case a name had to be changed for nomenclatural reasons. For the species cited by Laboute & Richer de Forges (2004), it has sometimes been necessary to correct species, genus and family names, and to re-arrange the classification. Moreover, genus names have been attributed to unidentified hydroid species due to easily recognizable characters on the photographs - as for instance the characteristic shape of the gonotheca in the genus *Gymnangium* (= *Halicornaria*) - or by similarity with species from the Indian Ocean well known to the author.

Thus a provisionally list of 109 species has been established for the hydroid fauna of New Caledonia (cf. list). The species in the list are divided in athecate and thecate hydroids; the families, genera and species are arranged inside these two groups in alphabetical order.

Table 1 shows the distribution of the 109 species in 15 athecates and 94 thecates, 16 families (athecates 8, thecates 8) and 34 genera (athecates 10, thecates 24).

Tab. 1 – Distribution of species into genera and families, and proportion of athecates versus thecates, within the entire collection including deep specimens.

	Families	Genera	Species	% species
ATHECATAE	8	10	15	14
THECATAE	8	24	94	86
TOTAL	16	34	109	100

The structure of the community is characterized by a large percentage of thecates (86%) dominating athecates (14%), and by the predominance of the family Sertulariidae (65) and Aglaopheniidae (14). In order to compare this community with those already described from other islands, Table 2 exhibits the results of species from shallow waters only.

Tab. 2 – Distribution of species from littoral shallow waters only (0-60m).

	Families	Genera	Species	% species
ATHECATAE	8	10	15	26
THECATAE	8	18	42	74
TOTAL	16	28	57	100

When collections from deep waters (over 100m depth) are excluded, the percentage of thecates remains higher (74%) than that of the athecates (26%) but less distinctly so (less than three times higher instead of six), and the predominance of the family Sertulariidae (14 species) is shared with the family Aglaopheniidae (14 species).

Discussion

The hydroid fauna of New Caledonia exhibits high species richness (109 species). According to our present knowledge, a higher level is reached in a few places in the world involving large areas like Japan and South Africa (Gravier-Bonnet & Bourmaud, 2006a).

A characteristic of the high richness of the New Caledonian hydroid fauna is that it belongs for a greater part to deep waters. Great depths indeed have been extensively sampled during several oceanographic cruises, due to special research programs, and they provided a lot of species, about half of the total number (53 of the 109 species). Vervoort (1993) mentions 57 species for the single family Sertulariidae, of whom 39 were new for Science, with some of them belonging to a new genus (*Gonaxia*). This strikingly large number of new species brings New Caledonia in the range of the high hot spots of endemism for hydroids, if not the highest.

Regarding shallow waters, they have not been well enough prospected and too poorly studied in this archipelago, and thus we can hypothesize that species richness of the coastal areas is far below that illustrated by the present list, reaching none the less 57 species. This is confirmed by the absence in the list of several important families (like Haleciidae and Lafoeidae) and genera (like *Antennella*, here monospecicific, and *Hebella*) distributed either worldwide or between the tropics. As illustrated in Table 3, the number of families and genera is low compared to that of other locations of the tropics like Glorieuses and Juan de Nova, two islands of the Mozambique Channel in the Indian Ocean where the shallow waters were recently studied (Gravier-Bonnet & Bourmaud, 2006a and 2006b). These numbers seem to be correlated to species richness as they increase accordingly.

Tab. 3 – Examples of number of families, genera and species and of proportion of athecates in shallow waters.

Number	New Caledonia	Glorieuses	Juan de Nova
Families	16	21	26
Genera	28	38	44
Species	57	88	95

Additional studies in shallow waters of New Caledonia will be necessary to increase present knowledge. It will be very interesting to investigate if endemism is also present at these depths as it is in deeper waters.

Results regarding community structure within the global list, with the family Sertulariidae widely dominating other families, are mainly due to two related facts: Vervoort studied this family in particular among others remaining to be studied (pers. com.), and a lot of the specimens studied were from deep waters where this family is known to be particularly well developed. About shallow waters, the dominance of the families Sertulariidae and Aglaopheniidae agrees with previous data obtained in other areas of the tropics (Gravier-Bonnet & Bourmaud, 2006a). However, as already said, it lacks entire families and genera. In addition, it seems that the microscopic fauna, usually including a lot of species, was not at all investigated until now.

In order to complete the present compilation of data, an accurate study of the literature should be done to discover scattered data dealing with New Caledonian hydroids that could be dispersed in older studies dealing with larger areas as for instance the entire Pacific.

Today, two collections of specimens from deep waters belonging to the families Lafoeidae and Aglaopheniidae have been committed respectively to Pr. W. Vervoort and Dr. Ansin Agis by the Museum of Natural History of Paris to be studied (Vervoort, pers. com.).

To conclude this brief comment, we recommend to continue hydroid studies in the rich environment of the New Caledonian archipelago where so many new species have been already discovered, with (a) much more detailed investigation of the shallow waters, including the microscopic fauna, (b) ongoing deep water explorations in the surroundings.

Aknowledgements

Many thanks are due to Wim Vervoort who amended the species list and improved the English.

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List of Hydroids

Order ATHECATAE (ANTHOMEDUSAE)

Family EUDENDRIIDAE

Eudendrium capillare Alder, 1856

Family HYDRACTINIDAE

Hydractinia carnea Sars, 1846

? Hydractinia sp.

Family HYDROCERATINIDAE

Clathrozoon wilsoni (Spencer, 1891)

Family MILLEPORIDAE

Millepora ? tenera Boschma, 1949

Millepora ? platyphylla Hemprich & Ehrenberg, 1834

Family PENNARIIDAE

Pennaria disticha (Goldfuss, 1820)

Family SOLANDERIDAE

Solanderia secunda minima (Hickson, 1903)

Family STYLASTERIDAE

Distichopora violacea (Pallas, 1766)

Stylaster brunneus Boschma, 1970

Stylaster sanguineus Valenciennes in Milne-Edwards and Haime, 1850

Stylaster sp. 1

Stylaster sp. 2

Family PORPITIDAE

Porpita pacifica Lesson, 1826

Velella velella (Linné, 1758)

Order THECATAE (LEPTOMEDUSAE)

Family AGLAOPHENIIDAE

Aglaophenia cupressina Lamouroux, 1816

Aglaophenia pluma Linné, 1758

Aglaophenia sibogae Billard, 1913

Aglaophenia postdentata Billard, 1913

Gymnangium sp. 1

? Gymnangium sp. 2

Macrorhynchia philippina (Kirchenpauer, 1872)

Macrorhynchia phoenicea (Busk, 1852)

Macrorhynchia sibogae (Billard, 1913)

Macrorhynchia sp.

Lytocarpia brevirostris (Busk, 1852)

Lytocarpia incisa (Coughtrey, 1875)

Lytocarpia orientalis Billard, 1908

Lytocarpia sp.

Family AEQUOREIDAE

Aequorea cf. australis Uchida, 1947

Family CAMPANULARIIDAE

Clytia gracilis (Sars, 1851)

Family HALOPTERIDIDAE

Antennella siliquosa (Hincks, 1877)

Halopteris diaphana (Heller, 1868)

Halopteris buskii (Bale, 1884)

Halopteris peculiaris (Billard, 1913)

Halopteris campunula (Busk, 1852)

Halopteris polymorpha Billard, 1913

Family PLUMULARIIDAE

Plumularia crater Billard, 1913
Plumularia habereri Stechow, 1909
Plumularia scabra Lamarck, 1816

Family SERTULARIIDAE

**Abietinaria immersa* Vervoort, 1993
Dictyocladium biseriale Vervoort, 1993
Diphasia attenuata (Hincks, 1868)
Diphasia digitalis (Busk, 1852)
Dynamena crisioides Lamouroux, 1824
Dynamena disticha (Bosc, 1802)
Dynamena heterodonta (Jarvis, 1922)
Dynamena quadridentata (Ellis & Solander, 1786)
Geminella ceramensis Billard, 1925
**Gonaxia amphorifera* Vervoort, 1993
**Gonaxia ampullacea* Vervoort, 1993
**Gonaxia anonyma* Vervoort, 1993
**Gonaxia bulbifera* Vervoort, 1993
**Gonaxia compacta* Vervoort, 1993
**Gonaxia complexa* Vervoort, 1993
**Gonaxia crassa* Vervoort, 1993
**Gonaxia crassicaulis* Vervoort, 1993
**Gonaxia crusgalli* Vervoort, 1993
**Gonaxia elegans* Vervoort, 1993
**Gonaxia errans* Vervoort, 1993
**Gonaxia intermedia* Vervoort, 1993
**Gonaxia pachyclados* Vervoort, 1993
**Gonaxia persimilis* Vervoort, 1993
**Gonaxia robusta* Vervoort, 1993
**Gonaxia scalariformis* Vervoort, 1993
**Gonaxia similis* Vervoort, 1993
**Gonaxia sinuosa* Vervoort, 1993
**Gonaxia stricta* Vervoort, 1993
**Hydrallmania falcata* (Linnaeus, 1758)
Idiellana pristis (Lamouroux, 1816)
Salacia tetracythara Lamouroux, 1816
**Sertularella acutidentata acutidentata* Billard, 1919
**Sertularella acutidentata profunda* Vervoort, 1993
**Sertularella anguina* Vervoort, 1993
**Sertularella areyi* Nutting, 1904
**Sertularella billardi* Vervoort, 1993
**Sertularella bipectinata* Vervoort, 1993
**Sertularella catena* (Allman, 1888)
**Sertularella crenulata* Nutting, 1905
Sertularella diaphana (Allman, 1885)
**Sertularella geodiae* Totton, 1930
**Sertularella helenae* Vervoort, 1993
Sertularella intricata Billard, 1919
**Sertularella leiocarpa* (Allman, 1888)
**Sertularella leiocarpoides* Vervoort, 1993
**Sertularella novaecaledoniae* Vervoort, 1993
**Sertularella paucicostata* Vervoort, 1993
**Sertularella pseudocostata* Vervoort, 1993
Sertularella polyzonias Linné, 1758
**Sertularella quadridens cornuta* Ritchie, 1909

Sertularella sinensis Jaderholm, 1896
Sertularella tenella (Alder, 1856)
Sertularia distans Lamouroux, 1816
Symplectoscyphus bathyalis Vervoort, 1972
Symplectoscyphus bathypacificus Vervoort, 1993
Symplectoscyphus commensalis Vervoort, 1993
Symplectoscyphus effusus Vervoort, 1993
Symplectoscyphus jonhstoni subtropicus Ralph, 1961
Symplectoscyphus jonhstoni tropicus Vervoort, 1993
Symplectoscyphus pedunculatus (Billard, 1919)
Symplectoscyphus pseudocolumnarius Vervoort, 1993
Symplectoscyphus cf. pseudodivaricatus Ralph, 1961
Symplectoscyphus ralphae Vervoort, 1993
Symplectoscyphus tuba Vervoort, 1993
Symplectoscyphus watsonae Vervoort, 1993

Family SYNTHECIIDAE

Synthecium samauense Billard, 1925

Family THYROSCYPHIDAE

Thyroscyphus fruticosus (Esper, 1793)
Thyroscyphus scorpioides Vervoort, 1993
Lytoscyphus junceus (Allman, 1876)

* Species checked in deep waters only (125-860m) (Vervoort, 1993)

Black corals (Antipatharia) of New Caledonia

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Antipatharians or black corals are colonial anthozoans characterized by small polyps possessing 6 tentacles and a horny, non-calcareous skeletal axis. The polyps of antipatharians are around or elongated transversally. In most species they are only 1-3 mm in diameter, but in some deep-water forms polyps can reach up to 6-8 mm in transverse diameter. All hitherto known species of antipatharians produce a horn-like, non-calcareous skeletal axis which can be unbranched or branched, bushy, flabellate, or pinnulate. The skeletal axis is usually brown or black in color and covered with small spines. Spines range in size 0.02 to 0.5 mm and can be of various form: triangular, conical, horn-shaped, cylindrical, bifurcated and sometimes dendritic. The surface of the spines can be smooth, papillose, or covered with tubercles. The features used for taxonomy are the size and structure of polyps as well as skeleton morphology, including mode of branching and/or pinnulation and also size, morphology and arrangement of spines.

Up to date more then 200 nominal species of antipatharians grouped in six families (Antipathidae, Aphanipathidae, Cladopathidae, Leiopathidae, Myriopathidae and Schizopathidae) are known worldwide and most of them (> 150 nominal species) are known from the tropical and subtropical waters of Indo-West Pacific region.

The information about black coral of New Caledonia is practically absent. Despite a rich collection of black corals collected in a number of cruises and deposited in MNHN, up to now only two species of deep-sea antipatharians are reported off New Caledonia: *Asteriopathes arachniformes* Opresko, 2004 (fam. Aphanipathidae) reported without precies locality, and *Saropathes margarita* Molodtsova, 2005 (fam. Schizopathidae) describeded from the northern part of Norfolk Ridge (Molodtsova, 2005) and also three deep-sea species of family Cladopathidae have to be described soon (Molodtsova in prep.). *A. arachniformes* is also known from Palau (Opresko, 2004), *S. margaritae* is up to now known from the type locality only.

The shallow-water antipatharians of New Caledonia are even worse studied. No special attention was focused at shallow-water antipatharians of New Caledonia so far. The only authors provided any list of black corals are Labout & Richer de Forges (2004) that pictured 17 species of black corals in their colorful book on fauna and flora of lagoons and reefs of New Caledonia. Only four of antipatharians are determined to species level and remaining 13 species are referred to the genus *Antipathes* (12 spp.) and genus *Cirripathes* (1 sp.). From the photo provided it is possible to see that at least one species (*Antipathes* sp. 2) represents a gorgonian and 5 species reported as *Antipathes* spp.4-8 have close affinity to genera *Cupressopathes* Opresko, 2003 (*A.* sp. 6 and *A.* sp. 7) and *Myriopathes* Opresko, 2003 (*A.* sp.4, *A.* sp. 5 and *A.* sp.8). However more precise determination requires thorough of actual material from the region. The list of antipatharians provided below does not pretend to be complete and detailed study of shallow and deep-sea black corals of New Caledonia is needed.

List of Antipatharia reported of New Caledonia

FAM. ANTIPATHIDAE

Antipathes cf. *reticulata* (Esper 1795)
Antipathes sp. 1
Antipathes sp. 3
Antipathes sp. 9
Antipathes sp. 10
Antipathes sp. 11
Antipathes sp. 12
Cirripathes cf. *anguina* Dana 1846 (= *Cirrripathes anguinus* in Laboute & Richer de Forges, 2004)

Cirripathes spiralis (Linnaeus, 1758)
Cirripathes sp.1

FAM. APHANIPATHIDAE
Asteriopathes arachniformes Opresko, 2004
FAM. MYRIOPATHIDAE
Cupressopathes cf. abies (Linnaeus, 1758)
Cupressopathes sp.1 (=*Antipathes* sp. 6 in Laboute & Richer de Forges, 2004)
Cupressopathes sp.2 (=*Antipathes* sp. 7 in Laboute & Richer de Forges, 2004)
Myriopathes sp.1 (=*Antipathes* sp. 4 in Laboute & Richer de Forges, 2004)
Myriopathes sp.2 (=*Antipathes* sp. 5 in Laboute & Richer de Forges, 2004)
Myriopathes sp.3 (=*Antipathes* sp. 8 in Laboute & Richer de Forges, 2004)
FAM. SCHIZOPATHIDAE
Saropathes margaritae Molodtsova, 2005
FAM. CLADOPATHIDAE
Hexapathes sp. 1
Hexapathes sp. 2
Trissopathes sp.

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Zoantharia of New Caledonia

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Although present in New Caledonia, zoanthids were poorly studied in that region. The "Mission Ranson en Océanie" in 1952 collected one species from New Caledonia. This sample was described as new species in 1956 by Pax & Muller. In 1979, Dr. B. Thomassin collected one sample and Dr. J. Picard in 1980 sampled two colonies. Unfortunately this material was not described and studied at the time of collection. After more than 20 years in formalin and stored in poor conditions, this material is of poor scientific use. More recently, a few deep sea samples were collected by the Dr. B. Richer-de-Forges during different collecting missions. In 1989, two missions (SMIB4 and MUSORSTOM4) a very special zoanthid associated to a eunicid worm was observed *in situ* and collected. In 2005, during the EBISCO cruise three samples of zoanthids belonging to two different species were sampled. A mission focusing on new caledonian zoanthids will be held in November 2006. The samples collected and analysed on this occasion will complete the few data already available.

The actual status of zoanthid taxonomy is very confused due to many inaccurate species description, lost type samples and mainly due to the lack of taxonomically relevant morphological characters. The development of the molecular techniques offers a good alternative to histological and cytological methods. The future of zoanthid taxonomy probably relies on a combination of molecular, morphological and ecological characters (Sinniger *et al.* 2005, Reimer *et al.* 2004).

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Annotated list of the taxa

* indicates deep sea taxa.

Suborder Macrocnemina

Family Epizoanthidae Delage and Hirouard, 1901

**Epizoanthus* aff. *abyssorum*: According to Carlgren (1923) those *Epizoanthus* specimens would belong to the species *abyssorum*. However, this species was found only in north-east Atlantic. As we had no atlantic samples to compare, we cannot be totally confident on the specific status of those samples. This zoanthid grows on shells inhabited by pagurids forming a carcinoecium. The greyish-yellow coloration is given by the incrustations composed of Globigerina ooze (sediment mainly composed of planktonic foraminiferans tests). The colonies are composed of 7 side polyps and 1 to 3 dorsal polyps. The samples were collected off New Caledonia around SE Fairway between 883m and 957m deep.

Epizoanthus spp.: Although no shallow water specimens were found yet in New Caledonia, the presence of this zoanthid is almost sure below 10m, maybe even higher. As those organisms once contracted look like a sandy crust on the substrate they are often ignored or missed.

Family Parazoanthidae Delage and Hirouard, 1901

*Undetermined Parazoanthidae: This epizoic zoanthid groups within the Parazoanthidae family. The hexactinellid spicule used as substrate is characteristic for a few species of *Epizoanthus* and *Isozoanthus* (Carlgren 1923). If molecular results exclude clearly this species from the genus *Epizoanthus*, the situation is less clear concerning *Isozoanthus*. More histological and molecular analyses would be necessary to answer this question. A polychaete worm is associated to both samples. Such an association (with *Eunice mindanavensis*) was also found by Carlgren with *E. fatuus*, *E. planus*, *I. valdiviae*, *I. arenosus* and *I. africanus*.

Parazoanthus spp.: Although no shallow water specimens were found yet in New Caledonia, the presence of this zoanthid is almost sure below 10m, maybe even higher. Species of this genus are most of the time closely associated with other organisms such as sponges, hydrozoans or diverse anthozoans.

Suborder Brachycnemina

Family Sphenopidae Hertwig, 1882

Sphenopus spp: The single non-colonial brachycnemic zoanthid. It lives buried in the sand with tentacles expanding at night. Specimens of this genus were caught in tropical Indian and Pacific oceans. The presence of this discrete species is possible in New Caledonia.

Palythoa spp.: This genus includes the former genus *Protopalythoa* (Reimer *et al.* 2006). The single zoanthid species from New Caledonia described in the literature is *Palythoa poeciloderma* (Pax and Muller 1956). Three different specimens belonging to this genus were collected in intertidal reef environment by Dr. J. Piccard in 1980. However, due to conservation issues, those samples are unidentifiable at the specific level. The development of the coenenchyme of this colonial zoanthid is very variable among species. In some species the polyps can be totally immersed in the coenenchyme whereas in others the coenenchyme will be reduced to a thin basal layer encrusting the substrate. A few species of this genus are surely present in New Caledonia shallow waters.

Family Zoanthidae Gray, 1840

Zoanthus spp.: They are some of the most common zoanthids present in tropical waters. A *Zoanthus* specimen was collected by Dr. B. Thomassin in 1979. This sample comes from the Isle of Pines but no indications on the depth are available. However this genus is likely to be found in shallow waters as it lives in symbiosis with *Symbiodinium* dinoflagellates. A few species of this genus are surely present in New Caledonia shallow waters.

Isaurus spp: Characterised by an asymmetric column, the polyps of this genus are open only at night. Three species (*I. tuberculatus*, *I. cliftoni* and *I. maculatus*) were recorded from Fiji (Muirhead and Ryland 1985), they could be present in New Caledonia especially *I. tuberculatus* and *I. cliftoni* which are present in Australia too.

Acrozoanthus australiae: This monospecific genus is very similar to *Zoanthus* from which it differs mainly by the epizoic status, growing on eunicid worm tubes. Differences in asexual reproduction and cnidome composition distinguish this genus from other zoanthidae. It is known from Indonesia and Great Barrier Reef (Ryland *et al.* 2004), thus its presence in New Caledonia is possible.

INCERTAE SEDIS

*Undescribed zoanthid: This very particular zoanthid was collected in different localities (South of the Isle of Pines, Sponge Bank) at depth ranging between 490 and 650m. This zoanthid build arborescent colonies in association with a eunicid worm. It is not clear until now if the zoanthid colonises the worm's tube or if the worm installs himself in the zoanthid colonies. Observation of the samples would rather suggest that the arborescent shape of the colony results of the zoanthid as branches without worm were found. Polyps are regularly distributed at the surface of the very dense coenenchyme building the arborescent structure. The solidity of the coenenchyme results in the extremely important incrustation of sand particle. No similar species where ever collected or observed until now in other parts of the world. Unfortunately, due to formalin fixation those samples were not suitable for molecular analyses. This zoanthid was photographed in situ and mentioned, with the pictures, in Laboute and Richier-de-Forges (2004).

Tube anemones (Ceriantharia Anthozoa) of New Caledonia

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Cerianthids or tube anemones are solitary anemone-like anthozoans. Most of cerianthids have very uniform appearance with long column, flattened oral disk and rounded aboral end. At the oral disk there are two crowns of simple numerous tentacles: shorter ones surround the mouth and longer ones are arrayed at the margin. Internally cerianthids have an actinopharynx with a single siphonoglyph and several tens of complete mesenteries. Members of the order Ceriantharia are principally bilateral animals: their tentacles and mesenteries are not arranged in pairs, but exclusively in couples and arise one by one in the single multiplication chamber.

When disturbed a cerianthids rapidly retract into tubes vertically arranged in the substrate, that composed of an interlacement of discharged cnidae (ptychocysts) and often incrusted with mucus, sand, broken shells and other debris. Tube of cerianthids can serve as a natural substrate to a variety of invertebrates such as phoronids, polychaetes, sipunculoids, bivalves, crustaceans etc. Many of cerianthids possess long-lived planktonic larvae that spend in plankton up to several months and that are often described under their own binomens (Molodtsova, 2004).

Three specimens of Ceriantharia from New Caledonia deposited in NMHN (Paris) were determined as *Pachycerianthus nobilis* (Haddon et Shackelton 1894) and *P. delwynae* Carter, 1995. *P. nobilis* (senior synonym of well-known *P. fimbriatus* McMurrich, 1910) is widely distributed in the Pacific and also known from the pacific coast of US and Canada. *P. delwynae* was recently described from the eastern cost of Australia. Both species have symbiotic phoronids.

Labout & Richer de Forges (2004) reported two other species of the family Cerianthidae (*Cerianthus maua* and *C.* sp. 1) and four species of Arachnactidae (*Arachnanthus* spp. 1 and 2 and two undetermined arachnactids). *Pachycerianthus maua* (Carlgren, 1900) was described from Zanzibar in the very beginning of XX century. This species was more than once reported from the West Pacific but none of determinations was proved by anatomy. It is quite possible that *C. maua* and *C.* sp.1 are in fact *P. nobilis* and *P. delwynae* but to be sure more material has to be studied.

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List of the taxa

Suborder Spirularia den Hartog, 1977

Fam. Cerianthidae

Pachycerianthus delwynae Carter, 1995
(?) *Pachycerianthus maua* (Carlgren, 1900)
Pachycerianthus nobilis (Haddon et Shackelton 1894)
Suborder Penicillaria den Hartog, 1977

Fam. Arachnactidae

Arachnanthus sp. 1
Arachnanthus sp. 2

Actinaria of New Caledonia

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This inventory of New Caledonia species of Actinaria is extracted from the wesite manage by Dr Daphne Fautin (*http://hercules.kgs.ku.edu/Hexacoral/Anemone2/supraspecific.cfm).*
In fact the species of Actinaria are more numerous but infortunately, the material collected by different programs by diving or by dredging, since 1980, logging in the MNHN in Paris, have not been studied yet.

ACTINIIDAE Rafinesque, 1815
Entacmaea quadricolor Ruppell & Leuckart , 1828 (Red Sea)
Isactinernus quadrilobatus Cralgren, 1918
ACTINISTOLIDAE Carlgren, 1932
Exocoelactis actinostoloides Wassilieff, 1908 (Japan)
EDWARDSIIDAE Andres 1881
Edwardsia mammilata Bourne, 1916 (New Caledonia)
ISOPHELLIIDAE Stephenson, 1935
Decaphellia psammomitra Bourne, 1918 (New Caledonia)
Telmatactis carlgreni Doumenc, Chintiroglou & Foubert, 1989 (New Caledonia)
Telmatactis allantoides Bourne, 1918
Telmatactis cylicoides Bourne, 1918
STICHODACTYLIIDAE Andres, 1833
Heteractis crispa Hempich& Ehrenberg, 1834
Stichodactyla gigantea Forskal, 1774
Stichodactyla haddoni Saville-Kent, 1893
Stichodactyla tapetum Hemprich & Ehrenberg, 1834
THALASSIANTHIDADAE Milne Edwards, 1857
Cryptodendrum adhaesivum Klunzinger, 1877 (Red sea)

Diversity of stylasterid corals (Cnidaria: Hydrozoa: Stylasteridae) in deep water habitats of New Caledonia

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Stylasterid corals are among the most important habitat-forming organisms on hard substrates in the deep-sea. Based on more than 3.000 specimens collected during the 2003 *Norfolk 2* survey off southern New Caledonia, I here present a report of the deep water stylasterid fauna discovered in the region. Morphological analyses of the collected specimens and comparison to type and non-type material deposited at the National Museum of Natural History, Smithsonian Institution, revealed 49 species (26 undescribed) in twelve genera (one of which new). The most speciose genera are *Crypthelia* (13 species, 9 of which undescribed), *Conopora* (9 species, 6 of which undescribed), and *Stylaster* (7 species, 3 of which undescribed). Previously known species are: *Adelopora crassilabrum, Adelopora fragilis, Calyptopora reticulata, Calyptopora sinuosa, Conopora anthohelia, Conopora candelabrum, Conopora laevis, Crypthelia cryptotrema, Crypthelia fragilis, Crypthelia polypoma, Crypthelia robusta, Inferiolabiata lowei, Lepidopora microstylus, Lepidopora polystichopora, Lepidotheca chauliostylus, Pseudocrypthelia pachypoma, Stylaster horologium, Stylaster imbricatus,* and *Systemapora ornata*. Another three species are tentatively assigned to *Lepidopora sarmentosa, Stylaster eguchii, and Stylaster multiplex*, but further studies are necessary to confirm these identifications. Diversity of stylasterids from southern New Caledonia (49 species) is greater than that of the entire Caribbean (42 species; Cairns, 1986), and is only surpassed by that of New Zealand (59 extant species; Cairns, 1991). Additionally, preliminary DNA-based analyses using mtDNA 16S (see Lindner, 2005, for methods) indicate the presence of putative cryptic species off New Caledonia (e.g., *Conopora candelabrum*). Moreover, non-exhaustive examination of specimens collected by previous expeditions in other regions of New Caledonia, indicate the presence of additional species. Therefore, it is possible that the ongoing study of stylasterids from New Caledonia will reveal that the region harbors the world´s largest stylasterid fauna.

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Annotated check list of New Caledonian soft corals

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The knowledge of the New Caledonian shallow-water soft coral fauna is mainly based on the work of Tixier-Durivault (1970) and Verseveldt (1974), small additions were made by Alderslade (1994) and Ofwegen (2001). The below check list is essentially the list Tixier-Durivault published, and consists of 173 species of soft corals in 20 genera, and 8 species of sea pens in 3 genera. The list must be considered somewhat doubtful as nowadays many of Tixier-durivault's identifications are challenged and a re-examination of the complete collection is necessary to get certainty about her identifications.

Still very little is known about octocoral biogeography, the only somewhat comparable study is Ofwegen (1996), in which 105 species of soft corals have been listed from the Bismarck Sea. These data suggest New Caledonia to be a much richer area, however, the Bismarck Sea material was collected in only three localities, Laing Island, Boësa Island, and Madang.

Ofwegen (2002) compared the distribution of all Indo-Pacific *Sinularia* species, New Caledonia was among the richest areas, only the Red Sea, the Seychelles-Mauritius Plateau, and eastern Africa had more species. But as already stated in that paper, those findings mostly reflected collection efforts. Similarly, because of lack of comparable studies, also little can be said about the level of endemism.

1 The species was described by Tixier-Durivault, 1970, as *Alcyonium catalai*. From the description it seems to be a species of *Eleutherobia*.

2 The species was identified by Tixier-Durivault, 1970, as *Anthomastus granulosus* Kükenthal, 1911. From the description it seems to be a species of *Paraminabea*.

3 A number of *Lobophytum* species identified by Tixier-Durivault, 1970, from New Caledonia were synonymized with *L. crassum* Marenzeller, 1886, by Verseveldt (1983): *Lobophytum caledonense* Tixier-Durivault, 1956; *Lobophytum crebriplicatum* Marenzeller, 1886; *Lobophytum crassospiculatum* Moser, 1919, and *Lobophytum cristagalli* Marenzeller, 1886.

4 Verseveldt (1983) synonymized *Lobophytum chevalieri* Tixier-Durivault, 1970, with *L. pauciflorum* (Ehrenberg, 1834).

5 Verseveldt (1983) referred *Sarcophyton proprium* Tixier-Durivault, 1970, to *Lobophytum*.

6 Verseveldt (1983) synonymized *Lobophytum roxasi* Moser, 1919, with *L. gazellae* Moser, 1919, while creating a new species for several specimens identified by Tixier Durivault, but nothing was said about her New Caledonia material.

7 Verseveldt (1983) synonymized *Lobophytum spissum* Tixier-Durivault, 1970, with *L. varium* Tixier-Durivault, 1970.

8 *Sarcophyton poculiforme* Tixier-Durivault, 1958, was mentioned by Tixier-Durivault (1970) to occur around New Caledonia; but Verseveldt (1982) synonymized this species with *S. cinereum*.

9 *Lobophytum radiatum* Tixier-Durivault, 1957, and *Lobophytum undatum* Tixier-Durivault, 1957, were mentioned by Tixier-Durivault (1970) to occur around New Caledonia but both species were synonymized with *Sarcophyton crassocaule* Moser, 1919, by Verseveldt (1983).

10 *Sarcophyton acutangulum* Marenzeller, 1886, and *S. molle* Tixier-Durivault, 1946, were mentioned by Tixier-Durivault (1970) to occur around New Caledonia but these two species were synonymized with *S. ehrenbergi* Marenzeller, 1886, by Verseveldt (1982).

11 *Sarcophyton gracile* Burchardt, 1902, was mentioned by Tixier-Durivault, (1970) to occur around New Caledonia but the species was synonymized with *S. glaucum* (Quoy & Gaimard, 1833) by Verseveldt (1982).

12 Verseveldt (1982) mentioned that *Sarcophyton moseri* Roxas, 1933, could be synonymous with *S. ehrenbergi* Marenzeller, 1886, but apparently specimens identified to this species were not re-examined by him.

13 Verseveldt 1982 synonymized *Sarcophyton puertogalerae* Roxas, 1933, with *S. crassocaule Moser*, 1919, excluded the identifications of Tixier-Durivault, but failed to mention what species they did belong to.

14 *Sarcophyton certum* Tixier-Durivault, 1970, and *S. manifestum* Tixier-Durivault, 1970, both were synonymized with *S. trocheliophorum* Marenzeller, 1886, by Verseveldt (1982).

15 The species was described by Tixier-Durivault, 1970, as *Anthomastus agilis*. Alderslade (1994) referred it to *Sinularia*.

16 Verseveldt (1980) mentioned identifications of *Sinularia andamanensis* (Thomson & Simpson, 1909) by Tixier-Durivault were incorrect, but didn't refer them to any other species.

17 Verseveldt (1980) synonymized *Sinularia cervicornis* Tixier-Durivault, 1970, and *Sinularia triaena* Kolonko, 1926, with *S. brassica* May, 1898; Benayahu *et al.* (1998) synonymized *S. dura* (Pratt, 1903), mentioned by Tixier-Durivault to occur around New Caledonia, with *S. brassica*.

18 Verseveldt (1980) mentioned identifications of *Sinularia capitalis* (Pratt, 1903) by Tixier-Durivault were incorrect, but didn't refer them to any other species.

19 Verseveldt (1980) mentioned identifications of *Sinularia conferta* (Dana, 1846) by Tixier-Durivault were incorrect, but didn't refer them to any other species.

20 Verseveldt (1980) mentioned Tixier-Durivault wrongly identified *Sinularia fungoides* Thomson & Henderson, 1906, but didn't refer them to any other species.

21 Vennam & Ofwegen (1996) referred specimens identified by Tixier-Durivault as *Sinularia gyrosa* (Klunzinger, 1877) to *S. gravis* Tixier-Durivault, 1970.

22 Verseveldt (1980) mentioned Tixier-Durivault wrongly identified *Sinularia hirta* (Pratt, 1903), but didn't refer them to any other species.

23 Verseveldt (1980) synonymized *Sinularia renei* Tixier-Durivault, 1970, with *Sinularia inflata* Tixier-Durivault, 1970.

24 Verseveldt (1980) synonymized *Sinularia partita* Tixier-Durivault, 1970, with *S. lochmodes* Kolonko, 1926.

25 *Sinularia intacta* Tixier-Durivault, 1970, and *Sinularia rotundata* Tixier-Durivault, 1970, were synonymized with *Sinularia molesta* Tixier-Durivault, 1970, by Ofwegen (2001).

26 Verseveldt (1980) synonymized *Sinularia crispa* Tixier-Durivault, 1970, with *S. numerosa* Tixier-Durivault, 1970.

27 Verseveldt (1980) synonymized *Sinularia elegans* Tixier-Durivault, 1970, with *S. querciformis* (Pratt, 1903).

28 Ofwegen (2005) referred *Nephthea granulata* Kükenthal, 1910, and *Nephthea inermis* (Holm, 1895) to the genus *Chromonephthea* Ofwegen, 2005. *N. granulata* was synonymized with *Chromonephthea hartmeyeri* (Kükenthal, 1910). Tixier-Durivaults identifications of these species were considered incorrect.

29 Alderslade (2000) suggested this could be a species of *Klyxum*; re-examinaton of the material is needed to confirm this.

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List of the taxa

CNIDAIRES

OCTOCORALLIAIRES

ALCYONACEA Lamouroux, 1812

ALCYONIIDAE Lamouroux, 1812

(1) *Eleutherobia* sp.
Klyxum echinatum (Tixier-Durivault, 1970)
Klyxum flaccidum (Tixier-Durivault, 1965)
Klyxum gracillimum (Kükenthal, 1906)
Klyxum legitimum (Tixier-Durivault, 1970)
Klyxum molle (Thomson & Dean, 1931)
Klyxum rotundum (Thomson & Dean, 1931)
Klyxum simplex (Thomson & Dean, 1931)
(2) *Paraminabea* sp.
Cladiella aspera Tixier-Durivault, 1970
Cladiella conifera (Tixier-Durivault, 1943)
Cladiella densa Tixier-Durivault, 1970
Cladiella digitulata (Klunzinger, 1877)
Cladiella elegantissima (May, 1899)
Cladiella elongata (Tixier-Durivault, 1944)
Cladiella foliacea (Tixier-Durivault, 1944)
Cladiella hicksoni (Tixier-Durivault, 1944)
Cladiella hirsuta Tixier-Durivault, 1970
Cladiella humesi Verseveldt, 1974
Cladiella krempfi (Hickson, 1919)
Cladiella latissima (Tixier-Durivault, 1944)
Cladiella madagascarensis (Tixier-Durivault, 1944)
Cladiella multiloba Tixier-Durivault, 1970
Cladiella pachyclados (Klunzinger, 1877)
Cladiella papillosa (Tixier-Durivault, 1942)

Cladiella prattae (Tixier-Durivault, 1944)
Cladiella pulchra (Tixier-Durivault, 1944)
Cladiella ramosa Tixier-Durivault, 1970
Cladiella rotundata Tixier-Durivault, 1970
Cladiella scabra Tixier-Durivault, 1970
Cladiella similis (Tixier-Durivault, 1944)
Cladiella sphaerophora (Ehrenberg, 1834)
Cladiella subtilis Tixier-Durivault, 1970
Cladiella tuberosa (Tixier-Durivault, 1944)
Cladiella tulearensis (Tixier-Durivault, 1944)
Lobophytum borbonicum (Marenzeller, 1886)
Lobophytum catalai Tixier-Durivault, 1957
(3) *Lobophytum crassum* Marenzeller, 1886
Lobophytum cristatum Tixier-Durivault, 1970
Lobophytum densum Tixier-Durivault, 1970
Lobophytum depressum Tixier-Durivault, 1966
Lobophytum irregulare Tixier-Durivault, 1970
Lobophytum legitimum Tixier-Durivault, 1970
Lobophytum microlobulatum Tixier-Durivault, 1970
(4) *Lobophytum pauciflorum* (Ehrenberg, 1834)
Lobophytum planum Tixier-Durivault, 1970
(5) *Lobophytum proprium* (Tixier-Durivault, 1970)
Lobophytum pusillum Tixier-Durivault, 1970
(6) *Lobophytum roxasi* Moser, 1886
Lobophytum salvati Tixier-Durivault, 1970
Lobophytum sarcophytoides Moser, 1886
Lobophytum schoedei Moser, 1886
Lobophytum solidum Tixier-Durivault, 1970
Lobophytum variatum Tixier-Durivault, 1957
(7) *Lobophytum varium* Tixier-Durivault, 1970
Lobophytum verum Tixier-Durivault, 1970
Sarcophyton acutum Tixier-Durivault, 1970
(8) *Sarcophyton cinereum* Tixier-Durivault, 1946
(9) *Sarcophyton crassocaule* Moser, 1919
Sarcophyton crassum Tixier-Durivault, 1946
Sarcophyton digitatum Moser, 1919
(10) *Sarcophyton ehrenbergi* Marenzeller, 1886
Sarcophyton elegans Moser, 1919
(11) *Sarcophyton glaucum* (Quoy & Gaimard, 1833)
Sarcophyton implanum Verseveldt, 1974
Sarcophyton infundibuliforme Tixier-Durivault, 1958
Sarcophyton latum (Dana, 1846)
(12) *Sarcophyton moseri* Roxas, 1933
Sarcophyton portentosum Tixier-Durivault, 1970
(13) *Sarcophyton puertogalerae* Roxas, 1933
Sarcophyton regulare Tixier-Durivault, 1946
Sarcophyton tenuispiculatum Thomson & Dean, 1931

(14) *Sarcophyton trocheliophorum* Marenzeller, 1886
(15) *Sinularia agilis* (Tixier-Durivault, 1970) (3)
(16) *Sinularia andamanensis* (Thomson & Simpson, 1909)
(17) *Sinularia brassica* May, 1898
(18) *Sinularia capitalis* (Pratt, 1903)
Sinularia compacta Tixier-Durivault, 1970
(19) *Sinularia conferta* (Dana, 1846)
Sinularia crassa Tixier-Durivault, 1945
Sinularia cristata Tixier-Durivault, 1970
Sinularia discrepans Tixier-Durivault, 1970
Sinularia dissecta Tixier-Durivault, 1945
Sinularia elongata Tixier-Durivault, 1970
Sinularia firma Tixier-Durivault, 1970
Sinularia flexibilis (Quoy & Gaimard, 1833)
Sinularia foveolata Verseveldt, 1974
(20) *Sinularia fungoides* Thomson & Henderson, 1906
(21) *Sinularia gravis* Tixier-Durivault, 1970
Sinularia halversoni Verseveldt, 1974
(22) *Sinularia hirta* (Pratt, 1903)
(23) *Sinularia inflata* Tixier-Durivault, 1970
Sinularia leptoclados (Ehrenberg, 1834)
(24) *Sinularia lochmodes* Kolonko, 1926
Sinularia macropodia (Hickson & Hiles, 1900)
Sinularia mayi Lüttschwager, 1914
Sinularia microclavata Tixier-Durivault, 1970
Sinularia microspiculata Tixier-Durivault, 1970
(25) *Sinularia molesta* Tixier-Durivault, 1970
(26) *Sinularia numerosa* Tixier-Durivault, 1970
Sinularia ornata Tixier-Durivault, 1970
Sinularia peculiaris Tixier-Durivault, 1970
Sinularia pedunculata Tixier-Durivault, 1945
Sinularia polydactyla (Ehrenberg, 1834)
(27) *Sinularia querciformis* (Pratt, 1903)
Sinularia ramosa Tixier-Durivault, 1945
Sinularia rigida (Dana, 1846)
Sinularia robusta Macfadyen, 1836
Sinularia triangula Tixier-Durivault, 1970
Sinularia variabilis Tixier-Durivault, 1945
Sinularia venusta Tixier-Durivault, 1970
Sinularia whiteleggei Lüttschwager, 1897

NEPHTHEIDAE Gray, 1862

Lemnalia bournei Light M.S., Roxas, 1933
Lemnalia elegans (May, 1898)
Lemnalia ramosa Tixier-Durivault, 1970
Paralemnalia thyrsoides (Ehrenberg, 1834)
Litophyton arboreum Forskäl, 1775
Nephthea albida (Holm, 1894)

Nephthea bayeri Verseveldt, 1966
Nephthea capnelliformis Thomson & Dean, 1931
Nephthea chabrolii Audouin, 1828
Nephthea columnaris Studer, 1894
(28) *Nephthea granulata* Kükenthal, 1910
(28) *Nephthea inermis* (Holm, 1895)
Nephthea laevis Kükenthal, 1913
Nephthea pacifica Kükenthal, 1903
Nephthea sibogae Thomson & Dean, 1931
Nephthea striata Kükenthal, 1903
Nephthea tongaensis Kükenthal, 1903
Dendronephthya armata (Holm, 1895)
Dendronephthya cervicornis (Wright & Studer, 1889)
Dendronephthya echinata (Tixier-Durivault & Prevorsek, 1959)
Dendronephthya elegans Henderson, 1909
Dendronephthya filigrana Kükenthal, 1906
Dendronephthya flammea Sheriffs, 1922
Dendronephthya gigantea (Verrill, 1864)
Dendronephthya golgotha Utinomi, 1952
Dendronephthya hirsuta (Tixier-Durivault & Prevorsek, 1960)
Dendronephthya köllikeri Kükenthal, 1905
Dendronephthya kükenthali Gravier, 1908
Dendronephthya merleti (Tixier-Durivault, 1970)
Dendronephthya microspiculata (Pütter, 1900)
Dendronephthya mucronata (Pütter, 1900)
Dendronephthya noumeensis Verseveldt, 1974
Dendronephthya novaezeelandiae Kükenthal, 1905
Dendronephthya palaoensis Utinomi, 1952
Dendronephthya palmata Utinomi, 1952
Dendronephthya punicea (Studer, 1888)
Dendronephthya roemeri Kükenthal, 1911
Dendronephthya spinifera (Holm, 1895)
Dendronephthya studeri (Ridley, 1884)
Dendronephthya wijsmanae Verseveldt, 1974
Stereonephthya hirsuta Tixier-Durivault, 1970
Stereonephthya inordinata Tixier-Durivault, 1970
Stereonephthya irregulare Tixier-Durivault, 1970
Stereonephthya plessisi Tixier-Durivault, 1970
Stereonephthya unicolor (Gray, 1862)
Umbellulifera striata (Thomson & Henderson, 1905)

NIDALIIDAE Gray, 1869

(29) *Nidalia tuberculosa* Tixier-Durivault, 1970
Siphonogorgia asperula Thomson & Simpson, 1909
Siphonogorgia dofleini Kükenthal, 1906
Siphonogorgia pendula Studer, 1889
Siphonogorgia squarrosa Kölliker MS, Studer, 1878
Siphonogorgia stuckiae Tixier-Durivault, 1970

Siphonogorgia variabilis (Hickson, 1903)

XENIIDAE Ehrenberg, 1828

Anthelia glauca Savigny, 1817

Funginus heimi (Tixier-Durivault, 1970)

Xenia intermedia Roxas, 1933

Xenia lillieae Roxas, 1933

Xenia membranacea Schenk, 1896

Xenia novaecaledoniaea Verseveldt, 1974

Xenia viridis Schenk, 1896

TUBIPORIDAE Ehrenberg, 1828

Tubipora musica Linné, 1758

PENNATULACEA Verrill, 1865

PTEROEIDIDAE Kölliker, 1880

Pteroeides bestae d'Hondt, 1984

Pteroeides caledonicum Kölliker, 1869

Pteroeides laboutei d'Hondt, 1984

Pteroeides caledonicum (Kölliker, 1869)

VERETILLIDAE Herklots, 1858

Cavernularia obesa Valenciennes MS & Haime,1850

Cavernulina grandiflora d'Hondt, 1984

VIRGULARIIDAE Verrill, 1868

Virgularia juncea (Pallas, 1766)

Virgularia gustaviana (Herklots, 1863)

Gorgonian of New Caledonia

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The following list was established after the indications and corrections of Dr Manfred Grasshoff. The shallow water gorgonians of New Caledonia was collected by divers during the program of natural products research in Nouméa since 1975. Recently, Grasshoff and Bargibant published a field guide on this groupe. It was the opportunity to revised different genera and described new species from shallow waters (Grasshoff, 1999 ; Grasshoff & Bargibant, 2001). The very rich collection of deep-sea gorgonians from New caledonia is still largely unstudied (Bayer & Stefani, 1987, 1988a, b ; Bayer, 1990).

The shallow water fauna of gorgonians is from 13 families, 45 genera and 93 species.

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List of the taxa

GORGONACEA Lamouroux, 1816

ANTHOTHELIDAE Broch, 1916

Iciligorgia querciformis (Nutting, 1911)
Solenocaulon akalyx Germanos, 1896
Solenocaulon tortuosum Gray,

BRIAREIDAE Gray, 1859

Briareum stechei (Kükenthal, 1908)

MELITHAEIDAE Gray, 1870

Acabaria baladea Grasshoff, 1999
Acabaria cinquemiglia Grasshoff, 1999
Acabaria kuea Grasshoff, 1999
Acabaria ouvea Grasshoff, 1999
Melithaea caledonica Grasshoff, 1999
Melithaea ochracea (Linné, 1758)

PARISIDIDAE Aurivillius, 1931

Parisis fruticosa Verrill, 1864
Parisis poindimia Grasshoff, 1999

SUBERGORGIIDAE Gray, 1859

Annella mollis (Nutting, 1910)
Annella reticulata (Ellis & Solander, 1786)
Subergorgia koellikeri Wright & Studer, 1889
Subergorgia rubra Thomson, 1905

Subergorgia suberosa (Pallas, 1766)

KEROEIDIDAE Kinoshita, 1910

Keroeides gracilis Whitelegge, 1897

GORGONIIDAE Lamouroux, 1812

Guaiagorgia anas Grasshoff & Alderslade, 1997
Hicksonella princeps Nutting, 1910
Rumphella aggregata (Nutting, 1910)

ACANTHOGORGIIDAE Gray, 1859

Acanthogorgia acrosoma Grasshoff, 1999
Acanthogorgia australiensis Hentschel, 1903
Acanthogorgia augusta Grasshoff, 1999
Acanthogorgia breviflora Whitelegge, 1897
Acanthogorgia glyphica Grasshoff, 1999
Acanthogorgia ildibaha Grasshoff, 1999
Acanthogorgia isoxya Grasshoff, 1999
Acanthogorgia meganopla Grasshoff, 1999
Acanthogorgia spinosa Hiles, 1899
Anthogorgia ochracea Grasshoff, 1999
Muricella paraplectana Grasshoff, 1999
Muricella plectana Grasshoff, 1999

PLEXAURIDAE Gray, 1859

Acanthomuricea mberea Grasshoff, 1999
Acanthomuricea uimea Grasshoff, 1999
Astrogorgia begata Grasshoff, 1999
Astrogorgia canala Grasshoff, 1999
Astrogorgia dumbea Grasshoff, 1999
Astrogorgia lafoa Grasshoff, 1999
Astrogorgia mengalia Grasshoff, 1999
Bebryce harpy Grasshoff, 1999
Bebryce sirene Grasshoff, 1999
Bebryce studeri Whitelegge, 1897
Echinogorgia noumea Grasshoff, 1999
Echinogorgia toombo Grasshoff, 1999
Echinomuricea indomalaccensis Ridley, 1884
Euplexaura amerea Grasshoff, 1999
Euplexaura rhipidalis Studer, 1895
Lepidogorgia cimenia Grasshoff, 1999
Menella kouare Grasshoff, 1999
Menella woodin Grasshoff, 1999
Paracis caecilia Grasshoff, 1996
Trimuricea caledonica Grasshoff, 1999
Villogorgia citrina Grasshoff, 1999
Villogorgia glaesaria Grasshoff, 1999
Villogorgia nozzolea Grasshoff, 1996
Villogorgia rubra Hiles, 1899

ELLISELLIDAE Gray, 1859

Dichotella gemmacea (Milne Edwards & Haime, 1857)
Ellisella acacesia Grasshoff, 1999
Ellisella azilia Grasshoff, 1999
Ellisella ceratophyta (Linné, 1758)
Ellisella cercidia Grasshoff, 1999
Ellisella eustala Grasshoff, 1999
Ellisella nuctenea Grasshoff, 1999
Ellisella plexauroides (Toeplitz (in Kükenthal 1919)
Ellisella rossafila Grasshoff, 1999

Heliania spinescens Gray, 1860
Junceella delicata Grasshoff, 1999
Junceella eunicelloides Grasshoff, 1999
Junceella juncea (Pallas, 1766)
Nicella carinata Nutting, 1910
Nicella flabellata (Whitelegge, 1897)
Nicella laxa Whitelegge, 1897
Nicella magna Grasshoff, 1999
Verrucella cerasina Grasshoff, 1999
Verrucella corona Grasshoff, 1999
Verrucella diadema Grasshoff, 1999
Verrucella pallida Grasshoff, 1999
Verrucella rosea Grasshoff, 1999
Verrucella ixobola Grasshoff, 1999
Viminella crassa Grasshoff, 1999
Viminella glabra Grasshoff, 1999
Viminella petila Grasshoff, 1999
Viminella rossa Grasshoff, 1999

PRIMNOIDAE Gray, 1857

Perissogorgia viridis Bayer & Stefani, 1988
Perissogorgia vitrea Bayer & Stefani, 1988
Pterostenella plumatilis anatole Bayer & Stefani, 1988

ISIDIDAE Lamouroux, 1812

Acanthoisis dhondtae (Bayer & Stefani, 1987)
Isis hippuris Linné, 1758
Paracanthoisis simplex (Tixier-Durivault, 1970)
Pteronisis laboutei (Bayer & Stefani, 1987)
Pteronisis provocatoris (Bayer & Stefani, 1987)
Pteronisis whiteleggei (Thomson et Mackinnon, 1911)

Scleractinia of New Caledonia: check list of reef dwelling species

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The scleractinianh corals of New Caledonia and nearby islands and reefs remains poorly known. Up until now, no comprehensive study of the reef corals (scleractinia) fauna has been carried out.

Although New Caledonia was discovered in 1774, the major maritime exploration voyages of the 19th century did not include it in their itineraries. In fact, the first coral collections from the area refer to deep sea (non-zooxanthellate) species obtained by Willey in the Loyalty Islands and were studied by Gardiner (1899). The first specimens collected in New Caledonia proper were gathered by the naturalist François in the vicinity of Noumea and were reef building species. They were to be subsequently studied by Matthai, who published his results in 1923. It is in 1960 that Chevalier undertook (within the frame of the "French expedition to the coral reefs of New Caledonia", supported by the Singer-Polignac Foundation) to methodically establish a collection of reef corals from New Caledonia, New Hebrides (now Vanuatu), Loyalty islands, and Chesterfield Atoll. As early as 1968, he published a first list of 66 species from Maré (Loyalty Islands). The several thousand specimens collected by Chevalier during his expeditions were to be the basis for a comprehensive morpho-taxonomic study of the scleractinia of French Melanesia. The first two parts were published in 1971 and 1975 respectively, but the enormous task undertaken by Chevalier was to remain unfinished, on account of his premature death. The two important volumes mentioned above provide a detailed account of 93 species of reef-dwelling, zooxanthellate scleractinians from what he had referred to as "French Melanesia" (New Caledonia, New hebrides, Loyalty Islands, Chesterfield ...) Other work of somewhat lesser importance have also contributed to the present knowledge of reef scleractinia of New Caledonia and dependencies. One must mention in particular Woodhead & Weber (1969) who listed 53 genera and subgenera in the reefs of New Caledonia, Wells (1961, 1968), who described a new genus and two new species from the material sent to him by Catala, and especially Wijsman-Best who published in 1972 a revision of the sub-family Faviinae from New Caledonia. Wijsman-Best's study is important on several counts, but particularly, because the observed intraspecific variations of the colony growth form and skeletal structures are linked to specific environmental conditions. This approach, which represents an improvement of the concept of "ecomorphose" defined by Laborel (1970) in his study of brazilian reef scleractinians lead Wijsman–Best to the notion of "ecotype". The concept was to be further modified and generalized by Veron & Pichon (1976) who coined the word "ecomorph". More recently , a number of species from the Chesterfield Islands have been cited or described by Veron & Pichon (1982) and Veron & Wallace (1984). As far as the genus *Acropora* is concerned, the specimens collected in New Caledonia by Pichon and by Wallace herself are included in Wallace's world revision of the genus (Wallace, 1999). Lastly, the study of the collection at IRD Noumea, undertaken by the author, has yielded a significant number of new records.

The check list includes 306 zooxanthellate scleractinian species and 4 non-zooxanthellate species commonly found in reef or lagoon environment (*Heterocyathus aequicostatus, Heteropsammia cochlea, Dendrophyllia micranthus* and *Tubastrea aurea*). The list of sclearctinian reef corals is presented in alphabetical order for the families, genera and species. Subfamilies and subgenera have not been specified. It is based – after relevant update of the synonymy- on species for which voucher specimens have been lodged in appropriate institutions and identified by the above mentioned authors. Some species have been originally described described from New Caledonia,and. are listed in Table I. (The present status of these species is not discussed here). One should also mention the genus name *Catalaphyllia,* given by Wells to accomodate Saville-Kent's species *jardinei*, common in some areas of the New Caledonian lagoon such as the Banc Gail, to honour René Catala, co-founder of the Aquarium of Noumea, and one of the pioneeers of reef coral studies in New Caledonia.

Table I - List of coral reef scleractinian species described from New Caledonia. Names in bold refer to New Caledonian place names or to major contributors to the knowledge of New Caledonia scleractinian fauna.

Species	Author and date	Type locality	Depth (m)	Museum reg. number
Barabattoia goroensis	Yabe & Sugiyama, 1941	Goro	(no data)	IGPTU 64331
Bantamia merleti	Wells, 1961	Banc Gail	35-40	USNM 45390
Alveopora catalai	Wells, 1968	Banc Gail	35-40	USNM 53132
Favia irregularis	Chevalier, 1971	Baie St Vincent, pinacle	9	MNHN scle 20292
Favia paucisepta	Chevalier, 1971	Canala	(no data)	MNHN scle 5923
Favia rugosa	Chevalier, 1971	Baie de St Vincent, patch reef	4	MNHN scle 20295
Favites gailei *	Chevalier, 1971	Banc Gail	35	MNHN scle 20296
Goniastrea regularis	Chevalier, 1971	«Nord de la Nelle-Calédonie»	(no data)	MNHN scle 20297
Montastrea magnistellata *	Chevalier, 1971	Pte Sud Ouest Ile Hugon	Reef flat	MNHN scle 20299
Euphyllia cristata	Chevalier, 1971	Récif Ouandemi, lagoon slope	15	MNHN scle 5809
Plerogyra taisnei	Chevalier, 1971	Baie de Saint Vincent	(no data)	MNHN scle 20303
Caulastrea curvata	Wijsman-Best, 1972	Baie de Prony	5	ZMA Coel 5989
Blastomussa wellsi	Wijsman-Best, 1973	Grotte Merlet	30-35	ZMA Coel 6905
Platygyra pini	Chevalier, 1975	Baie de Gu. Ile des Pins	33	MNHN scle 20302
Echinopora glabra	Chevalier, 1975	Récif Mangalia, lagoon slope	10	MNHN scle 5802
Acanthastrea rotundoflora	Chevalier, 1975	Atoll Fabre, inner patch reef	4-5	MNHN scle 20292
Lobophyllia pachysepta	Chevalier, 1975	Chesterfield atoll, pinacle	1	MNHN scle 20298
Parascolymia fungiformis	Chevalier, 1975	Récif Bogota, Outer slope	15	MNHN scle 20301
Echinophyllia rugosa *	Chevalier, 1975	Récif Ouandemi, Outer slope	4-5	MNHN scle 20294
Cantharellus noumeae	Hoeksema & Best, 1984	Nouméa	(no data)	RMNH 16241
Acropora chesterfieldensis	Veron & Wallace, 1984	Long Isl. Chesterfield atoll	8	MTQ G 55081

* : Species for which the holotype could not be located.

Abbreviations:
IGPTU: Institute of Geology and Paleontology, Tohoku University, Sendai
MNHN: Museum National d'Histoire Naturelle, Paris
RMNH: Rijksmuseum Van Natuurlijke Historie (Naturalis) Leiden
USNM: United States National Museum, Washington
ZMA: Zoologische Museum (Instuut voor Taxonomische Zoölogie), Amsterdam

As it stands now, the list is doubtless incomplete: On the one hand, some of the major collections have only been partially studied and it is expected that the collections in the Museum National d'Histoire Naturelle, Paris, and at IRD will yield additional species records. On the other hand, it is to be remembered that so far the major collecting effort has taken place in the vicinity of Nouméa and the South West lagoon. Many areas have not, as yet, been adequately sampled, and more species will be added to the list after they have been explored. This includes, for instance the reefs offf the North East coast of New Caledonia mainland, the récifs d'Entrecasteaux and most offshore reefal structures including Récif Pétrie, Astrolabe Reef, and the Bellona-Chesterfield area.

Given the present status of our knowledge, it can be stated, at least on a provisional basis, that the scleractinian faune of New Caledonia is remarkably diverse, although , and not unexpectedly not as species –rich as the geographic areas situated further North West, such as N.E. Australia, Papua-New Guinea or the Sulawesi-Moluccas area. The relative diversity of the scleractinian fauna, can be explained, on biogeographical grounds, by the fact that New Caledonia is not situated too far from the recognized coral "centre of biodiversity", and also, on ecological grounds by the remarkably diverse morphology of its coral reefs: Indeed they range from different types of atoll formations (Chesterfield, Huon, Surprise...), to barrier reefs, including double barriers, with various exposures to dominant wind and swell conditions, reef banks and drowned offshore reefs to fringing reefs around New Caledonian mainland and coral communities in very sheltered embayments or submerged banks, which are so characteristic of the New Caledonian coral reef scene (Baie du Prony, Banc Gail, for instance).

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List of Scleractinia of New Caledonia (coral reef species)

ACROPORIDAE Verrill, 1902

Acropora abrotanoides (Lamarck, 1816)
Acropora aculeus (Dana, 1846)
Acropora acuminata (Verrill, 1864)
Acropora aspera (Dana, 1846)
Acropora austera (Dana, 1846)
Acropora bushyensis Veron & Wallace, 1984
Acropora brueggemanni (Brook, 1893)
Acropora cerealis (Dana, 1846)
Acropora chesterfieldensis Veron & Wallace, 1984
Acropora clathrata (Brook, 1891)
Acropora cuneata (Dana, 1846)
Acropora cytherea (Dana, 1846)
Acropora dendrum (Bassett-Smith, 1890)
Acropora digitifera (Dana, 1846)
Acropora divaricata (Dana, 1846)
Acropora donei Veron & Wallace, 1984
Acropora elseyi (Brook, 1892)

Acropora florida (Dana, 1846)
Acropora gemmifera (Brook, 1892)
Acropora grandis (Brook, 1892)
Acropora horrida (Dana, 1846)
Acropora humilis (Dana, 1846)
Acropora hyacinthus (Dana, 1846)
Acropora intermedia (Brook, 1891)
Acropora kirstyae Veron & Wallace, 1984
Acropora latistella (Brook, 1892)
Acropora listeri (Brook, 1893)
Acropora longicyathus (Milne Edwards & Haime, 1860)
Acropora loripes (Brook, 1892)
Acropora lutkeni Crossland, 1952
Acropora microclados (Ehrenberg, 1834)
Acropora microphthalma (Verrill, 1869)
Acropora millepora (Ehrenberg, 1834)
Acropora monticulosa (Brüggemann, 1879)
Acropora muricata (Linnaeus, 1758)
Acropora nasuta (Dana, 1846)
Acropora palifera (Lamarck, 1816)
Acropora paniculata Verrill, 1902
Acropora polystoma (Brook, 1891)
Acropora pulchra (Brook, 1891)
Acropora robusta (Dana, 1846)
Acropora samoensis (Brook, 1891)
Acropora sarmentosa (Brook, 1892)
Acropora secale (Studer, 1878)
Acropora selago (Studer, 1878)
Acropora spicifera (Dana, 1846)
Acropora solitaryensis Veron & Wallace, 1984
Acropora subglabra (Brook, 1891)
Acropora subulata (Dana, 1846)
Acropora tenuis (Dana, 1846)
Acropora tortuosa (Dana, 1846)
Acropora cf valenciennesi (Milne Edwards & Haime, 1860)
Acropora valida (Dana, 1846)
Acropora vaughani Wells, 1954
Acropora verweyi Veron & Wallace, 1984
Acropora yongei Veron & Wallace, 1984
Anacropora forbesi Ridley, 1884
Anacropora puertogalerae Nemenzo, 1964
Astreopora expansa Brüggemann, 1877
Astreopora gracilis Bernard, 1896
Astreopora listeri Bernard, 1896
Astreopora myriophthalma (Lamarck, 1816)
Astreopora ocellata Bernard, 1896
Montipora aequituberculata Bernard, 1897
Montipora australiensis Bernard, 1897
Montipora caliculata (Dana, 1846)
Montipora crassituberculata Bernard, 1897
Montipora danae (Milne Edwards & Haime, 1851)
Montipora digitata (Dana, 1846)
Montipora efflorescens Bernard, 1897
Montipora cf effusa (Dana, 1846)
Montipora floweri Wells, 1954

Montipora foliosa (Pallas, 1766)
Montipora foveolata (Dana, 1846)
Montipora grisea Bernard, 1897
Montipora hispida (Dana, 1846)
Montipora hoffmeisteri Wells, 1954
Montipora incrassata (Dana, 1846)
Montipora informis Bernard, 1897
Montipora millepora Crossland, 1952
Montipora mollis Bernard, 1897
Montipora nodosa (Dana, 1846)
Montipora peltiformis Bernard, 1897
Montipora ramosa Bernard, 1897
Montipora spongodes Bernard, 1897
Montipora spumosa (Lamarck, 1816)
Montipora tuberculosa (Lamarck, 1816)
Montipora turgescens Bernard, 1897
Montipora turtlensis Veron & Wallace, 1984
Montipora undata Bernard, 1897
Montipora venosa (Ehrenberg, 1834)
Montipora verrucosa (Lamarck, 1816)

AGARICIIDAE Gray, 1847

Coeloseris mayeri Vaughan, 1918
Gardineroseris planulata (Dana, 1846)
Leptoseris explanata Yabe & Sugiyama, 1941
Leptoseris foliosa Dinesen, 1980
Leptoseris gardineri Van der Horst, 1921
Leptoseris hawaiiensis Vaughan, 1907
Leptoseris mycetoseroides Wells, 1954
Leptoseris scabra Vaughan, 1907
Leptoseris tenuis Van der Horst, 1921
Leptoseris yabei (Pillai & Scheer, 1976)
Pachyseris rugosa (Lamarck, 1801)
Pachyseris speciosa (Dana, 1846)
Pavona cactus (Forskal, 1775)
Pavona clavus (Dana, 1846)
Pavona decussata (Dana, 1846)
Pavona explanulata (Lamarck, 1816)
Pavona maldivensis (Gardiner, 1905)
Pavona minuta Wells, 1954
Pavona varians Verrill, 1864
Pavona venosa (Ehrenberg, 1834)

ASTROCOENIIDAE Koby, 1890

Stylocoeniella armata (Ehrenberg, 1834)
Stylocoeniella guentheri (Bassett-Smith, 1890)

CARYOPHYLLIIDAE Gray, 1847

Heterocyathus aequicostatus Milne Edwards & Haime, 1848

DENDROPHYLLIIDAE Gray, 1847

Dendrophyllia micranthus Ehrenberg, 1834
Heteropsammia cochlea (Spengler, 1781)
Tubastrea aurea (Quoy & Gaimard, 1833)
Turbinaria bifrons Brüggemann, 1877
Turbinaria conspicua Bernard, 1896
Turbinaria heronensis Wells, 1958
Turbinaria mesenterina (Lamarck, 1816)
Turbinaria peltata (Esper, 1794)

Turbinaria patula (Dana, 1846)
Turbinaria radicalis Bernard, 1896
Turbinaria reniformis Bernard, 1896
Turbinaria stellulata (Lamarck, 1816)
EUSMILIIDAE Milne Edwards & Haime, 1857
Catalaphyllia jardinei (Saville-Kent, 1873)
Euphyllia ancora Veron & Pichon, 1979
Euphyllia cristata Chevalier, 1971
Euphyllia divisa Veron & Pichon, 1979
Euphyllia glabrescens (Chamisso & Eysenhardt, 1821)
Plerogyra simplex Rehberg, 1892
Plerogyra sinuosa (Dana, 1846)
Physogyra lichtensteini (Milne Edwards & Haime, 1851)
FAVIIDAE Gregory, 1900
Barabattoia amicorum (Milne Edwards & Haime, 1850)
Caulastrea curvata Wijsman-Best, 1972
Caulastrea echinulata (Milne Edwards & Haime, 1849)
Caulastrea furcata Dana, 1846
Caulastrea tumida Matthai, 1928
Cyphastrea chalcidicum (Forskal, 1775)
Cyphastrea japonica Yabe & Sugiyama, 1932
Cyphastrea microphthalma (Lamarck, 1816)
Cyphastrea serailia (Forskal, 1775)
Diploastrea heliopora (Lamarck, 1816)
Echinopora gemmacea (Lamarck, 1816)
Echinopora hirsutissima Milne Edwards & Haime, 1849
Echinopora horrida Dana, 1846
Echinopora lamellosa (Esper, 1795)
Echinopora mammillata (Nemenzo, 1959)
Favia favus (Forskal, 1775)
Favia hululensis (Gardiner, 1904)
Favia irregularis Chevalier, 1971
Favia laxa (Klunzinger, 1879)
Favia lizardensis Veron, Pichon & Wijsman-Best, 1977
Favia maritima (Nemenzo, 1971)
Favia matthai Vaughan, 1918
Favia maxima Veron, Pichon & Wijsman-Best, 1977
Favia pallida (Dana, 1846)
Favia paucisepta Chevalier, 1971
Favia rotundata (Veron, Pichon & Wijsman-Best, 1977)
Favia rotumana (Gardiner, 1899)
Favia speciosa (Dana, 1846)
Favia stelligera (Dana, 1846)
Favites abdita (Ellis & Solander, 1786)
Favites chinensis (Verrill, 1866)
Favites complanata (Ehrenberg, 1834)
Favites flexuosa (Dana, 1846)
Favites halicora (Ehrenberg, 1834)
Favites pentagona (Esper, 1794)
Favites russelli (Wells, 1954)
Goniastrea aspera (Verrill, 1865)
Goniastrea australensis (Milne Edwards & Haime, 1857)
Goniastrea edwardsi Chevalier, 1971
Goniastrea favulus (Dana, 1846)
Goniastrea palauensis (Yabe, Sugiyama & Eguchi, 1936)

Goniastrea pectinata (Ehrenberg, 1834)
Goniastrea retiformis (Lamarck, 1816)
Leptastrea inaequalis Klunzinger, 1879
Leptastrea pruinosa Crossland, 1952
Leptastrea purpurea (Dana, 1846)
Leptastrea transversa Klunzinger, 1879
Leptoria phrygia (Ellis & Solander, 1786)
Montastrea annuligera (Milne Edwards & Haime, 1849)
Montastrea curta (Dana, 1846)
Montastrea magnistellata Chevalier, 1971
Montastrea valenciennesi (Milne Edwards & Haime, 1848)
Oulophyllia crispa (Lamarck, 1816)
Oulophyllia aspera Quelch, 1886
Platygyra daedalea (Ellis & Solander, 1786)
Platygyra lamellina (Ehrenberg, 1834)
Platygyra pini Chevalier, 1971
Platygyra sinensis (Milne Edwards & Haime, 1849)
Plesiastrea versipora (Lamarck, 1816)

FUNGIIDAE Dana, 1846

Cantharellus noumeae Hoeksema & Best, 1984
Ctenactis albitentaculata Hoeksema, 1989
Ctenactis echinata (Pallas, 1766)
Ctenactis crassa (Dana, 1846)
Fungia concinna Verrill, 1864
Fungia costulata Ortmann, 1889
Fungia cyclolites Lamarck, 1816
Fungia distorta Michelin, 1842
Fungia fragilis (Alcock, 1893)
Fungia fungites (Linnaeus, 1758)
Fungia granulosa Klunzinger, 1879
Fungia gravis Nemenzo, 1955
Fungia horrida Dana, 1846
Fungia moluccensis Van der Horst, 1919
Fungia paumotensis Stutchbury, 1833
Fungia repanda Dana, 1846
Fungia scabra Dôderlein, 1901
Fungia scruposa Klunzinger, 1879
Fungia scutaria Lamarck, 1801
Fungia sinensis Milne Edwards & Haime, 1851
Fungia somervillei Gardiner, 1909
Fungia spinifer Claereboudt & Hoeksema, 1987
Fungia vaughani Boschma, 1923
Halomitra pileus (Linnaeus, 1758)
Heliofungia actiniformis (Quoy & Gaimard, 1833)
Herpolitha limax (Esper, 1797)
Lithophyllum mokai Hoeksema, 1989
Podabacia crustacea (Pallas, 1766)
Polyphyllia novaehiberniae (Lesson, 1831)
Polyphyllia talpina (Lamarck, 1801)
Sandalolitha robusta (Quelch, 1886)

MERULINIDAE Verrill, 1866

Hydnophora exesa (Pallas, 1766)
Hydnophora microconos (Lamarck, 1816)
Hydnophora rigida (Dana, 1846)
Merulina ampliata (Ellis & Solander, 1786)

Merulina scabricula Dana, 1846
Scapophyllia cylindrica (Milne Edwards & Haime, 1848)
MUSSIDAE Ortmann, 1890
Acanthastrea bowerbanki Milne Edwards & Haime, 1857
Acanthastrea echinata (Dana, 1846)
Acanthastrea hillae Wells, 1955
Acanthastrea rotondoflora Chevalier, 1975
Blastomussa wellsi Wijsman-Best, 1973
Blastomussa merleti (Wells, 1961)
Cynarina lacrymalis (Milne Edwards & Haime, 1848)
Lobophyllia corymbosa (Forskal, 1775)
Lobophyllia costata (Dana, 1846)
Lobophyllia hataii Yabe, Sugiyama & Eguchi, 1936
Lobophyllia hemprichii (Ehrenberg, 1834)
Lobophyllia pachysepta Chevalier, 1975
Scolymia australis (Milne Edwards & Haime, 1849)
Scolymia fungiformis Chevalier, 1975
Scolymia vitiensis Brüggemann, 1877
Symphyllia agaricia Milne Edwards & Haime, 1849
Symphyllia radians Milne Edwards & Haime, 1849
Symphyllia recta (Dana, 1846)
Symphyllia valenciennesi Milne Edwards & Haime, 1849
OCULINIDAE Gray, 1847
Acrohelia horrescens (Dana, 1846)
Galaxea astreata (Lamarck, 1816)
Galaxea fascicularis (Linnaeus, 1758)
PECTINIIDAE Vaughan & Wells, 1943
Echinophyllia aspera (Ellis & Solander, 1786)
Echinophyllia echinata (Saville-Kent, 1871)
Echinophyllia orpheensis Veron & Pichon, 1979
Mycedium elephantotus (Pallas, 1766)
Oxypora glabra Nemenzo, 1959
Oxypora lacera (Verrill, 1864)
Pectinia alcicornis (Saville-Kent, 1871)
Pectinia lactuca (Pallas, 1766)
Pectinia paeonia (Dana, 1846)
POCILLOPORIDAE Gray, 1842
Madracis kirbyi Veron & Pichon, 1976
Palauastrea ramosa Yabe & Sugiyama, 1941
Pocillopora damicornis (Linnaeus, 1758)
Pocillopora eydouxi Milne Edwards & Haime, 1860
Pocillopora meandrina Dana, 1846
Pocillopora verrucosa (Ellis & Solander, 1786)
Pocillopora woodjonesi Vaughan, 1918
Seriatopora caliendrum Ehrenberg, 1834
Seriatopora hystrix Dana, 1846
Stylophora mordax (Dana, 1846)
Stylophora pistillata (Esper, 1797)
PORITIDAE Gray, 1842
Alveopora allingi Hoffmeister, 1925
Alveopora catalai Wells, 1968
Alveopora fenestrata (Lamarck, 1816)
Alveopora spongiosa Dana, 1846
Alveopora tizardi Bassett-Smith, 1890
Alveopora verrilliana Dana, 1872

Goniopora columna Dana, 1846
Goniopora djiboutiensis Vaughan, 1907
Goniopora fruticosa Saville-Kent, 1891
Goniopora lobata Milne Edwards & Haime, 1851
Goniopora minor Crossland, 1952
Goniopora norfolkensis Veron & Pichon, 1982
Goniopora pandoraensis Veron & Pichon, 1982
Goniopora somaliensis Vaughan, 1907
Goniopora stokesi Milne Edwards & Haime, 1851
Goniopora stutchbury Wells, 1955
Goniopora tenuidens Quelch, 1886
Porites australiensis Vaughan, 1918
Porites cylindrica Dana, 1846
Porites lichen Dana, 1846
Porites lobata Dana, 1846
Porites lutea Milne Edwards & Haime, 1860
Porites murrayensis Vaughan, 1918
Porites nigrescens Dana, 1846
Porites rus (Forskal, 1775)
Porites solida (Forskal, 1775)
Porites vaughani Crossland, 1952

PSAMMOCORIDAE Chevalier & Beauvais, 1987

Psammocora contigua (Esper, 1797)
Psammocora digitata Milne Edwards & Haime, 1851
Psammocora explanulata Van der Horst, 1922
Psammocora haimeana Milne Edwards & Haime, 1851
Psammocora nierstraszi Van der Horst, 1921

SIDERASTREIDAE Vaughan & Wélls 1943

Coscinaraea columna (Dana, 1846)
Coscinaraea exesa (Dana, 1846)
Coscinaraea monile (Forskal, 1775)
Coscinaraea wellsi Veron & Pichon, 1980

TRACHYPHYLLIIDAE Verrill, 1901

Trachyphyllia geoffroyi (Audouin, 1826)

Bryozoa of New Caledonia

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Very few studies had ever been made on New Caledonia Bryozoa until the MUSORSTOM cruises of the 1980s yielded much material that resulted in several papers between 1986 and 1999. As d'Hondt (1986) remarked, the fauna of the New Caledonian EEZ was very poorly known until that time. Philipps (1900) had reported on material collected by Arthur Willey in the wider region extending to Papua New Guinea. Most of the New Caledonian material came from the Loyalty Islands, especially Lifou, and comprised 63 species of which 9 were described as new. In his series of Siboga Expedition reports, Harmer (1915, 1926, 1934, 1957) discussed and revised several of Philipps's identifications. Redier (1966) added a number of species to the New Caledonian fauna, but described no new species. Redier also provided no illustrations, and, as d'Hondt (1986) pointed out, many of his identifications were in error or remain suspect. Recent publications of Hayward (2004) and Tilbrook (2006) discuss some species that are found in New Caledonia.

D'Hondt (1986) made a systematic study of collections from New Caledonian waters including the Chesterfield Bank and Coral Sea between 1977 and 1984, listing 226 species, of which 17 species and 6 subspecies were described as new. Unfortunately, most of the taxa that were not identified to species (65 in total), and 19 others that were only doubtfully attributed to particular species, were not illustrated, making it impossible to evaluate them without recourse to the museum material in Paris. These uncertainties are reflected in the checklist below by the use of a question mark («?»).

A series of papers followed in the 1990s based on the MUSORSTOM collections (Gordon & d'Hondt 1991, 1997; Gordon 1993; Gordon & Braga 1994; d'Hondt & Gordon 1996, 1999). In all, these authors added more than 150 species to the New Caledonian fauna, of which 115 were new to science, reflecting the high degree of taxonomic novelty and endemism in the fauna, especially from the northern Norfolk Ridge. The families Bryopastoridae, Petalostegidae, Bifaxariidae, and Siphonicytaridae have proportionately more species in New Caledonian waters than anywhere else in the world. The genera *Astoleiosalpinx* (Leiosalpingidae), *Lamourouxia* (Calloporidae), *Xynexecha* (Exechonellidae), *Pseudoplatyglena* (Euthyrisellidae), and *Phorioppnia* (Phorioppniidae) are presently known only from the New Caledonian EEZ and may be regarded as endemic. About 29% of all the species in the checklist below are known only from New Caledonian waters. A significant number of species in the fauna are widespread in the tropical Indo-Pacific or are considered cosmopolitan/tropicopolitan. Some 83 species have been reported in New Zealand waters, either from the Kermadec Ridge, or from deeper water, or they are cosmopolitan.

At present, the New Caledonian bryozoan fauna stands at 407 species, of which 60 are unidentified to species or are new. At least 178 species are known within the first 100 m and 232 species are known to occur deeper than 100 m. Of the two classes and three living bryozoan orders represented in the marine environment, by far the majority of species (382) belong to the Cheilostomata, 16 to the Cyclostomata, and 7 to the Ctenostomata. From what is known about bryozoan diversity in coral reefs and in deeper waters of the southwestern Pacific Ocean, these figures are highly conservative. One can predict that the bryozoan fauna of the New Caledonian EEZ should be at least 700 species, and probably many more. On the basis of present knowledge, the most speciose families are the lace-coral family Phidoloporidae (40 species), Candidae (36 species), and Bifaxariidae and Bugulidae (21 species each).

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Checklit of species

Bryozoans of coral reefs and shallow coastal environments to 100 m depth are indicated below by an asterisk (*). Where no depth data were provided with the published records, this is indicated by "n.d." (no data); the species entry may, however, be accompanied by an asterisk if, based on distributional data beyond New Caledonia, it is known to occur in shallow water. Deep-water New Caledonian Bryozoa are also listed but lack an asterisk. The general locality of the first description is given for all named and unnamed species. The known depth range, in New Caledonian waters only, is given for all species.

CLASS STENOLAEMATA
ORDER CYCLOSTOMATA
CRISIIDAE Johnston, 1847
Crisia elongata Milne Edwards, 1838 Mediterranean Sea 10–155 m
CRISINIDAE Borg, 1944
Mesonea radians (Lamarck, 1816) Australia 19 m
DENSIPORIDAE Borg, 1944
Favosipora holdsworthii (Busk, 1875) Sri Lanka n.d.
Favosipora watersi (Borg, 1944) southern Australia 250–350 m
DIAPEROECIIDAE Canu, 1918
Diaperoecia sp. d'Hondt 1986 New Caledonia 67 m
DIASTOPORIDAE Gregory, 1899
Plagioecia sp. d'Hondt 1986 New Caledonia 53 m
FILISPARSIDAE Borg, 1944
Nevianipora pulcherrima Kirkpatrick, 1890 South China Sea n.d.
Nevianipora sp. d'Hondt 1986 New Caledonia n.d.
HORNERIDAE Smitt, 1867
Hornera spinigera Kirkpatrick, 1888 Mauritius n.d.
LICHENOPORIDAE Smitt, 1867
Disporella pristis (MacGillivray, 1884) Victoria, Australia 15–20 m
Disporella truncata Philipps, 1900 New Caledonia 40 m
Disporella spp. d'Hondt 1986 New Caledonia 50–180 m
MECYNOECIIDAE Canu, 1918
Mecynoecia delicatula (Busk, 1875) Queensland, Australia 31 m
THEONOIDAE Busk, 1859
Telopora buski d 'Hondt, 1986 New Caledonia 33–350 m
TUBULIPORIDAE Johnston, 1838
Idmidronea flexuosa (Pourtalès, 1867) North Atlantic 14–230 m
Idmidronea sp. d'Hondt 1986 1–65 m
Platonea philippsae (Harmer, 1915) New Caledonia n.d.

CLASS GYMNOLAEMATA
ORDER CTENOSTOMATA
AETHOZOIDAE d'Hondt, 1983
Aethozoon pellucidum Hayward, 1978 North Atlantic 1410–1520 m
ALCYONIDIIDAE Johnston, 1838
Bockiella angusta Silén, 1942 Japan 495 m
ARACHNIDIIDAE Hincks, 1880
Nolella gracilipes d' Hondt, 1986 New Caledonia 15–20 m
Nolella sp. d'Hondt 1986 New Caledonia n.d.
FLUSTRELLIDRIDAE Bassler, 1953
Elzerina blainvillii Lamouroux, 1816 Australia 60–120 m
MIMOSELLIDAE Hincks, 1877
Bantariella bocki (Silén, 1942) Ogasawara Islands, Japan 65–120 m

PACHYOZOIDAE d'Hondt, 1983

Pachyzoon atlanticum d'Hondt, 1983 North Atlantic 595–2103 m

ORDER CHEILOSTOMATA

ADEONIDAE Jullien, 1903

Adeonella sp. d'Hondt New Caledonia n.d.

**Adeonellopsis* sp. d'Hondt 1986 New Caledonia 15–260 m

**Reptadeonella joloensis* (Bassler, 1936) Sulu Archipelago, Philippines n.d.

AETEIDAE Smitt, 1868

**Aetea ?australis* Jullien, 1888 Magellanic South America 35–54 m

**Aetea capillaris* d'Hondt, 1986 New Caledonia 15–20 m

ANTROPORIDAE Vigneaux, 1949

**Antropora granulifera* (Hincks, 1880) Madeira, Portugal 70 m

**Antropora minor* (Hincks, 1880) Bahia, Brazil 35–54 m

Parantropora laguncula (Canu & Bassler, 1929) Philippines 110 m

ASPIDOSTOMATIDAE Jullien, 1888

Crateropora stiliformis d'Hondt & Gordon, 1999 New Caledonia 445–560 m

BATOPORIDAE Neviani, 1900

Batopora sp. d'Hondt 1986 New Caledonia n.d.

BEANIIDAE Canu & Bassler, 1927

Beania discodermiae (Ortmann, 1890) Japan 440–650 m

**Beania magellanica* Busk, 1852 Magellanic South America 15–20 m

Beania sp. d'Hondt & Gordon, 1996 New Caledonia 515 m

Beania sp. d'Hondt & Gordon, 1996 New Caledonia 2103 m

BIFAXARIIDAE Busk, 1884

Bifaxaria bicuspis Gordon, 1993 New Caledonia 360–675 m

Bifaxaria compacta Gordon, 1993 New Caledonia 200 m

Bifaxaria gracilis Gordon, 1993 New Caledonia 3680–3740 m

Bifaxaria menorah Gordon, 1993 New Caledonia 1350–1870 m

Bifaxaria modesta Gordon, 1993 New Caledonia 965–1140 m

Bifaxaria multicostata Gordon, 1993 New Caledonia 1395 m

Bifaxaria submucronata Gordon, 1993 New Caledonia 960–2040 m

Diplonotos confragus Gordon, 1993 New Caledonia 233–1665 m

Diplonotos minus Gordon, 1993 New Caledonia 495 m

Diplonotos obesus Gordon, 1993 New Caledonia 470–680 m

Diplonotos serratus Gordon, 1993 New Caledonia 435–2099 m

Diplonotos similis Gordon, 1993 New Caledonia 700 m

Diplonotos sulcatus Gordon, 1993 New Caledonia 1230–1270 m

Diplonotos sp. Gordon 1993 New Caledonia 1350–1665 m

Diplonotos ?abyssicolus (Busk, 1884) North Pacific 1920–2040 m

Domosclerus edulis Gordon, 1993 New Caledonia 760–790 m

Domosclerus sp. Gordon & d'Hondt 1997 New Caledonia 1190 m

Domosclerus sp. Gordon 1993 New Caledonia 1820–1980 m

Raxifabia porosa Gordon, 1993 New Caledonia 1590–1665 m

Raxifabia rara Gordon, New Caledonia 825 m

Raxifabia vafra Gordon, 1988 New Zealand 505–520 m

BITECTIPORIDAE MacGillivray, 1895

Hippomonavella gymnae Gordon, 1984 Kermadec Ridge, New Zealand 510–525 m

Hippothyris caledonica Gordon & d'Hondt, 1997 New Caledonia 283–440 m

**Lagenicella cylindrica* (Harmer, 1957) Kalimantan, Indonesia 53 m

**Metroperiella montferrandii* (Audouin, 1826) Red Sea 35–54 m

Nigrapercula mutabilis (Canu & Bassler, 1929) Philippines 375–550 m

Parkermavella fidelis Gordon & d'Hondt, 1997 New Caledonia 283 m

Parkermavella minuta Gordon & d'Hondt, 1997 New Caledonia 275 m

**Parkermavella pseudoneptuni* (d'Hondt, 1986) New Caledonia 15–35 m

**Parkermavella* spp. d'Hondt 1986 (as *Schizomavella*) New Caledonia 15–54 m

Parkermavella sp. d'Hondt 1986 New Caledonia 525 m
**Pleurocodonellina signata* (Waters, 1889) New South Wales, Australia n.d.

BRYOPASTORIDAE d'Hondt & Gordon, 1999

Bryopastor challengeri Gordon, 1982 New Zealand 310–1640 m
Bryopastor crassus d'Hondt & Gordon, 1999 New Caledonia 380–700 m
Bryopastor octogonos d'Hondt & Gordon, 1999 New Caledonia 310–450 m
Bryopastor pentagonus (Canu & Bassler, 1929) Philippines 355–790 m
Bryopastor sp. d'Hondt & Gordon 1999 New Caledonia 470–480 m
Pseudothyracella candelaber d'Hondt & Gordon, 1999 New Caledonia 215–1270 m

BUFFONELLODIDAE Gordon & d'Hondt, 1997

Buffonellodes crosnieri Gordon & d'Hondt, 1997 New Caledonia 675 m
Ipsibuffonella repens Gordon & d'Hondt, 1997 New Caledonia 675 m

BUGULIDAE Gray, 1848

Bugulella gracilis (Nichols, 1911) Ireland 495–520 m
**Bugula dentata* (Lamouroux, 1816) ?SW Australia 35–54 m
**Bugula philippsae* Harmer, 1926 New Caledonia n.d.
**Bugula robusta* McGillivray, 1869 Victoria, Australia 33–35 m
**Bugula scaphoides* Kirkpatrick, 1890 South China Sea 19 m
Camptoplites lunatus Harmer, 1926 Timor 825 m
**Caulibugula inermis* Harmer, 1926 Java, Indonesia n.d.
Cornucopina aviculata d'Hondt & Gordon, 1996 New Caledonia 500–850 m
Cornucopina bella (Busk, 1884) Indonesia 535–965 m
Cornucopina buguloides d'Hondt & Gordon, 1996 New Caledonia 1350–1380 m
Cornucopina moluccensis (Busk, 1884) Indonesia 515–1640 m
Dendrobeania pseudexilis d'Hondt & Gordon, 1996 535–2750 m
Himantozoum (Beanodendria) elegans d'Hondt & Gordon, 1996 New Caledonia 535–1710 m
Himantozoum (Himantozoum) bicuspidatum d'Hondt & Gordon, 1996 New Caledonia 1230–1240 m
Himantozoum (Himantozoum) crassiavicularium d'Hondt & Gordon, 1999 New Caledonia 545–560 m
Himantozoum (Himantozoum) dissimile d'Hondt & Gordon, 1996 New Caledonia 1140–1900 m
Himantozoum (Himantozoum) gemellum d'Hondt & Gordon, 1996 New Caledonia 1140–199 m
Himantozoum (Himantozoum) rostratum d'Hondt & Gordon, 1996 New Caledonia 1820–1980 m
Himantozoum (Thaminozoum) hispidum d'Hondt & Gordon, 1996 New Caledonia 500–550 m
Nordgaardia cornucopioides d'Hondt, 1983 Brazil 1175–1950 m
Semidendrobeania pallida d'Hondt & Gordon, 1996 New Caledonia 500–965 m

CALLOPORIDAE Norman, 1903

**Alderina tuberosa* (Canu et Bassler, 1929) Philippines 70–256 m
Aplousina filum Jullien, 1903 Azores, Portugal [doubtful ID]
[?] *Callopora* sp. d'Hondt & Gordon, 1999 New Caledonia 310–315 m
Concertina cultrata Gordon, 1986 New Zealand 570–610 m
Copidozoum brevispinosum d' Hondt, 1986 New Caledonia 165 m
[?] *Corbulella translucens* (Harmer, 1926) Sulawesi, Indonesia 480–640 m
**Cranosina coronata* (Hincks, 1881) Singapore <100–275 m
Crassimarginatella spathulata Gordon, 1984 Kermadec Ridge 245 m
**Crassimarginatella* sp. d'Hondt 1986 New Caledonia 40 m
Crassimarginatella sp. d'Hondt & Gordon 1999 (as *incertae sedis*) New Caledonia 500–510 m
Lamourouxia canaliculata d'Hondt & Gordon, 1999 New Caledonia 500–2099 m
Marssonopora kermadecensis Gordon, 1984 Kermadec Ridge, New Zealand 480–640
Calloporidae *incertae sedis* d'Hondt & Gordon 1999 New Caledonia 440–450 m

CALWELLIIDAE MacGillivray, 1887

Ichthyaria simplex Gordon & d'Hondt, 1997 New Caledonia 1508–2365 m
Onchoporoides moseleyi (Busk, 1884) Kermadec Ridge, New Zealand 965–1870 m
Wrigiana strepsis Gordon & d'Hondt, 1997 New Caledonia 235 m

CANDIDAE d'Orbigny, 1851

**Amastigia rudis* (Busk, 1852) Bass Strait, Australia 1–3 m
Amastigia ?pateriformis (Busk, 1884) Chile 470 m

Amastigia vibraculifera Hastings, 1943 Falkland Islands n.d.
Amastigia sp. d'Hondt & Gordon, 1996 New Caledonia 515 m
[?]*Amastigia* sp. d'Hondt & Gordon 1996 New Caledonia 1350 m
**Caberea boryi* (Audouin, 1826) Red Sea n.d.
Caberea darwinii Busk, 1884 Magellan Strait 775 m
**Caberea dichotoma* Lamouroux, 1816 Bass Strait, Australia 35–54 m
**Caberea glabra* McGillivray, 1886 Victoria, Australia 65–440 m
**Caberea lata* Busk, 1852 Queensland, Australia 33–640 m
**Canda clypeata* (Haswell, 1880) Queensland, Australia 33–54 m
**Canda pecten* Thorneley, 1907 Burma n.d.
**Canda scutata* Harmer, 1926 New Caledonia n.d.
Candoscrupocellaria disconveniens d'Hondt & Gordon, 1996 New Caledonia 283 m
Candoscrupocellaria enigmatica (d'Hondt & Gordon, 1996) New Caledonia 404–416 m
Menipea patagonica Busk, 1852 SW Atlantic 760–790 m
Notoplites biocali d'Hondt & Gordon, 1996 New Caledonia 1395 m
Notoplites cassiduloides d'Hondt & Gordon, 1996 New Caledonia 650–3680 m
Notoplites dissimilis d'Hondt & Gordon, 1996 New Caledonia 775–825 m
Notoplites ? elongatus (Busk, 1884) Marion Island 515 m
Notoplites gibbosus d'Hondt & Gordon, 1996 New Caledonia 695–705 m
Notoplites longispinosus Gordon, 1984 Kermadec Ridge, New Zealand 620–775 m
Notoplites obliquidens Harmer, 1926 Sulawesi, Indonesia 1430–1470 m
Notoplites scutatus Harmer, 1926 Java, Indonesia 800–965 m
Notoplites sp. [a] d'Hondt & Gordon 1996 New Caledonia 515 m
Notoplites sp. [b] d'Hondt & Gordon 1996 New Caledonia 515 m
Notoplites sp. d'Hondt & Gordon 1996 New Caledonia 1800 m
Penemia crassospina d'Hondt & Gordon, 1996 New Caledonia 3690–3740 m
Penemia sp. d'Hont & Gordon 1996 New Caledonia 1820–2205 m
**Scrupocellaria curvata* Harmer, 1926 Indonesia 40 m
**Scrupocellaria delilii* (Audouin, 1826) Red Sea n.d.
**Scrupocellaria diadema* Busk, 1852 Queensland, Australia 17 m
**Scrupocellaria longispinosa* Harmer, 1926 33–35 m
**Scrupocellaria maderensis* Busk, 1880 Madeira, Portugal 1–20 m
**Scrupocellaria ?obtecta* Haswell, 1880 Queensland, Australia n.d.
**Scrupocellaria spatulata* (d' Orbigny, 1851) Red Sea 75 m
Semibugula elegantissima d'Hondt & Gordon, 1996 New Caledonia 1490–1620 m

CATENICELLIDAE Busk, 1852

Bryosartor sutilis (Gordon & Braga, 1994) New Caledonia 425–1600 m
**Catenicella elegans* Busk, 1852 Bass Strait, Australia 17–18 m
Costaticella benecostata (Levinsen, 1909) Australia n.d.
Costaticella peltata Gordon, 1993 New Caledonia 435 m
Strongylopora gracilis Gordon, 1993 New Caledonia 505–510 m
Terminocella perlucens Harmer, 1957 Indonesia 505–1395 m

CELLARIIDAE Hincks, 1880

Cellaria obliquidens d'Hondt & Gordon, 1999 New Caledonia 1590–1665 m
Cellaria parafistulosa d'Hondt & Gordon, 1999 New Caledonia 1590–1665 m
**Cellaria punctata* (Busk, 1852) Queensland, Australia 66 m
Cellaria tecta Harmer, 1926 Sulawesi, Indonesia n.d.
Cellaria tenuirostris (Busk, 1852) Bass Strait, Australia 1935 m
Cryptostomaria alata d'Hondt & Gordon, 1999 New Caledonia 235–1410 m
Euginoma conica Gordon, 1986 New Zealand 500–1190 m
Formosocellaria magnifica (Busk, 1884) Mid-Atlantic 535–1870 m
Melicerita (Henrimilnella) articulata d'Hondt & Gordon, 1999 New Caledonia 360 m
Melicerita (Henrimilnella) laurifolia d'Hondt & Gordon, 1999 New Caledonia 360 m
Melicerita (Melicerita) alternans d'Hondt & Gordon, 1999 New Caledonia 435 m
Melicerita (Melicerita) ejuncida Gordon, 1986 New Zealand 355–1675 m

Mesostomaria strictoramae Canu & Bassler, 1927 Philippines 200–680 m
Mesostomaria sp. d'Hondt & Gordon 1999 New Caledonia 503 m
Stomhypselosaria dupliforma Canu & Bassler, 1929 Philippines 480–640 m
Syringotrema calobi d'Hondt & Gordon, 1999 New Caledonia 510–525 m

CELLEPORIDAE Johnston, 1838

Buffonellaria erecta Gordon & d'Hondt, 1997 New Caledonia 495–515 m
Buffonellaria regenerata Powell, 1967 New Zealand 360–515 m
Celleporina ?rota MacGillivray, 1885 Victoria, Australia 375–550 m
Celleporina spatula MacGillivray, 1887 Victoria, Australia 260–280 m
Galeopsis mimicus Gordon, 1989 New Zealand 470–825 m
Galeopsis pentagonus (d'Orbigny, 1842) Falkland Islands 245–515 m
Galeopsis lageniporoides Gordon & d'Hondt, 1997 New Caledonia 700 m
Lagenipora sp. Gordon & d'Hondt 1997 New Caledonia 775 m
**Osthimosia* sp. Gordon & d'Hondt 1997 New Caledonia 65–120 m
Richbunea gracilis Gordon & d'Hondt, 1997 New Caledonia 470–500 m
**Scorpiodinipora bernardii* (Audouin, 1826) Red Sea n.d.
*[?] *Turbicellepora aculeata* (Canu et Bassler, 1929) Philippines 38 m
**Turbicellepora ?tuberosa* (Smitt, 1867) Norway [doubtful ID] 35 m

CHAPERIIDAE Jullien, 1888

Chaperia ?acanthina (Lamouroux, 1825) Falkland Islands 265 m
**Chaperia* sp. d'Hondt 1986 New Caledonia 57 m
**Chaperiopsis cervicornis* (Busk, 1854) Bass Strait, Australia 15–20 m

CHORIZOPORIDAE Vigneaux, 1949

**Chorizopora atrox* d' Hondt, 1986 New Caledonia 67 m
Chorizopora brongniartii (Audouin, 1826) Red Sea 250–350 m

CLEIDOCHASMATIDAE Cheetham & Sandberg, 1964

**Cleidochasma* sp. d'Hondt 1986 New Caledonia n.d.
Yrbozoon ringens Gordon, 1989 New Zealand 515 m

CONESCHARELLINIDAE Levinsen, 1909

Conescharellina atalanta Gordon & d'Hondt, 1997 New Caledonia 110–165 m
Conescharellina catella Canu & Bassler, 1929 Philippines 1660 m
Conescharellina crassa Tenison-Wood, 1880 250–350 m
Conescharellina sp. d'Hondt 1986 New Caledonia 250–350 m
Crucescharellina aster Gordon & d'Hondt, 1997 New Caledonia 760–1980 m
Ptoboroa gelasina Gordon & d'Hondt, 1997 New Caledonia 1790 m
Trochosodon sp. Gordon & d'Hondt, 1997 New Caledonia 1620–1959 m

CREPIDACANTHIDAE Levinsen, 1909

**Crepidacantha crinispina* Levinsen, 1909 Thailand 33–350 m

CRIBRILINIDAE Hincks, 1879

**Cribralaria fragilis* Powell, 1967 New Zealand 35–45 m
**Figularia* sp. d'Hondt 1986 New Caledonia 15–20 m
Klugerella musica Gordon, 1993 New Caledonia 510–590 m
Membraniporella skeletos Gordon, 1993 New Caledonia 310–315 m
Puellina ?flabellifera (Kirkpatrick, 1888) Mauritius n.d.
Puellina harmeri (Ristedt, 1985) Philippines 275 m
**Puellina innominata* (Couch, 1844) Great Britain [doubtful ID] 67–91 m
**Puellina radiata* (Moll, 1803) Mediterranean Sea [doubtful ID] n.d.
Puellina septemspinosa (d'Hondt, 1986) New Caledonia n.d.
Puellina sp. d'Hondt 1986 New Caledonia 15–35 m
Puellina sp. d'Hondt 1986 New Caledonia 550 m

DIDYMOSELLIDAE Brown, 1952

**Didymosella inopinata* d'Hondt, 1986 New Caledonia 1–3 m
**Tubiporella magnirostris* (McGillivray, 1883) Victoria, Australia 87 m

EMINOOECIIDAE Hayward & Thorpe, 1988

Macrocamera erecta Gordon & d'Hondt, 1997 New Caledonia 233–360 m

EUOPLOZOIDAE Harmer, 1926

Euoplozoum cirratum (Busk, 1884) Indonesia 965–1395 m

EUTHYRISELLIDAE Bassler, 1953

**Pseudoplatyglena mirabilis* Gordon & d'Hondt, 1997 New Caledonia 65–120 m

EXECHONELLIDAE Harmer, 1957

Xynexecha pulchra Gordon & d'Hondt, 1997 New Caledonia 335 m

FARCIMINARIIDAE Busk, 1852

Columnella magna (Busk, 1884) Argentina 1820–3740 m

Columnella vipera d'Hondt & Gordon, 1999 New Caledonia 500–1640 m

**Didymozoum triseriale* (Philipps, 1900) New Caledonia 10–53 m

FLUSTRIDAE Fleming, 1828

Carbasea laterogranulata d'Hondt & Gordon, 1999 New Caledonia 5-5–850 m

GIGANTOPORIDAE Bassler, 1935

Cosciniopsis ?coelatus (Canu & Bassler, 1927) Sulu Archipelago, Philippines 375–550 m

**Cosciniopsis lonchea* (Busk, 1884) Papua New Guinea 17–20 m

Gigantopora oropiscis Gordon & d'Hondt, 1997 New Caledonia 360 m

Gigantopora proximalis hispida d'Hondt, 1986 New Caledonia n.d.

**Gigantopora* sp. d.Hondt 1986 New Caledonia 40 m

HIANTOPORIDAE Gregory, 1893

**Hiantopora intermedia* (Kirkpatrick, 1890) Torres Strait 64 m

HIPPALIOSINIDAE Winston, 2005

**Hippaliosina acutirostris* Canu et Bassler, 1925 Sri Lanka 35–75 m

HIPPOPODINIDAE Levinsen, 1909

**Hippopodina feegensis* (Busk, 1884) Philippines n.d.

HIPPOTHOIDAE Busk, 1859

Hippothoa calciophilia Gordon, 1984 Kermadec Ridge, New Zealand 210 m

LACERNIDAE Jullien, 1888

**Arthropoma cecilii* (Audouin, 1826) Red Sea 15–350 m

Cribellopora divisopora (Waters, 1887) New South Wales, Australia n.d.

**Phonicosia circinata* (MacGillivray, 1869) Victoria, Australia n.d.

LANCEOPORIDAE Harmer, 1957

**Calyptotheca nivea* (Busk, 1884) South Africa [doubtful ID] 3 m

**Calyptotheca ?suluensis* Harmer, 1957 Indonesia 15 m

**Calyptotheca perpendiculata* Tilbrook, 2006 Queensland, Australia n.d.

**Calyptotheca inclusa* (Thorneley, 1906) Sri Lanka 67 m

**Calyptotheca ?triquetra* (Harmer, 1957) Indonesia 69 m

Calyptotheca ?wasinensis (Waters, 1913) Tanzania 130–318 m

**Calyptotheca* sp. d'Hondt 1986 New Caledonia 40 m

**Emballotheca pacifica* Harmer, 1957 Indonesia 57 m

Emballotheca rara Gordon & d'Hondt, 1997 New Caledonia 775 m

LEIOSALPINGIDAE d'Hondt & Gordon, 1996

Astoleiosalpinx pedunculata d'Hondt & Gordon, 1996 New Caledonia 350–775 m

Leiosalpinx australis (Busk, 1884) Indonesia 500–520 m

LEKYTHOPORIDAE Levinsen, 1909

Harpago dissidens Gordon & d'Hondt, 1997 New Caledonia 515 m

[?] *Poecilopora cribritheca* (Harmer, 1957) Indonesia 230–260 m

LEPRALIELLIDAE Vigneaux, 1949

**Celleporaria columnaris* (Busk, 1881) Australia 15–350 m

**Celleporaria ?cristata* Lamarck, 1816 Australia n.d.

**Celleporaria discoidea* (Busk, 1881) Torres Strait n.d.

**Celleporaria fusca* (Busk, 1854) Victoria, Australia 45–75 m

**Celleporaria ?labelligera* Harmer, 1957 Red Sea 67 m

Celleporaria macrodon Gordon, 1993 New Caledonia 200–250 m

Celleporaria mamillata (Busk, 1854) 675 m

**Celleporaria oculata* (Lamarck, 1816) ?NW Australia 45 m

**Celleporaria pigmentaria* (Waters, 1909) Red Sea 17 m
**Celleporaria tridenticulata* (Busk, 1881) Australia 50–180 m
**Celleporaria vagans* (Busk, 1881) Crozet Island n.d.
**Celleporaria ?vermiformis* (Waters, 1909) Red Sea 33–35 m
**Celleporaria* spp. d'Hondt 1986 New Caledonia 8–35 m
Kladapheles gammadeka Gordon, 1993 Norfolk Island 470–480 m

MACROPORIDAE Uttley, 1949
**Macropora polymorpha* (Philipps, 1900) New Caledonia 8–54 m
**Macropora spinifera* (Philipps, 1900) New Caledonia 1–87 m

MARGARETTIDAE Harmer, 1957
**Margaretta watersi* (Canu et Bassler, 1930) Australia 1–20 m
Margaretta sp. d'Hondt 1986 New Caledonia 210–220 m

MAWATARIIDAE Gordon, 1990
Mawatarius secundus Gordon & d'Hondt, 1997 New Caledonia 515 m

MEMBRANIPORIDAE Busk, 1852
Biflustra ?limosa Waters, 1909 Red Sea 162–965 m
**Biflustra savartii* (Audouin, 1826) Red Sea 35–45 m

MICROPORELLIDAE Hincks, 1879
**Fenestrulina ?catastictos* Gordon, 1984 Kermadec Ridge, New Zealand n.d.
**Fenestrulina ?gelasinoides* Gordon, 1984 Kermadec Ridge, New Zealand 17–18 m
Fenestrulina ?incompta Gordon, 1984 Kermadec Ridge, New Zealand 150–180 m
**Fenestrulina mutabilis* (Hastings, 1932) Queensland, Australia 33–350 m
**Fenestrulina thyreophora* (Busk, 1857) New Zealand 33–35 m
**Fenestrulina* sp. d'Hondt 1986 New Caledonia 67–210 m
**Microporella ciliata* (Pallas, 1766) Mediterranean Sea [doubtful ID] 67–255 m
Microporella lineata Canu & Bassler, 1929 Philippines 527 m
**Microporella ?orientalis* Harmer, 1957 Indonesia 40 m
**Microporella* sp. Gordon & d'Hondt 1997 New Caledonia 21 m

MICROPORIDAE Gray, 1848
**Micropora ?rimulata* Canu & Bassler, 1929 Philippines 1–3 m
**Micropora angusta* MacGillivray, 1887 Victoria, Australia 17–18 m
**Mollia multijuncta* (Waters, 1879) Mediterranean Sea 17–57 m
Promicroa dubitata d'Hondt & Gordon, 1999 New Caledonia 50–515 m

MONOPORELLIDAE Hincks, 1882
**Monoporella nodulifera* Hincks, 1881 Bass Strait, Australia 65 m

ONYCHOCELLIDAE Jullien, 1882
Onychocella ?subsymmetrica Canu & Bassler, 1929 Philippines n.d.
Smittipora adeoniformis d'Hondt, 1986 New Caledonia 150–180 m
Smittipora cordiformis Harmer, 1926 Sulawesi, Indonesia 15–65 m
Smittipora fenestrata d'Hondt & Gordon, 1999 New Caledonia 460 m

PASYTHEIDAE Davis, 1934
**Gemellipora eburnea* Smitt, 1873 Caribbean Sea 40–590 m

PETALOSTEGIDAE Gordon, 1984
Chelidozoum binarium Gordon & d'Hondt, 1991 New Caledonia 295 m
Chelidozoum quinarium Gordon & d'Hondt, 1991 New Caledonia 435–570 m
Chelidozoum ternarium Gordon & d'Hondt, 1991 New Caledonia 410–650 m
Petalostegus bicornis (Busk, 1884) Tahiti 570–1665 m
Petalostegus harmeri Gordon & d'Hondt, 1991 New Caledonia 515–650 m
Petalostegus pseudospinosus Gordon, 1993 New Caledonia 515–560 m
Petalostegus scopulus Gordon & d'Hondt, 1991 New Caledonia 515–965 m
Petalostegus vexillum Gordon & d'Hondt, 1991 New Caledonia 560–570 m

PETRALIELLIDAE Harmer, 1957
**Mucropetraliella gaudialis* d'Hondt, 1986 New Caledonia 67 m
**Mucropetraliella loculifera* Harmer, 1957 Indonesia 20 m
**Mucropetraliella philippinensis* (Canu & Bassler, 1929) Philippines 40–2050 m

Mucropetraliella robusta (Canu & Bassler, 1929) Philippines n.d.
**Mucropetraliella serrata* (Livingstone, 1926) Torres Strait 115–200 m
**Mucropetraliella vultur* (Hincks, 1882) Australia 15–20 m
**Petraliella chuakensis* (Waters, 1913) Tanzania n.d.
Riscopoda parva Gordon, 1989 New Zealand 540–831 m
Riscodopa sp. Gordon & d'Hondt 1997 New Caledonia 1620–1630 m
**Sinupetraliella littoralis* Hastings, 1932 Queensland, Australia n.d.

PHIDOLOPORIDAE Gabb & Horn, 1862

**Fodinella spinigera* (Philipps, 1900) New Caledonia n.d.
**Fodinella tuberculata* (Philipps, 1900) New Caledonia 64 m
**Iodictyum ?axillare* (Ortmann, 1889) Japan 35–230 m
Iodictyum bicuspidatum Gordon & d'Hondt, 1997 New Caledonia 283 m
Iodictyum blandum Gordon & d'Hondt, 1997 New Caledonia 440 m
**Iodictyum caledoniense* d'Hondt, 1986 New Caledonia 69–87 m
Iodictyum illinguum Gordon & d'Hondt, 1997 New Caledonia 245 m
Iodictyum perarmatum Harmer, 1934 Indonesia n.d.
**Iodictyum praesigne* d'Hondt, 1986 New Caledonia 67 m
Iodictyum trochus Gordon & d'Hondt, 1997 New Caledonia 283–775 m
**Iodictyum violaceum* Hayward, 2004 New Caledonia 15–30 m
**Iodictyum willeyi* Harmer, 1934 New Caledonia 45–66 m
Iodictyum sp. d'Hondt 1986 New Caledonia 210–220 m
**Lifuella articulata* (Philipps, 1900) New Caledonia 64 m
**Lifuella calyciformis* (Philipps, 1900) New Caledonia n.d.
**Lifuella ?multidentata* (Thornely, 1905) Sri Lanka 75 m
**Plesiocleidochasma porcellana* (Busk, 1860) Madeira [doubtful ID] 15–222 m
**Reteporella graeffei* (Kirchenpauer, 1869) Fiji 39–640 m
**Reteporella concinnoides* Gordon & d'Hondt, 1997 75–335 m
Reteporella defensa Gordon & d'Hondt, 1997 New Caledonia 245–470 m
Reteporella ferox Gordon & d'Hondt, 1997 New Caledonia 283 m
**Reteporella orstomia* Gordon & d'Hondt, 1997 New Caledonia 21 m
Reteporella sp. d'Hondt 1986 New Caledonia 415–460 m
**Reteporellina babelensis* (Chapman, 1941) Tasmania 48 m
**Reteporellina denticulata* (Busk, 1884) Hawaii 12 m
Reteporellina granulosa Gordon & d'Hondt, 1997 New Caledonia 360 m
Reteporellina projecta Gordon & d'Hondt, 1997 New Caledonia 760–920 m
Reteporellina sp. d'Hondt 1986 New Caledonia 309 m
**Rhynchozoon bifurcum* Harmer, 1957 Torres Strait 67–83
**Rhynchozoon detectum* Harmer, 1957 Sulawesi, Indonesia n.d.
**Rhynchozoon larreyi* (Audouin, 1826) Red Sea 17 m
Rhynchozoon ligulatum Gordon & d'Hondt, 1997 New Caledonia 360–560 m
**Rhynchozoon tubulosum* (Hincks, 1880) Australia 15–75 m
**Rhynchozoon* sp. d'Hondt New Caledonia 8–12 m
Schedocleidochasma sp. Gordon & d'Hondt 1997 New Caledonia 360 sp.
Stephanollona longispinata (Busk, 1884) southern Chile 150–180 m
**Triphyllozoon benemunitum* Harmer, 1957 Australia 60–69 m
**Triphyllozoon ?hirsutum* (Busk, 1884) Torres Strait n.d.
**Triphyllozoon mucronatum* Harmer, 1934 Philippines 45 m
**Triphyllozoon* sp. d'Hondt 1986 New Caledonia 45 m

PHORIOPPNIIDAE Gordon & d'Hondt, 1997

Oppiphorina epaxia (Gordon, 1984) Kermadec Ridge, New Zealand 310–515 m
Phorioppnia cookae Gordon & d'Hondt, 1997 New Caledonia 310–335 m
Phorioppnia nova Gordon & d'Hondt, 1997 New Caledonia 360 m

PORINIDAE d'Orbigny, 1852

Haswelliporina multiaviculata (Gordon, 1984) Kermadec Ridge, New Zealand 311–965 m
Haswelliporina quinaria Gordon & d'Hondt, 1997 New Caledonia 235–283 m

Haswelliporina vaubani (d'Hondt, 1986) New Caledonia 235–460 m
Mosaicoporina uniserialis Gordon & d'Hondt, 1997 New Caledonia 515 m
Semihaswellia umbrella Gordon & d'Hondt, 1997 New Caledonia 435–1980 m

QUADRICELLARIIDAE Gordon, 1984

**Nellia simplex* Busk, 1852 Torres Strait, Australia n.d.
**Nellia tenella* (Lamarck, 1816) ?NW Australia 20–45 m
Nelliella nelliiformis Harmer, 1926 Indonesia n.d.
**Quadricellaria bocki* (Silén, 1941) Japan 15–1959 m

ROMANCHEINIDAE Jullien, 1888

**Escharella* sp. d'Hondt 1986 New Caledonia 63 m
**Escharoides falcifera* d'Hondt, 1986 New Caledonia 33–35 m
**Exochella tricuspis* (Hincks, 1881) New Zealand 33–35 m

SAVIGNYELLIDAE Levinsen, 1909

**Halysisis diaphana* (Busk, 1960) Madeira n.d.

SCHIZOPORELLIDAE Jullien, 1883

**Hippomenella avicularis* (Livingstone, 1926) Queensland, Australia 0–75 m
**Hippomenella vellicata* (Hutton, 1873) New Zealand 40 m
**Stylopoma thornelyae* Livingstone, 1926 Queensland, Australia 87 m
**Stylopoma trispinosa* (d'Hondt, 1986) New Caledonia 87 m

SCRUPARIIDAE Gray, 1848

**Scruparia ambigua* d' Orbigny, 1841 Falkland Islands 15–20 m

SELENARIIDAE Busk, 1852

**Selenaria punctata* Tenison-Woods, 1880 Australia n.d.

SIPHONICYTARIDAE Harmer, 1957

Siphonicytara armata Gordon & d'Hondt, 1997 New Caledonia 675 m
Siphonicytara excentrica Gordon & d'Hondt, 1997 New Caledonia 360 m
Siphonicytara glabra Gordon & d'Hondt, 1997 New Caledonia 965 m
Siphonicytara granulosa Gordon & d'Hondt, 1997 New Caledonia 760–790 m
Siphonicytara mosaica Gordon & d'Hondt, 1997 New Caledonia 480–1980 m
Siphonicytara vittata Gordon & d'Hondt, 1997 New Caledonia 435–700 m

SMITTINIDAE Levinsen, 1909

Hemismittoidea ennea Gordon & d'Hondt, 1997 New Caledonia 515 m
**Parasmittina aviculifera* (d'Hondt, 1986) New Caledonia 33–35 m
Parasmittina erecta Gordon & d'Hondt, 1997 New Caledonia 500–515 m
**Parasmittina exasperatrix* d'Hondt, 1986 New Caledonia 8–12 m
**Parasmittina fistulata* Harmer, 1957 Torres Strait 45 m
Parasmittina glabra Gordon & d'Hondt, 1997 New Caledonia 515 m
**Parasmittina parsevalii* (Audouin, 1826) Red Sea 15–67 m
**Parasmittina raigii* (Audouin, 1826) Red Sea 33–255 m
**Parasmittina ?serrula* Soule & Soule, 1973 Hawaii 40 m
**Parasmittina tropica* (Waters, 1909) Red Sea 1–69 m
Smittina abyssicola (Harmer, 1957) Indonesia 210 m
**Smittina alata* d' Hondt, 1986 New Caledonia 15–35 m
Smittina asymmetrica Gordon & d'Hondt, 1997 New Caledonia 500–515 m
**Smittina malleolus* (Hincks, 1884) Burma 35 m
**Smittina* sp. d'Hondt New Caledonia n.d.
**Smittoidea ?levis* (Kirkpatrick, 1890) Torres Strait 33–69 m
Smittoidea maunganuiensis multiporosa Gordon & d'Hondt, 1997 New Caledonia 283 m
Smittoidea sp. d'Hondt 1986 New Caledonia

STOMACHETOSELLIDAE Canu & Bassler, 1917

**Cigclisula ?occlusa* (Busk, 1884) Torres Strait 87 m

STEGINOPORELLIDAE Hincks, 1884

**Steginoporella* sp. d'Hondt 1986 New Caledonia 15 m

TETRAPLARIIDAE Harmer, 1957

Tetraplaria caledoniensis d' Hondt, 1986 New Caledonia n.d.

**Tetraplaria immersa* (Haswell, 1880) Queensland, Australia n.d.
Tetraplaria orospinea Gordon & d'Hondt, 1997 New Caledonia 760–1870 m
**Tetraplaria ventricosa* (Haswell, 1881) Queensland, Australia 35–54 m
Tetraplaria sp. Gordon & d'Hondt 1997 New Caledonia 360 m

THALAMOPORELLIDAE Levinsen, 1902

**Thalamoporella quadrata* Gordon, 1984 Kermadec Ridge, New Zealand 15–20 m
**Thalamoporella rozieri* (Audouin, 1826) Red Sea n.d.
**Thalamoporella* sp. d'Hondt 1986 New Caledonia 87 m

TRYPOSTEGIDAE Gordon, Tilbrook & Winston *in* Winston, 2005

**Trypostega hankchaneyi* Tilbrook, 2006 Solomon Islands n.d.

WATERSIPORIDAE Vigneaux, 1949

**Watersipora subtorquata* (d'Orbigny, 1852) Brazil n.d.

INCERTAE SEDIS

Pseudolunularia sp. d'Hondt & Gordon 1999 New Caledonia 310–315 m
**Teuchopora biaviculata* d'Hondt, 1986 New Caledonia [not this genus] n.d.

Shallow water brachiopod species of New Caledonia

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Brachiopods are entirely marine, sessile, benthic invertebrates with soft body enclosed in a shell consisting of two valves which differ in size, shape, and sometimes even in ornamentation and colour. Most brachiopods have calcareous shell, except lingulids which have organophosphatic shell. They have a very long and impressive geological history but today they are regarded as a minor phylum and are reduced to about 110 genera. Nevertheless, brachiopods are widely distributed, being present in all of the world's oceans and they can locally dominate the benthic marine communities. Their bathymetric range is very wide, from the intertidal zone to depths of about 6000 meters, however, most commonly they occur from 100 to 500 m.

Among the 30 brachiopod species occurring in the New Caledonia region (d'Hondt 1987; Emig 1988; Laurin 1997), only four of them have been found in the shallow water less than 100 meters deep. The shallow water brachiopod fauna consists of 4 species belonging to 3 genera, in 3 families, 3 orders (Lingulida, Terebratulida and Thecideida) and 2 subphyla (Linguliformea and Rhynchonelliformea). Two *Lingula* species, namely *L. anatina* Lamarck and *L. adamsi* Dall, are recognised in New Caledonia. Lingulides are the only brachiopods which adopted an infaunal habit in soft sediments. Those two species are widely distributed in the West Pacific.

As in many West Pacific islands until Japan, the lingulides are cooked and eaten in New Caledonia where they are named "moules à queue" (more details in the local newspaper of Nouméa "Les Nouvelles" 25/10/1983 and 4/11/1983 (C. Emig, personal communication).

Frenulina sanguinolenta (Gmelin, 1791) is the only terebratulide found in shallow waters. This species is easily recognisable because of its red colour pattern. It lives attached by a pedicle to the hard substrate. *F. sanguinolenta* is reported from many localities in the Pacific Ocean, from Japan and Australia to Hawaii and French Polynesia, as well as in the Indian Ocean.

The fourth brachiopod species known from the shallow water is a thecideid, *Thecidellina maxilla* (Hedley). The thecideid brachiopods are small cementing forms which live in low to mid-latitudes. They inhabit commonly light-poor, shallow water environments, such as caves and crevices in coral reefs. *T. maxilla* is widespread in the Pacific Ocean, from Tuvalu to the Tuamotu Islands, and as far south as the Kermadec Islands.

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List of Brachiopoda of New Caledonia (0-100 m)

LINGULIDAE Menke, 1828
- *Lingula anatina* Lamarck, 1801
- *Lingula adamsi* Dall, 1873

FRENULINIDAE Hatai, 1938
- *Frenulina sanguinolenta* (Gmelin, 1791)

THECIDELLINIDAE Elliott, 1958
- *Thecidellina maxilla* (Hedley, 1899)

Phoronida of New Caledonia

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Worldwide, ten valid species of Phoronida are known. All have representative populations in the Pacific Ocean and four have been recorded in New Caledonian waters (Emig & Golikov, 1990; Emig & Roldán, 1992; and unpublished data). Benthic surveys of the lagoon of Nouméa (New Caledonia) in the 80's resulted in the first records of Phoronida: *Phoronis psammophila*, *P. muelleri*, *Phoronopsis albomaculata*, and *Phoronopsis harmeri*, and recently in Lifou Island (unpublished data).

In the Nouméa lagoon, *Phoronis psammophila*, a cosmopolitan species, occurs at a low density, from 3 to 100 individuals per square meter (Emig & Golikov, 1990; Emig & Roldán, 1992). It *dwells* in fine to coarse sands, generally covered with a rich epibiosis, and in seagrass beds of Halodule *minervis* with *Halimeda*. This species sometimes shares its habitat with one or two other phoronid species, e.g., *Phoronis muelleri*, a cosmopolitan species, *Phoronopsis albomaculata,* and/or *Phoronopsis harmer, a species* well-known in the Pacific (Emig, 1984, 1985). For example, in the Anse Vata and in the Baie des Citrons, *Phoronis psammophila* occurs with *Phoronopsis harmeri* at very shallow depth. *Phoronopsis albomaculata*, a tropical-temperate species, was collected at several stations at a low density of 3-9 individuals per square meter. This species occurs in sandy bottoms like those occupied by *Phoronis psammophila*, but in general they are somewhat coarser owing to stronger near-bottom currents. *P. psammophila* is more abundant in well-sorted fine sands, as for example in Sainte-Marie Bay where its density reaches 2000 individuals per square meter (ECOTROPE programme; unpublished data). *P. psammophila* has also been collected by Christer Erseus in the Chateaubriand Bay of Lifou Island (unpublished data).

The data obtained in New Caledonia confirm that, in the Phoronida, low densities occur in tropical and subtropical waters (Thomassin & Emig, 1983) in contrast to the higher densities cited at higher latitudes.

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THOMASSIN, B. A. & EMIG, C. C. 1983. Distribution des Phoronidiens dans les biotopes littoraux, coralliens et terrigènes, du Canal de Mozambique (S.W. Océan Indien). *Téthys*, 11 (1), 33-48.

See also: http://paleopolis.rediris.es/Phoronida/

List of Phoronida of New Caledonia (0-100 m)

Following the name of each species is the locality where it was first described.

LOPHOPHORATA

PHORONIDA Hatchek, 1888

Phoronis muelleri Selys-Longchamps, 1907 (Helgoland, Germany)
Phoronis psammophila Cori, 1889 (Messina, Italy)
Phoronopsis albomaculata Gilchrist, 1907 (False Bay, South Africa)
Phoronopsis harmeri Pixell, 1912 (Departure Bay, Vancouver, Canada)

Polychaetes of New Caledonia

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This list records 286 species and subspecies of polychaetes recorded from New Caledonian waters. This number is certainly an underestimate with several degrees of magnitudes and more than anything reflects our general lack of knowledge on polychaetes in many tropical areas. In Northern Europe, for example—a better known but presumabely much less species-rich area—there are around 1.000 polychaete species known.

The "cosmopolitan species issue" deserves some comments. Many earlier authors, one obvious example being Pierre Fauvel, had a very different view on species delimitations and distributions from most polychaete workers today. Fauvel had no problem to include the same species (and cut and paste the descriptions of them!) from France, India and the Pacific Ocean. Subsequent workers followed him and used his Faune de France volumes to identify New Caledonian polychaetes. In this list there is a fair numbers of species that are described from different regions, for example *Terebellides stroemi* that was originally described from Norway by Sars and is today a classical example of a cosmopolitan species or species complex. Today such distributions are usually regarded with suspicion. As we today observe polychaetes with better means, including electron microscopes and molecular tools, there is a clear tendence to split up previous, widely distributed species into different species with more narrow distributions.

There may also be more theoretical reasons behind these differences, relating to differences in species concepts. Unfortunately, however, these were rarely spelled out explicitly and this situation is actually still very much the same today. Concepts based on apomorphies, on morphological differences, or on genetic communication may all give very different results. A simple species list has both its practical and theoretical problems.

List of taxa

ANNELIDA
POLYCHAETA
ALCIOPIDAE Ehlers, 1864
- *Vanadis augeneri* Benham, 1929

AMPHICTENIDAE, PECTINARIIDAE Quatrefages, 1866 MalmgrenQuatrefages, 1867
- *Amphictene crassa* (Grube, 1870)
- *Pectinaria antipoda* Schmarda, 1861
- *Pectinaria australis* Ehlers, 1904

AMPHINOMIDAE Savigny Lamarck, 1818
- *Amphinome rostrata* (Pallas, 1766)
- *Chloeia flava* (Pallas, 1766)
- *Chloeia fusca* Mc Intosh, 1885
- *Euphrosyne laureata* SavignyLamarck, 1818
- *Eurythoe complanata* (Pallas, 1766)
- *Hipponoa gaudichaudi* Audouin & Milne-Edwards, 1833
- *Notopygos hispida* Potts, 1909
- *Pseudoeurythoeë acarunculata* Monro, 1937

APHRODITIDAE Malmgren, 1867
- *Aphroditae armifera* Moore, 1910 *

ARICIIDAE ORBINIIDAE Audouin & A. Milne, 1867, Hartman Edwards, 1942
- *Scoloplosia minima* Rullier, 1972

CAPITELLIDAE Grube, 1862
- *Capithellethus dispar* (Ehlers, 1907)
- *Dasybranchus caducus* (Grube, 1846)
- *Leiochrides australis* Augener, 1914
- *Mastobranchus trinchesii* Eisig, 1887
- *Notomastus latericeus* Sars, 1850

Pulliella armata Fauvel, 1929

CHAETOPTERIDAE Malmgren, 1867Audouin & Milne Edwards, 1833

Chaetopterus variopedatus (Renier, 1804)

Phyllochaetopterus major Claparède, 1868

CHRYSOPETALIDAE Ehlers, 1864

Bhawania cryptocephala Gravier, 1902

Bhawania goodei Webster, 1884

Chrysopetalum debile (Grube, 1855)

CIRRATULIDAE Carus Ryckholdt, 1851, 1863

Audouinia anchylochaeta (Schmarda, 1861)

Audouinia semicincta (Ehlers, 1905)

Audouinia tentaculata (Montagu, 1808)

Cirratulus africanus Gravier, 1906

Cirratulus chrysoderma Claparède, 1868

Cirratulus dasylophius Marenzeller, 1879

Cirriformia semicincta Ehlers, 1905

Dodecaceria fistulicola Ehlers, 1901

Dodecaceria laddi Hartman, 1954

Heterocirrus bioculatus (Keferstein, 1862)

Tharyx dorsobranchialis (Kirkegaard, 1959)

EUNICIDAE Savigny Bertholdt, 1827

Aglaurides fulgida (Savigny, 1818)

Amphiro pacifica Rullier, 1972

Arabella iricolor (Montagu, 1804)

Eunice afra paupera Grube, 1878

Eunice afra punctata Peters, 1854

Eunice antennata (Savigny, 1818)

Eunice aphroditois (Pallas, 1788)

Eunice australis Quatrefages, 1865

Eunice cincta (Kinberg, 1865)

Eunice filamentosa Grube, 1856

Eunice gracilis Crossland, 1904

Eunice grubei Gravier, 1900

Eunice indica Kinberg, 1865

Eunice plessisi Rullier, 1972

Eunice siciliensis Grube, 1840

Eunice tentaculata Quatrefages, 1865

Eunice vittata delle Chiaje, 1828

Lumbrinereis impatiens Claparède, 1868

Lumbrinereis inflata Moore, 1911

Lumbrinereis latreilli Audouin & H. Milne Edwards, 1834

Lumbrinereis lynnei Knox, 1951

Lumbrinereis sphaerocephala (Schmarda, 1861)

Lysidice collaris Grube, 1870

Marphysa bernardi Rullier, 1972

Marphysa capensis (Schmarda, 1861)

Marphysa mossambica (Peters, 1854)

Marphysa sanguinea (Montagu, 1815)

Nematonereis unicornis Schmarda, 1861

Protodorvillea biarticulata Day, 1963

Staurocephalus angolana Augener, 1918

Staurocephalus australiensis Benham, 1915

Staurocephalus gardineri Crossland, 1924

FLABELLIGERIDAE Saint-Joseph, 1894

Flabelligera pruvoti Fauvel, 1930

Pherusa swakopiana (Augener, 1918)

GLYCERIDAE Grube, 1850

Eone salvati Rullier, 1972
Glycera gigantea Quatrefages, 1866
Glycera lancadivae Schmarda, 1861
Glycera siphonostoma delle Chiaje,
Glycera tesselata Grube, 1863
Goniada brunnea Treadwell, 1906
Goniada emerita Audouin & Milne Edwards, 1833

HESIONIDAE Grube, 1850

Ancistrosyllis constricta Southern, 1921
Hesione intertexta Grube, 1878
Hesione pantherina Risso, 1826
Heteropodarke heteromorpha Hartmann-Schröder, 1962
Leocrates claparedii (Claparède, 1868)
Leocratides filamentosus Ehlers, 1908
Ophiodromus tigrinus Rullier, 1972
Podarke Ophiodromus latifrons (Grube, 1878)

MALDANIDAE Malmgren, 1867

Chaponella heterochaeta Rullier, 1972
Euclymene insecta (Ehlers, 1904)

NEPHTHYIDAE Grube, 1850

Nephthys sphaerocirrata Wesenberg, 1949

NEREIDIDAE Johnston, 1865

Ceratonereis pachychaeta Fauvel, 1919
Leonnates crosnieri León-González & Salazar-Vallejo, 2003 (Sakai)
Leonnates jousseaumei Gravier, 1899
Leptonereis foli Fauvel, 1930
Neanthes pleijeli Leon-Gonzalez & Salazar-Vallejo, 2003
Nereis costae (Grube, 1840)
Nereis cricognatha Ehlers, 1904
Nereis denhamensis Augener, 1913
Nereis dubia Rullier, 1972
Nereis homogompha Rullier, 1972
Nereis jacksoni Kinberg, 1866
Nereis kauderni Fauvel, 1921
Nereis mirabilis Kinberg, 1866
Nereis trifasciata Grube, 1878
Nereis unifasciata Willey, 1905
Nereis zonata persica Fauvel, 1911
Perinereis amblyodonta Schmarda, 1861
Perinereis cultrifera var. *floridana* (Ehlers, 1868)
Perinereis cultrifera var. *helleri* Grube, 1878
Perinereis cultrifera var. *striolata* Grube, 1878
Perinereis cultrifera var. *typica* Grube, 1840
Perinereis neocaledonica Pruvot, 1930
Perinereis nigropunctata (Horst, 1889)
Perinereis nuntia Savigny, 1818
Perinereis pseudocavifrons Fauvel, 1930
Perinereis singaporiensis Grube, 1878
Perinereis vancaurica (Ehlers, 1868)
Platynereis australis (Schmarda, 1861)
Platynereis dumerilii (Audouin & Milne Edwards, 1833)
Platynereis dumerilii var. *ocellata* Pruvot,*
Platynereis hugonis Rullier, 1972

Platynereis pulchella Gravier, 1902
Pseudonereis anomala Gravier, 1901
Pseudonereis gallapagensis Kinberg, 1866
Pseudonereis malasacensis Fauvel,

NERILLIDAE Levinsen, 1882
Mesonerilla biantennata pacifica Jouin, 1970

OPHELIIDAE Malmgren, 1867
Ammotrypane aulogaster Rathke, 1843
Armandia intermedia Fauvel, 1902
Armandia lanceolata Willey, 1905
Armandia leptocirris (Grube, 1878)
Polyophthalmus pictus (Dujardin, 1839)

OWENIIDAE Rioja, 1917
Owenia fusiformis Delle Chiaje, 1844

PARAONIDAE Cerruti, 1909
Aricidea cerrutii Laubier, 1967

PHYLLODOCIDAE WilliamsØrsted, 18511843
Eteonides Hesionura laubieri (Hartmann-Schröder, 1963)
Eulalia magalaensis Kinberg, 1866
Eulalia viridis (Linné, 1758)
Iospilus phalacroïdes Viguier, 1886
Mystides angolaensis Augener, 1918
Notophyllum splendens (Schmarda,)
Phyllodoce castanea (Marenzeller, 1879)
Phyllodoce fristedti Bergstrom, 1914
Phyllodoce lamelligera (Linné, 1788)
Phyllodoce macrophtalma Schmarda, 1861
Phyllodoce madeirensis Langerhans, 1880
Phyllodoce pruvoti Fauvel, 1930
Phyllodoce quadraticeps Grube, 1878

PILARGIDAE Saint-Joseph, 1899
Ancistrosyllis constricta Southern, 1921

POLYGORDIIDAE Czerniavsky, 1881
Polygordius triestinus Woltereck, Hempelmann, 1906

POLYNOIDAE Malmgren, 1867
Eulepis geayi Fauvel, 1918
Eupolyodontes gulo (Grube, 1855)
Gastrolepidia clavigera Schmarda, 1861
Harmothoe ampullifera (Grube, 1878)
Harmothoe imbricata Linné, 1767
Harmothoe lunulata nigra Aleyos &y Sanz, 1905
Harmothoe macrolepidota (Schmarda, 1861)
Harmothoe propinqua (Malmgren, 1867)
Harmothoe turbinata Hanley & Burke, 1991
Harmothoe vesicudenta Hanley & Burke, 1991
Hermenia acantholepis (Grube, 1876)
Heteralentia ptycholepis (Grube, 1878)
Hololepidella nigropunctata (Horst, 1915)
Hyperhalosydna striata (Kinberg, 1856)
Iphione coriolis Hanley & Burke, 1991
Iphione muricata (Savigny, 1818)
Iphione ovata Kinberg, 1856
Iphione treadwelli Pettibone, 1986
Lepidasthenia alba Hartman, 1942
Lepidasthenia elegans Grube, 1840

Lepidasthenia hirsuta Rullier, 1972
Lepidasthenia microlepis Potts, 1910
Lepidonotus arenosus Ehlers, 1901
Lepidonotus carinulatus (Grube, 1870)
Lepidonotus dictyolepis Haswell, 1883
Lepidonotus glaucus (Peters, 1854)
Lepidonotus hedleyi Benham, 1915
Lepidonotus hupferi Augener, 1918
Lepidonotus jukesi Baird, 1865
Lepidonotus permixturus Hanley & Burke, 1991
Lepidonotus salvati Rullier, 1972
Lepidonotus scanlandi Hanley & Burke, 1991
Lepidonotus spinosus Hanley & Burke, 1991
Lepidonotus taeniata Ehlers, 1881
Lepidonotus tenuisetosus (Gravier, 1902)
Paradyte crinoidicola (Potts, 1910)
Paralepidonotus indicus (Kinberg, 1856)
Scalisetosus levis Marenzeller, 1902
Scalisetosus pellucidus (Ehlers, 1864)
Subadyte chesterfieldensis Hanley & Burke, 1991
Subadyte papillifera (Horst, 1915)
Thormora jukesii Baird, 1865
Verrucapelma nigricans (Horst, 1915)
Verrucapelma retusa Hanley & Burke, 1991

POLYGORDIIDAE Czerniavsky, 1881

Polygordius triestinus (Woltereck & Hempelmann,1906)

PROTODRILIDAE Czerniavsky, 1881

Protodrilus indicus Aiyar & Alikunhi, 1944

SABELLIDAE Malmgren, 1867

Amphiglena mediterranea (Leydig, 1851)
Dasychone cingulata Grube, 1870
Hypsicomus phaeotaenia (Schmarda, 1861)
Megalomma suscipiens (Ehlers, 1904)
Oridia pacifica Rullier, 1972
Potamilla laciniosa Ehlers, 1904
Potamilla torelli Malmgren, 1866
Sabella melanostigma Schmarda,
Sabella nudicollis (Krøyer, 1856)
Sabella penicillus Linné, 1767
Sabellastarte indica (Savigny, 1818)
Sabellastarte sanctijosephi (Gravier, 1906)

SERPULIDAE Savigny, 1818

Filograna implexa Berkeley, 1828
Galeolaria cespitosa Lamarck,
Hydroides albiceps (Grube, 1870)
Hydroides bifurcata (Pixell, 1913)
Hydroides elegans (Haswell, 1883)
Hydroides exaltata (Marenzeller, 1884)
Hydroides heteroceros (Grube, 1868)
Hydroides longispinosa Imajima, 1976
Hydroides novaepommeraniae Augener, 1925
Hydroides tuberculata Imajima, 1976
Hydroides ralumianus Augener,*
Pomatoceros caeruleus (Schmarda, 1861)
Pomatoleios kraussii (Baird, 1865)

Protula tubularia (Montagu, 1803)
Salmacina incrustans Claparède, 1868
Serpula hartmanae Reish, 1968
Serpula tetratropica Imajima & ten Hove, 1984
Spirobranchus giganteus (Pallas, 1766)
Spirobranchus giganteus var. *tricornis* Morch, 1863
Spirobranchus polytrema (Philippi, 1844)
Spirobranchus tetraceros (Schmarda, 1861)
Vermiliopsis glandigerus Gravier, 1908
Vermiliopsis infundibulum ten Hove, 1975

SPIONIDAE Grube, 1850

Microspio mecznikowianus (Claparède, 1868)
Nerine cirratulus (delle Chiaje, 1828)
Polydora socialis (Schmarda, 1861)
Prionospio capensis Mc Intosh, 1885
Prionospio casperi Laubier, 1962
Scolelepis indica Fauvel,
Spio aequalis Ehlers, 1904
Spio multioculata (Rioja, 1918)

SPIRORBIDAE Chamberlin, 1919

Neodexiospira foraminosa (Moore & Bush, 1904)
Neodexiospira pseudocorrugata (Bush, 1904)
Simplicaria pseudomilitaris (Thiriot-Qie'vreux, 1965)
Vinearia koehleri (Caullery & Mesnil, 1897)

SYLLIDAE Grube, 1850

Atelesyllis rubrofasciata Pruvot,*
Autolytus bicolor Rullier, 1972
Eurysyllis brevipes Hartmann-SchröderGidholm, 1956
Eusyllis assimilis Marenzeller, 1875
Eusyllis ceylonica Augener,
Exogone longicornis Westheide, 1974
Opisthosyllis ankylochaeta Fauvel, 1921
Opisthosyllis australis Fauvel, 1921
Parasphaerosyllis indica Monro, 1937
Plakosyllis brevipes Hartmann-Schröder, 1956
Sphaerosyllis bulbosa Southern, 1914
Sphaerosyllis claperedii Ehlers, 1864
Syllis armillaris Malmgren, 1867
Syllis closterobranchia Schmarda,
Syllis cornuta Rathke, 1843
Syllis exilis Gravier, 1900
Syllis ferrugina Langerhans, 1881
Syllis filiformis Rullier, 1972
Syllis gracilis Grube, 1840
Syllis hyalina Grube, 1863
Syllis kinbergiana Haswell, 1886
Syllis krohnii Ehlers, 1864
Syllis nepiotoca Caullery & Mesnil, 1916
Syllis plessisi Rullier, 1972
Syllis prolifera Krohn, 1852
Syllis spongicola Grube, 1855
Syllis variegata Grube, 1860
Trypanosyllis zebra Grube, 1860

TEREBELLIDAE Grube, 1851

Eupolymnia nebulosa (Montagu, 1818)

Euthelepus kisembaensis Augener,
Loimia medusa (Savigny, 1818)
Lysilla pacifica Hessle, 1917
Nicolea chilensis (Schmarda, 1861)
Nicolea gracilibranchis (Grube, 1878)
Pista macrolobata Hessle, 1917
Polymnia nebulosa (Montagu, 1818)
Terebella ehrenbergi Grube, 1870
Terebella pterochaeta Schmarda,
Terebellides stroemi Sars, 1835
Terebellobranchia hugonis Rullier, 1972
Thelepus plagiostoma Schmarda, 1861
Thelepus setosus (Quatrefages, 1865)
Trichobranchus bibranchiatus Moore, 1903

TRIGONOSTOMIDAE Graff, 1905

Trigonostomum armatum (Jensen, 1878)
Trigonostomum denhartogi (Karling, 1978)
Trigonostomum franki Willems, 2004
Trigonostomum spinigerum Willems, 2004
Trigonostomum watsoni Willems, 2004

ECHIURA

ECHIURIDAE Quatrefages, 1847

Pseudobonellia biuterina Johnson & Tiegs, 1919

Fish parasites: Platyhelminthes (Monogenea, Digenea, Cestoda) and Nematodes, reported from off New Caledonia

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The records presented include a parasite-host list and a host-parasite list. The reference is indicated for each record. The lists deal only with published reports; unpublished results by the author or identifications of specimens by other researchers are not included. Papers with insufficient taxonomic information, such as those of Morand *et al.* (2000) which reports digeneans and nematodes in chaetodontid fishes, without any parasite names, are not included in the lists.

Numbers of parasites recorded

The present lists include a total of 130 records of parasites: 40 monopisthocotylean monogeneans, 4 polyopisthocotylean monogeneans, 66 digeneans, 6 cestodes and 14 nematodes. Although a few early reports might have escaped the attention of the author, a striking fact is that only a single monogenean (among 44 records) and a single nematode (among 14) were recorded before 2000. For the digeneans, a short visit by Manter in 1967 included 46 of the 66 records. The number of fish species in the lists is only 98, less than 10% of the total number of coral reef fish recorded; in addition, many of these fish have probably been investigated only for specific groups of parasites (i.e. only monogeneans, or only digeneans). Clearly, the biodiversity of fish parasites of New Caledonia has not been studied seriously and there are very few records before the beginning of the 21st century.

Is the list representative of the biodiversity of fish parasites in New Caledonia?

The answer is clearly no. These lists can be used as preliminary checklists, but certainly cannot be used as an evaluation of the biodiversity of parasites of coral reef fishes. Lim (1998) and Whittington (1998) have evaluated the number of monogeneans per fish species as 3 and 5, respectively. With about 1,200 species of coral reef fishes, the number of monogeneans expected to be found off New Caledonia is 3,600–6,000, numbers which, when compared to the number of species reported here (44, or about 1% of the expected number!), show the incredible paucity of our knowledge. Recent results show that certain species of coral reef fishes may harbour up to 13 species of gill monogeneans (Fig. 1; Justine, 2006), and perhaps as many other species of parasites as well. Including all groups, we may expect 10,000–20,000 species of parasites in the fish off New Caledonia. Again, the number recorded here (130 for all groups) is close to 1% of the expected total number.

About host names

A major work on the New Caledonian parasite fauna was that of Durio & Manter (1968a,b, 1969). Unfortunately, many fishes from which Manter collected digeneans were not identified at the species level. I have tried, in this paper, to "translate" the common names used by Manter into binomial nomenclature; this is based on an evaluation of the knowledge of fish taxonomy by local fishermen, and an appreciation of the difficulty of identifying species. The "bec de cane", known by everybody in New Caledonia, can safely be identified as *Lethrinus nebulosus*. The "anglais" is probably *Lutjanus bohar*. The "loche castex" is most probably a species of *Plectorhinchus* or *Diagramma pictum*. Manter used "leche", a misprint for "loche" the common name of groupers in New Caledonia; there are about 40 species of epinephelines in New Caledonia, so "leche" is translated here as "Serranidae". However, "loche bleue" can safely be identified as *Epinephelus cyanopodus*, because no other grouper is qualified as being "blue"; in contrast, the "red cod" could be any of the several species of *Epinephelus* or *Cephalopholis*. The host names, invalid or valid, are explained in full in the host-parasite section, but only a "probable translation" is retained in the parasite-host list. Host names have been updated using FishBase (Froese & Pauly, 2006).

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Parasite-host list

MONOGENEA MONOPISTHOCOTYLEA
(alphabetical order of families and species)

ANCYROCEPHALIDAE

***Aliatrema cribbi* Plaisance & Kritsky 2004**

Chaetodon auriga	Plaisance & Kritsky 2004
Chaetodon vagabundus	Plaisance & Kritsky 2004
Heniochus chrysostomus	Plaisance & Kritsky 2004

***Euryhaliotrematoides annulicirrus* (Yamaguti, 1968) Plaisance & Kritsky 2004**	
Chaetodon auriga	Plaisance & Kritsky 2004
Chaetodon vagabundus	Plaisance & Kritsky 2004
***Euryhaliotrematoides aspitis* Plaisance & Kritsky 2004**	
Chaetodon vagabundus	Plaisance & Kritsky 2004
***Euryhaliotrematoides grandis* (Mizelle & Kritsky, 1969) Plaisance & Kritsky 2004**	
Chaetodon auriga	Plaisance & Kritsky 2004
Chaetodon vagabundus	Plaisance & Kritsky 2004
***Euryhaliotrematoides microphallus* (Yamaguti, 1968) Plaisance & Kritsky 2004**	
Heniochus chrysostomus	Plaisance & Kritsky 2004
***Euryhaliotrematoides pirulum* Plaisance & Kritsky 2004**	
Chaetodon auriga	Plaisance & Kritsky 2004
***Haliotrema aurigae* (Yamaguti, 1968) Plaisance, Bouamer & Morand, 2004**	
Chaetodon auriga	Plaisance *et al.* 2004
Chaetodon citrinellus	Plaisance *et al.* 2004
Chaetodon vagabundus	Plaisance *et al.* 2004
Heniochus chrysostomus	Plaisance *et al.* 2004
***Haliotrema epinepheli* Young, 1969**	
Epinephelus maculatus	Justine, 2006
Variola albimarginata	Justine, 2005b
Variola louti	Justine, 2005b
***Haliotrema* sp.**	
Epinephelus maculatus	Justine, 2006
Tetrancistrum nebulosi	
Siganus fuscescens	Young, 1967
Siganus canaliculatus	Young, 1967
Siganus sp.	Young, 1967
CAPSALIDAE	
Capsalidae, immature	
Sphyraena sp. (recruiting larva)	Cribb *et al.*, 2000
***Benedenia* cf. *epinepheli* (Yamaguti, 1937)**	
Epinephelus fasciatus	Justine, 2005a
***Benedenia* sp.**	
Epinephelus howlandi	Hinsinger & Justine, 2006b
Trochopodinae Gen. sp.	
Plectropomus leopardus	Justine & Euzet, 2006
DIPLECTANIDAE	
***Echinoplectanum chauvetorum* Justine & Euzet, 2006**	
Plectropomus laevis	Justine & Euzet, 2006
***Echinoplectanum laeve* Justine & Euzet, 2006**	
Plectropomus laevis	Justine & Euzet, 2006
***Echinoplectanum leopardi* Justine & Euzet, 2006**	
Plectropomus leopardus	Justine & Euzet, 2006
***Echinoplectanum pudicum* Justine & Euzet, 2006**	
Plectropomus leopardus	Justine & Euzet, 2006
***Echinoplectanum rarum* Justine & Euzet, 2006**	
Plectropomus leopardus	Justine & Euzet, 2006
***Laticola dae* Journo & Justine, 2006**	
Epinephelus maculatus	Journo & Justine, 2006
***Pseudorhabdosynochus auitoe* Justine, 2006**	
Epinephelus maculatus	Justine, 2006
***Pseudorhabdosynochus buitoe* Justine, 2006**	
Epinephelus maculatus	Justine, 2006
***Pseudorhabdosynochus calathus* Hinsinger & Justine, 2006**	
Epinephelus rivulatus	Hinsinger & Justine, 2006b

***Pseudorhabdosynochus caledonicus* Justine, 2005**
Epinephelus fasciatus Justine, 2005a; Hinsinger & Justine, 2006b
***Pseudorhabdosynochus cuitoe* Justine, 2006**
Epinephelus maculatus Justine, 2006
***Pseudorhabdosynochus cupatus* (Young, 1969) Kritsky & Beverley-Burton, 1986**
Epinephelus fasciatus Justine, 2005a; Hinsinger & Justine, 2006b
***Pseudorhabdosynochus cyathus* Hinsinger & Justine, 2006**
Epinephelus howlandi Hinsinger & Justine, 2006b
***Pseudorhabdosynochus duitoe* Justine, 2006**
Epinephelus maculatus Justine, 2006
***Pseudorhabdosynochus euitoe* Justine, 2006**
Epinephelus maculatus Justine, 2006
***Pseudorhabdosynochus fuitoe* Justine, 2006**
Epinephelus maculatus Justine, 2006
***Pseudorhabdosynochus guitoe* Justine, 2006**
Epinephelus maculatus Justine, 2006
***Pseudorhabdosynochus hirundineus* Justine, 2005**
Variola louti Justine, 2005b
***Pseudorhabdosynochus melanesiensis* (Laird, 1958) Kritsky & Beverley-Burton, 1986**
Epinephelus merra Justine, 2005a; Hinsinger & Justine, 2006b
***Pseudorhabdosynochus huitoe* Justine, 2006**
Epinephelus maculatus Justine, 2006
***Pseudorhabdosynochus venus* Hinsinger & Justine, 2006**
Epinephelus howlandi Hinsinger & Justine, 2006a
***Pseudorhabdosynochus* cf. *coioidesis* Bu, Leong, Wong , Woo & Foo, 1999**
Epinephelus merra Hinsinger & Justine, 2006b
MONOCOTYLIDAE
***Decacotyle octona* (Young, 1967) Chisholm & Whittington, 1998**
Aetobatus cf. *narinari* Marie & Justine, 2005
***Decacotyle elpora* Marie & Justine, 2005**
Aetobatus cf. *narinari* Marie & Justine, 2005
***Clemacotyle australis* Young, 1967**
Aetobatus cf. *narinari* Marie & Justine, 2005
***Thaumatocotyle pseudodasybatis* Hargis, 1955**
Aetobatus cf. *narinari* Marie & Justine, 2005, 2006

MONOGENEA POLYOPISTHOCOTYLEA
(alphabetical order of species)
***Allopseudaxine* sp.**
Katsuwonus pelamis Rohde, Roubal & Hewitt, 1980
***Allopseudaxinoides vagans* (Ishii, 1936) Yamaguti, 1968**
Katsuwonus pelamis Rohde, Roubal & Hewitt, 1980
***Neothoracocotyle acanthocybii* (Meserve, 1938) Hargis, 1956**
Acanthocybium solandri Rohde, Roubal & Hewitt, 1980
***Polylabris sillaginae* (Woolcock, 1936) Dillon, Hargis & Harrises, 1983**
Sillago sihama Hayward, 1996

DIGENEA
(alphabetical order of families and species)

ACANTHOCOLPIDAE
***Stephanostomum japonocasum* Durio & Manter, 1969**
Epinephelus sp. "Red Cod" Durio & Manter, 1969
Serranidae "unidentified serranid" Durio & Manter, 1969

***Stephanostomum casum* (Linton, 1910) McFarlane, 1934**	
Lutjanus argentimaculatus	Durio & Manter, 1969
BIVESICULIDAE	
***Bivesiculoides posterotestis* Durio & Manter, 1968**	
Myctophidae "pretre" (? *Atherinomorus lacunosus* ?)	Durio & Manter, 1968a
BUCEPHALIDAE	
***Myorhynchus pritchardae* Durio & Manter, 1968**	
Serranidae ("leche"/ loche)	Durio & Manter, 1968a
***Neidhartia coronata* Durio & Manter, 1968**	
Epinephelus sp.	Durio & Manter, 1968a
***Prosorhynchus freitasi* Nagaty, 1937**	
Epinephelus sp.	Durio & Manter, 1968a
***Prosorhynchus longisaccatus* Durio & Manter, 1968**	
Serranidae ("leche"/ loche)	Durio & Manter, 1968a
***Prosorhynchus serrani* Durio & Manter, 1968**	
Variola louti	Durio & Manter, 1968a
***Rhipidocotyle* sp.**	
Labroides bicolor	Jones, Grutter & Cribb, 2003
Labroides dimidiatus	Jones, Grutter & Cribb, 2003, 2004
CRYPTOGONIMIDAE	
***Lobosorchis tibaldiae* Miller & Cribb, 2005**	
Lutjanus fulviflamma	Miller & Cribb, 2005
***Paracryptogonimus catalae* Durio & Manter, 1969**	
Lutjanus bohar ? ("anglais")	Durio & Manter, 1969
***Paracryptogonimus longitestis* Durio & Manter, 1969**	
Lutjanus bohar ? ("anglais")	Durio & Manter, 1969
***Paracryptogonimus provitellosus* Durio & Manter, 1969**	
Lutjanus fulvus	Durio & Manter, 1969
***Paracryptogonimus saccatus* Manter, 1963**	
Siganus sp.	Durio & Manter, 1969
***Paracryptogonimus testitactus* Durio & Manter, 1969**	
Lutjanus bohar ? ("anglais")	Durio & Manter, 1969
***Siphoderina paracatalae* Durio & Manter, 1969**	
Lutjanus bohar ? ("anglais")	Durio & Manter, 1969
DIDYMOZOIDAE	
Didymozoidae Larva sp. A	
Apogon coccineus (recruiting larvae)	Cribb *et al.*, 2000
Bleniidae sp (recruiting larvae)	Cribb *et al.*, 2000
Pseudogramma sp. (recruiting larvae)	Cribb *et al.*, 2000
Scorpaenidae Gen. sp. (recruiting larvae)	Cribb *et al.*, 2000
Synodontidae Gen. sp. (recruiting larvae)	Cribb *et al.*, 2000
Didymozoidae Larva sp. B	
Apogon coccineus (recruiting larvae)	Cribb *et al.*, 2000
Bothus pantherinus (recruiting larvae)	Cribb *et al.*, 2000
Didymozoidae Larva sp. C	
Synodontidae Gen. sp. 1 (recruiting larvae)	Cribb *et al.*, 2000
Didymozoidae Larva sp. D	
Labridae Gen. sp. (recruiting larvae)	Cribb *et al.*, 2000
Thalassoma sp. (recruiting larvae)	Cribb *et al.*, 2000
Didymozoidae Larva sp. E	
Apogon coccineus (recruiting larvae)	Cribb *et al.*, 2000
Didymozoidae Larva sp. F	
Apogon coccineus (recruiting larvae)	Cribb *et al.*, 2000
Larva sp. G	
Labridae Gen. sp. (recruiting larvae)	Cribb *et al.*, 2000

Thalassoma sp. (recruiting larvae)	Cribb *et al.*, 2000
FELLODISTOMATIDAE	
***Tergestia clonacantha* Manter, 1963**	
Hemiramphus sp.	Durio & Manter, 1968a
GYLIAUCHENIDAE	
***Affecauda salacia* Hall & Cribb, 2004**	
Zebrasoma veliferum	Hall & Cribb, 2004b
***Gyliauchen papillatus* (Goto & Matsudaira, 1918) Goto, 1919**	
Siganus sp.	Durio & Manter, 1969
***Ptychogyliauchen thistilbardi* Hall & Cribb, 2004**	
Siganus argenteus	Hall & Cribb, 2004a
Siganus canaliculatus	Hall & Cribb, 2004a
Siganus corallinus	Hall & Cribb, 2004a
Siganus doliatus	Hall & Cribb, 2004a
Siganus spinus	Hall & Cribb, 2004a
HAPLOPORIDAE	
***Atractotrema sigani* Durio & Manter, 1969**	
Siganus sp.	Durio & Manter, 1969
***Hapladena tanyorchis* Manter & Pritchard, 1961**	
Naso sp. "unicorn fish"	Durio & Manter, 1969
***Isorchis parvus* Durio & Manter, 1969**	
Chanos chanos	Durio & Manter, 1969
HAPLOSPLANCHNIDAE	
***Hymenocotta mulli* Manter, 1961**	
"Mullet" Mugilidae	Durio & Manter, 1968a
HEMIURIDAE	
***Dichadena obesa* (Manter, 1961) Manter, 1969**	
Strongylura leiura ?	Manter, 1969
***Erilepturus tiegsi* Woolcock, 1935**	
Epinephelus sp.	Manter, 1969
Serranidae "mottled grouper"	Manter, 1969
Epinephelus cyanopodus ? "loche bleue"	Manter, 1969
Hemiuridae (immature unidentifiable)	
Bleniidae sp (recruiting larvae)	Cribb *et al.*, 2000
***Ectenurus* sp.**	
Pseudogramma sp. (recruiting larvae)	Cribb *et al.*, 2000
Synodontidae Gen. sp. 2 (recruiting larvae)	Cribb *et al.*, 2000
***Erilepturus* sp. immature**	
Synodontidae Gen. sp. 1 (recruiting larvae)	Cribb *et al.*, 2000
***Hysterolecitha sigani* Manter, 1969**	
Siganus sp.	Manter, 1969
***Hysterolecithoides frontilatus* (Manter, 1969) Yamaguti, 1971**	
Siganus doliatus	Bray & Cribb, 2000a
***Lecithaster testilobatus* Manter, 1969**	
Scarus (= *Callyodon*) sp.	Manter, 1969
***Lecithochirium magnaporum* Manter, 1940**	
Lethrinus miniatus	Manter, 1969
Epinephelus sp.	Manter, 1969
***Lecithochirium polynemi* Chauhan, 1945**	
Lutjanus fulvus	Manter, 1969
***Lecithocladium aegyptensis* Fischtal & Kuntz, 1963**	
Scombridae "mackerel"	Manter, 1969
***Parahemiurus merus* (Linton, 1910)**	
Priacanthus hamrur	Bray & Cribb, 2005

***Quadrifoliovarium pritchardae* Yamaguti, 1965**	
Naso sp. "unicorn fish"	Manter, 1969
***Theletrum frontilatum* Manter, 1969**	
Siganus sp.	Manter, 1969
LECITHASTERIDAE	
***Aponurus chelebesoi* Bray & Cribb, 2000**	
Chaetodon auriga	Bray & Cribb, 2000b
Chaetodon citrinellus	Bray & Cribb, 2000b
Chaetodon ephippium	Bray & Cribb, 2000b
Chaetodon flavirostris	Bray & Cribb, 2000b
Chaetodon lineolatus	Bray & Cribb, 2000b
Chaetodon melannotus	Bray & Cribb, 2000b
Chaetodon mertensii	Bray & Cribb, 2000b
Chaetodon pelewensis	Bray & Cribb, 2000b
Coradion altivelis	Bray & Cribb, 2000b
Forcipiger flavissimus	Bray & Cribb, 2000b
Heniochus acuminatus	Bray & Cribb, 2000b
Heniochus chrysostomus	Bray & Cribb, 2000b
Heniochus monoceros	Bray & Cribb, 2000b
Siganus doliatus	Bray & Cribb, 2000b
LEPOCREADIIDAE	
***Holorchis plectorhynchi* Durio & Manter, 1968**	
Plectorhinchus goldmani	Durio & Manter, 1968b
Lethrinus miniatus	Durio & Manter, 1968b
***Intusatrium robustum* Durio & Manter, 1968**	
Bodianus perditio	Durio & Manter, 1968b
***Intusatrium secundum* Durio & Manter, 1968**	
Scaridae? "Brown-blotched parrot fish"	Durio & Manter, 1968b
***Neolepidapedon dollfusi* Durio & Manter, 1968**	
Epinephelus sp. "Red Cod"	Durio & Manter, 1968b
Epinephelus sp. "Spotted Grouper"	Durio & Manter, 1968b
***Lepidapedoides angustus* Bray, Cribb & Barker, 1996 (as *L. "kerapu"*)**	
Epinephelus merra	Rigby *et al.*, 1997
MICROSCAPHIDIIDAE	
***Hexangium sigani* Goto & Ozaki, 1929**	
Siganus sp.	Durio & Manter, 1968a
Lutjanus fulvus	Durio & Manter, 1968a
MONORCHIIDAE	
***Hysterorchis vitellosus* Durio & Manter, 1968**	
Plectorhinchus sp.	Durio & Manter, 1968a
***Lasiotocus longitestis* Durio & Manter, 1968**	
Plectorhinchus sp. ("loche castex")	Durio & Manter, 1968a
OPECOELIDAE	
***Allopodocotyle serrani* (Yamaguti, 1952) Pritchard, 1966**	
Serranidae ("leche"/ loche)	Durio & Manter, 1968b
***Hamacreadium diacopae* Nagaty & Abdel Aal, 1962**	
Lethrinus nebulosus ? ("bec de cane")	Durio & Manter, 1968b
***Hamacreadium mutabile* Linton, 1910**	
Lutjanus bohar ? ("anglais")	Durio & Manter, 1968b
Lutjanus amabilis	Durio & Manter, 1968b
Lethrinus miniatus	Durio & Manter, 1968b
***Choanostoma secundum* Durio & Manter, 1968**	
Plectorhinchus sp.	Durio & Manter, 1968b
Lutjanus vitta	Durio & Manter, 1968b

***Helicometra fasciata* (Rudolphi, 1819) Odhner, 1902**	
Epinephelus sp. "Red Cod"	Durio & Manter, 1968b
Epinephelus merra	Rigby *et al.*, 1997
***Orthodena tropica* Durio & Manter, 1968**	
Lethrinus nebulosus ? ("bec de cane")	Durio & Manter, 1968b
***Pacificreadium serrani* Durio & Manter, 1968**	
Epinephelus sp.	Durio & Manter, 1968b
***Pseudoplagioporus interruptus* Durio & Manter, 1968**	
Lethrinus nebulosus ? ("bec de cane")	Durio & Manter, 1968b
***Pseudoplagioporus lethrini* Yamaguti, 1938**	
Lethrinus nebulosus ? ("bec de cane")	Durio & Manter, 1968b
SANGUINICOLIDAE	
***Cardicola chaetodontis* Yamaguti, 1970**	
Chaetodon lineolatus	Nolan & Cribb, 2006
SYNCOELIIDAE	
***Syncoelium filiferum* (Sars, 1885) Odhner, 1911**	
Katsuwonus pelamis	Rohde, Roubal & Hewitt, 1980
ZOOGONIDAE	
***Diphtherostomum tropicum* Durio & Manter, 1968**	
Lethrinus nebulosus ?	Durio & Manter, 1968a

CESTODA

Acanthobothrium aetiobatis	
Aetobatus narinari	Baer & Euzet 1962
Nybelinia aequidentata	
Dendrochirus zebra	Palm & Beveridge, 2002
***Scolex polymorphus* (= tetraphyllidean metacestodes)**	
Epinephelus merra	Rigby *et al.*, 1997
Trypanorhyncha larvae	
Epinephelus merra	Rigby *et al.*, 1997
Metacestode	
Synodontidae Gen. sp. 3 (recruiting larvae)	Cribb *et al.*, 2000
Tetraphyllidea Metacestode	
Thalassoma sp. (recruiting larvae)	Cribb *et al.*, 2000

NEMATODA

(alphabetical order of families and species)

ANISAKIDAE	
***Raphidascaris (Ichtyiascaris) nemipteri* Moravec & Justine, 2005**	
Nemipterus furcosus	Moravec & Justine, 2005
***Hysterothylacium cenaticum* (Bruce & Cannon, 1989) Moravec & Justine, 2005**	
Tetrapturus audax	Moravec & Justine, 2005
***Terranova scoliodontis* (Baylis, 1931) Johnston & Mawson, 1945**	
Galeocerdo cuvier	Moravec & Justine, 2006a
CAMALLANIDAE	
***Procamallanus (Procamallanus) pacificus* Moravec, Justine, Würtz, Taraschewski & Sasal, 2006**	
Anguilla obscura	Moravec *et al.*, 2006
Anguilla reinhardtii	Moravec *et al.*, 2006
CUCULLANIDAE	
***Cucullanus bourdini* Petter & Le Bel, 1992**	
Aprion virescens	Petter & Le Bel, 1992
Pristipomoides filamentosus	Petter & Le Bel, 1992
Pristipomoides flavipinnis	Petter & Le Bel, 1992

GNATHOSTOMATIDAE	
***Echinocephalus sinensis* Ko, 1975**	
Aetobatus narinari	Moravec & Justine, 2006a
***Echinocephalus overstreeti* Deardoff & Ko, 1983**	
Taeniura meyeni	Moravec & Justine, 2006a
PHILOMETRIDAE	
***Philometra ocularis* Moravec, Ogawa, Suzuki, Miyazaki & Donai, 2002**	
Epinephelus coioides	Moravec & Justine, 2005
Epinephelus cyanopodus	Moravec & Justine, 2005
Epinephelus rivulatus	Moravec & Justine, 2005
Variola louti	Moravec & Justine, 2005
***Philometra lateolabracis* (Yamaguti, 1935)**	
Epinephelus cyanopodus	Moravec & Justine, 2005
Epinephelus fasciatus	Moravec & Justine, 2005
TRICHOSOMOIDIDAE	
***Huffmanela branchialis* Justine, 2004**	
Nemipterus furcosus	Justine, 2004
***Huffmanela filamentosa* Justine, 2004**	
Gymnocranius grandoculis	Justine, 2004
***Huffmanela lata* Justine, 2005**	
Carcharhinus amblyrhynchos	Justine, 2005c
***Huffmanela ossicola* Justine, 2004**	
Bodianus loxozonus	Justine, 2004
***Huffmanela* sp.**	
Pentapodus sp.	Justine, 2004

Host-parasite list

ELASMOBRANCHII
(alphabetical order of families and species)

CARCHARHINIDAE	
***Carcharhinus amblyrhynchos* (Bleeker, 1856)**	
Nematoda *Huffmanela lata*	Justine, 2005c
***Galeocerdo cuvier* (Péron & Lesueur, 1822)**	
Nematoda *Terranova scoliodontis*	Moravec & Justine, 2006a
DASYATIDAE	
***Taeniura meyeni* Müller & Henle, 1841**	
Nematoda *Echinocephalus overstreeti*	Moravec & Justine, 2006a
MYLIOBATIDAE	
***Aetobatus narinari* (Euphrasen, 1790)**	
Cestoda *Acanthobothrium aetiobatis*	Baer & Euzet 1962
Monopisthocotylea *Decacotyle octona*	Marie & Justine, 2005
Monopisthocotylea *Decacotyle elpora*	Marie & Justine, 2005
Monopisthocotylea *Clemacotyle australis*	Marie & Justine, 2005
Monopisthocotylea *Thaumatocotyle pseudodasybatis*	Marie & Justine, 2005, 2006
Nematoda *Echinocephalus sinensis*	Moravec & Justine, 2006a

ACTINOPTERYGII
(alphabetical order of families and species)

ACANTHURIDAE	
***Naso* sp. "unicorn fish"**	
Digenea *Hapladena tanyorchis*	Durio & Manter, 1969
Digenea *Quadrifoliovarium pritchardae*	Manter, 1969

***Zebrasoma veliferum* (Bloch, 1795)**	
Digenea *Affecauda salacia*	Hall & Cribb, 2004b
ANGUILLIDAE	
***Anguilla obscura* Günther, 1872**	
Nematoda *Procamallanus (Procamallanus) pacificus*	Moravec *et al*., 2006
***Anguilla reinhardtii* Steindachner, 1867**	
Nematoda *Procamallanus (Procamallanus) pacificus*	Moravec *et al*., 2006
ANTENNARIIDAE	
Antennariidae sp. (recruiting larvae)	
Digenea Hemiuridae (immature unidentifiable)	Cribb *et al*., 2000
APOGONIDAE	
***Apogon angustatus* (Smith & Radcliffe, 1911)? (recruiting larvae)**	
Digenea Didymozoidae larva B	Cribb *et al*., 2000
***Apogon coccineus* Rüppell, 1838 (recruiting larvae)**	
Digenea Didymozoidae larva A	Cribb *et al*., 2000
Digenea Didymozoidae larva B	Cribb *et al*., 2000
Digenea Didymozoidae larva E	Cribb *et al*., 2000
Digenea Didymozoidae larva F	Cribb *et al*., 2000
ATHERINIDAE	
Myctophidae "pretre" (? *Atherinomorus lacunosus* (Forster, 1801)	
Digenea *Bivesiculoides posterotestis*	Durio & Manter, 1968a
BELONIDAE	
***Strongylura leiura* (Bleeker, 1850) syn. of *Tylosurus leiurus* (Bleeker, 1850) ?**	
Digenea *Dichadena obesa*	Manter, 1969
BLENIIDAE	
Bleniidae Gen. sp. (recruiting larvae)	
Digenea Didymozoidae larva A	Cribb *et al*., 2000
Digenea Hemiuridae (immature unidentifiable)	Cribb *et al*., 2000
***Petroscirtes* sp. (recruiting larvae)**	
Digenea Hemiuridae (immature unidentifiable)	Cribb *et al*., 2000
Digenea *Lecithaster* sp. adult	Cribb *et al*., 2000
BOTHIDAE	
***Bothus pantherinus* (Rüppell, 1830) (recruiting larvae)**	
Digenea Didymozoidae larva B	Cribb *et al*., 2000
CHAETODONTIDAE	
Heniochus acuminatus* (Linnaeus, 1758) *"Chaetodon acuminatus"	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
***Chaetodon auriga* Forsskål, 1775**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Monopisthocotylea *Haliotrema aurigae*	Plaisance *et al*. 2004
Monopisthocotylea *Aliatrema cribbi*	Plaisance & Kritsky 2004
Monopisthocotylea *Euryhaliotrematoides annulicirrus*	Plaisance & Kritsky 2004
Monopisthocotylea *Euryhaliotrematoides grandis*	Plaisance & Kritsky 2004
Monopisthocotylea *Euryhaliotrematoides pirulum*	Plaisance & Kritsky 2004
***Chaetodon citrinellus* Cuvier, 1831**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Monopisthocotylea *Haliotrema aurigae*	Plaisance *et al*. 2004
Monopisthocotylea *Euryhaliotrematoides grandis*	Plaisance & Kritsky 2004
***Chaetodon ephippium* Cuvier, 1831**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
***Chaetodon flavirostris* Günther, 1874**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
***Chaetodon lineolatus* Cuvier, 1831**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Digenea *Cardicola chaetodontis*	Nolan & Cribb, 2006

Chaetodon melannotus **Bloch & Schneider, 1801**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Chaetodon mertensii **Cuvier, 1831**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Chaetodon pelewensis **Kner, 1868**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Chaetodon vagabundus **Linnaeus, 1758**	
Monopisthocotylea *Haliotrema aurigae*	Plaisance *et al.* 2004
Monopisthocotylea *Aliatrema cribbi*	Plaisance & Kritsky 2004
Monopisthocotylea *Euryhaliotrematoides aspitis*	Plaisance & Kritsky 2004
Monopisthocotylea *Euryhaliotrematoides grandis*	Plaisance & Kritsky 2004
Monopisthocotylea *Euryhaliotrematoides annulicirrus*	Plaisance & Kritsky 2004
Coradion altivelis **McCulloch, 1916**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Forcipiger flavissimus **Jordan & McGregor, 1898**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Heniochus acuminatus **(Linnaeus, 1758)**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Heniochus chrysostomus **Cuvier, 1831**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
Monopisthocotylea *Haliotrema aurigae*	Plaisance *et al.* 2004
Monopisthocotylea *Aliatrema cribbi*	Plaisance & Kritsky 2004
Monopisthocotylea *Euryhaliotrematoides microphallus*	Plaisance & Kritsky 2004
Heniochus monoceros **Cuvier, 1831**	
Digenea *Aponurus chelebesoi*	Bray & Cribb, 2000b
CHANIDAE	
Chanos chanos **(Forsskål, 1775)**	
Digenea *Isorchis parvus*	Durio & Manter, 1969
HAEMULIDAE	
Plectorhinchus **sp. ("loche castex")**	
Digenea *Lasiotocus longitestis*	Durio & Manter, 1968a
Digenea *Hysterorchis vitellosus*	Durio & Manter, 1968a
Digenea *Choanostoma secundum*	Durio & Manter, 1968b
Plectorhinchus goldmani **(Bleeker, 1853)**	
Digenea *Holorchis plectorhynchi*	Durio & Manter, 1968b
HEMIRAMPHIDAE	
Hemiramphus sp.	
Digenea *Tergestia clonacantha*	Durio & Manter, 1968a
ISTIOPHORIDAE	
Tetrapturus audax **(Philippi, 1887)**	
Nematoda *Hysterothylacium cenaticum*	Moravec & Justine, 2005
LABRIDAE	
Bodianus perditio **(Quoy & Gaimard, 1834) as *"Lepidaplois perditio"***	
Digenea *Intusatrium robustum*	Durio & Manter, 1968b
Bodianus loxozonus **(Snyder, 1908)**	
Nematoda *Huffmanela ossicola*	Justine, 2004
Labridae sp. (recruiting larvae)	
Digenea Didymozoidae larva D	Cribb *et al.*, 2000
Digenea Didymozoidae larva G	Cribb *et al.*, 2000
Labroides bicolor **Fowler & Bean, 1928**	
Digenea *Rhipidocotyle* sp.	Jones, Grutter & Cribb, 2003
Labroides dimidiatus **(Valenciennes, 1839)**	
Digenea *Rhipidocotyle* sp.	Jones, Grutter & Cribb, 2003, 2004
Thalassoma **sp. Labridae (recruiting larvae)**	
Digenea Didymozoidae larva D	Cribb *et al.*, 2000

Digenea Didymozoidae larva G	Cribb *et al.*, 2000
Digenea Tetraphyllidea Metacestode	Cribb *et al.*, 2000
Lethrinidae	
***Gymnocranius grandoculis* (Valenciennes, 1830)**	
Nematoda *Huffmanela filamentosa*	Justine, 2004
***Lethrinus miniatus* (Forster, 1801)**	
Digenea *Hamacreadium mutabil*	Durio & Manter, 1968b
Digenea *Holorchis plectorhynchi*	Durio & Manter, 1968b
Digenea *Lecithochirium magnaporum*	Manter, 1969
***Lethrinus nebulosus* (Forsskål, 1775) ? ("bec de cane")**	
Digenea *Diphtherostomum tropicum*	Durio & Manter, 1968a
Digenea *Hamacreadium diacopae*	Durio & Manter, 1968b
Digenea *Orthodena tropica*	Durio & Manter, 1968b
Digenea *Pseudoplagioporus lethrini*	Durio & Manter, 1968b
Digenea *Pseudoplagioporus interruptus*	Durio & Manter, 1968b
Lutjanidae	
***Aprion virescens* Valenciennes, 1830**	
Nematoda *Cucullanus bourdini*	Petter & Le Bel, 1992
Lutjanus amabilis	
Digenea *Hamacreadium mutabile*	Durio & Manter, 1968b
***Lutjanus argentimaculatus* (Forsskål, 1775)**	
Digenea *Stephanostomum casum*	Durio & Manter, 1969
***Lutjanus bohar* (Forsskål, 1775) ? ("anglais")**	
Digenea *Hamacreadium mutabile*	Durio & Manter, 1968b
Digenea *Paracryptogonimus longitestis*	Durio & Manter, 1969
Digenea *Paracryptogonimus catalae*	Durio & Manter, 1969
Digenea *Paracryptogonimus testitactus*	Durio & Manter, 1969
Digenea *Siphoderina paracatalae*	Durio & Manter, 1969
***Lutjanus fulviflamma* (Forsskål, 1775)**	
Digenea *Lobosorchis tibaldiae*	Miller & Cribb, 2005
***Lutjanus fulvus* (Forster, 1801) (as *Lutjanus vaigiensis*, junior synonym)**	
Digenea *Hexangium sigani*	Durio & Manter, 1968a
Digenea *Paracryptogonimus provitellosus*	Durio & Manter, 1969
Digenea *Lecithochirium polynemi*	Manter, 1969
***Lutjanus vitta* (Quoy & Gaimard, 1824)**	
Digenea *Choanostoma secundum*	Durio & Manter, 1968b
***Pristipomoides filamentosus* (Valenciennes, 1830)**	
Nematoda *Cucullanus bourdini*	Petter & Le Bel, 1992
***Pristipomoides flavipinnis* Shinohara, 1963**	
Nematoda *Cucullanus bourdini*	Petter & Le Bel, 1992
Mugilidae	
Mugilidae	
Digenea *Hymenocotta mulli*	Durio & Manter, 1968a
Nemipteridae	
***Nemipterus furcosus* (Valenciennes, 1830)**	
Nematoda *Huffmanela branchialis*	Justine, 2004
Nematoda *Raphidascaris (Ichtyiascaris) nemipteri*	Moravec & Justine, 2005
***Pentapodus* sp.**	
Nematoda *Huffmanela* sp.	Justine, 2004
Priacanthidae	
***Priacanthus hamrur* (Forsskål, 1775)**	
Digenea *Parahemiurus merus*	Bray & Cribb, 2005
Scaridae	
Scaridae? "Brown-blotched parrot fish"	
Digenea *Intusatrium secundum*	Durio & Manter, 1968b

***Scarus* (= *Callyodon*) sp.**	
Digenea *Lecithaster testilobatus*	Manter, 1969
SCOMBRIDAE	
***Acanthocybium solandri* (Cuvier, 1832)**	
Polyopisthocotylea *Neothoracocotyle acanthocybii*	Rohde, Roubal & Hewitt, 1980
***Katsuwonus pelamis* (Linnaeus, 1758)**	
Polyopisthocotylea *Allopseudaxine sp.*	Rohde, Roubal & Hewitt, 1980
Polyopisthocotylea *Allopseudaxinoides vagans*	Rohde, Roubal & Hewitt, 1980
Digenea *Syncoelium filiferum*	Rohde, Roubal & Hewitt, 1980
Scombridae "mackerel"	
Digenea *Lecithocladium aegyptensis*	Manter, 1969
SCORPAENIDAE	
***Dendrochirus zebra* (Cuvier, 1829)**	
Cestoda *Nybelinia aequidentata*	Palm & Beveridge, 2002
Scorpaenidae Gen. sp. (recruiting larvae)	
Digenea Didymozoidae larva A	Cribb *et al.*, 2000
SERRANIDAE	
***Epinephelus coioides* (Hamilton, 1822)**	
Nematoda *Philometra ocularis*	Moravec & Justine, 2005
***Epinephelus cyanopodus* (Richardson, 1846)**	
Nematoda *Philometra ocularis*	Moravec & Justine, 2005
Nematoda *Philometra lateolabracis*	Moravec & Justine, 2005
***Epinephelus cyanopodus* (Richardson, 1846) ? "loche bleue"**	
Digenea *Erilepturus tiegsi*	Manter, 1969
***Epinephelus fasciatus* (Forsskål, 1775)**	
Monopisthocotylea *Pseudorhabdosynochus cupatus*	Justine, 2005a, Hinsinger & Justine, 2006b
Monopisthocotylea *Pseudorhabdosynochus caledonicus*	Justine, 2005a, Hinsinger & Justine, 2006b
Monopisthocotylea *Benedenia* cf. *epinepheli*	Justine, 2005a
Nematoda *Philometra lateolabracis*	Moravec & Justine, 2005
***Epinephelus howlandi* (Günther, 1873)**	
Monopisthocotylea *Pseudorhabdosynochus venus*	Hinsinger & Justine, 2006a
Monopisthocotylea *Pseudorhabdosynochus cyathus*	Hinsinger & Justine, 2006b
Monopisthocotylea *Benedenia* sp.	Hinsinger & Justine, 2006b
***Epinephelus maculatus* (Bloch, 1790)**	
Monopisthocotylea *Laticola dae*	Journo & Justine, 2006
Monopisthocotylea *Pseudorhabdosynochus auitoe*	Justine, 2006
Monopisthocotylea *Pseudorhabdosynochus buitoe*	Justine, 2006
Monopisthocotylea *Pseudorhabdosynochus cuitoe*	Justine, 2006
Monopisthocotylea *Pseudorhabdosynochus duitoe*	Justine, 2006
Monopisthocotylea *Pseudorhabdosynochus euitoe*	Justine, 2006
Monopisthocotylea *Pseudorhabdosynochus fuitoe*	Justine, 2006
Monopisthocotylea *Pseudorhabdosynochus guitoe*	Justine, 2006
Monopisthocotylea *Pseudorhabdosynochus huitoe*	Justine, 2006
Monopisthocotylea *Haliotrema epinepheli*	Justine, 2006
Monopisthocotylea *Haliotrema* sp.	Justine, 2006
***Epinephelus merra* Bloch, 1793**	
Digenea *Helicometra fasciata*	Rigby *et al.*, 1997
Digenea *Lepidapedoides angustus*	Rigby *et al.*, 1997
Cestoda *Scolex polymorphus*	Rigby *et al.*, 1997
Cestoda Trypanorhyncha larvae	Rigby *et al.*, 1997
Monopisthocotylea *Pseudorhabdosynochus melanesiensis*	Justine, 2005a, Hinsinger & Justine, 2006b
Monopisthocotylea *Pseudorhabdosynochus* cf. *coioidesis*	Hinsinger & Justine, 2006b
***Epinephelus rivulatus* (Valenciennes, 1830)**	
Monopisthocotylea *Pseudorhabdosynochus calathus*	Hinsinger & Justine, 2006b
Nematoda *Philometra ocularis*	Moravec & Justine, 2005
***Epinephelus* sp.**	
Digenea *Neidhartia coronata*	Durio & Manter, 1968a

Digenea *Prosorhynchus freitasi*	Durio & Manter, 1968a
Digenea *Pacificreadium serrani*	Durio & Manter, 1968b
Digenea *Lecithochirium magnaporum*	Manter, 1969
Digenea *Erilepturus tiegsi*	Manter, 1969
***Epinephelus* sp. "Red Cod"**	
Digenea *Helicometra fasciata*	Durio & Manter, 1968b
Digenea *Neolepidapedon dollfusi*	Durio & Manter, 1968b
Digenea *Stephanostomum japonocasum*	Durio & Manter, 1969
***Epinephelus* sp. "Spotted Grouper"**	
Digenea *Neolepidapedon dollfusi*	Durio & Manter, 1968b
***Plectropomus laevis* (Lacépède, 1801)**	
Monopisthocotylea *Echinoplectanum chauvetorum*	Justine & Euzet, 2006
Monopisthocotylea *Echinoplectanum laeve*	Justine & Euzet, 2006
***Plectropomus leopardus* (Lacépède, 1802)**	
Monopisthocotylea *Echinoplectanum leopardi*	Justine & Euzet, 2006
Monopisthocotylea *Echinoplectanum pudicum*	Justine & Euzet, 2006
Monopisthocotylea *Echinoplectanum rarum*	Justine & Euzet, 2006
***Pseudogramma* sp. (recruiting larvae)**	
Digenea Didymozoidae larva A	Cribb *et al.*, 2000
Digenea Hemiuridae *Ectenurus* sp. adult	Cribb *et al.*, 2000
Serranidae ("leche"/ loche) several species?	
Digenea *Myorhynchus pritchardae*	Durio & Manter, 1968a
Digenea *Prosorhynchus longisaccatus*	Durio & Manter, 1968a
Digenea *Allopodocotyle serrani*	Durio & Manter, 1968b
Serranidae "unidentified serranid"	
Digenea *Stephanostomum japonocasum*	Durio & Manter, 1969
Serranidae "mottled grouper"	
Digenea *Erilepturus tiegsi*	Manter, 1969
***Variola albimarginata* Baissac, 1953**	
Monopisthocotylea *Haliotrema epinepheli*	Justine, 2005b
***Variola louti* (Forsskål, 1775)**	
Digenea *Prosorhynchus serrani*	Durio & Manter, 1968a
Monopisthocotylea *Pseudorhabdosynochus hirundineus*	Justine, 2005b
Monopisthocotylea *Haliotrema epinepheli*	Justine, 2005b
Nematoda *Philometra ocularis*	Moravec & Justine, 2005
SIGANIDAE	
***Siganus argenteus* (Quoy & Gaimard, 1825)**	
Digenea *Ptychogyliauchen thistilbardi*	Hall & Cribb, 2004a
***Siganus canaliculatus* (Park, 1797)**	
Digenea *Ptychogyliauchen thistilbardi*	Hall & Cribb, 2004a
***Siganus corallinus* (Valenciennes, 1835)**	
Digenea *Ptychogyliauchen thistilbardi*	Hall & Cribb, 2004a
***Siganus doliatus* Guérin-Méneville, 1829-38**	
Digenea *Hysterolecithoides frontilatus*	Bray & Cribb, 2000a
Digenea *Ptychogyliauchen thistilbardi*	Hall & Cribb, 2004a
Siganus fuscescens (Houttuyn, 1782)* as *Siganus nebulosus	
Monopisthocotylea *Tetrancistrum nebulosi*	Young, 1967
Siganus canaliculatus* (Park, 1797) as *Siganus oramin	
Monopisthocotylea *Tetrancistrum nebulosi*	Young, 1967
***Siganus spinus* (Linnaeus, 1758)**	
Digenea *Ptychogyliauchen thistilbardi*	Hall & Cribb, 2004a
***Siganus* sp.**	
Monopisthocotylea *Tetrancistrum nebulosi*	Young, 1967
Digenea *Hexangium sigani*	Durio & Manter, 1968a
Digenea *Atractotrema sigani*	Durio & Manter, 1969
Digenea *Gyliauchen papillatus*	Durio & Manter, 1969
Digenea *Paracryptogonimus saccatus*	Durio & Manter, 1969

Digenea *Hysterolecitha sigani*	Manter, 1969
Digenea *Theletrum frontilatum*	Manter, 1969
SILLAGINIDAE	
***Sillago sihama* (Forsskål, 1775)**	
Polyopisthocotylea *Polylabris sillaginae*	Hayward, 1996
SPHYRAENIDAE	
***Sphyraena* sp. (recruiting larvae)**	
Monopisthocotylea Capsalidae larva	Cribb *et al.*, 2000
SYNODONTIDAE	
Synodontidae Gen. sp. (recruiting larvae)	
Digenea Didymozoidae larva A	Cribb *et al.*, 2000
Synodontidae Gen. sp. 1 (recruiting larvae)	
Digenea Didymozoidae larva C	Cribb *et al.*, 2000
Digenea *Erilepturus* sp. immature	Cribb *et al.*, 2000
Synodontidae Gen. sp. 2 (recruiting larvae)	
Digenea *Ectenurus* sp. immature	Cribb *et al.*, 2000
Synodontidae Gen. sp. 3 (recruiting larvae)	
Cestoda metacestode	Cribb *et al.*, 2000

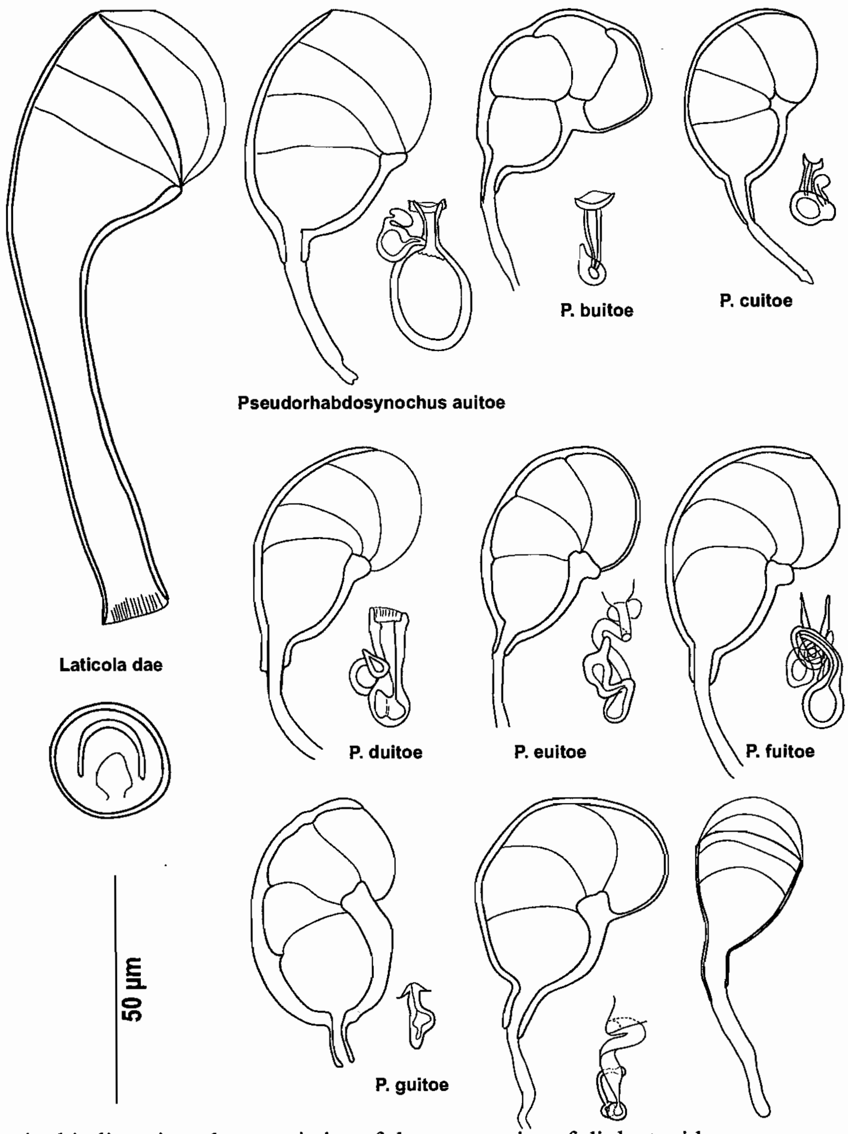

Figure 1. Parasite biodiversity: characteristics of the ten species of diplectanid monogenean present on the gill of a single fish, *Epinephelus maculatus*. Redrawn from Journo & Justine, 2006 and Justine, 2006.

Mollusca of New Caledonia

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The first record of a land mollusc (*Placostylus fibratus* (Martyn, 1784)) from New Caledonia can unequivocally be traced to the voyage of Cook that discovered the island in 1774. By contrast, the marine molluscs of New Caledonia ironically remained out of reach to European natural history cabinets until well into the 19th century. New Caledonia remained untouched by the circumnavigating expeditions of the 1830-1840s onboard, e.g., the "Astrolabe", the "Zélée" or the "Uranie". Seashells may have been collected in New Caledonia by whalers and other merchants in search of sandalwood or bêche-de-mer, and then traded, but by the time they reached European conchologists, all indication of their geographical origin had faded away. It is impossible to tell whether Indo-West Pacific species originally described from localities such as "Mers du Sud" or "Southern Seas" were originally collected in, e.g., Fiji, Tahiti, Australia or New Caledonia. However, even if New Caledonian shells may have arrived on the European market or in cabinets, it must have been in very small amount, as such an emblematic species of the New Caledonia molluscan fauna as *Nautilus macromphalus* was not named until 1859. In fact, it was not until Xavier Montrouzier set foot in New Caledonia that the island was placed on the map of marine conchology. From there on, three major periods can be recognized in the history of New Caledonia marine malacology.

The era of the missionaries: a hotspot of discoveries

Xavier Montrouzier was a catholic priest, the first of a remarkable group of missionaries that pioneered the exploration of the New Caledonia marine and non-marine biota. First settled in 1847 at Balade on the north-east coast of the main island, Montrouzier later moved to Art, in the Belep Islands, just north of New Caledonia, where he collected not only shells but also plants and insects. To break his isolation, he linked with Souverbie, the director of the natural history museum of Bordeaux. Between 1850 and 1879, their fruitful collaboration generated no less than 27 papers published in *Journal de Conchyliologie*, containing the descriptions of some 200 land and freshwater molluscs, often illustrated with exquisite, hand-painted colour plates. Montrouzier's example was followed by more marist fathers, among others Pierre Lambert, Benjamin Goubin, Pierre Rougeyron and Lubin Gaide. Based on their collects, Jean Hervier, procurator at the Service des Missions d'Océanie, in France, published between 1896 and 1899, also in *Journal de Conchyliologie*, a dozen papers on selected gastropod families (Turridae, Mitridae, Columbellidae and Triphoridae). After Hervier, the catholic connection continued through Goubin, missionary at Gaitcha (Lifou) between 1878 and 1913, with specimens ending up in the collection of Paris-based Philippe Dautzenberg. The catholic-protestant religious rivalry in Lifou was echoed by a malacology rivalry. James and Emma Hadfield, of the London Missionary Society, based at Chépénéhé (Lifou), started to send their collects to James Cosmo Melvill and Robert Standen in Great Britain, and were the source of their series of papers in *Journal of Conchology* (1895-1897, 1899).

In parallel with the achievements of the missionaries, it would be unfair not to highlight the work of another category of local collectors. When the city of Nouméa was founded and the convict settlement was established, more amateur naturalists emerged from among government officers, the military or traders, among whom Edouard-Auguste Marie. The center of their collecting activity was rather the southern part of the west coast of New Caledonia (Bay of St Vincent; Baie du Sud [now Baie de Prony]; Nou I.). Specimens reached Hippolyte Crosse in Paris and nearly every issue of the *Journal de Conchyliologie* between 1858 and 1898 containing a paper by him on New Caledonia molluscs.

Overall the results of this zealous collecting by missionaries and government administrators was a golden age for the malacology of New Caledonia. From a blank on the map in 1850 to the epoch-making papers by Crosse, Hervier and Melvill & Standen, so much was accomplished that Henri Fischer argued in 1901 that "Our colleagues abroad recognize that the mollusc fauna of New Caledonia and its dependencies is currently the best known region among the whole of Oceania". Goubin passed away in Nathalo (Lifou) in 1916, and this was the end of the fecund line of missonar-ies-malacologists.

Backwater again

By contrast, comparatively little happened in the following decades, but the work of Jean Risbec definitely makes an exception and represents a shift in scientific practice. Until then, New Caledonia-based collectors were sending their material to European erudites who never set foot in New Caledonia. Jean Risbec was teaching maths at Lycée Lapeyrouse in Nouméa and studied nudibranchs during his spare time, for which he was awarded a doctorate at the Sorbonne (Risbec 1928). The change in scientific practice is also exemplified by a shift from conchology (the missionary era) to malacology and biology. Risbec stayed in Nouméa until the early 1950s and published some 30 papers dealing with the anatomy and biology of intertidal and shallow subtidal molluscs. Risbec also established contacts with French and Australian zoologists, notably Pruvot-Fol and Bassett-Hull, who appear to have been the first non-resident malacologists collecting their own material New Caledonia; Pruvot-Fol collected nudibranchs at Ile des Pins in the late 1920s (see Pruvot-Fol 1930) and Basset-Hull appears to have collected at Lifou and on Grande-Terre in the 1930s material that was published by Iredale (Iredale 1940).

Modern times

Modern times in the history of malacology in New Caledonia can be rather precisely dated to 1978, the year the *Association Conchyliologique de Nouvelle-Calédonie* was founded, or to 1984, the year Bertrand Richer de Forges started his explorations of the marine fauna of New Caledonia. The cradle of the foundation of the *Association* was the furor for the melanistic cowries of New Caledonia (Pierson & Pierson 1975, Chatenay 1977) The society launched the journal *Rossiniana*, which steered away from the description of new species, but published new records in the collectable families and promoted amateur expertise in such families as the cones (Estival 1981) or the miters (Arnaud *et al.* 2002).

Academic exploration first focussed on deep water, with a series of dredging and trawling expeditions, essentially using Nouméa-based research vessels (*Vauban*, *Coriolis*, and later *Alis*) and occasionally also larger research vessels on temporary assignment to the South Pacific (*Jean-Charcot*, *Suroit*, *Cyana*). The saga of what has been called the "MUSORSTOM expeditions" is told by Bertrand Richer de Forges elsewhere. These 20 years were another golden age for marine zoological exploration in general, and malacology in particular. Our MNHN team has been involved closely in the work at sea, in the processing and sorting of the material, in coordinating a network of professional and non-professional taxonomists, and in editing the resulting publications. The results, which read like a Who's Who in the world of marine molluscan taxonomy, have appeared in several volumes of the *Résultats des Campagnes MUSORSTOM*, later *Tropical Deep-Sea Benthos* specially dedicated to molluscs (Crosnier & Bouchet 1991, Bouchet 1995, Bouchet & Marshall 2001), as well as in numerous articles in malacological and other journals (e.g., Geiger, 2006; Hadorn & Fraussen, 2005; Kool, 2004; Snyder & Bouchet, 2006; Vilvens & Heros, 2006; Valdes 2002). The coral reefs and other coastal environments were the subject of intensive sampling specifically for molluscs at three sites: Koumac (west coast), Touho (east coast), and Lifou (Loyalty Islands), each representing some 500 day-persons in the field and the collecting and sorting of over 100,000 specimens. These expeditions generated new knowledge on the composition and taxonomic identity of the marine molluscs of New Caledonia (e.g., Rudman, 1995; Boyer, 2003; Garcia, 2004; Taylor & Glover, 2005; Vilvens & Heros, 2005) and, perhaps more importantly, changed our perception of the magnitude of tropical molluscan species richness (Bouchet *et al.*, 2002).

Conclusion and Perspectives

One hundred years after Henri Fischer's statement on the quality of the New Caledonia mollusc inventory, it can safely be affirmed that, as a result of the recent sampling programs, both in shallow and in deep-water, no other South Pacific island group has been so intensively surveyed as New Caledonia. However, the question "How many species" still remains unanswered.

One lesson from the Koumac-Touho-Lifou study is that a 5-30,000 hectares coastal site in New Caledonia has in the order of 2,600-3,100 species of molluscs, and extrapolations from the cumulation curve indicate a range of 3,200-4,000 species potentially present at each site. Despite the intensity of the collecting effort, 28.5% of the species are represented only by empty shells, suggesting that the real richness of many soft-bodied marine taxa is probably underestimated in many surveys. Even more unexpectedly spatial heterogeneity is high, with only 21% of the total species shared by all three sites. This reflects the inaccuracy of any other survey of small benthic invertebrates. The second lesson is that most species are rare and small: at the Koumac site, 20% are represented by single specimens, and 48% are represented by five specimens or less. One-third have an adult size smaller than 4 mm, and macromolluscs larger than 40 mm account for only 8% of the total fauna. "Specialist" families are the most speciose, with the "Turridae" s.l. (ca. 280 species per site), Triphoridae (170), Eulimidae (140), Pyramidellidae (120) and Cerithiopsidae (100) together accounting for 37% of gastropod richness. The most speciose bivalve families are the Galeommatidae s.l. (ca. 60 species per site), Veneridae and Tellinidae (50 each). If we stretch our neck from these results, it seems reasonable to speculate that the coral reefs (s.l.) of New Caledonia are probably home to 8-10,000 species of marine molluscs.

A still more intimidating picture emerges when the deep-sea component is brought into consideration. The shallow-water (i.e. from less than 100 meters) turrids from Koumac-Touho-Lifou represent a cumulated total of 504 species actually documented, and an estimated actual total of 690 species. However, examination of the complete dataset from 0 to 3,700 m has revealed a shocking 1,726 turrid species actually documented, with Jack2 estimator placing the actual number as high as 3,058 species (Bouchet, Sysoev & Lozouet, 2004).

Admittedly, turrids are especially diversified in the deep sea and, based on our dataset, it would probably not be appropriate to extrapolate that the deep-sea mollusc fauna of New Caledonia is 2.5 times as rich as its shallow-water fauna. However, our sampling is barely adequate only for the 200-1,200 m range, and very inadequate below 1,500 meters. Even within the 200-1,200 m interval, and even in areas that have already been sampled, every new cruise returns with species not collected before.

All in all, the magnitude of the richness of the marine mollusc fauna of New Caledonia is probably in the order of 30-40,000 species. Of these, maybe 75% have now been collected at least once, 10% have been recorded in the literature at least once (under a correct or incorrect name) and 50-80% are undescribed.

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Checklist of species

Although there is a considerably historical body of literature on the marine molluscs of New Caledonia, many of the historical records cannot be used uncritically and this for several reasons: (1) The original identification may have been correct or incorrect; (2) the name then used may now be known to represent a species complex; (3) The original locality («New Caledonia») may or may not have been correct; (4) New species originally described from New Caledonia have often not been re-examined critically for decades, and their current status (valid, synonym) is not known. For all these reasons, the list presented below contains only those records (a) based on material issued from the recent sampling programs, with accurate locality data, and vouchered (mostly in MNHN); (b) identified by specialists, and thus based on the state-of-the-art of molluscan taxonomy.

MOLLUSCA
GASTROPODA
ACTEONIDAE d'Orbigny, 1842
Ringicula caledonica Morlet, 1880
Ringicula noumeensis Morlet, 1880
ARCHIDORIDIDAE Bergh, 1891
Guyonia flava Risbec, 1928
Phlegmodoris paagoumenei Risbec, 1928
ARCHITECTONICIDAE Gray, 1850
Granosolarium asperum (Hinds, 1844)
Heliacus areola (Gmelin , 1791)
Heliacus caelatus (Hinds, 1844)
Heliacus fenestratus (Hinds, 1844)
Heliacus geminus Bieler, 1993
Heliacus implexus (Mighels, 1845)
Heliacus infudibuliformis (Gmelin , 1791)
Heliacus trochoides (Deshayes, 1830)
Heliacus variegatus (Gmelin , 1791)
Psilaxis oxytropis (A. Adams, 1855)
Psilaxis radiatus (Röding, 1798)
BAPTODORIDIDAE Odhner, 1926
Baptodoris fongosa Risbec, 1928
BUCCINIDAE Rafinesque, 1815
Engina menkeana (Dunker, 1860)
Nassaria acuminata (Reeve, 1844)
Phos textilis A. Adams, 1851
BURSIDAE Thiele, 1925
Bufonaria perelegans Beu, 1987
Bufonaria thersites (Redfield, 1846)
Bursa condita (Gmelin, 1791)
Bursa cruentata (G.B. Sowerby II, 1835)
Bursa granularis (Röding, 1798)
Bursa lamarckii (Deshayes, 1853)
Bursa lucaensis Parth, 1991
Bursa rhodostoma (Beck *in* G.B. Sowerby II, 1835)
Bursa rosa (Perry, 1811)
Tutufa bubo (Linné, 1758)
Tutufa bufo (Röding, 1798)
Tutufa tenuigranosa (Smith, 1914)
Tutufa oyamai Habe, 1973
Tutufa rubeta (Linné, 1758)
CALLIOSTOMATIDAE Thiele, 1924
Calliostoma houbricki Marshall, 1995
Calliostoma richeri Marshall, 1995

Dactylastele poupineli (Montrouzier, 1875)
Laetifautor fundatus Marshall, 1995

CERITHIIDAE Fleming, 1822

Ataxocerithium fucatum Pease, 1861
Cerithium balteatum Philippi, 1838
Cerithium citrinum Sowerby, 1855
Cerithium columna Sowerby, 1834
Cerithium echinatum Lamarck, 1822
Cerithium granosum (Kiener)
Cerithium lifuensis Melvill & Standen, 1895
Cerithium munitum Sowerby, 1855
Cerithium nodulosum Bruguière, 1792
Cerithium novaehollandiae A. Adams, 1855
Cerithium rostratum Sowerby, 1855
Cerithium salebrosum Sowerby, 1855
Cerithium scabridum Philippi, 1848
Cerithium spiculum Hedley, 1899
Cerithium tenellum Sowerby, 1855
Cerithium zonatum (Wood, 1828)
Gourmya gourmyi (Crosse, 1861)
Pseudovertagus aluco (Linné, 1758)
Pseudovertagus clava (Gmelin, 1791)
Pseudovertagus nobilis (Reeve, 1855)
Rhinoclavis articulata (A. Adams & Reeve, 1854)
Rhinoclavis aspera (Linné, 1758)
Rhinoclavis fasciata (Bruguière, 1792)
Rhinoclavis kochi (Philippi, 1848)
Rhinoclavis sinensis (Gmelin, 1791)
Rhinoclavis sordidula (Gould, 1849)
Varicopeza pauxilla (A. Adams, 1854)

COLUMBELLIDAE Suter, 1909

Aesopus spiculus (Duclos, 1846)
Euplica ionida Duclos, 1840)
Euplica turturina (Lamarck, 1822)
Euplica varians (Sowerby, 1847)
Matanachis acleonta (Duclos, 1840)
Mitrella albina (Kiener, 1841)
Mitrella baculus (Reeve, 1859)
Mitrella conspersa (Gaskoin, 1851)
Mitrella goubini (Hervier, 1899)
Mitrella ligula (Duclos, 1840)
Mitrella nympha (Kiener, 1841)
Mitrella plurisulcata (Reeve, 1859)
Pyrene flava (Bruguière, 1779)
Zafrona isomella (Duclos, 1840)

CONIDAE Fleming, 1822

Conus acutangulus Lamarck, 1810
Conus ammiralis Linné, 1758
Conus arenatus Hwass, 1792
Conus articulatus Sowerby, 1873
Conus aulicus Linné, 1758
Conus aureus Hwass, 1792
Conus auricomus Hwass, 1792
Conus balteatus pigmentatus A. Adams & Reeve, 1848
Conus bandanus Hwass, 1792

Conus betulinus Linné, 1758
Conus bougei Sowerby, 1907
Conus bullatus Linné, 1758
Conus cabritii Bernardi, 1858
Conus canonicus Hwass, 1792
Conus capitaneus Linné, 1758
Conus catus Hwass, 1792
Conus chaldeus Röding, 1798
Conus cinereus Hwass, 1792
Conus circumactus Iredale, 1939
Conus coccineus Gmelin, 1791
Conus coelinae Crosse, 1858
Conus connectens A. Adams, 1855
Conus consors Sowerby II, 1833
Conus coronatus Gmelin, 1791
Conus crocatus Lamarck, 1810
Conus cylindraceus Broderip & Sowerby, 1830
Conus distans Hwass, 1792
Conus dusaveli (Adams H, 1872)
Conus ebraeus Linné, 1758
Conus eburneus Hwass, 1792
Conus emaciatus Reeve, 1849
Conus figulinus Linné, 1758
Conus flavidus Lamarck, 1810
Conus floccatus Sowerby, 1839
Conus floridulus A. Adams & Reeve, 1848
Conus frigidus Reeve, 1848
Conus fulgetrum Sowerby, 1834
Conus generalis Linné, 1767
Conus geographus Linné, 1758
Conus glans Hwass, 1792
Conus imperialis Linné, 1758
Conus kermadecensis Iredale, 1913
Conus lamberti Souverbie, 1877
Conus leopardus Röding, 1798
Conus legatus Lamarck, 1810
Conus lienardi Bernardi & Crosse, 1861
Conus lithoglyphus Hwass, 1792
Conus litteratus Linné, 1758
Conus luteus Sowerby, 1833
Conus magnificus Reeve, 1843
Conus magnus Linné, 1758
Conus marmoreus Linné, 1758
Conus miles Linné, 1758
Conus miliaris Hwass, 1792
Conus mitratus Hwass, 1792
Conus moluccensis Küster, 1838
Conus monachus Linné, 1758
Conus moreleti Crosse, 1858
Conus muriculatus Sowerby, 1833
Conus musicus Hwass, 1792
Conus mustelinus Hwass, 1792
Conus nigropunctatus Sowerby II, 1857
Conus nussatella Linné, 1758
Conus obscurus Sowerby, 1833

Conus omaria Hwass, 1792
Conus optimus (Sowerby, 1913)
Conus pertusus Hwass, 1792
Conus planorbis Born, 1778
Conus quercinus Solander in Lightfoot, 1786
Conus rattus Hwass, 1792
Conus retifer Menke, 1829
Conus richeri Richard & Moolenbeek, 1988
Conus sanguinolentus Quoy & Gaimard, 1834
Conus sazanka Shikama, 1970
Conus scabriusculus Dillwyn, 1817
Conus spectabilis A. Adams, 1853
Conus sponsalis Hwass, 1792
Conus striatellus Link, 1807
Conus striatus Linné, 1758
Conus sugillatus Reeve, 1844
Conus sulcatus Hwass, 1792
Conus swainsoni Estival, 1986
Conus terebra Born, 1778
Conus tessulatus Born, 1778
Conus textile Linné, 1758
Conus tirardi Röckel & Moolenbeek, 1996
Conus tulipa Linné, 1758
Conus varius Linné, 1758
Conus vexillum Gmelin, 1791
Conus virgo Linné, 1758
Conus vitulinus Hwass, 1792

COSTELLARIIDAE MacDonald, 1860
Vexillum albotaeniatum (Hervier, 1897)
Vexillum aubryanum (Hervier, 1897)
Vexillum catenatum (Broderip, 1836)
Vexillum diamesa (Hervier, 1897)
Vexillum diutenerum (Hervier, 1897)
Vexillum goubini (Hervier, 1897)
Vexillum humilis (Hervier, 1897)
Vexillum lanceolatum (Hervier, 1897)
Vexillum loyaltyensis (Hervier, 1897)
Vexillum ochracea (Hervier, 1897)
Vexillum pagodula (Hervier, 1897)
Vexillum plurinotatum (Hervier, 1897)
Vexillum rhodochroa (Hervier, 1897)
Vexillum roseotinctum (Hervier, 1897)
Vexillum rufobalteatum (Hervier, 1897)
Vexillum sculptile (Reeve, 1845)
Vexillum verecundulum (Hervier, 1897)

CYPRAEIDAE Rafinesque, 1815
Cypraea contaminata Sowerby, 1932

DRILLIIDAE Olsson, 1964
Plagiostropha turrita Wells, 1995
Splendrillia praeclara (Melvill, 1893)

EULIMIDAE Troschel, 1853
Echineulima mittrei (Petit, 1851)
Echineulima robusta (Pease, 1860)
Parvioris fulvescens (A. Adams, 1866)
Parvioris noumeae Warén, 1981

Peasistilifer edulis Hoskin & Warén, 1983
Pulicicochlea astropyga Ponder & Gooding, 1978
Pulicicochlea calamaris Ponder & Gooding, 1978 *Pulicicochlea faba* Ponder & Gooding, 1978
Pulicicochlea fusca Ponder & Gooding, 1978
Robillardia solida Warén, 1980
Scalenostoma carinata Deshayes, 1863
Trochostilifer mortenseni Warén, 1980
Vitreobalcis holdsworthi (H. Adams, 1874)

HALIOTIDAE Rafinesque, 1815
Haliotis clathrata Reeve, 1846
Haliotis crebrisculpta Sowerby, 1914
Haliotis dissona Iredale, 1929
Haliotis diversicolor Reeve, 1846
Haliotis jacnensis Reeve, 1846
Haliotis ovina Gmelin, 1791

MARGINELLIDAE Fleming, 1828
Hydroginella caledonica (Jousseaume, 1876)

MATHILDIDAE Dall, 1889
Mathilda amanda Thiele, 1925
Mathilda eurytima Melvill & Standen, 1896

MITRIDAE Swainson, 1831
Domiporta carnicolor (Reeve, 1844)
Mitra amaura Hervier, 1897

MURICIDAE Rafinesque, 1815
Aspella media Houart, 1987
Aspella ponderi (Radwin & d'Attilio 1976)
Attiliosa caledonica (Jousseaume, 1881)
Chicomurex laciniatus (Sowerby, 1841)
Chicomurex superbus (Sowerby, 1889)
Chicomurex venustulus Rehder & Wilson, 1975
Chicoreus banksii (Sowerby, 1841)
Chicoreus brunneus (Link, 1807)
Chicoreus maurus (Broderip, 1833)
Chicoreus microphyllus (Lamarck, 1822)
Chicoreus nobilis Shikama, 1977
Chicoreus orchidiflorus (Shikama, 1973)
Chicoreus ramosus (Linné, 1758)
Chicoreus rossiteri (Crosse, 1872)
Chicoreus territus (Reeve, 1845)
Chicoreus torrefactus (Sowerby, 1841)
Chicoreus turschi Houart, 1981
Cronia crassulnata (Hedley, 1915)
Cronia elata (de Blainville, 1832)
Cronia elongata (de Blainville, 1832)
Dermomurex triclotae Houart, 2001
Drupa grossularia Röding, 1798
Drupa morum morum Röding, 1798
Drupa ricinus (Linné, 1758)
Drupella cornus (Röding, 1798)
Drupella fragum (de Blainville, 1832)
Drupella rugosa (Born, 1778)
Ergalatax contracta (Reeve, 1846)
Ergalatax margariticola (Broderip, 1833)
Favartia brevicula (Sowerby, 1834)
Favartia cirrosa (Hinds, 1844)

Favartia garrettii (Pease, 1868)
Favartia leonae d'Attilio & Myers, 1985
Favartia minatauros Radwin & d'Attilio, 1976
Favartia rosamiae d'Attilio & Hyers, 1985
Favartia salmonea (Melvill & Standem, 1899)
Habromorula euryspira Houart, 1994
Habromorula lepida Houart, 1994
Hancinella mancinella (Linné, 1758)
Haustellum haustellum (Linné, 1758)
Homalocantha lamberti (Poirier, 1883)
Homalocantha pele (Pilsbry, 1918)
Homalocantha scorpio (Linné, 1758)
Lataxiena desserti Houart, 1995
Lataxiena fimbriata (Hinds, 1844)
Maculotriton ingens Houart, 1987
Maculotriton serriale (Deshayes, 1834)
Monstrotyphis singularis Houart, 2002
Morula ambrosia (Houart, 1995)
Morula andrewsi (E. A. Smith)
Morula bicatenata (Reeve, 1846)
Morula biconica (Blainville, 1852)
Morula dichrous (Tapparone Canefri, 1880)
Morula dumosa (Conrad, 1837)
Morula euracantha (A. Adams, 1853)
Morula euryspira Houart, 1995
Morula granulata (Rödind, 1798)
Morula lepida Houart, 1995
Morula nodulifera (Menke, 1829)
Morula spinosa (H.& A. Adams, 1853)
Murex tenuirostrum Lamarck, 1822
Murex tribulus (Linné, 1758)
Murexiella sykesi rosamiae d'Attilio & Hyers, 1985
Muricodrupa fenestrata (de Blainville, 1832)
Muricodrupa fiscella (Gmelin, 1791)
Muricopsis cuspidatus (Sowerby, 1879)
Muricopsis micra Houart, 2001
Muricopsis spiculus Houart, 1986
Naquetia cumingii (A. Adams, 1853)
Nassa mucronata (A. Adams)
Nassa serta (Bruguière, 1789)
Orania adiastolos Houart, 1995
Orania archaea Houart, 1995
Orania fischeriana (Tapparone Canefri, 1882)
Orania pacifica (Nakayama, 1988)
Pagodula procera Houart, 2001
Pascula lefevreiana (Tapparone Canefri, 1880)
Pascula muricata (Reeve, 1846)
Pterynotus aparrii d'Attilio & Bertsch, 1980
Pterynotus barclayanus (H. Adams, 1874)
Pterynotus martinetana (Röding, 1798)
Pterynotus pellucidus (Reeve, 1845)
Pterynotus pinnatus (Swainson, 1833)
Pterynotus tripterus (Born, 1778)
Spinidrupa andrewsi (E. A. Smith, 1873)
Spinidrupa euracantha (A. Adams, 1853)

Spinidrupa spinosa (A. Adams, 1853)
Thais aculeata (Link, 1807)
Thais armigera (Link, 1807)
Thais grossa Houart, 2001
Typhis carolinae Houart, 1987
Typhis neocaledonicus Houart, 1987
Vitularia crenifer (Montrouzier, 1861)
Vitularia miliaris (Gmelin, 1791)

NASSARIIDAE Iredale, 1916

Cyllene concinna A. Adams, 1851
Nassarius abyssicolus (A. Adams, 1852)
Nassarius albescens albescens (Dunker, 1846)
Nassarius arcus Cernohorsky, 1991
Nassarius barsdelli Ladd, 1976
Nassarius bifarius (Baird in Brenchley, 1873)
Nassarius castus (Gould, 1850)
Nassarius comphes (A. Adams, 1852)
Nassarius comptus (A. Adams, 1852)
Nassarius concinnus (Powys, 1835)
Nassarius conoidalis (Deshayes in Bélanger, 1832)
Nassarius crematus (Hinds, 1844)
Nassarius delicatus (A. Adams, 1852)
Nassarius ecstilbus (Melvill & Standen, 1896)
Nassarius fraudulentus (Marrat, 1877)
Nassarius fretorum (Melvill & Standen, 1899)
Nassarius gaudiosus (Hinds, 1844)
Nassarius glans glans (Linné, 1758)
Nassarius globosus (Quoy & Gaimard, 1833)
Nassarius granifer (Kiener, 1834)
Nassarius haldemanni (Dunker, 1847)
Nassarius idyllius (Melvill & Standen, 1901)
Nassarius leptospirus Adams A, 1852
Nassarius multipunctatus (Schepman, 1911)
Nassarius nodicostatus (A. Adams, 1852)
Nassarius pauperus (Gould, 1850)
Nassarius quadrasi (Hidalgo, 1904)
Nassarius shacklefordi (Melvill & Standen, 1896)
Nassarius sinusigerus (A. Adams, 1852)
Nassarius siquijorensis (A. Adams, 1852)
Nassarius splendidulus (Dunker, 1846)
Nassarius stigmarius (A. Adams, 1852)
Nassarius troendleorum Cernohorsky, 1980
Nassarius vidalensis (Barnard, 1959)
Nassarius vitiensis (Rousseau, 1854)

OLIVIDAE Latreille, 1825

Amalda bellonarum Kilburn & Bouchet, 1988
Amalda montrouzieri (Souverbie, 1860)
Oliva carneola (Gmelin, 1791)
Oliva miniacea (Röding, 1798)

PERSONIDAE Gray, 1854

Distorsio anus (Linné, 1758)
Distorsio decipiens (Reeve, 1844)
Distorsio habei Lewis, 1972
Distorsio kurzi Petuch & Harasewych, 1980
Distorsio parvimpedita Beu, 1998

Distorsio reticularis (Linné, 1758)
Distorsomina pusilla (Pease, 1861)

PICKWORTHIIDAE Iriedale, 1917

Clatrosansonia troendlei Le Renard & Bouchet, 2003

RANELLIDAE Gray, 1854

Charonia tritonis (Linné, 1758)
Cymatium aquatile (Reeve, 1844)
Cymatium armatum (Sowerby III, 1897)
Cymatium caudatum (Gmelin, 1791)
Cymatium comptum (A. Adams, 1855)
Cymatium dunkeri (Lischke, 1868)
Cymatium exaratum (Reeve, 1844)
Cymatium exile (Reeve, 1844)
Cymatium fittkaui Parth, 1991
Cymatium gemmatum (Reeve, 1844)
Cymatium gutturnium (Röding, 1798)
Cymatium hepaticum (Röding, 1798)
Cymatium iredalei (Beu, 1994)
Cymatium labiosum (Wood, 1828)
Cymatium lotorium (Linné, 1758)
Cymatium mixtum Arthur & Garcia-Talavera, 1990
Cymatium mundum (Gould, 1849)
Cymatium muricinum (Röding, 1798)
Cymatium nicobaricum (Röding, 1798)
Cymatium occidentale (Mörch, 1877)
Cymatium parthenopeum (Salis Marschlins,1793)
Cymatium pfeifferianum (Reeve, 1844)
Cymatium pileare (Linné, 1758)
Cymatium pyrum (Linné, 1758)
Cymatium rubeculum (Linné, 1758)
Cymatium sarcostoma (Reeve, 1844)
Cymatium sinense (Reeve, 1844)
Cymatium springsteeni Beu, 1987
Cymatium succinctum (Linné, 1771)
Cymatium testudinarium (Adams & Reeve, 1850)
Cymatium vespaceum (Lamarck, 1822)
Gyrineum gyrinum gyrinum (Linné, 1758)
Gyrineum lacunatum (Mighels, 1845)
Gyrineum longicaudatum Beu, 1998
Gyrineum roseum (Reeve, 1844)

RISSOELLIDAE Gray, 1850

Rissoella confusa Ponder & Yoo, 1978
Rissoella globosa Ponder & Yoo, 1978

SPONDYLIDAE Gray, 1826

Spondylus albibarbatus Reeve, 1856
Spondylus anacanthus Mawe, 1823
Spondylus asperrimus Sowerby, 1847
Spondylus butleri Reeve, 1856
Spondylus candidus Lamarck, 1819
Spondylus castus Reeve, 1856
Spondylus deforgesi Lamprell & Healy, 2001
Spondylus echinatus Schreibers, 1793
Spondylus exiguus Lamprell & Healy, 2001
Spondylus foliaceus Schreibers, 1793
Spondylus heidkeae Lamprell & Healy, 2001

Spondylus lamarcki Chenu, 1845
Spondylus maestratii Lamprell & Healy, 2001
Spondylus mireilleae Lamprell & Healy, 2001
Spondylus nicobaricus Schreibers, 1793
Spondylus ocellatus Reeve, 1856
Spondylus orstomi Lamprell & Healy, 2001
Spondylus rippingalei Lamprell & Healy, 2001
*Spondylus rubicundus*Reeve, 1856
Spondylus sinensis Schreibers, 1793
Spondylus squamosus Schreibers, 1793
Spondylus variegatus Schreibers, 1793
Spondylus varius Sowerby, 1827
Spondylus versicolor Schreibers, 1793
Spondylus victoriae Sowerby, 1860
Spondylus zonalis Lamarck, 1819

STROMBIDAE Rafinesque, 1815

Strombus dentatus Linné, 1758
Strombus dilatatus Swainson, 1821
Strombus epidromus Linné, 1758
Strombus erythrinus Dillwyn, 1817
Strombus fragilis (Röding, 1798)
Strombus gibberulus gibbosus (Röding, 1798)
Strombus haemastoma Sowerby II, 1842
Strombus labiatus (Röding, 1798)
Strombus luhuanus Linné, 1758
Strombus minimus Linné, 1771
Strombus mutabilis Swainson, 1821
Strombus plicatus Reeve, 1851
Strombus thersites Swainson, 1823
Strombus variabilis Swainson, 1820
Strombus vomer (Röding, 1798)
Strombus wilsoni Abbott, 1967

TEREBRIDAE Mörch, 1852

Terebra affinis Gray, 1834
Terebra albocancellata Bratcher, 1988
Terebra amanda Hinds, 1844
Terebra amoena Deshayes, 1859
Terebra anilis (Röding, 1798)
Terebra areolata (Link, 1807)
Terebra argus Hinds, 1844
Terebra babylonia Lamarck, 1822
Terebra chlorata Lamarck, 1822
Terebra cinctella Deshayes, 1859
Terebra cingulifera Lamarck, 1822
Terebra columellaris Hinds, 1844
Terebra conspersa Hinds, 1844
Terebra cumingii Deshayes, 1857
Terebra exiguoides Schepman, 1913
Terebra fijiensis (E. A. Smith, 1873)
Terebra flavofasciata Pilsbry, 1921
Terebra funiculata Hinds, 1844
Terebra jenningsi Bursh, 1965
Terebra kilburni Bursh, 1965
Terebra laevigata Gray, 1834
Terebra lima Deshayes, 1857

Terebra livida Reeve, 1840
Terebra maculata (Linné, 1758)
Terebra marmorata Deshayes, 1859
Terebra nebulosa Sowerby, 1825
Terebra parkinsoni Cernohorsky & Bratcher, 1976
Terebra parva Baird, 1873
Terebra paucincisa Bratcher, 1988
Terebra paucistriata (E. A. Smith, 1873)
Terebra pertusa (Born, 1798)
Terebra polygyrata Deshayes, 1859
Terebra punctatostriata Gray, 1834
Terebra subulata (Linné, 1767)
Terebra succincta (Gmelin, 1791)
Terebra textilis Hinds, 1844
Terebra tricolor Sowerby, 1825
Terebra triseriata Gray, 1834
Terebra turrita (E. A. Smith, 1873)
Terebra undulata Gray, 1834
Terebra virgo Schepman, 1913
Terenolla pygmaea Hinds, 1844

TRAPEZIDAE Lamy, 1920
Glossocardia obesa (Reeve, 1843)

TRIVIIDAE Troschel, 1863
Dolichupis producta (Gaskoin, 1836)

TROCHIDAE Rafinesque, 1815
Monodonta fischeri Montrouzier, 1866
Rotella montrouzieri Souverbie, 1858
Stomatella crassa Montrouzier, 1870
Stomatella granosa Lambert, 1874
Stomatella picta Montrouzier, 1862
Stomatella stellata Souverbie, 1863
Tectaria montrouzieri Fischer, 1878
Trochus artensis Fischer, 1878
Trochus calcaratus Souverbie, 1875
Trochus constellatus Souverbie, 1863
Trochus fabrei Montrouzier, 1878
Trochus fossulatulus Souverbie, 1875
Trochus gilberti Montrouzier, 1878
Trochus lamberti Souverbie, 1875
Trochus lifuanus Fischer, 1878
Trochus niloticus Linné, 1758
Trochus poupineli Montrouzier, 1875
Trochus reevei Montrouzier, 1866
Trochus rhodomphalus Souverbie, 1875
Trochus scrobiculatus Souverbie, 1866

TURBINIDAE Rafinesque, 1815
Turbo artensis Montrouzier, 1860
Turbo laetus Montrouzier, 1863
Turbo naninus Souverbie, 1864

TURRIDAE H. & A. Adams, 1853
Clavus canalicularis (Röding, 1798)
Clavus exasperatus Reeve, 1843
Clavus pulicarius Wells, 1991
Comitas pachycercus Sysoev & Bouchet, 2001
Plagiostropha turrita Wells, 1995

Splendrillia praeclara (Melville, 1893)

VOLUTIDAE Rafinesque, 1815

Cymbiola deshayesi (Reeve, 1855)
Cymbiola rossiniana (Bernardi, 1859)
Cymbiolacca thatcheri (McCoy, 1868)
Lyria grangei Cernohorsky, 1980
Lyria deliciosa (Montrouzier, 1859)

XENOPHORIDAE Philippi, 1853

Xenophora cerea (Reeve, 1845)
Xenophora corrugata Watson, 1886
Xenophora lamberti Souverbie, 1871
Xenophora mekranensis konoi Habe, 1953
Xenophora pallidula (Reeve, 1842)
Xenophora solarioides (Reeve, 1845)

NUDIBRANCHIA Cuvier, 1817

AEGIRIDAE Fischer, 1883

Aegirus villosus Farran, 1905
Aegirus leuckarti Verany,
Aegirus citrinus Pruvot-Fol, 1930

AEOLIDIADAE Bergh,

Aeolidia bourailli (Risbec,1928)
Aeolidia cornuta (Risbec,1928)
Aeolidia dangeri (Risbec,1928)
Aeolidia diffusa (Risbec,1928)
Aeolidia ducrosi (Risbec,1928)
Aeolidia joubini (Risbec,1928)
Aeolidia pelseneeri Risbec, 1937
Aeolidia poindimiei (Risbec,1928)
Aeolidia trunca (Risbec,1928)
Aeolidia violacea (Risbec,1928)
Aeolidiella alba Risbec, 1928
Aeolidiella hulli Risbec, 1928
Caloria australis Risbec, 1937
Caloria guenanti Risbec, 1928
Coryphella ornata Risbec, 1928
Cratena cornuta Risbec, 1928
Cratena diffusa Risbec, 1928
Cratena exigua Risbec, 1928
Cratena grisea Risbec, 1928
Cuthona acinosa Risbec, 1928
Cuthona germaini Risbec, 1937
Cuthona mimetica Pruvot-Fol, 1930
Cuthonella amoena Risbec, 1928
Digitobranchus nebae Risbec, 1930
Embletonia gracile Risbec, 1928
Eubranchus montraveli Risbec, 1937
Facalana lamyi Risbec, 1937
Facelina bouraili Risbec, 1928
Facelina fragilis Risbec, 1928
Favorinus gouaroi Risbec, 1928
Favorinus joubini Risbec, 1928
Favorinus violaceus Risbec, 1928
Globiferina noumeae Risbec, 1937
Hervia ducrosi Risbec, 1928

Hervia dangeri Risbec, 1928
Hervia trunca Risbec, 1928
Noumeaella curiosa Risbec, 1937
Phestilla poindimiei Risbec, 1928
Phidiana obscura Risbec, 1928
Pteraeolidia semperi Bergh,

ARCHIDORIDIDAE Bergh, 1892

Guyonia flava Risbec, 1928
Phlegmodoris paagoumenei Risbec, 1928
Phlegmodoris papillosa Risbec, 1928

BAPTODORIDIDAE Odhner, 1926

Baptodoris fongosa Risbec, 1928

BORNELLIDAE Bergh, 1842

Bornella digitata Adams, 1861

CHROMODORIDIDAE Bergh, 1892

Cadlina ornatissima (Risbec,1928)
Cadlinella hirsuta (Rudman, 1995)
Cadlinella ornatissima (Risbec,1953)
Ceratosoma caledonicum (Fischer,1876)
Ceratosoma francoesii (Rochebrune,1894)
Ceratosoma tenue Abraham, 1876
Ceratosoma trilobatum (Gray, 1827)
Chromodoris alderi (Collingwood, 1828)
Chromodoris australis (Risbec, 1928)
Chromodoris clitonota (Bergh, 1905)
Chromodoris clavata (Risbec,1928)
Chromodoris coi (Risbec, 1956)
Chromodoris decora (Pease, 1960)
Chromodoris decorata (Risbec, 1928)
Chromodoris diardii (Kelaart,)
Chromodoris fidelis (Kelaart,)
Chromodoris geometrica (Risbec, 1928)
Chromodoris kuniei (Pruvot-Fol, 1930)
Chromodoris lamberti (Crosse, 1875)
Chromodoris lata (Risbec, 1928)
Chromodoris lineolata (Van Hasselt,)
Chromodoris marginata (Pease,) 1860
Chromodoris mariei (Crosse, 1875)
Chromodoris mouaci (Risbec, 1928)
Chromodoris n'dukuei (Risbec, 1928)
Chromodoris odhneri (Risbec, 1953)
Chromodoris pallescens (Bergh, 1905)
Chromodoris preciosa (Kelaart, 1858)
Chromodoris quadricolor (Rüppel, 1828)
Chromodoris souverbiei (Crosse, 1875)
Chromodoris striatella Bergh, 1877
Chromodoris tenuis (Collingwood, 1828)
Chromodoris trouilloti (Risbec, 1928)
Chromodoris variata (Risbec, 1928)
Chromodoris verrieri (Crosse, 1875)
Chromodoris versicolor (Risbec,1928)
Durvilledoris albofimbria (Rudman,1995)
Glossodoris aureola (Rudman,1995)
Glossodoris aeruginosa (Rudman,1995)
Glossodoris pullata (Rudman,1995)

Hypselodoris flavomarginata (Rudman,1995)
Hypselodoris koumacensis (Rudman,1995)
Hypselodoris lacteola (Rudman, 1995)
Hypselodoris punicea (Rudman,1995)
Hypselodoris maculosa (Pease, 1871)
Noumea decussata Risbec, 1928
Noumea flava (Eliot, 1904)
Noumea laboutei Rudman, 1986
Noumea romeri Risbec, 1928
Noumea verconiforma (Rudman,1995)
Noumea violacea Risbec, 1930
Risbecia francoisi (Odhner,1934)
Risbecia odhneri Risbec, 1928
Risbecia versicolor Risbec, 1928
Thorunna australis (Risbec, 1928)
Thorunna montrouzieri (Rudman,1995)

DENDRODORIDIDAE Ehrenberg, 1831

Dendrodoris clavulata Alder & Hancock, 1864
Dendrodoris communis (Risbec,1928)
Dendrodoris elongata Baba, 1936
Dendrodoris erubescens Bergh, 1905
Dendrodoris fosseti Risbec, 1928
Dendrodoris maculata Risbec, 1928
Dendrodoris mariei Crosse, 1875
Dendrodoris mollis (Risbec,1928)
Dendrodoris montrouzieri Crosse,
Dendrodoris murina Risbec, 1928
Dendrodoris nigra (Stimpson, 1855)

DORIDIDAE Rafinesque, 1815

Asteronotus boholiensis Ribesc, 1930,
Carminodoris cockerelli Risbec, 1930
Carminodoris punctulifera Bergh,
Carminodoris flavescens Risbec, 1937
Doriopsis pecten Coll, 1881
Doriopsis viridis Pease, 1861
Kentrodoris inframaculata Von Ihering
Kentrodoris nigra Risbec, 1928
Kentrodoris pseudofusca Risbec, 1928
Peltodoris noumeae Risbec, 1937
Pharodoris diaphora Valdes, 2001
Rostanga atrata Kelaart, 1859
Staurodoris aspera Risbec, 1928
Thordisa hilaris Bergh, 1905
Trippa intecta Kelaart, 1853
Trippa spinosa Risbec, 1928

DOTIDAE Vayssière, 1888

Doto racemosa Risbec, 1928

ELYSIADAE Bergh, 1892

Elysia gracilis Risbec, 1930
Elysia ornata Pease, (Swaison, 1840)
Elysia nigropuncta Pease,
Elysia pilosa Risbec, 1928
Elysia pruvotae Risbec, 1928
Elysia vatae Risbec, 1928
Elysiobranchus mercieri Pruvot-Fol, 1930

Placobranchus guttatus Stimpson, 1858

GONIODORIDIDAE H. & A. Adams, 1854

Goniodoris joubini Risbec, 1928
Goniodoris violacea Risbec, 1928
Hopkinsia pilosa Bouchet & Ortea, 1983

GRUVELIIDAE Risbec, 1928

Gruvelia spahri Risbec, 1928

GYMNODORIDIDAE Odhner, 1941

Trevelyana bicolor Alder & Hancock, 1864
Trevelyana ceylonica Kelaart, 1858
Trevelyana kouaouae Risbec, 1928
Trevelyana perlucens Risbec, 1928
Trevelyana suggens Risbec, 1928

HEXABRANCHIDAE Bergh, 1892

Hexabranchus marginatus Quoy & Gaimard, 1832

MADRELLIDAE Vayssière, 1909

Madrella ferruginea Alder & Hancock, 1866

PHYLLIDIIDAE Rafinesque, 1814

Phyllidia bourgini Risbec, 1928
Phyllidia tuberculata Risbec, 1928
Phyllidia nobilis Bergh, 1888
Phyllidia scottjohnsoni Brunckhorst, 1993

PHYLLOBRANCHILLIDAE

Phyllobranchillus orientalis Kelaart, 1858

PLATYDORIDIDAE Bergh, 1891

Platydoris carinata Risbec,1928
Platydoris cruenta Quoy & Gaimard, 1832
Platydoris immonda Risbec, 1928
Platydoris laminea Risbec,1928
Platydoris noumeae Risbec,1928
Platydoris spongilla Risbec,1928

POLYCERIDAE Alder & Hancock, 1845

Analogium striatum Eliot, 1908
Joubiniopsis bourailli Risbec, 1928
Plocamopherus ceylonicus Kelaart,
Plocamopherus fulgurans Risbec, 1928
Polycera funerea Pruvot-Fol, 1930
Polycera picta Risbec, 1928
Polycera pruvotae Risbec, 1953
Polycera tabescens Risbec, 1928
Spahria minima Risbec, 1928

POROMYIDAE Dall, 1886

Cetomya butoni (Prashad, 1932)

SCYLLAEIDAE Bergh, 1892

Scyllaea pelagica Linné, 1758

TETHYMELIBIDAE Bergh, 1892

Melibe engeli Risbec, 1937
Melibe papillosa Filippi, 1867

TRITONIADAE Bergh, 1892

Mariana rosea Pruvot-Fol, 1930

VAYSSIEREIDAE Thiele, 1931

Vayssierea caledonica Risbec, 1928

PELECYPODA (Goldfuss, 1820)

CARDIIDAE Lamarck, 1809

Acrosterigma attenuatum (Sowerby, 1841)
Acrosterigma biradiatum (Bruguière, 1789)
Acrosterigma dianthinum (Melvill & Standen, 1899)
Acrosterigma elongatum coralense Vidal, 1999
Acrosterigma hobbsae Vidal, 1999
Acrosterigma maculosum (Wood, 1815)
Acrosterigma maculosum howense Vidal, 1999
Acrosterigma punctolineatum Healy & Lamprell, 1992
Acrosterigma selene Vidal, 1999
Acrosterigma sewelli (Prashad, 1932)
Acrosterigma simplex (Spengler, 1799)
Acrosterigma transcendens (Melvill & Standen, 1899)
Fulvia aperta (Bruguière, 1789)
Fulvia australis (Sowerby, 1834)
Fulvia dulcis (Deshayes, 1863)
Fulvia fragiformis Vidal, 1994
Fulvia hungerfordi Sowerby, 1901
Fulvia lineonotata Vidal, 1994
Fulvia scalata Vidal, 1994
Fulvia undatopicta (Pilsbry, 1904)
Vasticardium elongatum (Bruguière, 1789)
Vasticardium orbita philippinense (Hedley, 1899)
Vasticardium pectiniforme (Born, 1780)

CHAMIDAE Lamarck, 1809

Eopseuma phyllotrapezium Matsukuma, 1996

GLOSSIDAE Gray, 1847

Meiocardia moltkiana (Gmelin , 1791)

LUCINIDAE Fleming, 1828

Lucina edentula (Linné)

OSTREIDAE Rafinesque, 1815

Crassostrea cuculata (Born)

PECTINIDAE Rafinesque, 1815

Annachlamys flabellata kuhnholtzi Bernardi, 1860
Annachlamys iredalei Powell, 1950
Anguipecten picturatus Dijkstra, 1995
Argopecten rehderi Grau, 1960
Bractechlamys coudeini (Bavay , 1903)
Bractechlamys kuhnholtzi (Bernardi, 1860)
Bractechlamys lamberti (Souverbie, 1874)
Bractechlamys vexillum (Reeve, 1853)
Chlamys cloacata (Reeve, 1853)
Chlamys coruscans coruscans Hinds, 1845
Chlamys elegantissima Deshayes, 1863
Chlamys quadrilirata Lischke, 1870
Chlamys squamosa Gmelin, 1791
Chlamys wilhelminae Bavay, 1904
Coralichlamys madreporarum (Sowerby II, 1842)
Coralichlamys spectabilis (Reeve, 1853)
Coralichlamys spondyloideum (Gmelin, 1791)
Cryptopecten amicum (E.A. Smith, 1885)
Cryptopecten bernardi nux Reeve, 1853
Cryptopecten deliciosa (Iredale, 1939)
Cryptopecten elegantissima (Deshayes , 1863)

Cryptopecten forbesianus (A.Adams & Reeve, 1849)
Cryptopecten iredalei (Powell, 1958)
Cryptopecten maldivense (E.A. Smith, 1903)
Cryptopecten nux (Reeve, 1853)
Cryptopecten quadrilirata (Lischke, 1870)
Cryptopecten rastellum (Lamarck, 1819)
Cryptopecten senatoria (Gmelin, 1791)
Decatopecten pallium (Linné, 1758)
Decatopecten radula (Linné, 1758)
Haumea rehderi (Grau, 1960)
Hemipecten forbesianus A.Adams & Reeve, 1849
Laevichlamys andamanica (Preston, 1908)
Laevichlamys balloti (Bernardi, 1861)
Laevichlamys barnetti (Dijkstra, 1988)
Laevichlamys irregularis (Sowerby II, 1842)
Laevichlamys mirificus (Reeve, 1853)
Laevichlamys squamosa (Gmelin, 1791)
Laevichlamys wilhelminae (Bavay, 1904)
Mimachlamys deliciosa Iredale, 1939
Mimachlamys gloriosa (Reeve, 1853)
Mimachlamys senatoria Gmelin, 1791
Scaeochlamys livida (Iredale, 1939)
Semipallium coruscans (Hinds, 1845)
Semipallium fulvicostatum (A. Adams & Reeve,1850)
Semipallium kengaluorum Dijkstra, 1986
Serratovola gardineri (E.A. Smith, 1903)
Serratovola tricarinata (Anton, 1839)

PROPEAMUSSIIDAE Abbott, 1954

Parvamussium pauciliratum (E. A. Smith, 1903)

TELLINIDAE Blainville, 1814

Tellina staurella (Lamarck) 1818

VENERIDAE Rafinesque, 1815

Callista accincta Römer, 1864
Callista lilacina (Lamarck, 1818)
Callista roseotincta (Smith & Withehead , 1885)
Gafrarium gibbium (Lamarck)
Lioconcha annettae Lamprell & Withehead, 1990
Lioconcha berthaulti Lamprell & Healy, 2002
Lioconcha caledonensis Harte & Lamprell, 1999
Lioconcha castrensis (Linné, 1758)
Lioconcha macaulayi Lamprell & Healy, 2002
Lioconcha melharteae Lamprell & Stanisic, 1996
Lioconcha ornata (Dillwyn, 1817)
Lioconcha philippinarum (Hanley, 1844)
Lioconcha polita (Röding, 1798)
Lioconcha richerdeforgesi Lamprell & Stanisic, 1996
Lioconcha schioettei Lamprell & Healy, 2002
Lioconcha trimaculata (Lamarck, 1818)
Pitar affinis (Gmelin, 1791)
Pitar caperi Lamprell & Healy, 1997
Pitar citrina (Lamarck, 1818)
Pitar healyi Lamprell & Stanisic, 1996
Pitar intricata (Dautzenberg, 1907)
Pitar japonica Kuroda & Kawamoto, 1956
Pitar nancyae Lamprell & Withehead, 1990

Pitar noguchii Habe, 1958
Pitar pellucidus (Lamarck, 1818)
Pitar potteri Healy & Lamprell, 1992
Pitar prora (Conrad, 1837)
Pitar sophiae (Angas, 1877)
Pitar spoori Lamprell & Withehead, 1990

POLYPLACOPHORA Gray, 1821
ACANTHOCHITONIDAE Simroth, 1894
Notoplax producta (Carpenter, 1892)
CHITONIDAE Rafinesque, 1815
Acanthopleura araucariana (Hedley, 1898)
Acanthopleura gemmata (de Blainville, 1825)
Tegulaplax pulchra Kaas, 1991
SCHIZOCHITONIDAE Dall, 1889
Loricella profundior (Dell, 1956)

SCAPHOPODA Bronn, 1862
DENTALIIDAE Gray, 1847
Antalis weinkauffi (Dunker, 1877)
Dentalium pluricostatum Boissevain, 1906
Dentalium variabile Deshayes, 1825
Graptacme lactea (Deshayes, 1825)
Pictodentalium festivum (Sowerby, 1914)
Tesseracme tetrapleura (Boissevain, 1906)
FUSTIARIIDAE Steiner, 1991
Fustiaria langfordi (Habe, 1963)
Fustiaria nipponica (Yokoyama, 1922)
GADILIDAE Stoliczka, 1868
Dischides yateensis Scarabino, 1995
Cadulus aratus Hedley, 1899
GADILINIDAE Chistikov, 1975
Episiphon subtorquatum (Fischer, 1871)

Pycnogonida of New Caledonia

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Recording of pycnogonids from the New Caledonia region began as recently as 1977 (Child, 1977). Since then, the intensive sampling by cruises from the Paris Museum over the last twenty years has revealed a high diversity of pycnogonids in the Western Pacific, particularly in the area of the Melanesian island systems. The entire known pycnogonid fauna of the Melanesia-Micronesia-Polynesia region was discussed and summarized by Bamber (2004). The list below is of all species recorded from New Caledonia, the Loyalty Islands, the Chesterfield Islands and Vanuatu, including those from deeper water. There are as yet no published records of pycnogonids from the Matthew and Hunter Islands, the Norfolk Ridge or the Lord Howe Rise.

Although the region is relatively understudied for the rarer arthropod taxa, the high diversity of the region, and the preponderance of novel taxa are nevertheless surprising. Of 122 species listed for the wider area by Bamber (2004), 74 are known from the New Caledonia system as defined above, of which 66 are recorded from New Caledonia itself. The region represent the type-locality of 39 of these species, and 36 have not recorded elsewhere. At higher taxonomic levels, the monotypic genus *Proboehmia* (Ammotheidae) is only known from New Caledonia, while the subgenus *Austrodecus (Tubidecus)* (Austrodecidae) is only known from New Caledonia and the Loyalty Islands (Melanesia). Whether this represents endemism cannot be said, owing to the general lack of study of pycnogonids in the western Pacific. Essentially, the pycnogonid fauna of the Melanesia-Micronesia-Polynesia island systems represents a subset of the Indo-West Pacific pycnogonid fauna, of high diversity. The concept of local endemicity was predicted for this region by the model of Bamber (1998), and is supported by the fact that few of these species are known also from Japan, an admittedly cooler region but one which has been the subject of intensive study and which also shows high endemicity (Nakamura & Child 1991).

The following checklist indicates the local provenance of the species, those for which this is the type-locality, and those which are currently "endemic". The family structure is based on Arnaud and Bamber (1987), except for the resurrection of the family Pallenopsidae (see Bamber, 2004); *Ammothella indica* Stock, 1954 is currently treated as a junior synonym of *A. appendiculata* (Dohrn, 1881).

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List of taxa

Class Pycnogonida

Family Nymphonidae Wilson, 1878

Nymphon adenopus Stock, 1991 (New Caledonia) [1,2]
Nymphon apicatum Stock, 1991 (New Caledonia) [1,2]
Nymphon fortunatum Stock, 1997 (New Caledonia) [1,2]
Nymphon novaecaledoniae Stock, 1991 (New Caledonia) [1,2]
Nymphon parum Stock, 1991 (New Caledonia) [1,2]
Nymphon spinifex Stock, 1997 (New Caledonia) [1,2]

Family Ammotheidae Dohrn, 1881

Achelia assimilis (Haswell, 1885) (New Caledonia)
Achelia nana Loman, 1908 (New Caledonia)
Ammothella appendiculata (Dohrn, 1881) (New Caledonia)
Ammothella nimia Stock, 1991 (New Caledonia) [1,2]
Ammothella stauromata Child, 1982 (New Caledonia)
Scipiolus plumosus Loman, 1908 (New Caledonia, Loyalty Islands)
Ascorhynchus breviscapus Stock, 1968 (New Caledonia)
Ascorhynchus cactoides Stock, 1954 (New Caledonia)
Ascorhynchus constrictus Stock, 1991 (Vanuatu) [1,2]
Ascorhynchus fragilis Stock, 1991 (New Caledonia) [1,2]
Ascorhynchus ornatus (Helfer, 1938) (New Caledonia)
Ascorhynchus pilipes Stock, 1991 (New Caledonia, Loyalty Islands) [1,2]
Ascorhynchus seticauda Stock, 1991 (New Caledonia, Chesterfield islands) [1,2]
Bathyzetes setiger (Loman, 1908) (New Caledonia)
Cilunculus achelioides Stock, 1991 (New Caledonia) [1,2]
Cilunculus ateuchus Bamber, 2004 (New Caledonia) [1,2]
Cilunculus australiensis Clark, 1963 (New Caledonia)
Cilunculus compactus Stock, 1991 (New Caledonia)
Cilunculus crinitus Stock, 1991 (New Caledonia) [1,2]
Cilunculus frontosus Loman, 1908 (New Caledonia)
Cilunculus pedatus Stock, 1991 (New Caledonia) [1,2]
Cilunculus scaurus Stock, 1997 (New Caledonia) [1,2]
Dromedopycnon arthritis Bamber, 2004 (New Caledonia) [1,2]
Heterofragilia brevicauda Stock, 1991 (New Caledonia) [1,2]
Sericosura cochleifovea Child, 1989 (New Caledonia)
Proboehmia tubirostris Stock, 1991 (New Caledonia) [1,2]

Family Endeidae Norman, 1908

Endeis mollis (Carpenter, 1904) (New Caledonia)

Family Pallenopsidae Fry, 1978

Pallenopsis (Pallenopsis) angusta Stock, 1991 (New Caledonia, Loyalty Islands)
Pallenopsis (P,) dentifera Stock, 1983 (New Caledonia)
Pallenopsis (P.) spinipes Carpenter, 1907 (Vanuatu)
Pallenopsis (P.) virgata Loman, 1908 (New Caledonia, Chesterfield islands, Vanuatu)
Pallenopsis (B.) juttingae Stock, 1964 (New Caledonia)
Pallenopsis (B.) longimana Stock, 1991 (New Caledonia) [1,2]
Pallenopsis (B.) longirostris Wilson, 1881 (Vanuatu)
Pallenopsis (B.) mollissima (Hoek, 1881) (Vanuatu)
Pallenopsis (B.) richeri Bamber, 2000 (Vanuatu)
Pallenopsis (B.) scoparia Fage, 1956 (Chesterfield Islands)
Pallenopsis (B.) tydemani Loman, 1908 (Vanuatu)

Family Callipallenidae Hilton, 1942

Callipallene ersei Bamber, 1997 (New Caledonia) [1,2]
Callipallene fallax (stock, 1994) (New Caledonia)
Seguapallene tricuspidata Stock, 1991 (New Caledonia) [1,2]

Parapallene arnaudae Stock, 1991 (New Caledonia) [1,2]
Parapallene australiensis (Hoek, 1881) (New Caledonia)
Pigrogromitus timsanus Calman, 1927 (New Caledonia)

Family Phoxichilidiidae Sars, 1891

Anoplodactylus batangensis (Helfer, 1938) (New Caledonia)
Anoplodactylus cribellatus Calman, 1923 (New Caledonia)
Anoplodactylus longiformis Child, 1977 (New Caledonia) [1,2]
Anoplodactylus pycnosoma (Helfer, 1938) (New Caledonia)
Anoplodactylus typhloides Stock, 1991 (New Caledonia) [1,2]
Phoxichilidium forfex Stock, 1991 (New Caledonia) [1,2]
Phoxichilidium tuberculatum Stock, 1991 (New Caledonia) [1,2]

Family Colossendeidae Hoek, 1881

Colossendeis colossea Wilson, 1881 (New Caledonia, Chesterfield islands, Vanuatu)
Colossendeis leptorhynchus Hoek, 1881 (New Caledonia, Vanuatu)
Colossendeis macerrima Wilson, 1881 (Chesterfield islands, Vanuatu)
Colossendeis minor Schimkewitsch, 1893 (New Caledonia)
Colossendeis pipetta Stock, 1991 (New Caledonia, Loyalty Islands, Chesterfield Islands) [1]
Colossendeis sinuosa Stock, 1997 (New Caledonia) [1]
Rhopalorhynchus filipes Stock, 1991 (New Caledonia, Loyalty Islands, Chesterfield Islands)
Hedgpethia tibialis Stock, 1991 (New Caledonia) [1,2]

Family Austrodecidae Stock, 1954

Austrodecus calvum Stock, 1991 (New Caledonia) [1,2]
Austrodecus (Tubidecus) bathyale Stock, 1991 (New Caledonia, Loyalty Islands) [1,2]
Austrodecus (T.) excelsum Stock, 1991 (New Caledonia) [1,2]
Austrodecus (T.) latum Stock, 1991 (New Caledonia, Loyalty Islands) [1,2]
Austrodecus (T.) oferrecans Bamber, 2000 (New Caledonia) [1,2]
Austrodecus (T.) tuberculatum Stock, 1991 (New Caledonia) [1,2]

Family Pycnogonidae Wilson, 1878

Pycnogonum crosnieri Stock, 1991 (New Caledonia) [1,2]
Pycnogonum occa Loman, 1908 (New Caledonia)
Pycnogonum (Nulloviger) lobipes Stock, 1991 (New Caledonia) [1,2]
Pycnogonum (N.) moniliferum Stock, 1991 (New Caledonia) [1]

[1] type locality
[2] currently endemic

Copepoda of New Caledonia

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Knowledge of copepods from New Caledonia is patchy. Unusually it is the parasitic and associated taxa that are better known than the free-living, with the majority of species being reported from the orders Cyclopoida (now including the Poecilostomatoida) and the Siphonostomatoida. Marine invertebrates serve as hosts to the great majority of the recorded cyclopoids and fish serve as hosts to the majority of the siphonostomatoids. The plankton is relatively poorly known but will contain a diverse array of Calanoida representing numerous families, including the Pontellidae, Acartiidae, Tortanidae and Centropagidae. These taxa have not been surveyed here. The non-calanoid planktonic taxa include the abundant taxa such as the families Oithonidae, Oncaeidae, Sapphirinidae and Corycaeidae. These families will be represented by many known species, but have also not been surveyed for the current list. The free-living Harpacticoida will be abundant and diverse in the interstitial environment as well as in the epibenthic community and in macroalgae. Little descriptive taxonomy has been carried out on the benthic copepods of New Caledonia and it is reasonable to expect that numerous new taxa will be found.

List of taxa

COPEPODA H. Milne Edwards, 1840
CALANOIDA Sars, 1903
CENTROPAGIDAE Giesbrecht, 1893
Parathalassius fagesi Dussart, 1986
PARACALANIDAE Giesbrecht, 1893
Paracalanus parvus (Claus, 1863)
CYCLOPOIDA Burmeister, 1834
ANCHIMOLGIDAE Humes & Boxshall, 1996
Amardopsis merulinae Humes, 1974
Anchimolgus abbreviatus Humes, 1991
Anchimolgus compressus Humes, 1996
Anchimolgus contractus Humes, 1979
Anchimolgus convexus Humes, 1978
Anchimolgus gratus Humes, 1996
Anchimolgus latens Humes, 1978
Anchimolgus maximus Kim, 2003
Anchimolgus multidentatus Kim, 2003
Anchimolgus nasutus Humes, 1996
Anchimolgus noumensis Kim, 2003
Anchimolgus punctilis Humes, 1978
Anchimolgus tanaus Humes, 1991
Anchimolgus tener Humes, 1973
Anchimolgus tenuipes Kim, 2003
Anchimolgus tridentatus Kim, 2003
Cerioxynus alatus Humes, 1974
Cerioxynus faviticolus Humes, 1974
Clamocus spinifer Humes, 1979
Dumbeana undulatipes Humes, 1996
Ecphysarion ampullum Humes, 1993
Ecphysarion lobophorum (Humes & Ho, 1968)
Haplomolgus incolumis Humes, 1991
Haplomolgus montiporae Humes & Ho, 1968
Jamescookina exigua Kim, 2003
Jamescookina palmata Kim, 2003

Juxtandrianellus probus Humes, 1995
Karanges galaxeanus Humes, 1979
Lipochaetes extrusus Humes, 1996
Mycoxynus longicauda Humes, 1973
Odontomolgus bulvalis Humes, 1991
Odontomolgus exilipes Kim, 2003
Odontomolgus forhani Humes, 1978
Odontomolgus geminus Kim, 2003
Odontomolgus mundulus Humes, 1974
Odontomolgus scitulus Humes, 1973
Panjakus directus Humes, 1995
Panjakus necopinus Humes, 1995
Panjakus platygyrae Humes & Stock, 1973
Paraclamocus hiulcus Humes, 1997
Schedomolgus dumbensis Kim, 2003
Schedomolgus exilliculus Humes, 1993
Schedomolgus idanus Humes, 1993
Schedomolgus insignellus Humes, 1993
Schedomolgus majusculus Humes, 1993
Schedomolgus tenuicaudatus Kim, 2003
Schedomolgus walteri Kim, 2003
Scyphuliger aristoides Humes, 1993
Scyphuliger concavipes Humes, 1991
Scyphuliger eumorphus Humes, 1993
Scyphuliger latus Kim, 2003
Scyphuliger longicaudatus Kim, 2003
Scyphuliger manifestus Humes, 1991
Scyphuliger pennatus Kim, 2003
Scyphuliger pilosus Kim, 2003
Scyphuliger paucisurculus Kim, 2003
Scyphuliger tenuatus (Humes, 1990)
Uncispina latigenitalis Humes, 1993

ANTHESSIIDAE Humes, 1986
Anthessius alatus Humes & Stock, 1965
Anthessius amicalis Humes & Stock, 1965
Anthessius alatus Humes & Stock, 1965
Anthessius brevicauda (Leigh-Sharpe, 1934)
Anthessius dolabellae Humes & Ho, 1965
Anthessius pinctadae Humes, 1973

ASCIDICOLIDAE Thorell, 1860
Adenaplostoma monniotorum Stock, 1993

BOMOLOCHIDAE Sumpf, 1871
***Pumiliopes capitulatus* Cressey & Boyle, 1973**

CYCLOPIDAE Dana, 1846
Euryte bellatula Humes, 1991

HERPYLLOBIIDAE Hansen, 1892
Eurysilenium intermedium Stock, 1986

KELLERIIDAE Humes & Boxshall. 1996
Kelleria australiensis Bayly, 1971

LICHOMOLGIDAE Kossmann, 1877
Lichomolgus chamarum Humes, 1968
Lichomolgus ieversi Thompson & A. Scott, 1903
Paclabius lumidus Kossmann, 1877
Pterioidicola antennatus Kim, 2003
Stellicola novaecaledoniae Humes, 1976

Stellicola oreastriphilus Kossmann, 1877
Stellicola parvulipes Humes, 1976
Synstellicola acanthasteris (Humes, 1970)
Synstellicola pichoni (Humes & Ho, 1967)

MACROCHIRONIDAE Humes & Boxshall, 1996

Macrochiron lytocarpi Humes, 1966
Macrochiron rostratum Humes, 1966

MYTILICOLIDAE Bocquet & Stock, 1957

Cerastocheres trochicola Monod & Dollfus, 1932

NOTODELPHYIDAE Dana, 1853

Achelidelphys steinitzi Lafargue & Laubier, 1977
Apodelphys lamellipes Illg, 1970
Doropygus catalai Illg, 1970
Paranotodelphys constricta Illg, 1970

OCTOPICOLIDAE Humes & Boxshall, 1996

Octopicola regalis Humes, 1974

OITHONIDAE Dana, 1853

Oithona simplex Farran, 1913

PHILOBLENNIDAE Izawa, 1976

Briarella disphaerocephala Monod & Dollfus, 1932
Briarella risbeci Monod, 1928

PSEUDANTHESSIIDAE Humes & Stock, 1972

Mecomerinx heterocentroti Humes, 1977
Mecomerinx notabilis (Humes & Cressey, 1961)
Pseudanthessius implanus Humes, 1979
Pseudanthessius madrasensis Reddiah, 1968
Pseudanthessius major Stock, 1967
Pseudanthessius pictus Humes, 1977
Pseudanthessius vinnulus Humes, 1977
Senariellus diadematis Humes, 1977
Senariellus latiseta Humes, 1977

RHYNCHOMOLGIDAE Humes & Stock, 1972

Acanthomolgus astrictus Humes & Stock, 1973
Acanthomolgus exilipes (Humes & Ho, 1968)
Acanthomolgus gentilis (Humes & Ho, 1968)
Acanthomolgus varirostratus (Humes & Ho, 1968)
Alcyonomolgus bicrenatus (Humes, 1982)
Alcyonomolgus insolens (Humes & Ho, 1968)
Alcyonomolgus lumellifer Humes, 1990
Alcyonomolgus petalophorus (Humes, 1982)
Alcyonomolgus relativus (Humes, 1982)
Alcyonomolgus sarcophyticus (Humes, 1982)
Anisomolgus dissimilis Humes, 1982
Anisomolgus ensifer Humes, 1982
Anisomolgus goniodes Humes, 1982
Anisomolgus protentus (Humes & Frost, 1964)
Anisomolgus pterolobatus Humes, 1982
Colobomolgus cristatus (Humes & Ho, 1968)
Colobomolgus dentipes (Thompson & A. Scott, 1903)
Colobomolgus epaxius Humes, 1990
Critomolgus antennulus Humes, 1991
Critomolgus audens (Humes, 1959)
Critomolgus brevicaudatus Kim, 2003
Critomolgus caelatus Humes, 1985
Critomolgus cladiellae Humes, 1990

Critomolgus cylichnophorus (Humes, 1982)
Critomolgus dunnae (Humes, 1982)
Critomolgus foxi (Gurney, 1927)
Critomolgus hispidulus (Humes, 1982)
Critomolgus linguifer Kim, 2003
Critomolgus magnificus (Humes, 1964)
Critomolgus mandoensis Kim, 2003
Critomolgus orectopus Humes, 1990
Critomolgus paterellis (Humes, 1982)
Critomolgus penicillatus (Humes, 1982)
Critomolgus scyphulanus (Humes, 1982)
Diallagomolgus productus Humes, 1979
Diallagomolgus vicinus Humes, 1979
Doridicola aculeatus (Humes & Ho, 1968)
Doridicola cincinnatus (Humes, 1975)
Doridicola cinctus (Humes & Stock, 1973)
Doridicola commodus (Humes, 1964)
Doridicola comparatus (Humes, 1975)
Doridicola cuspis (Humes, 1964)
Doridicola echinasteris (Humes, 1976)
Doridicola inaequalis (Humes & Ho, 1966)
Doridicola mimicus (Humes, 1975)
Doridicola parvicaudatus Kim, 2003
Doridicola petalopus Humes, 1990
Doridicola praelongipes (Humes, 1975)
Doridicola rostripes Humes, 1990
Doridicola rumphellae Humes, 1993
Doridicola senticauda Humes, 1990
Doridicola spinulifer (Humes & Frost, 1964)
Emunoa protenta Humes, 1996
Lambanetes gennulatus Humes, 1982
Lambanetes stichodactylae Humes, 1982
Mandobius regalis Humes, 1991
Meringomolgus hamatus Humes & Stock, 1973
Notoxynus crinitus Humes, 1982
Notoxynus mundus Humes, 1975
Numboa porosa Humes, 1997
Pachysericola compressus Kim, 2003
Paradoridicola adelphus (Humes & Ho, 1968)
Paradoridicola angularis Humes, 1990
Paradoridicola drepanophorus Humes, 1990
Paradoridicola hystricosus Humes, 1990
Paradoridicola simulator Humes, 1990
Paradoridicola sinulariae Humes & Stock, 1973
Paradoridicola squamiger (Humes & Frost, 1964)
Paramolgus alcyoniicus Humes, 1990
Paramolgus centor Humes, 1990
Paramolgus clavatus (Humes & Ho, 1968)
Paramolgus eniwetokensis Humes, 1973
Paramolgus galeatus Kim, 2003
Paramolgus inconstans Humes & Dojiri, 1979
Paramolgus nephtheanus Humes, 1980
Paramolgus pavonae Humes, 1994
Paramolgus promiculus Humes, 1980
Paramolgus quadrangularis Humes, 1990

Paramolgus setellus Humes, 1992
Paramolgus spathophorus (Humes & Ho, 1968)
Paramolgus subincisus Humes, 1990
Paramolgus timendus Humes, 1990
Paredromolgus decorus (Humes & Frost, 1964)
Verutipes laticeps Humes, 1982

SYNAPTICOLIDAE Humes & Boxshall, 1996

Chauliolobion bulbosum Humes, 1975
Chauliolobion halodeimatis Humes, 1975
Chauliolobion tylotus Humes, 1975
Lecanurius planifrontalis Humes, 1980
Scambicornus calcaratus Humes, 1975
Scambicornus campanulipes (Humes & Cressey, 1961)
Scambicornus idoneus (Humes & Cressey, 1961)
Scambicornus modestus (Humes & Cressey, 1961)
Scambicornus poculiferus (Humes & Cressey, 1961)
Scambicornus sewelli Humes, 1975
Scambicornus subtilis (Humes & Cressey, 1961)
Scambicornus tuberatus (Humes & Cressey, 1961)
Scambicornus tylotus Humes, 1975

TAENIACANTHIDAE Wilson, 1911

Clavisodalis abbreviatus Dojiri & Humes, 1982
Clavisodalis dilatatus Dojiri & Humes, 1982
Clavisodalis parvibullatus Dojiri & Humes, 1982
Clavisodalis tenuis Dojiri & Humes, 1982
Echinosocius finitimus Dojiri & Humes, 1982
Echinosocius gulicolus Dojiri & Humes, 1982
***Irodes** sauridi* (Pillai, 1963)
Metataenicanthus vulgaris Cressey & Cressey, 1979
Taeniacanthus aluteri (Avdeev, 1977)
Taeniacanthus kitamakura (Yamaguti & Yamasu, 1959)

XARIFIIDAE Humes, 1960

Lipochrus acroporinus Humes & Dojiri, 1982
Xarifia albusa Humes & Dojiri, 1982
Xarifia acicularis Humes, 1985
Xarifia anomala Humes & Ho, 1968
Xarifia diminuta Humes & Ho, 1967
Xarifia echinoporae Humes & Dojiri, 1982
Xarifia eminula Humes, 1985
Xarifia fastigiata Humes & Dojiri, 1982
Xarifia fimbriata Humes, 1960
Xarifia finitima Humes, 1985
Xarifia formosa Humes, 1985
Xarifia gerlachi Humes, 1962
Xarifia guttulifera Humes & Dojiri, 1982
Xarifia imitans Humes, 1985
Xarifia imparilis Humes, 1985
Xarifia jugalis Humes, 1985
Xarifia levis Humes, 1985
Xarifia mucronata Humes & Dojiri, 1982
Xarifia obesa Humes & Ho, 1968
Xarifia pectinea Humes & Dojiri, 1982
Xarifia quinaria Humes, 1985
Xarifia rosariae Humes & Dojiri, 1982
Xarifia sabiuraensis Misaki, 1978

Xarifia sectilis Humes, 1985
Xarifia simplex Humes, 1985
Xarifia temnura Humes & Ho, 1968
Xarifia trituberata Humes & Dojiri, 1982
Xarifia tumorisa Misaki, 1978
Xarifia umbonata Humes, 1985
Xarifia varilabrata Humes, 1985
Xarifia villosa Humes & Dojiri, 1982

FAMILY UNCERTAIN
Ruthra humesi Kim, 2003
HARPACTICOIDA Sars, 1903
AMEIRIDAE Monard, 1927
Ameira parvula (Claus, 1866)
Nitocra affinis Gurney, 1927
Psyllocamptus minutus Sars, 1911
CANUELLIDAE Lang, 1944
Intersunaristes dardani (Humes & Ho, 1969)
Sunaristes inaequalis Humes & Ho, 1969
ECTINOSOMATIDAE Sars, 1903
Ectinosoma acutorostratum Vervoort, 1962
HAMONDIIDAE Huys, 1990
Ambunguipes rufocincta (Brady, 1880)
HARPACTICIDAE Dana, 1846
Harpacticus compsonyx Monard, 1926
LAOPHONTIDAE T. Scott, 1905
Corbulaseta bulligera (Farran, 1913)
Laophonte thoracica Boeck, 1865
Paralaophonte obscura Vervoort, 1962
MIRACIIDAE Dana, 1846
Amphiascus angustipes Gurney, 1927
Paramphiascella pacifica Vervoort, 1962
PELTIDIIDAE Sars, 1904
Alteuthellopsis corallina Humes, 1981
PORCELLIDIIDAE Boeck, 1865
Porcellidium brevicaudatum Thompson & A. Scott, 1903
THALESTRIDAE Sars, 1905
Dactylopodella clypeata Sars, 1911
TISBIDAE Stebbing, 1910
Tisbe acanthifera Vervoort, 1962
SIPHONOSTOMATOIDA Burmeister, 1835
ASTEROCHERIDAE Giesbrecht, 1899
Asteropontius acroporus Kim, 2003
Asteropontius brevioris Kim, 2003
Asteropontius caledoniensis Kim, 2003
Asteropontius dissimilis Kim, 2003
Asteropontius minutus Kim, 2003
Collocheres commantiphilus Humes, 1987
Collocheres serrulatus Humes, 1987
Glyptocheres extrusus Humes, 1987
Hetairosyna laciniata Humes, 1991
Hetairosyna sororia Humes, 1991
Hetairosyna terpena Humes, 1991
Orecturus amplus Humes, 1996
Tondua tholincola Humes, 1997
CALIGIDAE Burmeister, 1835
Alebion carchariae Krøyer, 1863

Alebion gracilis Wilson, 1905
Avitocaligus assurgericola Boxshall & Justine, 2005
Caligus bonito Wilson, 1905
Caligus confusus Pillai, 1961
Caligus cordyla Pillai, 1963
Caligus coryphaenae Steenstrup & Lutken, 1861
Caligus infestans Heller, 1868
Caligus isonyx Steenstrup & Lütken, 1861
Caligus lobodes (Wilson, 1911)
Caligus* cf. *mauritanicus Brian, 1924
Caligus novocaledonicus Kabata, 1968
Caligus productus Dana, 1852
Gloiopotes hygomianus Steenstrup & Lutken, 1861
Gloiopotes watsoni Kirtisinghe, 1934
Paralebion elongatus Wilson, 1911
Pseudanuretes fortipedis Kabata, 1965

DISSONIDAE Yamaguti, 1963

Dissonus manteri Kabata, 1966
***Dissonus** spinifer*, Wilson, 1906

EUDACTYLINIDAE Wilson, 1922

Nemesis robusta (van Beneden, 1851)

HATSCHEKIIDAE Kabata, 1979

Hatschekia balistae Nunes-Ruivo, 1954
Hatschekia cernae Goggio, 1905
Hatschekia cf. *plectropomi* Ho & Dojiri, 1966
Hatschekia sphyraeni Pillai, 1964

KROYERIIDAE Kabata, 1979

Kroyeria dispar Wilson, 1935

LERNANTHROPIDAE Kabata, 1979

Lernanthropus cadenati Delamare Deboutteville & Nunes Ruivo, 1954
Lernanthropus corniger Yamaguti, 1954
Lernanthropus tylosuri Richiardi, 1880
Norion priacanthi (Kirtisinghe, 1956)
Sagum epinepheli (Yamaguti & Yamasu, 1960)

LERNAEOPODIDAE Olsson, 1869

Brachiella thynni Cuvier, 1830
Margolisius cf. *abditus* Benz, Kabata & Bullard, 2000
Naobranchia cf. *spinosa* Pearse, 1952
Parabrachiella appendiculata (Heegaard, 1947)

NANASPIDIDAE Humes & Cressey, 1959

Nanaspis mixta Humes, 1975

PANDARIDAE Milne Edwards, 1840

Demoleus latus Shiino, 1954
Dinemoura latifolia (Steenstrup & Lutken, 1861)
Echthrogaleus coleoptratus (Guerin-Meneville, 1837)
Nesippus crypturus Heller, 1868
Nesippus tigris Cressey, 1967
Pandarus satyrus Dana, 1852
Pandarus smithii Rathbun, 1886
Pseudopandarus gracilis Kirtisinghe, 1950

PENNELLIDAE Burmeister, 1835

Lernaeolophus striatus Wilson, 1913

PSEUDOCYCNIDAE Wilson, 1922

Pseudocycnus appendiculatus Heller, 1868

STELLICOMITIDAE Humes & Cressey. 1958

Astroxynus culcitae Humes, 1971

Ostracoda from New Caledonia

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Ostracoda (Suborder Myodocopina) collected in vicinity of New Caledonia (data from Brady, 1890, and McKenzie (1986). Numbers 3, 5-7 refer to station data at bottom of list.

Asterope australis Brady, 1890; 6, 7.

Streptoleberis crenulata Brady, 1890; 6, 7.

Pleoschisma moroides Brady, 1890; 3, 6.

Sarsiella simplex Brady, 1890; 3, 6.

Sarsiella foveata Brady, 1890; 7.

Sarsiella sculpta Brady, 1890; 5, 6.

Rutiderma (Alternochelata) sp. (McKenzie, 1986); 6.

Station data: 3, Port of Noumea, 3-4 fathoms, muddy sand. 5, Near Noumea, between Ile Porc-Epic and shore, 2 fathoms, weedy bottom. 6, Near Noumea, off Cap Bon Louis, 4 fathoms, weedy bottom. 7, Near Noumea, Banc de l'Aiguille, 2-3 fathoms, weedy bottom, coral sand.

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Provisional list of the marine and freshwater isopods (Crustacea) of New Caledonia

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Little is known about the marine isopods of New Caledonia, and the level of documented knowledge for the region can be described only as minimal. For example, the highly species-rich Sphaeromatidae (currently 682 species world wide) is represented by only three formally recorded species. The isopod fauna listed here for New Caledonia totals 83 species. The nearby regions of New Zealand (Gordon in press and updated) and eastern Australia (Poore 2002, 2005) have, in comparison, marine isopod species totals of 315 and approximately (depending on where geographical boundaries are drawn) 625 named species respectively; those regions cannot be regarded as at a level of knowledge that could be yet described as 'well known'.

One could make predictions as to the likely potential diversity of isopods to be found in New Caledonia, based on known totals from elsewhere, and arrive at an assumed figure. The typical facies that is found on coral reefs is by now reasonably well known, and is highly diverse as suggested by Kensley (1988). The large-sized component (> 8 mm) of the isopod fauna of the continental shelf and slope has been sampled by various programs under the MUSORSTOM programs and this author's examination of those collections indicates that a high diversity (between 35 and 60 species of mostly undescribed Aegidae, Cirolanidae, Cymothoida and Sphaeromatidea) will be found if collections are made using appropriate techniques. A reasonable and conservative expectation would be that the number of marine isopods in the New Caledonia EEZ could be as high as 1000 species to a depth of 2000 metres.

Monod (1973) recorded two species of marine isopod, but these are considered to be misidentifications (Bruce 1997a; Lowry& Dempsey in press). Some records of isopods from New Caledonia, particularly from the Chesterfield Reefs in the Coral Sea, have appeared as incidental records in papers that do not mention the region in the title, such as Bruce (1994a), Poore & Kensley (1981) and Poore & Lew Ton (1998, 1990, 2002).

Notes: Classification follows Brandt & Poore (2003). For the sake of completeness all aquatic isopods known from New Caledonia are listed, including freshwater taxa. Oniscidea are not included. For Bopyridae only the host noted for New Caledonia is included, and the host name is as it appears in the cited publication.

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List of New Caledonia marine and freshwater Isopoda

*Authoritative but unpublished identifications are marked with an asterisk.

ASELLOTA Latreille, 1802

Microparasellidae Karaman, 1933

Microcharon heimi Coineau, 1968; 4–8 m

Microcharon salvati Coineau, 1968; interstitial

Paracharon renaudae Coineau, 1968; interstitial

Munnopsidae Lilljeborg, 1864

Acanthocope mendeleevi Malyutina, 1998; 3400–3410 m

CYMOTHOIDA Wagele, 1989

Aegidae White 1850

Aega alazon Bruce, 2004; 46–550 m

**Aega coroo* Bruce, 1983; 230–600 m

Aega hamiota Bruce, 2004; 508–700 m

Aega kixalles Bruce, 2004; 540–545 m

**Aega monophthalma* Johnston, 1834; 590–600 m

Aega musorstom Bruce, 2004; 475–615 m

**Aega plebeia* Hansen, 1897; 768–1788 m

Aega rickbruscai Bruce, 2004; 535–615 m

**Aega urotoma* Barnard, 1914 (= *'webbi'* of Trilles & Justine 2004, misidentification]; 110–329 m

**Aega vigilans* Haswell, 1881; shallow to 146 m
Aega sp. (*'angustata'* of Trilles & Justine 2004, misidentification]
**Syscenus latus* Richardson, 1909; 688–1056 m
Syscenus moana Bruce, 2005; 1220–1410 m

Bopyridae Rafinesque, 1815

Asymmetrorbione drepanopleon Boyko, 2003; *Sicyonia truncata* (Kubo, 1949) and *S. curvirostris* Balss, 1913, 260–522 m
Asymmetrorbione cf. *kempi* (Chopra, 1923); host *Sicyonia truncata* (Kubo), 440 m (Markham 1994; Boyko 2003)
Bopyrinina paucimaculata Markham, 1990; host *Periclimenes hertwigi* Blass, Menou & Tirard, 442–462 m
Entophilus omninectus Richardson, 1903; host Munida 'incerta' Henderson, 710 m (Markham 1994)
Eragia profunda Markham, 1994; host *Prionocrangon* sp., 2100–2110 m
Eriphrixus obesus Markham, 1990; host *Periclimenes vaubani* Bruce, 450 m
Filophryxus dorsalis Bruce, 1972; host *Periclimenes uniunguiculatus* Bruce, 600 m (Markham 1990)
Gigantione elconaxii Markham, 1994; host *Elconaxia* sp., 920–760 m
Ionella maculata Markham, 1994; host *Callianassa* sp., 65 m
Mediophrixus pinuum Markham, 1990; host *Athanas* sp., depth not stated
Metaphrixus rastriferis Markham, 1990; host *Periclimenes rastifer* Bruce, 33 m
Parapenaeon brevicoxalis Bourdon, 1981; host *Hymenopenaeus halli* Bruce, 675–710 m (Markham 1994)
Parapenaeon expansa Bourdon, 1979; host *Metapenaeopsis gailardi* Crosnier, 15 (Markham 1994)
Pseudione clevai Boyko, 2004; 558–647 m; host *Parastylodactylus tranterae* Cleva, 1990, 490–647 m
Pseudione stylopoda Boyko, 2004; 558–647 m; host *Parastylodactylus richeri* Cleva, 1990, 393–397 m
Pseudostegia setoensis Shiino, 1933; host '*Trizopagurus*', 400–560 m (Markham 1994)
Schizobopyrina andamanica (Chopra, 1923); host *Periclimenes bidentatus* Bruce, 33–82 m (Markham 1990)

Cirolanidae Dana, 1852

Bathynomus sp. nov. (Lowry & Dempsey in press)
Eurydice orientalis Hansen, 1890; surface plankton to shallow (doubtful, see Bruce 1980a)
Hansenolana anisopous Stebbing, 1900; shallow (Monod 1971)
Metacirolana neocaledonica Bruce, 1996; 1753–2049 m
Metacirolana nana (Bruce, 1980a); 12–20 m
Metacirolana basteni (Bruce, 1980a); 0–15 m
Politolana crosnieri Bruce, 1996; 650 m
Scutulana pezata Bruce, 1996; 440 m
Sintorolana atrox Bruce, 1996; 1635 m

Cymothoidae Leach, 1814

Anilocra australis Schioedte & Meinert, 1881; fish parasite
Anilocra gigantea (Herklots, 1870); fish parasite (Trilles 1972)
Anilocra longicauda Schioedte & Meinert, 1881; fish parasite
Ceratothoa carinata (Bianconi, 1869); fish parasite (Trilles 1972)
Ceratothoa impressa (Say, 1818); fish parasite (Trilles 1972)
Elthusa parabothi Trilles & Justine, 2004; fish parasite
Nerocila excisa (Richardson, 1901); fish parasite (Trilles 1972)

Anthuridae Leach, 1814

Apanthura restio Poore & Lew Ton, 1988; shallow reef to 15 m
Haliophasma profunda Negoescu, 1994; 1040 m
Quantanthura caledonensis Negoescu, 1994; 500 m
Stygocyathura numeae Wagele, 1982; interstitial

Pendanthura anophthalma Negoescu, 1994; 261–435 m

Expanthuridae

Coralanthura endevourae Poore & Kensley, 1981; shallow reef to 15 m

Eisothistos bellonae Poore & Lew Ton, 2002; shallow reef

Expanthura ardaea (Poore & Kensley, 1981); intertidal reef to 10 m (Poore & Lew Ton 2002)

Expanthura collaris (Kensley, 1979); shallow reef to 30 m (Poore & Lew Ton 2002)

Hyssuridae Wägele, 1981

Kupellonura caudoserrata Negoescu, 1994; 310–315 m

Leptanthuridae Poore, 2001

Accalathura singularia Negoescu, 1994; 305–310 m

Accalathura themeda Poore & Lew Ton, 1990; shallow reef to 20 m

Aenigmathura calliandra Poore & Lew Ton, 1986; shallow reef to 15 m

*Aenigmathura lifouensis*Negoescu, 1994; 510–520 m

Bullowanthura furcillata Negoescu, 1994; 760–790 m

Leptanthura monnioti Negoescu, 1994; 500–790 m

Leptanthura segonzaci Negoescu, 1994; 975–1560 m

Leptanthura sp. 1; 595 m (Negoescu, 1994)

Paranthuridae Menzies & Glynn, 1968

Aenigmathura lifouensis Negoescu, 1994; 510–520 m

Pseudanthura baeckea Poore & Lew Ton, 1986; 1620–1630 (Negoescu 1994)

Colanthura sp.; 470–480 m (Negoescu 1994)

LIMNORIIDEA Wagele, 1989

Keuphyliidae Bruce, 1980

Keuphylia nodosa Bruce, 1980b; 6–20 m

SPHAEROMATIDEA Wagele, 1989

Serolidae Dana, 1852

Acutiserolis cidaris Poore & Brandt, 1997; 891–1491 m

Caecoserolis novaecaledoniae Poore & Brandt, 1997; 500–2750 m

Sphaeromatidae Latreille, 1825

Neosaesa rugosa Harrison & Holdich, 1982; intertidal reefs to 27 m, to 75 m at Hawaii (Bruce 1994b)

Oxinasphaera corypantha Bruce, 1997b; 20 m

Platysphaera membranata Holdich & Harrison, 1981; shallow reefs to 30 m (Bruce 1994a)

VALVIFERA Sars, 1882

Arcturidae Dana, 1849

Chaetarcturus crosnieri Poore, 1998; 970–2040 m

Chaetarcturus taniae Poore, 1998; 1618–1740 m

Dolichiscus cornutus (Beddard, 1886); 530–1410 m (Poore 1998)

Chaetiliidae Dana, 1849

Stegidotea carinata Poore, 1991; 535–650 m

Stegidotea forcipes Poore, 1991; 595 m

Stegidotea longipes Poore, 1991; 1395–1410 m

The Amphipoda of New Caledonia

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Aside from the work of Chevreux (1915) studies of the New Caledonian amphipods did not start until the early 1970's. There have been only two faunistic monographs on the New Caledonian amphipods. Based on ORSTOM collections using mainly an Isaacs Kidd midwater trawl Répelin (1978) recorded 86 species of pelagic amphipods in the seas around New Caledonia. Based on shallow water benthic collections Ledoyer (1984) reported about 51 species of amphipods living among sea grasses. Other studies have concentrated on specific groups: Chevreux (1915) and Ruffo & Paiotta (1972) studied terrestrial talitrids; from deep water IRD (ORSTOM) collections Laubitz (1991) studied caprellids and Lowry & Stoddart (1994) studied lysianassoids; Myers (1998) studied aorids and Lowry & Myers (2003) studied iphimediid amphipods, both based on collections made by the authors and IRD divers in 1995. Watson *et al.* (2004) reported the first iciliid amphipods from New Caledonia.

Because of the short history of amphipod taxonomy in New Caledonia a number of families, such as the Ampeliscidae, Caprellidae, Colomastigidae, Hyalidae, Ischyroceridae, Leucothoidae, Oedicerotidae, Photidae and Phoxocephalidae are seriously under-represented and other families of shallow and deep water amphipods certain to be present, such as the Amathillopsidae, Amphilochidae, Bogidiellidae, Cheluridae, Chevaliidae, Exoedicerotidae, Kamakidae, Liljeborgiidae, Nihotungidae, Ochlesidae, Pardaliscidae, Platyischnopidae, Sebidae, Stegocephalidae and Stenothoidae, have not yet been reported. Based on unpublished data of Lowry and Myers it is reasonable to expect about 200 shallow water species just from the South-east Lagoon.

No hyperiidean amphipods are endemic to this area. At the moment 28 of the 88 shallow water species (32%) are considered to be endemic to New Caledonia. It is difficult to predict endemicity levels until more is known about the New Caledonian fauna and studies currently underway on the fauna of the Great Barrier Reef are completed. New Caledonian benthic species currently recorded from outside the area are known mainly from eastern Australia, Fiji, Hawaii, Kiribati, Micronesia, the Solomon Islands, Vietnam, Tonga and Western Samoa.

There are currently 58 families, 122 genera and 199 species of amphipods known from New Caledonian waters. These include 88 shallow water benthic species, 25 deep water benthic or demersal species and 86 pelagic species.

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List of Shallow and deep water Amphipoda of New Caledonia

*Species recorded from more than 100 m depth.

Following the name of each species (except "pelagic" amphipods) is the locality of the first description.

AMARYLLIDIDAE Lowry & Stoddart, 2002 (2 species)

Amaryllis sp.

**Bathyamaryllis ouvea* Lowry & Stoddart, 1994 [south of Île des Pins, New Caledonia, 22°47.30'S 167°14.30'E, 450 m]

AMPELISCIDAE Krøyer, 1842 (1 species)

Ampelisca ?australis Haswell, 1880 (Ledoyer, 1984) [Port Jackson, Australia]

AMPITHOIDAE Stebbing, 1899 (10 species)

Ampithoe maxillissius Ledoyer, 1984 [Recif d'Abore, New Caledonia]

Ampithoe ramondi Audouin, 1826 (Ledoyer, 1984) [Mediterranean Sea]

Cymadusa filosa Savigny, 1816 (Ledoyer, 1984) [Cargliari, Sardinia]

Cymadusa grossimana Ledoyer, 1984 [I'îlot Maître, New Caledonia]

Cymadusa ?imbroglio Rabindranath, 1972 (Ledoyer, 1984) [Manoli Island, Gulf of Mannar, India]

Cymadusa setosa (Haswell, 1879) (Ledoyer, 1984) [Botany Bay, Australia]

Cymadusa vadosa Imbach, 1967 (Ledoyer, 1984) [Bay of Nha-Trang, Vietnam]

Exampithoe (Exampithoe) gracilipes Ledoyer, 1984 [I'île aux Canards, New Caledonia]

Exampithoe (Melanesius) cooki Ledoyer, 1984 [New Caledonia]

Paradusa pilipes Ledoyer, 1984 [I'îlot Mba, New Caledonia]

AORIDAE Stebbing, 1899 (14 species)

Aora aoraformis (Ledoyer, 1984) (Myers, 1998) [New Caledonia]

Aora spinimerus (Ledoyer, 1984) (Myers, 1998) [I'îlot Maître, New Caledonia]

Bemlos aequimanus Schellenberg, 1938 (Myers, 1998) [Abemama Atoll, Kiribati]

Bemlos saloteae (Myers, 1985) (Myers, 1998) [Pangaimotu Island, Tongatapu, Tonga]

Bemlos tui (Myers, 1985) (Myers, 1998) [Matautu, Upolu Island, Western Samoa]

Bemlos waipio (J.L. Barnard, 1970) (Myers, 1998) [Barbers Point, Oahu, Hawaiian Islands]

Globosolembos clavicornis Myers, 1998 (Grand Recif Mbere, Southeast Lagoon, New Caledonia)

Globosolembos excavatus (Myers, 1975) (Ledoyer, 1984 as *Lembos processifer*) (Myers, 1998) [Watamu Bay, Kenya]

Globosolembos forgesi Myers, 1998 [Off Recif To, Passe de Boulari, New Caledonia]

Globosolembos lunatus Myers, 1988 (Myers, 1998) [Westernport, Victoria, Australia]

Grandidierella bispinosa Schellenberg, 1938 (Ledoyer, 1984) [Ralum, Bismarck Archipelago, New Guinea]

Grandidierella kanakensis Myers, 1998 [I'îlot Maître, New Caledonia]

Protolembos crouyensis Myers, 1998 [midway between Îlot des Goelands and Recif d'Abore, New Caledonia]

Xenocheira sp. (Myers, 1998)

ARISTIIDAE Lowry & Stoddart, 1997 (2 species)

**Aristias thio* Lowry & Stoddart, 1994 [east of Thio, New Caledonia, 23°09.71'S 166°22.7'E, 1807 m]

**Aristias uokona* Lowry & Stoddart, 1994 [south of Île des Pins, New Caledonia, 21°26'S 167°10.27'E, 675 m]

ATYLIDAE Lilljeborg, 1865 (1 species)

Atylus ?japonicus Nagata, 1961 (Ledoyer, 1979, 1984) [Japan]

BRACHYSCELIDAE Stephensen, 1923 (3 species)

Brachyscelus crusculum Bate, 1861 (Répelin, 1978)

Brachyscelus macrocephalus Stephensen, 1925 (Répelin, 1978)

Brachyscelus rapax (Claus, 1879) (Répelin, 1978)

CALLIOPIIDAE Sars, 1895 (2 species)
Oradarea dawa Lowry & Myers, 2003 [I'îlot Maître, New Caledonia]
Stenopleura atlantica Stebbing, 1888 (Répelin, 1978)
CAPRELLIDAE Leach, 1814 (9 species)
Caprella scaura Templeton, 1836 (Laubitz, 1991) [Rio de Janeiro, Brazil]
Metaprotella sandalensis Mayer, 1898 [Lifou, Loyalty Islands]
**Metaproto ?novaehollandiae* (Haswell, 1880) (Laubitz, 1991) [Port Jackson, Australia]
**Monoliropus* sp. (Laubitz, 1991)
**Othoprotella mayeri* K.H. Barnard, 1916 (Laubitz, 1991) [Glendower Beacon, near Port Alfred, South Africa]
**Paedaridium miserum* Mayer, 1903 (Laubitz, 1991) [Banda Sea, eastern Indonesia]
Paradeutella laevis Mayer, 1903 (Laubitz, 1991) [Singapore, intertidal]
Paradeutella spinosa Mayer, 1903 (Laubitz, 1991) [Singapore, intertidal]
**Protoplesius enigma* Mayer, 1903 (Laubitz, 1991) [Banda Sea, eastern Indonesia, 2081 m]
COLOMASTIGIDAE Stebbing, 1899 (1 species)
Colomastix sp. (Ledoyer, 1984)
CYPHOCARIDIDAE Lowry & Stoddart, 1997 (5 species)
Cyphocaris bellona Lowry & Stoddart, 1994 [west of middle Bellona, Chesterfield Islands, 21°20.40'S 158°02.20'E, 1000 m]
Cyphocaris anonyx Boeck, 1871 (Répelin, 1978)
Cyphocaris challengeri Stebbing, 1888 (Répelin, 1978)
Cyphocaris faurei K.H. Barnard, 1916 (Répelin, 1978)
Cyphocaris richardi Chevreux, 1905 (Répelin, 1978)
Procyphocaris indurata K.H. Barnard, 1925 (off South Africa)
CYPROIDEIDAE J.L. Barnard, 1974 (1 species)
Cyproidea serratipalma Schellenberg, 1938 (Ledoyer, 1984) [Tapeteuea Island, Kiribati]
CYSTISOMATIDAE Willemoes-Suhn, 1875 (2 species)
Cystisoma fabricii Stebbing, 1888 (Répelin, 1978)
Cystisoma pellucida (Willemose-Suhm,1874) (Répelin, 1978)
DEXAMINIDAE Leach, 1814 (7 species)
Dexaminnoculus grobbeni (Spandl, 1923) [Gulf of Suez, Red Sea (28°40'N 32°57'E)]
Paradexamine excavata Ledoyer, 1984 [I'îlot Maître, New Caledonia]
Paradexamine ?frinsdorfi Sheard, 1938 (Ledoyer, 1984) [South Australia]
Paradexamine ?marlie J.L. Barnard, 1972 (Ledoyer, 1984) [Jervois Bay, Cockburn Sound, Western Australia]
Paradexamine micronesica Ledoyer, 1979 (Ledoyer, 1984) [Grand Récif de Tulear, Madagascar]
Paradexamine ?windarra J.L. Barnard, 1972 (Ledoyer, 1984) [Cheyne Beach, east of Albany, Western Australia]
Sebadexius neocaledoniensis Ledoyer, 1984 [I'île aux Canards, New Caledonia]
EPIMERIIDAE Boeck, 1871 (1 species)
Epimeria sp.
EURYTHENEIDAE Stoddart &Lowry, 2004 (2 species)
**Eurythenes gryllus* (Lichtenstein in Mandt, 1822) [Greenland Sea]
**Eurythenes thurstoni* Stoddart & Lowry, 2004 [off Twofold Bay, New South Wales, Australia]
EUSIRIDAE Stebbing, 1888 (1 species)
Eusiropsis riisei Stebbing, 1897 (Répelin, 1978)
HYALIDAE Bulycheva, 1957 (1 species)
Hyale bidentata Ledoyer, 1984 [New Caledonia]
ICILIIDAE Dana, 1852 (1 species)
Icilius caledoniana Watson, Lowry & Steinberg, 2004 [I'îlot Maître, New Caledonia]
IPHIMEDIIDAE Boeck, 1871 (3 species)
Coboldus mberensis Lowry & Myers, 2003 (Grand Récif Mbere, Southeast Lagoon, New Caledonia)
Iphimedia caledoniana Lowry & Myers, 2003 [I'îlot Maître, New Caledonia]
Iphimedia maitrensis Lowry & Myers, 2003 [I'îlot Maître, New Caledonia]

ISCHYROCERIDAE Stebbing, 1899 (1 species)

Ericthonius pugnax (Dana, 1852) [Sulu Sea, Indonesia]

***KERGUELENIA*-GROUP (LYSIANASSOIDEA)** (3 species)

**Clepidecrella tropicalis* Lowry & Stoddart, 1994 [south of Île des Pins, New Caledonia, 22°47.30'S 167°14.30'E, 450 m]

**Kerguelenia koutoumo* Lowry & Stoddart, 1994 [south of Île des Pins, New Caledonia, 22°52.70'S 167°23'E, 616 m]

**Kerguelenia lifou* Lowry & Stoddart, 1994 [south of Point Lefèvre, Lifou, Loyalty Island, 21°01.53'S 166°57.41'E, 2040 m]

LANCEOLIDAE Bovallius, 1888 (3 species)

Lanceola loveni loveni Bovallius, 1885 (Répelin, 1978)

Lanceola pacifica Stebbing, 1888 (Répelin, 1978)

Lanceola sayana Bovallius, 1885 (Répelin, 1978)

***LEPIDEPECRELLA*-GROUP (LYSIANASSOIDEA)** (1 species)

**Lepidepecreella sarcelle* Lowry & Stoddart, 1994 [north of Île des Pins, New Caledonia, 22°8.65'S 167°23.30'E, 860 m]

LESTRIGONIDAE Zeidler, 2004 (3 species)

Hyperioides longipes Chevreux, 1900 (Répelin, 1978)

Lestrigonus schizogeneios (Stebbing, 1888) (Répelin, 1978)

Phronimopsis spinifera Claus, 1879 (Répelin, 1978)

LEUCOTHOIDAE Dana, 1852 (4 species)

Leucothoe assimilis J.L. Barnard, 1974 (Ledoyer, 1984) [Westernport, Victoria, Australia]

Leucothoe commensalis Haswell, 1879 (Ledoyer, 1984) [Port Jackson, New South Wales, Australia]

Leucothoe squalidens Ledoyer, 1984 [I'îlot Maître, New Caledonia]

Leucothoides torrida J.L. Barnard, 1974 (Ledoyer, 1984) [Ella Islet, Ifaluk, Micronesia]

LYCAEIDAE Claus, 1879 (4 species)

Lycaea pachypoda (Claus, 1879) (Répelin, 1978)

Lycaea pulex Marion, 1874 (Répelin, 1978)

Lycaea serrata Claus, 1879 (Répelin, 1978)

Simorhynchotus antennarius (Claus, 1871) (Répelin, 1978)

LYCAEOPSIDAE Chevreux, 1913 (1 species)

Lycaeopsis themistoides Claus, 1879 (Répelin, 1978)

LYSIANASSIDAE Dana, 1849 (10 species)

Azotostoma sp.

**Hippomedon vao* Lowry & Stoddart, 1994 [south of Île des Pins, New Caledonia, 22°05.27'S 167°44.95'E, 700 m]

**Onesimoides abyssalis* Lowry & Stoddart, 1994 [northeast of Lifou, Loyalty Island, 20°34.54'S 167°24.68'E, 2040 m]

**Orchomenella distincta* Birstein & Vinogradov, 1960 (south of Palau Islands, North Pacific Ocean, 05°02'N 135°33'E, 4732 m)

Parambaasia acuticaudata Ledoyer, 1984 [I'îlot Maître, New Caledonia]

Parawaldeckia ?lowryi Myers, 1985 [Momi Bay, Viti Levu, Fiji]

Shoemakerella sp.

**Socarnes tienda* Lowry & Stoddart, 1994 [east of Tiendi reef, Grand Récif Sud, New Caledonia, 22°15.50'S 167°08.30'E, 365 m]

**Tryphosella ama* Lowry & Stoddart, 1994 [south of Île des Pins, New Caledonia, 22°52.70'S 167°23'E, 616 m]

**Tryphosella oupi* Lowry & Stoddart, 1994 [north of Île des Pins, New Caledonia, 22°8.65'S 167°23.30'E, 860 m]

Waldeckia sp. Lowry & Stoddart, 1994

MAXILLIPIIDAE Ledoyer, 1973 (1 species)

Maxillipides laticarpus Ledoyer, 1984 [New Caledonia]

MELITIDAE Bousfield, 1973 (12 species)

Cheirocratus spinibasus Ledoyer, 1984 [New Caledonia]

Dulichiella pacifica Lowry & Springthorpe, 2005 [between Tandai Point and Koilo

Point, Guadalcanal, Solomon Islands (9°22.5'S 159° 52.2'E)]

Elasmopus molakai J.L. Barnard, 1970 (Ledoyer, 1984) [Barbers Point, Oahu, Hawaiian Islands]

Elasmopus pseudaffinis Schellenberg, 1938 (Ledoyer, 1984) [Arunuka Island, Kiribati]

Eriopisella upolu J.L. Barnard, 1970 (Ledoyer, 1984) [Kaneohe Bay, Oahu, Hawaiian Islands]

Maera brevicaudata Ledoyer, 1984 [New Caledonia]

Mallacoota schellenbergi Ledoyer, 1984 [I'îlot Maître, New Caledonia]

Mallacoota? subcarinata (Haswell, 1879) (Ledoyer, 1984) [Port Jackson, New South Wales, 33°51'S 151°16'E and Port Stephens, New South Wales, 32°42'S 152°06'E]

Melita myersi Karaman, 1987 [Suva and Lucala Island, Fiji]

Parelasmopus mallacootaformis Ledoyer, 1984 [New Caledonia]

Quadrimaera pacifica (Schellenberg, 1938) (Ledoyer, 1984) [Makin Island, Kiribati]

Quadrimaera serrata (Schellenberg, 1938) (Ledoyer, 1984) [Abemama Atoll, Kiribati]

MELPHIDIPPIDAE Stebbing, 1899 (1 species)

Melphisana madagascarensis Ledoyer, 1984 [I'îlot Maître, New Caledonia]

OEDICEROTIDAE Liljeborg, 1895 (2 species)

Aborolobatea paracheliformis Ledoyer, 1984 [Recif d'Abore, New Caledonia]

Monoculodes sp. (Ledoyer, 1984)

OXYCEPHALIDAE Bate, 1861 (13 species)

Calamorhynchus pellucidus Streets 1878 (Répelin, 1978)

Cranocephalus scleroticus (Streets, 1878) (Répelin, 1978)

Glossocephalus milneedwardsi Bovallius, 1887 (Répelin, 1978)

Leptocotis tenuirostris (Claus, 1871) (Répelin, 1978)

Oxycephalus clausi Bovallius, 1887 (Répelin, 1978)

Oxycephalus latirostris Clans, 1889 (Répelin, 1978)

Oxycephalus piscator Milne Edwards, 1830 (Répelin, 1978)

Rhabdosoma armatum (Milne Edwards, 1840) (Répelin, 1978)

Rhabdosoma brevicaudatum Stebbing, 1888 (Répelin, 1978)

Rhabdosoma whitei Bate, 1862 (Répelin, 1978)

Streetsia challengeri Stebbing, 1888 (Répelin, 1978)

Streetsia porcella (Claus, 1879) (Répelin, 1978)

Streetsia steenstrupi (Bovallius, 1887) (Répelin, 1978)

***PACHYNUS*-GROUP (LYSIANASSOIDEA)** (2 species)

**Coriolis novacaleonia* Lowry & Stoddart, 1994 [west of Lifou, Loyalty Islands, 20°48.12'S 166°14.53'E, 1630 m]

**Figorella tasmanica* Lowry, 1984 [east of Port Kembla, New South Wales, Australia]

PARACALLIOPIIDAE Barnard & Karaman, 1982 (1 species)

Paracalliope novaecaledoniae Ruffo & Paiotta, 1972 [Hienghène River, New Caledonia]

PARAPHRONIMIDAE Bovallius, 1887 (2 species)

Paraphronima crassipes Claus, 1879 (Répelin, 1978)

Paraphronima gracilis Claus, 1879 (Répelin, 1978)

PARASCELIDAE Bovallius, 1887 (3 species)

Parascelus edwardsi Claus, 1879 (Répelin, 1978)

Parascelus typhoides Claus, 1879 (Répelin, 1978)

Thyropus sphaeroma (Claus, 1879) (Répelin, 1978)

PARDALISCIDAE Boeck, 1871 (1 species)

**Halice macronyx* (Stebbing, 1888) (Répelin, 1978) [South Pacific, 38°S 94°W, 2743 m]

PHLIANTIDAE Stebbing, 1899 (1 species)

Iphiplateia whiteleggei Stebbing, 1899 [Watsons Bay, Port Jackson, New South Wales, Australia]

PHOTIDAE Boeck, 1871 (1 species)

Photis dolichmmata Stebbing, 1910 [off Manning River; off Port Hacking; Botany Bay; off Coogee; off Wollongong; off Port Kembla; off Watta Molla, New South Wales, Australia]

PHOXOCEPHALIDAE Sars, 1891 (1 species)

Protophoxus australis K.H. Barnard, 1930 [off North Cape, North Island, New Zealand]

PHRONIMIDAE Rafinesque, 1815 (9 species)
Phronima atlantica Guérin Méneville, 1836 (Répelin, 1978)
Phronima bucephala Giles, 1887 (Répelin, 1978)
Phronima colletti Bovallius, 1887 (Répelin, 1978)
Phronima curvipes Vosseler, 1901 (Répelin, 1978)
Phronima pacifica Streets, 1877 (Répelin, 1978)
Phronima sedentaria (Forskål, 1775) (Répelin, 1978)
Phronima solitaria Guérin-Méneville, 1836 (Répelin, 1978)
Phronima stebbingi Vosseler, 1901 (Répelin, 1978)
Phronimiella elongata (Claus, 1862) (Répelin, 1978)
PHROSINIDAE Dana, 1853 (3 species)
Anchylomera blossevillei Milne Edwards, 1830 (Répelin, 1978)
Phrosina semilunata Risso, 1822 (Répelin, 1978)
Primno macropa Guérin-Méneville, 1836 (Répelin, 1978)
PLATYSCELIDAE Bate, 1862 (8 species)
Amphithyrus bispinosus Claus, 1879 (Répelin, 1978)
Amphithyrus glaber Spandl, 1924 (Répelin, 1978)
Paratyphis maculatus Claus, 1879 (Répelin, 1978)
Platyscelus armatus (Claus, 1879) (Répelin, 1978)
Platyscelus crustulatus (Claus, 1879) (Répelin, 1978)
Platyscelus ovoides (Risso, 1816) (Répelin, 1978)
Platyscelus serratulus Stebbing, 1888 (Répelin, 1978)
Tetrathyrus forcipatus Claus 1879 (Répelin, 1978)
PODOCERIDAE Leach, 1814 (1 species)
Podocerus sp. (Ledoyer, 1984)
PONTOGENEIIDAE Stebbing, 1906 (2 species)
Tethygeneia cavitelson Ledoyer, 1984 [I'îlot Yé, New Caledonia]
Tethygeneia pacifica (Schellenberg, 1938) (Ledoyer, 1984) [Honolulu, Hawaii]
PRONOIDAE Claus, 1879 (5 species)
Eupronoe maculata Claus, 1879 (Répelin, 1978)
Eupronoe minuta Claus, 1879(Répelin, 1978)
Paralycaea gracilis Claus, 1879 (Répelin, 1978)
Parapronoe crustulum Claus, 1879(Répelin, 1978)
Parapronoe parva Claus, 1879(Répelin, 1978)
SCINIDAE Stebbing, 1888 (12 species)
*Scina borealis (G.*0. Sars, 1882) (Répelin, 1978)
Scina crassicornis (Fabricius, 1775) (Répelin, 1978)
Scina incerta Chevreux, 1900 (Répelin, 1978)
Scina lamperti Vosseler, 1901 (Répelin, 1978)
Scina langhansi Wagler, 1926 (Répelin, 1978)
Scina marginata (Bovallius, 1885) (Répelin, 1978)
Scina oedicarpus Stebbing, 1895 (Répelin, 1978)
Scina spinosa Vosseler, l901 (Répelin, 1978)
Scina tullbergi (Bovallius, 1885) (Répelin, 1978)
Scina vosseleri Tattersall, 1906 (Répelin, 1978)
Scina uncipes Author, date (Répelin, 1978)
Scina wolterecki Wagler, 1926 (Répelin, 1978)
STEGOCEPHALIDAE Dana, 1852 (1 species)
Bathystegocephalus globulus (Walker, 1909) (Répelin, 1978)
SYNOPIIDAE Dana, 1852 (2 species)
Synopia ultramarina Dana, 1853 (Répelin, 1978)
Telosynopia variabilis (Spandl, 1923) (Ledoyer, 1984) [Red Sea]
TALITRIDAE Raphinesque, 1815 (5 species)
Chiltonorchestia pusilla (Chevreux, 1915) [New Caledonia]

Chiltonorchestia sarasini (Chevreux, 1915) [Forest of Mount Ignambi, 700-1000 m altitude, New Caledonia]

Chiltonorchestia starmuehlneri (Ruffo & Paiotta, 1972) [Mount Pouèdihi, New Caledonia]

Floresorchestia anomala (Chevreux, 1901) (Ledoyer, 1984) [Île Ronde, Seychelles, Indian Ocean]

"*Talorchestia*" *antennulata* Chevreux, 1915 [New Caledonia]

TRISCHIZOSTOMATIDAE Liljeborg, 1865 (1 species)

Trischizostoma richeri Lowry & Stoddart, 1994 [Loyalty Islands Basin, 21°12'S 166°59.85'E, 2205 m]

UNCIOLIDAE Myers & Lowry, 2003 (1 species)

Orstomia kanakia Myers, 1998 [Grand Récif Mbere, Southeast Lagoon, New Caledonia]

URISTIDAE Hurley, 1963 (4 species)

Ichnopus annasona Lowry & Stoddart, 1992 [Elizabeth Reef, Tasman Sea]

Ichnopus malpatun Lowry & Stoddart, 1992 [Astrolabe Bay, Papua New Guinea]

Nagada sp.

**Stephonyx* sp.

UROTHOIDAE Bousfield, 1978 (1 species)

Urothoides pseudodernae Ledoyer, 1984 [I'îlot Maître, New Caledonia]

VIBILIIDAE Dana, 1852 (5 species)

Vibilia armata Bovallius, 1887 (Répelin, 1978)

Vibilia australis Stebbing, 1888 (Répelin, 1978)

Vibilia cultripes Vosseler, 1901 (Répelin, 1978)

Vibilia propinqua Stebbing, 1888 (Répelin, 1978)

Vibilia stebbingi Behning & Woltereck, 1912 (Répelin, 1978)

WANDINIDAE Lowry & Stoddart, 1990 (1 species)

Wandin griffini Lowry & Stoddart, 1990 [Lizard Island, Great barrier Reef, Australia]

The Cirripedia of New Caledonia

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The Indo-Pacific deep-sea benthos was investigated by major expeditions such as those of «Challenger» (1873-1876), «Investigator» (1884-1887), «Valdiva» (1898-1899), «Siboga» (1899-1900), «Albatross» (1907-1910) and «Galathea» (1950-52). However, none of these expeditions collected in the waters of New Caledonia and its surrounding areas. The cirripede fauna of the region was first documented through the brief report of Fischer (1884), who described the shallow water barnacles of New Caledonia. Fischer briefly listed 15 species from specimens deposited in the Musée de Bordeaux by the missionaries Montrouzier and Lambert. From that time, there was no documentation of the fauna until the latter half of the 20th century, when a rigorous collection and taxonomic program was conducted in the region supported through IRD (ORSTOM) and the Muséum national d'Histoire naturelle, Paris. Since 1978, numerous barnacle specimens have been collected in the deep waters off Vanuatu (MUSORSTOM 8 1994), New Caledonia, the Chesterfield and Loyalty Islands (BIOCAL 1985, MUSORSTOM 4 1985, LAGON 1985, MUSORSTOM 5 1986, CHALCAL 2 1986, SMIB 2 1986, SMIB 3 1987, CORAIL 2 1988, MUSORSTOM 6 1989, VAUBAN 1989, ALIS 1989, SMIB 6 1990, BERYX 2 1992, BATHUS 2 1993, SMIB 8 1993, HALIPRO 2 1996), the Wallace and Futuna Islands, Combe, Field, Tuscarora and Waterwich Banks (MUSORSTOM 7 1992), the Norfolk Ridge (SMIB 4 1989, SMIB 5 1989, BATHUS 3 1993, BATHUS 4 1994) and the Matthew and Hunter Islands (VOLSMAR 1989).

Examination of these collections has yielded an exceptional diversity of thoracican cirripedes. Buckeridge (1994, 1997) provided a comprehensive account of the deep-sea Verrucomorpha (Cirripedia) from collections made by several French cruises in the New Caledonian area and the Wallace and Futuna Islands. Seventeen species were described, including 10 new species from the New Caledonian area, of which eight are endemic. Two new coral barnacles (Balanomorpha: Pyrogomatidae) were described from the shallow waters of New Caledonia, *Parahoekia aster* Ross and Newman (1995) and *Cionophora guillaumae* Achituv (in Achituv and Newman, 2002), respectively. The living fossil, *Waikalasma boucheti* (Balanomorpha: Pachylasmatidae), was described by Buckeridge (1996) from bathyal waters of Vanuatu and a new, relictual chionelasmatine, *Chionelasmus crosnieri* (Balanomorpha: Chionolasmatidae) from the Norfolk Ridge (Buckeridge 1998).

More recently, Jones (2000) reviewed the balanomorph superfamilies Chionelasmatoidea and Pachylasmatoidea, describing 23 new taxa from material collected from New Caledonia, Vanuatu and the Wallis and Futuna Islands. Of the 21 species reported, 18 were new to science, of which 14 were considered endemic to the Vanuatu/New Caledonian region, with the remaining three occurring in a broader area that included the Futuna and Wallis Islands region. In addition, four new genera and one new subfamily were described. An exceptional diversity of species in the Pachylasmatidae (Pachylasmatinae and Hexelasmatinae) was recorded. The number of new pachylasmatines represented 46% of the known species and that of the new hexelasmatines 40%, indicating the richness of these waters.

With the further addition of barnacle species collected by these French expeditions (being described by Jones, *in prep.)* the New Caledonian cirripede fauna currently consists of 166 species in 53 genera, 19 families, five suborders, three orders (Lepadiformes, Scalpelliformes, Sessilia) and one superorder (Thoracica). Twenty-seven species (16%) are recorded from shallow water (0-100 m) and 139 (84%) from deep water (>100 m). The most diverse fauna occurs in New Caledonian waters (113 species), followed by Vanuatu (54), the Loyalty Islands (47) and the Norfolk Ridge (43). Lesser numbers are recorded at the Loyalty Ridge and the Chesterfield Islands (both with 16 species).

The cirripede fauna demonstrates a high level of endemism, with 91 species (55%) endemic to the New Caledonia area (10 shallow: 81 deep water species). Of the remainder, 12% (20 species) are widely distributed in the Indo-west Pacific faunal province (i.e. from east African shores through to the Hawaiian Islands, Pacific Ocean, and from Australia through the South China Sea to Japan). Eighteen species (11%) have cosmopolitan distributions and 11% (18 species) occur in the Pacific Ocean. Seventeen species (10%) occur in the Indo-Australian sub-province of the Indo-west Pacific region (i.e. the area defined by the Indo-Malayan Archipelago, Australia and New Guinea, to Japan) and 1% (2 species) in eastern Australia and the Western Pacific Ocean. The occurrence of three relictual species, the chionelasmatines *Chionelasmus crosnieri* and *C. darwini*, and the eolasmatine, *Waikalasma boucheti*, in the waters of the New Caledonian region supports the hypothesis that the south-west Pacific is a relictual area (Newman, 1991).

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List of Shallow and deep water Cirripedia of New Caledonia

Following the name of each species, the locality of the first description

Subclass **CIRRIPEDIA Burmeister, 1834**
Superorder **THORACICA Darwin, 1854**
Order **LEPADIFORMES Buckeridge and Newman, 2006**
Suborder **Heteralepdomorpha Newman, 1987**

HETERALEPADIDAE Nilsson-Cantell, 1921

Heteralepas sp. nov. 1 (New Caledonia)
Heteralepas smilium Ren, 1983 (E China Sea)
Heteralepas utinomii Newman, 1970 (Tasmania)
Paralepas nodulosa (Broch, 1922) (Philippine Archipelago)
Paralepas dannevigi (Broch, 1922) (SE Australia)
Paralepas morula (Hoek, 1907) (Indonesia)

MICROLEPADIDAE Zevina, 1980

Microlepas echinotrichae Grygier and Newman, 1991 (New Caledonia)

Suborder **Lepadomorpha Gruvel, 1905**

OXYNASPIDIDAE Gruvel, 1905

Oxynaspis sp. nov. 1 (New Caledonia)
Oxynaspis sp. nov. 2 (New Caledonia)
Oxynaspis sp. nov. 3 (Norfolk Ridge)
Oxynaspis sp. nov. 4 (New Caledonia)
Oxynaspis sp. nov. 5 (Loyalty Ridge)
Oxynaspis sp. nov. 6 (Norfolk Ridge)
Oxynaspis sp. nov. 7 (Loyalty Islands)
Oxynaspis celata Darwin, 1851 (Madeira)
Oxynaspis connectens Broch, 1931 (Kei Is)

POECILASMATIDAE Annandale, 1909

Glyptelasma annandalei Pilsbry, 1907 (North Carolina)
Arcoscalpellum michelottianum (Seguenza, 1876) (unknown)
Glyptelasma gigas (Annandale) (Bali Straits)
Megalasma elegans Zullo and Newman, 1964 (SE Pacific Ocean)
Megalasma minus Annandale, 1906 (Andaman Sea)
Megalasma striatum Hoek, 1883 (Philippine Archipelago)
Temnaspis amygdalum (Aurivillius, 1894) (Java Sea)
Octolasmis sp. nov. 1 (New Caledonia)
Octolasmis hawaiensis Pilsbry, 1907 (Hawaiian Islands)
Octolasmis weberi (Hoek, 1907) (Banda Sea)

LEPADIDAE Darwin, 1851

Lepas (Anatifa) anatifera Linnaeus, 1758 (unknown)
Lepas (Anatifa) ?anserifera Linnaeus, 1767 (Loyalty Islands)
Lepas (Anatifa) hilli (Leach, 1818) (S Atlantic)
Lepas (Anatifa) pectinata Spengler, 1793 (S Atlantic)

Order **SCALPELLIFORMES Buckeridge and Newman 2006**

Suborder **Scalpellomorpha Newman, 1987**

CALANTICIDAE Zevina, 1978

Scillaelepas sp. nov. 2 (Loyalty Islands)
Scillaelepas sp. nov. 3 (New Caledonia)
Scillaelepas sp. nov. 4 (Loyalty Islands)
Calantica sp. nov. B (New Caledonia)
Calantica sp. nov. 1 (New Caledonia)
Calantica sp. nov. 2 (New Caledonia)
Calantica studeri (Weltner, 1922) (NW Australia)
Crosnieriella sp. nov. (Chesterfield Islands)
Smilium vaubanianum Rosell, 1981 (Philippine Archipelago)
Smilium sp. nov. 2 (New Caledonia)
Smilium sp. nov. 3 (New Caledonia)
Smilium sp. nov. 4 (Loyalty Islands)
Smilium sp. nov. 6 (Loyalty Islands)
Smilium sp. nov. 7 (New Caledonia)
Smilium sp. nov. 8 (Norfolk Ridge)
Smilium sp. nov. 9 (Vanuatu)
Smilium acutum Hoek, 1883 (Azores and N of New Zealand)

LITHOTRYIDAE Gruvel, 1905

Lithotrya valentiana (Gray, 1825: 102) (unknown)

POLLICIPEDIDAE Gruvel, 1905

Capitulum mitella (Linnaeus, 1758: 668) (unknown)

SCALPELLIDAE Pilsbry, 1907

Scalpellum sp. nov. 1 (Vanuatu)
Alcockianum alcockianum (Annandale, 1905) (Andaman Sea)
Annandaleum lambda Annandale, 1910: 115 (Andaman Sea)
Gymnoscalpellum sp. nov. 1 (Loyalty Islands)
Neoscalpellum sp. nov. 1 (New Caledonia)
Neoscalpellum sp. nov. 2 (New Caledonia)
Neoscalpellum debile (Aurivillius, 1898) (E Atlantic)
Amigdoscalpellum sp. nov. 1 (New Caledonia)
Amigdoscalpellum sp. nov. 2 (Vanuatu)
Amigdoscalpellum sp. nov. 3 (Loyalty Islands)
Amigdoscalpellum sp. nov. 4 (Loyalty Islands)
Amigdoscalpellum sp. nov. 5 (Loyalty Islands)
Amigdoscalpellum praeceps (Hoek, 1907) (Moluccas)
Amigdoscalpellum vitreum (Hoek, 1883) (Japan)
Anguloscalpellum sp. 1 (New Caledonia)
Anguloscalpellum microceros Macdonald, 1929 (Caribbean Sea)
Anguloscalpellum pedunculatum (Hoek, 1883) (SW Pacific Ocean)
Arcoscalpellum sp. nov. A (Loyalty Islands)
Arcoscalpellum sp. nov. B (New Caledonia)
Arcoscalpellum sp. nov. 1 (Loyalty Islands)
Arcoscalpellum sp. nov. 2 (New Caledonia)
Arcoscalpellum sp. nov. 3 (New Caledonia)
Arcoscalpellum sp. nov. 4 (New Caledonia)
Arcoscalpellum sp. nov. 5 (Loyalty Islands)
Arcoscalpellum ?galapaganum Pilsbry, 1907 (Galapagos Islands)
Arcoscalpellum ?discolor (Hoek, 1907) (Indonesia)
Arcoscalpellum mendeleevi Zevina, 1981 (SE Indian Ocean)
Arcoscalpellum michelottianum (Seguenza, 1876) (unknown)
Arcoscalpellum moluccanum (Hoek, 1883) (Banda Sea)
Arcoscalpellum regium (Thomson, 1877) (Atlantic Ocean)
Catherinum ?perlongum (Pilsbry, 1907) (California)
Pilsbryiscalpellum sp. nov. 1 (New Caledonia)
Planoscalpellum sp. nov. 1 (Vanuatu)
Planoscalpellum sp. nov. 2 (New Caledonia)
Trianguloscalpellum sp. nov. 2 (New Caledonia)
Trianguloscalpellum balanoides (Hoek, 1883) (Banda Sea)
Trianguloscalpellum rubrum (Hoek, 1883) (Philippine Archipelago)
Verum sp. nov. 1 (New Caledonia)
Verum sp. nov. 2 (New Caledonia)
Verum sp. nov. 3 (New Caledonia)
Verum sp. nov. 4 (New Caledonia)
Verum sp. nov. 5 (New Caledonia)
Verum sp. nov. 6 (Vanuatu)
Verum sp. nov. 7 (Vanuatu)
Verum sp. nov. 8 (Vanuatu)
Verum virgatum (Hoek, 1907) (Indonesia)

Order **SESSILIA Lamarck, 1818**
Suborder **Verrucomorpha Pilsbry, 1916**

VERRUCIDAE Darwin, 1854

Altiverruca cristallina (Gruvel, 1907) (Andaman Islands)
Altiverruca galapagosa Zevina, 1987 (Galapagos Islands)
Altiverruca jonesae Buckeridge, 1997 (Vanuatu)

Altiverruca laeviscuta Buckeridge, 1994: 96 (New Caledonia)
Altiverruca navicula (Hoek, 1913) (Indonesia and Moluccas)
Altiverruca nitida (Hoek, 1883) (Moluccas)
Brochiverruca crosnieri Buckeridge, 1997 (Loyalty Ridge)
Brochiverruca polystriata Buckeridge, 1994 (New Caledonia)
Cameraverruca nodiscuta Buckeridge, 1994 (Chesterfield Islands)
Metaverruca defayae Buckeridge, 1994 (S of Vanuatu)
Metaverruca maclaughlinae Buckeridge, 1997 (Vanuatu)
Metaverruca norfolkensis Buckeridge, 1994 (New Caledonia)
Metaverruca pacifica Buckeridge, 1994 (Chesterfield Islands)
Metaverruca plicata Buckeridge, 1994 (Loyalty Islands)
Metaverruca recta (Aurivillius, 1898) (Azores)
Rostratoverruca intexta (Pilsbry, 1912) (Philippine Archipelago)
Rostratoverruca kruegeri (Broch, 1922) (Philippine Archipelago)

Suborder **Balanomorpha Pilsbry, 1916**
Superfamily **Chionolasmatoidea Buckeridge, 1983**

CHIONOLASMATIDAE Buckeridge, 1983
Chionelasmus crosnieri Buckeridge, 1998 (Norfolk Ridge)
Chionelasmus darwini (Pilsbry, 1907) (Hawaiian Islands)
PACHYLASMATIDAE Utinomi, 1968 (emend. Jones, 2000)
Waikalasma boucheti Buckeridge, 1996 (Vanuatu)
Eutomolasma maclaughlinae Jones, 2000 (New Caledonia)
Eutomolasma orbiculatum Jones, 2000 (Loyalty Islands)
Microlasma fragile Jones, 2000 (Loyalty Islands)
Pachylasma bacum Jones, 2000 (Vanuatu)
Pachylasma laeviscutum Jones, 2000 (Futuna Island)
Pachylasma ovatum Jones, 2000 (New Caledonia)
Eurylasma angustum Jones, 2000 (Loyalty Islands)
Eurylasma ferulum Jones, 2000 (Norfolk Ridge)
Eurylasma pyramidale Jones, 2000 (Norfolk Ridge)
Tetrapachylasma arcuatum Jones, 2000 (Loyalty Islands)
Metalasma crassum Jones, 2000 (Loyalty Islands)
Bathylasma alearum (Foster, 1978) (SE of New Zealand)
Hexelasma aureolum Jones, 2000 (Norfolk Ridge)
Hexelasma flavidum Jones, 2000 (New Caledonia)
Hexelasma foratum Jones, 2000 (Loyalty Islands)
Hexelasma globosum Jones, 2000 (New Caledonia
Hexelasma persicum Jones, 2000 (Loyalty Islands)
Hexelasma sandaracum Jones, 2000 (New Caledonia)
CHTHAMALIDAE Darwin, 1854
Chinochthamalus scutelliformis (Darwin, 1854) (?China Sea)
CHELONIBIIDAE Pilsbry, 1916
Chelonibia testudinaria (Linnaeus, 1758) (unknown)
PLATYLEPADIDAE Newman and Ross, 1976
Platylepas hexastylos (Fabricius, 1798) (unknown)
CORONULIDAE Leach, 1817
Coronula diadema (Linnaeus, 1767) (unknown)
TETRACLITIDAE Gruvel, 1903
Tetraclitella costata Darwin, 1854 (Philippine Archipelago)
Newmanella vitiata (Darwin, 1854) (unknown)
Tetraclita squamosa (Bruguière, 1789) (unknown)
ARCHAEOBALANIDAE Newman and Ross, 1976
Acasta sp. nov. 1 (New Caledonia)

Acasta sp. nov. 2 (New Caledonia)
Acasta sp. nov. 3 (New Caledonia)
Acasta sp. nov. 4 (Norfolk Ridge)
Acasta sp. nov. 5 (New Caledonia)
Acasta sp. nov. 6 (New Caledonia)
Acasta sp. nov. 7 (New Caledonia)
Striatobalanus amaryllis (Darwin, 1854) (unknown)
Striatobalanus tenuis (Hoek, 1883) (Philippine Archipelago)
Conopea cymbiformis (Darwin, 1854) (Madras)
Conopea ?pygmaea Broch, 1931 (Kei Islands)
Conopea sp. nov. 3 (Loyalty Islands)
Conopea sp. nov. 4 (New Caledonia)
Conopea sp. nov. 5 (Norfolk Ridge)
Conopea sp. nov. 6 (New Caledonia)
Solidobalanus (Solidobalanus) auricoma (Hoek, 1913) (Moluccas)
Solidobalanus (Solidobalanus) maldivensis (Borradaile, 1903) (E Indian Ocean)
Solidobalanus (Solidobalanus) pseudauricoma (Broch, 1931) (Philippine Archipelago and Japan)
Solidobalanus (Bathybalanus) sp. nov. (Loyalty Ridge)

PYRGOMATIDAE Gray, 1825

Cantellius iwayama (Hiro, 1938) (Palau Island)
Cionophora guillaumae Achituv, 2002 (Palau Islands)
Hiroa stubbingsi Ross and Newman, 1973: 153 (Truk Islands)
Parahoekia aster Ross and Newman, 1995 (New Caledonia)
Pyrogoma cancellata Leach, 1818 (?West Indies)

BALANIDAE Leach, 1817

Amphibalanus amphitrite amphitrite (Darwin, 1854) (S Africa)
Megabalanus ajax (Darwin, 1854) (Philippine Archipelago)

Carideans, stenopedideans and lobsters of the New Caledonian shallow waters

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The first report dealt with a collection of carideans and lobsters from the New Caledonia was by Borradaile in 1899, which reported 18 species. Since then, there were scattered reports on the shrimps and lobsters of the New Caledonia. Only after 1990 there have been active works on the New Caledonian shrimps and lobsters. For the shallow marine species, Bruce (1991), Short and Marquet (1998), and Li and Bruce (in press) reported extensively on the palaemonids, Hayashi (1995/6) on *Leptochela* (family Pasiphaeidae), and Okuno (1997) on *Cinetorhynchus* (family Rhychocinetidae) of the New Caledonia. A general account of the lobsters of the New Caledonia was given by Richer de Forges and Laboute (1995/6) while Holthuis (2002) revised those genera previously assigned to *Scyllarus* based on an extensive collection from the New Caledoina.

Now 154 species of carideans, 1 stenopodidean species and 17 species of lobsters are known from the shallow waters (less than 100m) of New Caledonia, with the family Palaemonidae being the most speciose (100 species). Considering the diversity of palaemonids in New Caledonia is comparable to those from the other parts of the Western Pacific such the Philippines and Japan (Chace and Bruce, 1993; Miyake, 1998) with a high diversity, the number of alpheid species (ie. 10) in New Caledonia should be severely underestimated as the ecology and diversity of alpheids in the shallow waters of the Western Pacific generally resemble those of palaemonids (see Chace and Bruce, 1993; Miyake, 1998). Furthermore, it is highly likely that some more species will be found in the families Hippolytidae, Crangonidae, Palaemonidae, Processidae, Rhychocinetidae and Stenopodidae from the shallow waters of New Caledonia. It may need to point out that some families, such as Enoplometopidae, Ogyrididae as well as some families of the superfamily Bresilioidea are still await to be discovered in the New Caledonian shallow waters.

At present, 23 species of carideans and 2 species of lobsters were originally described from the shallow waters of the New Caledonia (including the Loyalty Island) and are still valid. Nevertheless, only 13 species are still so far known from the Caledonia.

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List of taxa

CARIDEA Dana, 1852

ALPHEIDAE Rafinesque, 1815

Alpheus gracilipes Stimpson, 1860
Alpheus lottini Guérin, 1829
Alpheus gracilidigitus Miers, 1884
Alpheus diadema Dana, 1852
Alpheus obesomanus Dana, 1852
Alpheus frontalis H. Milne Edwards, 1837 (Borridaile used Say, 1832)
Potamalpheops pininsulae Bruce & Iliffe, 1992 (? holotype from New Caledonia and still endemic)
Synalpheus demani Borradaile, 1899
Synalpheus streptodactylus Coutière, 1905
Synalpheus stimpsonii (de Man, 1888)

ANCHISTIOIDIDAE Borradaile, 1915

Anchistioides willeyi (Borradaile, 1899)

CRANGONIDAE Haworth, 1825

Aegaeon orientalis Henderson, 1893
Pontocaris hilarula (de Man, 1918)
Philocheras pilosus (Kemp, 1916)

GNATHOPHYLLIDAE Dana, 1852

Gnathophyllum americanum Guérin-Méneville, 1855

HIPPOLYTIDAE Dana, 1852

Gelastocaris paronae (Nobili, 1905)
Gelastreutes crosnieri Bruce, 1990*
Hippolysmata grabhami Gordon, 1935 (Atlantic species!!)
Hippolysmata multiscissa Nobili, 1904
Hippolysmata vittata Stimpson, 1860
Hippolyte caradina Holthuis, 1947
Latreutes mucronatus (Stimpson, 1860)
Latreutes pygmoeus Nobili, 1904
Parhippolyte uveae Borradaille, 1899*
Lysmata zacae Armstrong, 1941
Saron neglectus (de Man, 1902)
Thor paschalis (Heller, 1862)
Thor spinosus Boone, 1935
Tozeuma armatum Paulson, 1875

HYMENOCERIDAE Ortmann, 1890

Hymenocera picta Dana, 1852
Phyllognathia ceratophthalma (Balss, 1913)

OPLOPHORIDAE Dana, 1852

Oplophorus gracilirostris A. Milne-Edwards, 1881

PALAEMONIDAE Rafinesque, 1815

Allopontonia iaini Bruce, 1972
Anchiopontonia hurii (Holthuis, 1981)
Anchistus australis Bruce, 1977
Anchistus custos (Forsskäl, 1745)

Anchistus demani Kemp, 1922
Anchistus gravieri Kemp, 1922
Anchistus miersi (de Man, 1888)
Anchistus pectinis Kemp, 1925
Apopontonia dubia Bruce, 1982
Brachycarpus biunguiculatus (Lucas, 1846)
Brachycarpus crosnieri Bruce, 1998*
Conchodytes meleagrinae Peters, 1852
Conchodytes maculatus Bruce, 1989
Conchodytes tridacnae Peters, 1852
Coralliocaris graminea (Dana, 1852)
Coralliocaris superba (Dana, 1852)
Dactylonia monnioti (Bruce, 1990)*
Dactylonia ascidicola (Borradaile, 1898)
Dasycaris symbiotes Kemp, 1922
Dasycaris zanzibarica Bruce, 1973
Hamodactylus boschmai Holthuis, 1952
Hamodactylus noumeae Bruce, 1970*
Harpiliopsis depressa (Stimpson, 1860)
Harpiliopsis spinigera (Ortmann, 1890)
Isopontonia platycheles Bruce, 1982*
Jocaste japonica (Ortman, 1890)
Jocaste lucina (Nobili, 1901)
Kemponia agag (Kemp, 1922)
Kemponia amymone (de Man, 1902)
Kemponia anacanthus (Bruce, 1988)
Kemponia andamanensis (Kemp, 1922)
Kemponia darwiniensis (Bruce, 1987)
Kemponia elegans (Paulson, 1875)
Kemponia ensifrons (Dana, 1852)
Kemponia grandis (Stimpson, 1860)
Kemponia nilandensis (Borradaile, 1915)
Kemponia seychellensis (Borradaile, 1915)
Kemponia tenuipes (Borradaile, 1898)
Leander plumosus Bruce, 1994
Leander tenuicornis (Say, 1818)
Leandrites cyrtorhynchus Fujino & Miyake, 1969
Macrobrachium equidens (Dana, 1852)
Manipontonia psamathe (de Man, 1902)
Metapontonia fungiacola Bruce, 1967
Odontonia compacta (Bruce, 1996)*
Odontonia katoi (Kubo, 1940)
Odontonia sibogae (Bruce, 1972)
Odontonia simplicipes (Bruce, 1996)
Onycocaris longirostris Bruce, 1980*
Palaemon concinnus Dana, 1852
Palaemon debilis Dana, 1852
Palaemon pacificus (Stimpson, 1860)
Palaemonella dolichodactylus Bruce, 1991*
Palaemonella hachijo Okuno, 1999
Palaemonella pottsi (Borradaile, 1915)
Palaemonella pusilla Bruce, 1975
Palaemonella rotumana (Borradaile, 1898)
Palaemonella spinulata Yokoya, 1936
Palaemonetes atrinubes Bray, 1976

Paraclimenes franklini (Bruce, 1990)
Paranchistus nobilii Holthuis, 1952
Parapontonia nudirostris Bruce, 1968*
Periclimenaeus arabicus (Calman, 1939)
Periclimenaeus bidentatus Bruce, 1970
Periclimenaeus colodactylus Bruce, 1996*
Periclimenaeus jeancharcoti Bruce, 1991*
Periclimenaeus nobilii Bruce, 1974
Periclimenaeus rastrifer Bruce, 1980*
Periclimenaeus stylirostris Bruce, 1969
Periclimenella spinifera (de Man, 1902)
Periclimenes affinis (Zehntner, 1894)
Periclimenes amboinensis (de Man, 1888)
Periclimenes brevicarpalis (Schenkel, 1902)
Periclimenes ceratophthalmus Borradaile, 1915
Periclimenes commensalis Borradaile, 1915
Periclimenes hertwigi Balss, 1913
Periclimenes hirsutus Bruce, 1971
Periclimenes holthuisi Bruce, 1969
Periclimenes imperator Bruce, 1967
Periclimenes incertus Borradaile, 1915
Periclimenes ischiospinosus Bruce, 1991*
Periclimenes kempi Bruce, 1969
Periclimenes lanipes Kemp, 1922
Periclimenes lepidus Bruce, 1978
Periclimenes magnificus Bruce, 1979
Periclimenes novaecaledoniae Bruce, 1968*
Periclimenes obscurus Kemp, 1922
Periclimenes soror Nobili, 1904
Periclimenes tenuirostris Bruce, 1991*
Periclimenes venustus Bruce, 1990
Philarius imperialis (Kubo, 1940)
Philarius lifuensis (Borradaile, 1898)*
Pliopontonia furtiva Bruce, 1973
Pontoniopsis comanthi Borradaile, 1915
Stegopontonia commensalis Nobili, 1906
Thaumastocaris streptopus Kemp, 1922*
Typtonychus crassimanus Bruce, 1996*
Urocaridella antonbrunii (Bruce, 1967)
Urocaridella urocaridella (Holthuis, 1950)
Zenopontonia noverca (Kemp, 1922)*

PANDALIDAE Hayworth, 1825

Chlorocurtis jactans (Nobili, 1904)
Chlorotocella gracilis Balss, 1914
Plesionika narval (Fabricius, 1787)

PASIPHAEIDAE Dana, 1852

Leptochela chacei Hayashi, 1995 (or 1996)
Leptochela crosnieri Hayashi, 1995 (or 1996)*
Leptochela irrobusta Chace, 1976
Leptochela robusta Stimpson, 1860
Leptochela sydniensis Dakin & Colefax, 1940

PROCESSIDAE Ortmann, 1896

Nikoides danae Paulson, 1875
Nikoides gurneyi Hayashi, 1975
Nikoides steinii (Edmondson, 1935)

Clytomanningus coutieri (Nobili, 1904)
Hayashidonus japonica (de Haan, 1844)
Processa zostericola Hayashi, 1975

RHYNCHOCINETIDAE Ortmann, 1890

Cinetorhynchus concolor (Okuno, 1994)
Cinetorhynchus erythrostictus Okuno, 1997
Cinetorhynchus hendersoni (Kemp, 1925)
Cinetorhynchus hiatti (Holthuis & Hayashi, 1967)
Cinetorhynchus reticulatus Okuno, 1997*
Cinetorhynchus striatus (Nomura & Hayashi, 1992)
Rhynchocinetes brucei Okuno, 1994

STYLODACTYLIDAE Bate, 1888

Neostylodactylus amarynthis (de Man, 1902)

STENOPODIDEA Bate, 1888

STENOPODIDAE Claus, 1872

Stenopus tenuirostris de Man, 1888

PALINURA Latreille, 1803

PALINURIDAE Latreille, 1803

Palinurellus wieneckii (de Man, 1881)
Panulirus penicillatus (Olivier, 1791)
Panulirus versicolor (Latreille, 1804)
Panulirus ornatus (Fabricius, 1798)
Panulirus longipes bispinosus Borradile, 1899*
Panulirus homarus (Linnaeus, 1758)

SCYLLARIDAE Latreille, 1825

Arctides regalis Holthuis, 1963
Biarctus vitiensis (Dana, 1852)
Crenarctus bicuspidatus (de Man, 1905)
Eduarctus martensii (Pfeffer, 1881)
Eduarctus reticulatus Holthuis, 2002
Galearctus aurora (Holthuis, 1982)
Gibbularctus gibberosus (de Man, 1905)
Parribacus antarcticus (Lund, 1793)
Parribacus caledonicus Holthuis, 1960*
Petrarctus rugosus (H. Milne Edwards, 1837)
Scyllarides squammosus (H. Milne Edwards, 1837)

Peneides shrimps of New Caledonia

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The following list of peneid shrimps was establihed by Alain Crosnier who has worked on the material of numerous expeditions from New Caledonia. The diversity known is 6 family, 30 genera and 102 species. There are certainly more species in the area and some groups are still unstudied like genus *Solenocera*.

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List of taxa

DECAPODA Latreille, 1803
PENAEOIDA Rafinesque-Schmaltz, 1815
ARISTEIDAE Wood-Mason, 1891
Aristaeomorpha foliacea (Risso, 1827)
Aristaeopsis edwardsiana (Johnson, 1867)
Aristeus mabahissae Ramadan, 1938
Aristeus semidentatus Bate, 1881
Aristeus virilis (Bate, 1881)
Austropenaeus nitidus (Barnard, 1947)
Hemipenaeus carpenteri Wood-Mason, 1891
Plesiopenaeus armatus (Bate, 1881)
BENTHESICYMIDAE (Bouvier, 1908)
Benthesicymus hovensis Dall, 2001
Benthesicymus investigatoris Alcock & Anderson, 1899
Benthesicymus urinator Burkenroad, 1936
Gennadas bouvieri Kemps, 1909
Gennadas capensis Calman, 1925
Gennadas clavicarpus de Man, 1907
Gennadas incertus (Balss, 1927)
Gennadas gilchristi Calman, 1925
Gordonella paravillosa Crosnier, 1988
Gordonella kensleyi Crosnier, 1988
PENAEIDAE Rafinesque, 1815
Funchalia villosa (Bouvier, 1905)
Funchalia taaningi Burkenroad, 1940
Pelagopenaeus balboae (Faxon, 1892)

Penaeus semisulcatus de Haan, 1850
Penaeus latisulcatus Kishinouye, 1900
Penaeus monodon Fabricius, 1798
Fenneropenaeus merguiensis (de Man, 1888)
Melicertus longistylus Kubo, 1943
Melicertus canaliculatus Olivier, 1811
Melicertus longistylus Kubo, 1943
Heteropenaeus longimanus de Man, 1896
Metapenaeopsis aegyptia Galil & Golani, 1990
Metapenaeopsis ceylonica Starobogatov, 1972
Metapenaeopsis commensalis Borradaile, 1898
Metapenaeopsis difficilis Crosnier, 1991
Metapenaeopsis distincta (de Man, 1907)
Metapenaeopsis evermanni (Rathbun, 1906)
Metapenaeopsis gaillardi Crosnier, 1991
Metapenaeopsis gallensis (Pearson, 1905)
Metapenaeopsis hilarula (de Man, 1911)
Metapenaeopsis lamellata (de Haan, 1844)
Metapenaeopsis mannarensis de Bruin, 1965
Metapenaeopsis marquesas Crosnier, 1991
Metapenaeopsis menoui Crosnier, 1991
Metapenaeopsis mogiensis complanata Crosnier, 1991
Metapenaeopsis propinqua Crosnier, 1991
Metapenaeopsis provocatoria Racek & Dall, 1965
Metapenaeopsis quinquedentata (de Man, 1907)
Metapenaeopsis richeri Crosnier, 1991
Metapenaeopsis sibogae (de Man, 1907)
Metapenaeopsis sinica Liu & Zhong, 1988
Metapenaeopsis stridulans (Alcock, 1905)
Metapenaeopsis tarawensis Racek & Dall, 1965
Metapenaeopsis toloensis Hall, 1962
Metapenaeopsis velutina (Dana, 1852)
Metapenaeus anchistus (de Man, 1920)
Metapenaeus endeavouri (Schmitt, 1926)
Metapenaeus ensis (de Haan, 1844)
Parapenaeus cayrei Crosnier, 2005
Parapenaeus fissurus (Bate, 1881)
Parapenaeus investigatoris Alcock & Anderson, 1899
Parapenaeus kensleyi Crosnier, 2005
Parapenaeus murrayi Ramadan, 1938
Parapenaeus sextuberculatus Kubo, 1949
Penaeopsis balsii Ivanov & Hassan, 1976
Penaeopsis challengeri de Man, 1911
Penaeopsis eduardoi Perez Farfante, 1977
Penaeopsis jerryi Perez Farfante, 1979
Penaeopsis rectacuta (Bate, 1881)
Trachypenaeopsis richtersii (Miers, 1884)
Trachypenaeopsis mobilispinis (Rathbun, 1915)

SOLENOCERIDAE Wood-Mason & Alcock, 1891

Cryptopenaeus clevai Crosnier, 1984
Cryptopenaeus crosnieri Pérez Farfante & Kensley, 1985
Hadropenaeus lucasii (Bate,1881)
Hadropenaeus spinicauda Liu & Zhong, 1983
Haliporoides sibogae (de Man, 1907)
Haliporoides cristatus Kensley, Tranter & Griffin, 1987

Haliporus thetis Faxon, 1893
Hymenopenaeus equalis (Bate, 1888)
Hymenopenaeus debilis Smith, 1882
Hymenopenaeus halli A.Bruce, 1966
Hymenopenaeus methalli Crosnier & Dall, 2004
Hymenopenaeus neptunus (Bate, 1881)
Hymenopenaeus obliquirostris (Bate, 1881)
Hymenopenaeus propinquus (de Man, 1907)
Mesopenaeus brucei Crosnier, 1986
Solenocera comata Stebbing, 1915

SICYONIIDAE Ortmann, 1898

Sicyonia altirostrum Crosnier, 2003
Sicyonia benthophila de Man, 1907
Sicyonia bispinosa De Haan, 1841
Sicyonia cf. australiensis Hanamura & Wadley, 1998
Sicyonia curvirostris Balss, 1913
Sicyonia dejouanneti Crosnier, 2003
Sicyonia fallax de Man, 1907
Sicyonia furcata Miers, 1878
Sicyonia inflexa (Kubo, 1949)
Sicyonia laevis Bate, 1881
Sicyonia lancifer (Olivier, 1811)
Sicyonia rectirostris de Man, 1907
Sicyonia robusta Crosnier, 2003
Sicyonia rotunda Crosnier, 2003
Sicyonia trispinosa de Man, 1907
Sicyonia truncata (Kubo, 1949)
Sicyonia vitulans (Kubo, 1949)

SERGESTIDAE Dana, 1852

Sergestes talismani (Barnard, 1947)

Thalassinideans shrimps of New Caledonia

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History and remarks

The first thalassinidean shrimp reported from New Caledonia was *Neaxius acanthus* (A.Milne-Edwards, 1878). More than 100 years later, Sakai & Saint Laurent (1989) recorded two axiids and one calocaridid and Ngoc-Ho (1989) described two new species of upogebiids from that region. The most detailed study on the thalassinidean fauna of New Caledonia is that of Ngoc-Ho (1991) who reported six species (three of them new) of callianassids and seven (three new) species of upogebiids. Later, Ngoc-Ho (1994) described another two new species of Upogebiidae. Poore (1997) added three new species of Micheleidae and Thomassiniidae. Recently, Lin (2006) added one new species each of Micheleidae and Axiidae and Ngoc-Ho (2006) another axiid to the fauna of this region.

It is remarkable, that most thalassinidean species came from deeper sediment bottoms where they have been collected with grabs, trawls and dredges. Except for *N. acanthus* and the unpublished record of *G. armatus*, nothing is known about the Thalassinidea inhabiting intertidal and shallow subtidal habitats.

Taxonomic remarks (off the record)

The validity of some species is still unclear:

Callianassa caledonica Ngoc-Ho, 1991 was synonymised with *C. amboinae* Bate, 1888 by Sakai (1999d), later with *C. tonkinae* Grebenjuk, 1975 by Sakai (2002) and again with *C. amboinae* by Sakai (2005b). I think it is rather *amboinae*, probably *tonkinae* is also synonymous with *amboinae*.

Callianassa rectangularis Ngoc-Ho, 1991 was synonymised with *C. bouvieri* Nobili, 1904 by Sakai (1999d). I consider *C. rectangularis* as a synonym of *C. maldivensis* Borradaile, 1904, another species synonymised with *C. bouvieri* by Sakai (1999). My studies show that *C. bouvieri* and *C. maldivensis* are different morphologically as well as ecologically. As my results are unpublished, I would list this species as *C. rectangularis*.

Glypturus armatus (A.Milne-Edwards, 1878) is an unpublished record for New Caledonia (pers. comm. M. de Saint Laurent, 1988). Sakai (1999b) synonymised *G. laurae* (de Saint Laurent, 1984) as synonym of *G. armatus*; I do not agree. On the other hand, Sakai (1999, 2005) lists *Glypturus motupore* Poore & Suchanek, 1988 from Papua New Guinea as member of *Neocallichirus*. I consider *G. motupore* as synonym of *G. armatus*. My results are still unpublished.

Systematic arrangement of families follows Poore (1994).

Sakai (1999a) erected Gourretiinae for *Gourretia* and *Dawsonius*, placing *Paracalliax* in Ctenochelinae. Later, Sakai (2004) elevated the subfamily to family rank adding *Callianopsis*, *Laurentgourretia*, and *Paragourretia* and placing *Paracalliax* this time in Callianassidae. If this taxonomic arrangement is followed, Callianopsinae Manning and Felder, 1991 has precedence as a family level name over Gourretiidae. I therefore follow Manning & Felder and list *Gourretia* under Ctenochelidae.

With respect to generic placement of the Callianassidae, I followed Manning & Felder (1991) for the Callichirinae. The Callianassinae are listed all as *Callianassa* sensu lato. This genus is considered here as polyphyletic clade, with the species (except *C. rectangularis*) included as listed in Tudge *et al.* (2000), but not in the sense of Sakai (1999d) who proposed a much larger genus.

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List of taxa

THALASSINIDEA Latreille, 1831

THOMASSINIIDAE de Saint Laurent, 1979

Crosniera panie Poore, 1997 New Caledonia 40 m

MICHELEIDAE Sakai, 1992

Meticonaxius dentatus Lin, 2006 New Caledonia 250-386 m

Meticonaxius noumea Poore, 1997 New Caledonia, 275-320 m

Michelea novaecalidoniae Poore, 1997 New Caledonia 37-52 m

AXIIDAE Huxley, 1879

Oxyrhynchaxius tricarinatus Lin, 2006 New Caledonia 253-600 m

Acanthaxius gadaletae Ngoc-Ho, 2006 Solomon Islands, New Caledonia 135-300 m

Acanthaxius miyazakiensis (Yokoya, 1933) Japan, Philippines, New Caledonia 120-210 m

Bouvieraxius rudis (Rathbun, 1906) Hawaii, Madagascar, Australia, New Caledonia 75-420 m

CALOCARIDIDAE Ortmann, 1891

Ambiaxius alcocki (McArdle, 1900) Japan, Sri Lanka, Natal, New Caledonia 380-1000 m

STRAHLAXIIDAE Poore, 1994

Neaxius acanthus A.Milne-Edwards, 1878 New Caledonia, Australia, Indonesia, Mauritius, Comores, Guam, Taiwan 0-1 m

UPOGEBIIDAE Borradaile, 1903

Gebiacantha lagonensis Ngoc-Ho, 1989 New Caledonia 12-58 m
Gebiacantha richeri Ngoc-Ho, 1989 New Caledonia 43-47 m
Gebiacantha lifuensis Ngoc-Ho, 1994 New Caledonia, Loyality Isl. 6-10 m
Gebiacantha multispinosa Ngoc-Ho, 1994 New Caledonia, Loyality Isl. 6-10 m
Upogebia allobranchus Ngoc-Ho, 1991 New Caledonia n.d.
Upogebia holthuisi Sakai, 1982 Gilbert Islands, New Caledonia 4-75 m
Upogebia ovalis Ngoc-Ho, 1991 New Caledonia n.d.
Upogebia pugnax de Man, 1905 Indonesia, Japan, Maldives, New Caledonia 36-55 m
Upogebia stenorhynchus Ngoc-Ho, 1991 New Caledonia n.d.

CALLIANASSIDAE Dana, 1852

[*Glypturus armatus* (A.Milne-Edwards, 1878) Indo-Pacific 0-20 m]
Callianassa amboinensis de Man, 1888 Indonesia, Australia, Philippines, Mauritius, Red Sea, New Caledonia 18-366 m
Callianassa caledonica Ngoc-Ho, 1991 New Caledonia 21 m
Callianassa joculatrix de Man, 1905 Indonesia, Australia, Philippines, Vietnam, Taiwan, New Caledonia 10-330 m
Callianassa rectangularis Ngoc-Ho, 1991 New Caledonia 36 m
Cheramus propinquus (de Man, 1905) Indonesia, Australia, New Caledonia 75-300 m

CTENOCHELIDAE Manning & Felder, 1991

Gourretia crosnieri Ngoc-Ho, 1991 New Caledonia 29 m

GLYPHEOIDEA Wrinckler, 1883

GLYPHEIDAE Zittel, 1883

Neoglyphea novaecalidonica Richer de Forges, 2006

Paguroidea of New Caledonia and environs: Remarks on the preliminary checklist

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The shallow-water tropical paguroid communities of the Indo-Pacific typically are dominated by representatives of the family Diogenidae. However, while some 1217 dredgings were made in New Caledonian lagoons between 1984 and 1989 (Richers de Forges, 1991), the majority at depths of less than 100 meters, it is clear from the species listing that the hermit crab fauna from those collections have received little attention. The highly specious genera *Clibanarius*, *Dardanus* and *Diogenes* are conspicuously absent. Further study of the collections of the Muséum national d'Historie naturelle will undoubtedly result is appreciable increases in the representation of these genera. In contrast, the monographic study of *Ciliopagurus*, *Strigopagurus* and *Trizopagurus* by Forest (1995) and a similar study of species of *Paguristes* sensu lato in progress by Rahayu (in preparation) indicate that these genera are more accurately represented in the present checklist.

With the exception of species of the genus *Calcinus*, in all four families of paguroids, the preponderance of New Caledonian species documented to date has been collected during explorations of the bathyal fauna. Species representations in the families Pylochelidae and Parapaguridae are, for the most part, accurate indications of the biodiversity in the New Caledonia EEZ (Forest, 1987; Lemaitre, 1996, 1999, 2004a, b); however, that is not the case for the Paguridae. The monographic generic reviews of McLaughlin & Forest (1997), McLaughlin (2000, 2004a, b), Asakura (2005), and McLaughlin & Rahayu (2006) account for all but three of the listed species. Considerable additional study is necessary before biodiversity and potential endemism can be discussed.

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List of the taxa of Paguroidea from New Caledonia and environs.

(From published reports and works in progress. The localities cited in parentheses following each species are the type localities)

PYLOCHELIDAE Bate, 1888
Trizocheles caledonicus Forest, 1987 (New Caledonia)
Trizocheles pulcher Forest, 1987 (New Caledonia)
Trizocheles spinosus bathamae Forest & de Saint Laurent, 1987 (New Zealand)

DIOGENIDAE Ortmann, 1892
Calcinus anani Poupin & McLaughlin, 1998 (Tuamotu, French Polynesia)
Calcinus argus Wooster, 1984 (Guam)
Calcinus gaimardii (H. Milne Edwards, 1848) (Indonesia)
Calcinus imperialis Whitelegge, 1901 (Tasman Sea, Australia)
Calcinus inconspicuus Morgan, 1991 (Tasman Sea, Australia)
Calcinus latens Randall, 1840 (Hawaiian Islands)
Calcinus lineapropodus Morgan & Forest, 1991 [Cocos (Keeling) Ialands]
Calcinus minutus Buitendijk, 1937 (Indonesia)
Calcinus morgani Rahayu & Forest, 1999 (Indonesia)
Calcinus pulcher Forest, 1958 (Vietnam)
Calcinus spicatus Forest, 1951 (Gambier Islands, French Polynesia)
Ciliopagurus alcocki Forest, 1995 (New Caledonia)
Ciliopagurus krempfi (Forest, 1952) (Vietnam)
Ciliopagurus pacificus Forest, 1995 (Tuamotu Archipelago)
Ciliopagurus strigatus (Herbst, 1804) ("East Indies")
Paguristes aciculus Grant, 1905 (New South Wales, Australia)
Paguristes alcocki McLaughlin & Rahayu, 2005 (Australia)
Paguristes palythophilus Ortmann, 1892 (Japan)
Paguristes puniceus Henderson, 1896 (Bay of Bengal, India)
Paguristes ortmanni Miyake, 1978 (Japan)
Paguristes versus Komai, 2001 (Japan)
Pseudopaguristes laurentae (Morgan & Forest, 1991) (Western Australia)
Pseudopaguristes monoporus (Morgan, 1987) (Northern Territory, Australia)
Stratiotes ngochoae Rahayu, 2005 (Indonesia)
Stratiotes micheleae Rahayu, 2005 (Indonesia)
Strigopagurus boreonotus Forest, 1995 (New Caledonia)

PAGURIDAE Latreille, 1802
Alainopaguroides megalophthalmus McLaughlin, 2006 (New Caledonia)
Alainopagurus crosnieri Lemaitre & McLaughlin, 1995 (New Caledonia)
Anapagurus bonnieri Nobili, 1905 (Persian Gulf)
Catapagurus danida McLaughlin, 2002 (Andaman Sea)
Catapagurus franklinae McLaughlin, 2004 (Queensland, Australia)
Catapagurus imperialis (Asakura, 2001) (Sagami Bay, Japan)
Catapagurus tanimbarensis McLaughlin, 1997 (Tanimbar Islands, Indonesia)
Diacanthurus ecphyma McLaughlin & Forest, 1997 (New Caledonia)
Diacanthurus richeri McLaughlin & Forest, 1997 (New Caledonia)

Icelopagurus crosnieri McLaughlin, 1997 (Tanimbar Islands, Indonesia)
Icelopagurus undulatus McLaughlin, 2006 (New Caledonia)
Michelopagurus limatulus (Henderson, 1888) (south of Philippine Islands)
Micropagurus polynesiensis (Nobili, 1906) (French Polynesia)
Micropagurus spinimanus Asakura, 2005 (New Caledonia)
Nematopagurus alcocki McLaughlin, 1997 (Kai Islands, Indonesia)
Nematopagurus australis (Henderson, 1888) (Arafura Sea)
Nematopagurus diadema Lewinsohn, 1969 (Gulf of Aqaba, Red Sea)
Nematopagurus gardineri Alcock, 1905 (Maldive Islands)
Nematopagurus indicus Alcock, 1905 (Travancore coast, Arabian Sea)
Nematopagurus kosiensis McLaughlin, 1998 (east coast of South Africa)
Nematopagurus lepidochirus (Doflein, 1902) (Sagami Bay, Japan)
Nematopagurus lewinsohni Türkay, 1986 (Saudi Arabia)
Nematopagurus meiringae McLaughlin, 1998 (eastern South Africa)
Nematopagurus ricei McLaughlin, 2004 (New Caledonia)
Nematopagurus richeri McLaughlin, 2004 (New Caledonia)
Nematopagurus scutelliformis McLaughlin (Kai Islands, Indonesia)
Nematopagurus spinulosensoris McLaughlin & Brock, 1974 (Hawaii)
Nematopagurus spongioparticeps McLaughlin, 2004 (New Caledonia)
Nematopagurus vallatus (Melin, 1939) [Ogasawara (Bonin) Islands, Japan]
Pagurojacquesia polymorpha (de Saint Laurent & McLaughlin, 1999) (Vanuatu)
Porcellanopagurus chiltoni de Saint Laurent & McLaughlin, 2000 (Kermadec Islands)
Porcellanopagurus filholi de Saint Laurent & McLaughlin, 2000 (New Zealand)
Porcellanopagurus haptodactylus McLaughlin, 2000 (New Caledonia)
Porcellanopagurus tridentatus Whitelegge, 1900 (New South Wales, Australia)
Propagurus haigae (McLaughlin, 1997) (Kai Islands, Indonesia)
Pteropagurus inermis McLaughlin & Rahayu, 2006 (New Caledonia)
Pteropagurus spina McLaughlin & Rahayu, 2006 (New Caledonia)
Solitariopagurus triprobolus Poupin & McLaughlin, 1996 (French Polynesia)
Solitariopagurus trullirostris McLaughlin, 2000 (New Caledonia)
Solitariopagurus tuerkayi McLaughlin, 1997 (Kai Islands, Indonesia)
Tomopaguroides valdiviae (Balss, 1911) (off Somalia)
Xylopagurus caledonicus Forest, 1997 (New Caledonia)

PARAPAGURIDIAE Smith, 1882

Parapagurus latimanus Henderson, 1888 (New Zealand)
Parapagurus richeri Lemaitre, 1999 (New Caledonia)
Parapagurus furici Lemaitre, 1999 (New Caledonia)
Strobopagurus breviacus Lemaitre 2004 (New Caledonia)
Strobopagurus gracilipes (A. Milne-Edwards, 1891) (Azores, eastern Atlantic)
Strobopagurus sibogoae (de Saint Laurent, 1972 (Indonesia)
Sympagurus acinops Lemaitre, 1989 (Bahamas, western Atlantic)
Sympagurus affinis (Hendersoon, 1888) (Meangis Islands, north of New Guinea)
Sympagurus aurantium Lemaitre, 2004 (New Caledonia)
Sympagurus brevipes (de Saint Laurent, 1972) (Indonesia)
Sympagurus dofleini (Balss, 1912) (Sagami Bay, Japan)
Sympagurus burkenroadi Thompson, 1943 (Zanzibar)
Sympagurus planimanus (de Saint Laurent, 1972) (Flores Sea, Indonesia)
Sympagurus poupini Lemaitre, 1994 (Tuamotu Archipelago)
Sympagurus soela Lemaitre, 1996 (Queensland, Australia)
Sympagurus symmetricus Lemaitre, 2004 (New Caledonia)
Sympagurus trispinosus (Balss, 1911) (Zanzibar)
Sympagurus villosus Lemaitre, 1996 (Queensland, Australia)
Tylaspis anomala Henderson, 1888 (South Pacific, "Challenger" station 285)

Galatheoidea of New Caledonia and environs: Remarks on the preliminary checklist

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This taxa contains two of the most diverse families of anomuran decapod crustaceans, Galatheidae and Chirostylidae, and includes crabs found in all marine habitats world-wide (Baba, 1988). The species are commonly found living on corals, gorgonians and sponges in rocky or muddy bottoms. The number of species is clearly higher in the waters of the West Pacific than in other oceans, although clearly lower in shallow waters (< 300 m) than in the continental shelf and slope (Macpherson, 1994). Until recently, the family Galatheidae was divided into 16 genera, *Munida* being the most speciose genus in the continental shelf and slope around the world (Baba, 1988, 2005). After the discovery of numerous undescribed species during numerous expeditions across the West Pacific – from the Philippines to New Caledonia the genus has been split into 5 genera: *Agononida, Crosnierita, Munida, Paramunida,* and *Raymunida* (Baba, 1988; 2005). A closely related genus, *Bathymunida*, which until the last decade was comprised of a few species, was also enriched by the material obtained in these expeditions and now 5 new genera (*Anoplonida, Heteronida, Neonida, Onconida,* and *Plesionida*) are recognized in the *Bathymunida* group. However, the genus *Galathea* containing numerous representatives, mostly shallow-water species, is still under study. The family Chirostylidae is also under study and numerous new species will be added to the New Caledonian Fauna (K. Baba, in prep.).

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List of taxa

Family Galatheidae

Agononida laurentae (Macpherson, 1994)
Agononida ocyrhoe (Macpherson, 1994)
Agononida sphecia (Macpherson, 1994)
Agononida squamosa (Henderson, 1885)
Alainius crosnieri Baba, 1991
Bathymunida balssi van Dam, 1838
Bathymunida eurybregma Baba & de Saint-Laurent, 1996
Bathymunida nebulosa Baba & de Saint-Laurent, 1996
Bathymunida ocularis Baba & de Saint-Laurent, 1996
Bathymunida rudis Baba & de Saint-Laurent, 1996
Bathymunida sibogae van Dam, 1838
Crosnierita dicata (Macpherson, 1994)
Crosnierita urizae (Macpherson, 1994)
Enriquea leviantennata (Baba, 1988)
Galathea ohshimai Miyake & Baba, 1967

Galathea squamea Baba, 1979
Galathea subsquamata Stimpson, 1858
Galathea ternatensis deMan, 1902
Munida acantha Macpherson, 1994
Munida armilla Macpherson, 1994
Munida clinata Macpherson, 1994
Munida distiza Macpherson, 1994
Munida eclepsis Macpherson, 1994
Munida gilii Macpherson, 1993
Munida gordoae Macpherson, 1994
Munida guttata Macpherson, 1994
Munida heteracantha Ortmann, 1892
Munida inornata Henderson, 1885
Munida javieri Macpherson, 1994
Munida leagora Macpherson, 1994
Munida leptitis Macpherson, 1994
Munida leptosyne Macpherson, 1994
Munida lineola Macpherson, 1994
Munida masi Macpherson, 1994
Munida moliae Macpherson, 1994
Munida notata Macpherson, 1994
Munida olivarae Macpherson, 1994
Munida ommata Macpherson, 2004
Munida pagesi Macpherson, 1994
Munida pectinata Macpherson & Machordom, 2005
Munida pontoporea Macpherson, 1994
Munida proto Macpherson, 1994
Munida pseliophora Macpherson, 1994
Munida rogeri Macpherson, 1994
Munida rufiantennulata Baba, 1969
Munida runcinata Macpherson, 1994
Munida sao Macpherson, 1994
Munida semoni Ortmann, 1894
Munida simulatrix Macpherson & Machordom, 2005
Munida spilota Macpherson, 1994
Munida stigmatica Macpherson, 1994
Munida taenia Macpherson, 1994
Munida thoe Macpherson, 1994
Munida tyche Macpherson, 1994
Munida zebra Macpherson, 1994
Munidopsis latimana Miyake & Baba, 1966
Onconida alaini Baba & de Saint-Laurent, 1996
Onconida tropis Baba & de Saint-Laurent, 1996
Paramunida belone Macpherson, 1993
Paramunida labis Macpherson, 1993
Paramunida longior Baba, 1988
Paramunida pictura Macpherson, 1993
Paramunida setigera Baba, 1988
Paramunida stichas Macpherson, 1993
Paramunida thalie Macpherson, 1993
Phylladiorhynchus ikedai Baba, 1969
Phylladiorhynchus integrirostris (Dana, 1852)
Raymunida dextralis Macpherson & Machordom, 2001
Raymunida elegantissima (de Man, 1902)
Torbenia calvata Macpherson, 2006
Torbenia insolita (Macpherson, 2004)

Family Chirostylidae

Eumunida minor deSaint-Laurent & Macpherson, 1990

The Brachyura of New Caledonia

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Modern New Caledonia was discovered by James COOK in 1774 but the marine natural history of this part of the world started really on the second half of the 19th century when naturalist collected samples and corresponded with scientists in Europe. The first comprehensive work on the crabs of New Caledonia is the large study by renowned French carcinologist Alphonse Milne-Edwards between 1872 and 1873 on material collected essentially by the botanist Balansa, in which he recorded 182 species from the following (modern) families: Calappidae, Domeciidae, Eriphiidae, Gecarcinidae, Goneplacidae, Grapsidae, Hymenosomatidae, Leucosiidae, Majidae, Macrophthalmidae, Mictyridae, Ocypodidae, Palicidae, Parthenopidae, Pilumnidae, Pinnotheridae, Plagusiidae, Portunidae, Sesarmidae, Tetraliidae, Trapeziidae, Varunidae and Xanthidae.

Since this important « first » step by A. Milne-Edwards, many more species have since been described by numerous taxonomists. In 1977, the deep-sea slopes were sampled for the first time, revealing a suite of many new species. It was the begining of the MUSORSTOM epoch and a new era in carcinology. Vast collections of crabs were deposited in the Muséum national d'Histoire naturelle in Paris and, thanks to Alain Crosnier, have been studied by many renowned carcinologists. A large part of the taxonomical studies on these crabs, often published as revisions, were published in the long-running series « Résultats des Campagnes MUSORSTOM », which became « Tropical Deep Sea Benthos » since volume 22.

Some noteworthy studies of crabs of New Caledonia are listed below by families: Calappidae (Galil, 1993, 1997; Crosnier, 1997); Cancridae (Davie, 1991); Cryptochiridae (Manning, 1991); Cyclodorippidae and Cymonomidae (Tavares, 1993, 1997); Dorippidae (Chen, 1993); Dromiidae (McLay, 1993); Dynomenidae (McLay, 1999); Goneplacidae (Guinot & Richer de Forges, 1981a ; Ng, 2002); Grapsidae (Monod, 1973; Serène, 1973); Homolidae (Griffin & Brown, 1976; Guinot & Richer de Forges, 1981; Guinot & Richer de Forges, 1995); Homolodromiidae (Guinot, 1993, 1995); Hymenosomatidae (Davie & Richer de Forges, 1996; Ng & Richer de Forges, 1996); Latreilliidae (Castro *et al.*, 2003); Leucosiidae (Chen, 1989; Tan & Richer de Forges, 1993; Tan & Ng, 1996; Galil, 2001, 2003a-c, 2005); Majidae (Griffin & Brown, 1976; Griffin & Tranter, 1986, Guinot & Richer de Forges, 1981b; 1982a, b; 1986, 1988; Richer de Forges & Guinot, 1989); Matutidae (Galil & Clark, 1994); Palicidae (Castro, 2000); Parthenopidae (Chiong & Ng, 1998 ; Tan & Ng, 2003); Pilumnidae (Guinot-Dumortier, 1959; Davie, 1993; Castro *et al.*, 1995; Chia & Ng, 1998, 2000; Ng & Chia, 1999); Plagusiidae (Crosnier, 2001); Portunidae (Moosa, 1996; Ng, 2000; Crosnier, 2002, 2003; Davie & Crosnier, 2006); Retroplumidae (McLay, 2006); Trapezidae (Galil & Clark, 1990; Castro, 1997) ; and Xanthidae (Guinot, 1971; Crosnier, 1987; Davie, 1997; Tan & Ng, 1994; Ng, 1993; Clark & Ng, 1999).

The present check list includes 552 species of crabs recorded from New Caledonia. The area considered includes the Loyalty Islands, Chesterfield and Bellona Plateau and Lord Howe seamounts, Matthew & Hunter Islands as well as the Norfolk Ridge seamounts. Of course, there are many more species living there, collected but still unstudied. In particular the large families of Majidae and Xanthidae have several comon species unlisted. In any case, the known diversity of New Caledonia is very impressive. Japan and China has some 800 plus species each (Dai & Yang, 1991; Sakai, 1976). Comparing island systems, the 552 species now known from New Caledonia compares very favourably with Taiwan with 550 species (Ng *et al.*, 2001) and Guam and Micronesia with 401 species (Paulay *et al.*, 2003). French Polynesia alone has 380 species (http//:decapoda.free.fr; Poupin, 1998). With regards to their biogeographical affinities, the crabs of New Caledonia are clearly from the Indo-Pacific province and have many species in common with NE coast of Australia and SE Asia.

Some interesting stories about the discovery of crabs in New Caledonia are following.

Mursia musortomia Galil, 1993

This family, often called box crabs (primarily due to the most speciose genus, *Calappa*), is characterised by dimorphic chelae – one has a special tooth for « cutting » open shells (gastropods), the other with long slender fingers to pull out the exposed gastropod. Interestingly, the cutting chela is almost always right-handed. The reason is simple – the right-handed cutter works best when the shell has the opening (the aperture) on the right as well. This situation is reminiscent of tools designed for use for right-handed people. For example, can-openers are best used by right handed people who can apply the best leverage. Left-handed people have a terrible time using normal can-openers. In the sea, hunters (crabs) and hunted (gastropods) are engaged in an arms race ! The shells have the opening on the right, the crabs have evolved the relevant weapon to deal with it ! Remarkably, this connection was only discovered in 1984 !

Paradynomene quasimodo McLay and Ng, 2004

The sea is full of cryptic species – i.e. forms which are difficult to separate. This is compounded by the difficulty in collecting many supposedly rare species, the resultant paucity of specimens making the taxonomist's job even more difficult. Often, when enough material becomes available because of new methods, many problems are solved, and « suddenly », many species get discovered ! The strange dynomenid genus *Paradynomene* is a case in point. Even until the mid-1990s, only one species was recognised – *P. tuberculata*. Good collections from the Philippines forced a rethink of its taxonomy – as a result, six species are now recognised – of which three occur in New Caledonia. One species, is named after the French character of literary legend – Quasimodo – because of the many humps on its back !

Parapilumnus cristimanus (A. Milne-Edwards, 1873)

Rarity is an illusion. Most animals are rare because we simply do not know where they live, or are unable to catch them ! Until less than a decade ago, *Pilumnus cristimanus*, a hairy crab named by the great French carcinologist Alphose Milne-Edwards in 1873 was known only from two female specimens and long regarded as a pilumnid crab. When males were finally found in the South China Sea and males of a related species discovered in Guam – our views changed completely. The diagnostic male characters showed that the species needed to be transferred to another genus (*Parapilumnus*) and they belong to a separate family (Goneplacidae). And why are these crabs so « cryptic » ? Simple – they live deep in the rubble zone – where few scientists can or bother to sample intensely !

Dolos petraeus (Milne Edwards, 1874)

Crabs have a myriad of ways to hide from potential predators. In the mid-1990s, a Singapore researcher and French scientist found that the strange leucosiid, *Tlos petraeus* had a habit of hiding among dead pieces of the coralline algae *Halimeda*. This observation solved a long-standing question about this peculiar animal - why did it look an eroded piece of coral rubble of a particular size and shape ? The asnwer was simple – they were mimiking the dead pieces of *Halimeda* ! With this knowledge, more specimens were found, and subsequent studies showed that the species proved so strange that it needed its own genus – *Dolos*.

Discoplax longipes A. Milne-Edwards, 1867

Land crabs are always interesting – they are obvious, often quite large and sometimes edible. Until the 1990s, one of the least understood land crabs was a species everyone was calling *Cardisoma longipes*. Supposedly described from New Caledonia, scientists never did find the species there and there was uncertainty. The species was found in some other small Pacific karst islands, but never common. Things moved fast in the late 1990s when the species was better understood – they like karst formations, living in the vegetation, and are nocturnal. The reason why they were never found on New Caledonia (where they were supposedly discovered from) was that the label was inaccurate. They were common in the nearby Loyalty Islands – which are karsts! A French expedition deep into the caves found them in good numbers! More were then found in Guam. To make the story even more interesting, in a joint study, French and Singapore researchers named a new allied species from karst caves in the Philippines, and showed that the genus *Discoplax* – erected by Milne-Edwards in 1867 – but sunk under *Cardisoma* by workers for decades – was in fact a good genus!

Odiomaris pilosus (A. Milne-Edwards, 1873)
Some one-sixth of the world's crab species are true freshwater crabs – i.e. they spend their ENTIRE life in this medium. New Caledonia, being so old and isolated, does not host any of the major freshwater crab groups. To fill the niche, one group of spider crabs have evolved to take advantage of this « empty » niche. Because there is almost no competition and nno major crustacean predators (like other freshwater crabs !), *Odiomaris pilosus* has grown large – it is the largest freshwater hymenosomatid crab known – and in some drainages, is a dominant species. The species was long placed in the genus Amarinus, but recent studies by French, Singapore and Australian scientists showed the species deserved its own genus. Moreover, a second species (*O. estaurius*) with more marine tendencies was also discovered and named !

Neikolambrus polemistes Tan & Ng, 2003
Benthochascon hemingi Alcock & Anderson, 1899
Symethis corallica Davie, 1989
Lybia tutelina Tan and Ng, 1994
Sulcodius miliaris (A. Milne-Edwards, 1873)

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Checklist of brachyura from New Caledonia

BRACHYURA Latreille, 1803

AETHRIDAE Dana, 1851

Aethra scruposa (Linne, 1764)

CALAPPIDAE Weber, 1795

Calappa calappa (Linné, 1758)
Calappa capellonis (Laurie, 1906)
Calappa clypeata (Borradaile, 1903)
Calappa depressa Miers, 1886
Calappa gallus (Herbst, 1803)
Calappa hepatica (Linné, 1758)
Calappa lophos (Herbst, 1782)
Calappa philargius (Linné, 1758)

Mursia armata de Haan, 1837
Mursia australensis Campbell, 1971
Mursia longispina Crosnier, 1997
Mursia microspina Davie & Short, 1989
Mursia musortomia Galil, 1993
Mursia trispinosa Parisi, 1914
CAMPTANDRIIDAE Stimpson, 1858
Nanusia starmuehlneri (Pretzmann, 1968)
CANCRIDAE Latreille, 1803
Platepistoma nanum Davie, 1991
CARPILIIDAE Ortmann, 1893
Carpilius convexus (Forskål, 1775)
Carpilius maculatus (Linné, 1758)
CORYSTIDAE Samouelle, 1819
Gomeza bicornis Gray, 1831 = *Corystes (Oeidea) vigintispinosa* De Haan, 1835
CRYPTOCHIRIDAE Paulson, 1875
Cecidocarcinus zibrowii Manning, 1991
Cryptochirus coralliodytes (Heller, 1861)
Hapalocarcinus marsupialis Stimpson, 1859
Lithoscaptus nami (Fize & Serène, 1957)
Lithoscaptus paradoxus A. Milne-Edwards,
Lithoscaptus prionotus Kropp, 1994
Pseudocryptochirus viridis Hiro, 1938
Xynomaia boissoni (Fize & Serène, 1955)
CYCLODORIPPIDAE Ortmann, 1892
Genkaia kenjii Tavares, 1993
Ketamia depressa (Ihle, 1916)
Krangalangia orstom Tavares, 1993
Krangalangia spinosa (Zarenkov, 1970)
Phyllotymolinum crosnieri Tavares, 1993
Tymolus daviei Tavares, 1997
Xeinostoma richeri Tavares, 1993
CYMONOMIDAE Bouvier, 1897
Elassopodus stellatus Tavares, 1993
DAIRIDAE Ng & Rodriguez, 1986
Daira perlata (Herbst, 1790)
DORIPPIDAE MacLeay, 1838
Ethusa abbreviata Castro, 2005
Ethusa crosnieri Chen, 1993
Ethusa curvipes Chen, 1993
Ethusa furca Chen, 1993
Ethusa granulosa Ihle, 1916
Ethusa indica Alcock, 1894
Ethusa izuensis Sakai, 1937
Ethusa magnipalmata Chen, 1993
Ethusa minuta Sakai, 1937
Ethusa obliquidens Chen, 1993
Ethusa orientalis Miers, 1884 = *Ethusa major* Chen, 1993
Ethusa parapygmaea Chen, 1993
Ethusa pygmaea Alcock, 1894
Ethusa quadrata Sakai, 1937
Ethusina brevidentata Chen, 1993
Ethusina ciliacirrata Castro, 2005
Ethusina coronata Castro, 2005
Ethusina dilobotus Chen, 1993

Ethusina microspina Chen, 2000
Ethusina paralongipes Chen, 1993
Ethusina pubescens Chen, 1993
Ethusina robusta Miers, 1886
Ethusina stenommata Castro, 2005
Ethusina vanuatuensis Chen, 2000

DOMECIIDAE Ortmann, 1893

Domecia hispida Eydoux & Souleyet, 1842
Jonesius triunguiculatus (Borradaile, 1902)

DROMIIDAE de Haan, 1833

Cryptodromia amboinensis de Man, 1888
Cryptodromia coronata Stimpson, 1858
Cryptodromia fallax (Lamarck, 1818)
Cryptodromia fukuii (Sakai, 1936)
Cryptodromia hilgendorfi de Man, 1888
Cryptodromia longipes McLay, 1993
Cryptodromia tuberculata Stimpson, 1858
Cryptodromiopsis bullifera (Alcock, 1900)
Cryptodromiopsis plumosa (Lewinsohn, 1984)
Cryptodromiopsis unidentata (Rüppell, 1830)
Dromia dormia (Linné, 1763)
Dromia foresti MacLay, 1991
Dromia wilsoni (Fulton & Grant, 1902)
Dromidiopsis dubia Lewinsohn, 1984
Dromidiopsis lethrinusae (Takeda & Kurata, 1976)
Dromidiopsis tridentata Borradaile, 1903
Eodromia denticulata MacLay, 1991
Epigodromia areolata (Ihle, 1913)
Epigodromia ebaloides (Alcock, 1899)
Epigodromia nodosa (Sakai, 1936)
Epigodromia rotunda MacLay, 1991
Epigodromia rugosa McLay, 1993
Frodromia atypica (Sakai, 1936)
Hemisphaerodromia abellana Barnard, 1954
Homalodromia coppingeri Miers, 1884
Lamarckdromia globosa (Lamarck, 1818)
Lauridromia intermedia (Laurie, 1906)
Lewindromia unidentata (Ruppel, 1830)
Mclaydromia colini Guinot & Tavares, 2003
Petalomera pulchra Miers, 1884
Petalomera wilsoni Fulton & Grant, 1902
Sphaerodromia kendalli Alcock & Anderson, 1894
Sphaerodromia lamellata Crosnier, 1994
Takedromia cristatipes (Sakai, 1969)
Takedromia longispina MacLay, 1991

DYNOMENIDAE Ortmann, 1892

Dynomene hispida Guérin-Méneville, 1832
Dynomene pilumnoides Alcock, 1899
Dynomene praedator A. Milne-Edwards, 1879
Metadynomene tanensis (Yokoya, 1933)
Paradynomene demon McLay and Ng, 2004
Paradynomene diablo McLay and Ng, 2004
Paradynomene quasimodo McLay and Ng, 2004

ERIPHIIDAE MacLeay, 1838

Bountiana norfolcensis (Grant & McCulloch, 1907)

Epixanthus corrosus A. Milne-Edwards, 1873
Epixanthus frontalis (H. Milne Edwards, 1834)
Eriphia sebana (Shaw & Nodder, 1803) = *Eriphia levimana* Latreille, 1817
Eriphia scabricula Dana, 1852
Globopilumnus actumnoides (A. Milne-Edwards, 1873)
Globopilumnus laciniatus (Sakai, 1980)
Hypothalassia armata (De Haan, 1833)
Ozius guttatus H. Milne Edwards, 1834
Ozius rugulosus Stimpson, 1858
Ozius tuberculosus H. Milne Edwards, 1834

GECARCINIDAE McLeay, 1838

Cardisoma carnifex (Herbst, 1796)
Discoplax hirtipes (Dana, 1852)
Discoplax longipes A. Milne-Edwards, 1867
Discoplax rotunda (Quoy & Gaimard, 1824)

GERYONIDAE Colosi, 1923

Chaceon bicolor Manning & Holthuis, 1989

GONEPLACIDAE Dana, 1851

Carcinoplax cooki Rathun, 1906
Carcinoplax crosnieri Guinot & Richer de Forges, 1981
Carcinoplax microphthalmus Guinot &Richer de Forges, 1981
Carcinoplax polita Guinot, 1989
Carcinoplax setosus A. Milne-Edwards, 1869
Goneplax marivenae Komatsu & Takeda, 2004
Hexapus sexpes (Fabricius, 1798)
Intesius pilosus Guinot & Richer de Forges, 1981
Intesius richeri Crosnier & Ng, 2004
Mathildella maxima Guinot & Richer de Forges, 1981
Notonyx nitidus A. Milne-Edwards, 1873
Parapilumnus cristimanus (A. Milne-Edwards, 1873)
Platypilumnus jamiesoni Richer de Forges, 1996
Progeryon vaubani Guinot & Richer de Forges, 1981
Psopheticus vocans Guinot, 1985

GRAPSIDAE MacLeay, 1838

Geograpsus grayi (H. Milne Edwards, 1853)
Grapsus albolineatus Lamarck, 1818
Grapsus tenuicrustatus (Herbst, 1783)
Metagrapsus integer A. Milne-Edwards, 1873
Metagrapsus punctatus A. Milne-Edwards, 1873
Metasesarma aubryi A. Milne-Edwards, 1869
Metopograpsus pictus (A. Milne-Edwards, 1863)
Metopograpsus thukuhar (Owen, 1839)
Pachygrapsus minutus A. Milne-Edwards, 1873
Pachygrapsus planifrons De Man, 1888
Pachygrapsus plicatus (H. Milne Edwards, 1837)

HEXAPODIDAE Miers, 1886

Hexaplax megalops Doflein, 1904

HOMOLIDAE de Haan, 1839

Dagnaudus petterdi (Grant, 1905)
Homola coriolisi Guinot & Richer de Forges, 1995
Homola mieensis Sakai, 1979
Homola orientalis Henderson, 1888
Homola ranunculus Guinot & Richer de Forges, 1995
Homolochunia kullar Griffin & Brown, 1976
Homologenus levii Guinot & Richer de Forges, 1995

Homolomannia sibogae Ihle, 1912
Ihlopsis tirardi Guinot & Richer de Forges, 1995
Lamoha inflata (Guinot & Richer de Forges, 1981)
Latreillopsis antennata Guinot & Richer de Forges, 1995
Latreillopsis gracilipes Guinot & Richer de Forges, 1981
Paromola bathyalis Guinot & Richer de Forges, 1995
Paromolopsis boasi Wood-Mason, 1891

HOMOLODROMIIDAE Alcock, 1899

Dicranodromia foersteri Guinot, 1993
Dicranodromia spinulata Guinot, 1995
Homolodromia kai Guinot, 1993

HYMENOSOMATIDAE MacLeay, 1838

Elamena minuta A M Edwards, 1873
Elamena truncata (Stimpson, 1858)
Elamena vesca Ng & Richer de Forges, 1996
Elamenopsis lineata A. Milne-Edwards, 1873
Halicarcinus keijibabai (Takeda & Miyake, 1971)
Micas minutus (A. Milne-Edwards, 1873)
Micas falcipes Ng & Richer de Forges, 1996
Neorhynchoplax euryrostris Davie& Richer deForges,1996
Odiomaris estuarius Davie & Richer de Forges, 1996
Odiomaris pilosus (A. Milne-Edwards, 1873)

LATREILLIIDAE Stimpson, 1858

Latreillia metanesa William, 1982

LEUCOSIIDAE Samouelle, 1819

Alox ornatum (Ihle, 1918)
Alox patella (Alcock, 1896)
Alox rugosum (Stimpson, 1858)
Arcania elongata Yokoya, 1933
Arcania gracilis (Henderson, 1893)
Arcania tuberculata Bell, 1855
Ebaliopsis erosa (A. Milne-Edwards, 1873)
Dolos petraeus (A. Milne Edwards, 1874)
Euclosia concinna Galil, 2003
Leucosia anatum (Herbst, 1783) = *Leucosia neocaledonica* A. Milne-Edwards, 1873
Leucosia rubripalma Galil, 2003
Myra eudactyla Bell, 1855
Myra fugax (Fabricius, 1798)
Myra kesselerii (Paulson, 1875)
Nucia speciosa Dana, 1852
Oreophorus crosnieri Tan & Ng, 1995
Oreotlos bertrandi Tan & Ng, 1995
Oreotlos etor Tan & Richer de Forges, 1993
Oreotlos pax Tan & Ng, 1995
Philyra taekoae Takeda, 1972
Randallia serènei Richer de Forges, 1983
Raylilia coniculifera Galil, 2001
Raylilia mirabilis Galil, 2001
Raylilia uenoi (Takeda, 1995)
Tanaoa nanus Galil, 2003
Tanaoa pustulosus (Wood-Mason, in Wood-Mason & Alcock, 1891)
Toru granuloides (Sakai, 1961)
Toru pilus (Tan, 1996)
Toru septimus, Galil, 2003
Urnalana elata (A. Milne-Edwards, 1873)

Urnalana elatoides Galil, 2005
Urnalana granulimera Galil, 2005
Urnalana insularis (Takeda & Miyake, 1976)
Urnalana margaritata (A. Milne-Edwards, 1873)

MAJIDAE Samouelle, 1819

Camposcia retusa Latreille, 1829
Criocarcinus superciliosus (Linné, 1767)
Cyclax suborbicularis (Stimpson, 1858)
Cyrtomaia coriolisi Richer de Forges & Guinot, 1988
Cyrtomaia cornuta Richer de Forges & Guinot, 1988
Cyrtomaia ericina Guinot & Richer de Forges, 1982
Cyrtomaia furici Richer de Forges & Guinot, 1988
Cyrtomaia griffini Richer de Forges & Guinot, 1989
Cyrtomaia horrida Rathbun, 1916
Cyrtomaia ihlei Guinot & Richer de Forges, 1982
Cyrtomaia murrayi Miers, 1886
Cyrtomaia platypes Yokoya, 1933
Grypacheus hyalinus (Alcock & Anderson, 1894)
Hoplophrys oatesii Henderson, 1893
Hyastenus sebae White, 1847
Kimbla neocaledonica Griffin & Tranter, 1986
Lahaina agassizii (Rathbun, 1902)
Menaethius monoceros (Latreille, 1825)
Micippa philyra (Herbst, 1803)
Micippa platipes Rûppell, 1830
Micippa thalia (Herbst, 1803)
Oncinopus neptunus Adams & White, 1848
Oxypleurodon mammatus Guinot & Richer de Forges, 1986
Oxypleurodon orbiculatus (Guinot & Richer de Forges, 1986)
Oxypleurodon stuckiae (Guinot & Richer de Forges, 1986)
Perinia tumida Dana, 1851
Picroceros armatus A. Milne-Edwards, 1865
Platymaia fimbriata Rathbun, 1916
Platymaia rebierei Guinot & Richer de Forges, 1985
Platymaia wyvillethomsoni Miers, 1886
Pleistacantha cervicornis Ihle & Ihle-Landenberg, 1931
Pleistacantha exophthalmus Guinot & Richer de Forges, 1982
Pleistacantha japonica (Yokoya, 1933)
Schizophroida hilensis (Rathbun, 1906)
Schizophrys aspera (H. Milne Edwards, 1834)
Tiarinia gracilis Dana, 1852
Tylocarcinus styx (Herbst, 1803)
Xenocarcinus depressus Miers, 1874
Xenocarcinus tuberculatus White, 1847

MACROPHTHALMIDAE Dana, 1851

Macrophthalmus bosci Audouin & Savigny, 1825
Macrophthalmus convexus Stimpson, 1858
Macrophthalmus latreillei (Desmarest, 1822)
Macrophthalmus milloti Crosnier, 1965
Macrophthalmus quadratus A. Milne-Edwards, 1873
Macrophthalmus tomentosus Eydoux & Souleyet, 1842

MATUTIDAE De Haan, 1835

Ashtoret lunaris (Forskål, 1775)
Izanami inermis (Miers, 1884)

MICTYRIDAE Dana, 1852

Mictyris longicarpus Latreille, 1806

OCYPODIDAE Ortmann, 1894

Ocypode ceratophthalmus (Pallas, 1772)
Ocypode cordimanus Latreille, 1818
Uca arcuata (de Haan, 1835)
Uca crassipes (Adams & White, 1848)
Uca coarctata coarctata (H. Milne Edwards, 1852)
Uca dussumieri dussumieri (H. Milne Edwards, 1852)
Uca lactea lactea (de Haan, 1835)
Uca perplexa (H. Milne Edwards, 1852)
Uca tetragonon (Herbst, 1790)
Uca triangularis triangularis (A. Milne-Edwards, 1873)
Uca vomeris McNeill, 1920

PALICIDAE Bouvier, 1898

Crossotonotus compressipes A. Milne-Edwards, 1873
Crossotonotus lophocheir Castro, 2000
Crossotonotus spinipes (de Man, 1888)
Miropalicus vietnamensis (Zarenkov, 1968)
Neopalicus contractus (Rathbun, 1902)
Neopalicus jukesii (White, 1847)
Palicoides longimanus (Miyake, 1936)
Palicoides whitei (Miers, 1884)
Paliculus foliatus Castro, 2000
Paliculus kyusyuensis (Yokoya, 1933)
Parapalicus ambonensis Moosa & Serène, 1981
Parapalicus armatus Castro, 2000
Parapalicus clinodentatus Castro, 2000
Parapalicus denticulatus Castro, 2000
Parapalicus inanis Castro, 2000
Parapalicus piruensis Moosa & Serène, 1981
Parapalicus trispiralis Castro, 2000
Pseudopalicus acanthodactylus Castro, 2000
Pseudopalicus amadaibai (Sakai, 1963)
Pseudopalicus declivis Castro, 2000
Pseudopalicus glaber Castro, 2000
Pseudopalicus investigatoris (Alcock, 1900)
Pseudopalicus oahuensis (Rathbun, 1906)
Pseudopalicus serripes (Alcock & Anderson, 1895)
Rectopalicus amphiceros Castro, 2000
Rectopalicus ampullatus Castro, 2000
Rectopalicus woodmasoni (Alcock, 1900)

PARTHENOPIDAE Miers, 1879

Aulacolambrus diacanthus (de Haan, 1837)
Aulacolambrus hoplonotus (Adams & White, 1849)
Certolambrus pugilator (A. Milne-Edwards, 1873)
Cryptopodia pan Laurie, 1906
Daldorfia horrida (Linné, 1758)
Furtipodia petrosa (Klunziger, 1906)
Garthambrus poupini (Garth, 1992)
Neikolambrus polemistes Tan & Ng, 2003
Rhinolambrus pelagicus (Rüppell, 1830)

PILUMNIDAE Samouelle, 1819

Actumnus setifer (De Haan, 1835)
Camptoplax coppingeri Miers, 1884
Ceratocarcinus dilatatus A. Milne-Edwards, 1872

Ceratocarcinus longimanus White, 1847
Eumedonus brevirhynchus Chia & Ng, 1997
Glabropilumnus dispar (Dana, 1852)
Globopilumnus actumnoides A M Edwards, 1873
Gonatonotus nasutus Chia & Ng, 2000
Harrovia longipes Lanchester, 1900
Pilumnopeus granulatus Balss, 1933
Pilumnus caerulescens A. Milne-Edwards, 1873
Pilumnus cursor A. Milne-Edwards, 1873
Pilumnus heterodon Sakai, 1934
Pilumnus levimanus Dana, 1852
Pilumnus longipes A. Milne-Edwards, 1873
Pilumnus minutus de Haan, 1835
Pilumnus purpureus A. Milne-Edwards, 1873
Pilumnus vermiculatus A. Milne-Edwards, 1873
Pilumnus vespertilio Fabricius, 1793
Takedana eriphioides Davie, 1989
Tiaramedon spinosum (Miers, 1879)
Zebrida adamsii White, 1847

PINNOTHERIDAE De Haan, 1833

Pinnotheres globosus (Lucas, 1852)
Tetrias fischeri (A. Milne-Edwards, 1867)
Xanthasia murigera White, 1846

PLAGUSIIDAE Dana, 1851

Euchirograpsus timorensis Türkay, 1975
Miersiograpsus australiensis Türkay, 1978
Percnon affine (H. Milne Edwards, 1853) = *Acanthopus pilimanus* (A. Milne-Edwards, 1873)
Percnon planissimum (Herbst, 1804)
Plagusia squamosa (Herbst, 1799)

PORTUNIDAE Rafinesque, 1815

Benthochascon hemingi Alcock & Anderson, 1899
Brusinia elongata (Sakai, 1969)
Brusinia profunda Moosa, 1996
Caphyra laevis (A. Milne-Edwards, 1869)
Caphyra rotundifrons (A. Milne-Edwards, 1869)
Carupa tenuipes Dana, 1851
Charybdis amboinensis Leene, 1938
Charybdis anisodon (de Haan, 1850)
Charybdis beauforti Leene & Buitendijk, 1949
Charybdis caledonicus opici Moosa, 1997
Charybdis hellerii (A. Milne-Edwards, 1867)
Charybdis orientalis Dana, 1852
Charybdis rufodactylus Stephenson & Rees, 1968
Charybdis truncata (Fabricius, 1798)
Echinolatus caledonicus (Moosa, 1996)
Goniosoma sexdentatum (Herbst, 1803)
Libystes lepidus Miyake & Takeda, 1970
Libystes nitidus A. Milne-Edwards, 1867
Lissocarcinus laevis Miers, 1880
Lissocarcinus orbicularis Dana, 1852
Lissocarcinus polybioides Adams & White, 1849
Lupocyclus philippinensis Semper, 1880
Lupocyclus quinquedentatus Rathbun, 1906
Lupocyclus sexspinosus Leene, 1940
Lupocyclus tugelae Barnard, 1950

Nectocarcinus pubescens Moosa, 1996
Ovalipes iridescens (Miers, 1886)
Parathranites intermedius Crosnier, 2002
Parathranites orientalis Miers, 1886
Podophthalmus nacreus Alcock, 1899
Podophthalmus vigil (Weber, 1795)
Portunus argentatus (A. Milne-Edwards, 1861)
Portunus dubius Laurie, 1906
Portunus granulatus (H. Milne Edwards, 1834)
Portunus haanii (Stimpson, 1858)
Portunus hastatoides Fabricius, 1798
Portunus innominatus Rathbun, 1909
Portunus iranjae Crosnier, 1962
Portunus lecromi Moosa, 1996
Portunus longispinosus (Dana, 1852)
Portunus macrophthalmus Rathbun, 1906
Portunus mariei Guinot, 1957
Portunus nipponensis (Sakai, 1938)
Portunus orbitosinus Rathbun, 1911
Portunus pelagicus (Linné, 1758)
Portunus pubescens (Dana, 1852)
Portunus rubromarginatus (Lanchester, 1900)
Portunus rugosus (A. Milne-Edwards, 1867)
Portunus sanguinolentus (Herbst, 1796)
Portunus spiniferus Stephenson & Rees, 1967
Portunus stephensoni Moosa, 1981
Portunus tenuicaudatus Stephenson, 1961
Portunus tuberculosus (A. Milne-Edwards, 1867)
Richerellus moosai Crosnier, 2003
Scylla serrata (Forskäl, 1755)
Thalamita admete (Herbst, 1803)
Thalamita crenata (Latreille, 1829)
Thalamita danae Stimpson, 1858
Thalamita demani Nobili, 1905
Thalamita gracilipes (A. Milne-Edwards, 1873)
Thalamita picta Stimpson, 1858
Thalamita prymna (Herbst, 1803)
Thalamita savignyi (Herbst, 1803)
Thalamita sima H.Milne Edwards, 1834
Thalamita spinifera Borradaile, 1902
Thalamita spinimana Dana, 1852
Thalamita stimpsoni (A. Milne-Edwards, 1867)
Thalamitoides quadridens A. Milne-Edwards, 1869
Thalamitoides tridens A. Milne-Edwards, 1869

RANINIDAE de Haan, 1839
Lyreidus brevifrons Sakai, 1937
Symethis corallica Davie, 1989

RETROPLUMIDAE Gill, 1894
Retropluma laurentae McLay, 2006
Retropluma serenei de Saint Laurent, 1989

SESARMIDAE Dana, 1851
Clistocoeloma balansae A. Milne-Edwards, 1873
Metasesarma aubryi A. Milne-Edwards, 1869
Muradium tetragonum (Fabricius, 1798)
Nanosesarma edamensis (de Man, 1887)

Neosarmatium fourmanoiri Serène, 1973
Neosarmatium integrum (A. Milne-Edwards, 1873)
Neosarmatium punctatum (A. Milne-Edwards, 1873)
Neosarmatium smithi (H. Milne Edwards, 1853)
Neosarmatium trispinosum Davie, 1994
Sarmatium crassum Dana, 1851
Sesarmops impressum (H. Milne Edwards, 1837)
Parasesarma ellenae (Pretzmann, 1968)
Parasesarma leptosoma (Hilgendorf, 1869)
Parasesarma plicatum (Latreille, 1806)
Perisesarma lividum (A. Milne-Edwards, 1869)

TETRALIIDAE Castro, Ng & Ahyong, 2004
Tetralia cinctipes Paulson, 1875
Tetralia glaberrima (Herbst, 1790) = *Tetralia fulva* Serène, 1984, *T. sanguineomaculata* Galil & Clark, 1990
Tetralia nigrolineata Serène & Dat, 1957
Tetralia rubridactyla Garth, 1971
Tetraloides heterodactyla (Heller, 1861)
Tetraloides nigrifrons (Dana, 1852)

TRAPEZIIDAE Miers, 1886
Calocarcinus africanus Calman, 1909
Calocarcinus crosnieri Galil & Clark, 1990
Quadrella coronata Dana, 1852
Quadrella maculosa Alcock, 1898
Trapezia areolata Dana, 1852
Trapezia bidentata (Forskål, 1775) = *T. ferruginea* Latreille, 1828
Trapezia cymodoce (Herbst, 1801)
Trapezia digitalis Latreille, 1828
Trapezia flavopunctata Eydoux & Souleyet, 1842
Trapezia formosa Smith, 1869
Trapezia guttata Rüppell, 1830
Trapezia lutea Castro, 1997
Trapezia plana Ward, 1941 = *T. punctipes* Castro, 1997
Trapezia rufopunctata (Herbst, 1799)
Trapezia septata Dana, 1852
Trapezia serènei Odinetz, 1984

VARUNIDAE H. Milne Edwards, 1853
Helice leachi Hess, 1865
Orcovita mcnieceae Ng & Ng, 2002
Ilyograpsus paludicola (Rathbun, 1909)
Pseudograpsus albus Stimpson, 1858
Pseudograpsus elongatus (A. Milne-Edwards, 1873) = *Heterograpsus elongatus* A. Milne-Edwards, 1873
Ptychognathus barbatus (A. Milne-Edwards, 1873)
Utica barbimana (A. Milne-Edwards, 1873)
Utica glabra (A. Milne-Edwards, 1873)
Varuna litterata (Fabricius, 1798)

XANTHIDAE MacLeay, 1838
Actaea rugata Adams & White, 1848
Actaea savignyi (H. Milne Edwards, 1834)
Actaeodes hirsutissimus (Rüppell, 1830)
Actaeodes tomentosus (H. Milne Edwards, 1834)
Actumnus pugilator A. Milne-Edwards, 1873
Actumnus tomentosus Dana, 1852
Alainodaeus alis Davie, 1997
Alainodaeus rimatara Davie, 1993
Antrocarcinus petrosus Ng & Chia, 1994

Atergatis dilatatus de Haan, 1835
Atergatis floridus (Linné, 1767)
Atergatis integerrimus (Lamarck, 1818)
Atergatis obtusus A. Milne-Edwards, 1865
Atergatopsis lucasi Montrouzier, 1865
Banareia armata A. Milne-Edwards, 1869
Chlorodiella barbata (Borradaile, 1900)
Chlorodiella nigra (Forskäl, 1775)
Cranaothus deforgesi Ng, 1993
Cymo andreossyi (Audouin, 1826)
Cymo deplanatus A. Milne-Edwards, 1873
Cymo melanodactylus de Haan, 1833
Demania cultripes (Alcock, 1898)
Demania garthi Guinot, 1980
Demania intermedia Guinot, 1969
Demania mortenseni (Odhner, 1925)
Demania wardi Garth & Ng, 1985
Etisus bargibanti Crosnier, 1987
Etisus dentatus (Herbst, 1785)
Etisus electra (Herbst, 1801)
Etisus laboutei Crosnier, 1987
Etisus laevimanus Randall, 1840
Etisus utilis Jacquinot, 1852
Etisus villosus Clark & Galil, 1995
Euryxanthops latifrons Davie, 1997
Euxanthus exsculptus (Herbst, 1790)
Euxanthus ruali Guinot, 1971
Gaillardiellus bathus Davie, 1997
Glyptocarcinus politus Ng & Chia, 1994
Hepatoporus guinotae (Zarenkov, 1971)
Heteropanope glabra Stimpson, 1858
Leptodius davaoensis Ward, 1941
Leptodius exaratus (H. Milne Edwards, 1834)
Leptodius nudipes (Dana, 1852)
Leptodius sanguineus (H. Milne Edwards, 1834)
Liomera cinctimana (White, 1847)
Liomera granosimana A. Milne-Edwards, 1869
Liomera laevis (A. Milne-Edwards, 1873)
Liomera margaritata (A. Milne-Edwards, 1873)
Liomera monticulosa (A. Milne-Edwards, 1873)
Liomera nigrimanus Davie, 1997
Liomera rugata (H. Milne Edwards, 1834)
Liomera stimpsoni (A. Milne-Edwards, 1865)
Liomera tristis (Dana, 1852)
Liomera venosa (H. Milne Edwards, 1834)
Lophactaea actoeoides A. Milne-Edwards, 1867
Lophozozymus bertonciniae Guinot & Richer de Forges, 1981
Lophozozymus cristatus A. Milne-Edwards, 1867
Lophozozymus dodone (Herbst, 1801)
Lophozozymus pulchellus A. Milne-Edwards, 1867
Lophozozymus superbus (Dana, 1852)
Lybia tutelina Tan & Ng, 1994
Macromedaeus crassimanus (A. Milne-Edwards, 1867)
Macromedaeus nudipes (A. Milne-Edwards, 1867)
Medaeops gemini Davie, 1997

Medaeops merodontos Davie, *1997*
Medaeus aztec Davie, 1997
Medaeus elegans (A. Milne-Edwards, 1867)
Medaeus nodosus (A. Milne-Edwards, 1867)
Meractaea multidentata Davie, 1997
Metaxanthops acuta Serène, 1984
Miersiella haswelli (Miers, 1886)
Neoliomera insularis (White, 1847)
Neoxanthias impressus (Lamarck, 1818)
Neoxanthops lineatus (A. Milne-Edwards, 1867)
Palatigum trichostoma Davie, 1997
Paractaea retusa (Nobili, 1905)
Paramedaeus globosus Serène & Vadon, 1981
Paramedaeus simplex (A. Milne Edwards, 1873)
Paraxanthias notatus (Dana, 1852)
Paraxanthias pachydactylus (A. Milne-Edwards, 1867)
Paraxanthodes cumatodes (MacGilchrist, 1905)
Phymodius monticulosus (Dana, 1852)
Phymodius nitidus (Dana, 1852)
Phymodius ungulatus (H. Milne Edwards, 1834)
Pilodius areolatus (H. Milne Edwards, 1834)
Pilodius flavus Rathbun, 1894
Pilodius maotieni Serène, 1971
Pilodius nigrocrinitus Stimpson, 1858
Pilodius pubescens Dana, 1852
Pilodius pugil Dana, 1852
Platypodia anaglypta (Heller, 1861)
Platypodia granulosa (Rüppell, 1830)
Platypodia pseudogranulosa Serène, 1984
Psaumis cavipes (Dana, 1852)
Pseudoliomera violacea (A. Milne-Edwards, 1873)
Rata chalcal Davie, 1997
Sulcodius miliaris (A. Milne-Edwards, 1873)
Xanthias lamarcki (H. Milne Edwards, 1834)
Xanthias pachydactylus (A. Milne-Edwards, 1873)
Xanthias punctatus (H. Milne Edwards, 1834)
Xanthias teres Davie, 1997
Zosimus aeneus (Linné, 1758)
Zosimus pilosus A. Milne-Edwards, 1867

Shallow water Stomatopoda of New Caledonia (0–100 m)

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The most recent summary of the Stomatopoda of New Caledonia and adjacent localities recorded 69 species in 31 genera and 10 families of which 60 occurred at depths of 100 m or less. Richer de Forges & Moosa (1992) analysed the distribution patterns of the stomatopods from the lagoons of New Caledonia and Chesterfield Atoll based on the results of Moosa (1991). The present revised list of New Caledonian Stomatopoda is derived from recent revisionary studies (Ahyong, 2001) and reexamination of the stomatopod collections in the Muséum national d'Histoire naturelle, Paris (Ahyong, unpublished). Sixty-two species of stomatopod distributed in 35 genera and 9 families occur in the 0–100 m depth range in the New Caledonian EEZ.

The New Caledonian stomatopod fauna can be broadly divided into coral reef and lagoon components. The coral reef component largely corresponds to the cavity dwelling gonodactyloids of the families Gonodactylidae, Odontodactylidae, Protosquillidae, Pseudosquillidae and Takuidae. The gonodactyloids are the most speciose and abundant stomatopods on hard substrates and all, except for the pseudosquillids, are 'smashers'. The lagoonal component corresponds to the soft-bottom burrowing families, all of which are 'spearers', namely Eurysquillidae, Lysiosquillidae, Nannosquillidae and Squillidae. The division between reef and lagoon components, however, is not a strict one. Many gonodactyloids also occur in the lagoon amongst rubble and coral outcrops, and many burrowers, mainly lysiosquillids and nannosquillids also live in the reef flat sediments. The minute squillid, *Parvisquilla multituberculata*, lives only in deep coral cavities, and odontodactylids occupy both coral reef crevices and burrows constructed on the lagoon floor.

Fifty New Caledonian species range widely in the Indo-West Pacific, extending beyond Oceania. Seven stomatopod species are shared only with Australia. At present, only two shallow water species have not been recorded beyond New Caledonia: *Pontiosquilla caledonica* and *Neoanchisquilla semblatae*. Whether these prove to be endemic awaits further study of regional faunas. Additional described and undescribed genera and species that are apparently endemic to New Caledonia are known, but these live at depths exceeding 100 m (Ahyong, unpublished). Thus, taking present data at face value, the shallow water stomatopods of New Caledonia appear to form part of a more widespread western Pacific fauna, with low levels of endemicity. Of course, sampling that specifically targets stomatopods remains to be conducted in the region, particularly in deep coral crevices and deep burrows in soft substrates. Study of these habitats will almost certainly reveal a rich undescribed fauna that will probably also include numerous endemic species.

The new records of *Gonodactylellus micronesicus*, *G. espinosus*, *Gonodactylaceus ternatensis* and *Odontodactylus hansenii* from New Caledonia represent incremental range extensions of species previously recorded from Australia or other western Pacific localities. The record of *Gonodactyloideus tricarinatus*, however, previously known only from French Polynesia, represents a significant range extension (Ahyong, 2002).

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Checklist of the shallow water Stomatopoda of New Caledonia(0–100 m)

New records are marked *, widespread Indo-West Pacific species are marked +, species shared only with Australia %, and species presently known only from New Caledonia @.

STOMATOPODA Latreille, 1817
EURYSQUILLIDAE Manning, 1977
Coronidopsis bicuspis Hansen, 1926 +
Manningia australiensis Manning, 1970 +
GONODACTYLIDAE Giesbrecht, 1910
Gonodactylaceus falcatus (Forskäl, 1775) +
Gonodactylaceus randalli (Manning, 1978) +
Gonodactylaceus ternatensis (Manning, 1978) +
Gonodactylellus affinis (de Man, 1902) +*
Gonodactylellus erdmanni Ahyong, 2001 +
Gonodactyellus espinosus (Borradaile, 1898) +*
Gonodactylellus micronesicus (Manning, 1971) +*
Gonodactylellus rubriguttatus Erdmann & Manning, 1978 +
Gonodactylellus viridis (Serène, 1954) +
Gonodactylus chiragra (Fabricius, 1781) +
Gonodactylus platysoma Wood-Mason, 1895 +
Gonodactylus smithii Pocock, 1893 +
Gonodactyloideus tricarinatus Ahyong, 2002 +*
LYSIOSQUILLIDAE Giesbrecht, 1910
Lysiosquilla maculata (Fabricius, 1793) +
NANNOSQUILLIDAE Manning, 1980
Acanthosquilla derijardi Manning, 1969 +
Acanthosquilla multifasciata (Wood-Mason, 1895) +
Pullosquilla pardus Moosa, 1991 %
ODONTODACTYLIDAE Bigelow, 1893
Odontodactylus cultrifer (White, 1850) +
Odontodactylus hansenii (Pocock, 1893) +*
Odontodactylus latirostris Borradaile, 1907 +
Odontodactylus scyllarus (Linné, 1758) +
PROTOSQUILLIDAE Brooks, 1886
Chorisquilla hystrix (Nobili, 1899) +
Chorisquilla pococki Manning, 1975 +
Chorisquilla tuberculata (Borradaile, 1907) +
Chorisquilla tweediei (Serène, 1950) %
Echinosquilla guerinii (White, 1861) +
Haptosquilla glyptocercus (Wood-Mason, 1875) +
Haptosquilla trispinosa (Dana, 1852) %
PSEUDOSQUILLIDAE Manning, 1977
Pseudosquilla ciliata (Fabricius, 1787) +
Pseudosquillana richeri (Moosa, 1991) +
Raoulserenea hieroglyphica (Manning, 1972) +
Raoulserenea komaii (Moosa, 1991) +
SQUILLIDAE Latreille, 1803
Alimopsoides tuberculatus Moosa, 1991 %
Anchisquilla chani Ahyong, 2001 %
Areosquilla indica (Hansen, 1926) +
Areosquilla interstincta Manning, 1976 +

Areosquilla sp.nov. *
Busquilla quadraticauda (Fukuda, 1911) +
Carinosquilla australiensis Ahyong, 2001 %
Carinosquilla redacta Ahyong, 2001 %
Clorida denticauda (Chhapgar & Sane, 1967) +
Clorida gaillardi Moosa, 1985 +
Cloridina chlorida Brooks, 1886 +
Cloridina ichneumon (Fabricius, 1798) +
Cloridina inflata (Moosa, 1991) %
Cloridina moluccensis Moosa, 1973 +
Cloridina malaccensis (Manning, 1968) +
Cloridina verrucosa (Hansen, 1926) +
Fallosquilla fallax (Bouvier, 1914) +
Harpiosquilla japonica Manning, 1969 +
Leptosquilla schmeltzii (A. Milne Edwards, 1873) +
Levisquilla jurichi (Makarov, 1979) +
Miyakea nepa (Latreille, 1828) +
Neoanchisquilla semblatae Moosa, 1991 @
Oratosquilla fabricii (Holthuis, 1941) +
Oratosquillina gravieri (Manning, 1978) +
Paralimopsis carinata Moosa, 1991 +
Pontiosquilla caledonica Moosa, 1991 @
Quollastria subtilis Manning, 1978 +

TAKUIDAE Manning, 1995

Taku spinosocarinatus (Fukuda, 1909) +

Echinodermata of New Caledonia

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Prior to the research efforts conducted by the IRD (Institut pour la Recherche et le Développement) and the MNHN (Muséum National d'Histoire Naturelle de Paris) during the project MUSORSTOM, very few studies had examined the Echinodermata of New Caledonia (Cherbonnier 1980; Conand, 1979; Intes & Menou, 1979). However, the 1980's saw an increase in the research effort on littoral echinoderms of New Caledonia (Cherbonnier & Féral, 1984a et b; Guille & Vadon, 1985; Jangoux, 1984), cumulating in the Guide to the Echinoderms (Guille *et al.*, 1986), which is to date the most complete guide to this fauna in the region. With the increase in fieldwork, researchers in systematics became interested in the deep water echinoderms of New Caledonia (Bourseau *et al.*, 1991; Gebruk, 1997; Mah, 1999; O'Hara & Stöhr, in press; Smirnov, 1997, 1999; Vadon, 1991).
The littoral New Caledonian fauna is highly diverse and comprises of: 257 species, in 135 genera, from 61 families, divided into 18 orders that are spread across 5 classes. 11% of the species are from the Crinoidea, 22% the Asteroidea, 26% the Ophiuroidea, 18% the Echinoidea and 23% in the Holothuroidea. This is in comparison to 378 species observed in a study from China and 300 from the Philippines. Of the species observed in New Caledonian waters, 41% have a large distribution area and are found in the Pacific Ocean covering a region from Japan to Hawaii as well as in the Indian Ocean. 54% of them are found in the Western Indo-Pacific province and 5% of them have been observed in Australia, notably on the Great Barrier Reef. Only 4% of the echinoderm species observed are endemic to New Caledonia. Finally, the remaining 1% are cosmopolitan and are observed all over, including the Mediterranean and the Caribbean.This diversity probably represents only a small percentage of the species living in this region as several littoral echinoderms widely distributed in the west Indo-Pacific, from the Australian coast to the Indian Ocean, are not yet recorded from NC.
Indeed, fieldwork has produced samples that are rich, abundant and well conserved, but sadly, still very little studied. The focus to date has essentially been on the littoral and deep water Ophiuroidea, the littoral Holothuroidea and the stalked Crinoidea. Moreover, with each new investigation new species are described as highlighted in several recent publications (Goppard, 2006 ; Messing, 2003; O'Hara & Stöhr, 2006). The number of echinoderms found in New Caledonia should increase once all of the material collected will have been studied. The present underestimated diversity is the result of the low number of specialists working in the field combined with the relative inaccessibility of the study sites. The Echinodermata are inaccessible for the following reasons:

Cryptic species;
Species living off substrates that are difficult to access (eg. stalked Crinoidea from the Holopodia and Eudesicrinidia are small and colonise the escarpments of submarine mountains);
Cavity dwelling species;
Nocturnal species (essentially littoral species);
Species with a small size;

The low rates of endemnicity of the littoral fauna are more related to the lack of focussed study on the already collected samples rather than the lack of species. Only the common species have been inventoried while the rest is still remains to be analysed. The deep water fauna of New Caledonia possesses a high degree of endemicity. The fauna also presents several paedomorphic forms, such as the ophiurians *Ophiphycis guillei* and *Ophiopyrgus trispinosus*. This deep water fauna is composed of many archaic taxons such as *Gymnochrinus richeri* (a stalked crinoid) that was discovered for the first time in New Caledonia in 1987. This gender belongs to the family Hemicrinidae, thought to have been extinct since the Cretacean. Similarly, *Prosiocrinus ruberrimus* is the only representative of the Jurassic family the Millericrinidae and *Proeudesicrinus lifouensis,* an endemic genre and species, is the only representative of the liasic family of the Eudesicrinidae.

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Some comments on the Species List of New Caledonia

ASTERIDES

BRISINGIDA
BRISINGASTERIDAE

**Brisingaster robillardi* Loriol, 1883

Novodinia sp. Mah, in prep.

FORCIPULATIDA

ASTERIIDAE

Coronaster pauciporis Jangoux, 1984 **NC**

ZOROASTERIDAE

**Zoroaster* sp. Mah, in prep.

NOTOMYOTIDA

BENTHOPECTINIDAE

*benthopecinids *juvenils* Mah, in prep.

PAXILLOSIDA

ASTROPECTINIDAE

Astropecten polyacanthus Müller & Troschel, 1842

GONIASTERIDAE

Iconaster uchelbeluuensis Mah, 2005

Tosia queenslandensis Livingstone, 1932

LUIDIIDAE

Luidia maculata Müller & Troschel, 1842

Luidia savignyi (Audouin, 1826)

SPINULOSIDA

ECHINASTERIDAE

Echinaster callosus von Marenzeller, 1895

Echinaster luzonicus (Gray, 1840)

Echinaster varicolor H.L. Clark, 1938

VALVASTERIDAE

Valvaster striatus (Lamarck, 1816)

VALVATIDA

ACANTHASTERIDAE

Acanthaster planci (Linné, 1758)

ARCHASTERIDAE

Archaster typicus Müller & Troschel, 1840

ASTERINIDAE

Asterina burtoni Gray, 1840

Disasterina abnormalis Perrier, 1875

Nepanthia briareus (Bell, 1894)

Patiriella exigua (Lamarck, 1816)

ASTERODISCIDIDAE

Asterodiscides helenotus (Fisher, 1913)

Asterodiscides soelae Rowe, 1985

ASTEROPSEIDAE

Asteropsis carinifera (Lamarck, 1816)

CHAETASTERIDAE

Chaetaster moorei Bell, 1894

MITHRODIIDAE

Mithrodia clavigera (Lamarck, 1816)

Thromidia catalai Pope & Rowe, 1977

OPHIDIASTERIDAE

Celerina heffernani (Livingstone, 1931)

Cistina columbiae Gray, 1840

Fromia indica (Perrier, 1869)

Fromia milleporella (Lamarck, 1816)

Fromia monilis Perrier, 1875

Fromia pacifica H.L. Clark, 1921

Gomophia egyptiaca Gray, 1840

Gomophia watsoni (Livingstone, 1936)

Heteronardoa carinata (Koehler, 1910)

Leiaster coriaceus Peters, 1852
Leiaster leachi (Gray, 1840)
Leiaster speciosus von Martens, 1866
Linckia guildingi Gray, 1840
Linckia laevigata (Linné, 1758)
Linckia multifora (Lamarck, 1816)
Nardoa frianti Koehler, 1910
Nardoa gomophia (Perrier, 1875)
Nardoa novaecaledoniae (Perrier, 1875)
Nardoa tuberculata Gray, 1844
Neoferdina cumingi (Gray, 1840)
Neoferdina offreti (Koehler, 1910)
Ophidiaster cribrarius Lütken, 1871
Ophidiaster granifer Lütken, 1871
Ophidiaster helicostichus Sladen
Ophidiaster hemprichi Müller & Troschel, 1842
Tamaria fusca (Gray, 1840)
**Tamaria* sp. Mah, in prep.

OREASTERIDAE

Choriaster granulatus Lütken, 1869
Culcita novaeguineae Müller & Troschel, 1842
Halityle regularis Fisher, 1913
Pentaceraster alveolatus (Perrier, 1875)
Pentaceraster regulus (Müller & Troschel, 1842)
Poraster superbus (Moebius, 1859)
Protoreaster nodosus (Linné, 1758)

VELATIDA

PTERASTERIDAE

Euretaster attenuatus Jangoux, 1984 **NC**
Euretaster insignis (Sladen, 1882)

SOLASTERIDAE

Seriaster regularis Jangoux, 1984

ECHINIDES

CIDAROIDA

CIDARIDAE

Chondrocidaris brevispina (H.L. Clark, 1925)
Chondrocidaris gigantea A. Agassiz, 1863
Eucidaris metularia (Lamarck, 1816)
Phyllacanthus imperialis (Lamarck, 1816)
Prionocidaris australis (Ramsay, 1885)
Prionocidaris baculosa (Lamarck, 1816)
Prionocidaris bispinosa (Lamarck, 1816)

ECHINOIDA

ECHINOMETRIDAE

Echinometra mathaei (de Blainville, 1825)
Echinostrephus aciculatus A. Agassiz, 1863
Heterocentrotus mammillatus (Linné, 1758)
Heterocentrotus trigonarius (Lamarck, 1816)

PARASALENIIDAE

Parasalenia gratiosa A. Agassiz, 1863
Parasalenia pöhlii Pfeffer, 1887

TOXOPNEUSTIDAE

Gymnechinus epistichus H.L. Clark, 1912
Pseudoboletia indiana (Michelin, 1862)

Toxopneustes pileolus (Lamarck, 1816)
Tripneustes gratilla (Linné, 1758)
DIADEMATOIDA
DIADEMATIDAE
Astropyga radiata (Leske, 1778)
Diadema savignyi (Michelin, 1845)
Diadema setosum (Leske, 1778)
Echinothrix calamaris (Pallas, 1774)
Echinothrix diadema (Linné, 1758)
ECHINOTHURIOIDA
ECHINOTHURIIDAE
Asthenosoma varium Grube, 1868
PHYMOSOMATOIDA
STOMOPNEUSTIDAE
Stomopneustes variolaris (Lamarck, 1816)
ARBACIIDAE
Coelopleurus n.sp. (Coppard, in press) NC
TEMNOPLEUROIDA
TEMNOPLEURIDAE
Mespilia globulus (Linné, 1758)
Salmacis belli Döderlein, 1902
Temnopleurus toreumaticus (Leske, 1778)
SPATANGOIDA
BRISSIDAE
Brissopsis luzonica (Gray, 1851)
Brissus latecarinatus (Leske, 1778)
Eupatagus rubellus Mortensen, 1948
Metalia angustus de Ridder, 1984
Metalia spatagus (Linné, 1758)
Metalia sternalis (Lamarck, 1816)
SCHIZASTERIDAE
Schizaster lacunosus (Linné, 1758)
SPATANGIDAE
Maretia planulata (Lamarck, 1816)
LOVENIIDAE
Lovenia elongata (Gray, 1845)
CLYPEASTEROIDA
CLYPEASTERIDAE
Clypeaster humilis (Leske, 1778)
Clypeaster latissimus (Lamarck, 1816)
Clypeaster oshimensis Ikeda, 1935
Clypeaster reticulatus (Linné, 1758)
LAGANIDAE
Laganum depressum tonganense L. Agassiz, 1841
Peronella lesueuri (L. Agassiz, 1841)
SCUTELLIDAE
Echinodiscus auritus Leske, 1778
Echinodiscus bisperforatus truncatus (L. Agassiz, 1841)
Echinodiscus tenuissimus (L. Agassiz, 1847)

HOLOTHURIDES
APODIDA
CHIRIDOTIDAE
Polycheira rufescens (Brandt, 1835)
**Trochodota neocaledonica* Smirnov, 1997 NC

SYNAPTIDAE

Euapta godeffroyi (Semper, 1868)
**Labidoplax georgii* Smirnov, 1997 NC
Opheodesoma australiensis Heding, 1931
Opheodesoma spectabilis Fisher, 1907
Polyplectana kefersteini (Selenka, 1867)
**Rynkatorpa coriolis* Smirnov, 1997 NC
Synapta maculata (Chamisso & Eysenhardt, 1821)
Synapta ooplax Wien, 1881
Synapta reticula Semper, 1868
Synaptula media Cherbonnier & Féral, 1984

ASPIDOCHIROTIDA

HOLOTHURIIDAE

Actinopyga albonigra Cherbonnier & Féral, 1984
Actinopyga crassa Panning, 1944
Actinopyga echinites (Jaeger, 1833)
Actinopyga flammea Cherbonnier, 1979
Actinopyga fusca Cherbonnier, 1980 NC
Actinopyga lecanora (Jaeger, 1833)
Actinopyga mauritiana (Quoy & Gaimard, 1833)
Actinopyga miliaris (Quoy & Gaimard, 1833)
Actinopyga palauensis Panning, 1944
Actinopyga spinea Cherbonnier, 1980
Bohadschia argus Jaeger, 1833
Bohadschia graeffei (Semper, 1868)
Bohadschia maculisparsa Cherbonnier & Féral, 1984 NC
Bohadschia marmorata (Jaeger, 1833)
Bohadschia similis (Semper, 1868)
Bohadschia tenuissima (Semper, 1868)
Bohadschia vitiensis (Semper, 1867)
Holothuria altaturricula Cherbonnier & Féral, 1984 NC
Holothuria artensis Cherbonnier & Feral, 1984
Holothuria atra Jaeger, 1833
Holothuria cinerascens Brandt, 1835
Holothuria coluber Semper, 1868
Holothuria conusalba Cherbonnier & Féral, 1984
Holothuria coronopertusa Cherbonnier, 1980
Holothuria decorata Marenzeller, 1881
Holothuria difficilis Semper, 1868
Holothuria dura Cherbonnier & Feral, 1981
Holothuria edulis Lesson, 1830
Holothuria flavomaculata Semper, 1868
Holothuria fuscocinerea Jaeger, 1833
Holothuria fuscogilva Cherbonnier, 1980
Holothuria fuscopunctata Jaeger, 1833
Holothuria hilla Lesson, 1830
Holothuria impatiens (Forskäl, 1775)
Holothuria leucospilota (Brandt, 1835)
Holothuria maculosa Pearson, 1913
Holothuria monacaria Lesson, 1830
Holothuria nobilis (Selenka, 1967)
Holothuria ocellata (Jaeger, 1833)
Holothuria pardalis Selenka, 1867
Holothuria pervicax Selenka, 1867
Holothuria rigida (Selenka, 1867)

Holothuria scabra Jaeger, 1833
Holothuria turriscelsa Cherbonnier, 1980
Holothuria verrucosa Selenka, 1867
STICHOPODIDAE
Stichopus chloronotus Brandt, 1835
Stichopus horrens Selenka, 1867
Stichopus noctivagus Cherbonnier, 1980
Stichopus pseudhorrens Cherbonnier, 1967
Stichopus variegatus Semper, 1868
Thelenota ananas (Jaeger, 1833)
Thelenota anax H.L. Clark, 1921
Thelenota rubricolineata Massin & Lane, 1991
DENDROCHIROTIDA
CUCUMARIIDAE
Pentacta pentagona Quoy & Gaimard, 1833
Plesiocolochirus australis (Ludwig, 1875)
PHYLLOPHORIDAE
Cladolabes aciculus (Semper, 1868)
Neothyonidium magnum (Ludwig, 1882)
Ohshimella castanea Cherbonnier, 1980
ELPIDIIDAE
**Peniagone thieli* Gebruk, 1997 NC
MYRIOTROCHIDAE
**Myriotrochus neocaledonicus* Smirnov, 1999 NC
**Prototrochus belyaevi* Smirnov, 1997 NC

CRINOIDES
COMATULIDA
ANTEDONIDAE
Antedon parviflora (A.H. Clark, 1912)
CALOMETRIDAE
Reometra mariae (A.H. Clark, 1912)
COLOBOMETRIDAE
Cenometra bella (Hartlaub, 1890)
Colobometra perspinosa (Carpenter, 1881)
Colobometra perspinosa vepretum Clark, 1909
Oligometra serripinna (Carpenter, 1881)
Pontiometra andersoni (Carpenter, 1888)
COMASTERIDAE
Capillaster multiradiatus (Linné, 1758)
Comactinia titan Messing, 2003 **NC**
Comantheria briareus (Bell, 1882)
Comanthina schlegeli (Carpenter, 1888)
Comanthus bennetti (Müller, 1841)
Comanthus parvicirrus (Müller, 1841)
Comaster distinctus (Carpenter, 1888)
Comaster multibrachiatus (Carpenter, 1888)
Comaster multifidus (Müller, 1841)
Comatella maculata (Carpenter, 1888)
Comatella nigra (Carpenter, 1888)
Comatula pectinata (Linné, 1758)
HIMEROMETRIDAE
Himerometra robustipinna (Carpenter, 1881)
MARIAMETRIDAE
Dichrometra flagellata (J. Müller, 1841)

Lamprometra palmata (J. Müller, 1841)
Oxymetra erinacea (Hartlaub, 1890)
Stephanometra echinus (A.H. Clark, 1908)
Stephanometra oxyacantha (Hartlaub, 1890)
Stephanometra spicata (P.H. Carpenter, 1881)
TROPIOMETRIDAE
Tropiometra afra (Hartlaub, 1870)
ZYGOMETRIDAE
Catoptometra magnifica (A.H. Clark, 1908)
ISOCRINIDA
PENTACRINIDAE
Metacrinus levii* Améziane-Cominardi, 1990 **NC
**Metacrinus musorstomae* Roux, 1981
**Saracrinus nobilis* (Carpenter, 1884)
**Endoxocrinus (Diplocrinus) alternicirrus* (Carpenter, 1884)
**Endoxocrinus (D.) sibogae* (Döderlein, 1907)
MILLERICRINIDA
MILLERICRINIDAE
**Proisocrinus ruberrimus* A.H. Clark, 1910
BOURGUETICRINIDAE
Porphyrocrinus* sp. **NC
BATHYCRINIDAE
Bathycrinus* sp. **NC
Caldeonicrinus vaubani* Avocat & Roux, 1990 **NC
**Naumachocrinus hawaiiensis* A.H. Clark, 1912
CYRTOCRINIDA
HEMICRINIDAE
**Gymnocrinus richeri* Bourseau *et al.*, 1987
HYOCRINIDAE
Hyocrinus cyanae* Bourseau *et al.*, 1991 **NC
**Thalassocrinus aff. pontifer* A.H. Clark, 1911
HOLOPODIDAE
Holopus alidis* Bourseau *et al.*, 1991 **NC
EUDESICRINIDAE
Proeudesicrinus lifouensis* Améziane & Bourseau, 1991 **NC
INCERTAE SEDIS
Guillecrinus neocaledonicus* Bourseau *et al.*, 1991 **NC

OPHIURIDES
EURYALIDA
ASTEROSCHEMATIDAE
Astrobrachion constrictum (Farquhar, 1900)
EURYALIDAE
Asteromorpha tenax Baker,
Euryale aspera Lamarck, 1816
GORGONOCEPHALIDAE
Astroboa granulatus (H.L. Clark, 1938)
Astroboa nuda (Lyman, 1874)
Astrocladus exiguus(Lamarck, 1816)
Astrocladus tonganus Döderlein, 1911
Astroglymma sculptum (Döderlein, 1896)
OPHIURIDA
AMPHIURIDAE
Amphiura luetkeni Duncan, 1879
Ophiocentrus asper (Koehler, 1905)
Ophiocentrus dilatatus (Koehler, 1905)

Ophiodaphne formata (Koehler, 1905)
HEMIEURYALIDAE
**Ophiomoeris nodosa* (Koehler, 1905)
OPHIACANTHIDAE
**Amphilimna transacta* (Koehler, 1930)
**Ophiacantha levispina* Lyman, 1878
**Ophiacantha longidens* Lyman, 1878
**Ophiacantha levispina* Lyman, 1878
* *Ophiacantha pentagona* (Koehler, 1897)
**Ophiacantha plicata* (Lyman, 1878)
* *Ophiacantha renekoehleri* (Koehler, 1904)
**Ophiacantha rosea* Lyman, 1878
**Ophiacantha yaldwyni* Fell, 1958
**Ophiacantha* n.sp. 1 O'Hara & Stöhr, in press NC
**Ophiacantha* n.sp. 2 O'Hara & Stöhr, in press NC
**Ophiocamax vitrea* Lyman, 1878
**Ophiologimus quadrispinus* H.L. Clark, 1925
* *Ophiomitrella granulosa* (Lyman, 1878)
**Ophiomitrella* n.sp. 1 O'Hara & Stöhr, in press NC
**Ophiomitrella* n.sp. 2 O'Hara & Stöhr, in press NC
**Ophioplinthaca* n.sp. O'Hara & Stöhr, in press NC
* *Ophioplinthaca bythiaspis* (H.L. Clark, 1911)
**Ophiurothamnus clausa* (Lyman, 1878)
*n. gen. n.sp. O'Hara & Stöhr, in press NC
OPHIACTIDAE
Ophiosphaera insignis Brock, 1888
OPHIOCOMIDAE
Ophiarthrum elegans Peters, 1851
Ophiocoma dentata Müller & Troschel, 1842
Ophiocoma erinaceus Müller & Troschel, 1842
Ophiocoma pusilla (Brock, 1888)
Ophiocoma scolopendrina (Lamarck, 1816)
Ophiomastix annulosa (Lamarck, 1816)
Ophiomastix asperula Lütken, 1869
Ophiomastix caryophyllata Lütken, 1869
Ophiomastix mixta Lütken, 1869
Ophiomastix palaoensis Murakami, 1943
Ophiomastix variabilis Koehler, 1095
Ophiopsila multipapillata Guille, 1978
Ophiopsila timida Koehler, 1930
**Ophiotreta stimulea* (Lyman, 1878)
OPHIODERMATIDAE
Cryptopelta longibrachialis Koehler, 1930
Ophiarachna delicata (H.L. Clark, 1932)
Ophiarachna incrassata (Lamarck, 1816)
Ophiarachnella gorgonia (Müller & Troschel, 1842)
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Ophioclastus hataii Murakami, 1943
**Ophioconis cupida* Koehler, 1905
Ophiostegastus novaecaledoniae Guille & Vadon, 1985 NC
OPHIOMYXIDAE
Ophiomyxa australis Lütken, 1869
**Ophiomyxa brevirima* H.L. Clark, 1915

OPHIONEREIDAE

Ophiochiton lentus Lyman, 1874
Ophionereis dubia (Müller & Troschel, 1842)
Ophionereis fusca Brock, 1888
**Ophionereis lamellosa* Matsumoto, 1915
Ophionereis porrecta Lyman, 1860

OPHIOTRICHIDAE

Gymnolophus obscura (Ljungman, 1867)
Macrophiothrix belli (Döderlein, 1896)
Macrophiothrix longipeda (Lamarck, 1816)
Macrophiothrix propinqua (Lyman, 1861)
Macrophiothrix rugosa H.L. Clark, 1938
**Ophiogymna pellicula* (Duncan, 1887)
Ophiolophus novarae Marktanner, 1887
Ophiomaza cacaotica Lyman, 1871
Ophiopteron elegans Ludwig, 1888
Ophiothela danae Verrill, 1869
Ophiothrix ciliaris (Lamarck, 1816)
Ophiothrix hybrida H.L. Clark, 1915
Ophiothrix picteti de Loriol, 1893
Ophiothrix proteus Koehler, 1905
Ophiothrix purpurea von Martens, 1867
Ophiothrix savigny (Müller & Troschel, 1842)
Ophiothrix trilineata Lütken, 1869
Ophiothrix vigelandi A.M. Clark, 1968

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**Anthophiura granulata* (Clarck, 1939)
**Anthophiura ingolfi* Fasmer, 1930
**Aspidophiura cherbonnieri* Vadon, 1991
**Astrophiura levii* Vadon, 1991
**Amphiophiura bakeri* McKnight, 2003
**Amphiophiura bullata* Litvinova, 1971
**Amphiophiura liberata* (Koehler, 1904)
**Amphiophiura pertusa* (Koehler, 1930)
**Amphiophiura sordida* (Koehler, 1930)
**Amphiophiura taraniua* McKnight, 1968
**Amphiophiura trifolium* Hertz, 1927
**Dictenophiura ctenophora* (H.L. Clark, 1909)
**Dictenophiura squamosa* Baker, 1979
Ophiolepis cincta Müller & Troschel, 1842
Ophiolepis superba H.L. Clark, 1915
**Ophiomusium laquatum* Lyman, 1882
**Ophiomusium simplex* Lyman, 1878
**Ophiophyllum novaecaledonia* Vadon, 1991
**Ophiopycis guillei* Vadon, 1991 NC
*Ophiopycis *aff.* guillei Vadon, 1991 NC
**Ophiopyrgus biocalae* Vadon, 1991 NC
**Ophiopyrgus trispinosus* Koehler, 1904
**Ophiotypa simplex* Koehler, 1897
**Ophiozonella media* (Koehler, 1904)
**Ophiura aequalis* (Lyman, 1878)
**Ophiura fluctuans* Koehler, 1922
**Ophiura irrorata* (Lyman, 1878)
**Ophiura micracantha* H.L. Clark, 1911
**Perlophiura profundissima* Belayev & Litvinova, 1972

Some comments on the Ascidian of New Caledonia

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The large exploration program focussed on the littoral marine fauna of New Caledonia (SNOM – SMIB - LAGON) demonstrated the great diversity of ascidians and considerably increased the number of identified species. In addition to this program, conducted in cooperation with the MNHN, several other oceanographic programs have, in turn, examined the fauna of the continental slope surrounding New Caledonia. The results from the examination of the samples collected by divers and from dredges have been published in several papers dating from 1987 onwards by Claude and Françoise Monniot. These authors have described 229 littoral species and 88 deep water species from more than 100m depth, of which numerous were new species. The collections are catalogued at the MNHN. Only two publications dating from before 1987 are known for New Caledonian ascidians: T. Tokioka (1961) who examined 14 species collected from the Aquarium in Noumea and from the hull of a boat; and from P. Vasseur (1967) who cites 12 species from the area surrounding Nouméa. Adding one species described by Pruvot-Fol in 1929 and the deep water species noted by Millar in 1975, this gives a total of 22 species.

The list of species attached shows the great diversity of genera, with all the important families being represented. The order Aplousobranchia (colonial ascidians) dominates in the littoral forms, similar to that observed in other tropical environments. Within this order, the Didemnidae are particularly difficult to identify and consequently, many rest unidentified. The order Stolidobranchia, which are majorly solitary, the Styelidea is the dominant in terms of number of species, as is the case in other parts of the world. The knowledge to date of the fauna of Ascidicolia in the Tropical west Pacific is insufficient enough to determine if there are endemic species in New Caledonia, this is even more complicated considering the facility with which these species can be transported on boats.

Around 50% of the species presently identified are found on the East Australian coast. A few of the species are found in New Zealand, for which there is little information. At present, species collection by divers is on the increase however, the lack of specialists in the field slows the identification process. The ascidians of New Caledonia are far from totally inventoried. At present, most of the collections come from the south and none from the coral walls. Many of the samples collected were either not mature or were too contracted to permit identification. Moreover, many species are too small or too cryptic and as a consequence have been ignored.

The affinities of the deeper water ascidians vary as a function of their family and their types of adaptation. They are generally similar to the fauna from the deep water species from temperate systems. There is no relation between the surface water species and the deep water species, even though some of the deep water species can be found in depths of less than 100m.

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ASCIDIIDAE Herdman, 1980

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Ascidia gemmata Sluiter, 1895
Ascidia glabra Hartmeyer, 1922
Ascidia melanostoma Sluiter, 1885
Ascidia munda Sluiter, 1897
Ascidia sulca C. Monniot, 1991
Ascidia sydneiensis Stimpson, 1855
Ascidia sydneiensis samea (Oka, 1935)
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Phallusia julinea (Sluiter, 1919)

CIONIDAE Lahille, 1887

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Didemnum ahu Monniot & Monniot, 1987
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Didemnum biglutinum F. Monniot, 1994
Didemnum bimasculum F. Monniot, 1994
Didemnum cineraceum (Sluiter, 1898)
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Didemnum hiopaa Monniot & Monniot, 1987
Didemnum lacertosum F. Monniot, 1994
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Aplidium nadaense (Nishikawa, 1980)
Aplidium triggsensis Kott, 1963
Euherdmania claviformis (Ritter, 1903)
Euherdmania dumosa F. Monniot, 1987
Homoeodistoma omasum F. Monniot, 1987
Polyclinum constellatum Savigny, 1816

Polyclinum macrophyllum Michaelsen, 1919
Polyclinum pute Monniot & Monniot, 1987
Pseudodistoma arborescens Millar, 1967
Pseudodistoma fragilis Tokioka, 1958
Ritterella circularis F. Monniot, 1987
Synoicum partitionis F. Monniot, 1987

PYURIDAE Hartmeyer, 1908

Bolteniopsis pacificus C. Monniot, 1989
Halocynthia cactus (Oka, 1932)
Halocynthia hispida (Herdman, 1881)
Herdmania contorta C. Monniot, 1992
Herdmania momus (Savigny, 1816)
Herdmania pallida (Heller, 1878)
Microcosmus exasperatus Heller, 1878
Microcosmus longicloa Monniot & Monniot, 1991
Microcosmus multiplicatus Tokioka, 1952
Microcosmus tuberculatus Kott, 1985
Pyura albanyensis Michaelsen, 1927
Pyura columna (Monniot & Monniot, 1991) *Herdmania*
Pyura confragosa Kott, 1985
Pyura momus (Savigny, 1816)
Pyura sacciformis (Drasche, 1884)
Pyura scortea Kott, 1985
Pyura uatio C. Monniot, 1991
Pyura viarecta Kott, 1985
Pyura vittata (Stimpson, 1852)

STYELIDAE Sluiter, 1895

Amphicarpa agnata (Kott, 1985)
Amphicarpa duploplicata (Sluiter, 1913)
Amphicarpa laboutei C. Monniot, 1988
Botryllus arenaceus C. Monniot, 1988
Botryllus aster C. Monniot, 1991
Botryllus gracilis Michaelsen, 1927
Botryllus humilis C. Monniot, 1988
Botryllus leptus (Herdman, 1899)
Botryllus niger (Herdman, 1886)
Botryllus ovalis C. Monniot, 1988
Botryllus tuberatus Ritter & Forsyth, 1917
Chorizocarpa guttata Michaelsen, 1904
Cnemidocarpa alisi C. Monniot, 1992
Cnemidocarpa areolata (Heller, 1878)
Cnemidocarpa humilis (Heller, 1878)
Cnemidocarpa irene (Hartmeyer, 1906)
Cnemidocarpa recta C. Monniot, 1991
Cnemidocarpa valborg Hartmeyer, 1919
Eusynstyela aliena C. Monniot, 1991
Eusynstyela grandis Kott, 1990
Eusynstyela misakiensis (Watanabe & Tokioka, 1972)
Eusynstyela phiala C. Monniot, 1991
Metandrocarpa manina Monniot & Monniot, 1987
Metandrocarpa manina reducta (C. Monniot, 1988)
Oculinaria occultare C. Monniot, 1991
Polyandrocarpa glandulosa C. Monniot, 1987
Polyandrocarpa rollandi Tokioka, 1961
Polycarpa anguinea (Sluiter, 1898)

Polycarpa argentata (Sluiter, 1890)
Polycarpa aurita (Sluiter, 1890)
Polycarpa circumarata (Sluiter, 1904)
Polycarpa clavata Hartmeyer, 1919
Polycarpa contecta (Sluiter, 1904)
Polycarpa cryptocarpa (Sluiter, 1885)
Polycarpa insulsa (Sluiter, 1898)
Polycarpa moebii Michaelsen, 1905
Polycarpa mytiligera (Savigny, 1816)
Polycarpa nigerrima Monniot & Monniot, 2001
Polycarpa nigricans Heller, 1878
Polycarpa papillata (Sluiter, 1885)
Polycarpa pedunculata Heller, 1878
Polycarpa picteti Pizon, 1909
Polycarpa pigmentata (Herdman, 1906)
Polycarpa procera (Sluiter, 1885)
Polycarpa richeri C. Monniot, 1987
Polycarpa stirpes Kott, 1985
Stolonica variata C. Monniot, 1988
Styela areolata Heller, 1878
Styela canopus (Savigny, 1816)
Styela partita (Stimpson, 1852)
Symplegma alterna C. Monniot, 1988
Symplegma oceania Tokioka, 1961

Ascidian from deep habitats in the vicinity of New Caledonia

AGNESIIDAE Monniot & Monniot, 1991
Corynascidia alata Monniot & Monniot, 1991 23°19.6S-168°03.4E
ASCIDIIDAE Herdman, 1980
Ascidia alterna Monniot & Monniot, 1991 24°46.6S-159°40.3E 280m
Fimbrora calsubia Monniot & Monniot, 1991 21°26S-166°22.7E 1860m
Pterygascidia inversa Monniot & Monniot, 1989 23°07.6S-166°50.5E 850m
DIAZONIDAE
Araneum pedunculatum Monniot & Monniot, 1991 22°53.1S-167°17.1E 600m
DIDEMNIDAE Verrill, 1871
Leptoclinides duminus Millar, 1982 22°39.0S-167°07.4E 230m
HEXACROBILIDAE
Asajirus hemisphericus (Monniot & Monniot, 1990) 20°18.55S-167°17.6E 3700m
Asajirus gulosus (Monniot & Monniot, 1984) 20°34S-167°25E 2000-4000m
Asajirus indicus (Oka, 1913) 22°46S-166°20E 2000m
Asajirus longitestis (Monniot & Monniot, 1990) 24°19.1S-167°48.7E 1400m
Asajirus ovirarus (Monniot & Monniot, 1990) 23°05.5S-166°26.4E 1500m
Oligotrema psammites Bourne, 1902 24°47S-159°39.2E 270m
Sorbera unigonas Monniot & Monniot, 1974 23°43.3S-166°57.1E 1500-1600m
MOLGULIDAE Lacaze Duthiers, 1877
Fungulus minutulus Monniot & Monniot, 1991 22°47.3S-167°14.3E 450m
Molgula delicata Monniot & Monniot, 1991 23°08.6S-167°11.0E 500-700m
Molguloides mollis Monniot & Monniot, 1991 23°05.3S-167°45.0E 700m
Molguloides monocarpa (Millar, 1959) 22°09.0S-167°33.2E 800-2300m
Molguloides tonsus Monniot & Monniot, 1991 21°00.9S-160°50.3E 800m
Molguloides translucidus Monniot & Monniot, 1991 22°55.1S-167°22.8E 700m
Protomolgula cornuta Monniot & Monniot, 1991 22°46.4S-166°19.9E 2100m

OCTACNEMIDAE

Dicopia fimbriata Sluiter, 1905 23°19.8S-167°300.5^{E} 1200m
Myopegma melanesium Monniot & Monniot, 2003 22°16.25S-167°15.53^{E} 450m
Octacnemus bythius Moseley, 1876 23°19.8S-167°30.5^{E} 1200m
Octacnemus ingolfi Madsen, 1947 21°01.5S-166°57.4^{E} 2000m
Situla cuculli Monniot & Monniot, 1991 22°45.8S-166°20.3^{E} 2040m
Situla galeata Monniot & monniot, 1991 21°16.5S-166°43.6^{E} 2340m
Situla rineharti Monniot & Monniot, 1989 20°34.5S-167°24.7^{E} 3900m

PLURELLIDAE

Microgastra granosa (Sluiter, 1904)

POLYCITORIDAE Michaelsen, 1904

Distaplia progressa Monniot & Monniot, 1991 22°58S-167°29^{E} 520m
Protoholozoa anthos Monniot & Monniot, 1991 23°13.7S-168°04.3^{E} 320m
Protoholozoa lilium Monniot & Monniot, 1991 24°28.7S-168°O7.7^{E} 2160m

POLYCLINIDAE Milne Edwards, 1842

Aplidiopsis parvastigma Monniot & Monniot 1991 23°03.6S-167°27.0^{E} 850m
Aplidium fistulosum Monniot & Monniot 1991 23°20S-168°05^{E} 230m
Aplidium pusillum Monniot & Monniot, 1991 22°47.3S-167°14.8^{E} 450m
Aplidium scyphus Monniot & Monniot, 1991 22°59.5S-167°22.0^{E} 500m
Pharyngodictyon bisinus Monniot & Monniot 1991 23°05.8S-167°46.5^{E} 600m
Pharyngodictyon cauliflos Monniot & Monniot, 1991 22°59.5S-167°22^{E} 500m
Pharyngodictyon magnifili Monniot & Monniot 1991 18°52.8S-163°21.7^{E} 545m
Ritterella folium Monniot & Monniot, 1991 18°56.0S-163°20.0^{E} 450-660m
Ritterella rete Monniot & Monniot 1991 23°15.6S-168°03.1^{E} 300m

PYURIDAE Hartmeyer, 1908

Bathypyura asymetrica Monniot F., 1970 23°43.3S-166°58.1^{E} 1500-1600m
Boltenia hirta Monniot & Monniot, 1977 24°19.1S-167°48.7^{E} 1400m
Culeolus caudatus Monniot & Monniot , 1991 23°O8.6S-167°11.0E 600-700m
Culeolus elegans Monniot & Monniot, 1991 24°01.4S-167°08.4^{E} 1500m
Culeolus herdmani Sluiter, 1904 22°39.7S-166°27.4^{E} 400-1700m
Culeolus recumbens Herdman, 1881 23°05.5S166°26.4^{E} 1900-2000m
Herdmania columna (Monniot & Monniot, 1991) 20°48.7S-165°19.3^{E} 110m
Herdmania pennata (Monniot & Monniot, 1991) 24°42.8S-168°09.1^{E} 250m

STYELIDAE Sluiter, 1895

Bathyoncus tantulus Monniot & Monniot, 1991 23°43.3S-166°58.1^{E} 1500m
Bathyoncus lanatus Monniot & Monniot, 1991 18°48.2S-163°10.8^{E} 720m
Bathystyeloides miriducta Monniot & Monniot, 1991 23°56.2S-166°41.1^{E} 2650m
Cnemidocarpa intestinata Kott, 1985 23°05.3S-167°45.0^{E} 700m
Distomus pacificus Monniot & Monniot, 1991 22°58.7S-167°21.1^{E} 550m
Polycarpa captiosa (Sluiter, 1885)
Polycarpa carpocincta Monniot & Monniot, 2003 22°29S-166°25^{E} 250m
Polycarpa macra Monniot & Monniot, 1991 23°56.2S-166°41.1^{E} 2650m
Polycarpa producta Monniot & Monniot, 2003 23°22S-168°02^{E} 300m
Polycarpa reviviscens Monniot & Monniot, 2001 22°44S-167°17^{E} 350m
Styela kottae Monniot & Monniot, 1991 22°45.8S-166°20.3^{E} 2000-2600m

Checklist of the shore fishes of New Caledonia

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The present checklist includes the fish species known from the upper 100 m of the New Caledonian seas. Some deep-sea fishes which are occasionally found in shallow water (e.g. Loyalty Islands), high sea species which only rarely enter coastal waters, or freshwater fish species which may be found in estuaries, are excluded from this list. The geographical distribution of the shore fishes of New Caledonia is discussed by Kulbicki (in press).

A detailed annotated checklist of all New Caledonian fish species including distribution data, literature references and material lists is in preparation by R. Fricke. In the present checklist of shore fish species, all records which are verified either by museum specimens or by confirmation by revising authors, are included. Families are arranged systematically according to Nelson (2006), and species alphabetically under the family names. Doubtful records are discussed after the family name. The names which have been applied to New Caledonian shore fish species in the literature are either listed as valid species, or as synonyms or misidentifications in parentheses behind the species name. In the checklist, reference is given to materials in the collections of the Australian Museum Sydney (AMS), the Muséum National d'Histoire Naturelle Paris (MNHN), and the Staatliches Museum für Naturkunde Stuttgart (SMNS), in order to document new records.

The present checklist of the shore fishes of New Caledonia includes a total of 1694 species. Among these, 85 species are recorded from New Caledonia for the first time. As there is still a number of additional undescribed species known to the authors, and as the New Caledonian fish fauna is still incompletely known, with gaps of knowledge mainly around northern Grande Terre and the northern reefs, the Grand Récif Sud, the Ile des Pins, some of the Loyalty Islands, and the islands of Walpole, Matthew and Hunter, additional species are expected to be added to the list in future.

The 10 largest shore fish families are the Gobiidae (153 species, 9.0 % of the total species), Labridae (113 species, 6.7 %), Pomacentridae (110 species, 6.5 %), Serranidae (85 species, 5.0 %), Apogonidae (78 species, 4.6 %), Blenniidae (61 species, 3.6 %), Muraenidae (52 species, 3.1 %), Scorpaenidae (43 species, 2.5 %), Syngnathidae (42 species, 2.5 %), and Carangidae (40 species, 2.4 %). Among the shore fishes of New Caledonia, 39 species (2.3 % of the total shore fish species) are endemic to the territory. The reason for this relatively low endemism rate is that neighbouring island groups like Lord Howe Island or southern Vanuatu are relatively close, so that most species could easily disperse there in the past. If species living in deeper water (100-600 m) were included in the checklist, the figure of endemic species would be much higher. But even for shore fish species, the percentage of endemic species is expected to rise in the future as several apparently endemic species are still undescribed.

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List of Shore fishes of New Caledonia (0-100 m)

STEGOSTOMATIDAE

Stegostoma fasciatum (Seba in Hermann, 1783) (Synonym: *Stegostoma varium*).

GINGLYMOSTOMATIDAE

Nebrius ferrugineus (Lesson, 1831) (Reported by several authors under the name *Nebrius concolor*)

RHINCODONTIDAE

Rhincodon typus (Smith, 1828)

ODONTASPIDIDAE

Odontaspis noronhai (Maul, 1955)

PSEUDOCARCHARIIDAE

Pseudocarcharias kamoharai (Matsubara, 1936)

ALOPIIDAE

Alopias pelagicus Nakamura, 1935
Alopias superciliosus (Lowe, 1841)
Alopias vulpinus (Bonnaterre, 1788)

LAMNIDAE

Carcharodon carcharias (Linnaeus, 1758)
Isurus oxyrinchus Rafinesque-Schmaltz, 1810
Isurus paucus Guitart Manday, 1966

SCYLIORHINIDAE

Aulohalaelurus kanakorum Séret, 1990

CARCHARHINIDAE

Carcharhinus albimarginatus (Rüppell, 1837)
Carcharhinus amblyrhynchos (Bleeker, 1856)
Carcharhinus brevipinna (Müller & Henle, 1839)
Carcharhinus falciformis (Bibron in Müller & Henle, 1839)
Carcharhinus leucas (Valenciennes in Müller & Henle, 1839)
Carcharhinus limbatus (Valenciennes in Müller & Henle, 1839)
Carcharhinus longimanus (Poey, 1861)
Carcharhinus melanopterus (Quoy & Gaimard, 1824)
Carcharhinus obscurus (LeSueur, 1818)
Carcharhinus plumbeus (Nardo, 1827)
Carcharhinus sorrah (Valenciennes in Müller & Henle, 1839)
Galeocerdo cuvier (Peron & LeSueur in LeSeur, 1822)
Negaprion acutidens (Rüppell, 1837)
Prionace glauca (Linnaeus, 1758)
Triaenodon obesus (Rüppell, 1837)

SPHYRNIDAE
Sphyrna lewini (Griffith & Smith, 1834)
Sphyrna mokarran (Rüppell, 1837)
HEXANCHIDAE
Hexanchus vitulus Springer & Waller, 1969
SQUALIDAE
Squalus blainville (Risso, 1827)
Squalus megalops (Macleay, 1882)
RHINIDAE
Rhina ancylostoma Bloch & Schneider, 1801
RHINOBATIDAE
Rhinobatus djiddensis (Forsskål in Niebuhr, 1775)
DASYATIDAE
Dasyatis bennetti (Müller & Henle, 1841)
Dasyatis fluviorum Ogilby, 1908
Dasyatis kuhlii (Müller & Henle, 1841)
Himantura fai Jordan & Seale, 1906
Himantura granulata (Macleay, 1883)
Pastinachus sephen (Forsskål in Niebuhr, 1775)
Taeniura lymma (Forsskål in Niebuhr, 1775)
Taeniura meyeni Müller & Henle, 1841 (Synonym: *Taeniura melanospila*)
Urogymnus asperrimus (Bloch & Schneider, 1801)
MYLIOBATIDAE
- SUBFAMILY MYLIOBATINAE
Aetobatus narinari (Euphrasen, 1790)
Aetomylaeus maculatus (Gray, 1832)
Aetomylaeus vespertilio (Bleeker, 1852)
- SUBFAMILY MOBULINAE
Manta birostris (Walbaum, 1792)
Mobula tarapacana (Philippi, 1893)
ELOPIDAE
Elops hawaiiensis Regan, 1909 (Reported by several authors under the name *Elops machnata*).
MEGALOPIDAE
Megalops cyprinoides (Broussonet, 1782)
ALBULIDAE
Albula forsteri Valenciennes in Cuvier & Valenciennes, 1846 (Reported by several authors under the name *Albula vulpes*).
Albula glossodonta (Forsskål in Niebuhr, 1775)
ANGUILLIDAE
Anguilla australis Richardson, 1841 (Synonym: *Anguilla australis schmidti*)
Anguilla marmorata Quoy & Gaimard, 1824 (Synonym: *Anguilla mauritiana*)
Anguilla megastoma Kaup, 1856
Anguilla obscura Günther, 1871
Anguilla reinhardtii Steindachner, 1867
MORINGUIDAE
Moringua ferruginea Bliss, 1883
Moringua javanica (Kaup, 1856)
Moringua macrochir Bleeker, 1855
Moringua microchir Bleeker, 1853
CHLOPSIDAE
Kaupichthys atronasus Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953
Kaupichthys brachychirus Schultz, 1953 (**New record** from New Caledonia based on SMNS material from northeastern Grande Terre)
Kaupichthys diodontus Schultz, 1943
Kaupichthys hyoproroides (Strömmann, 1896)

Xenoconger fryeri Regan, 1912

MURAENIDAE

A record of *Echidna xanthospilos* (Bleeker, 1859), under the name *Gymnomuraena xanthopleura* needs verification.

Anarchias cantonensis (Schultz, 1943)
Anarchias seychellensis Smith, 1962
Echidna amblyodon (Bleeker, 1856) (**New record** from New Caledonia based on SMNS 22791 from Tao, northeastern Grande Terre)
Echidna delicatula (Kaup, 1856) (**New record** from New Caledonia based on SMNS 22943 from Lifou, Loyalty Islands)
Echidna leucotaenia Schultz, 1943 (**New record** from New Caledonia based on SMNS material from Grande Terre and Loyalty Islands)
Echidna nebulosa (Ahl, 1789)
Echidna polyzona (Richardson, 1845) (Synonym: *Megaderus catenatus*)
Echidna unicolor Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953
Enchelycore bayeri (Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953)
Enchelycore pardalis (Temminck & Schlegel, 1846)
Gymnomuraena zebra (Shaw & Nodder, 1797)
Gymnothorax albimarginatus (Temminck & Schlegel, 1846) (Reported by Rivaton *et al.* [1989] under the name *Gymnothorax hepaticus)*
Gymnothorax berndti Snyder, 1904
Gymnothorax boschii (Bleeker, 1853)
Gymnothorax buroensis (Bleeker, 1857)
Gymnothorax chilospilus Bleeker, 1865
Gymnothorax eurostus (Abbott, 1861)
Gymnothorax fimbriatus (Bennett, 1832) (Reported by Whitley [1961] under the name *Lycodontis melanospilos*)
Gymnothorax flavimarginatus (Rüppell, 1830)
Gymnothorax fuscomaculatus (Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953)
Gymnothorax gracilicauda Jenkins, 1903 (**New record** from New Caledonia based on SMNS 22912 from Lifou, Loyalty Islands)
Gymnothorax javanicus (Bleeker, 1859)
Gymnothorax kidako (Temminck & Schlegel, 1846) (**New record** from New Caledonia; reported as *Gymnothorax* sp. 5 by Laboute & Grandperrin [2000: 114])
Gymnothorax margaritophorus (Bleeker, 1865) (Synonym: *Gymnothorax talofa*)
Gymnothorax marshallensis (Schultz, 1953)
Gymnothorax melatremus Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953
Gymnothorax meleagris (Shaw in Shaw & Nodder, 1795)
Gymnothorax monochrous (Bleeker, 1856)
Gymnothorax nudivomer (Günther in Playfair & Günther, 1867) (Synonym: *Gymnothorax xanthostomus*)
Gymnothorax pictus (Ahl, 1789) (Reported as *Gymnothorax* sp. 4 by Laboute & Grandperrin [2000: 113])
Gymnothorax pindae Smith, 1962 (Reported as *Gymnothorax* sp. 3 by Laboute & Grandperrin [2000: 113])
Gymnothorax polyuranodon (Bleeker, 1853)
Gymnothorax porphyreus (Guichenot, 1848) (Reported as *Gymnothorax* sp. 2 and 6 by Laboute & Grandperrin [2000: 113, 114])
Gymnothorax pseudothyrsoideus (Bleeker, 1852)
Gymnothorax richardsonii (Bleeker, 1852) (Reported by Laboute & Grandperrin [2000: 112] under the name *Gymnothorax reticularis*)
Gymnothorax rueppellii (McClelland, 1845) (Name erroneously spelled *Gymnothorax rueppelliae* by authors)
Gymnothorax thyrsoideus (Richardson, 1845)
Gymnothorax undulatus (Commerson & Lacepède in Lacepède, 1803)

Gymnothorax zonipectis Seale, 1906
Rhinomuraena quaesita Garman, 1888
Scuticaria tigrina (Lesson, 1828)
Siderea prosopeion (Bleeker, 1853)
Strophidon sathete (Hamilton, 1822) (Synonym: *Thyrsoidea macrura*)
Uropterygius alboguttatus Smith, 1962 (**New record** from New Caledonia based on SMNS 23687 from Lifou, Loyalty Islands)
Uropterygius concolor Rüppell, 1838
Uropterygius fuscoguttatus Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953
Uropterygius macrocephalus (Bleeker, 1865)
Uropterygius makatei Gosline, 1958
Uropterygius marmoratus (Lacepède 1803) (**New record** from New Caledonia based on SMNS 18274 from southeastern Grande Terre)
Uropterygius xanthopterus Bleeker, 1859 (Reported by Schmeltz [1869: 27]; record needs verification)
Uropterygius xenodontus McCosker & Smith, 1997

OPHICHTHIDAE

Apterichtus klazingai (Weber, 1913)
Callechelys catostoma (Forster in Bloch & Schneider, 1801) (Synonym: *Callechelys melanotaenia*)
Callechelys marmorata (Bleeker, 1853) (**New record** from New Caledonia; reported as *Myrichthys* sp. by Laboute & Grandperrin [2000: 118])
Ichthyapus vulturis (Weber & Beaufort, 1916) (**New record** from New Caledonia based on SMNS 21759 from Chesterfield Islands)
Lamnostoma kampeni (Weber & Beaufort, 1916)
Lamnostoma orientalis (McClelland, 1845)
Leiuranus semicinctus (Lay & Bennett, 1839)
Muraenichthys gymnotus Bleeker, 1857
Muraenichthys laticaudatus (Ogilby, 1898)
Muraenichthys macropterus Bleeker, 1857
Muraenichthys schultzi Bleeker, 1857 (**New record** from New Caledonia based on SMNS 22801 from northern Grande Terre)
Myrichthys colubrinus (Boddaert, 1781)
Myrichthys maculosus (Cuvier, 1816)
Myrophis uropterus (Temminck & Schlegel, 1842)
Ophichthus bonaparti (Kaup, 1856)
Ophichthus cephalozona (Bleeker, 1864)
Pisodonophis boro (Hamilton, 1822)
Schismorhynchus labialis (Seale, 1917)
Schultzidia johnstonensis (Schultz & Woods, 1949)
Yirrkala insolitus McCosker, 1999 (Reported by Rivaton *et al.* [1989] under the name *Yirrkala lumbricoides*)

MURAENESOCIDAE

Muraenesox bagio (Hamilton-Buchanan, 1822)

CONGRIDAE

Ariosoma anagoides (Bleeker, 1854)
Ariosoma anago (Temminck & Schlegel, 1846)
Ariosoma mauritianum (Pappenheim, 1914)
Ariosoma scheelei (Strömman, 1896)
Conger cinereus (Rüppell, 1828) (Reported by Jouan [1879] as *Conger marginatus*; reported by Fourmanoir, [1981] under the name *Conger japonicus*)
Conger verreauxi Kaup, 1856
Conger wilsoni (Banning in Bloch & Schneider, 1801)
Gnathophis habenatus (Richardson, 1848) (Reported by Castle [1963] as *Gnathophis habenatus longicaudus*)

Gnathophis umbrellabius (Whitley, 1948) (Synonym: *Gnathophis incognitus* Castle, 1963; **new record** from New Caledonia based on Castle [1963: 37-45])
Heteroconger hassi (Klausewitz & Eibl-Eibesfeld, 1959) (Synonym: *Taenioconger hassi neocaledoniensis* Castle, 1967)
Heteroconger tomberua Castle & Randall, 1999

ENGRAULIDAE

Encrasicholina devisi (Whitley, 1940)
Encrasicholina heteroloba (Rüppell, 1837)
Encrasicholina punctifer (Fowler, 1938)
Engraulis australis (White, 1790) (Reported by Fowler [1928: 33] under the name *Engraulis indica*, and by Fourmanoir [1971: 110] as *Engraulis japonicus*).
Stolephorus indicus (Hasselt, 1823)
Stolephorus insularis Hardenberg, 1933 (Reported by Rivaton *et al.* [1989] under the name *Stolephorus tri*)
Stolephorus waitei Jordan & Seale, 1906
Thryssa baelama (Forsskål in Niebuhr, 1775)

CHIROCENTRIDAE

Chirocentrus dorab (Forsskål in Niebuhr, 1775) (Synonym: *Neosudis vorax* Castelnau, 1873)

CLUPEIDAE

Amblygaster clupeoides Bleeker, 1849
Amblygaster sirm (Walbaum, 1792)
Anodontostoma chacunda (Hamilton Buchanan, 1822)
Dussumieria elopsoides Bleeker, 1849 (Reported by several authors under the name *Dussumieria acuta*)
Herklotsichthys quadrimaculatus (Rüppell, 1837) (*Clupea mauritiana* Bennett, 1833 is a senior synonym according to Fricke [1999: 73], but should not be used)
Nematalosa come (Richardson, 1846)
Sardinella fijiense (Fowler & Bean, 1923) (Reported by Borodin [1932] under the name *Clupea sindensis*)
Sardinella melanura (Cuvier, 1829)
Spratelloides delicatulus (Bennett, 1832)
Spratelloides gracilis (Temminck & Schlegel, 1846)

CHANIDAE

Chanos chanos (Forsskål in Niebuhr, 1775)

GONORYNCHIDAE

Gonorynchus greyi (Richardson, 1845) (Reported by several authors under the name *Gonorynchus gonorynchus* with different spelling)

PLOTOSIDAE

Plotosus lineatus (Thunberg, 1787) (Synonyms: *Plotosus anguillaris*, *Plotosus arab*)

AULOPIDAE

Hime japonica (Günther, 1880) (Reported by several authors under the name *Aulopus japonicus*)

SYNODONTIDAE

A record of *Saurida longimanus* (Norman, 1939) by Rivaton *et al.* (1989: 74) needs verification.
Saurida gracilis (Quoy & Gaimard, 1824)
Saurida nebulosa Valenciennes in Cuvier & Valenciennes, 1850 (This species was confused by some authors with *S. gracilis*)
Saurida tumbil (Bloch, 1795)
Saurida undosquamis (Richardson, 1848) (Reported by Laboute & Grandperrin, 2000: 126 under the name *Saurida* sp.)
Synodus binotatus Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953
Synodus dermatogenys Fowler, 1912 (This species was confused by several authors with *Synodus variegatus* and *Synodus englemani*)
Synodus doaki Russell & Cressey, 1979
Synodus hoshionis (Tanaka, 1917)
Synodus jaculum Russell & Cressey, 1979

Synodus macrocephalus (Cressey, 1981)
Synodus oculeus Cressey, 1981
Synodus rubromarmoratus Russell & Cressey, 1979
Synodus similis (McCulloch, 1921)
Synodus tectus (Cressey, 1981) (Reported by Rivaton [1989: 142] under the name *Synodus variegatus*)
Synodus variegatus (Commerson in Lacepède, 1803) (Reported by Thollot & Kulbicki [1988: 618] under the name *Synodus englemani*)
Trachinocephalus myops (Forster in Bloch & Schneider, 1801)

MYCTOPHIDAE

Some species of Myctophidae, like *Diaphus metopoclampus* (Cocco, 1829) or *Myctophum nitidulum* Garman, 1899, may be encountered inshore at night (e.g. at Baie du Santal, Lifou, Loyalty Islands; identification based on SMNS material).

VELIFERIDAE

Metavelifer multiradiatus (Regan, 1907)

LAMPRIDAE

Lampris guttatus (Brünnich, 1788) (Reported by Fourmanoir & Laboute [1976: 326] under the name *Lampris regius*)

TRACHIPTERIDAE

Zu cristatus (Bonelli, 1819)

POLYMIXIIDAE

Polymixia berndti Gilbert, 1905

BREGMACEROTIDAE

Bregmaceros sp. (Undescribed species; reported by authors under the name *Bregmaceros macclellandi* or *Bregmaceros mcclellandii*)
Bregmaceros japonicus Tanaka, 1908 (**New record** from New Caledonia based on SMNS 23663 from Lifou, Loyalty Islands)
Bregmaceros nectabanus Whitley, 1941
Bregmaceros rarisquamosus Munro, 1950

MORIDAE

Physiculus therosideros Paulin, 1987

CARAPIDAE

Carapus mourlani (Petit, 1934)
Echiodon coheni Williams, 1984
Encheliophis homei (Richardson, 1846)
Encheliophis vermicularis (Müller, 1842)
Onuxodon fowleri (Smith, 1955) (Reported by authors under the name *Onuxodon margaritiferae*)
Onuxodon parvibrachium (Fowler, 1927)
Pyramodon ventralis Smith & Radcliffe, 1913

OPHIDIIDAE

Brotula multibarbata Temminck & Schlegel, 1846
Brotula townsendi Fowler, 1901
Monomitopus garmani (Smith & Radcliffe in Radcliffe, 1913)
Ophidion muraenolepis (Günther, 1880)

BYTHITIDAE

Several undescribed species are known to occur at New Caledonia; descriptions are under preparation by Schwarzhans, Møller and Nielsen.
Diancistrus brevirostris Schwarzhans, Møller & Nielsen, 2005 (Reported by Kulbicki & Williams [1997: 12] under the name *Brosmophyciops pautzkei* [in part])
Diancistrus longifilis Ogilby, 1899
Diancistrus tongaensis Schwarzhans, Møller & Nielsen, 2005 (Reported by authors under the name *Brosmophyciops pautzkei* [in part])
Dinematichthys randalli Machida, 1994
Dinematichthys riukiuensis Aoyagi, 1954

ANTENNARIIDAE

Antennarius coccineus (Cuvier in Lesson, 1831) (Synonym: *Abantennarius neocaledoniensis* Danois, 1964)

Antennarius commerson (Commerson & Lacepède in Anonymus, 1798) (Synonym: *Antennarius moluccensis*; reported by Laboute & Grandperrin [2000: 131] under the name *Antennarius* sp. 1-3)

Antennarius duescus Snyder, 1904

Antennarius hispidus (Bloch & Schneider, 1801) (**New record** from New Caledonia based on SMNS 19848 from Maré, Loyalty Islands)

Antennarius maculatus (Desjardins, 1840)

Antennarius nummifer Cuvier, 1816

Antennarius pictus (Shaw in Shaw & Nodder, 1794) (Reported by Whitley [1961: 64] under the name *Antennarius phymatodes*)

Antennarius rosaceus Smith & Radcliffe in Radcliffe, 1912 (**New record** from New Caledonia based on SMNS 23913 from Lifou, Loyalty Islands)

Antennarius striatus (Shaw in Shaw & Nodder, 1794) (Synonyms: *Chironectes tridens* Temminck & Schlegel, 1845; *Phrynelox zebrinus* Schultz, 1957)

Antennatus tuberosus (Cuvier, 1817) (Reported by Laboute & Grandperrin [2000: 132] under the name *Antennarius* sp. 4; **new record** from New Caledonia, also based on SMNS 23904 from Lifou, Loyalty Islands)

Histrio histrio (Linnaeus, 1758)

MUGILIDAE

Mugil broussoneti Valenciennes in Cuvier & Valencienes, 1836 was doubtfully recorded from New Caledonia by Harrsion & Senou, (1999: 2095).

Cestraeus goldiei (Macleay, 1883)

Cestraeus oxyrhyncus Valenciennes in Cuvier & Valenciennes, 1836

Cestraeus plicatilis Valenciennes in Cuvier & Valenciennes, 1836

Chelon macrolepis (Smith, 1849)

Chelon melinopterus (Valenciennes in Cuvier & Valenciennes, 1836)

Chelon planiceps (Valenciennes in Cuvier & Valenciennes, 1836) (Synonym: *Liza tade*)

Chelon subviridis (Valenciennes in Cuvier & Valenciennes, 1836)

Crenimugil crenilabis (Forsskål in Niebuhr, 1775) (Synonym: *Mugil neocaledonicus* Castelnau, 1873)

Crenimugil heterocheilos (Bleeker, 1855)

Ellochelon vaigiensis (Quoy & Gaimard, 1824) (Synonym: *Liza macrolepidotus*)

Moolgarda buchanani (Bleeker, 1853)

Moolgarda cunnesius (Valenciennes in Cuvier & Valenciennes, 1836)

Moolgarda engeli (Bleeker, 1858)

Moolgarda seheli (Forsskål in Niebuhr, 1775)

Mugil cephalus Linnaeus, 1758 (Synonym: *Mugil catalarum* Whitley, 1951)

Oedalechilus labiosus (Valenciennes in Cuvier & Valenciennes, 1836) (**New record** from New Caledonia based on SMNS 23994 from southern Grande Terre)

ATHERINIDAE

Record of *Atherinomorus insularum* (Jordan & Evermann, 1903) by Borodin (1932: 76) under the name *Atherina insularum* needs verification.

Atherinomorus duodecimalis (Valenciennes in Cuvier & Valenciennes, 1835) (Reported by authors under the name *Atherinomorus endrachtensis*).

Atherinomorus lacunosus (Forster in Bloch & Schneider, 1801) (Reported by Whitley [1961: 65] under the name *Pranesus ogilbyi*, and by Fourmanoir & Laboute [1976: 306] under the name *Pranesus pinguis*).

Atherion elymus Jordan & Starks, 1901

Hypoatherina barnesi Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953

Hypoatherina ovalaua (Herre, 1935)

Hypoatherina temminckii (Bleeker, 1853)

Stenatherina panatela (Jordan & Richardson, 1908)

EXOCOETIDAE

Records of *Cypselurus bruuni* Kotthaus, 1965 by Fourmanoir (1971: 111), and of *Hirundichthys volador* (Jordan, 1884) by Rivaton *et al.* (1989: 38) under the name *Prognichthys rondeletii*, need verification.

Cheilopogon atrisignis (Jenkins, 1904)
Cheilopogon dorsomacula (Fowler, 1944)
Cheilopogon furcatus (Mitchill, 1815)
Cheilopogon rapanouiensis Parin, 1962
Cheilopogon spilonotopterus (Bleeker, 1866)
Cheilopogon spilopterus (Valenciennes in Cuvier & Valenciennes, 1846)
Cheilopogon unicolor (Valenciennes in Cuvier & Valenciennes, 1847) (Synonym: *Cypsilurus ogilbyi* Jordan & Snyder in Jordan & Dickerson, 1908)
Cypselurus angusticeps Nichols & Breder, 1935
Cypselurus naresii (Günther, 1889)
Cypselurus oligolepis (Bleeker, 1866)
Cypselurus poecilopterus (Valenciennes in Cuvier & Valenciennes, 1846)
Exocoetus obtusirostris Günther, 1866
Exocoetus volitans Linnaeus, 1758
Hirundichthys speculiger (Valenciennes in Cuvier & Valenciennes, 1847)
Oxyporhamphus meristocystis (Parin, 1961)
Parexocoetus brachypterus (Günther, 1866)

HEMIRAMPHIDAE

Euleptorhamphus viridis (Russell in Hasselt, 1823)
Hemirhamphus far (Forsskål in Niebuhr, 1775) (Reported by Jouan [1879] under the name *Hemiramphus marginatus*, and by Castelnau, [1873] under the name *Hemirhamphus commersonii*)
Hyporhamphus dussumieri (Valenciennes in Cuvier & Valenciennes, 1846)
Zenarchopterus dispar (Valenciennes in Cuvier & Valenciennes, 1846)

BELONIDAE

Ablennes hians (Valenciennes in Cuvier & Valenciennes, 1846)
Platybelone argalus platyura (Bennett, 1832)
Strongylura incisa (Valenciennes in Cuvier & Valenciennes, 1846)
Strongylura leiura (Bleeker, 1851)
Strongylura urvillii (Valenciennes in Cuvier & Valenciennes, 1846)
Tylosurus acus melanotus (Bleeker, 1851)
Tylosurus crocodilus crocodilus (Peron & LeSueur in LeSueur, 1821) (Reported by Seale [1935: 345] under the name *Tylosurus indica*)

ANOMALOPIDAE

Anomalops katopron Bleeker, 1856
Photoblepharon palpebratus (Boddaert, 1781)

MONOCENTRIDIDAE

Monocentris japonica (Houttuyn, 1782)

TRACHICHTHYIDAE

Gephyroberyx darwini (Johnson, 1866)
Paratrachichthys traillli (Hutton, 1875)
Parinoberyx horridus Kotlyar, 1984

BERYCIDAE

Beryx splendens Lowe, 1834
Centroberyx affinis (Günther, 1859)
Centroberyx druzhinini (Busakhin, 1981)

HOLOCENTRIDAE

Records of *Myripristis amaena* by Rivaton *et al.* (1989: 43) and Kulbicki & Williams (1997: 12) are probably based on *Myripristis pralinia*.
Myripristis adusta Bleeker, 1853
Myripristis berndti Jordan & Evermann, 1903 (Reported by Fourmanoir & Laboute [1976: 155] under the name *Myripristis amaenus*)
Myripristis botche Cuvier, 1829 (Synonym: *Myripristis melanostictus*; reported by Fourmanoir & Laboute [1976: 156-157] under the name *Myripristis murdjan*)
Myripristis hexagona (Lacepède, 1802)
Myripristis kuntee Valenciennes in Cuvier & Valenciennes, 1831

Myripristis murdjan (Forsskål in Niebuhr, 1775) (Synonym: *Myripristis bowditchae* Woods in Schultz *et al.*, 1953)
Myripristis pralinia Cuvier, 1829
Myripristis violacea Bleeker, 1851
Myripristis vittata Valenciennes in Cuvier & Valenciennes, 1831 (Reported by Borodin [1932: 75] under the name *Myripristis trachyacron*, and by Laboute & Grandperrin [2000: 45, 140] under the name *Myripristis* sp.)
Myripristis woodsi Greenfield, 1974 (Reported by Laboute & Grandperrin [2000: 143] under the name *Myripristis* sp.; **new record** from New Caledonia)
Neoniphon argenteus (Valenciennes in Cuvier & Valenciennes, 1831)
Neoniphon opercularis (Valenciennes in Cuvier & Valenciennes, 1831)
Neoniphon sammara (Forsskål in Niebuhr, 1775)
Ostichthys hypsipterygion Randall, Shimizu & Yamakawa, 1982
Ostichthys japonicus (Cuvier in Cuvier & Valenciennes, 1829)
Ostichthys kaianus (Günther, 1880)
Plectrypops lima (Valenciennes in Cuvier & Valenciennes, 1831) (Reported by Laboute & Grandperrin [2000: 141] under the name *Myripristis hexagona*)
Sargocentron caudimaculatum (Rüppell, 1838)
Sargocentron cornutum (Bleeker, 1853)
Sargocentron diadema (Commerson & Lacepède in Lacepède, 1802)
Sargocentron ensifer (Jordan & Evermann, 1903) (Reported by Fourmanoir & Laboute [1976: 153] and Laboute & Grandperrin [2000: 138, 145] under the name *Adioryx furcatus* or *Sargocentron furcatum*)
Sargocentron iota Randall, 1998
Sargocentron lepros (Allen & Cross, 1983)
Sargocentron melanospilos (Bleeker, 1858)
Sargocentron microstoma (Günther, 1859)
Sargocentron praslin (Lacepède, 1802) (**New record** from New Caledonia based on SMNS 22634 from southern Grande Terre)
Sargocentron punctatissimum (Cuvier in Cuvier & Valenciennes, 1829)
Sargocentron rubrum (Forsskål in Niebuhr, 1775)
Sargocentron spiniferum (Forsskål in Niebuhr, 1775)
Sargocentron tiere (Cuvier in Cuvier & Valenciennes, 1829)
Sargocentron violaceum (Bleeker, 1853)

ZEIDAE
Zenopsis nebulosa (Temminck & Schlegel, 1845)

PEGASIDAE
Eurypegasus draconis (Linné, 1766)

SOLENOSTOMIDAE
Solenostomus cyanopterus Bleeker, 1854
Solenostomus paradoxus (Pallas, 1770)

SYNGNATHIDAE
Acentronura breviperula Fraser-Brunner & Whitley, 1949 (Reported by Rivaton *et al.* [1989: 73] under the names *Acentronura tentaculata*, *Acentronura australe* and *Acentronura gracilissima*, and by Laboute & Grandperrin [2000: 157, 159] under the names *Halicampus* sp. and *Hippocampus* sp.)
Corythoichthys sp. (Undescribed species similar to *Corythoichthys amplexus*)
Corythoichthys conspicillatus (Jenyns, 1842) (Reported by Fourmanoir [1971: 112] under the name *Corythoichthys flavofasciatus*).
Corythoichthys haematopterus (Bleeker, 1851)
Corythoichthys intestinalis (Ramsay, 1881) (Reported by Whitley [1961: 64] under the name *Corythoichthys flavofasciatus*, by Plessis & Fourmanoir [1966: 125] under the name *Hippichthys intestinalis waitei*, and by Kulbicki *et al.* [1994: 15] under the name *Corythoichthys amplexus*)
Corythoichthys nigripectus Herald in Schultz, Herald, Lachner, Welander & Woods, 1953
Corythoichthys ocellatus Herald in Schultz, Herald, Lachner, Welander & Woods, 1953
Corythoichthys paxtoni Dawson, 1977

Corythoichthys schultzi Herald in Schultz, Herald, Lachner, Welander & Woods, 1953
Cosmocampus banneri (Herald & Randall, 1972)
Doryrhamphus melanopleura (Bleeker, 1858) (Reported by several authors under the name *Doryrhamphus excisus excisus*)
Dunckerocampus chapmani (Herald in Schultz, Herald, Lachner, Welander & Woods, 1953)
Dunckerocampus dactyliophorus (Bleeker, 1853)
Festucalex kulbickii Fricke, 2004 (Reported by Plessis & Fourmanoir [1966: 125] and other authors under the name *Ichthyocampus erythraeus* or *Festucalex erythraeus*, by others as *Festucalex gibbsi*, and by Kuiter [2000: 122] as *Festucalex* sp. 1)
Festucalex wassi Dawson, 1977
Halicampus boothae (Whitley, 1964)
Halicampus brocki (Herald in Schultz, Herald, Lachner, Welander & Woods, 1953)
Halicampus dunckeri (Chabanaud, 1929)
Halicampus mataafae (Jordan & Seale, 1906)
Halicampus nitidus (Günther, 1873)
Halicampus spinirostris (Dawson & Allen, 1981)
Hippichthys spicifer (Rüppell, 1838)
Hippocampus bargibanti Whitley, 1970
Hippocampus curvicuspis Fricke, 2004 (Reported by several authors under the name *Hippocampus histrix*, by Fourmanoir [1971: 112] as *Hippocampus jayakari*, and by Myers [1999: 89] and Laboute & Grandperrin [2000: 158, large fig.] as *Hippocampus kuda*)
Hippocampus pusillus Fricke, 2004
Hippocampus semispinosus Kuiter, 2001 (Reported by several authors under the name *Hippocampus kuda*, and by Lourie, Vincent & Hall [1999: 92-93] as *Hippocampus fisheri*)
Hippocampus taeniopterus Bleeker, 1852
Micrognathus brevicorpus Fricke, 2004 (Reported by several authors under the name *Micrognathus andersonii*)
Micrognathus micronotopterus (Fowler, 1938)
Micrognathus natans Dawson, 1982
Micrognathus pygmaeus Fritzsche, 1981 (Reported by several authors under the name *Micrognathus brevirostris*)
Microphis argulus (Peters, 1855)
Microphis brachyurus (Bleeker, 1853)
Microphis brevidorsalis (Beaufort, 1913)
Microphis leiaspis (Bleeker, 1853)
Microphis retzii (Bleeker, 1856)
Phoxocampus belcheri (Kaup, 1856)
Phoxocampus diacanthus (Schultz, 1943)
Siokunichthys herrei Herald in Schultz, Herald, Lachner, Welander & Woods, 1953
Siokunichthys striatus Fricke, 2004
Syngnathoides biaculeatus (Bloch, 1785)
Trachyrhamphus bicoarctatus (Bleeker, 1857) (Reported by Jouan [1879: 332] under the name *Ichthyocampus maculatus*, by Fourmanoir [1971: 112] and Fourmanoir & Laboute [1976: 272] as *Yozia intermedia*, and by Rivaton *et al.* [1989: 74] and Rivaton & Bourret [1999: 46] as *Trachyrhamphus longirostris*)

AULOSTOMIDAE

Aulostomus chinensis (Linné, 1766)

FISTULARIIDAE

Fistularia commersonii Rüppell, 1838 (Confused with *Fistularia petimba* by Fowler [1928: 117-118])
Fistularia petimba Lacepède, 1803 (Records from New Caledonia need verification; they may be based on *F. commersonii* according to Fritzsche & Thiesfeld [1999: 2279]; synonym: *Fistularia villosa*)

MACRORAMPHOSIDAE

Macroramphosus scolopax (Linnaeus, 1758)

CENTRISCIDAE

Aeoliscus strigatus (Günther, 1860) (Reported by Jouan [1863: 183] and Fowler [1928: 118] under the name *Amphisile scutatum* or *Centriscus scutatus*)

DACTYLOPTERIDAE

Dactyloptena orientalis (Cuvier in Cuvier & Valenciennes, 1829)

SCORPAENIDAE

- SUBFAMILY SCORPAENINAE

Dendrochirus bellus (Jordan & Hubbs, 1925)

Dendrochirus biocellatus (Fowler, 1938)

Dendrochirus brachypterus (Cuvier in Cuvier & Valenciennes, 1829)

Dendrochirus zebra (Cuvier in Cuvier & Valenciennes, 1829) (Reported by Whitley [1961: 65] under the name *Pterois volitans*)

Iracundus signifer Jordan & Evermann, 1903

Parascorpaena mcadamsi (Fowler, 1938)

Parascorpaena mossambica (Peters, 1855)

Parascorpaena picta Kuhl & Hasselt in Cuvier, 1829 (Synonym: *Sebastapistes bynoensis*)

Phenacoscorpius megalops Fowler, 1938

Pterois antennata (Bloch, 1787)

Pterois lunulata Temminck & Schlegel, 1844

Pterois mombasae (Smith, 1957)

Pterois radiata Cuvier, 1829

Pterois volitans (Linnaeus, 1758)

Rhinopias aphanes Eschmeyer, 1973

Scorpaena neglecta Temminck & Schlegel, 1844

Scorpaenodes albaiensis (Evermann & Seale, 1907)

Scorpaenodes corallinus Smith, 1957

Scorpaenodes guamensis (Quoy & Gaimard, 1824) (Reported by Laboute & Grandperrin [2000: 167] under the name *Scorpaenodes* sp. 2)

Scorpaenodes hirsutus (Smith, 1957)

Scorpaenodes kelloggi (Jenkins, 1903) (Reported by Laboute & Grandperrin [2000: 167] under the name *Scorpaenodes* sp. 1)

Scorpaenodes minor (Smith, 1958) [*Scorpaenodes brocki* (Schultz, in Schultz, Woods & Lachner, 1966) is a synonym]

Scorpaenodes parvipinnis (Garrett, 1864)

Scorpaenodes scaber (Ramsay & Ogilby, 1885)

Scorpaenodes varipinnis Smith, 1957

Scorpaenopsis diabolus Cuvier, 1829

Scorpaenopsis eschmeyeri Greenfield & Randall, 2004

Scorpaenopsis macrochir Ogilby, 1910 (Reported by several authors under the name *Scorpaenopsis gibbosa*, and by Laboute & Grandperrin [2000: 169] under the name *Scorpaenopsis* sp.)

Scorpaenopsis neglecta Heckel, 1837

Scorpaenopsis papuensis (Cuvier in Cuvier & Valenciennes, 1829) (Reported by Fourmanoir & Laboute [1976: 158] under the name *Scorpaenopsis cirrhosa*, and by other authors as *Scorpaenopsis oxycephala*)

Scorpaenopsis possi Randall & Eschmeyer, 2001

Scorpaenopsis ramaraoi Randall & Eschmeyer, 2001

Scorpaenopsis venosa (Cuvier in Cuvier & Valenciennes, 1829)

Scorpaenopsis vittapinna Randall & Eschmeyer, 2001 (Reported by Kulbicki *et al.* [1994: 17] under the name *Scorpaenopsis brevifrons*)

Sebastapistes cyanostigma (Bleeker, 1856) (Synonym: *Scorpaena albobrunnea* Günther, 1874)

Sebastapistes coniorta Jenkins, 1903 (**New record** from New Caledonia based on SMNS 23749 from Lifou, Loyalty Islands)

Sebastapistes fowleri (Pietschmann, 1934)

Sebastapistes galactacma Jenkins, 1903 (**New record** from New Caledonia based on SMNS material from Lifou, Loyalty Islands)

Sebastapistes mauritiana (Cuvier, 1829)
Sebastapistes strongia (Cuvier, 1829) (Synonym: *Kantapus oglinus* Smith, 1947)
Sebastapistes tinkhami (Fowler, 1946)
Taenianotus triacanthus Lacepède, 1802
- SUBFAMILY TETRAROGINAE
Ablabys taenianotus (Cuvier in Cuvier & Valenciennes, 1829)
Ocosia apia Poss & Eschmeyer, 1975
Paracentropogon longispinis (Cuvier, 1829)
Richardsonichthys leucogaster (Richardson, 1848)
Tetraroge barbata (Cuvier, 1829)
- SUBFAMILY SYNANCEIINAE
Erosa erosa (Langsdorf in Cuvier & Valenciennes, 1829)
Inimicus caledonicus (Sauvage, 1878)
Inimicus didactylus (Pallas, 1769)
Minous monodactylus (Bloch & Schneider, 1801)
Minous pusillus Temminck & Schlegel, 1843
Minous trachycephalus (Bleeker, 1854)
Synanceia horrida (Linné, 1766)
Synanceia verrucosa (Bloch & Schneider, 1801)

CARACANTHIDAE
Caracanthus maculatus (Gray, 1831)
Caracanthus unipinna (Gray, 1831)

APLOACTINIDAE
Aploactis aspera (Richardson, 1844)
Cocotropus dermacanthus (Bleeker, 1852)
Cocotropus richeri Fricke, 2004
Erisphex pottii (Steindachner, 1896)
Neoaploactis tridorsalis Eschmeyer & Allen, 1978
Paraploactis sp. (Very similar to *Paraploactis kagioshimensis* from Japan and *P. obbesi* from Indonesia; specimens under study by Stuart G. Poss according to Randall [2005: 130])
Paraploactis trachyderma Bleeker, 1865

TRIGLIDAE
Pterygotrigla andertoni Waite, 1910 (Reported by Cerro & Lloris [1997: 15-117] under the name *Pterygotrigla picta*)
Satyrichthys rieffeli (Kaup, 1859)

PLATYCEPHALIDAE
Records of *Papilloculiceps longiceps* (Ehrenberg in Cuvier & Valenciennes, 1829) by Rivaton *et al.* [1989: 61] and Rivaton & Bourret [1999: 50] are erroneous, as the species is restricted to the Red Sea and Western Indian Ocean.
Cociella crocodila (Tilesius, 1812)
Cymbacephalus beauforti (Knapp, 1973) (Reported by Whitley [1961: 64] under the name *Cociella crocodilus*)
Cymbacephalus staigeri (Castelnau, 1875)
Eurycephalus arenicola (Schultz, in Schultz, Woods & Lachner, 1966)
Eurycephalus otaitensis (Parkinson in Cuvier & Valenciennes, 1829)
Onigocia bimaculata Knapp, Imamura & Sakashita, 2000
Onigocia macrolepis (Bleeker, 1854)
Onigocia pedimacula (Regan, 1908) (Reported by several authors under the name *Onigocia spinosa*; records from New Caledonia need verification, may be based on *O. bimaculata*)
Rogadius patriciae Knapp, 1987
Rogadius pristiger (Cuvier in Cuvier & Valenciennes, 1829) (Reported by Rivaton *et al.* [1989: 61] under the name *Rogadius asper*)
Rogadius serratus (Cuvier in Cuvier & Valenciennes, 1829)
Rogadius welanderi (Schultz, in Schultz, Woods & Lachner, 1966) (Reported by Kulbicki *et al.* [1994: 18] under the name *Rogadius* sp.; **new record** from New Caledonia based on SMNS 21758 from

Chesterfield Islands)
Thysanophrys celebicus (Bleeker, 1854)
Thysanophrys chiltonae Schultz, in Schultz, Woods & Lachner, 1966

AMBASSIDAE
Ambassis buruensis Bleeker, 1856
Ambassis interruptus Bleeker, 1852
Ambassis miops Günther, 1871

SYMPHYSANODONTIDAE
Symphysanodon maunaloae Anderson, 1970

SERRANIDAE
- SUBFAMILY ANTHIINAE
Caprodon schlegelii (Günther, 1859)
Luzonichthys waitei (Fowler, 1931) (Synonym: *Luzonichthys robustus* Fourmanoir, 1977)
Luzonichthys whitleyi (Smith, 1955)
Luzonichthys williamsi Randall & McCosker, 1992
Plectranthias sp. 1 (Undescribed species, based on SMNS material from Lifou, Loyalty Islands)
Plectranthias sp. 2 (Undescribed species, based on SMNS material from Lifou, Loyalty Islands)
Plectranthias fourmanoiri Randall, 1980
Plectranthias kamii Randall, 1980 (Reported by Rivaton *et al.* [1989: 70] under the name *Plectranthias anthioides*)
Plectranthias kelloggi (Jordan & Evermann, 1903)
Plectranthias longimanus (Weber, 1913)
Plectranthias nanus Randall, 1980
Plectranthias randalli Fourmanoir & Rivaton, 1980
Plectranthias retrofasciatus Fourmanoir & Randall, 1979
Plectranthias rubrifasciatus Fourmanoir & Randall, 1979
Plectranthias wheeleri Randall, 1980 (**New record** from New Caledonia based on SMNS 24052 from Lifou, Loyalty Islands)
Plectranthias winniensis (Tyler, 1966)
Pseudanthias bicolor (Randall, 1979)
Pseudanthias carlsoni Randall & Pyle, 2001
Pseudanthias cichlops (Bleeker, 1853)
Pseudanthias cooperi (Regan, 1902) (Reported by Laboute & Grandperrin [2000: 203] under the name 'Anthiinae indéterminée 3')
Pseudanthias elongatus (Franz, 1910)
Pseudanthias flavicauda Randall & Pyle, 2001 (Reported by Laboute & Grandperrin [2000: 203] under the name Anthiinae indéterminée 2; **new record** for New Caledonia)
Pseudanthias hypselosoma (Bleeker, 1878)
Pseudanthias lori (Lubbock & Randall, 1976)
Pseudanthias pascalus (Jordan & Tanaka, 1927)
Pseudanthias pictilis (Randall & Allen, 1978)
Pseudanthias pleurotaenia (Bleeker, 1857)
Pseudanthias rubrizonatus (Randall, 1983)
Pseudanthias squamipinnis (Peters, 1855)
Pseudanthias ventralis ventralis (Randall, 1979)
Sacura margaritacea (Hilgendorf, 1879)
Serranocirrhitus latus Watanabe, 1949 (Synonym: *Dactylanthias mcmichaeli* Whitley, 1962)
- SUBFAMILY EPINEPHELINAE
- TRIBE EPINEPHELINI
A record of *Epinephelus corallicola* (Valenciennes in Cuvier & Valenciennes, 1828) by Plessis & Fourmanoir (1966: 127), and the record of *Epinephelus melanostigma* Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953 and *Plectropomus areolatus* (Rüppell, 1830) by Rivaton *et al.* (1989: 69, 70) need verification.
Aethaloperca rogaa (Forsskål in Niebuhr, 1775)
Anyperodon leucogrammicus (Valenciennes in Cuvier & Valenciennes, 1828)

Cephalopholis argus Bloch & Schneider, 1801
Cephalopholis aurantia (Valenciennes in Cuvier & Valenciennes, 1828)
Cephalopholis boenak (Bloch, 1790) (Reported by Fourmanoir & Laboute [1976: 52, 53] and other authors under the names *Cephalopholis formosanus* (non Shaw & Nodder, 1812) and *Cephalopholis pachycentron*)
Cephalopholis igarashiensis Katayama, 1957
Cephalopholis leopardus (Lacepède, 1801)
Cephalopholis microprion (Bleeker, 1852)
Cephalopholis miniata (Forsskål in Niebuhr, 1775)
Cephalopholis sonnerati (Valenciennes in Cuvier & Valenciennes, 1828)
Cephalopholis spiloparaea (Valenciennes in Cuvier & Valenciennes, 1828)
Cephalopholis urodeta (Forster in Bloch & Schneider, 1801)
Cromileptes altivelis (Valenciennes in Cuvier & Valenciennes, 1828)
Epinephelus areolatus (Forsskål in Niebuhr, 1775) (Synonym: *Serranus angularis* Valenciennes in Cuvier & Valenciennes, 1828)
Epinephelus coeruleopunctatus (Bloch, 1790) (Synonym: *Serranus hoevenii* Bleeker, 1849)
Epinephelus chlorostigma (Valenciennes in Cuvier & Valenciennes, 1828)
Epinephelus coioides (Hamilton, 1822) (Synonym: *Serranus suillus* Valenciennes in Cuvier & Valenciennes, 1828)
Epinephelus cyanopodus (Richardson, 1846) (Synonyms: *Serranus hoedtii* Bleeker, 1855; *Epinephelus kohleri* Schultz in Schultz *et al.*, 1953)
Epinephelus fasciatus (Forsskål in Niebuhr, 1775)
Epinephelus fuscoguttatus (Forsskål in Niebuhr, 1775) (Synonym: *Serranus horridus* Valenciennes in Cuvier & Valenciennes, 1828)
Epinephelus hexagonatus (Bloch & Schneider, 1801)
Epinephelus howlandi (Günther, 1873) (Reported by Whitley [1961: 64] under the name *Epinephelus corallicola*; synonym: *Epinephelus spilotus* Schultz in Schultz *et al.*, 1953)
Epinephelus lanceolatus (Bloch, 1790)
Epinephelus macrospilos (Bleeker, 1855)
Epinephelus maculatus (Bloch, 1790)
Epinephelus magniscuttis Postel, Fourmanoir & Guézé, 1963
Epinephelus malabaricus (Bloch & Schneider, 1801) (Reported by Borodin [1932: 79] under the name *Serranus stoliczkae* [non Day, 1875]; synonym: *Epinephelus cylindricus* Postel, 1965)
Epinephelus merra Bloch, 1793
Epinephelus morrhua (Valenciennes in Cuvier & Valenciennes, 1833)
Epinephelus ongus (Bloch, 1790) (Reported by several authors under the name *Epinephelus summana* [non Forsskål in Niebuhr, 1775])
Epinephelus polyphekadion (Bleeker, 1849) (Synonym: *Epinephelus microdon*)
Epinephelus retouti (Bleeker, 1868)
Epinephelus rivulatus (Valenciennes in Cuvier & Valenciennes, 1830) (Synonym: *Serranus rhyncholepis* Bleeker, 1852)
Epinephelus spilotoceps Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953 (Reported by Laboute & Grandperrin [2000: 189] under the name *Epinephelus* sp.; **new record** from New Caledonia)
Epinephelus tauvina (Forsskål in Niebuhr, 1775)
Gracila albomarginata (Fowler & Bean, 1930)
Plectropomus laevis (Lacepède, 1802) (Synonym: *Plectropomus melanoleucus*)
Plectropomus leopardus (Lacepède, 1802) (Reported by Whitley [1961: 65] under the name *Plectropomus maculatus*)
Variola albimarginata Baissac, 1952
Variola louti (Forsskål in Niebuhr, 1775)
- TRIBE DIPLOPRIONI
Belonoperca chabanaudi Fowler & Bean, 1930
Diploprion bifasciatum Kuhl & Hasselt in Cuvier & Valenciennes, 1828
- TRIBE LIOPROPOMATINI
Liopropoma susumi (Jordan & Seale, 1906)

Liopropoma tonstrinum Randall & Taylor, 1988
- TRIBE GRAMMISTINI
Aporops bilinearis Schultz, 1943
Grammistes sexlineatus (Thunberg, 1792)
Grammistops ocellatus Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953
Pogonoperca punctata (Valenciennes in Cuvier & Valenciennes, 1830)
Pseudogramma astigmum Randall & Baldwin, 1997 (**New record** from New Caledonia based on SMNS material from Lifou, Loyalty Islands)
Pseudogramma polyacanthum polyacanthum (Bleeker, 1856)
Suttonia lineata Gosline, 1960

CALLANTHIIDAE
Callanthias australis Ogilby, 1900
Grammatonotus laysanus Gilbert, 1905
Grammatonotus surugaensis Katayama, Yamakawa & Suzuki, 1980

PSEUDOCHROMIDAE
Cypho purpurascens (DeVis, 1884) (Reported by Fourmanoir & Laboute [1976: 285] under the name *Pseudochromis mccullochi*, and by Laboute & Grandperrin [2000: 205] as 'Pseudochromidae indéterminée')
Ogilbyina salvati (Plessis & Fourmanoir, 1966) (Reported by Whitley [1961: 65] under the name *Pseudochromis novaehollandiae*)
Pictichromis coralensis Gill, 2004 (Reported by several authors under the name *Pseudochromis paccagnellae*)
Pseudochromis cyanotaenia Bleeker, 1857
Pseudochromis fuscus Müller & Troschel, 1849 (Synonym: *Pseudochromis aurea* Seale, 1910)
Pseudochromis jamesi Schultz, 1943
Pseudochromis kolythrus Gill & Winterbottom, 1993
Pseudochromis marshallensis Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953
Pseudochromis tapeinosoma Bleeker, 1853
Pseudoplesiops howensis Allen, 1987
Pseudoplesiops immaculatus Gill & Edwards, 2002
Pseudoplesiops multisquamatus Allen, 1987
Pseudoplesiops rosae Schultz, 1943

PLESIOPIDAE
A record of *Plesiops corallicola* (Bleeker, 1853) by Rivaton *et al.* (1989: 61) needs verification
Assessor macneilli Whitley, 1935
Belonepterygion fasciolatum (Ogilby, 1889)
Calloplesiops altivelis (Steindachner, 1903)
Plesiops coeruleolineatus Rüppell, 1835 (Synonym: *Plesiops melas* Bleeker, 1849)
Plesiops insularis Mooi & Randall, 1991 (Reported by Rivaton *et al.* [1989: 61] under the name *Plesiops oxycephalus*)
Plesiops verecundus Mooi, 1995

OPISTOGNATHIDAE
Opistognathus sp. 1 (To be described by W.F. Smith-Vaniz)
Opistognathus sp. 2 (To be described by W.F. Smith-Vaniz)
Stalix histrio Jordan & Snyder, 1902

BANJOSIDAE
Banjos banjos (Richardson, 1846)

PRIACANTHIDAE
Cookeolus japonicus (Cuvier, 1829)
Heteropriacanthus cruentatus (Lacepède, 1802)
Priacanthus hamrur (Forsskål in Niebuhr, 1775) (Synonym: *Priacanthus longipinnis* Borodin, 1932)
Priacanthus macracanthus Cuvier, 1829
Priacanthus sagittarius Starnes, 1988
Pristigenys niphonia (Cuvier, 1829)

APOGONIDAE

A record of *Ostorhinchus poecilopterus* Cuvier, 1828 by Rivaton *et al.* (1989) under the name *Apogon poecilopterus* needs verification.

Apogon amboinensis Bleeker, 1853
Apogon caudicinctus Randall & Smith, 1988
Apogon crassiceps Garman, 1903 (Reported by Plessis & Fourmanoir [1966: 128] under the name *Apogon erythrinus*, and by other authors under the name *Apogon coccineus*)
Apogon doryssa (Jordan & Seale, 1906)
Apogon ellioti Day, 1878
Apogon fasciatus (White, 1790)
Apogon gilberti (Jordan & Seale, 1905)
Apogon hyalosoma Bleeker, 1853
Apogon indicus Greenfield, 2001 (Reported by Kulbicki & Williams [1997: 14] under the name *Apogon erythrinus*)
Apogon melas Bleeker, 1848
Apogon notatus (Houttuyn, 1782)
Apogon noumeae Whitley, 1958
Apogon semiornatus Peters, 1876
Apogon susanae Greenfield, 2001
Apogon talboti Smith, 1961
Apogonichthys ocellatus (Weber, 1913)
Apogonichthys perdix Bleeker, 1854
Archamia fucata (Cantor, 1850)
Archamia leai Waite, 1916
Archamia macroptera (Cuvier in Cuvier & Valenciennes, 1828) (Reported by several authors under the name *Archamia lineolata* or *A. lineolatus*; **new record** from New Caledonia)
Archamia zosterophora (Bleeker, 1856)
Cercamia cladara Randall & Smith, 1988
Cheilodipterus artus Smith 1961
Cheilodipterus isostigmus (Schultz, 1940)
Cheilodipterus macrodon (Lacepède, 1802) (Reported by several authors under the name *Cheilodipterus lachneri*)
Cheilodipterus quinquelineatus Cuvier in Cuvier & Valenciennes, 1828
Cheilodipterus singapurensis Bleeker, 1859 (Synonym: *Cheilodipterus subulatus* Weber, 1909; **new record** from New Caledonia)
Foa fo Jordan & Seale, 1906 (Reported by several authors under the name *Foa brachygramma*, and by Laboute & Grandperrin [2000: 219] as 'Apogonidae indéterminé 1')
Fowleria aurita (Valenciennes, 1831)
Fowleria isostigma (Jordan & Seale, 1906)
Fowleria marmorata (Alleyne & Macleay, 1877)
Fowleria vaiulae (Jordan & Seale, 1906) (Synonym: *Fowleria abocellata* Goren & Karplus, 1980; reported by Laboute & Grandperrin [2000: 218] under the name *Fowleria* sp.)
Fowleria variegata (Valenciennes, 1832)
Gymnapogon philippinus (Herre, 1939)
Gymnapogon urospilotus Lachner in Schultz, Herald, Lachner, Welander & Woods, 1953
Neamia catalai (Fourmanoir, 1973)
Neamia octospina Smith & Radcliffe in Radcliffe, 1912
Ostorhinchus angustatus (Smith & Radcliffe, 1911)
Ostorhinchus apogonides (Bleeker, 1856)
Ostorhinchus aureus (Lacepède, 1802)
Ostorhinchus bandanensis (Bleeker, 1854) (Reported by Laboute & Grandperrin [2000: 216] under the name *Apogon* sp. 6)
Ostorhinchus capricornis (Allen & Randall, 1993)
Ostorhinchus compressus (Smith & Radcliffe in Radcliffe, 1911)
Ostorhinchus cookii (Macleay, 1881)

Ostorhinchus cyanosoma (Bleeker, 1853)
Ostorhinchus diversus (Smith & Radcliffe in Radcliffe 1912)
Ostorhinchus doederleini (Jordan & Snyder, 1901)
Ostorhinchus endekataenia (Bleeker, 1852)
Ostorhinchus euspilotus (Fraser, 2006)
Ostorhinchus flavus (Allen & Randall, 1993)
Ostorhinchus fuscus (Quoy & Gaimard, 1825)
Ostorhinchus guamensis (Bleeker, 1856) (Synonym: *Apogon nubilus* Garman, 1903; reported by Whitley [1961: 64] under the name *Aspiscis savayensis*, by Rivaton *et al.* [1989: 24] as *Apogon ocellatus*, and by Laboute & Grandperrin [2000: 219] as 'Apogonidae indéterminé 2')
Ostorhinchus kiensis (Jordan & Snyder, 1901) (Reported by Laboute & Grandperrin [2000: 215] under the name *Apogon* sp. 3)
Ostorhinchus lateralis (Valenciennes, 1832) (Synonym: *Apogon ceramensis* Bleeker, 1852)
Ostorhinchus nigrofasciatus (Lachner in Schultz, Herald, Lachner, Welander & Woods, 1953)
Ostorhinchus norfolcensis (Ogilby, 1888) (Reported by Laboute & Grandperrin [2000: 215] under the names *Apogon* sp. 2 and *Apogon* sp. 4)
Ostorhinchus novemfasciatus (Cuvier in Cuvier & Valenciennes, 1828)
Ostorhinchus rubrimacula (Randall & Kulbicki, 1988)
Ostorhinchus savayensis (Günther, 1872)
Ostorhinchus sealei (Fowler, 1918) (**New record** from New Caledonia based on SMNS material from southern Grande Terre)
Ostorhinchus selas (Randall & Hayashi, 1990)
Ostorhinchus septemstriatus (Günther, 1880)
Ostorhinchus taeniophorus (Regan, 1905)
Pristiapogon exostigma (Jordan & Starks, 1906)
Pristiapogon fraenatus (Valenciennes, 1832)
Pristiapogon kallopterus (Bleeker, 1856) (Reported by Fourmanoir & Laboute [1976: 290] under the names *Apogon* sp. and *Apogon snyderi*; reported by Laboute & Grandperrin [2000: 216] under the name *Apogon* sp. 7)
Pristiapogon taeniopterus (Bennett, 1835)
Pristicon trimaculatus (Cuvier in Cuvier & Valenciennes, 1828) (Reported by Rivaton *et al.* [1989: 24] under the names *Apogon taeniatus* and *A. koilomatodon*)
Pseudamia gelatinosa Smith, 1955 (Reported by Laboute & Grandperrin [2000: 218] under the name *Pseudamia* sp.)
Pseudamia zonata Randall, Lachner & Fraser, 1985
Pseudamiops gracilicauda (Lachner in Schultz, Herald, Lachner, Welander & Woods, 1953)
Rhabdamia cypselura Weber, 1909 (Reported by Laboute & Grandperrin [2000: 66] under the name 'Apogonidae indéterminé')
Rhabdamia gracilis (Bleeker, 1856)
Siphamia versicolor (Smith & Radcliffe, 1909) (Reported by Laboute & Grandperrin [2000: 218] under the name *Siphamia* sp.)
Sphaeramia nematoptera (Bleeker, 1856)
Sphaeramia orbicularis (Kuhl & Hasselt in Cuvier & Valenciennes, 1828)
Zoramia fragilis (Smith, 1961) (Reported by Laboute & Grandperrin [2000: 215] under the name *Apogon* sp. 1)
Zoramia leptacantha (Bleeker, 1856) (reported by several authors under the name *Apogon graeffei*)

SILLAGINIDAE

Sillago ciliata Cuvier in Cuvier & Valenciennes, 1829 (Synonym: *Sillago insularis* Castelnau, 1873)
Sillago sihama (Forsskål in Niebuhr, 1775)

MALACANTHIDAE

Branchiostegus wardi Whitley, 1932
Hoplolatilus chlupatyi Klausewitz, McCosker, Randall & Zetzsche, 1978
Hoplolatilus cuniculus Randall & Dooley, 1974
Hoplolatilus fronticinctus Günther, 1887
Hoplolatilus starcki Randall & Dooley, 1974

Malacanthus brevirostris Guichenot, 1848 (Synonyms: *Malacanthus hoedti* Bleeker, 1859; *Dikellorhynchus incredibilis* Smith, 1956)
Malacanthus latovittatus (Lacepède, 1802)

CORYPHAENIDAE

Coryphaena equiselis Linnaeus, 1758
Coryphaena hippurus Linnaeus, 1758

ECHENEIDAE

Echeneis naucrates Linnaeus, 1758
Phtheirichthys lineata (Menzies, 1791)
Remora osteochir (Cuvier, 1829)
Remorina albescens (Temminck & Schlegel, 1845)

CARANGIDAE

Records of *Carangoides malabaricus* (Bloch & Schneider, 1801) by Jouan (1879: 334), *Trachinotus rhomboides*) by Borodn (1932: 77) of *Caranx malabaricus* and of *Decapterus macrosoma* Bleeker, 1951 by Rivaton *et al.* [1989: 31] needs verification.
Alectis ciliaris (Bloch, 1787) (Reported by several authors under the name *Alectis indicus*)
Alepes apercna Smith-Vaniz in Grant, 1987 (Reported by Fourmanoir & Laboute [1976: 176] under the name *Alepes kalla*, and by several authors under the name *Alepes djeddaba*)
Alepes vari (Cuvier, 1833)
Atule mate (Cuvier in Cuvier & Valenciennes, 1833)
Carangoides coeruleopinnatus (Rüppell, 1830) (Synonyms: *Carangoides caeruleopinnatus*; *Carangoides uii*)
Carangoides chrysophrys (Cuvier in Cuvier & Valenciennes, 1833)
Carangoides dinema Bleeker, 1851
Carangoides ferdau (Forsskål in Niebuhr, 1775) (Synonym: *Carangoides gilberti*)
Carangoides fulvoguttatus (Forsskål in Niebuhr, 1775) (Synonym: *Carangoides emburyi*)
Carangoides gymnostethus (Cuvier in Cuvier & Valenciennes, 1833)
Carangoides hedlandensis (Whitley, 1934) (Reported by Fourmanoir [1971: 113] under the name *Caranx armatus*).
Carangoides orthogrammus Jordan & Gilbert, 1881
Carangoides plagiotaenia (Bleeker, 1857)
Caranx ignobilis (Forsskål in Niebuhr, 1775)
Caranx lugubris Poey, 1860
Caranx melampygus Cuvier in Cuvier & Valenciennes, 1833
Caranx papuensis Alleyne & Macleay, 1877 (Synonym: *Caranx celetus* Smith, 1968)
Caranx sexfasciatus (Quoy & Gaimard, 1824) (Reported by Plessis & Fourmanoir [1966: 129] under the name *Caranx hippos*)
Caranx tille Cuvier, 1833
Decapterus macarellus (Valenciennes in Cuvier & Valenciennes, 1833)
Decapterus muroadsi (Temminck & Schlegel, 1844)
Decapterus russelli (Rüppell, 1829) (Synonym: *Decapterus lajang* Bleeker, 1855)
Decapterus tabl Berry, 1967
Elagatis bipinnulata (Quoy & Gaimard, 1825)
Gnathanodon speciosus (Forsskål in Niebuhr, 1775)
Megalaspis cordyla (Linnaeus, 1758)
Naucrates ductor (Linnaeus, 1758
Pseudocaranx dentex (Bloch & Schneider, 1801) (Synonym: *Carangoides georgianus*)
Scomberoides commersonnianus Lacepède, 1801
Scomberoides lysan (Forsskål in Niebuhr, 1775)
Scomberoides tol (Cuvier in Cuvier & Valenciennes, 1832)
Selar boops (Cuvier in Cuvier & Valenciennes, 1833)
Selar crumenophthalmus (Bloch, 1793)
Seriola dumerili (Risso, 1810)
Seriola lalandi Valenciennes in Cuvier & Valenciennes, 1833 (Synonym: *Seriola aureovittata*)
Seriola rivoliana Valenciennes in Cuvier & Valenciennes, 1833

Trachinotus anak Ogilby, 1909
Trachinotus baillonii (Lacepède, 1801)
Trachinotus blochii (Lacepède, 1801)
Uraspis uraspis (Günther, 1860)

MENIDAE

A record of *Mene maculata* (Bloch & Schneider, 1801) by Rivaton *et al*. (1989: 52) needs verification.

LEIOGNATHIDAE

A record of *Leiognathus lineolatus* (Valenciennes in Cuvier & Valenciennes, 1835) by Rivaton *et al*. (1989: 48) needs verification.
Gazza minuta (Bloch, 1795) (Synonym: *Gazza equulaeformis* Rüppell, 1835)
Leiognathus bindus (Valenciennes in Cuvier & Valenciennes, 1835)
Leiognathus equulus (Forsskål in Niebuhr, 1775)
Leiognathus fasciatus (Lacepède, 1803)
Leiognathus leuciscus (Günther, 1860)
Leiognathus splendens (Cuvier, 1829)
Photoplagios rivulatus (Temminck & Schlegel, 1845)
Secutor insidiator (Bloch, 1787)
Secutor ruconius (Hamilton Buchanan, 1822)

BRAMIDAE

Brama dussumieri Cuvier, 1831
Brama myersi Mead, 1972
Brama orcini Cuvier in Cuvier & Valenciennes, 1831 (Synonym: *Collybus drachme*)
Pteraclis aesticola (Jordan & Snyder, 1901)
Pterycombus petersii (Hilgendorf, 1878)
Taractes asper Lowe, 1843
Taractes rubescens (Jordan & Jordan, 1887)
Taractichthys steindachneri (Döderlein, 1883) (Reported by several authors under the name *Taractichthys longipinnis*)

EMMELICHTHYIDAE

Emmelichthys nitidus nitidus Richardson, 1845
Erythrocles taeniatus Randall & Rivaton, 1992 (Reported by several authors under the name *Erythrocles schlegelii*)

LUTJANIDAE

Records of *Lutjanus erythropterus* Bloch, 1790 and *Paracaesio gonzalezi* Fourmanoir & Rivaton, 1979 by Rivaton *et al*. (1989: 49) need verification.
Aphareus furca (Lacepède, 1801)
Aphareus rutilans Cuvier in Cuvier & Valenciennes, 1830
Aprion virescens Valenciennes in Cuvier & Valenciennes, 1830
Etelis carbunculus Cuvier in Cuvier & Valenciennes, 1828
Etelis coruscans Valenciennes, 1862 (Synonym: *Etelis oculatus lifuensis* Fourmanoir, 1971)
Etelis radiosus Anderson, 1981
Lutjanus adetii (Castelnau, 1873) (Synonyms: *Lutjanus amabilis*; *Lutjanus parvavitta* Postel, 1965)
Lutjanus argentimaculatus (Forsskål in Niebuhr, 1775)
Lutjanus bohar (Forsskål in Niebuhr, 1775)
Lutjanus fulviflamma (Forsskål in Niebuhr, 1775)
Lutjanus fulvus (Bloch & Schneider, 1801)
Lutjanus fuscescens (Valenciennes in Cuvier & Valenciennes, 1830)
Lutjanus gibbus (Forsskål in Niebuhr, 1775)
Lutjanus kasmira (Forsskål in Niebuhr, 1775)
Lutjanus lutjanus (Bloch, 1790) (Reported by Fourmanoir & Laboute [1976: 76] under the name *Lutjanus lineolatus*)
Lutjanus malabaricus (Bloch & Schneider, 1801)
Lutjanus monostigma (Cuvier in Cuvier & Valenciennes, 1828)
Lutjanus quinquelineatus Bloch, 1790
Lutjanus rivulatus (Cuvier in Cuvier & Valenciennes, 1828)

Lutjanus rufolineatus (Valenciennes in Cuvier & Valenciennes, 1830) (Reported by several authors under the name *Lutjanus boutton*; **new record** from New Caledonia)
Lutjanus russelli (Bleeker, 1849)
Lutjanus sebae (Cuvier, 1816)
Lutjanus semicinctus Quoy & Gaimard, 1824
Lutjanus vitta (Quoy & Gaimard, 1824)
Macolor macularis Fowler, 1931
Macolor niger (Forsskål in Niebuhr, 1775)
Paracaesio caerulea (Katayama, 1934)
Paracaesio kusakarii Abe, 1960
Paracaesio sordida Abe & Shinohara, 1962
Paracaesio xanthura (Bleeker, 1869)
Pristipomoides argyrogrammicus (Valenciennes, 1831)
Pristipomoides filamentosus (Valenciennes in Cuvier & Valenciennes, 1830)
Pristipomoides flavipinnis Shinohara, 1963
Pristipomoides multidens (Day, 1870) (Reported by several authors under the name *Pristipomoides typus*)
Pristipomoides zonatus (Valenciennes in Cuvier & Valenciennes, 1830)
Symphorichthys spilurus (Günther, 1874)
Symphorus nematophorus (Bleeker, 1860)

CAESIONIDAE

Caesio caerulaurea Lacepède, 1802
Caesio cuning (Bloch, 1791) (Synonym: *Caesio erythrogaster* Cuvier in Cuvier & Valenciennes, 1830)
Caesio lunaris Ehrenberg & Cuvier in Cuvier in Cuvier & Valenciennes, 1830
Caesio teres Seale, 1906 (Synonym: *Caesio pulcherrimus*; reported by Rivaton *et al.* [1989: 30] under the name *Caesio xanthonota*)
Dipteronotus balteatus (Valenciennes in Cuvier & Valenciennes, 1830)
Gymnocaesio gymnoptera (Bleeker, 1856)
Pterocaesio chrysozona (Cuvier in Cuvier & Valenciennes, 1830)
Pterocaesio digramma (Bleeker, 1865)
Pterocaesio marri Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953 (Reported by Laboute & Grandperrin [2000: 259] under the name *Pterocaesio* sp. 1)
Pterocaesio pisang (Bleeker, 1853)
Pterocaesio tessellata Carpenter, 1987
Pterocaesio tile (Cuvier in Cuvier & Valenciennes, 1830)
Pterocaesio trilineata Carpenter, 1987

LOBOTIDAE

Lobotes surinamensis (Bloch, 1790)

GERREIDAE

Gerres filamentosus Cuvier, 1829
Gerres longirostris (Lacepède, 1801) (Synonym: *Gerres acinaces*)
Gerres oblongus Cuvier in Cuvier & Valenciennes, 1830 (Synonym: *Gerres macrosoma*)
Gerres ovatus Günther, 1859
Gerres oyena (Forsskål in Niebuhr, 1775) (Synonym: *Gerres argyreus*)

HAEMULIDAE

Diagramma pictum (Thunberg, 1792) (Reported by Borodin [1932: 83] under the name *Diagramma punctatum*)
Plectorhinchus albovittatus (Rüppell, 1835) (Synonym: *Plectorhinchus harrawayi*, taxonomic decision of Randall & Johnson ([2000: 479]).
Plectorhinchus chaetodonoides Lacepède, 1800
Plectorhinchus chrysotaenia (Bleeker, 1855)
Plectorhinchus flavomaculatus (Ehrenberg in Cuvier & Valenciennes, 1830) (Reported by Whitley [1961: 65] under the name *Plectorhinchus roughleyi*)
Plectorhinchus gibbosus (Lacepède, 1802)
Plectorhinchus lessonii (Cuvier in Cuvier & Valenciennes, 1830) (Reported by Rivaton *et al.*

[1989: 43] under the name *Plectorhinchus diagrammus*)

Plectorhinchus lineatus (Linnaeus, 1758) (Synonym: *Plectorhinchus goldmanni*)

Plectorhinchus obscurus (Günther, 1871)

Plectorhinchus picus (Cuvier in Cuvier & Valenciennes, 1830)

Plectorhinchus vittatus (Linnaeus, 1758) (Synonym: *Plectorhinchus orientalis*)

Pomadasys argenteus (Forsskål in Niebuhr, 1775) (Synonym: *Pomadasys hasta*; reported by Borodin [1932: 83] under the name *Pristipoma operculare*)

NEMIPTERIDAE

A record of *Parascolopsis inermis* (Temminck & Schlegel, 1843) from New Caledonia by Rivaton *et al.* (1989: 57) needs verification.

Nemipterus balinensoides (Popta, 1918) (Reported by Borodin [1932: 84] under the name *Synagris striatus*)

Nemipterus furcosus (Valenciennes in Cuvier & Valenciennes, 1830) (Reported by Laboute & Grandperrin [2000: 274, 275] under the name *Nemipterus peronii*)

Nemipterus peronii (Valenciennes in Cuvier & Valenciennes, 1830) (Synonym: *Dentex tolu*)

Nemipterus zysron (Bleeker, 1856) (Synonym: *Nemipterus metopias*)

Pentapodus aureofasciatus Russell, 2001 (Reported by various authors under the names *Pentapodus microdon* [non Bleeker, 1853] and *Pentapodus nagasakiensis* [non Tanaka, 1915])

Pentapodus caninus (Cuvier in Cuvier & Valenciennes, 1830) (Synonym: *Pentapodus macrurus*)

Pentapodus paradiseus (Günther, 1859)

Scolopsis affinis Peters, 1877 (Reported by Fourmanoir [1971: 112] under the name *Scolopsis personatus*)

Scolopsis bilineata (Bloch, 1793) (Reported by Whitley [1961: 65] under the name *Scolopsis cancellatus*)

Scolopsis ciliata (Lacepède, 1802)

Scolopsis lineatus Quoy & Gaimard, 1824

Scolopsis taeniopterus (Kuhl & Hasselt in Cuvier & Valenciennes, 1830)

Scolopsis temporalis (Cuvier in Cuvier & Valenciennes, 1830) (Reported by Randall, Allen & Steene [1997: 207] under the name *Scolopsis monogramma* [part].

Scolopsis trilineatus Kner, 1868

LETHRINIDAE

Gnathodentex aureolineatus (Lacepède, 1802)

Gymnocranius sp. (Undescribed species, reported by several authors under the name *Gymnocranius lethrinoides* [non Bleeker, 1850])

Gymnocranius audleyi Ogilby, 1916 (Synonym: *Gymnocranius bitorquatus*)

Gymnocranius elongatus Senta, 1973

Gymnocranius euanus Günther, 1879 (Synonym: *Gymnocranius japonicus* Akazaki, 1961)

Gymnocranius grandoculis (Valenciennes in Cuvier & Valenciennes, 1830) (Synonym: *Gymnocranius rivulatus*; reported by Kulbicki [1988: 306] under the name *Gymnocranius robertsi*)

Lethrinus atkinsoni (Seale, 1909) (Reported by several authors under the name *Lethrinus mahsena*; reported by Laboute & Grandperrin [2000: 272] under the name *Lethrinus* sp.)

Lethrinus erythracanthus Valenciennes in Cuvier & Valenciennes, 1830 (Synonym: *Lethrinus kallopterus* Bleeker, 1856)

Lethrinus genivittatus Valenciennes in Cuvier & Valenciennes, 1830 (Frequently used synonym: *Lethrinus nematacanthus*)

Lethrinus harak (Forsskål in Niebuhr, 1775) (Reported by Whitley [1961: 64] under the name *Lethrinus glyphodon*)

Lethrinus laticaudis Alleyne & Macleay, 1877 (Synonym: *Lethrinus anarhynchus* Postel, 1965)

Lethrinus lentjan (Lacepède, 1802)

Lethrinus miniatus (Forster in Bloch & Schneider, 1801) (Synonym: *Lethrinus chrysostomus* Richardson, 1848)

Lethrinus nebulosus (Forsskål in Niebuhr, 1775) (Reported by Borodin [1932: 83] under the name *Lethrinus hematopterus* [non Temminck & Schlegel, 1844])

Lethrinus obsoletus (Forsskål in Niebuhr, 1775) (Synonym: *Lethrinus ramak*)

Lethrinus olivaceus Valenciennes in Cuvier & Valenciennes, 1830 (Synonym: *Lethrinus rostratus* Valenciennes in Cuvier & Valenciennes, 1830)

Lethrinus ravus Carpenter & Randall, 2003
Lethrinus rubrioperculatus Sato, 1978
Lethrinus semicinctus Valenciennes in Cuvier & Valenciennes, 1830
Lethrinus variegatus Ehrenberg in Valenciennes in Cuvier & Valenciennes, 1830
Lethrinus xanthochilus Klunzinger, 1870
Monotaxis grandoculis (Forsskål in Niebuhr, 1775)
Monotaxis heterodon (Bleeker, 1854)
Wattsia mossambica (Smith, 1957)

SPARIDAE

Acanthopagrus berda (Forsskål in Niebuhr, 1775)

POLYNEMIDAE

Eleutheronema tetradactylum (Shaw, 1804)
Polydactylus microstomus (Bleeker, 1851)
Polydactylus plebeius (Broussonet, 1782)
Polydactylus sexfilis (Valenciennes in Cuvier & Valenciennes, 1831)

MULLIDAE

A record of *Mulloidichthys pfluegeri* (Steindachner, 1901) from New Caledonia by Rivaton *et al.* (1989: 53) under the name *Mulloides pflugeri* needs verification.

Mulloidichthys flavolineatus (Lacepède, 1801) (Synonym: *Mulloides samoensis*)
Mulloidichthys vanicolensis (Valenciennes in Cuvier & Valenciennes, 1831)
Parupeneus barberinoides (Bleeker, 1852)
Parupeneus barberinus (Lacepède, 1801)
Parupeneus ciliatus (Lacepède, 1801) (Reported by Fourmanoir & Laboute [1976: 199] under the name *Parupeneus porphyreus*, and by several authors under the name *Parupeneus dispilurus* or *Parupeneus dispirilus*)
Parupeneus crassilabris (Valenciennes in Cuvier & Valenciennes, 1831) (Reported by several authors under the name *Parupeneus bifasciatus*)
Parupeneus cyclostomus (Lacepède, 1802) (Synonym: *Parupeneus chryserydros*)
Parupeneus heptacanthus (Lacepède, 1801) (Synonym: *Parupeneus pleurospilos*; reported by Borodin [1932: 84] under the name *Upeneus cinnaborinus*)
Parupeneus indicus (Shaw, 1803) (Reported by Whitley [1961: 65] under the name *Pseudupeneus filamentosus*)
Parupeneus multifasciatus (Quoy & Gaimard, 1824) (Reported by several authors under the name *Parupeneus trifasciatus*)
Parupeneus pleurostigma (Bleeker, 1853)
Parupeneus spilurus (Bleeker, 1854) (Synonyms: *Parupeneus signatus*; *Pseudupeneus jeffi* Ogilby, 1908; reported by several authors under the name *Parupeneus signatus* [Günther, 1867], with the latter name considered as valid for the New Caledonian populations by Kuiter [1993], which was not accepted by subsequent authors like Randall [2005: 299])
Upeneus australiae Kim & Nakaya, 2002
Upeneus filifer (Ogilby, 1910)
Upeneus moluccensis (Bleeker, 1855)
Upeneus mouthami Randall & Kulbicki, 2005
Upeneus sulphureus Cuvier in Cuvier & Valenciennes, 1829 (Reported by Rivaton *et al.* [1989: 53] under the name *Upeneus bensasi*)
Upeneus tragula Richardson, 1845
Upeneus vittatus Lacepède, 1801

PEMPHERIDAE

Parapriacanthus dispar (Herre, 1935)
Parapriacanthus marei Fourmanoir, 1971
Parapriacanthus ransonneti Steindachner, 1870 (Reported by Fourmanoir & Laboute [1976: 292-293] under the name *Parapriacanthus beryciformes*)
Pempheris oualensis Cuvier in Cuvier & Valenciennes, 1831 (Synonym: *Pempheris otaitensis*)
Pempheris schwenkii Bleeker, 1855

MONODACTYLIDAE

Monodactylus argenteus (Linnaeus, 1758)

KYPHOSIDAE

Kyphosus cinerascens (Forsskål in Niebuhr, 1775)

Kyphosus pacificus Sakai & Nakabo, 2004 (Reported by several authors from Grande Terre under the name *Kyphosus bigibbus*; reported by Laboute & Grandperrin [2000: 288] under the name *Kyphosus* sp. 1; **new record** from New Caledonia)

Kyphosus sydneyanus (Günther, 1886) (Reported by Laboute & Grandperrin [2000: 289] under the name *Kyphosus* sp. 2)

Kyphosus vaigiensis (Quoy & Gaimard, 1825)

Microcanthus strigatus (Cuvier in Cuvier & Valenciennes, 1831)

DREPANIDAE

Drepane punctata (Linnaeus, 1758)

CHAETODONTIDAE

Amphichaetodon howensis (Waite, 1903)

Chaetodon auriga Forsskål in Niebuhr, 1775

Chaetodon baronessa Cuvier in Cuvier & Valenciennes, 1831

Chaetodon bennetti Cuvier in Cuvier & Valenciennes, 1831

Chaetodon citrinellus Cuvier in Cuvier & Valenciennes, 1831

Chaetodon ephippium Cuvier in Cuvier & Valenciennes, 1831

Chaetodon flavirostris Günther, 1874

Chaetodon guentheri Ahl, 1923

Chaetodon kleinii Bloch, 1790

Chaetodon lineolatus Cuvier in Cuvier & Valenciennes, 1831

Chaetodon lunula (Lacepède, 1802)

Chaetodon lunulatus Quoy & Gaimard, 1825 (Reported by several authors under the name *Chaetodon trifasciatus*)

Chaetodon melannotus Bloch & Schneider, 1801

Chaetodon mertensii Cuvier in Cuvier & Valenciennes, 1831 (Reported by Whitley [1961: 64] under the name *Chaetodon dixsoni*)

Chaetodon meyeri Bloch & Schneider, 1801

Chaetodon ornatissimus Cuvier in Cuvier & Valenciennes, 1831

Chaetodon pelewensis Kner, 1868

Chaetodon plebeius Cuvier in Cuvier & Valenciennes, 1831

Chaetodon rafflesii Bennett, 1830

Chaetodon reticulatus Cuvier in Cuvier & Valenciennes, 1831

Chaetodon semeion Bleeker, 1855

Chaetodon speculum Cuvier in Cuverr & Valenciennes, 1831

Chaetodon trifascialis (Quoy & Gaimard, 1824)

Chaetodon ulietensis Cuvier in Cuvier & Valenciennes, 1831 (Reported by Plessis & Fourmanoir [1966: 130] under the name *Chaetodon falcula*):

Chaetodon unimaculatus Bloch, 1787

Chaetodon vagabundus Linnaeus, 1758

Coradion altivelis McCulloch, 1916

Forcipiger flavissimus Jordan & McGregor, 1898

Forcipiger longirostris (Broussonet, 1782)

Hemitaurichthys polylepis (Bleeker, 1857) (Reported by Whitley [1961: 64] under the name *Hemitaurichthys zoster*)

Heniochus acuminatus (Linnaeus, 1758)

Heniochus chrysostomus Cuvier in Cuvier & Valenciennes, 1831 (Reported by Whitley [1961: 64] and Fourmanoir & Laboute [1976: 228-229] under the name *Heniochus permutatus*)

Heniochus monoceros Cuvier in Cuvier & Valenciennes, 1831

Heniochus singularius Smith & Radcliffe, 1911

Heniochus varius (Cuvier in Cuvier & Valenciennes, 1829)

Prognathodes guyotensis (Yamamoto & Tameka in Okamura *et al*., 1982)

POMACANTHIDAE

Apolemichthys trimaculatus (Cuvier in Cuvier & Valenciennes, 1831)
Centropyge bicolor (Bloch, 1787)
Centropyge bispinosa (Günther, 1860)
Centropyge flavicauda Fraser-Brunner, 1933
Centropyge flavissima (Cuvier in Cuvier & Valenciennes, 1831)
Centropyge heraldi Woods & Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953
Centropyge loricula (Günther, 1874)
Centropyge multifasciata (Smith & Radcliffe, 1911)
Centropyge nigriocella Woods & Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953
Centropyge nox (Bleeker, 1853)
Centropyge tibicen (Cuvier in Cuvier & Valenciennes, 1831)
Centropyge vrolikii (Bleeker, 1853)
Chaetodontoplus conspicillatus (Waite, 1900)
Genicanthus melanospilos (Bleeker, 1857)
Genicanthus watanabei (Yasuda & Tominaga, 1970)
Pomacanthus annularis (Bloch, 1787)
Pomacanthus imperator (Bloch, 1787)
Pomacanthus semicirculatus (Cuvier in Cuvier & Valenciennes, 1831)
Pomacanthus sexstriatus (Cuvier in Cuvier & Valenciennes, 1831)
Pomacanthus xanthometopon (Bleeker, 1853)
Pygoplites diacanthus (Boddaert, 1772)

PENTACEROTIDAE

Evistias acutirostris (Temminck & Schlegel, 1844)
Pentaceros decacanthus Günther, 1883
Pseudopentaceros richardsoni (Smith, 1849)

TERAPONTIDAE

Mesopristes kneri (Bleeker, 1873)
Terapon jarbua (Forsskål in Niebuhr, 1775) (Synonym: *Therapon servus*)
Terapon theraps (Cuvier in Cuvier & Valenciennes, 1829)

KUHLIIDAE

Kuhlia marginata (Cuvier in Cuvier & Valenciennes, 1829)
Kuhlia mugil (Forster in Bloch & Schneider, 1801)
Kuhlia munda (De Vis, 1885) (Synonym: *Kuhlia humilis*)
Kuhlia rupestris (Lacepède, 1802)

CIRRHITIDAE

Amblycirrhitus bimacula (Jenkins, 1903)
Cirrhitichthys falco Randall, 1963
Cirrhitichthys oxycephalus (Bleeker, 1855)
Cirrhitus pinnulatus (Forster in Bloch & Schneider, 1801)
Cyprinocirrhites polyactis (Bleeker, 1875)
Neocirrhites armatus Castelnau, 1873 (**New record** from New Caledonia based on AMS IB.7081 from southern Grande Terre)
Oxycirrhites typus Bleeker, 1857
Paracirrhites arcatus (Parkinson in Cuvier & Valenciennes, 1829)
Paracirrhites forsteri (Bloch & Schneider, 1801)
Paracirrhites hemistictus (Günther, 1874)

CHEILODACTYLIDAE

Goniistius francisi (Burridge, 2004) (Reported from New Caledonia by authors under the name *Cheilodactylus vittatus*)
Goniistius vestitus (Castelnau, 1878) (Reported from New Caledonia by authors under the name *Cheidodactylus gibbosus*, or *Goniistius gibbosus*)

CICHLIDAE

Oreochromis mossambicus (Peters, 1852) (Introduced species)

POMACENTRIDAE

A record of *Amblyglyphidodon ternatensis* (Bleeker, 1853) from New Caledonia by Rivaton *et al.* (1989: 62), and records of *Amblypomacentrus breviceps* (Schlegel & Müller, 1839) (under the name *Pomacentrus breviceps*), *Chromis elerae* Fowler & Bean, 1928 and *Chrysiptera unimaculata* (Cuvier in Cuvier & Valencienes, 1830) (under the name *Abudefduf unimaculatus*) from Nouméa by Borodin (1932: 92, 93), need verification. Kulbicki & Williams (1997: 19) recorded *Stegastes* cf. *apicalis* from Ouvéa, Loyalty Islands; this also needs verification.

Abudefduf septemfasciatus (Cuvier in Cuvier & Valenciennes, 1830)
Abudefduf sexfasciatus (Lacepède, 1801) (Synonym: *Glyphisodon coelestinus* Cuvier in Cuvier & Valenciennes, 1830)
Abudefduf sordidus (Forsskål in Niebuhr, 1775) (Synonym: *Glyphidodon leucopleura* Day, 1877)
Abudefduf vaigiensis (Quoy & Gaimard, 1825) (Reported by Rivaton *et al.* [1989: 62] under the name *Abudefduf saxatilis*)
Abudefduf whitleyi Allen & Robertson, 1974
Amblyglyphidodon aureus (Cuvier in Cuvier & Valenciennes, 1830)
Amblyglyphidodon curacao (Bloch, 1787)
Amblyglyphidodon leucogaster (Bleeker, 1847)
Amblyglyphidodon orbicularis (Hombron & Jacquinot, 1853) (Reported by Laboute & Grandperrin [2000: 318] from New Caledonia under the name *Amblyglyphidodon* sp.)
Amphiprion akindynos Allen, 1972
Amphiprion chrysopterus Cuvier in Cuvier & Valenciennes, 1830 (**New record** from New Caledonia based on SMNS material from Maré, Loyalty Islands)
Amphiprion clarkii (Bennett, 1830) (Reported by Whitley [1961: 64] under the name *Amphiprion bicinctus*)
Amphiprion melanopus Bleeker, 1852 (Reported by Whitley [1961: 64] and subsequent authors under the name *Amphiprion ephippium*)
Amphiprion perideraion Bleeker, 1855
Amphiprion tricinctus Schultz & Welander in Schultz, 1953 (Reported by several authors from the northern lagoon of Grande Terre and Îles Bélep)
Cheiloprion labiatus (Day, 1877) (Reported by Rivaton *et al.* [1989: 63] on the basis of specimen MNHN 1980-0347 from Grande Terre)
Chromis acares Randall & Swerdloff, 1973
Chromis agilis Smith, 1960
Chromis alpha Randall, 1988
Chromis amboinensis (Bleeker, 1873)
Chromis analis (Cuvier in Cuvier & Valenciennes, 1830)
Chromis atripectoralis Welander & Schultz, 1951
Chromis atripes Fowler & Bean, 1928
Chromis caudalis Randall, 1988
Chromis chrysura (Bliss, 1883)
Chromis flavomaculata Kamohara, 1960 (Synonym: *Chromis kennensis* Whitley, 1964)
Chromis fumea (Tanaka, 1917)
Chromis iomelas Jordan & Seale, 1906
Chromis lepidolepis Bleeker, 1877
Chromis leucura Gilbert, 1905
Chromis margaritifer Fowler, 1946
Chromis mirationis Tanaka, 1917
Chromis nitida (Whitley, 1928)
Chromis notata (Temminck & Schlegel, 1843)
Chromis retrofasciata Weber, 1913
Chromis ternatensis (Bleeker, 1856) [*Chromis caerulea* (Cuvier in Cuvier & Valenciennes, 1830) is the senior synonym, but was suppressed by the International Commission on Zoological Nomenclature, Opinion 1563]
Chromis vanderbilti (Fowler, 1941)
Chromis viridis (Cuvier in Cuvier & Valenciennes, 1830)

Chromis weberi Fowler & Bean, 1928
Chromis xanthochira (Bleeker, 1851)
Chromis xanthura (Bleeker, 1854)
Chrysiptera biocellata (Quoy & Gaimard, 1825) (Synonym: *Glyphisodon zonatus* Cuvier in Cuvier & Valenciennes, 1830)
Chrysiptera brownriggii (Bennett, 1828) (Synonym: *Chrysiptera leucopoma*; reported from Baie de Saint-Vincent/Grande Terre by Plessis & Fourmanoir [1966: 134] under the name *Pomacentrus albo-fasciatus*)
Chrysiptera cyanea (Quoy & Gaimard, 1825) (Synonym: *Glyphisoson uniocellatus* Quoy & Gaimard, 1825)
Chrysiptera flavipinnis (Allen & Robertson, 1974)
Chrysiptera glauca (Cuvier in Cuvier & Valenciennes, 1830)
Chrysiptera notialis (Allen, 1975)
Chrysiptera rex (Snyder, 1909)
Chrysiptera rollandi (Whitley, 1961)
Chrysiptera starcki (Allen, 1973)
Chrysiptera talboti (Allen, 1975) (**New record** from New Caledonia based on SMNS 21623 from Maré, Loyalty Islands)
Chrysiptera taupou (Jordan & Seale, 1906)
Chrysiptera tricincta (Allen & Randall, 1974)
Dascyllus aruanus (Linnaeus, 1758)
Dascyllus flavicaudus Randall & Allen, 1977 (**New record** from New Caledonia based on SMNS 24048 from Grand Récif Sud)
Dascyllus melanurus Bleeker, 1854
Dascyllus reticulatus (Richardson, 1846) (Reported by Whitley [1961: 65] under the name *Pellochromis marginatus*)
Dascyllus trimaculatus (Rüppell, 1828)
Dischistodus fasciatus (Cuvier in Cuvier & Valenciennes, 1830) (**New record** from New Caledonia based on SMNS 19727 from southern Grande Terre)
Dischistodus prosopotaenia (Bleeker, 1852) (**New record** from New Caledonia based on SMNS material from southern Grande Terre)
Lepidozygus tapeinosoma (Bleeker, 1856)
Neoglyphidodon carlsoni (Allen, 1975)
Neoglyphidodon melas (Cuvier in Cuvier & Valenciennes, 1830)
Neoglyphidodon nigroris (Cuvier in Cuvier & Valenciennes, 1830)
Neoglyphidodon polyacanthus (Ogilby, 1889)
Neopomacentrus anabatoides (Bleeker, 1847) (Reported from Grande Terre, New Caledonia by Whitley [1961: 65] under the name *Parapomacentrus bankieri*)
Neopomacentrus azysron (Bleeker, 1877)
Neopomacentrus bankieri (Richardson, 1846) (New record from New Caledonia based on SMNS 22661 from southern Grande Terre)
Neopomacentrus cyanomos (Bleeker, 1856)
Neopomacentrus filamentosus (Macleay, 1883)
Neopomacentrus nemurus (Bleeker, 1857)
Neopomacentrus taeniurus (Bleeker, 1856)
Neopomacentrus violascens (Bleeker, 1848)
Parma polylepis Günther, 1862
Plectroglyphidodon dickii (Liénard, 1839)
Plectroglyphidodon imparipennis Vaillant & Sauvage, 1875
Plectroglyphidodon johnstonianus Fowler & Ball, 1924
Plectroglyphidodon lacrymatus (Quoy & Gaimard, 1825)
Plectroglyphidodon leucozonus leucozonus (Bleeker, 1859)
Pomacentrus adelus Allen, 1991
Pomacentrus amboinensis Bleeker, 1868
Pomacentrus arenarius Allen, 1987

Pomacentrus aurifrons Allen, 2004 (Reported by several authors including Laboute & Grandperrin [2000: 326] under the name *Pomacentrus smithi*)
Pomacentrus bankanensis Bleeker, 1853
Pomacentrus brachialis Cuvier in Cuvier & Valenciennes, 1830 (Synonym: *Pomacentrus melanopterus* Bleeker, 1852)
Pomacentrus chrysurus Cuvier in Cuvier & Valenciennes, 1830 (Synonym: *Pomacentrus rhodonotus* Bleeker, 1853)
Pomacentrus coelestis Jordan & Starks, 1901
Pomacentrus grammorhynchus Fowler, 1918
Pomacentrus imitator (Whitley, 1964)
Pomacentrus lepidogenys Fowler & Bean, 1928
Pomacentrus moluccensis Bleeker, 1853 (Synonyms: *Pomacentrus popei* Evermann & Seale, 1907; *Pomacentrus sufflavus* Whitley, 1927)
Pomacentrus nagasakiensis Tanaka, 1909 (Synonum: *Pomacentrus arenarius* Allen, 1987 Reported from New Caledonia by Fourmanoir [1981: 27] under the name *Pomacentrus wardi*, and Laboute & Grandperrin [2000: 327] under the name *Pomacentrus* sp.)
Pomacentrus nigromanus Weber, 1913 (**New record** from New Caledonia based on SMNS 24117 from Lifou, Loyalty Islands)
Pomacentrus pavo (Bloch, 1787)
Pomacentrus philippinus Evermann & Seale, 1907
Pomacentrus reidi Fowler & Bean, 1928
Pomacentrus simsiang Bleeker, 1856
Pomacentrus spilotoceps Randall, 2002 (**New record** from New Caledonia based on SMNS material from Grande Terre and Lifou/Loyalty Islands).
Pomacentrus taeniometopon: Bleeker, 1852
Pomacentrus tripunctatus Cuvier in Cuvier & Valenciennes, 1830
Pomacentrus vaiuli Jordan & Seale, 1906
Pomachromis richardsoni (Snyder, 1909)
Pristotis obtusirostris (Günther, 1862) (Synonym: *Pristotis jerdoni*; reported from New Caledonia by Laboute & Grandperrin [2000: 327] under the name *Pristotis* sp.)
Stegastes albifasciatus (Schlegel & Müller, 1839) (Synonym: Pomacentrus eclipticus Jordan & Seale, 1906)
Stegastes apicalis (DeVis, 1885)
Stegastes aureus (Fowler, 1927)
Stegastes fasciolatus (Ogilby, 1889)
Stegastes gascoynei (Whitley, 1964)
Stegastes nigricans (Lacepède, 1803) (Synonym: *Pomacentrus subniger* DeVis, 1885)
Stegastes punctatus (Quoy & Gaimard, 1825) (Reported from New Caledonia by Myers [1999: 187] under the name *Stegastes lividus*)

LABRIDAE

Records of *Bodianus unimaculatus* (Günther, 1862) under the name *Bodianus oxycephalus* (non Bleeker, 1862) by Rivaton *et al.* (1989: 45) and *Labroides rubrolabiatus* Randall, 1958 by Fourmanoir & Laboute (1976: 127) need verification.
Anampses caeruleopunctatus Rüppell, 1828
Anampses femininus Randall, 1972
Anampses geographicus Valenciennes in Cuvier & Valenciennes, 1840
Anampses neoguinaicus Bleeker, 1878
Anampses twistii Bleeker, 1856
Bodianus anthioides (Bennett, 1831)
Bodianus axillaris (Bennett, 1831)
Bodianus bimaculatus Allen, 1973
Bodianus busellatus Gomon, 2006 (**New record** from New Caledonia; previously reported from New Caledonia by several authors including Laboute & Grandperrin [2000: 350] and Randall [2005: 392] under the name *Bodianus bilunulatus*)

Bodianus cylindriatus (Tanaka, 1930)
Bodianus dictynna Gomon, 2006 (Previously reported from New Caledonia by authors under the name *Bodianus diana*)
Bodianus izuensis Araga & Yoshino in Masuda, Araga & Yoshino, 1975
Bodianus loxozonus (Snyder, 1908) (Reported from New Caledonia by Whitley [1961: 64] under the name *Bodianus hirsutus*)
Bodianus masudai Araga & Yoshino, 1975
Bodianus mesothorax (Bloch & Schneider, 1801)
Bodianus paraleucosticticus Gomon, 2006
Bodianus perditio (Quoy & Gaimard, 1824)
Cheilinus chlorourus (Bloch, 1791)
Cheilinus fasciatus (Bloch, 1791)
Cheilinus oxycephalus Bleeker, 1853
Cheilinus trilobatus (Lacepède, 1801)
Cheilinus undulatus Rüppell, 1835
Cheilio inermis (Forsskål in Niebuhr, 1775)
Choerodon anchorago (Bloch, 1791)
Choerodon fasciatus (Günther, 1867)
Choerodon graphicus (De Vis, 1885) (Synonym: *Choerodon transversalis* Whitley, 1956)
Choerodon jordani (Snyder, 1908) (Reported from New Caledonia by several authors under the name *Choerodon melanostigma*)
Choerodon margaritiferus Fowler & Bean, 1928
Cirrhilabrus bathyphilus Randall & Nagareda, 2002
Cirrhilabrus laboutei Randall & Lubbock, 1982
Cirrhilabrus lineatus Randall & Lubbock, 1982
Cirrhilabrus punctatus Randall & Kuiter, 1989
Cirrhilabrus roseafascia Randall & Lubbock, 1982
Coris aygula Lacepède, 1801 (Synonyms: *Coris cingulum*; *Coris angulatus*; *Coris variegata* Ramsay & Ogilby, 1887)
Coris batuensis (Bleeker, 1856) (Synonym: *Coris schroederi*)
Coris dorsomacula Fowler, 1908 (Reported from New Caledonia by Rivaton & Bourret [1999: 158] under the name *Coris multicolor*)
Coris gaimard (Quoy & Gaimard, 1824)
Coris picta (Bloch & Schneider, 1801)
Coris pictoides Randall & Kuiter, 1982
Coris sandeyeri (Hector, 1884) (Reported from Nouméa by Whitley [1961: 64] under the name *Guntheria trimaculata*; **new record** from New Caledonia based on AMS IB.4152).
Cymolutes praetextatus (Quoy & Gaimard, 1834) (Reported from New Caledonia by Whitley [1961: 64] under the name *Cymolutes lecluse*)
Cymolutes torquatus (Valenciennes in Cuvier & Valenciennes, 1840)
Diproctacanthus xanthurus (Bleeker, 1856) (**New record** from New Caledonia based on AMS IB.7799 from southern Grande Terre)
Epibulus insidiator (Pallas, 1770)
Gomphosus varius Lacepède, 1801 (Synonym: *Thalassoma stuckiae* Whitley, 1959)
Halichoeres argus (Bloch & Schneider, 1801) (Synonym: *Halichoeres leparensis*)
Halichoeres biocellatus Schultz in Schultz, Chapman, Lachner & Woods, 1960
Halichoeres chrysus Randall, 1981
Halichoeres chloropterus (Bloch, 1791)
Halichoeres hortulanus (Lacepède, 1801)
Halichoeres lamarii annularis (Valenciennes in Cuvier & Valenciennes, 1839) (Reported from New Caledonia by several authors under the name *Halichoeres marginatus*; **new record** from New Caledonia based on these records and SMNS material from Grande Terre and Lifou/Loyalty Islands)
Halichoeres margaritaceus (Valenciennes in Cuvier & Valenciennes, 1839)
Halichoeres melanurus (Bleeker, 1851) (Synonym: *Halichoeres hoevenii*; reported by Rivaton et al. [1989: 46] under the name *Halichoeres timorensis*)

Halichoeres miniatus (Kuhl & Hasselt in Valenciennes in Cuvier & Valenciennes, 1839)
Halichoeres nebulosus (Valenciennes in Cuvier & Valenciennes, 1839)
Halichoeres ornatissimus (Garrett, 1863) (Reported from New Caledonia by Rivaton *et al.* [1989: 46] under the name *Halichoeres vrolikii*)
Halichoeres prosopeion (Bleeker, 1853)
Halichoeres scapularis (Bennett, 1832) (**New record** from New Caledonia based on SMNS 21560 from southern Grande Terre)
Halichoeres trimaculatus (Quoy & Gaimard, 1834)
Halichoeres zeylonicus (Bennett, 1833)
Hemigymnus fasciatus (Bloch, 1792)
Hemigymnus melapterus (Bloch, 1791)
Hologymnosus annulatus (Lacepède, 1801)
Hologymnosus doliatus (Lacepède, 1802)
Hologymnosus longipes (Günther, 1862)
Iniistius aneitensis (Günther, 1862)
Iniistius celebicus (Bleeker, 1856) (**New record** from New Caledonia based on *Xyrichthys* sp. of Kulbicki, Randall & Rivaton [1994: 30] from Chesterfield Islands).
Iniistius pavo (Valenciennes in Cuvier & Valenciennes, 1839)
Labrichthys unilineatus (Guichenot, 1847)
Labroides bicolor Fowler & Bean, 1928
Labroides dimidiatus (Valenciennes in Cuvier & Valenciennes, 1839)
Labroides pectoralis Randall & Springer, 1975
Labropsis australis Randall, 1981
Labropsis xanthonota Randall, 1981
Macropharyngodon choati Randall, 1978
Macropharyngodon kuiteri Randall, 1978
Macropharyngodon meleagris (Valenciennes in Cuvier & Valenciennes, 1839)
Macropharyngodon negrosensis Herre, 1932
Novaculichthys taeniourus (Lacepède, 1802)
Oxycheilinus bimaculatus (Valenciennes in Cuvier & Valenciennes, 1839)
Oxycheilinus celebicus (Bleeker, 1853)
Oxycheilinus digrammus (Lacepède, 1801)
Oxycheilinus nigromarginatus Randall, Westneat & Gomon, 2003
Oxycheilinus orientalis (Günther, 1862)
Oxycheilinus unifasciatus (Streets, 1877) (Reported from New Caledonia by Fourmanoir & Laboute [1976: 117] under the name *Cheilinus rhodocrous*)
Pseudocheilinus evanidus Jordan & Evermann, 1903
Pseudocheilinus hexataenia (Bleeker, 1857)
Pseudocheilinus ocellatus Randall, 1999
Pseudocheilinus octotaenia Jenkins, 1900
Pseudocheilinus tetrataenia Schultz in Schultz, Chapman, Lachner & Woods, 1960
Pseudocoris bleekeri (Hubrecht, 1876) (Reported from New Caledonia by authors under the name *Coris philippina*)
Pseudocoris yamashiroi (Schmidt, 1931)
Pseudodax moluccanus (Valenciennes in Cuvier & Valenciennes, 1839)
Pseudojuloides cerasinus (Snyder, 1904)
Pteragogus sp. (Undescribed species, which has been reported from New Caledonia by several authors under the name *Pteragogus cryptus*, a species which is restricted to the Red Sea according to Kuiter [2002: 56])
Pteragogus enneacanthus (Bleeker, 1853)
Pteragogus flagellifer (Valenciennes in Cuvier & Valenciennes, 1839) (Reported from New Caledonia by authors under the names *Pteragogus opercularis* and *P. flagellifera*)
Stethojulis bandanensis (Bleeker, 1851) (Reported from New Caledonia by Whitley [1961: 65] under the name *Stethojulis axillaris*)

Stethojulis notialis Randall, 2000 (Reported from New Caledonia by various authors under the name *Stethojulis interrupta*)
Stethojulis strigiventer (Bennett, 1832)
Suezichthys arquatus Russell, 1985
Suezichthys devisi (Whitley, 1941) (Reported from New Caledonia by various authors under the name *Suezichthys gracilis*)
Terelabrus rubrovittatus Randall & Fourmanoir, 1998
Thalassoma amblycephalum (Bleeker, 1856) (Reported from New Caledonia by Whitley [1961: 65] under the name *Thalassoma melanochir*)
Thalassoma hardwicke (Bennett, 1830)
Thalassoma lunare (Linnaeus, 1758)
Thalassoma lutescens (Lay & Bennett, 1839) (Reported from New Caledonia by Whitley [1961: 65] under the name *Thalassoma aneitense*)
Thalassoma nigrofasciatum Randall, 2003 (Reported from New Caledonia by several authors under the name *Thalassoma jansenii*)
Thalassoma purpureum (Forsskål in Niebuhr, 1775)
Thalassoma quinquevittatum (Lay & Bennett, 1839) (Reported from Lifou/Loyalty Islands by Günther [1909: 294-295] under the name *Julis güntheri*)
Thalassoma trilobatum (Lacepède, 1801)
Wetmorella albofasciata Schultz & Marshall, 1954
Wetmorella nigropinnata Seale, 1901 (Reported from New Caledonia by Fourmanoir & Laboute [1976: 128] under the name *Wetmorella ocellata*)
Xiphocheilus typus Bleeker, 1856 (Reported from New Caledonia by Parenti & Randall [2000: 48] under the name *Xiphocheilus quadrimaculatus*)

SCARIDAE

Records by Plessis & Fourmanoir (1966: 136) of *Scarus tricolor* Bleeker, 1847 (under the name *Scarus mus*) need verification.
Bolbometopon muricatum (Valenciennes in Cuvier & Valenciennes, 1839)
Calotomus carolinus (Valenciennes in Cuvier & Valenciennes, 1840)
Calotomus spinidens (Quoy & Gaimard, 1824)
Cetoscarus ocellatus (Valenciennes in Cuvier & Valenciennes, 1840) (Reported from New Caledonia by various authors under the name *Cetoscarus bicolor*; **new record** from New Caledonia, also based on AMS IB.3830)
Chlorurus bleekeri (Beaufort, 1940)
Chlorurus frontalis (Valenciennes in Cuvier & Valenciennes, 1839)
Chlorurus microrhinos (Bleeker, 1854) (Reported from New Caledonia by several authors under the name *Scarus gibbus*, and by Rivaton & Bourret [1999: 16] confused with *Scarus rhoduropterus*)
Chlorurus sordidus (Forsskål in Niebuhr, 1775)
Hipposcarus longiceps (Valenciennes in Cuvier & Valenciennes, 1840)
Leptoscarus vaigiensis (Quoy & Gaimard, 1824)
Scarus altipinnis (Steindachner, 1879)
Scarus chameleon Choat & Randall, 1986
Scarus dimidiatus Bleeker, 1859
Scarus flavipectoralis Schultz, 1958
Scarus forsteni (Bleeker, 1861)
Scarus frenatus Lacepède, 1802
Scarus ghobban (Forsskål in Niebuhr, 1775) (Reported from New Caledonia by Laboute & Grandperrin [2000: 383] under the name *Scarus* sp. 3)
Scarus globiceps Valenciennes in Cuvier & Valenciennes, 1839
Scarus longipinnis Randall & Choat, 1980 (Reported from New Caledonia by Laboute & Grandperrin [2000: 383] under the name *Scarus* sp. 1)
Scarus niger (Forsskål in Niebuhr, 1775)
Scarus oviceps Valenciennes in Cuvier & Valenciennes, 1839
Scarus psittacus Forsskål in Niebuhr, 1775
Scarus quoyi Valenciennes in Cuvier & Valenciennes, 1840

Scarus rivulatus Valenciennes in Cuvier & Valenciennes, 1840 (Reported from New Caledonia by several authors under the name *Scarus fasciatus*)
Scarus rubroviolaceus Bleeker, 1847
Scarus schlegeli (Bleeker, 1861) (Reported from New Caledonia by various authors under the name *Scarus venosus*)
Scarus spinus (Kner, 1868)

PINGUIPEDIDAE

Parapercis australis Randall, 2003 (Reported by various authors under the name *Parapercis cylindrica*)
Parapercis binivirgata (Waite, 1904)
Parapercis clathrata Ogilby, 1910
Parapercis colemani Randall & Francis, 1993 (**New record** from New Caledonia based on SMNS 23850 from Lifou, Loyalty Islands)
Parapercis hexophtalma (Cuvier in Cuvier & Valenciennes, 1829) (Reported from New Caledonia by various authors under the name *Parapercis polyophthalma*)
Parapercis lineopunctata Randall, 2003
Parapercis millepunctata (Günther, 1860)
Parapercis multiplicata Randall, 1984
Parapercis nebulosa (Quoy & Gaimard, 1825) (New record from New Caledonia, based on SMNS 23673 from Lifou, Loyalty Islands)
Parapercis schauinslandii (Steindachner, 1900)
Parapercis snyderi Jordan & Starks, 1905 (Reported from New Caledonia by Laboute & Grandperrin [2000: 391] under the name *Parapercis* sp.)
Parapercis xanthozona (Bleeker, 1849)

TRICHONOTIDAE

Trichonotus elegans Shimada & Yoshino, 1984
Trichonotus filamentosus (Steindachner, 1867)
Trichonotus setiger (Bloch & Schneider, 1801)

CREEDIIDAE

Chalixodytes tauensis Schultz, 1943 (Synonym: *Chalixodytes chameleontoculis*)
Limnichthys nitidus Smith, 1958 (Synonym: *Limnichthys donaldsoni* Schultz in Schultz *et al.*, 1960)

AMMODYTIDAE

Ammodytoides vagus (McCulloch & Waite, 1916) (Reported from New Caledonia by Laboute & Grandperrin [2000: 387] under the name *Ammodytes* sp.)
Bleekeria mitsukurii Jordan & Evermann, 1902

URANOSCOPIDAE

A record of *Ichthyoscopus lebeck* Bloch & Schneider, 1801 by two authors needs verification; New Caledonian populations may be referable to *Ichthyscopus sannio* Whitley, 1936.
Uranoscopus oligolepis Bleeker, 1858
Uranoscopus sulphureus Valenciennes in Cuvier & Valenciennes, 1831

TRIPTERYGIIDAE

Ceratobregma helenae Holleman, 1987 (Synonym: *Ceratobregma striata* Fricke, 1994)
Enneapterygius elegans (Peters, 1877)
Enneapterygius flavoccipitis Shen & Wu, 1994 (Synonym: *Enneapterygius bichrous* Fricke, 1994)
Enneapterygius hemimelas (Kner & Steindachner, 1867) (Reported from Chesterfield Islands by Kulbicki *et al.* [1994: 32] under the name *Enneapterygius semilarvatus*, a nomen nudum)
Enneapterygius howensis Fricke, 1997
Enneapterygius nanus (Schultz in Schultz, Chapman, Lachner & Woods, 1960)
Enneapterygius niger Fricke, 1994
Enneapterygius paucifasciatus Fricke, 1994
Enneapterygius philippinus (Peters, 1869) (Synonym: *Enneapterygius minutus*; reported from New Caledonia by Whitley [1961: 65] under the name *Vauclusella rufopileum*)
Enneapterygius rhabdotus Fricke, 1994
Enneapterygius rhothion Fricke, 1997
Enneapterygius rubicauda Shen & Wu, 1994

Enneapterygius rufopileus (Waite, 1904)
Enneapterygius similis Fricke, 1997
Enneapterygius triserialis Fricke, 1994
Enneapterygius trisignatus Fricke, 2001
Enneapterygius tutuilae Jordan & Seale, 1906
Enneapterygius williamsi Fricke, 1997
Helcogramma sp. (To be described by J.T. Williams) (Reported by several authors from New Caledonia under the name *Helcogramma ellioti*)
Helcogramma hudsoni (Jordan & Seale, 1906)
Helcogramma novaecaledoniae Fricke, 1994
Helcogramma trigloides (Bleeker, 1858)
Norfolkia brachylepis (Schultz in Schultz, Chapman, Lachner & Woods, 1960)
Norfolkia squamiceps (McCulloch & Waite, 1916)
Norfolkia thomasi Whitley, 1964
Springerichthys kulbickii (Fricke & Randall in Fricke, 1994)
Ucla xenogrammus Holleman, 1993

BLENNIIDAE

Records of *Andamia reyi* (Sauvage, 1880) by Rivaton *et al.* (1989: 27), *Ecsenius aequalis* Springer, 1988 and *Salarias sinuosus* Snyder, 1908 by Rivaton *et al.* (1989: 28, 29) need verification. Records of *Cirripectes variolosus* (Valenciennes in Cuvier & Valenciennes, 1836) (under the name *C. sebae*) by several authors also need verification.

Alticus sp. (To be described by J.T. Williams)
Alticus sertatus (Garman, 1903)
Andamia amphibius (Walbaum, 1792) (**New record** from New Caledonia, based on SMNS 23579 from Lifou, Loyalty Islands)
Aspidontus dussumieri (Valenciennes in Cuvier & Valenciennes, 1836)
Aspidontus taeniatus Quoy & Gaimard, 1836
Atrosalarias fuscus holomelas (Günther, 1872)
Blenniella chrysospilos (Bleeker, 1857)
Blenniella paula (Bryan & Herre, 1903) (**New record** from New Caledonia based on SMNS 22752 from northeastern Grande Terre)
Blenniella periophthalmus (Valenciennes in Cuvier & Valenciennes, 1836)
Cirripectes alboapicalis (Ogilby, 1899) (Reported from New Caledonia by Laboute & Grandperrin [2000: 397] under the name *Cirripectes* sp.; **new record** from New Caledonia, also based on SMNS 23810 from Lifou, Loyalty Islands)
Cirripectes castaneus (Valenciennes in Cuvier & Valenciennes, 1836)
Cirripectes chelomatus Williams & Maugé, 1983
Cirripectes filamentosus (Alleyne & Macleay, 1877) (**New record** from New Caledonia, based on SMNS 22769 from northern Grande Terre)
Cirripectes fuscoguttatus Strasburg & Schultz, 1953 (**New record** from New Caledonia, based on SMNS material from northern Grande Terre and Lifou/Loyalty Islands)
Cirripectes polyzonus Bleeker, 1868
Cirripectes stigmaticus Strasburg & Schultz, 1953
Crossosalarias macrospilus Smith-Vaniz & Springer, 1971
Ecsenius bicolor (Day, 1888)
Ecsenius fourmanoiri Springer, 1972
Ecsenius isos McKinney & Springer, 1976 (Reported from New Caledonia by Laboute & Grandperrin [2000: 399] under the name *Ecsenius* sp.)
Ecsenius midas Starck, 1969
Ecsenius nalolo Smith, 1959
Ecsenius stictus Springer, 1988 (Reported by several authors under the name *Ecsenius yaeyamaensis*)
Ecsenius tessera Springer, 1988 (Reported from New Caledoniy by Laboute & Grandperrin [2000: 399] under the name *Ecsenius oculus*)
Enchelyurus ater (Günther, 1877)
Enchelyurus kraussii (Klunzinger, 1871)

Entomacrodus caudofasciatus (Regan, 1909)
Entomacrodus decussatus (Bleeker, 1858)
Entomacrodus sealei Bryan & Herre, 1903
Entomacrodus striatus (Quoy & Gaimard, 1836)
Entomacrodus thalassinus (Jordan & Seale, 1906) (Reported from New Caledonia by Laboute & Grandperrin [2000: 400] under the name 'Blenniidae indéterminé'; **new record** from New Caledonia, also based on SMNS 19796 from southern Grande Terre)
Exallias brevis (Kner, 1868)
Istiblennius dussumieri (Valenciennes in Cuvier & Valenciennes, 1836) (Reported by Günther [1877: 208] under the name *Salarias meleagris*, by Whitley [1927: 304] as *Salarias geminatus*, and by Plessis & Fourmanoir [1966: 140] under the name *Halmablennius striatomaculatus*) Plessis & Fourmanoir, 1966: 140 (Nouvelle-Calédonie/Grande Terre, New Caledonia).
Istiblennius edentulus (Forster in Bloch & Schneider, 1801)
Istiblennius lineatus (Valenciennes in Cuvier & Valenciennes, 1836)
Meiacanthus anema (Bleeker, 1852)
Meiacanthus atrodorsalis (Günther, 1877)
Meiacanthus ditrema Smith-Vaniz, 1976
Meiacanthus grammistes (Valenciennes in Cuvier & Valenciennes, 1836)
Meiacanthus phaeus Smith-Vaniz, 1976
Nannosalarias nativitatus (Regan, 1909) (**New record** from New Caledonia based on SMNS material from southern Grande Terre)
Omobranchus germaini (Sauvage, 1883) (Synonym: *Graviceps alexanderi* Whitley, 1945)
Omobranchus obliquus (Garman, 1903) (Reported from New Caledonia by Rivaton *et al.* [1989: 28] under the name *Omobranchus banditus*)
Omox biporos Springer, 1972
Parablennius tasmanianus (Richardson, 1849) (Synonym: *Parablennius tasmanianus caledoniensis* Bath, 1989; taxonomic decision of H. Bath, personal communication, June 2006)
Petroscirtes breviceps (Valenciennes in Cuvier & Valenciennes, 1836)
Petroscirtes lupus (De Vis, 1886) (Synonym: *Dasson icelii*)
Petroscirtes mitratus Rüppell, 1830
Petroscirtes variabilis Cantor, 1850
Petroscirtes xestus Jordan & Seale, 1906
Plagiotremus laudandus (Whitley, 1961)
Plagiotremus rhinorhynchos (Bleeker, 1852)
Plagiotremus tapeinosoma (Bleeker, 1857) (Reported from New Caledonia by Laboute & Grandperrin [2000: 68] under the name *Omox* sp.)
Praealticus bilineatus (Peters, 1868)
Rhabdoblennius snowi (Fowler, 1928) (Reported from New Caledonia by Kulbicki *et al.* [1994: 33] under the name *Rhabdoblennius ellipes*)
Salarias alboguttatus Kner, 1867
Salarias fasciatus (Bloch, 1786) (Reported from New Caledonia by Fourmanoir & Laboute [1976: 137] under the name *Petroscirtes mitratus*)
Salarias guttatus Valenciennes in Cuvier & Valenciennes, 1836 (**New record** from New Caledonia based on SMNS 19777 from southeastern Grande Terre)
Stanulus seychellensis Smith, 1959 (**New record** from New Caledonia based on SMNS 23616 from Lifou, Loyalty Islands)
Stanulus talboti Springer, 1968 (**New record** from New Caledonia based on SMNS 23617 from Lifou, Loyalty Islands)
Xiphasia setifer Swainson, 1839

CLINIDAE

Springeratus sp. (Undescribed species) (Reported from New Caledonia under the names *Petraites roseus*, *Petraites sellularius* and *Petraites nasutus*)

GOBIESOCIDAE

Conidens samoensis (Steindachner, 1906)
Diademichthys lineatus (Sauvage, 1883)

Discotrema crinophila Briggs, 1976
Lepadichthys sp. (Undescribed species based on SMNS material from southern Grande Terre)
Lepadichthys frenatus Waite, 1904
Lepadichthys minor Briggs, 1955
Pherallodus indicus (Weber, 1913) (Reported by Kulbicki & Williams [1997: 12] under the name *Pherallodus* sp.; **new record** from New Caledonia, also based on SMNS material from Lifou, Loyalty Islands)

CALLIONYMIDAE

Callionymus sp. (Chesterfield Islands; to be described by R. Fricke; recorded by Kulbicki *et al.* [1994: 33] under the name *Calliurichthys japonicus*, and by Fricke [2000: 20-24, part] under the name *Callionymus scaber*)
Callionymus brevianalis Fricke, 1983
Callionymus corallinus Gilbert, 1905
Callionymus enneactis Bleeker, 1879
Callionymus keeleyi Fowler, 1941 (Reported from New Caledonia by several authors under the name *Repomucenus virgis*)
Callionymus pleurostictus Fricke, 1982
Callionymus rivatoni Fricke, 1993 (Reported from New Caledonia by several authors under the name *Repomucenus huguenini*; reported by Laboute & Grandperrin [2000: 400] as *Diplogrammus goramensis*)
Callionymus simplicicornis Valenciennes in Cuvier & Valenciennes, 1837
Callionymus tethys Fricke, 1993
Diplogrammus goramensis (Bleeker, 1858)
Synchiropus circularis Fricke, 1984
Synchiropus morrisoni Schultz in Schultz, Chapman, Lachner & Woods, 1960 (Reported from New Caledonia by Laboute & Grandperrin [2000: 401, left fig.] under the name *Synchiropus ocellatus* [part])
Synchiropus ocellatus (Pallas, 1770) (Reported by Laboute & Grandperrin [2000: 401] under the name *Synchiropus* sp.)
Synchiropus rameus (McCulloch, 1926)
Synchiropus rubrovinctus (Gilbert, 1905) (**New record** from New Caledonia based on SMNS material from Lifou, Loyalty Islands)
Synchiropus sechellensis Regan, 1908
Synchiropus splendidus (Herre, 1927)
Synchiropus springeri Fricke, 1983 (Reported from New Caledoniy by Rivaton *et al.* [1989: 31] under the name *Synchiropus postulus*, and by Kulbicki & Williams [1997: 21] under the name *Minysynchiropus laddi*)

ELEOTRIDAE

Butis amboinensis (Bleeker, 1853)
Calumia godeffroyi (Günther, 1877)
Eleotris acanthopoma Bleeker, 1853
Eleotris fusca (Bloch & Schneider, 1801) (Reported from New Caledonia by Whitley [1961: 64] under the name *Culius melanosoma*)
Eleotris melanosoma Bleeker, 1852

XENISTHMIDAE

Xenisthmus eirospilus Gill & Hoese, 2004 (Reported from Chesterfield Islands by Kulbicki *et al.* [1994: 35] under the name *Xenisthmus* sp.; **new record** from New Caledonia)
Xenisthmus polyzonatus (Klunzinger, 1871)

KRAEMERIIDAE

Kraemeria samoensis Steindachner, 1906

GOBIIDAE

Records of *Drombus triangularis* (Weber, 1909), under the name *Acentrogobius bontii*, by several authors including Fourmanoir (1981: 27), *Amblyeleotris japonica* Takagi, 1957 by Fourmanoir & Laboute (1976: 140), *Bathygobius petrophilus* (Bleeker, 1853) by Plessis & Fourmanoir [1966: 139], *Parapocryptes serperaster* (Richardson, 1846) (under the name *Apocryptes s.*) by Borodin (1932: 96), and *Amblygobius hectori* (Smith, 1957), *Bryaninops ridens* Smith, 1959 and *Valenciennea sexguttata* (Valenciennes in Cuvier & Valenciennes, 1837) by Rivaton *et al.* [1989: 40, 42], need verification.

Amblyeleotris bellicauda Randall, 2004
Amblyeleotris biguttata Randall, 2004
Amblyeleotris diagonalis Polunin & Lubbock, 1979 (Reported by Laboute & Grandperrin [2000: 405] under the name *Amblyeleotris* sp. 1)
Amblyeleotris fasciata (Herre, 1953) (Synonym: *Amblyeleotris wheeleri*)
Amblyeleotris fontanesii (Bleeker, 1852)
Amblyeleotris guttata (Fowler, 1938)
Amblyeleotris novaecaledoniae Goren, 1981
Amblyeleotris ogasawarensis Yanagisawa, 1978 (Reported from New Caledonia by Laboute & Grandperrin [2000: 7, 8] under the names *Amblyeleotris* sp. 7 and *Amblyeleotris* sp. 8)
Amblyeleotris periophthalma (Bleeker, 1853) (Synonym: *Amblyeleotris exilis*)
Amblyeleotris randalli Hoese & Steene, 1978
Amblyeleotris rubrimarginata Mohlmann & Randall, 2002 (Reported from New Caledonia by Laboute & Grandperrin [2000: 406] under the name *Amblyeleotris* sp. 9)
Amblyeleotris steinitzi (Klausewitz, 1974)
Amblyeleotris stenotaeniata Randall, 2004 (Reported from New Caledonia by Laboute & Grandperrin [2000: 406] under the names *Amblyeleotris* sp. 4 and *Amblyeleotris* sp. 5)
Amblygobius bynoensis (Richardson, 1844)
Amblygobius decussatus (Bleeker, 1855)
Amblygobius linki (Herre, 1927)
Amblygobius nocturnus (Herre, 1945)
Amblygobius phalaena (Valenciennes in Cuvier & Valenciennes, 1837) (Reported from New Caledonia by several authors under the name *Amblygobius albimaculatus*)
Amblygobius sphynx (Valenciennes in Cuvier & Valenciennes, 1837)
Asterropterix ensifera (Bleeker, 1874)
Asterropterix semipunctata Rüppell, 1830
Asterropterix spinosa (Goren, 1981)
Barbuligobius sp. (Record based on SMNS 23775 from Lifou, Loyalty Islands)
Bathygobius coalitus (Bennett, 1832) (Reported from Grande Terre by several authors under the name *Bathygobius albopunctatus*, which is a synonym; **new record** from New Caledonia, also based on MNHN material from Grande Terre)
Bathygobius cocosensis (Bleeker, 1854)
Bathygobius cotticeps (Steindachner, 1880) (**New record** from New Caledonia based on SMNS material from northeastern, southwestern and southern Grande Terre and Lifou/Loyalty Islands)
Bathygobius cyclopterus (Valenciennes in Cuvier & Valenciennes, 1837)
Bathygobius fuscus (Rüppell, 1830) (Synonyms: *Gobius caledonicus* Sauvage, 1880; *Gobius filamentosus* Sauvage, 1883, both originally described from New Caledonia)
Bryaninops loki Larson, 1985
Bryaninops natans Larson, 1985
Bryaninops yongei (Davis & Cohen, 1968)
Cabillus tongarevae (Fowler, 1927)
Callogobius hasseltii (Bleeker, 1851)
Callogobius maculipinnis (Fowler, 1918) (Synonyms: *Callogobius irrasus*; *Intosagobius kuderi* Herre, 1943)
Callogobius sclateri (Steindachner, 1880)
Cryptocentrus fasciatus (Playfair & Günther, 1867)
Cryptocentrus leptocephalus Bleeker, 1876 (Reported from New Caledonia by several authors including Laboute & Grandperrin [2000: 409] under the name *Cryptocentrus lutheri*; new record from New Caledonia, also based on SMNS 21552 from southern Grande Terre)
Cryptocentrus strigilliceps (Jordan & Seale, 1906)
Ctenogobiops aurocingulus (Herre, 1935)
Ctenogobiops feroculus Lubbock & Polunin, 1977
Ctenogobiops pomastictus Lubbock & Polunin, 1977

Ctenotrypauchen microcephalus (Bleeker, 1860)
Eviota afelei Jordan & Seale, 1906
Eviota albolineata Jewett & Lachner, 1983
Eviota cometa Jewett & Lachner, 1983
Eviota distigma Jordan & Seale, 1906 (Reported by Whitley [1961: 64] under the name *Eviota abax*)
Eviota fasciola Karnella & Lachner, 1981
Eviota herrei Jordan & Seale, 1906 (**New record** from New Caledonia based on SMNS 18327 from southeastern Grande Terre)
Eviota hoesei Gill & Jewett, 2004
Eviota latifasciata Jewett & Lachner, 1983
Eviota melasma Lachner & Karnella, 1980
Eviota monostigma Fourmanoir, 1971
Eviota nebulosa Smith, 1958
Eviota nigriventris Giltay, 1933
Eviota pellucida Larson, 1976
Eviota prasina (Klunzinger, 1871)
Eviota prasites Jordan & Seale, 1906
Eviota pseudostigma Lachner & Karnella, 1980
Eviota punctulata Jewett & Lachner, 1983 (**New record** from New Caledonia based on SMNS material from southern Grande Terre and Maré/Loyalty Islands)
Eviota queenslandica Whitley, 1932 (**New record** from New Caledonia based on SMNS material from northern Grande Terre and Lifou/Loyalty Islands)
Eviota sebreei Jordan & Seale, 1906
Eviota smaragdus Jordan & Seale, 1906
Eviota sparsa Jewett & Lachner, 1983
Eviota zebrina Lachner & Karnella, 1978
Eviota zonura Jordan & Seale, 1906
Exyrias belissimus (Smith, 1959) (Reported from New Caledonia by Laboute & Grandperrin [2000: 417] under the name 'Gobiidae indéterminé 1')
Exyrias puntang (Bleeker, 1851) (Synonym: *Gobius canalae* Sauvage, 1881)
Favonigobius reichei (Bleeker, 1853)
Fusigobius duospilus Hoese & Reader, 1985
Fusigobius gracilis (Randall, 2001)
Fusigobius humeralis (Randall, 2001)
Fusigobius longispinus Goren, 1978 (**New record** from New Caledonia based on SMNS 22888 from Ile des Pins)
Fusigobius maximus (Randall, 2001)
Fusigobius neophytus (Günther, 1877)
Fusigobius pallidus (Randall, 2001)
Fusigobius signipinnis Hoese & Obika, 1988
Glossogobius sp. (An undescribed species which was reported by several authors under the name *Glossogobius celebius*)
Glossogobius biocellatus (Valenciennes in Cuvier & Valenciennes, 1837)
Glossogobius giuris (Hamilton Buchanan, 1822)
Gnatholepis anjerensis (Bleeker, 1851)
Gnatholepis cauerensis cauerensis (Bleeker, 1853) (Synonym: *Gnatholepis scapulostigma*)
Gobiodon acicularis Harold & Winterbottom, 1995 (**New record** from New Caledonia based on SMNS 23914 from Lifou, Loyalty Islands)
Gobiodon axillaris DeVis, 1884 (**New record** from New Caledonia based on SMNS material from Grande Terre and Lifou, Loyalty Islands)
Gobiodon brochus Harold & Winterbottom, 1999
Gobiodon citrinus (Rüppell, 1838)
Gobiodon multilineatus Wu, 1979
Gobiodon okinawae Sawada, Arai & Abe, 1972
Gobiodon quinquestrigatus (Valenciennes in Cuvier & Valenciennes, 1837)

Gobiodon rivulatus (Rüppell, 1830)
Gobiopsis malekulae (Herre, 1935) (**New record** from New Caledonia based on SMNS 23692 from Lifou, Loyalty Islands)
Heterеleotris sp. (Undescribed species; record based on SMNS material from Lifou, Loyalty Islands)
Istigobius decoratus (Herre, 1927) (Reported from New Caledonia by Laboute & Grandperrin [2000: 417] under the name 'Gobiidae indéterminé 6')
Istigobius nigroocellatus (Günther, 1873) (Reported from New Caledonia by Laboute & Grandperrin [2000: 412] under the name *Istigobius* sp.)
Istigobius ornatus (Rüppell, 1830)
Istigobius rigilius (Herre, 1953)
Istigobius spence (Smith, 1947) (Synonym: *Acentrogobius aestuarius* Smith, 1959)
Koumansetta rainfordi (Whitley, 1940)
Lubricogobius exiguus Tanaka, 1915
Lubricogobius ornatus Fourmanoir, 1966
Macrodontogobius wilburi Herre, 1936
Mahidolia mystacina (Valenciennes in Cuvier & Valenciennes, 1837) (Synonym: *Mahidolia duque* Smith, 1947)
Mugilogobius mertoni (Weber, 1911)
Mugilogobius notospilus (Günther, 1877) (Synonym: *Mugilogobius duospilus*)
Oplopomus caninoides (Bleeker, 1852)
Oplopomus oplopomus (Valenciennes in Cuvier & Valenciennes, 1837)
Oxyurichthys papuensis (Valenciennes in Cuvier & Valenciennes, 1837) (Reported from New Caledonia by Laboute & Grandperrin [2000: 413] under the name *Oxyurichthys* sp.)
Oxyurichthys tentacularis (Valenciennes in Cuvier & Valenciennes, 1837)
Paragobiodon echinocephalus (Rüppell, 1828)
Paragobiodon lacunicolus (Kendall & Goldsborough, 1911)
Paragobiodon melanosomus (Bleeker, 1852)
Paragobiodon modestus (Regan, 1908) (**New record** from New Caledonia based on SMNS material from northern and southern Grande Terre, and Maré and Lifou, Loyalty Islands)
Paragobiodon xanthosomus (Bleeker, 1852)
Periophthalmus argentilineatus Valenciennes in Cuvier & Valenciennes, 1837 (Synonym: *Periophthalmus vulgaris* Eggert, 1935)
Pleurosicya bilobata (Koumans, 1941) (Synonym: *Pleurosicya taisnei* Plessis & Fourmanoir, 1966)
Pleurosicya coerulea Larson, 1990
Pleurosicya micheli Fourmanoir, 1971
Pleurosicya mossambica Smith, 1959
Priolepis cincta (Regan, 1908) (Synonym: *Priolepis naraharae*; reported from New Caledonia by some authors including Plessis & Fourmanoir [1966: 139] under the name *Quisquilius eugenius*)
Priolepis compita Winterbottom, 1985
Priolepis fallacincta Winterbottom & Burridge, 1992
Priolepis inhaca (Smith, 1949) (**New record** from New Caledonia based on SMNS 21677 from Lifou, Loyalty Islands)
Priolepis kappa Winterbottom & Burridge, 1992
Priolepis semidoliata (Valenciennes in Cuvier & Valenciennes, 1837)
Priolepis squamogena Winterbottom & Burridge, 1989 (**New record** from New Caledonia based on SMNS 22934 from Lifou, Loyalty Islands)
Stonogobiops yasha Yoshino & Shimada, 2001 (Reported by Laboute & Grandperrin [2000: 414] under the name *Stonogobiops* sp.)
Sueviota lachneri Winterbottom & Hoese, 1988
Tomiyamichthys sp. (Reported from New Caledonia by Laboute & Grandperrin [2000: 417] under the name 'Gobiidae indéterminé 5')
Trimma sp. (Undescribed species; previously reported by several authors under the name *Trimma naudei*)
Trimma benjamini Winterbottom, 1996
Trimma caesiura Jordan & Seale, 1906
Trimma emeryi Winterbottom, 1985 (**New record** from New Caledonia based on SMNS material

from Ile des Pins and Chesterfield Islands)
Trimma milta Winterbottom, 2002 (**New record** from New Caledonia based on SMNS material from Chesterfield Islands and Lifou, Loyalty Islands)
Trimma okinawae (Aoyagi, 1949)
Trimma striata (Herre, 1945) (Synonym: *Zonogobius capostriatus* Goren, 1981)
Trimma taylori Lobel, 1979
Trimma tevegae Cohen & Davis, 1969
Trimma unisquamis (Gosline, 1959)
Trimmatom eviotops (Schultz, 1943) (Synonym: *Eviota corneliae* Fricke, 1998)
Trimmatom nanus Winterbottom & Emery, 1981
Valenciennea decora Hoese & Larson, 1994
Valenciennea helsdingenii (Bleeker, 1858)
Valenciennea limicola Hoese & Larson, 1994
Valenciennea longipinnis (Lay & Bennett, 1839)
Valenciennea parva Hoese & Larson, 1994
Valenciennea puellaris (Tomiyama, 1955)
Valenciennea randalli Hoese & Larson, 1994
Valenciennea strigata (Broussonet, 1782)
Valenciennea wardii (Playfair, 1866)
Vanderhorstia sp. 1 (Undescribed species; Blackblotched shrimp goby; reported by several authors under the name *Vanderhorstia ornatissima*)
Vanderhorstia sp. 2 (Undescribed species; Halfstreaked shrimp goby; reported from New Caledonia by Laboute & Grandperrin [2000: 418] under the name 'Gobiidae indétermine 10')
Vanderhorstia ambanoro (Fourmanoir, 1957)
Yongeichthys criniger (Valenciennes in Cuvier & Valenciennes, 1837) (Reported from New Caledonia by Laboute & Grandperrin [2000: 418] under the name 'Gobiidae indétermine 12')
Yongeichthys nebulosus (Forsskål in Niebuhr, 1775)
Yongeichthys pavidus (Smith, 1959)

MICRODESMIDAE
Gunnellichthys curiosus Dawson, 1968
Gunnelichthys monostigma Smith, 1958
Gunnellichthys pleurotaenia Bleeker, 1858 (**New record** from New Caledonia based on SMNS 21546 from southern Grande Terre)
Gunnellichthys viridescens Dawson, 1968

PTERELEOTRIDAE
Nemateleotris decora Randall & Allen, 1973
Nemateleotris helfrichi Randall & Allen, 1973
Nemateleotris magnifica Fowler, 1938
Parioglossus dotui Tomiyama, 1958
Parioglossus neocaledonicus Dingerkus & Séret, 1992
Parioglossus philippinus (Here, 1945) (**New record** from New Caledonia based on SMNS material from southern Grande Terre and Lifou/Loyalty Islands)
Parioglossus nudus Rennis & Hoese, 1985 (**New record** from New Caledonia based on SMNS 21674 from Lifou/Loyalty Islands)
Parioglossus rainfordi McCulloch, 1921
Ptereleotris evides (Jordan & Hubbs, 1925)
Ptereleotris hanae (Jordan & Snyder, 1901)
Ptereleotris heteroptera (Bleeker, 1855)
Ptereleotris microlepis (Bleeker, 1856)
Ptereleotris monoptera Randall & Hoese, 1985
Ptereleotris zebra Fowler, 1938

EPHIPPIDAE
Platax orbicularis (Forsskål in Niebuhr, 1775)
Platax pinnatus (Linnaeus, 1758)
Platax teira (Forsskål in Niebuhr, 1775)

SCATOPHAGIDAE

Scatophagus argus (Linné, 1766)
Scatophagus tetracanthus (Lacepède, 1801)
Selenotoca multifasciata (Richardson, 1846)

SIGANIDAE

Siganus argenteus (Quoy & Gaimard, 1825)
Siganus corallinus (Valenciennes in Cuvier & Valenciennes, 1835)
Siganus doliatus Guérin-Méneville, 1829-1838
Siganus fuscescens (Houttuyn, 1782) (Synonym: *Siganus nebulosus*; reported from New Caledonia by several authors under the names *Siganus oramin* or *Siganus canaliculatus*, and by Laboute & Grandperrin [2000: 443] as *Siganus* sp.)
Siganus lineatus (Valenciennes in Cuvier & Valenciennes, 1835)
Siganus puellus (Schlegel, 1852)
Siganus punctatus (Forster in Bloch & Schneider, 1801)
Siganus spinus (Linnaeus, 1758)
Siganus uspi Gawel & Woodland, 1974
Siganus vermiculatus (Valenciennes in Cuvier & Valenciennes, 1835)
Siganus vulpinus (Schlegel & Müller, 1844)
Siganus woodlandi Randall & Kulbicki, 2005 (This species has been misidentified by authors as *Siganus argenteus* [non Quoy & Gaimard, 1825])

ZANCLIDAE

Zanclus cornutus (Linnaeus, 1758)

ACANTHURIDAE

Acanthurus achilles Shaw, 1803
Acanthurus albipectoralis Allen & Ayling, 1987
Acanthurus blochii Valenciennes in Cuvier & Valenciennes, 1835
Acanthurus dussumieri Valenciennes in Cuvier & Valenciennes, 1835
Acanthurus grammoptilus Richardson 1843 (**New record** from New Caledonia based on SMNS 22986 from southern Grande Terre)
Acanthurus guttatus Bloch & Schneider, 1801
Acanthurus leucopareius (Jenkins, 1903)
Acanthurus lineatus (Linnaeus, 1758)
Acanthurus mata (Cuvier in Cuvier & Valenciennes, 1829) (Synonym: *Acanthurus bleekeri*)
Acanthurus nigricans (Linnaeus, 1758) (Synonym: *Acanthurus aliala* Lesson, 1831; reported from New Caledonia by several authors under the name *Acanthurus gahm*).
Acanthurus nigricauda Duncker & Mohr, 1929
Acanthurus nigrofuscus (Forsskål in Niebuhr, 1775)
Acanthurus nigroris (Valenciennes in Cuvier & Valenciennes, 1835) (**New record** from New Caledonia based on SMNS 19367 from the barrier reef off southern Grande Terre)
Acanthurus nubilus (Fowler & Bean, 1929)
Acanthurus olivaceus Forster in Bloch & Schneider, 1801
Acanthurus pyroferus Kittlitz, 1834 (Synonym: *Acanthurus celebicus* Bleeker, 1852)
Acanthurus thompsoni (Fowler, 1923)
Acanthurus triostegus triostegus (Linnaeus, 1758)
Acanthurus xanthopterus Valenciennes in Cuvier & Valenciennes, 1835 (Synonym: *Acanthurus fuliginosus* Lesson, 1831)
Ctenochaetus binotatus Randall, 1955
Ctenochaetus cyanocheilus Randall & Clements, 2001 (Reported by various authors under the name *Ctenochaetus strigosus*)
Ctenochaetus striatus (Quoy & Gaimard, 1825)
Naso annulatus (Quoy & Gaimard, 1824)
Naso brachycentron (Valenciennes in Cuvier & Valenciennes, 1835)
Naso brevirostris (Cuvier, 1829) rnfish
Naso caesius Randall & Bell, 1992
Naso fageni Morrow, 1954 (doubtful record from New Caledonia by Randall [2002: 81])

Naso hexacanthus (Bleeker, 1855) (Synonyms: *Naso vomer*; *Naso thorpei*)
Naso lituratus (Forster in Bloch & Schneider, 1801)
Naso lopezi Herre, 1927
Naso maculatus Randall & Struhsaker, 1981
Naso tonganus (Valenciennes in Cuvier & Valenciennes, 1835) (Reported by various authors under the name *Naso tuberosus*)
Naso unicornis (Forsskål in Niebuhr, 1775)
Naso vlamingii (Valenciennes in Cuvier & Valenciennes, 1835)
Paracanthurus hepatus (Linné, 1766)
Prionurus maculatus Ogilby, 1887
Zebrasoma scopas (Cuvier, 1829)
Zebrasoma veliferum (Bloch, 1797) (Synonym: *Zebrasoma veliferum novacaledoniae* Borodin, 1932; reported by Fourmanoir & Laboute [1976: 210] and other authors under the name *Zebrasoma desjardinii*)

SPHYRAENIDAE

A record of *Sphyraena waitii* Ogilby, 1908 by several authors (under the name *S. waittei*) needs verification.
Sphyraena barracuda (Walbaum, 1792)
Sphyraena flavicauda Rüppell, 1838
Sphyraena forsteri (Cuvier in Cuvier & Valenciennes, 1829) (Synonym: *Sphyraena toxeuma* Fowler, 1904; reported from New Caledonia by authors under the name *Sphyraena japonica*, and by Laboute & Grandperrin [2000: 337] as *Sphyraena* sp. 2)
Sphyraena helleri Jenkins, 1901 (Reported from New Caledonia by authors under the name *Sphyraena acutipinnis* and *Sphyraena novaehollandiae*)
Sphyraena jello Cuvier in Cuvier & Valenciennes, 1829 (Reported from New Caledonia by Laboute & Grandperrin [2000: 337] under the name *Sphyraena* sp. 1)
Sphyraena obtusata Cuvier in Cuvier & Valenciennes, 1829 (Reported from New Caledonia by Fourmanoir & Laboute [1976: 185] under the name *Sphyraena chrysotaenia*)
Sphyraena putnamae Jordan & Seale, 1905 (Synonym: *Sphyraena bleekeri* Williams, 1959)
Sphyraena qenie Klunzinger, 1870

GEMPYLIDAE

Gempylus serpens Cuvier, 1829
Prometichthys prometheus (Cuvier in Cuvier & Valenciennes, 1831)
Ruvettus pretiosus Cocco, 1829

TRICHIURIDAE

Trichiurus lepturus Linnaeus, 1758 (Synonym: *Trichiurus haumela*)

SCOMBRIDAE

Acanthocybium solandri (Cuvier in Cuvier & Valenciennes, 1831)
Auxis thazard (Lacepède, 1801)
Euthynnus affinis (Cantor, 1849)
Grammatorcynus bicarinatus (Quoy & Gaimard, 1824)
Grammatorcynus bilineatus (Rüppell, 1836)
Gymnosarda unicolor (Rüppell, 1838)
Katsuwonus pelamis (Linnaeus, 1758)
Rastrelliger kanagurta (Cuvier, 1829)
Scomberomorus commerson (Lacepède, 1802)
Thunnus alalunga (Bonnaterre, 1788)
Thunnus albacares (Bonnaterre, 1788)
Thunnus obesus (Lowe, 1839)

NOMEIDAE

Psenes cyanophrys Valenciennes in Cuvier & Valenciennes, 1833

CAPROIDAE

Antigonia capros Lowe, 1843

PARALICHTHIDAE

Pseudorhombus arsius (Hamilton Buchanan, 1822)

BOTHIDAE

Arnoglossus dalgleishi (Bonde, 1922) (**New record** from New Caledonia, based on SMNS 23571 from Lifou, Loyalty Islands)
Arnoglossus japonicus Hubbs, 1915
Arnoglossus macrolophus (Alcock, 1899)
Arnoglossus polyspilus (Günther, 1880)
Arnoglossus tenuis Günther, 1880
Asterorhombus annulatus (Weber, 1913)
Asterorhombus fijiensis (Norman, 1931)
Asterorhombus filifer Hensley & Randall, 2003
Asterorhombus intermedius (Bleeker, 1866)
Bothus mancus (Broussonet, 1782) (Synonym: *Pleuronectes lunulatus* Jouan, 1861)
Bothus pantherinus (Rüppell, 1830)
Engyprosopon bellonaensis Amaoka, Mihara & Rivaton, 1993
Engyprosopon grandisquamum (Temminck & Schlegel, 1846)
Engyprosopon hureaui Quéro & Golani, 1990
Engyprosopon longipterum Amaoka, Mihara & Rivaton, 1993
Engyprosopon macrolepis (Regan, 1908)
Engyprosopon maldivensis (Regan, 1908)
Engyprosopon rostratum Amaoka, Mihara & Rivaton, 1993
Engyprosopon septempes Amaoka, Mihara & Rivaton, 1993 (The species has been reported from the Chesterfield Islands under the names *Engyprosopon longipelvis* or *Engyprosopon latifrons*)
Grammatobothus pennatus Ogilby, 1913
Grammatobothus polyophthalmus (Bleeker, 1866)

SAMARIDAE

Samaris cristatus Gray, 1831
Samaris macrolepis Norman, 1927
Samaris spinea Mihara & Amaoka, 2004
Samariscus latus Matsubara & Takamuri, 1951
Samariscus triocellatus Woods in Schultz, Woods & Lachner, 1966

SOLEIDAE

Aesopia cornuta (Kaup, 1858)
Aseraggodes magnoculus Randall, 2005
Aseraggodes melanostictus (Peters, 1877) (**New record** from New Caledonia based on SMNS 23790 from Lifou, Loyalty Islands)
Aseraggodes ramsayi (Ogilby, 1889)
Aseraggodes whitakeri Woods in Schultz *et al.*, 1966
Pardachirus pavoninus (Lacepède, 1802)
Soleichthys heterorhinos (Bleeker, 1856)
Zebrias japonica (Bleeker, 1860)

CYNOGLOSSIDAE

Cynoglossus interruptus Günther, 1880

BALISTIDAE

A record of *Pseudobalistes flavimarginatus* (Rüppell, 1829) by Rivaton *et al.* (1989: 26) needs verification.
Abalistes stellatus (Anonymus [ex Commerson, ex Lacepède], 1798)
Balistapus undulatus (Mungo Park, 1797)
Balistoides conspicillum (Bloch & Schneider, 1801)
Balistoides viridescens (Bloch & Schneider, 1801)
Canthidermis maculatus (Bloch, 1786)
Melichthys vidua (Solander, 1844)
Odonus niger (Rüppell, 1836) (Synonym: *Balistes erythrodon* Günther, 1870)
Pseudobalistes fuscus (Bloch & Schneider, 1801)
Rhinecanthus aculeatus (Linnaeus, 1758)
Rhinecanthus lunula Randall & Steene, 1983

Rhinecanthus rectangulus (Bloch & Schneider, 1801)
Rhinecanthus verrucosus (Linnaeus, 1758)
Sufflamen bursa (Bloch & Schneider, 1801)
Sufflamen chrysopterum (Bloch & Schneider, 1801)
Sufflamen fraenatum (Latreille, 1804) (Synonym: *Sufflamen capistratus*)
Xanthichthys auromarginatus (Bennett, 1831) (Reported by several authors under the name *Xanthichthys ringens* or *Balistes ringens*)

MONACANTHIDAE

Acreichthys radiatus (Popta, 1900)
Acreichthys tomentosus (Linnaeus, 1758) (Reported from New Caledonia by Laboute & Grandperrin [2000: 461] under the name 'Monacanthidae indéterminé 1')
Aluteres monoceros (Linnaeus, 1758)
Aluteres scriptus (Osbeck, 1765)
Amanses scopas (Cuvier, 1829)
Brachaluteres jacksonianus (Quoy & Gaimard, 1824)
Brachaluteres taylori Woods in Schultz, Woods & Lachner, 1966
Cantherhines dumerilii (Hollard, 1854)
Cantherhines fronticinctus (Günther in Playfair & Günther, 1867)
Cantherhines pardalis (Rüppell, 1835)
Kentrocapros flavofasciatus (Kamohara, 1938)
Oxymonacanthus longirostris (Bloch & Schneider, 1801)
Paraluteres prionurus (Bleeker, 1851)
Paramonacanthus curtorhynchos (Bleeker, 1855) (Reported by several authors under the name *Paramonacanthus japonicus*, and by Laboute & Grandperrin [2000: 461] under the name 'Monacanthidae indéterminé 2')
Paramonacanthus lowei Hutchins, 1997
Pervagor alternans (Ogilby, 1889)
Pervagor aspricaudus (Hollard, 1854)
Pervagor janthinosoma (Bleeker, 1854)
Pervagor melanocephalus (Bleeker, 1853)
Pseudalutarius nasicornis (Temminck & Schlegel, 1846)
Thamnaconus modestoides (Barnard, 1927)

OSTRACIIDAE

Lactoria cornuta (Linnaeus, 1758)
Lactoria diaphana (Bloch & Schneider, 1801)
Lactoria fornasini (Bianconi, 1846)
Ostracion cubicus Linnaeus, 1758 (Synonym: *Ostracion tuberculatus* Linnaeus, 1758)
Ostracion meleagris Shaw, 1796
Tetrosomus concatenatus (Bloch & Schneider, 1801)
Tetrosomus gibbosus (Linnaeus, 1758)

TRIODONTIDAE

Triodon macropterus Lesson in Cuvier & Valenciennes, 1829

TETRAODONTIDAE

Arothron alboreticulatus (Tanaka, 1908)
Arothron caeruleopunctatus Matsura, 1994
Arothron hispidus (Linnaeus, 1758)
Arothron immaculatus (Bloch & Schneider, 1801)
Arothron manilensis (Marion de Procé, 1822)
Arothron mappa (Lesson, 1830)
Arothron meleagris (Lacepède, 1798)
Arothron nigropunctatus (Bloch & Schneider, 1801)
Arothron stellatus (Bloch & Schneider, 1801)
Canthigaster amboinensis (Bleeker, 1865) (**New record** from New Caledonia based on SMNS 23610 from Lifou, Loyalty Islands)
Canthigaster bennetti (Bleeker, 1854)

Canthigaster compressa (Marion de Procé, 1822)
Canthigaster coronata (Vaillant & Sauvage, 1875)
Canthigaster epilampra (Jenkins, 1903)
Canthigaster janthinoptera (Bleeker, 1855)
Canthigaster ocellicincta Allen & Randall, 1977
Canthigaster papua (Bleeker, 1848)
Canthigaster rivulata (Temminck & Schlegel, 1850)
Canthigaster solandri (Richardson, 1844)
Canthigaster valentini (Bleeker, 1853)
Chelonodon patoca (Hamilton Buchanan, 1822) (**New record** from New Caledonia based on AMS IB.7080 from southern Grande Terre; specimen identified by G. Hardy)
Lagocephalus sceleratus (Gmelin, 1789)
Sphoeroides pachygaster (Müller & Troschel, 1848)
Torquigener brevipinnis (Regan, 1902)
Torquigener hypselogeneion (Bleeker, 1852)
Torquigener pallimaculatus Hardy, 1983
Torquigener tuberculiferus (Ogilby, 1912)
Tylerinus spinosissimus (Regan, 1908)

DIODONTIDAE

Cyclichthys spilostylus (Leis & Randall, 1982)
Cyclichthys orbicularis (Bloch, 1785)
Diodon holocanthus Linnaeus, 1758
Diodon hystrix (Linnaeus, 1758)
Diodon liturosus Shaw, 1804
Lophodiodon calori (Bianconi, 1855)

MOLIDAE

Masturus lanceolatus (Liénard, 1841)
Mola mola (Linnaeus, 1758)
Mola ramsayi (Giglioli, 1883)
Ranzania laevis (Pennant, 1776)

The sea snakes of New Caledonia (Elapidae, Hydrophiinae)

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Résumé

Seuls des serpents marins de la famille des Elapidae sont présents en Nouvelle-Calédonie. Ils appartiennent tous à la sous-famille des Hydrophiinae qui regroupe également les Elapidae terrestres australiens et mélanésiens (serpent tigre, taipan, ...). La vie marine est apparue de façon indépendante à au moins deux reprises dans cette lignée. Les Elapidae marins de Nouvelle-Calédonie comprennent trois espèces du groupe des serpents marins amphibies (ovipares ; les tricots-rayés du genre *Laticauda*) et 12 espèces du groupe des serpents marins vrais (ovovivipares), soit au total 15 espèces. Les affinités du peuplement sont partagées entre d'une part la région australienne et d'autre part l'Asie. Deux espèces ne sont connues que par un unique spécimen de Nouvelle-Calédonie (*Lapemis curtus* et *Hydrophis spiralis*) et la présence de populations reproductrices devra y être confirmée. La présence de populations reproductrices de *Laticauda frontalis* n'est pas non plus attestée. Il pourrait s'agir, dans ces trois cas, d'individus erratiques transportés accidentellement par les courants marins lors d'anomalies climatiques comme les cyclones, colonisation non suivie par l'installation d'une population reproductrice. *Hydrophis laboutei*, décrit récemment à partir de deux exemplaires, n'a pas été retrouvé depuis et sa répartition devra être précisée. Le genre *Laticauda* et *Emydocephalus annulatus* font l'objet de recherches importantes (écologie) en Nouvelle-Calédonie. Les techniques les plus modernes à présent disponibles en écologie devraient pouvoir être appliquées aux serpents marins vrais autres que *E. annulatus* (les espèces du genre *Hydrophis* par exemple) car leur biologie et leur écologie strictement marines demeurent pratiquement inconnues.

Abstract

Only sea snakes of the family Elapidae are present in New Caledonia. They all belong to the subfamily Hydrophiinae comprising also Australian and Melanesian terrestrial elapids (tiger snake, taipan, ...). Marine life has appeared independently at least two times in that lineage. Marine elapids of New Caledonia comprised three species of amphibious sea snakes (oviparous sea kraits; the locally called 'tricots-rayés' of the genus *Laticauda*) and 12 species of the true sea snakes group (ovoviviparous), in total 15 marine snake species. Affinities of the sea snakes of New Caledonia are shared between on one hand the Australian area and on the other hand Asia. Two species are known by only one specimen from New Caledonia with unknown collect localities (*Lapemis curtus* and *Hydrophis spiralis*) and the occurrence of reproductive populations has to be confirmed. The occurrence of reproductive populations for *Laticauda frontalis* has also to be assessed. These three cases could correspond to erratic specimens accidentally transported by ocean currents during climatic anomalies like hurricanes, a colonisation not followed by the installation of a reproductive population. *Hydrophis laboutei*, recently described from only two specimens, has never been found again since its original description and its distribution has to be determined. The genus *Laticauda* and *Emydocephalus annulatus* are subjects of important researches (ecology) in New Caledonia. The most modern techniques nowadays available in ecology should also be applied to true sea snakes others than *E. annulatus* (e.g. species of the genus *Hydrophis*) since their strictly marine biology and ecology are nearly completely unknown.

Introduction

Neglected for a long time by herpetologists, sea snakes of New Caledonia are nowadays subject to particular attentions, notably the study of ecology of the most abundant and easy to study species (sea kraits and another species that feeds only on fish eggs, *Emydocephalus annulatus*). Their systematic and their distribution have been revised in a recent synthetic book (Ineich & Laboute, 2002) also giving the first data on their ecology. This book reports first occurrence of several species previously unknown for the area, but most are still known by less than five specimens in New Caledonia, often by one or two specimens only. These marine reptiles all belongs to the family Elapidae also comprising species like Afro-Asiatic cobras, African mambas and American coral snakes. The diversity of that group is highest in Australia where one can find, among others, tiger snake or the famous taipan. Sea snakes are present in Persian Gulf, on the whole tropical Indian Ocean and tropical and subtropical Pacific Ocean, but their diversity is maximal in the Indo-Australian area. They are absent from the Red Sea, Atlantic Ocean and Mediterranean Sea. The diversity of sea snakes decreased rapidly when going away from the Indo-Pacific area in both directions and one rapidly only just find one remaining species, in the East as in the West, the Yellow-bellied Sea Snake, *Pelamis platura*. The sea snakes of interest to us there all belongs to the same lineage than Australian and Melanesian terrestrial elapids with which they share a common ancestor (subfamily Hydrophiinae). Among these sea snakes two clades can be distinguished. The first comprised amphibious forms of the genus *Laticauda* Laurenti, 1768, apparently all oviparous [sea kraits or '*amphibious sea snakes*', represented by three species in New Caledonia] and the second comprised the '*true sea snakes*' [represented by 12 species in New Caledonia]. These later never come to land and their reproduction is ovoviviparous: they give birth to live offspring. Both groups possess different phylogenetic origins and their marine life is related to at least two different independent evolutionary events. Amphibious sea snakes comprised 8 species in the World, all placed in the genus *Laticauda*, whereas true sea snakes comprised 57 species (Ineich, 2004; Heatwole *et al.*, 2005; Kharin, 2005b), thus totalising 65 marine elapid species. Despite their diversity in New Caledonia (15 species), their relative abundance and their frequent occurrence on Noumea main beaches (Baie des Citrons, Anse Vata), theses snakes are responsible of few envenomations (see e.g. Anonymous, 2005). A determination key of New Caledonian sea snakes is found in Ineich & Laboute (2002).

Origin of our knowledge

The lack of venomous terrestrial snakes has been reported for New Caledonia since a long time (Trouessart, 1898). First acquired knowledge on New Caledonian sea snakes is based on some old specimens deposited in national museums (MNHN of Paris and NHM of London mostly) and were included in the Monograph of Malcolm A. Smith (1926). Very few of the 15 species presently known are reported in that book from New Caledonia. The first study totally devoted to New Caledonian sea snakes dated from 1958 (Gail & Rageau, 1958), but is not well documented and has several determination mistakes. Some studies followed, but only concerned ectodermic parasites of amphibious sea snakes (Rageau, 1960, 1967; Rageau & Vervent, 1959). The first serious ecological study on sea snakes of New Caledonia concerned amphibious sea snakes (Saint Girons, 1964a); this excellent work was later translated from French in 1990 by American herpetologists and published a second time (Saint Girons, 1964b). Our knowledge about distribution of those snakes in New Caledonia were later improved by some American and Australian field trips, notably to Chesterfield Islands (Minton & Dunson, 1985). Some other punctual works also permitted a better knowledge on their biology (see e.g. Rancurel & Intes, 1982; Bauer & DeVaney, 1987; Zimmerman *et al.*, 1994); a first synthesis based on recently collected material was done by Ineich and Rasmussen in 1997, followed by the Monograph of New Caledonian herpetofauna published on 2000 by Bauer and Sadlier which put together knowledge on that group at that time. It is mostly through collections and numerous underwater observations made by the IRD of Noumea (Philippe Bourret, Pierre Laboute and Jean-Louis Menou) that our knowledge has progressed (Ineich & Rasmussen, 1997). Later a new species for Science has been described from New Caledonian waters and two others reported for the first time from there (Rasmussen & Ineich, 2000). Those collections allowed publication of a recent synthesis book, largely illustrated by excellent submarine photographs (Ineich & Laboute, 2002; see also Bauer, 2002). Ecological studies undertaken by Richard Shine (University of Sydney, Australia) and by Xavier Bonnet and François Brischoux (CNRS of Chizé, France) still continue (see e.g. Bonnet *et al.*, 2005; Shine *et al.*, 2003a, 2003b, 2004, 2005; Shine, 2005). The Thesis of François Brischoux dealing with the ecology of amphibious sea snake populations of New Caledonia will be soon submitted and certainly will provide new and interesting information about these reptiles.

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List of taxa

Laticauda frontalis (De Vis, 1905) – Vanuatu sea krait (Plature du Vanuatu)
Kharin (1984b) revised the genus *Laticauda* and split it in two genera, *Laticauda sensu stricto* and the new genus *Pseudolaticauda* Kharin, 1984. *Pseudolaticauda* comprised two species, *P. semifasciata* (Reinwardt, 1837) and *P. schistorhynchus* (Günther, 1874), but its validity was generally not accepted. Later the study of geographical variation of the populations of *Laticauda colubrina* (Schneider, 1799) allowed to show that this binomen comprised a complex of four species about which the revalidated *Laticauda frontalis* mostly limited to Vanuatu and whose occurrence in New Caledonia has to be confirmed, a first new species, *Laticauda saintgironsi* Cogger and Heatwole, in press, restricted to New Caledonia and Loyalty Islands, a second new species, *Laticauda guineai* Heatwole, Busack and Cogger, 2005, only present south of Papua New Guinea and *L. colubrina* (Schneider, 1799) *sensu stricto* with a large distribution in south-east Asia, Indo-Malay archipelago, Indonesia and Melanesia (Heatwole *et al.*, 2005).
L. frontalis is known from New Caledonia by a unique specimen without precise location from Paris Museum collections (MNHN 3966) and three specimens from Loyalty Islands deposited at Sydney University (MM 633) and Paris Museum (MNHN 1886.0385 and 0388). The occurrence of reproductive populations in New Caledonia has not yet been assessed. Biology and ecology of that species are well known in Vanuatu (Reed *et al.*, 2002; Shine *et al.*, 2002a, 2002b). Concerning New Caledonia, nothing is known about biology and distribution of the species.

Laticauda saintgironsi Cogger and Heatwole, in press – Saint Girons' sea krait (Plature de Saint Girons)
This species is reported and diagnosed by Heatwole *et al.* (2005), but its original description has not yet been published (Cogger & Heatwole, 2006). Nearly all reports of *L. colubrina* or *L.* cf. *colubrina* for New Caledonia refers to that new species (see e.g. Ineich & Rasmussen, 1997; Bauer & Sadlier, 2000; Ineich & Laboute, 2002). It is one of both most common snakes of New Caledonia. Its mean size varies around 90 cm, but larger specimens are reported. This amphibious snake is feeding in the sea, mainly among small species of moray eels or other anguilliform fish, and returned to land to digest them, shelter, shed skin and reproduce; nearly 30 species of unknown moray eels for New Caledonia have been found in stomachs of that snake and of *L. laticaudata* (Ineich *et al.*, 2006). Biology of Saint Girons' sea krait is relatively well known, at least during its terrestrial part of life (Ineich & Laboute, 2002) and the Thesis of François Brischoux will certainly give rise to interesting additional data. Recent field works realised on Fiji (Shetty & Sivasundar, 1998; Shetty & Shine, 2002a, 2002b) showed that *L. colubrina* presents an important phylopatry, and clearly showed that individuals from one island generally return to the same island; such a situation also seems to occur in New Caledonia for *L. saintgironsi*.

Laticauda laticaudata (Linnaeus, 1758) – Brown-lipped sea krait (Plature à bandes)
This amphibious species shows a large distribution encompassing Indian subcontinent, Indo-Malay archipelago, South China Sea, Philippines, Indonesia and the Australian area as far in the east as Niue Island. Its mean size is situated around one meter, with a known maximum of 1.36 m. It's a common species in the New Caledonian great lagoon. This snake is much more nocturnal than *L. saintgironsi* and less terrestrial in its habits (Bonnet *et al.*, 2005). It frequents the lagoon to feed, and comes back to land to digest preys and reproduce. Its alimentation is relatively distinct from that of the previous species and notably differences exist between sexes in both species (Ineich *et al.*, submitted).

Acalyptophis peroni (A.M.C. Duméril, 1853) – Horned sea snake (Acalypte de Péron)
This species is the only member of its genus. Its size varies from 80 to 110 cm, with a known maximum reaching nearly 130 cm. This snake is present from Gulf of Thailand to Vietnam and as far as the Australian area in the east. It is an ubiquitous animal, sometimes nocturnal, which occupies loose sandy-silty bottoms, seagrass beds and solid substrates, from coastal bays to inlets, on the whole New Caledonian great lagoon. The species is characteristic by the presence of folded and/or spiny scales on the top of its supraocular plates. It seems to mainly feed on gobies but juvenile also eat commensal shrimps of the genus *Alpheus*. Its biology is not well known (Ineich & Laboute, 2002).

Aipysurus duboisi (Bavay, 1869) – Dubois' sea snake (Aipysure de Dubois)
Kharin (1981) revised the genus *Aipysurus* Lacepède, 1804 and recognised two subgenera: *Aipysurus* and

Smithohydrophis Kharin, 1981. He placed that species in the subgenera *Aipysurus*. This author also provides an identification key for the species of the genus. Kharin (1984b) diagnosed the new subfamily Aipysurinae and include only two genera in it: *Aipysurus* (7 recognized species) and *Emydocephalus* Krefft, 1869 (2 species), both primitive true sea snake species still showing clearly enlarged ventral plates. *A. duboisi* has been described from a specimen nowadays lost and collected on Loyalty Islands (Lifou). This snake is present from Western Australia to New Caledonia in the east and to New Guinea north. Its mean size varies between 70 and 80 cm, with a known maximum of 148 cm. It mostly occupies sandy-silty sedimentary zones covered by seaweed or invertebrates that could serve him as shelter (gorgonian and antipatharian corals, sponges). It occurs from shallow waters until depths of up to 50 meters and even more (one collected at 80 meters; see Ineich & Laboute, 2002). This snake is less active, and shows a body often covered by phoretic seaweed. It feeds on various benthic fish that he stalks among the seabed.

Aipysurus laevis (Lacepède, 1804) – Olive sea snake (Aipysure lisse)
Kharin (1981) revised that genus and placed the species in the subgenus *Aipysurus*. This snake is common in the waters of the Australian Great Barrier Reef and its biology is well known. Olive sea snake is present from Western Australia to Loyalty Islands in the east and to New Guinea in the north. It's a common species in the great lagoon of New Caledonia. Its mean size varies from 110 to 150 cm, but its maximal known size reaches about 200 cm. Females are larger than males. This snake, particularly active at night, occurs mostly in coral reefs located between 3 and 50 m depth, but does not really appreciate external slope. It is not shy about swimming right up to divers, attracted by their bright face mask but is generally not aggressive. It's a generalist feeder, preying upon several reef fish. It gives birth to 1 to 5 large sized offspring.

Emydocephalus annulatus (Krefft, 1869) – Turtle-headed sea snake (Emydocéphale annelé)
This species feeds only on fish eggs (McCarthy, 1987) that it really browse on coral blocks (Shine *et al.*, 2004) with the help of an adapted mouth musculature. In New Caledonia, it appreciated eggs of damselfish, blennies and gobies. Eggs' searching is made by smelling rather than vision. Shine (2005) has shown that in that species vision is very important to recognize a sexual partner and that pheromones are only active during physical contacts. Vision is however efficient only at short distances, below one meter, and the snake often can mix a black snake like object with a congener. Mean size of that snake varies from 70 to 90 cm. Male can be distinguished from the female by the presence of a larger rostral spine. That spine allows him to stimulate the female during copulation and has no role in feeding as previously though (Guinea, 1996). This snake occurs from northern Australia to the Timor Sea at west, and as far as Loyalty Islands in the east. It is common and abundant in the New Caledonian great lagoon and easy to observe in the sea on the beaches around Noumea. It is a typical clear water and coral reef species, often seen in groups of specimens separated by several meters among each other. A recent work has shown that probably exist a strong social cohesion between specimens of that species belonging to a same group (Shine *et al.*, 2005). Marking, capture-recapture method allows to show that specimens of a same group are synchronously recaptured during time. This behaviour seems to be placed in parallel with the phylopatry observed by *Laticauda colubrina* on Fiji and could have been selected by evolution for the greater ability of a group of individuals to succeed in a colonisation rather than a unique snake on disseminated oceanic islands like those of the southern Pacific.

Hydrophis coggeri (Kharin, 1984) – Cogger's sea snake (Hydrophide de Cogger)
This species was originally described by Kharin (1984a) in the genus *Leioselasma* Lacepède, 1804, a genus with uncertain validity but still in use (Kharin, 2005a, 2005c). Kharin (2005b) later placed the species in the subgenus *Leioselasma* inside the genus *Hydrophis* Latreille *in* Sonnini and Latreille, 1802. The genus *Hydrophis* comprised a large number of species (nearly 40) about which six are present in New Caledonian waters. This species is present from Timor Sea and north coasts of Sulawesi (Indonesia) as far as northern Australian coasts, southern New Guinea, New Caledonia, Vanuatu and Fiji. It was recently reported from Loyalty Islands (Ineich & Borsa, 2003). Its mean size is nearly 100 cm and known maximal size is about 137 cm. Females are larger and heavier than males. It is a ubiquitous species, mainly nocturnal, occurring around seabeds with loose organic material and sediment within the 1-40 m depth range. It is also found along the coast, near mangroves, in low water and on white coral seabeds behind the barrier reef. This snake mainly feeds on Ophichthidae and Congridae fish. Viviparous like all true sea snakes, it gives birth to 1 to 8 offspring.

Hydrophis laboutei Rasmussen and Ineich, 2000 – Laboute's sea snake (Hydrophide de Laboute)

This species was only recently described based on two unique specimens. It was no more reported since that time. Kharin (2005b) placed it in the subgenus *Chitulia* Gray, 1849, inside the genus *Hydrophis*. Its mean total length is around one meter. Its actual distribution is limited to Chesterfield Islands (2,20° 21,98' S; 161° 4,87' E). This animal seems to occupy depth sea since one of both types was collected at 62 m depth. Its biology, alimentation and reproduction are unknown.

Hydrophis macdowelli Kharin, 1983 – McDowell's sea snake (Hydrophide de McDowell)
This species was only described in 1983 (Kharin, 1983). Kharin revised that group of sea snakes and later (Kharin, 2004, 2005b) placed that species in the subgenus *Hydrophis* inside the genus *Hydrophis*. It is a small animal which only rarely reach over 50 to 60 cm total length; the known maximum is 90 cm. Its distribution seems to be limited from northern Australia to southern New Guinea and to New Caledonia in the east. It's a highly wary snake occurring around grey bottoms in the middle of the lagoon at depths ranging from 10 to 40 m. McDowell's sea snake actively forage for prey in burrows that fish dig in the sediment.

Hydrophis major (Shaw, 1802) – Olive-headed sea snake (Hydrophide cerclé)
Kharin (2005b) placed that species in the genus *Disteira* Lacepède, 1804 inside the new tribe of Disteirini, but that position is not accepted by all. It's a large snake with a known maximum total length of 156 cm; mean size varies around 120 cm. This snake is present from western Australian coasts to New Caledonia and is still imperfectly known. It seems to search for muddy waters with numerous seaweeds and feed on small fish captured near coral reef cavities. It gives birth to a mean of 9 offspring and this number varies from 6 to 12.

Hydrophis ornatus ornatus (Gray, 1842) – Ornate sea snake (Hydrophide orné)
Kharin (2005b) placed that species in the subgenus *Chitulia* inside the genus *Hydrophis*. Australian populations are classically attributed to *H. ornatus ocellatus* (Gray, 1849) whereas those of New Caledonia and Asia are attributed to *H. ornatus ornatus*. The validity of those forms and their status have to be assessed, but they clearly should correspond to two distinct species. Occurrence of black ocellus-shaped markings on the sides is never observed in New Caledonian and Asiatic populations, whereas it is constant in Australia. Biology and ecology of that species in Thailand are reviewed by Rasmussen (1989). It's a small species with a mean size varying from 85 to 100 cm in Australia whereas it is only around 70 cm in New Caledonia (Ineich & Laboute, 2002). Known maximum size in New Caledonia is 78.7 cm total length for an adult female. The species is distributed from Indian Ocean, Persian Gulf, Indo-Malay archipelago, South China Sea, Philippines, Indonesia, to northern Australia, New Guinea to New Caledonia. It's a common species in Australia and it was reported as far south as Tasmania. It seems to occupy a great number of habitats, even going up some estuaries in Australia, but precise knowledge is still lacking. Its alimentation seems to be specialised against consumption of gobies directly taken from their burrows on grey substrates.

Hydrophis spiralis (Shaw, 1802) – Yellow sea snake (Hydrophide spirale)
This species is sometimes included in the genus *Leioselasma* but this position is not regularly followed (see David & Ineich, 1999); Kharin (2005b) placed it in the subgenus *Leioselasma* inside the genus *Hydrophis*. It was reported from New Caledonia by a unique specimen with unknown collect location. It's a large animal (1582 cm total length in New Caledonia) and a specimen from Malaysia (Penang) of 1745 cm total length is the record size for an elapid sea snake. This species occurs from Indian Ocean to the Indo-Malay archipelago, South China Sea and as far as Indonesia and ? New Caledonia. This snake seems to prefer depth waters and surfaces only to warm up. It is an active swimmer that feeds on anguilliform fish.

Lapemis curtus (Shaw, 1802) – Short sea snake (Lapémide court)
Lapemis hardwickii Gray, 1835 is generally considered as a synonym of that species but that position is not unanimously shared; this later binomen is sometimes still used to designate Australian area populations. This snake is heavily built and its mean size is around one meter with a known maximum of 128 cm. It occurs from Persian Gulf to Australian waters and New Caledonia from where it is presently known by a unique specimen with unknown collect location. It frequents unclear waters around sandy and muddy seabeds, but also clear waters around coral reefs and even some estuaries in Australia but prefers soft bottoms. It's generally a diurnal animal with a skin often covered with different parasites and phoretic organisms. It feeds on a wide variety of fish and probably small crustaceans.

Pelamis platura (Linnaeus, 1766) – Yellow-bellied sea snake (Pélamide bicolore)
Biology, ecology and distribution of that species have been reviewed by Ineich (1988). This species is certainly the best known sea snake but finally is not really representative of the group. It's the only species in its genus. Its mean size is around 60 to 90 cm with a maximum known of 113 cm. The species occupies a wide distribution area encompassing nearly all tropical and subtropical marine areas of Indian Ocean and Pacific Ocean from Madagascar to Central America coasts. This snake is present in open sea and is the only pelagic sea snake. It commonly lives at surface and preys on fish in slicks which are channels of vegetation and floating debris created by ocean currents. The Yellow-bellied sea snake is present between 35 to 50 m depth. It's an ecological generalist feeding on numerous fish. It gives birth to 2 to 8 offspring of about 25 cm total length. Its high densities, e.g. around Central America coasts, certainly makes it being one of the most abundant snake in the World. Global earth warming could facilitate its range extension in the coming years.

Originality of New Caledonian sea snakes and biogeographical affinities

Sea snakes of New Caledonia clearly shows double affinities: on one side they comprise typical Australian species related to coral reefs (e.g. *Acalyptophis peroni*, *Aipysurus duboisi* and *A. laevis*, *Emydocephalus annulatus*, *Hydrophis coggeri* and *H. macdowelli*) and on the other side taxa with rather Asiatic affinities as *Laticauda* sp., *Hydrophis spiralis* and *H. o. ornatus*, absent or very rare in the waters located between New Guinea and Australia. The occurrence of resident populations for several species has to be confirmed (*Laticauda frontalis*, *Lapemis curtus*, *Hydrophis spiralis*). Specimens of those three species from New Caledonia also could correspond to erratic individuals arrived through accidental natural transport and not resident in the area. The distribution of *Hydrophis laboutei* has to be clarified by complementary collects or observations.

Marine turtles of New Caledonia

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Introduction

The "Association pour la Sauvegarde de la Nature Néo-Calédonienne " (Association for the protection of New-Caledonian nature) was established on the 6th of May 1971. Since the eighties, ASNNC has been interested in marine turtles which utilise our lagoons as forging grounds and come to nest on our shores. Based on the principle that "knowledge forms the basis for protection", ASNNC initiated a research program on marine turtles, motivated by that fact that (i) little was being done by other organisations for these endangered species and (ii) these organisms are considered to be truly emblematic of New Caledonia (and the Pacific).

From 1989 to 2004, ASNNC organised tagging campaign, mainly on Entrecasteaux Reefs. The main goal of these efforts was to not only estimate the population size of marine turtles visiting these Northern islets, but also to study these species' migration routes. So far reports have shown that marine turtles caught in New-Caledonia mainly travel to eastern Australia.

At the same time, the Association organised public awareness and information campaigns.

ASNNC's work would not have been possible without the incredible support afforded by the French navy, PROE (Pacific Regional Environment Program), New Caledonia Provinces, CIPAC Beachcomber, WWF and IFRECOR, and the invaluable contributions by scientists such as George H. Balazs (Hawaii), Peter Pritchard (USA), Colin Limpus (Australia) and Scott Baker (New-Zealand).

Species present in New Caledonia

Marine turtles's history dates back to over 100 million years. They belong to the Reptile class, and all marine turtles are part of the Chelonidae family, with the exception of the leatherback turtle (which belongs to the Dermochelidae).

In New Caledonia, four species of sea turtles are known to occur (of 7 worldwide). They are, in decreasing order of importance:

- The green turtle (*Chelonia mydas* Linnaeus, 1758) is the most abundant. With a carapace length at times exceeding 1.25m, individuals can weigh up to 250 kg. A rather peaceful animal, as an adult it feeds mainly on marine plants. As a juvenile it sometimes eats crustaceans, molluscs, echinoderms, sponges and jellyfish. This species is characterized & generally identified by: (i) a sharply serrated cutting rim to the beak (ii) 1 pair of elongated prefrontal scales (iii) 4 pairs of lateral scutes, the foremost not touching the precentral scute;
- The loggerhead turtle (*Caretta caretta* Linnaeus, 1758) – so named because of its large head - is more aggressive. Although generally larger in size, it can measure up to 1.35 m, it is usually less heavy, rarely weighing in at more than 150 kg. It is carnivorous. The species is typically redish brown in colour, and is characterised by 5 pairs of laterala, the anterior touching the precentral scute; 5 central (neural) scutes; and 2 pairs of prefrontal scales;
- The hawksbill turtle (*Eretmochelys imbricate* Linnaeus, 1766) has the same vernacular name 'caret' as the loggerhead turtle. Smaller, it barely reaches 90cm. It can easily be distinguished from other species due to its sharp hooked 'beak' and highly imbricated scutes at maturity – the overlapping character is frequently lost.in older individuals. Carnivorous, it is fairly aggressive in nature. Its head possesses 2 pairs of prefrontal scales and the scutelation of the carapace is similar to that of Chelonia, with 4 pairs of laterals (the first not touching the precentral scute);

- The leatherback turtle (*Dermochelys coriacea* Vandelli, 1761) can easily be discerned from other species. This is a turtle of colossal proportions, reaching up to 2 m in length and weighing more than 500 kg. This species' carapace is supported by a thick matrix of cartilaginous tissue with 7 doral keels. Adults are covered by a rubber-like, leathery skin, typically blue-black in colour with scattered white blotches. The beak of adult nidividuals is feeble, but sharpedged, lacking crushing surfaces, well adapted to grab jellyfish and tunicates, the mainstay of its diet. The leatherback turtle is a highly pelagic species and its meat is not sought after. Leatherback turtles are protected as their nesting sites are few and this species population has been suffering a precipitous and dangerous decline.

WORK CARRIED OUT BY ASNNC

Tagging of marine turtles at Entrecasteaux Reefs (Northern end of New Caledonia)

ASNNC conducted 12 fifteen-day tagging campaigns between 1989 and 2002 on Surprise, Fabre, le Leizour and Huon islets. 3651 female green turtles were tagged at the time of the nesting.

Between October 2003 and January 2004, ASNNC organised 3 three-week long camps on Huon islet. These allowed researchers to do some more in depth studies and to tag 437 female green turtles.

Tracks and nests study

At various occasions, track censuses were undertaken at Chesterfield islands, Loop islet, Beautemps Beaupré, Anemata, Pléiades North and South, Ouvéa, and Roche Percée at Bourail (loggerhead turtle).

NESTING SITES AND ESTIMATED POPULATIONS

- Green turtle

The main nesting site is located at Entrecasteaux reefs. A few nesting sites can also be found along the Northern and Northeastern end of the territory, as well as on the West and the South coasts. The population has been estimated at 2000 mature females.

- Loggerhead turtle

Roche Percée beach at Bourail constitutes an important nesting site (arround 200 nests). Its dark sand, favouring incubation tempatures higher than 28.5°C, seem to indicate that hatchlings from this beach would mainly be female. Other nesting sites can be found all along the West coast, on Iles des Pins and Loyalty Islands. Total population size has been estimated at 250 mature females.

- Hawksbill turtle

It appears as if the main population (about 200 individuals) is located on the Northeastern coast, but no nesting site was known in 2006.

A few sites can also be found on Loyalty islands, Iles des Pins, and in the South.

- Leatherback turtle

It is only transiting through New Caledonia and only a few occasional sightings have been reported.

PUBLIC AWARENESS AND INFORMATION CAMPAIGNS

Owing to various sources of funding, ASNNC conducted, in addition to tagging campaigns, a large scale in depth study spanning the entire territory from May 2002 to may 2004. The 3 three- week long camps on Huon islet took place during this study, as well as several operations in the three Provinces, and the satellite tagging on April 21st 2004 of a young loggerhead (nicknamed "Bip-bip") released from the Nouméa aquarium. The Argos tag was recovered in December 2004 near Maitre islet where this turtle seemed to have settled. This operation was a huge success with many New Caledonians daily following the turtle's tracks on the internet.

For the past twenty years, ASNNC has also published many documents, articles, posters, identification cards, booklets, and has organised numerous conferences and competitions, which have certainly contributed to increased public, political and administrative awareness in New Caledonia. As turtles always return to the nesting beach they first emerged from, it is important New Caledonia takes the appropriate steps to preserve its natural heritage into the future.

THREATS AND PROTECTION

Accidental mortality due to industrial fishing gears, including surface long-lines

Ingestion of various types of waste (plastics, cigarette filters, polystyrene ...)

Poaching and sale of meat, eggs and carapaces

Destruction of nesting sites due to human activities & development

High natural hatchling mortality (typically only 1 out of a 1000 hatchlings makes it to adulthood)

Predation by dogs on some beaches

The legal capturing of turtles only ceased in 2006 in the Northern and Southern Provinces, (with the exception of special authorisations granted for native ceremonies).

Prior to local legislative measures, marine turtles were already protected under CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna), prohibiting international trade and transport. In 1990, IUCN (International Union for the Conservation of Nature) listed green and loggerhead turtles as "endangered" species, and hawksbill and leatehrback turtles as "critically endangered".

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New Caledonian seabirds

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Abstract

Fifty-five seabird species (among which 26 are confirmed breeders) from 24 genera and 11 families were listed for different regions of New Caledonia (Chesterfield and Bampton atolls, d'Entrecasteaux reef, Loyalty islands, Grande Terre / Isle of Pines, Northern lagoon, Southern lagoon, Walpole island, Matthew island, and Hunter island). A detailed account of systematics, taxonomy, distribution, and conservation status was given for the four breeding species represented by subspecies considered to be endemic to New Caledonia. These include two Procellariidae (New Caledonian Petrel, *Pterodroma leucoptera caledonica*, and the New Caledonian subspecies of Tahiti Petrel, *Pseudobulweria rostrata trouessarti*) and two Laridae (New Caledonian Silver Gull, *Larus novaehollandiae forsteri*, and New Caledonian Fairy Tern, *Sterna nereis exsul*). Two seabird species that breed in New Caledonia are considered by the World Conservation Union as vulnerable (Gould's Petrel, *Pterodroma leucoptera* and White-throated Storm Petrel, *Nesofregetta fuliginosa*) and two others, as near-threatened (Tahiti Petrel and Beach Thick-knee, *Esacus magnirostris*). Several species (Masked Booby, *Sula dactylatra*, Brown Booby, *S. leucogaster*, Fairy Tern, Silver Gull and possibly Herald Petrel, *Pterodroma heraldica*) have been extirpated from regions of New Caledonia where they bred until recently. Drastic conservation measures are urgently needed for the New Caledonian Fairy Tern.

Résumé

Oiseaux marins de Nouvelle-Calédonie. – Cinquante cinq espèces d'oiseaux marins (dont 26 nicheuses confirmées), appartenant à 24 genres et 11 familles, ont été inventoriées pour différentes régions de la Nouvelle-Calédonie (atolls des Chesterfield et Bampton, récif d'Entrecasteaux, îles Loyauté, Grande Terre / Ile des Pins, lagon Nord, lagon Sud, île Walpole, îlot Matthew et îlot Hunter). Une présentation approfondie est faite de la systématique, de la taxinomie, de la distribution, et de l'état de conservation des quatre espèces représentées en Nouvelle-Calédonie par des sous-espèces considérées comme endémiques. Il s'agit de deux Procellariidae (le Pétrel de Nouvelle-Calédonie, *Pterodroma leucoptera caledonica*, et la sous-espèce néo-calédonienne du Pétrel de Tahiti, *Pseudobulweria rostrata trouessarti*), ainsi que deux Laridae (la sous espèce néo-calédonienne de la Mouette argentée, *Larus novaehollandiae forsteri*, et celle de la Sterne nereis, *Sterna nereis exsul*). Parmi les espèces d'oiseaux marins qui nichent en Nouvelle-Calédonie, deux sont considérées par l'Union mondiale pour la nature comme étant vulnérables (le Pétrel de Gould, *Pterodroma leucoptera* et le Pétrel-tempête à gorge blanche, *Nesofregetta fuliginosa*) et deux autres comme étant quasi-menacées (le Pétrel de Tahiti et l'Oedycnème des récifs, *Esacus magnirostris*). Plusieurs autres espèces (Fou masqué, *Sula dactylatra*, Fou brun, *S. leucogaster*, Sterne nereis, Mouette argentée, ainsi que, peut-être, le Pétrel de Herald, *Pterodroma heraldica*) ont disparu de régions de Nouvelle-Calédonie où elles étaient, jusqu'à récemment, nicheuses. Des mesures drastiques de conservation s'imposent pour la Sterne nereis en Nouvelle-Calédonie.

Introduction

Visiting naturalists to New Caledonia and surrounding islands have mentioned seabirds as early as 1858-1860, (Bourne *et al.* 2005). Layard and Layard (1882) provided a first list of New Caledonian "waterbirds", including four Procellariidae [*Oestrelata rostrata* (now *Pseudobulweria rostrata*), *O. mollis* (*Pterodroma mollis*, apparently a misidentification of *P. leucoptera caledonica*), *Adamastor cinereus* (*Procellaria cinerea*), *Puffinus brevicaudus* (*P. tenuirostris*)], one Hydrobatidae [*Oceanites wilsoni* (*O. oceanicus*)], two Phaethontidae [*Phaethon candidus* (*P. lepturus*), *P. rubricauda*], two Sulidae [*Sula piscator* (*S. leucogaster*) and *Dysporus sula* (*S. sula*)], one Phalacrocoracidae [*Phalacrocorax melanoleucus* (*P. melanoleucos*)], one Fregatidae [*Tachypetes aquilus* (*Fregata minor*?)], one Burhinidae (*Esacus magnirostris*) and six Laridae [*Larus novaehollandiae*, *Sterna bergii*, *S. melanauchen* (*S. sumatrana*), *S. gracilis* (*S. dougallii*), *Sternula placens* (*Sterna nereis*), *Haliplana fuliginosa* (*S. fuscata*)]. However, it was only recently that the census of populations was completed for the Southern lagoon of New Caledonia's Grande Terre (Pandolfi-Benoît and Bretagnolle 2002), and initiated in the Northern lagoon , excluding Belep and Daos archipelagos (Baudat-Franceschi 2006). Our knowledge of seabird populations in the other regions of New Caledonia is still partial.

The objective of this paper was to present an updated list of New Caledonian seabirds by region, with emphasis on endemic taxa. For the latter, we provided details on current distribution, habitats, population sizes, and conservation status.

Methods

New Caledonia is located in the southwest Pacific Ocean, approximately 1,200 km east of Australia and 1,500 km northwest of New Zealand. The New Caledonian administrative territory extends from approximately 16°52'S to 23°10'S and 157°51'E to 173°57'E (Dubois 1981). The geopolitical definition of New Caledonia thus encompasses a main island, Grande Terre, the Loyalty chain of islands (Beautemps–Beaupré, Ouvéa, Lifou, Tiga, Maré, Walpole, all calcareous platforms arisen by tectonic movements) and about a hundred islands and islets scattered from the middle of the Coral sea (the Chesterfield archipelago, comprising low coral sand islets and cays) to the southern New Hebrides ark (Matthew and Hunter islands, both andesitic stratovolcanoes). Grande Terre is by far the largest island, at 350 km in length and between 50 to 70 km wide. A mountain range peaking over 1,600 m runs the length of the island. Surrounding Grande Terre, a barrier reef delimitates a large lagoon, geographically divided into two main lagoons, at the northern and southern extremities of Grande Terre.

We compiled all the information that was accessible to us from the literature on the occurrence, taxonomy and distribution of New Caledonian seabirds. This included articles accessible through ISI Web of Science (Institute for Scientific Information, Philadelphia; http://portal.isiknowledge.com), the articles and documents listed in the bibliographic catalogue on the marine environment of New Caledonia compiled by Fromaget and Richer de Forges (1992), the articles and other reports listed in Barré and Dutson's (2000) commented list of New Caledonian birds, unpublished reports by researchers from ORSTOM / IRD archived at the IRD library, Nouméa, unpublished reports by researcher from CIRAD / IAC, Port-Laguerre, and the collection of articles, books, and unpublished reports archived at Société calédonienne d'ornithologie (SCO), Nouméa, which currently is the only birdwatcher association of New Caledonia and BirdLife International affiliate since 2000. Many of the reports presently archived at SCO were collected during the BirdLife Int. project on important bird areas or IBAs in New Caledonia (Spaggiari *et al.* 2006). Additional, unpublished reports were provided by Direction des ressources naturelles of the province Sud government, Nouméa.

The term 'seabirds' as it is used here follows Harrison (1995), and includes all species of the families Diomedeidae, Procellariidae, Hydrobatidae, Phaethontidae, Pelecanidae, Sulidae, Phalacrocoracidae, Fregatidae, and Laridae. We added to this list the Osprey (Accipitridae) and the Beach Thick-knee (Burhinidae) as these two species rely mainly, if not exclusively, on marine resources and nest on the shore or on islets in the lagoon. The taxonomy used in the present list followed Brooke (2004) for Diomedeidae, Procellariidae and Hydrobatidae, and Marchant and Higgins (1990, 1993) and Higgins and Davies (1996) for the other seabird families.

Results and Discussion

The present paper compiled the data on seabirds from 42 articles in scientific journals, 7 books and 37 other reports, to which a few unpublished observations were added. The updated list of New Caledonian seabirds, by region, is presented in Table 1. Although we may have missed some valuable contributions, we believe that the list presented here is likely to be exhaustive regarding the seabird species currently known to breed in New Caledonia. Fifty-five seabird species, belonging to 24 genera, from 11 families were thus listed in total. Among them, 26 were confirmed breeders in New Caledonia. We did not include the Grey Petrel, *Procellaria cinerea* in our list of 55, as the location where it was collected was not precise enough ("off the coast, between Noumea and Australia"; Layard and Layard 1882). Neither did we include Beck's Petrel, *Pseudobulweria becki* in that list. Beck's Petrel, which was unrecorded since 1929 and considered as possibly extinct, was recently sighted in the Coral sea (BirdLife International 2006). This observation took place near Cato island, in Australian waters (R. Baxter, in litt.) and not strictly within New Caledonian waters. However, since Beck's Petrel's colonies historically were, and presumably still are located in the Solomon islands, it is likely from R. Baxter's sighting that its zone of foraging includes a wide part of the northern Coral sea and is therefore likely to extend to New Caledonian waters.

Among the species that breed in New Caledonia, two (Gould's Petrel, *Pterodroma leucoptera*, White-throated Storm Petrel *Nesofregetta fuliginosa*) are considered by the World conservation union (IUCN) as vulnerable, and two other species (Tahiti Petrel, *Pseudobulweria rostrata*, Beach Thick-knee, *Esacus magnirostris*), as near-threatened (IUCN 2006). Some other species have been extirpated from regions where they bred until recently: *Sula dactylatra* and *S. leucogaster* signalled as breeders in the southern lagoon (de Naurois and Rancurel 1978) no longer nest there. Idem, *Sterna nereis exsul* on Grande Terre (Layard and Layard 1882). We consider the latter to be the most endangered of all New Caledonian seabirds (see below). The Herald Petrel, *Pterodroma heraldica*, has not been observed on the Chesterfield islands since the collection of two presumed breeding adults, presumably on those islands in 1858-1960 (Bourne *et al.* 2005). The seabird fauna, and the fragile vegetation and soil of the Chesterfield islands were subsequently devastated by whalers and by guano-extraction activities (Bourne *et al.* 2005). This may have extirpated Herald Petrels from the Chesterfield islands. Last, the Silver Gull, *Larus novaehollandiae forsteri*, was said to breed in large numbers on the Huon islands, d'Entrecasteaux reef, at the end of the 18th century (Layard and Layard 1882). Unlike the Chesterfield islands, no guano-extraction activities were known in d'Entrecasteaux reef (Spaggiari *et al.* 2006).

Four of the breeding species are represented by subspecies considered to be endemic, including two Procellariidae (New Caledonian Petrel, *Pterodroma leucoptera caledonica* and Tahiti Petrel, *Pseudobulweria rostrata trouessarti*), and two Laridae (Silver Gull, *Larus novaehollandiae forsteri* and Fairy Tern, *Sterna nereis exsul*). We restricted the following species account to those 4 endemics. This account includes details on their taxonomy and systematics, their distribution and their current conservation status.

Table 2 is a provisional list of the voucher specimens available for a number of species, including two of the four endemics.

New Caledonian Petrel, *Pterodroma leucoptera caledonica* de Naurois, 1978

Gould's Petrel (*Pterodroma leucoptera*) breeds only in Australia and New Caledonia. The Australian subspecies *P. l. leucoptera* is restricted to two closely distant breeding locations – Cabbage Tree island and Boondelbah island at the entrance to Port Stephens, New South Wales (Marchant and Higgins 1990; Priddel and Carlile 1997; Brooke 2004).

A form of Gould's Petrel breeding in the mountains of New Caledonia was discovered by de Naurois (1978) during his studies of Petrels in New Caledonia. This author first recognized New Caledonian Gould's Petrel as a distinct subspecies on the basis of larger bill and paler plumage on the back, wings and sides of chest (Imber and Jenkins 1981) but eventually changed his mind because he believed that the old Australian *P. leucoptera* specimens he had compared his New Caledonian specimens to were too few to ascertain the distinction, hence the validity of the new subspecies (Imber and Jenkins 1981; Palma and Tennyson 2005). Morphometrics subsequently allowed Imber and Jenkins (1981) to assign specimens of Gould's Petrels washed up on the shores of New Zealand's North island between 1942 and 1980 to the New Caledonian subspecies. The New Caledonian Petrel is clearly distinct from its close Australian relative, hence it was considered a valid subspecies (Imber and Jenkins 1981). These authors considered de Naurois (1978) as the authority for the new subspecies, as "he provided an available name, a breeding locality and some valid characters" although he did not formally describe the subspecies nor designate a type specimen. Imber and Jenkins (1981) nevertheless understood that the specimens studied by de Naurois (1978), now deposited at Museum National d'Histoire Naturelle, Paris, were the types of *P. leucoptera caledonica*, but Palma and Tennyson (2005) recently considered otherwise and designated a specimen from New Caledonia preserved at the American Museum of Natural History as lectotype (Table 2). Palma and Tennyson (2005) also proposed that the authorship of the subspecies be ascribed to Imber and Jenkins (1981), instead of de Naurois (1978) as it is currently cited in major ornithological publications (e.g. Marchant and Higgins 1990; del Hoyo 1992; Dickinson 2003).

This subspecies breeds in New Caledonia and Vanuatu (Tana island: V. Bretagnolle, in Brooke 2004). New Caledonian Petrel breeding sites in New Caledonia are the steep, vegetated slopes of the central chain of mountains at 400-650 m above sea level (de Naurois 1978; V. Bretagnolle, in Brooke 2004). The population size of New Caledonian Petrel is estimated to be on the order of 1,000 – 10,000 pairs (V. Bretagnolle, in Brooke 2004).

Tahiti Petrel, *Pseudobulweria rostrata trouessarti* Brasil, 1917

The Tahiti Petrel is widespread in the South West Pacific. Its breeding locations include the Society islands, the Gambier archipelago, the Marquesas islands, Fiji, and New Caledonia (Villard *et al.* 2006, and references therein).

Two subspecies are currently recognized for Tahiti Petrel, namely *Pseudobulweria r. rostrata* and *P. r. trouessarti*. Brasil's (1917) recognition of the New Caledonian form of Tahiti Petrel as a distinct subspecies was later challenged by Murphy and Pennoyer (1952). However, a morphometric analysis of 14 individuals from New Caledonia and 13 from Tahiti confirmed the distinctness of the New Caledonian Tahiti Petrels, on the basis of its heavier bill and longer tarsus (de Naurois and Erard 1979), hence validating Brasil's (1917) taxonomy. Further biometric measurements have confirmed the distinction between *P. r. trouessarti* and *P. r. rostrata* (the other subspecies) from Polynesia (Villard *et al.* 2006). Based on mitochondrial-DNA (cytochrome *b* gene) sequences, Bretagnolle *et al.* (1998) reported that *P. r. trouessarti* differed from Polynesian *P. r. rostrata* by 0.6% nucleotide divergence, which was less than the divergences estimated between nominal species in *Pseudobulweria* and in *Pterodroma*. Additional biometric and genetic data for those and geographically intermediate samples are nevertheless needed to confirm whether *P. r. trouessarti* is a valid subspecies, and whether it eventually would deserve specific rank.

In New Caledonia, the Tahiti Petrel breeds in small scattered colonies on the mountain slopes of Grande Terre up to 1000 m or more, and on coral and rocky islets in the lagoon (Spaggiari *et al.* 2006; Villard *et al.* 2006, and references therein). Tahiti Petrels are frequently observed from the outer reef to further offshore (Baudat-Franceschi 2006; BirdLife International 2006; Borsa 2006). Individuals are regularly encountered along roads or near villages, up to 45 km from the sea in northern Grande Terre (Baudat-Franceschi 2006).

The Tahiti Petrel, which digs its burrow under arbustive or forested cover, is threatened by introduced predators (feral pigs and cats, and dogs) and habitat destruction (grazing ungulates, fires and open-cast mining). As those threats occur in many of the islands of the tropical southern Pacific, that is overall almost its whole breeding range, the survival of Tahiti Petrels depends on the long-term preservation of forested terrestrial island ecosystems in the Pacific. The current population size of Tahiti Petrel in New Caledonia is unknown. An estimate of population size has only been provided for the Southern lagoon (ca. 100 pairs; Pandolfi-Benoît and Bretagnolle 2002).

New Caledonian Silver Gull, *Larus novaehollandiae forsteri* Mathews, 1912

Three subspecies of Silver Gull have been recognized following the review of Johnstone (1982): *L. n. novaehollandiae*, which is distributed along the shores of Australia and Tasmania, *L. n. scopulinus*, which occurs in New Zealand and in the Chatham, Snares, Auckland and Campbell islands, and *L. n. forsteri* in New Caledonia (Higgins and Davies 1996). Silver Gulls are occasional visitors to Lord Howe and Norfolk islands, and southern New Guinea. They have also been sighted in Vanuatu (Higgins and Davies 1996).

Silver Gulls from New Caledonia apparently have distinct wing patterns to birds from Queensland (Johnstone 1982), with which they were earlier thought to be of the same subspecies, while recognized as different from those of southern Australia and Tasmania (Dwight 1925, in Higgins and Davies 1996). Although abundant morphometric data are currently available for *L. n. novaehollandiae* and *L. n. scopulinus* (Higgins and Davies 1996), no data was mentioned by these authors for *L. n. forsteri*. More study is therefore needed to clarify the patterns of geographical variation in Silver Gulls and, in particular, to characterize the New Caledonian subspecies. We believe this should be based on morphometrics, coupled with molecular population genetics. Novel microsatellite markers for Silver Gull (Given *et al.* 2002) should prove adequate tools to investigate population structure and gene flow patterns between populations.

New Caledonian Silver Gulls forage on the sandy, coralline or rocky beaches and nearby reefs, beach-rock platforms, mudflats, and sand banks. They also catch small fish swimming at the surface. On land, Silver Gulls are generally attracted to sites of human waste, such as fish landing docks and dumps. They breed on both low vegetated islets and rocky islets of the lagoon around Grande Terre (Pandolfi-Benoît and Bretagnolle 2002; Baudat-Franceschi 2006). As its population size in the Southern lagoon is < 1,500 pairs (Pandolfi-Benoît and Bretagnolle 2002), and that of the Northern lagoon is < 500 pairs (Baudat-Franceschi 2006), the total population size of New Caledonian Silver Gull, non-breeders included, is likely to be no more than within the few thousands.

New Caledonian Fairy Tern, *Sterna nereis exsul* Mathews 1912

Three subspecies are currently recognized that differ mainly in size, one each for Australia and Tasmania (*S. n. nereis*), New Zealand (*S. n. davisae*), and New Caledonia (*S. n. exsul*) (Higgins and Davies 1996). The Australian-Tasmanian population of Fairy Tern is the largest, with ca. 3,000-9,000 individuals, and that of New Zealand is the smallest (8 breeding pairs), with intermediate population size for New Caledonia (ca. 100 breeding pairs) (Brunton and Baling 2005; Baling *et al.* 2006b, and references therein).

Brunton and Baling (2005) produced mitochondrial DNA nucleotide sequences (1,041 base pairs of the ND2 gene) for samples of Fairy Tern from western Australia, southeastern Australia, New Zealand and New Caledonia. A salient feature of the parsimony network of Fairy Tern haplotypes (Fig. 2 of Brunton and Baling 2005) was the long branch (0.5% nucleotide divergence) separating the unique New Caledonian haplotype from that of New Zealand, the latter being in turn separated from a cluster of Australian haplotypes by ca. 0.3% nucleotide divergence. Conversely, populations as far apart as those from western and southeastern Australia shared the same, major haplotype. In other terms, on the basis of the available data, the three Fairy Tern subspecies are geographically isolated from each other, reaching relatively strong levels of genetic divergence and forming reciprocally monophyletic lineages. To our opinion, specific rank might well be justified for the current subspecies of Fairy Tern. Further genetic studies on Fairy Tern populations including, if possible, the analysis of samples from an intermediate location for which no data are currently available (the Chesterfield and Bampton atolls) may help address that question.

Until recently, the New Caledonian Fairy Tern was known to breed only on small coral islets of the Southern lagoon, including the islets immediately south to Nouméa (Layard and Layard 1878), Kouaré islet (Rancurel 1976) and Redika islet (P.B., unpubl. obs. in 1993). The breeding population was estimated to be <10 pairs in the mid-1990s (Pandolfi-Benoît and Bretagnolle 2002). More recently, the population size in the Southern lagoon was estimated to be <20 pairs, breeding on 3 islets including Kaé islet and Atiré islet, with a very low reproduction success as checked at the fledgling stage (Brunton and Baling 2005; Baling *et al.* 2006b). Fairy Terns were reported to also breed in the Chesterfield islands (Rancurel 1976; de Naurois et Rancurel 1978). The islets off the northwestern coast of Grande Terre have recently been identified as a key area for the New Caledonian Fairy Tern (N. Baillon, N.B., J.B-F. unpubl.). Overall, the population is considered to be declining, owing to human disturbance at nesting sites (Brunton and Baling 2005). As the status of Fairy Tern in New Caledonia is now highly critical, drastic steps for its conservation should be taken urgently. Considerable effort has been devoted in New Zealand to achieve similar objectives, not without some success (Ferreira *et al.* 2005).

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Table 1 Updated list of New Caledonian seabirds, by region. *Chest.* Chesterfield- Bampton islands; *d'Entr.* d'Entrecasteaux reef; *Loyalty* Loyalty islands; *Gde Terre* Grande Terre and Isle of Pines; *N. Lag.* Northern lagoon; *S. Lag.* Southern lagoon; *Walpole* Walpole island; *Matthew* Matthew island; *Hunter* Hunter island; *o* observed; breeding status: *b* confirmed breeder; *l* likely breeder. *At sea* at-sea records: *o* records for which references were provided (for all non-breeding and for some rarely observed species); + many records, for which references were not provided. References: 1. Bourne (1967); 2. Delacour (1966); 3. Hannecart and Létocart (1983); 4. MacDonald and Lawford (1954); 5. Warner (1947); 6. J.S., unpubl. obs. in 2006; 7. Anonymous (1996); 8. Barré *et al.* (2006a); 9. Chapman (1983); 10. Rancurel (1976); 11. P.B., unpubl. obs. in 2002; 12. Layard and Layard (1882); 13. Barré and Dutson (2000); 14. Barré *et al.* (2006b); 15. Baudat-Franceschi (2006); 16. Bedin (1996); 17. Bell (1998); 18. Beugnet *et al.* (1993); 19. Bourne *et al.* (2005); 20. Condamin (1977); 21. Condamin (1978); 22. Condamin (1979); 23. de Naurois and Rancurel (1978); 24. Desmoulins and Barré (2006); 25. Kusser and Suprin (1990); 26. Lambert (1987); 27. Pandolfi-Benoît (1993a); 28. Pandolfi-Benoît (1993c); 29. Pandolfi-Benoît and Bretagnolle (2002); 30. Rancurel (1973a); 31. Rancurel (1973b); 32. Robinet, Craig and Chardonnet (1998); 33. Robinet *et al.* (1997); 34. SCO (1996); 35. Spaggiari and Barré (2003); 36. Spaggiari and Barré (2005); 37. Villard (2002a); 38. Villard (2002b); 39. Villard (2003); 40. Walker and Savage (1990), in Bourne *et al.* (2005); 41 . Bourne (1984); 42. Meeth and Meeth (1983); 43. Layard and Layard (1878a); 44. Gray (1859); 45. Mayr (1945); 46. Bourne (1966); 47. Jespersen (1933); 48. Borsa (2004); 49. de Naurois (1978); 50. de Naurois and Erard (1979); 51. Hannecart (1988); 52. Spaggiari and Barré (2004); 53. Villard and Barré (2002); 54.Villard *et al.* (2006); 55. obs. by F. Hannecart in 1981 (pers comm.); 56. Salvin (1888); 57. Spaggiari *et al.* (2006); 58. Gibson (1960); 59. P.B., unpubl. obs. in 2004; 60. Bretagnolle (2001); 61. Imber and Jenkins (1981); 62. J.S., unpubl. obs. in 2005; 63 Bourne (1970); 64. Barritt (1975); 65. de Naurois and Rancurel (1978); 66. Sullivan (1928); 67. Condamin and de Naurois (1987); 68. Godard (1982); 69. Layard and Layard (1880); 70. Pandolfi-Benoît (1993b); 71. Sirgouant (1994); 72. Villard (2001); 73. Borsa (2006); 74. Cohic (1959); 75. Costa and Thévenon (1987); 76. Hamel (1993); 77. Hannecart and Laplagne (1969); 78. Kusser (1986); 79. Rancurel (1974); 80. Barré and Géraux (2004); 81. Hannecart and Létocart (1980); 82. Manceau and Barré (2001); 83. Bretagnolle *et al.* (2001); 84. Bruce (1978); 85. Bruce (1985); 86. Condamin (1978); 87. obs. by G. Dutson in 2003 (pers comm.); 88. Barré and Bachy (2003); 89. Baling *et al.* (2006b); 90. Bretagnolle and Pandolfi-Benoît (1997); 91. de Naurois (1985); 92. MacMillan (1938); 93. J.B-F., unpubl. obs. in 2006; 94. N.B., unpubl. obs. in 2005.

Table 1

Family, Species	Vernacular name	Region of New Caledonia									At	References
		Chest..	d'Entr.	Loyalty	Gde Terre	N. Lag.	S. Lag.	Walpole	Matthew	Hunter	sea	
Diomedeidae												
Diomedea exulans	Wandering Albatross										o	1, 2, 3, 4, 5
Diomedea antipodensis	Antipodean Albatross				o (dead)							6
Diomedea epomophora	Southern Royal Albatross				o (dead)							7
Thalassarche melanophrys	Black-browed Albatross										o	2, 3, 5
Procellariidae												
Macronectes giganteus	Southern Giant Petrel				o							3
Macronectes halli	Northern Giant Petrel				o							8
Daption capense	Cape Petrel						o				o	9, 10, 11
Procellaria cinerea	Grey Petrel										o	12
Calonectris leucomelas	Streaked Shearwater										o	13
Puffinus pacificus chlororhynchus [1]	Wedge-tailed Shearwater	b	b	b	b	b	b	o	o	b	+	10, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
Puffinus carneipes	Flesh-footed Shearwater										o	11, 41
Puffinus griseus	Sooty Shearwater										o	4 ,13, 42
Puffinus tenuirostris	Short-tailed Shearwater					o					o	5, 13, 15, 42, 43, 93
Puffinus gavia	Fluttering Shearwater										o	2, 4, 43, 44, 45
Puffinus lherminieri gunax	Audubon's Shearwater										o	2, 8, 45
Puffinus assimilis	Little Shearwater										o	46, 47
Pseudobulweria rostrata trouessarti	Tahiti Petrel			o	b	b	b		o	o	+	2, 12, 14, 15, 17, 29, 48, 49, 50, 51, 52, 53, 54, 55
Pterodroma heraldica [2]	Herald Petrel					1				b	o	1, 8, 15, 19, 45, 56, 57
Pterodroma solandri	Providence Petrel				o						o	58, 59
Pterodroma inexpectata	Mottled Petrel										o	1, 13
Pterodroma brevipes	Collared Petrel										o	8
Pterodroma leucoptera caledonica	New Caledonian Petrel				b		o	o	1		+	10, 45, 49, 51, 60, 61
Pterodroma cookii	Cook's Petrel										o	11, 42
Pterodroma cervicalis	White-necked Petrel										o	42
Pterodroma nigripennis	Black-winged Petrel			o		1	b		o	1	+	15, 21, 22, 29, 42, 51, 55, 61

Table 1 (continued)

Family, Species	Vernacular name	Region of New Caledonia									At sea	References
		Chest..	d'Entr.	Loyalty	Gde Terre	N. Lag.	S. Lag.	Walpole	Matthew	Hunter		
Hydrobatidae												
Oceanites oceanicus	Wilson's Storm Petrel					o					o	3, 12, 15, 43, 45, 62, 93
Fregetta grallaria	White-bellied Storm-Petrel										o	4, 63
Nesofregetta fuliginosa [3]	White-throated Storm Petrel										o	13, 64
Phaethontidae												
Phaethon lepturus	White-tailed Tropicbird			l				b	o	o	o	14, 21, 37, 51, 57, 65, 66
Phaethon rubricauda	Red-tailed Tropicbird	b	b	b			o	b	b	b	o	10, 12, 14, 21, 31, 32, 33, 34, 37, 48, 51, 57, 59, 65, 66, 67, 68, 69, 70, 71, 72
Pelecanidae												
Pelecanus conspicillatus	Australan Pelican				o							3
Sulidae												
Sula serrator	Australasian Gannet					o						13
Sula dactylatra personata [4]	Masked Booby	b	b	b		b	b		b	b	+	10, 14, 15, 16, 19, 21, 25, 26, 27, 28, 30, 33, 34, 40, 48, 51, 57, 65, 72, 73, 74, 75, 76
Sula sula rubripes [5]	Red-footed Booby	b	b	o			b	b		b	+	10, 14, 17, 19, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 37, 39, 40, 57, 65, 70, 71, 73, 74, 76, 77, 78, 79,
Sula leucogaster plotus [6]	Brown Booby	b	b	b		b	b	b	b	b	+	10, 14, 15, 16, 19, 20, 21, 25, 26, 27, 28, 30, 31, 33, 34, 37, 40, 51, 57, 65, 67, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79
Phalacrocaricidae												
Phalacrocorax carbo	Great Cormorant				b							13, 80
Phalacrocorax sulcirostris	Little Black Cormorant	o										13, 20, 68, 80, 81
Phalacrocorax melanoleucos melanoleucos	Little Pied Cormorant		o		b						+	13, 28, 68, 80, 81
Fregatidae												
Fregata ariel ariel	Lesser Frigatebird	b	b	o		o		b		b	+	10, 12, 14, 15, 19, 21, 30, 31, 32, 33, 34, 37, 38, 40, 51, 65, 69, 71, 72, 74, 76, 82, 93
Fregata minor	Great Frigatebird	b	b	o		o		b	o	b	+	10, 14, 15, 19, 20, 21, 28, 30, 31, 32, 33, 34, 37, 40, 48, 51, 65, 69, 70, 71, 74, 76, 79, 82, 93

Table 1 (continued)

Family, Species	Vernacular name	Region of New Caledonia Chest..	d'Entr.	Loyalty	Gde Terre	N. Lag.	S. Lag.	Walpole	Matthew	Hunter	At sea	References
Accipitridae												
Pandion haliaetus leucocephalus	Osprey			o	b	b	b				+	10, 15, 45, 81, 83, 84
Burhinidae												
Esacus magnirostris [7]	Beach Thick-knee					b						3, 12, 15, 85, 86
Laridae												
Catharacta maccormicki	South Polar Skua										o	13, 42
Stercorarius pomarinus	Pomarine Jaeger				o							87
Stercorarius parasiticus	Arctic Jaeger										o	9, 10, 13
Larus novaehollandiae forsteri [8]	Silver Gull			o	o	b	b				+	5, 14, 15, 17, 29, 39, 43, 44, 51, 81, 82
Sterna bergii cristata	Great Crested Tern	b	o	b		b	b				+	5, 10, 12, 14, 15, 19, 23, 29, 30, 37, 38, 39, 40, 43, 51, 57, 68, 72, 82
Sterna dougallii bangsi	Roseate Tern			o		b	b				+	5, 10, 12, 13, 14, 15, 19, 23, 29, 38, 39, 40, 51
Sterna sumatrana sumatrana	Black-naped Tern	o	b	o		b	b				+	4, 10, 14, 15, 19, 23, 29, 32, 33, 38, 39, 40, 51
Sterna albifrons sinensis	Little Tern				o		o					88
Sterna nereis exsul [9]	Fairy Tern	b				b	b					4, 10, 12, 15, 17, 23, 29, 39, 45, 51, 89, 94
Sterna anaethetus	Bridled Tern		o			b	b				+	10, 15, 17, 23, 29, 39, 57, 90, 91
Sterna fuscata serrata	Sooty Tern	b	b	b		b	l	o	b	o	+	10, 15, 19, 20, 21, 23, 26, 30, 31, 32, 33, 34, 39, 40, 48, 51, 57, 64, 67, 70, 73, 75, 76, 77, 78, 92, 94
Anous stolidus pileatus	Common Noddy	b	b	o		b	b	b	b	b	+	5, 10, 14, 15, 16, 17, 19, 20, 21, 23, 25, 26, 28, 29, 30, 31, 32, 33, 34, 39, 40, 51, 67, 71, 73, 76, 78
Anous minutus minutus	Black Noddy	b	b			l	b	b		b	+	5, 10, 15, 17, 19, 21, 23, 25, 27, 29, 30, 32, 39, 40, 51, 57, 67, 76, 73

[1] One observation, of a light-phase individual, done in June 2005 at Yaté, Grande Terre (V. Chartendrault, pers. comm.); dark phase otherwise (see Plates); [2] Known in the Chesterfield islands from the two specimens presumed to have been collected there by HMS *Herald* in 1858-1860 (Bourne et al. 2005). Not observed in the Chesterfield islands since then; [3] Reported as breeder in New Caledonia (BirdLife International 2000); [4] Historical breeder in the Southern lagoon, until 1974 (de Naurois and Rancurel 1978); [5] Dark and light phases in similar proportions in New Caledonia (Rancurel 1976); [6] Historical breeder in the Southern lagoon, until 1974 (de Naurois and Rancurel 1978); [7] Historical breeder on Huon island, d'Entrecasteaux reef and also reported from the eastern coast of Grande Terre by Layard and Layard (1882); [8] Historical breeder in d'Entrecasteaux reef (Layard and Layard 1882); [9] Historical breeder on Grande Terre (Layard and Layard 1882)

Table 2. Voucher specimens for New Caledonian seabirds. *NHM* Natural History Museum, London; *MNHN* Muséum National d'Histoire Naturelle, Paris; *AMNH* American Museum of Natural History, New York

Species	Collection (specimen nos.)	Comments	Reference
Pseudobulweria rostrata trouessarti	MNHN	Type specimen studied by Brasil (1917) and 12 skins and skeletons collected by de Naurois (1978)	de Naurois and Erard (1979)
	MNHN, AMNH, NHM	Several specimens studied by Villard et al. (2006)	Villard et al. (2006)
Pterodroma heraldica	NHM (nos. 62.6.22.10 and 88.5.18.110)	Two specimens assumed to have been collected by H.M.S. *Herald* in the Chesterfield in 1858-1860	Bourne et al. (2005)
Pterodroma leucoptera caledonica	AMNH (no. 824271, coll. no. NC20)	Specimen designated lectotype by Palma and Tennyson (2005)	Palma and Tennyson (2005)
	MNHN	Several specimens from Monts Dzumac collected by de Naurois	Imber and Jenkins (1981)
Sterna dougallii	F. Hannecart, private collection	Two stuffed specimens	F. Hannecart, pers. comm.

Marine mammals of New Caledonia and the Loyalty islands
Check list of the species

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Résumé

Les mammifères marins de Nouvelle-Calédonie et des îles Loyauté sont représentés par 24 espèces réparties en 17 genres, 7 familles et 3 ordres. Quinze espèces ont été observées en mer et 9 espèces ne sont connues que par des échouages. La plupart des espèces répertoriées ont une large répartition et aucun endémisme n'a été relevé en Nouvelle-Calédonie néanmoins quelques originalités peuvent être notées.

La présence d'une espèce de pinnipède, *Arctocephalus forsteri*, est le fait de quelques individus isolés probablement transportés accidentellement par les courants marins. La Nouvelle-Calédonie abrite une petite population reproductrice de Dugong (*Dugong dugon*) qui constitue la plus grande population d'Océanie et la troisième population mondiale. Les Cétacés comprennent six espèces de Mysticètes et seize espèces d'Odontocètes dont certaines ne sont connues que par un unique spécimen (*Balaenoptera edeni, B. borealis, B. muscuslus brevicauda, Ziphius cavirostris, Delphinus delphis, Peponocephala electra*). Parmi les îles du Pacifique sud la présence du cachalot pygmée (*Kogia breviceps*) ainsi que celle de la sous espèce de baleine bleue pygmée (*Balaenoptera musculus brevicauda*) n'est confirmée qu'en Nouvelle-Calédonie. La baleine à bosse fait l'objet d'importantes recherches (biologie, écologie, génétique). Une petite population de baleines à bosse présentant une reproduction et une démographie autonome utilise le lagon sud comme zone de reproduction. Des études sont également conduites sur le dugong (*Dugong dugon*) et le grand dauphin de l'Indo Pacifique (*Tursiops aduncus*) pour lesquels la présence de populations reproductrices a été confirmée. De nombreuses espèces inventoriées en Nouvelle-Calédonie sont classées comme en danger ou menacées dans le livre rouge de l'UICN et inscrites dans les annexes des principales conventions internationales comme la Convention de Bonn (CITES). Les programmes de recherche menés en Nouvelle-Calédonie ont amélioré la connaissance sur certaines espèces mais la poursuite des études s'avère nécessaire pour établir leur statut et déterminer la distribution de nombreuses autres espèces de ce groupe zoologique.

Abstract

The marine mammal fauna of New Caledonia and the Loyalty islands is represented by 24 species distributed in 17 genera, 7 families and 3 orders. Fifteen species have been sighted at least once at sea and 9 species are only known from stranding. No endemism exists in New Caledonia as most of the species identify are widely distributed species nevertheless some originalities exist.

The occurrence of one Pinniped, *Arctocephalus forsteri*, probably correspond to erratic specimens accidentally transported by ocean currents. New Caledonia hosted the largest population of *Dugong dugon* in Oceania and the third world largest population. Cetacean comprised six species of baleen whales and sixteen species of toothed whales. Some of them are known by only one specimen (*Balaenoptera edeni, B. borealis, B. musculus brevicauda, Ziphius cavirostris, Delphinus delphis, Peponocephala electra*). Among the South Pacific islands region the presence of the pygmy sperm whale (*Kogia breviceps*) and that of the subspecies of pygmy blue whale (*Balaenoptera musculus brevicauda*) was only confirmed in New Caledonia. The humpback whale (*Megaptera novaeangliae*) is subject of important researches (biology, ecology and genetic). A small population of humpback whales with reproductive and demographic autonomy is breeding in the Southern part of the lagoon. In a lesser extent studies are also conducted on Dugong (*Dugong dugon*) and Indian Ocean bottlenose dolphin (*Tursiops aduncus*) for which occurrence of reproductive populations has been confirmed.

Many of the species inventoried are listed as endangered or threatened on the IUCN Red List and are included on the Appendices of the major international conventions on wildlife such as CMS and CITES. The research programs conducted in New Caledonia provide a better knowledge on some species but further studies are required to establish the status and determine the distribution of many species of this zoological group.

With the exception of humpback whales (*Megaptera novaeangliae*) reported in New Caledonian archipelago in 1842 (Pisier, 1975; Bérard, 1854), the marine mammals fauna of New Caledonia was poorly known until recently. The first acquired knowledge came from biologists that occasionally documented stranding events (Rancurel, 1973 and 1975; Robineau and Rancurel, 1981; Sylvestre, 1988) but no published sighting of marine mammals was available for New Caledonia or the Loyalty Islands.

The first research program devoted to marine mammals began fifteen years ago and is still on going. It included numerous sea and land-based surveys (Garrigue, 2004a and b, 2005), collection of biological, behavioural and acoustic data at sea (Garrigue *et al.*, 2001, 2004a), collection of biological material and biometric measurements on stranding specimens (Opération Cétacés, unpublished data), collection of opportunistic sightings (Garrigue and Greaves, 2001).

A sampling effort of 557 days of sea surveys totalising more than 3,900 h of observation completed by 445 days of land-based survey totalising more than 2,300 h of observation (Garrigue, 2005), was developed during this scientific program. More than 800 opportunistic sightings was reported using form made available to public since 1991 (Garrigue and Greaves, 2001). Forty six stranding events were documented by the author and thirty five stranded animals were examined by the author (Bustamante *et al.*, 2003; Garrigue *et al.*, 2003 and 2000; Opération Cétacés, unpublished data).

A first checklist of marine mammals from New Caledonia was established in 2001 (Garrigue and Greaves, 2001). A revision was carried on using the synthesis of all the studies conducted since 1991 plus a few opportunistic data (Borsa, 2006). The marine mammal fauna of New Caledonia and the Loyalty islands now consists of 24 species distributed in 17 genera, 7 families and 3 orders. Fifteen species have been sighted at least once at sea and 9 species are only known from stranding.

The records of one Pinnipeds of the Otariidae family (*Arctocephalus forsteri*) in four occasions (Rancurel, 1975; King, 1976; Opération Cétacés, unpublished data) is interesting because records of Pinnipeds in the South Pacific tropics are rare (Reeves *et al.*, 1999). It is highly probable that these seals were accidentally transported by ocean currents from one of the nearest breeding colonies of Australia or New Zealand.

Only one Sirenian, the dugong (*Dugong dugon*) is inhabiting New Caledonia. This coastal species is mainly distributed inside of the lagoon more frequently on the west coast (Garrigue and Patenaude, 2004). New Caledonia houses the third worldwide largest population of dugong (Garrigue *et al.*, in prep.) which is extremely important because it is located close to the border of the species distribution (Nishiwaki *et al.*, 1979).

Concerning the Cetaceans, six species of baleen whales and sixten toothed whales have been identified in New Caledonia. There is no endemism as most of the species identified are widely distributed nevertheless some originalities exist.

All the baleen whales found in New Caledonia present a cosmopolite distribution with the exception of the Bryde's whale (*Balaenoptera edeni*) which is only found in the tropic and subtropical areas. The humpback and minke whales (*Balaenoptera acutorostrata*, *Megaptera novaeangliae*) are regular inhabitants of New Caledonia. The former one (*M. novaeangliae*) has been identify in most of the South Pacific islands groups for which information are available, probably because of the habits of this species to congregate on breeding grounds (Garrigue *et al.*, 2002). In New Caledonia the southern lagoon has been identified as an important breeding ground for a small population of humpback whale (Garrigue *et al.*, 2001). Both Antarctic minke whales (*Balaenoptera bonaerensis*) and dwarf minke whales (*B. acutorostrata subspecies*) likely occur in South Pacific waters. There are records of minke whales from many islands but in most cases there is insufficient information to confirm which of the two species they are. The presence of dwarf minke whales has been confirmed genetically only in New Caledonia and Tonga. Antarctic minke whales have been identified from pigmentation patterns in New Caledonia and Samoa (Borsa, 2006; Walsh *et al.*, 2003) and genetically in French Polynesia. Three species of baleen whales have only been documented stranded: the bryde's whale (*B. edeni*), the sei whale (*Balaenoptera borealis*) and the pygmy blue whale (*Balaenoptera musculus brevicauda*) (Reeves *et al.*, 1999; Borsa 2006; Clua, 2002; Garrigue *et al.*, 2003; Borsa and Hoarau, 2004). Blue whale (*B. musculus*) has been identify in few island but the presence of the subspecies of pygmy blue whale (*B. musculus brevicauda*) was only confirmed in New Caledonia (Clua, 2002; Garrigue *et al.*, 2003; Borsa and Hoarau, 2004).

Four families of toothed whales are represented in New Caledonia. The Physeteridae family only hosts the sperm whale (*Physeter macrocephalus*) which has a cosmopolite distribution. It is a common species in the oceanic waters surrounding the New Caledonian archipelago and it has been largely identify in the South Pacific (Reeves *et al.*, 1999; Opération Cétacés unpublished data). Sperm whales are mainly encountered in the end of spring and in summer but the vocalisations recorded in winter (Garrigue, 2004a) and the temporal distribution of the stranding events (N=24, Borsa, 2006; Opération Cétacés unpublished data) lets suppose that the species could be found year around in New Caledonia. The sighting of large pods and the observation of stranded calves in summer suggest that sperm whales may reproduce in New Caledonian waters.

Both representatives of the Kogiidae family, the pygmy and the dwarf sperm whale (*Kogia breviceps* and *Kogia sima*) have been listed among the most commonly stranded cetaceans in some parts of the world (Ploen, 2004). They are commonly reported stranded in New Caledonia where the good condition of carcasses and the distribution of events year round suggest that *Kogia* could be a regular inhabitant of the waters outside/surrounding of the barrier reef. These species are considered to be rare, mainly because of their offshore distribution (Ploen, 2004). One opportunistic sighting has recently been reported but confirmation of the species was not possible as there are no reliable criteria to distinguish sightings of these lifelike species (Leatherwood and Reeves, 1983). Although these species are distributed in tropical and warm temperate waters, sighting are still rare probably because of the discreet behaviour of both species which make them difficult to observe at sea. Dwarf sperm whale (*K. sima*) has only been reported in three of the South Pacific islands: New Caledonia, French Polynesia and Samoa and pygmy sperm whale (*K. breviceps*) has only been notified in New Caledonia.

Two species of beaked whales belonging to the Ziphiidae family have been identified in New Caledonia. The dense beaked whale (*Mesoplodon densirostris*) is the mostly widely distributed species in the genus *Mesoplodon*. It was first identify from tooth that came from a stranding animal (Garrigue and Greaves, 2001). A second stranding event allowed confirmation of identity through DNA taxonomy. The maternal lineage (mitochondrial DNA haplotype) represented by this animal has also been found in animals from French Polynesia and Chile (M. Dalebout pers. comm.). Opportunistic sightings in the Loyalty basin (Borsa and Robineau, 2005) and the New Caledonia basin (Opération Cétacés, unpublished data) let suppose that the species, which occurs in temperate and tropical waters of all the oceans, could be largely distributed around New Caledonia. The presence of the second species, Cuvier's beaked whale (*Ziphius cavirostris*), was confirmed through the DNA identification of a decomposed animal found stranded in Ouvea (Loyalty island) in October 2003 (D. Steel, pers. comm.). The maternal lineage represented by this whale is relatively common throughout the range of this species, but occurs most frequently among animals from the North pacific (Dalebout *et al.*, 2005; M. Dalebout, pers. comm.).

The Delphinidae family is well represented in New Caledonia with 10 species. Most of them have a large oceanic distribution in tropical to subtropical or warm temperate waters and are found in other South Pacific islands region. Six representatives of the Globicephalinae subfamily have been identified in New Caledonia. The short-finned pilot whale (*Globicephala macrorhynchus*) has regularly been encountered at sea, where as the false killer whale (*Pseudorca crassidens*), the killer whale (*Orcinus orca*) and the Risso's dolphin (*Grampus griseus*) have been less frequently observed. The melon-headed whale (*Peponocephala electra*) and the pygmy killer whale (*Feresa attenuata*) have only been documented by stranding. From the five members of the Delphinidae subfamily listed in New Caledonia three are oceanic species. The spinner dolphin (*Stenella longirostris*) which is actively feeding at night in the mesopelagic waters, is commonly observed in some back reef areas of the lagoon where shallow sandy waters are used as resting areas during the day. The pan tropical spotted dolphin (*Stenella attenuata*) has been sighted around New Caledonia and the Loyalty islands, and the common dolphin (*Delphinus delphis*) has only been documented by a skull preserved in the National Museum of Natural History in Paris (Borsa, 2006). The originality of the Delphinidae in New Caledonia comes from the existence of two species of *Tursiops*. The bottlenose dolphins (genus *Tursiops*) are found in tropical and temperate waters with both coastal and pelagic populations (Mead and Brownell 1993; Rice, 1998). *T. truncatus* has only been encountered in the oceanic environments outside of the barrier reef of New Caledonia and in the Loyalty islands where as its congeneric species the Indian Ocean bottlenose dolphin (*T. aduncus*) is one of the most frequently sighted species into the lagoon of Grande Terre. Photo-identification studies supported the existence of resident coastal populations (Garrigue, 2004b; Opération Cétacés, unpublished data). Identifications of the two *Tursiops* species has been confirmed by genetic analyses (Moller and Beheregaray, 2001; Wang *et al.*, 1999, de Tesanos Pinto *et al.*, 2005). *T. truncatus* is largely represented in the South Pacific where as *T. aduncus* has only been reported in New Caledonia where its presence extends the eastern range of distribution of this species (Ross, 1977; Ross and Cockcroft, 1990; Wang *et al.*, 2000).

There is a large gap in the knowledge of marine mammals in the South Pacific as there have been few dedicated offshore cetacean surveys in the region. Limited data on distribution and status of these animals are available in many of the islands groups and no information exist in other islands. Due to the vastness of the region a huge sampling effort will be necessary to identify the pelagic species and to obtain data on their distribution. Until recently most of the available information came from whaling data (Townsend, 1935; Dawbin, 1959 and 1964), or consisted of opportunistic sightings from non-systematic efforts of individual scientists. Coastal surveys have recently been conducted by the SPWRC and local researchers in Samoa, Fiji and Vanuatu (SPWRC, 2004; Garrigue and Russell, 2004; Garrigue *et al.*, 2004b; Walsh *et al.*, 2003) and will be carried on in Tuvalu and Kiribati later this year (SPWRC, 2006). Using the available information the diversity of marine mammals in the South Pacific Islands region have been established to be 33 species of which 30 cetaceans (8 baleen whales and 22 toothed whales), 1 sirenian and 2 carnivores emphasizing the importance of the area for conservation of marine mammals (Reeves *et al.*, 1999; Garrigue and Russell, 2004; Garrigue *et al.*, 2004b; Walsh *et al.*, 2003; SPWRC, 2003). Many of the species inventoried are listed as endangered or threatened on the IUCN Red List and are included on the Appendices of the major international conventions on wildlife (such as CMS and CITES). The diversity of marine mammals in New Caledonia represents a good proportion of species actually known to inhabit the region but it is highly probable that more species could be found if dedicated surveys would be undertaken outside of the barrier reef because the presence of a huge lagoon, especially around Grande Terre, prevents pelagic species to be observed.

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List of taxa

English and French name are given after the name of each species.

CETACEA OF NEW CALEDONIA
BALAENOPTERIDAE

Balaenoptera musculus brevicauda (Ichira, 1966) Zemsky and Boronin, 1964
Pygmy blue whale - baleine bleue pygmée
Balaenoptera acutorostrata subspecies (Lacépède, 1804)
Dwarf minke whale - petit rorqual pygmée
Balaenoptera bonaerensis (Burmeister, 1867)
Antarctic minke whale – petit rorqual Antarctique

Balaenoptera borealis (Lesson, 1828)
Sei whale - Rorqual de Rudolphi ou rorqual boréal
Balaenoptera edeni (Anderson, 1878)
Bryde's whale – Rorqual de Bryde ou rorqual tropical
Megaptera novaeangliae (Borowski, 1781)
Humpback whale – Baleine à bosse ou jubarte

PHYSETERIDAE

Physeter macrocephalus (Linaeus, 1758)
Sperm whale – Grand cachalot

KOGIIDAE

kogia breviceps (de Blainville, *1838*)
Pygmy sperm whale – Cachalot pygmée
kogia sima (Owen, 1866)
Dwarf sperm whale – Cachalot nain

ZIPHIIDAE

Ziphiius cavirostris (Cuvier, 1823)
Cuvier's beaked whale – Baleine à bec de Cuvier
Mesoplodon densirostris (de Blainville, 1817)
Dense beaked whale – Baleine à bec de Blainville

DELPHINIDAE

ORCININAE

Orcinus orca (Linnaeus, 1758)
Killer whale - Orque
Pseudorca crassidens (Owen, 1846)
False killer whale – Fausse Orque

GLOBICEPHALINAE

Globicephala macrorhynchus (Gray, 1846)
Short-finned pilot whale – Globicéphale tropical
Feresa attenuata (Gray, 1875)
Pygmy killer whale – Orque pygmée
Peponocephala electra (Gray, 1846)
Melon-headed whale – Péponocéphale ou dauphin d'Electre
Grampus griseus (Cuvier, 1812)
Risso's dolphin – Grampus ou Dauphin de Risso

DELPHININAE

Tursiops truncatus (Montagu, 1821)
Bottlenose dolphin – Grand dauphin
Tursiops aduncus (Ehrenberg, 1832)
Indian Ocean Bottlenose dolphin – Grand dauphin de l'Indo Pacifique
Stenella attenuata (Gray, 1846)
Pan troical spotted dolphin – Dauphin tacheté du Pacifique
Stenella longirostris (Gray, 1828)
Spinner dolphin - Dauphin à long bec
Delphinus delphis (Linnaeus, 1758)
Common dolphin – Dauphin commun

SIRENIA OF NEW CALEDONIA

DUGONGIDAE

Dugong dugon (Müller, 1776)
Dugong – Dugong ou vache marine

CARNIVORA OF NEW CALEDONIA

OTARIIDAE

Artcephalus forsteri (Lesson, 1828)
New Zealand fur seal – Otarie de Nouvelle-Zélande

Plates

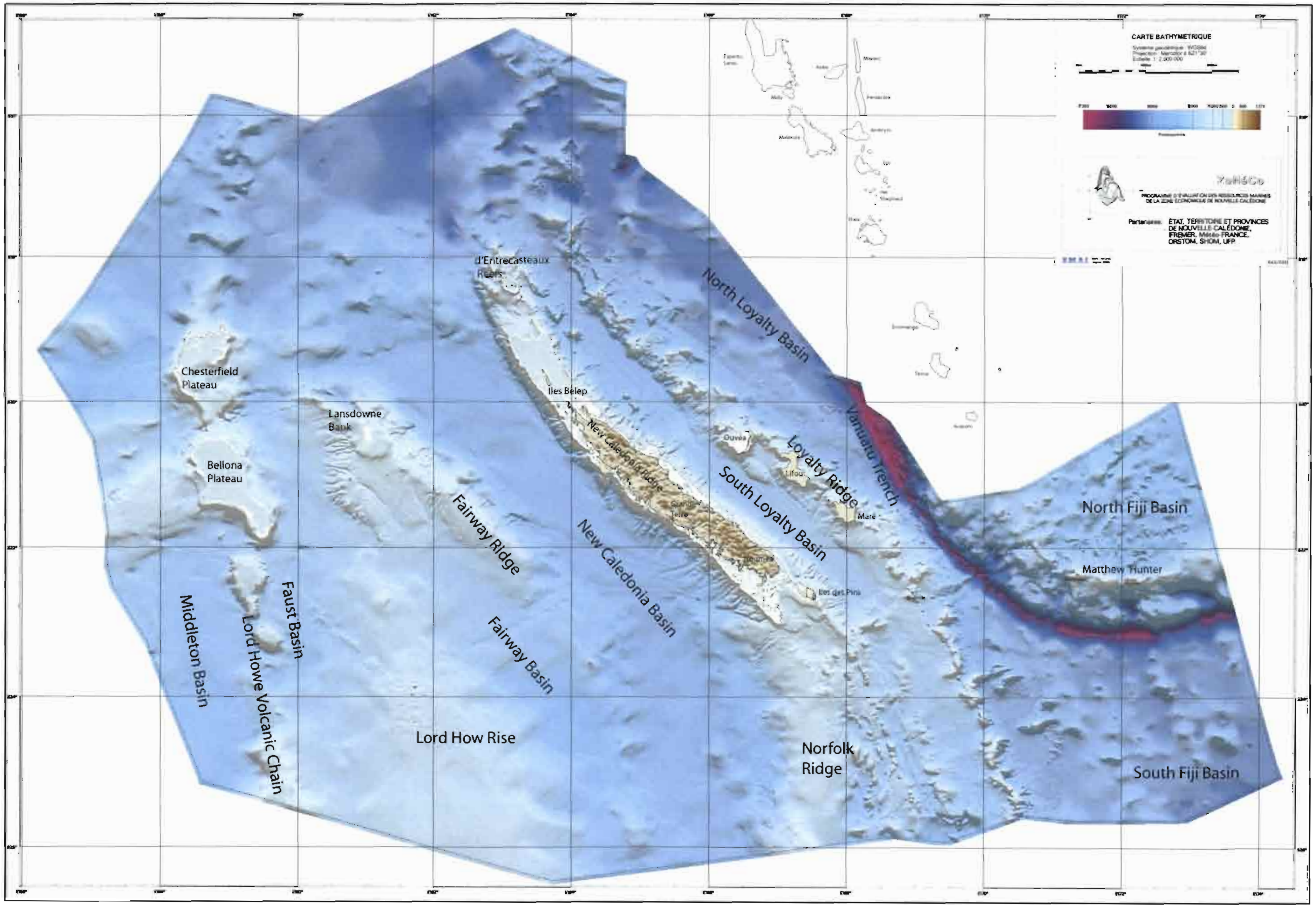


Figure 1: Bathymetry of the New Caldonia Exclusive Economic zone (From ZoNéCo Programm, 1998)

Plate 1 / 1

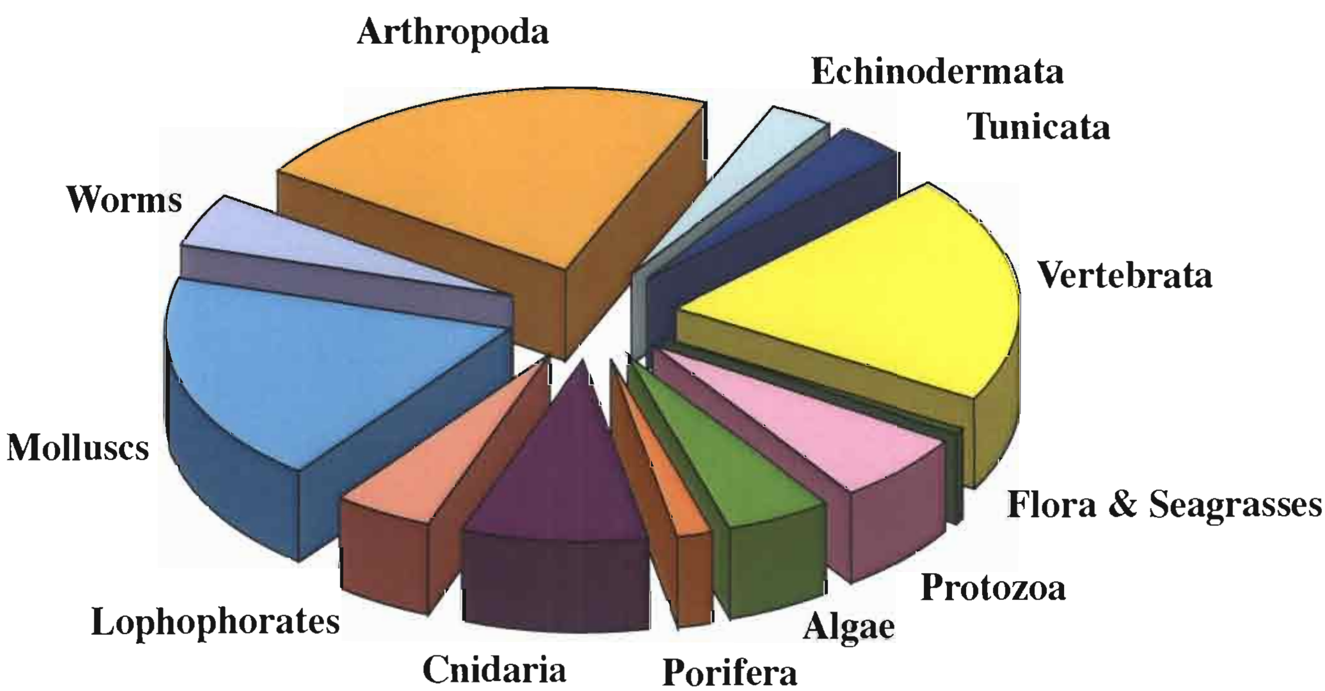


Figure 2. Divisions of the marine biodiversity of New Caledonia between the different groups as established from the species lits in this volume (total of 8783 species).

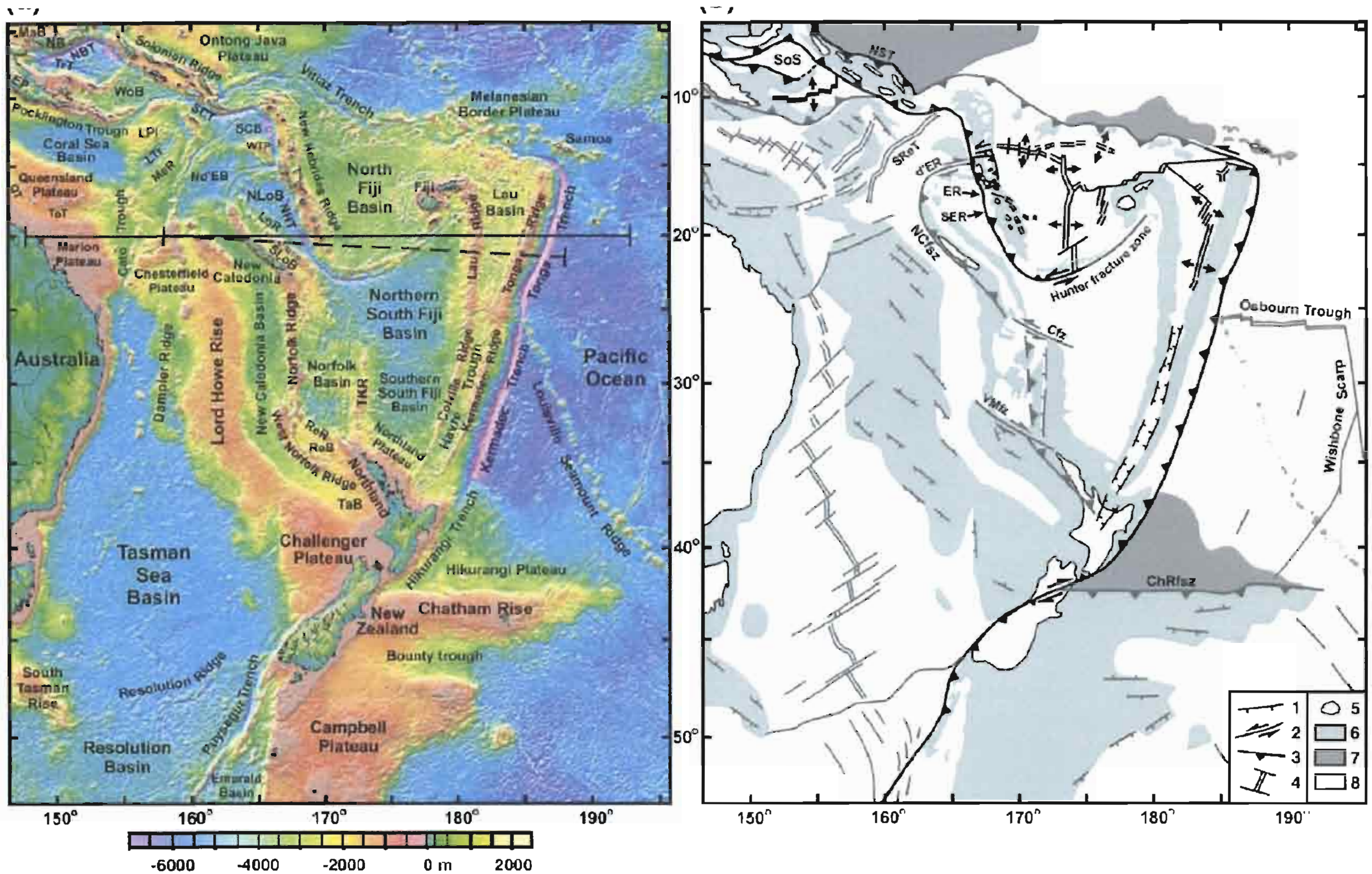


Fig. 2 . (a) Topography and bathymetry of the Southwest Pacific region (fromSmith and Sandwell (1997)) and (b) regional tectonic setting of (a). Cfz, Cook fracture zone; ChRfsz, Chatham Rise fossil subduction zone; d'ER, d'Entrecasteaux Ridge; EP, East Papua; ER, Efate Re-entrant; LPl, Louisiade Plateau; LoR, Loyalty Ridge; LTr, Louisiade Trough; MaB, Manus Basin; MeR, Melish Rise; NB, New Britain; NBT, New Britain Trench; NCfsz, New Caledonia fossil subduction zone; Nd'EB, North d'Entrecasteaux Basin; NHT, New Hebrides Trench; NLoB, North Loyalty Basin; NST, North Solomon Trough; QT, Queensland Trough; ReB, Reinga Basin, ReR, Reinga Ridge; SCB, Santa Cruz Basin; SCT, San Cristobal Trench; SER, South Efate Re-entrant; SLoB, South Loyalty Basin; SoS, Solomon Sea; SReT, South Rennell Trough; TaB, Taranaki Basin; TKR, Three Kings Ridge; ToT, Townsville Trough; TrT, Trobriand Trough; VMfz, Vening Meinesz fracture zone; WoB, Woodlark Basin; WTP, West Torres Plateau. 1, normal fault; 2, strike-slip fault; 3, subduction zone; 4, spreading ridge (double line) and transform faults (single lines); 5, land; 6-8, sea, with 6, continental or arc crust; 7, oceanic plateau; and 8, basin/ocean floor. Structures in light grey indicate that they are inactive. Thick continuous east-west line at latitude 20° S in panel (a) shows location of cross-section plotted in Fig. 3 h.

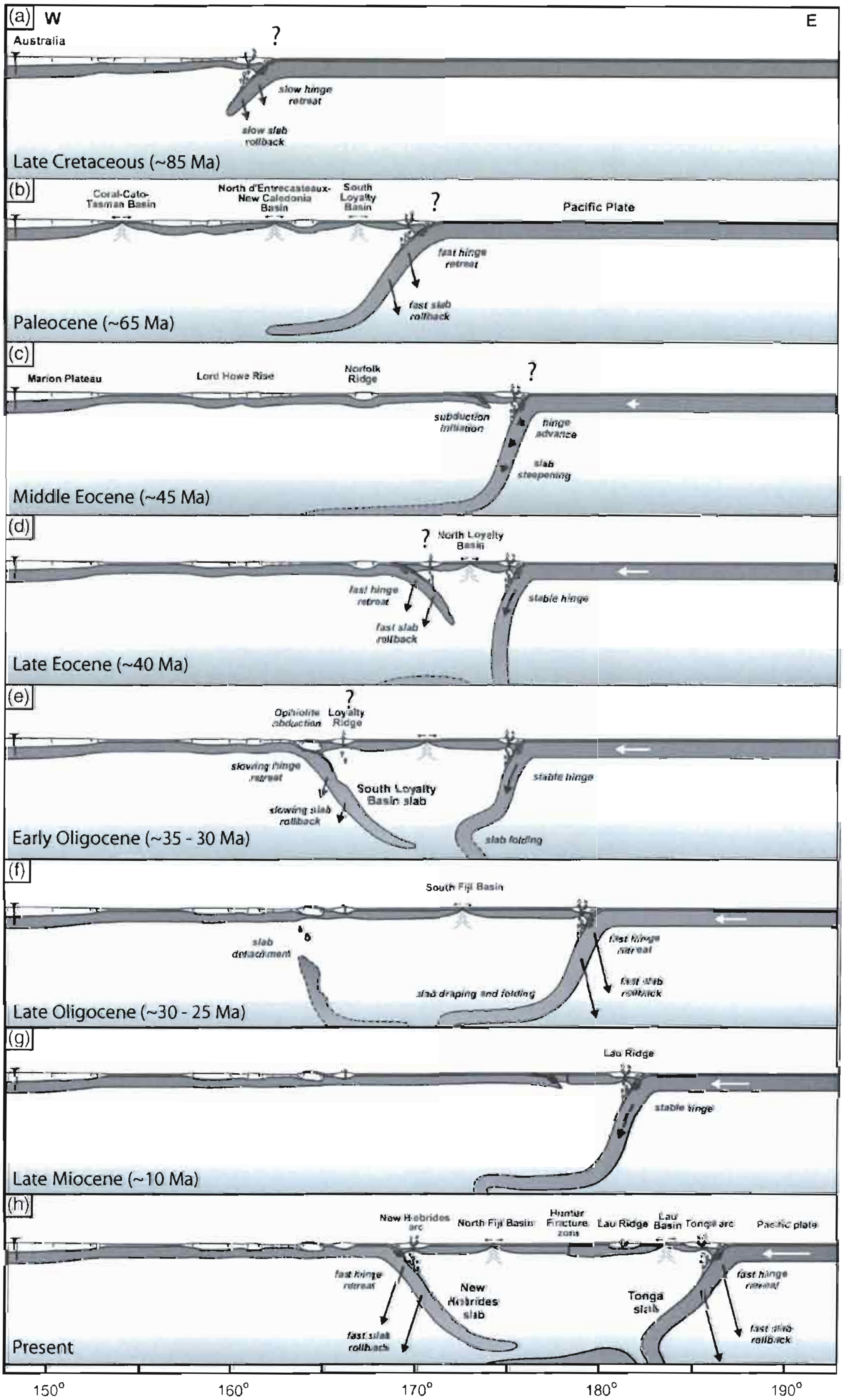


Figure 3 : East-west cross-sections illustrating the evolution of the Southwest Pacific region since the Late Cretaceous. Line of section is shown on Fig 2a. (modified from Schellart et al, 2006)

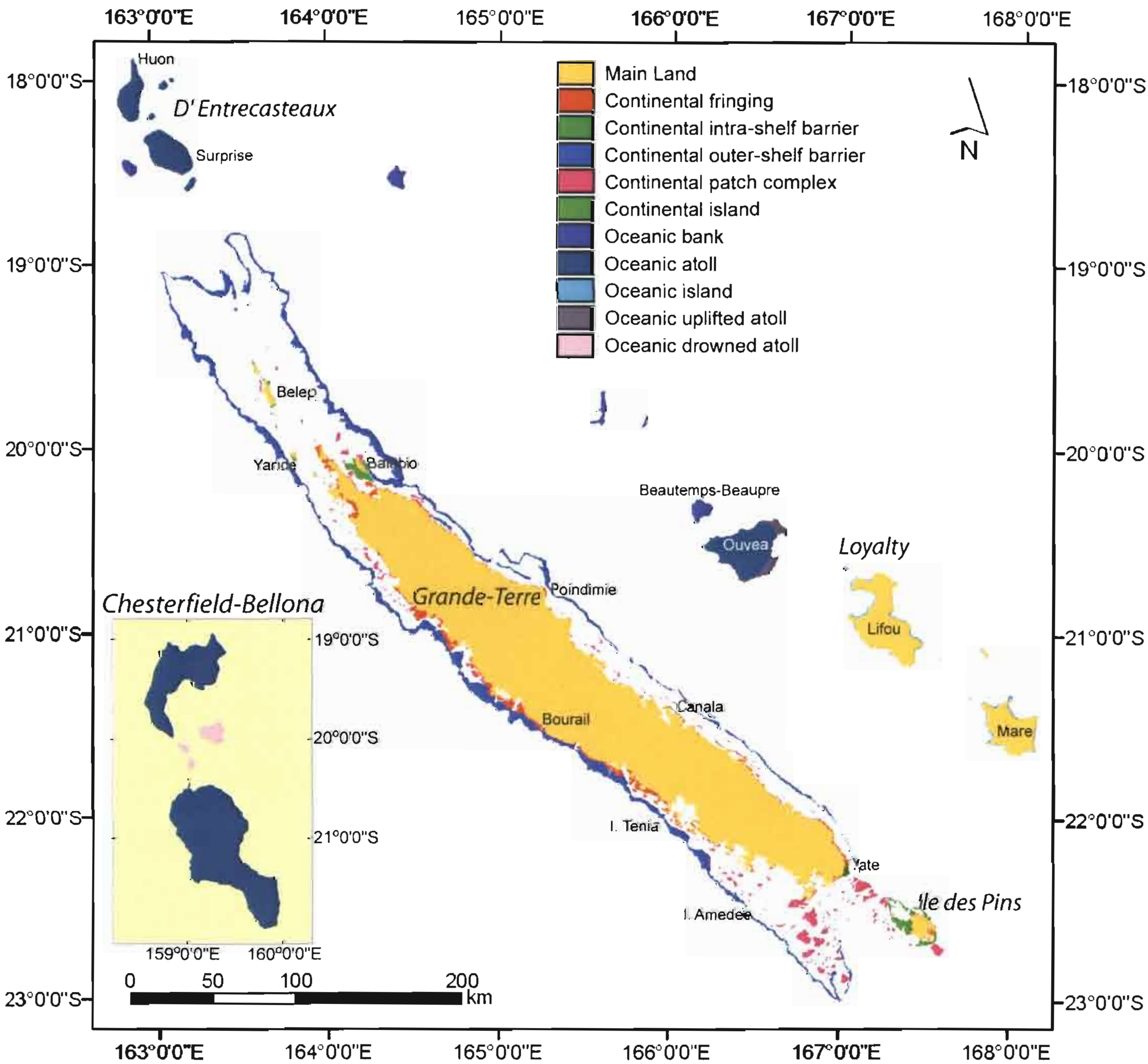


Figure 1: Reef geomorphology map of New Caledonia according to the Millennium Mapping Project typology (modified from Andréfouët & Torres-Pulliza, 2004).

Oceanic Reefs

- *Atoll*
  - Drowned atoll
  - Lagoon
  - Rim
  - Patch
- *Bank*
  - Drowned bank
  - Bridge
  - Lagoon
  - Barrier
  - Patch
- *Uplifted Atoll*
- *Island*
  - Land
  - Non reefal water bodies
  - Coastal Barrier
  - Outer Barrier
  - Multiple Barrier
  - Imbricated Barrier
  - Barrier-Fringing
  - Coastal/fringing Patch
  - Intra-lagoon Patch
  - Intra-seas Patch
  - Shelf Patch
  - Ocean Exposed Fringing
  - Intra-seas Exposed Fringing
  - Lagoon Exposed Fringing
  - Shelf Reefs

Continental (shelf) Reefs

- *Atoll*
  - Drowned atoll
  - Lagoon
  - Rim
  - Patch
- *Bank*
  - Drowned Bank
  - Bridge
  - Lagoon
  - Barrier
  - Patch
- *Uplifted Atoll*
- *Island*
  - Land
  - Non reefal water bodies
  - Coastal Barrier
  - Outer Barrier
  - Multiple Barrier
  - Imbricated Barrier
  - Barrier-Fringing
  - Coastal/fringing Patch
  - Intra-lagoon Patch
  - Intra-seas Patch
  - Shelf Patch
  - Ocean Exposed Fringing
  - Intra-seas Exposed Fringing
  - Lagoon Exposed Fringing
  - Shelf Reefs
- *Patch*
  - Coastal/fringing Patch
  - Intra-lagoon Patch
  - Intra-seas Patch
  - Shelf Patch
- *Intra-shelf Barrier*
  - Coastal Barrier
  - Outer Barrier
  - Multiple Barrier
  - Imbricated Barrier
  - Barrier-Fringing
- *Outer-Shelf Barrier*
  - Coastal Barrier
  - Outer Barrier
  - Multiple Barrier
  - Imbricated Barrier
  - Barrier-Fringing
- *Fringing*
  - Ocean Exposed Fringing
  - Intra-seas Exposed Fringing
  - Lagoon Exposed Fringing
- *Shelf*

Figure 7: Main nodes of the Millennium coral reef typology (from Andréfouët *et al.*, 2006).

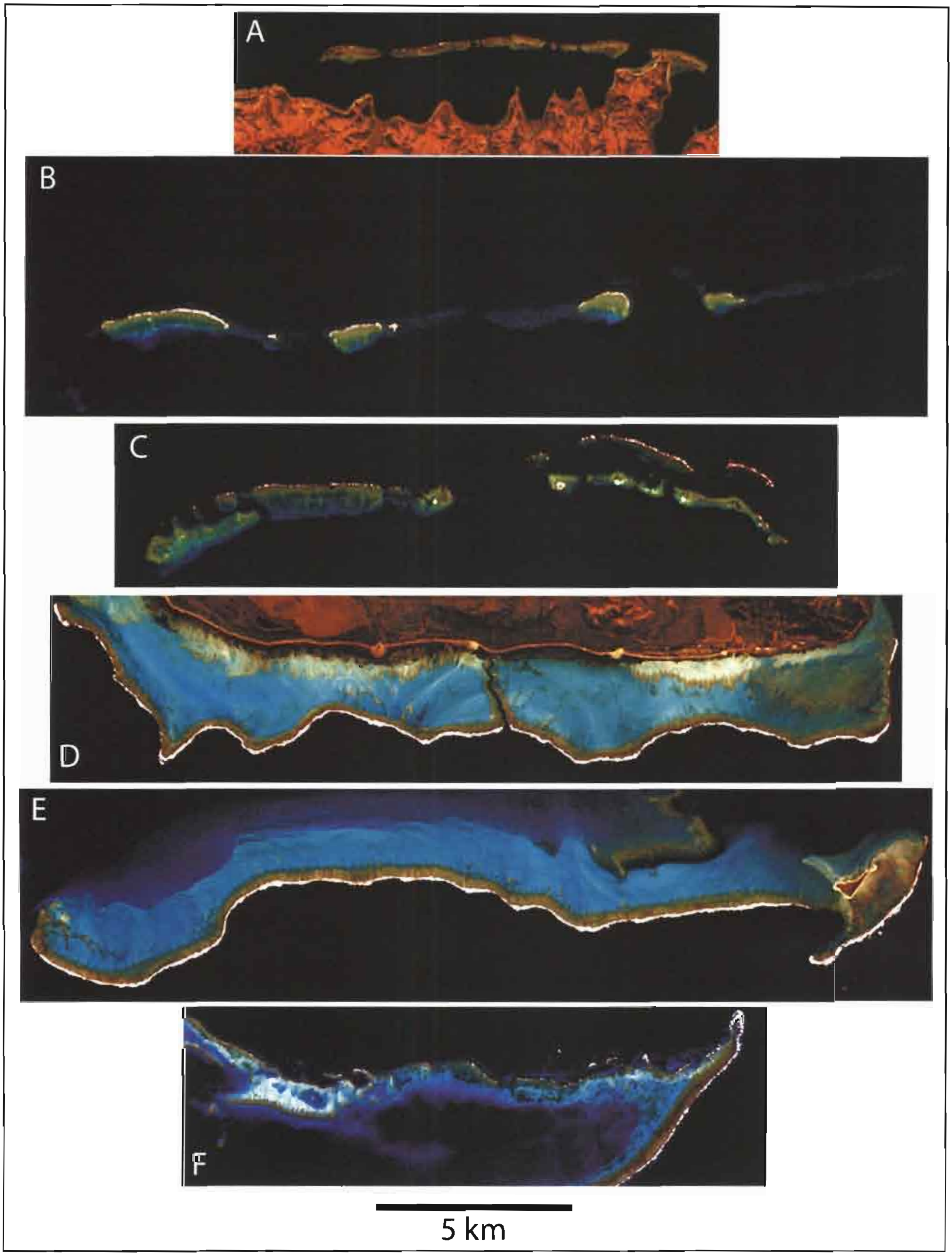


Figure 8: Examples of the diversity of New Caledonia barrier reefs (BR). Landsat images acquired between 1999-2003. Imges are at the same scale, but have been rotated for easier comparisons. On the East Coast: A: intra-shelf BR, Bogota Reef, Ouasse-Canala. B: outer-shelf outer BR, Canala, large portions of the reef are drowned. C: outer-shelf multiple (double) BR, Poindimié; Ilot Bayes, a drilling site, is visible. On the West Coast: D: outer-shelf coastal BR, Poe. E: outer-shelf outer BR, Grand Récif Extérieur, Boulouparis; Ilot Tenia, a drilling site is visible on the right side. F: outer-shelf imbricated BR, Corne Sud.

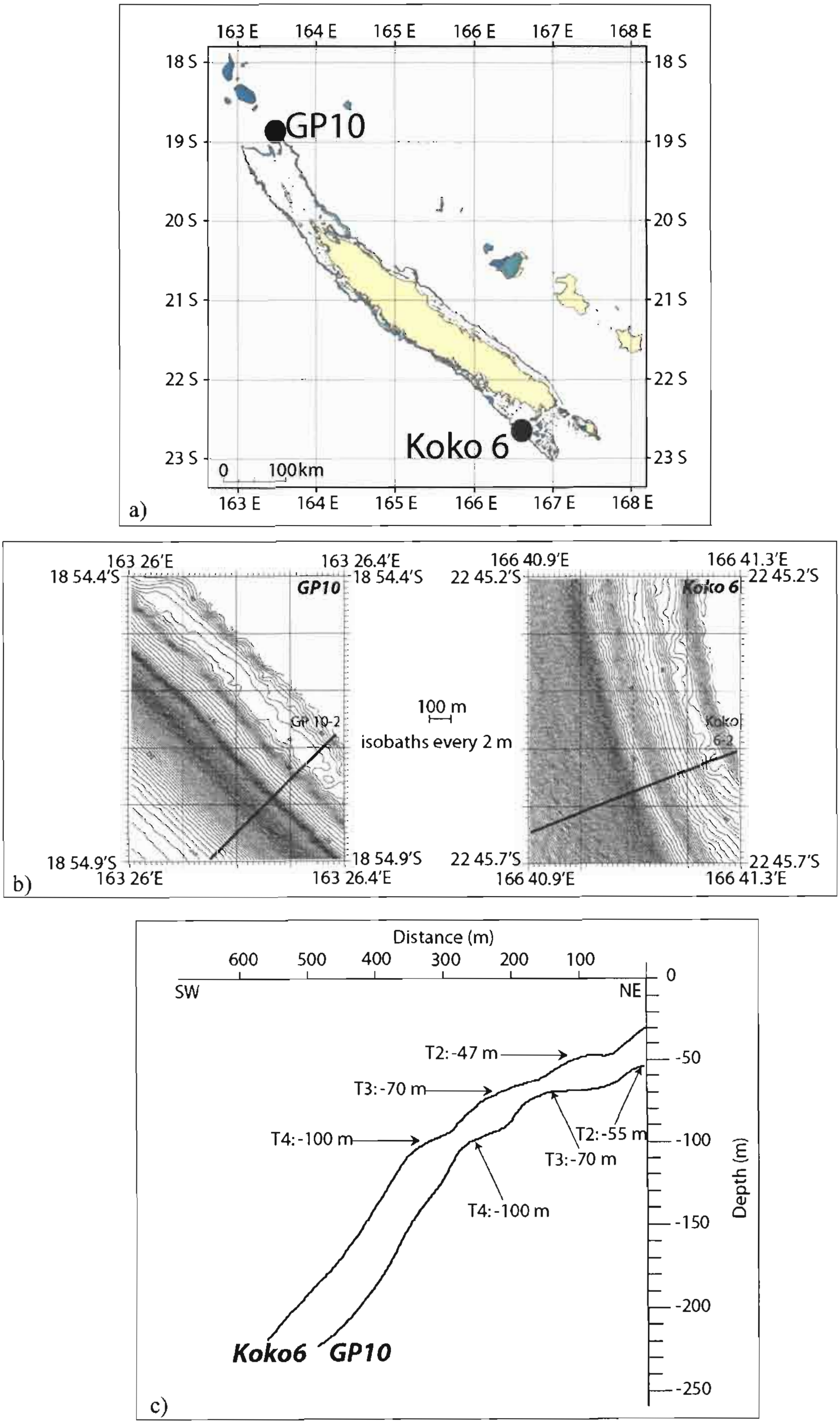


Figure 9: Detailed bathymetric maps from two different locations, in the north (Grand Passage 10) and South (Koko 6) of New Caledonia. The profiles show the depth and morphology of the marine terraces.

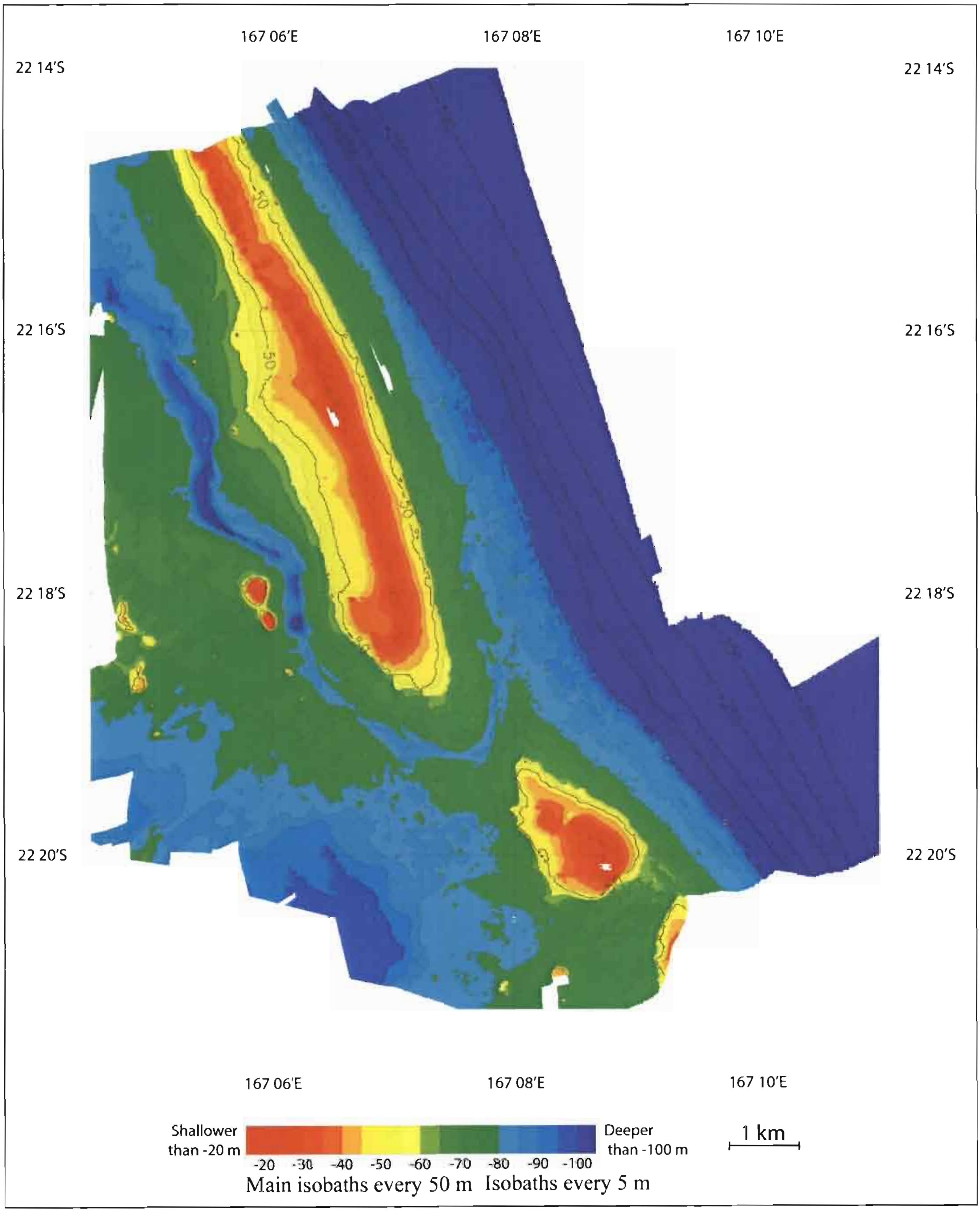


Figure 10: Bathymetric map of the Coëtlogon Bank area (modified from Flamand, 2006).

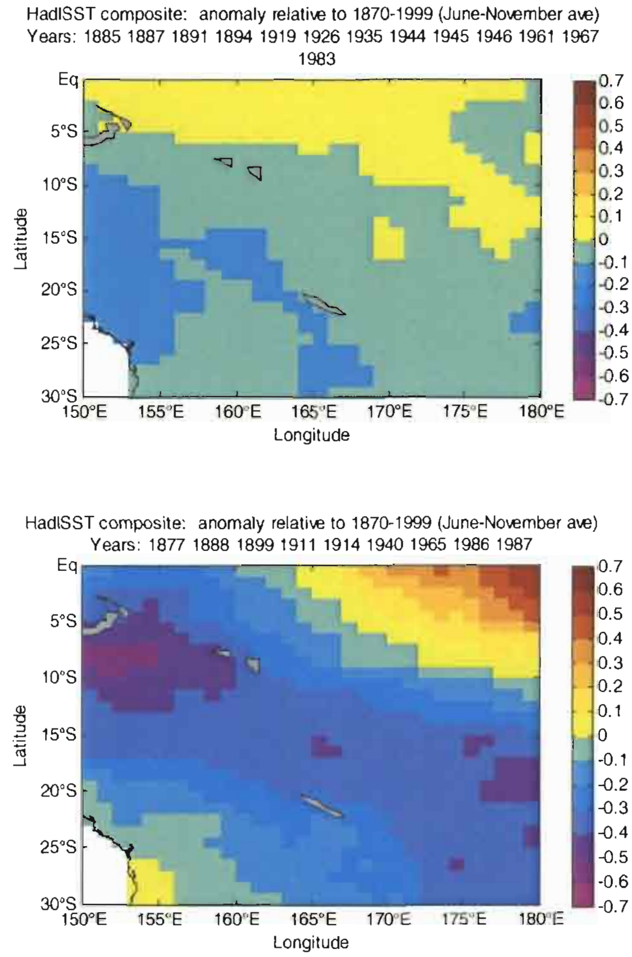


Figure 2. Composite averages of SST anomaly during June to November for the pure IOD mode (top) and pure ENSO mode (bottom) as classified in Table 1 (courtesy of Gary Meyers). These analyses were derived from the historical SST data compiled by the Hadley Centre for 1876 to 1999, the so called HadISST 1.0 data set (Rayner *et al.*, 2003).

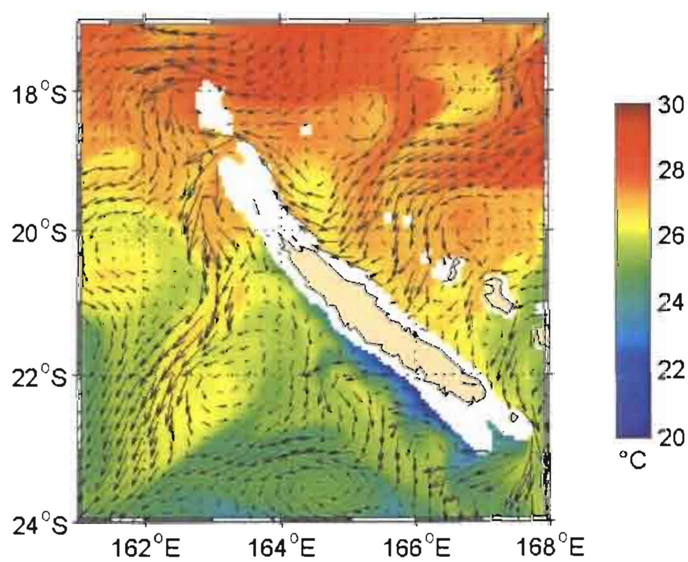


Figure 5. Snapshot of surface currents and SST simulated by ROMS in 29 April 2000 (after Vega, A., P. Marchesiello, J. Lefèvre and A. Ganachaud, Coastal upwelling modulated by island wake effect off New Caledonia, submitted *to Geophys. Res. Lett.*, 2006).

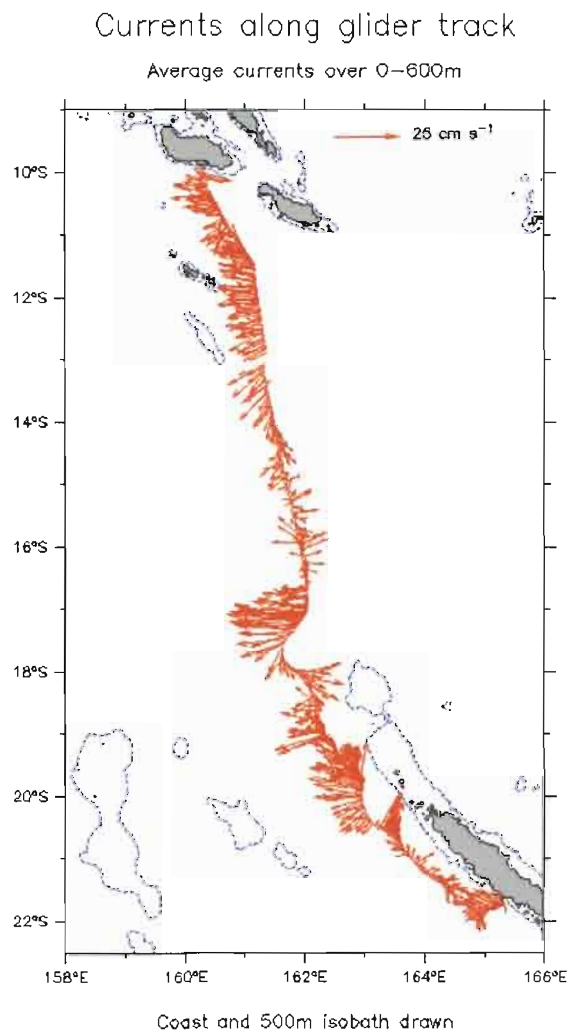


Figure 4. Vectors of the 0 to 600 m average velocity for each dive of the 4-month mission (July to October 2005) deduced from the position of an autonomous glider (after Gourdeau, L., W. S. Kessler, R. Davis, J. Sherman, and C. Maes, Zonal jets entering the Coral Sea, *submitted to Journal of Physical Oceanography*, 2006). Note the presence of the North Caledonian zonal jet around 17°S and the complex activity in eddies along the northwest coast of the Caledonian reef. The dashed line in blue represents the 500 m isobath.

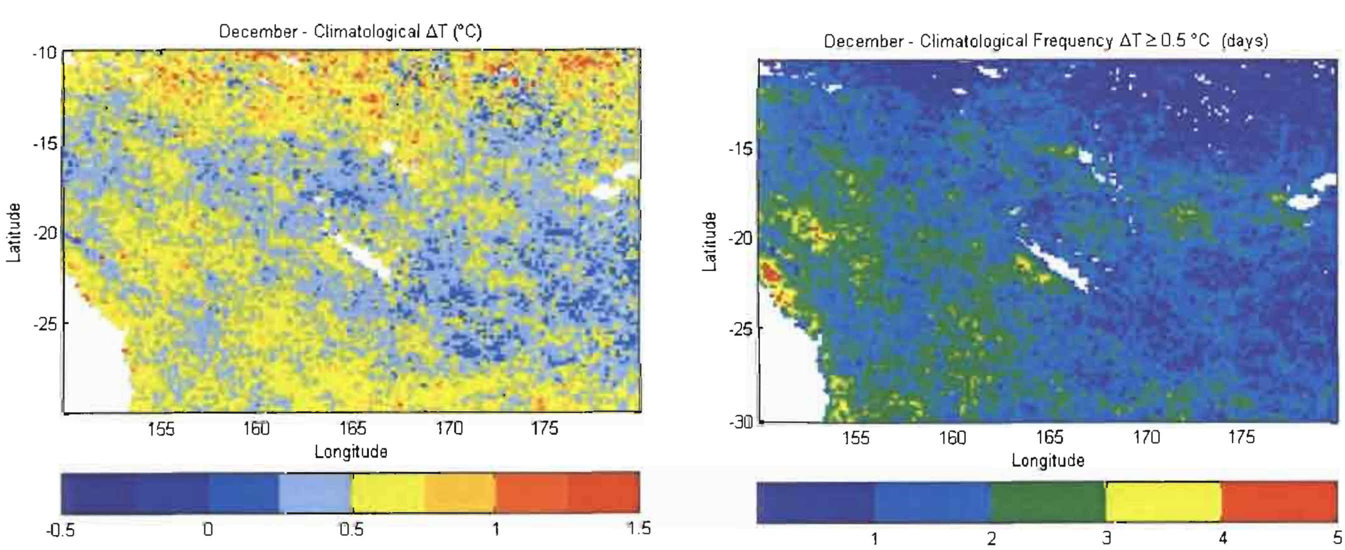
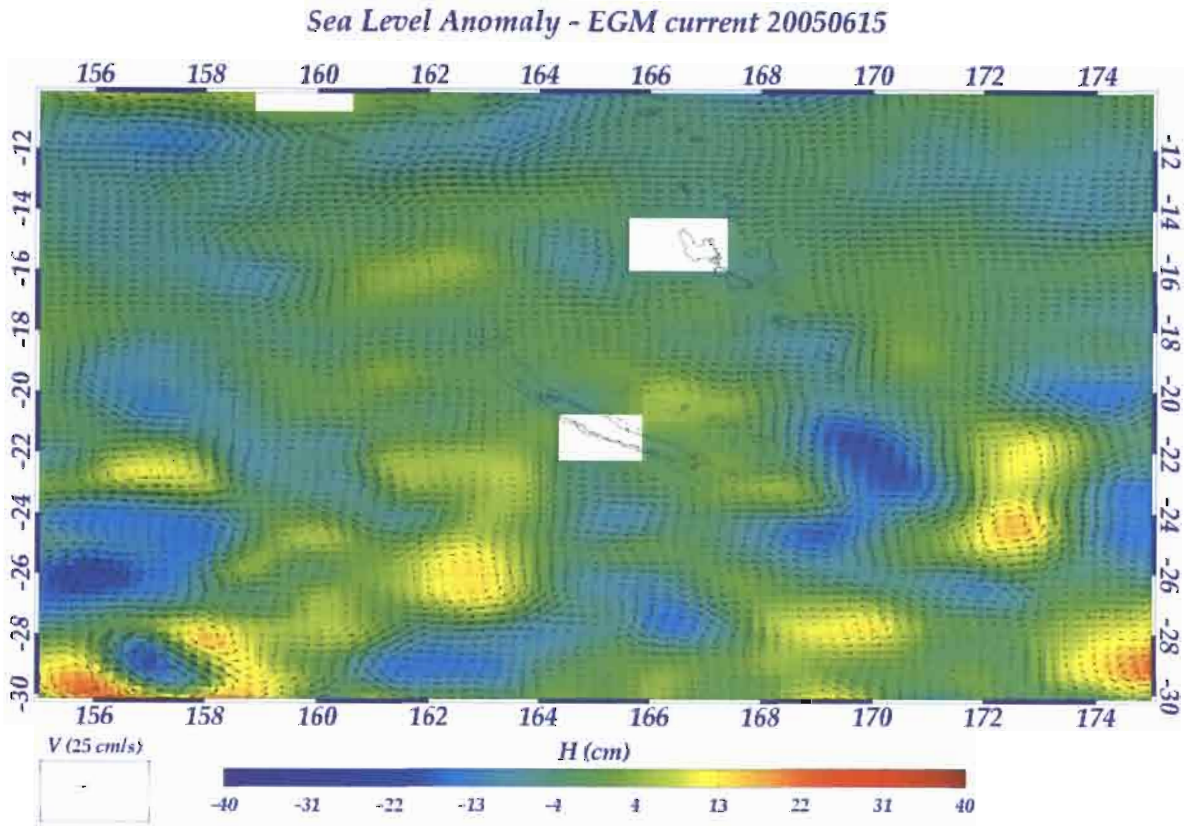


Figure 6. Monthly mean distribution in December of diurnal warming (left) and number of occurrences in days when $\Delta T > 0.5°C$ (right) based on satellite-derived SST (courtesy of Alice Stuart-Menteth).



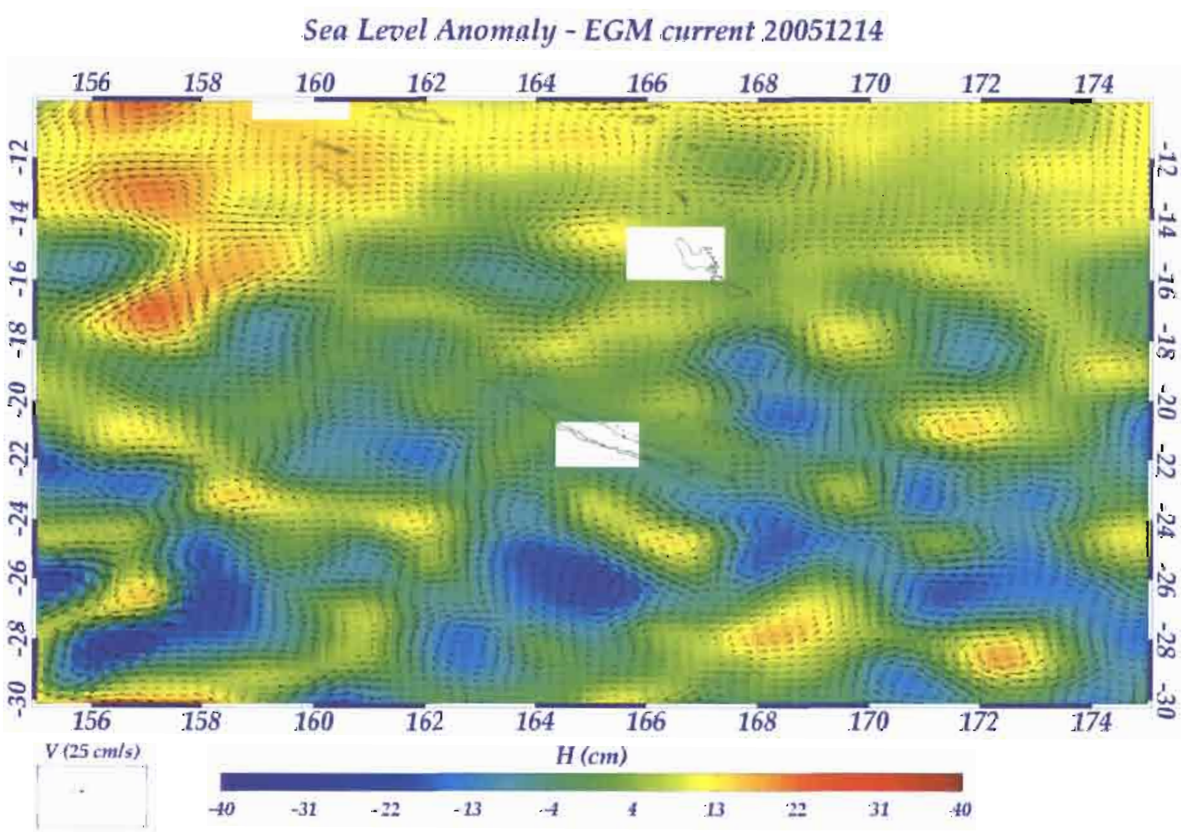


Figure 7. Sea surface currents derived from satellite data superimposed on sea level anomaly observed from altimetric satellites for the 15 June and 14 December 2005, respectively. Such analyses are based on the surface current products supplied by Sudre and Morrow (2006). These snapshots underline the strong activity in eddies superimposed on the general surface circulation, mainly zonal, from east to west.

Avicennia, *Rhizophora* sp. and *Bruguiera* sp., Païta

Tidal marsh and algal blanket, Gadji

Landward herbaceous swamp and mangal, Prony

Xylocarpus granatum, Dumbéa

RHYZO *Brugieria* cf. *gymnorhiza*, Prony

MALVA *Heritiera littoralis*, Prony

Sonneratia alba, Tamoa

Lumnitzera racemosa visited by *Rygchium caledonicus*. Gadji


Racines échasses de *Rhizophora* sp., Tamoa


Bruguiera sp., baie de Prony


Vieil *Avicennia marina*, Tontouta

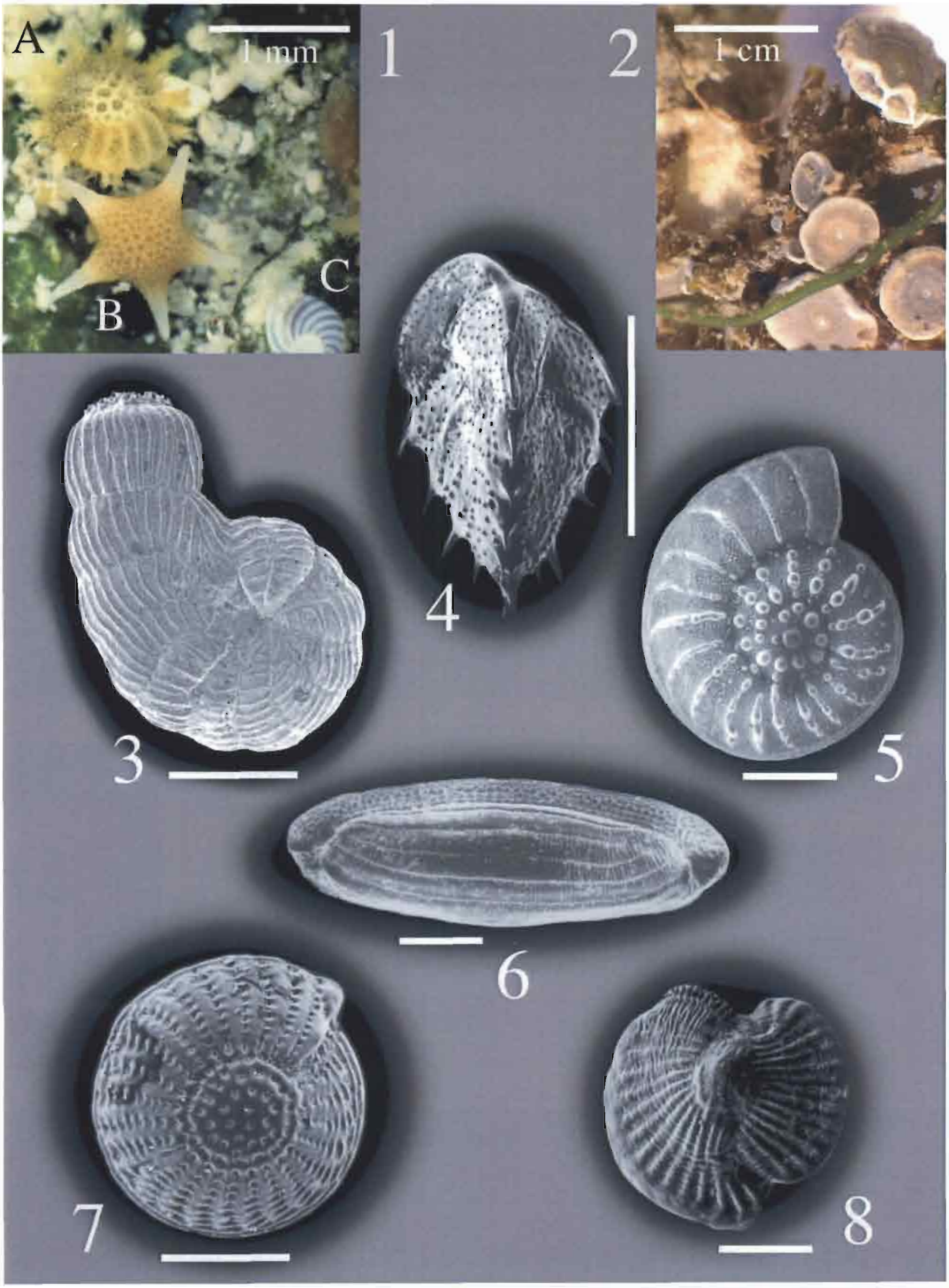

Détail d'*Avicennia marina*, Poroukoé


Pluchea odorata en limite de tanne, Tontouta


Lumnitzera littorea, Prony

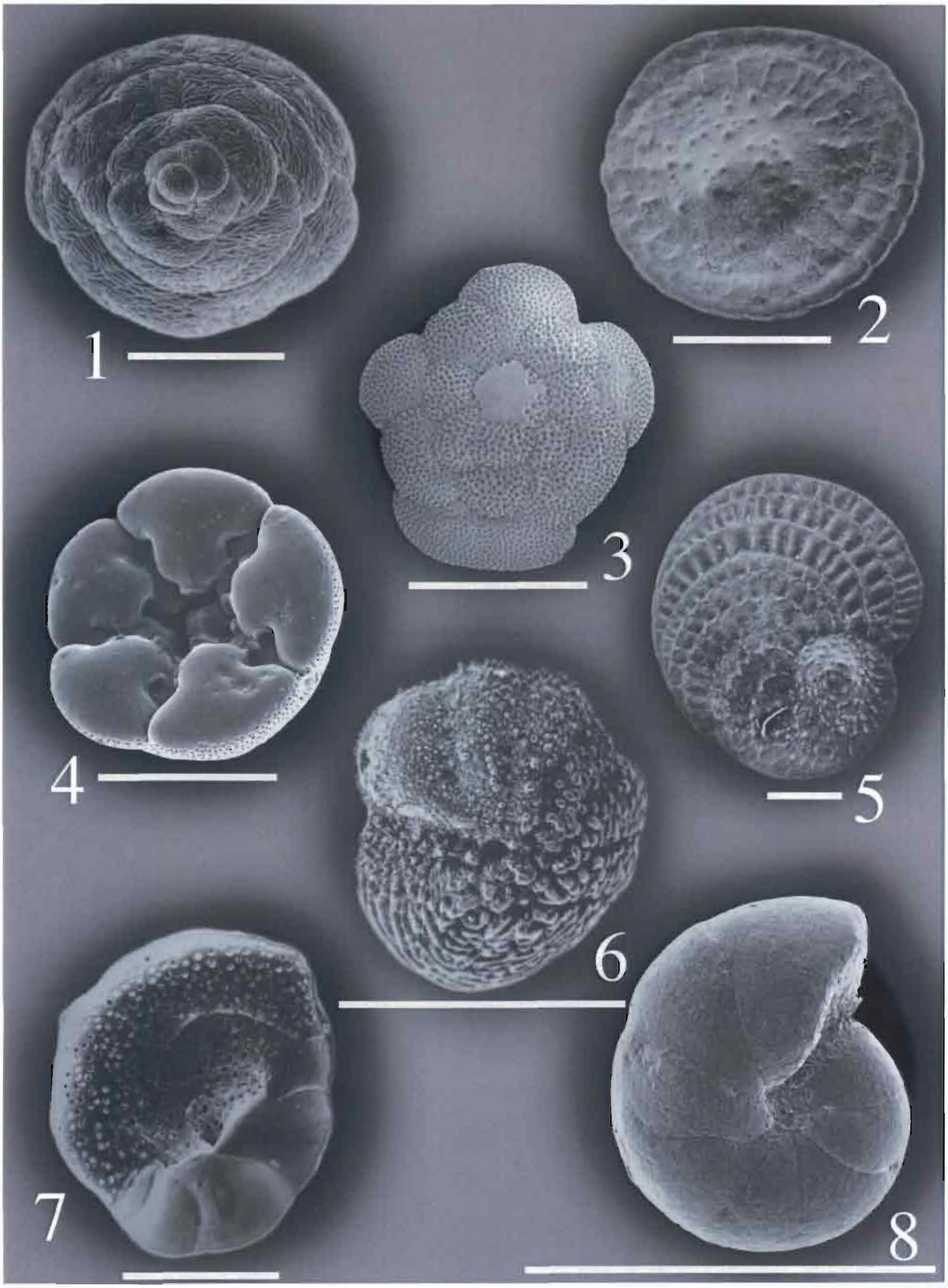

Myoporum sp., Pindaï


Rhizophora apiculata, Golone



1. Living *Calcarina hispida* (A), *Baculogypsina sphaerulata* (B) and *Peneroplis planatus* (C)
2. Living *Marginopora vertebrali*; 3. *Spirolina arietina*; 4. *Reussella spinulosa*; 5. *Operculina ammonoides*; 6. *Alveolinella quoyi*; 7. *Elphidium craticulatum*; 8. *Pseudohauerina occidentalis* var. *involuta*

Scale bar = 0.5 mm



1. *Carterina spiculotesta*; 2. *Cycloclypeus carpenteri*; 3. *Cymbaloporetta squammosa*; 4. *Cymbaloporetta squammosa*; 5. *Heterostegina operculinoides*; 6. *Parrellina hispida*; 7. *Poroeponides lateralis*; 8. *Haplophragmoides wilberti*

Scale bar = 0.5 mm

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Cymodocea rotundata

© IRD/Catherine Geoffray

Cymodocea serrulata

© IRD/Jean-Louis Menou

Cymodocea serrulata

© IRD/Jean-Louis Menou

Halodule pinifolia

© IRD/Jean-Louis Menou

Halodule uninervis

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Syringodium isoetifolium

© IRD/Jean-Louis Menou

Syringodium isoetifolium

© IRD/Jean-Louis Menou

Enhalus acoroïdes

Halophila capricorni

Halophila decipiens

Halophila decipiens

Halophila minor

Halophila ovalis

Halophila ovalis

Thalassia hemprichii

Thalassia hemprichii

Caulerpa racemosa (Chlorophyta)

Codium saccatum (Chlorophyta)

Halimeda discoidea (Chlorophyta)

Rhipilia penicilloides (Chlorophyta)

Struvea thoracica (Chlorophyta)

Udotea geppiorum (Chlorophyta)

Dictyopteris crassinervia (Ochrophyta)

Distromium didymothrix (Ochrophyta)

Padina stipitata (Ochrophyta)

Sargassum decurrens (Ochrophyta)

Chondria ryukyuensis (Rhodophyta)

Corynocystis prostrata (Rhodophyta)

Dasyphila plumarioides (Rhodophyta)

Lenormandiopsis lorentzii (Rhodophyta)

Lithothamnion proliferum (Rhodophyta)

Pinnatiphycus menouii (Rhodophyta)


© IRD/Jean-Louis Menou

Aka sp.


© IRD/Jean-Louis Menou

Chlathria rugosa


© IRD/Jean-Louis Menou

Dactyllia delicata


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Hamigera strongylata


© IRD/Jean-Louis Menou

Lamellodysidea herbacea


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Liosina paradoka


© IRD/Jean-Louis Menou

Lissodendouyx schmidti


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Lufariella cylindrica

Myrmekioderma sp.

Petrosia capsa

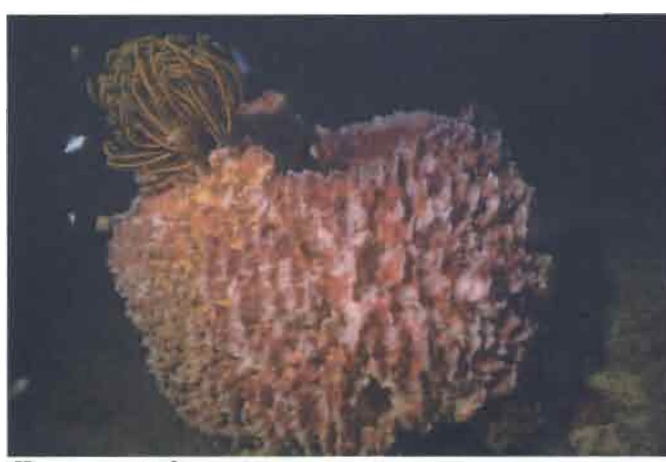
Phakellia cavernosa

Phyllospongia papyracca

Psammocora sp.

Spheciospongia vagabunda

Sycon sp.



Xetospongia berquista


Acabaria baladea
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Acanthogorgia isoxya
© IRD/Georges Bargibant


Annella reticulata
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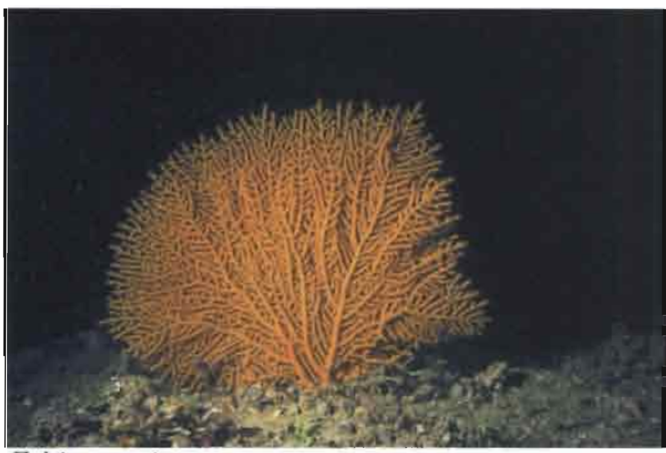
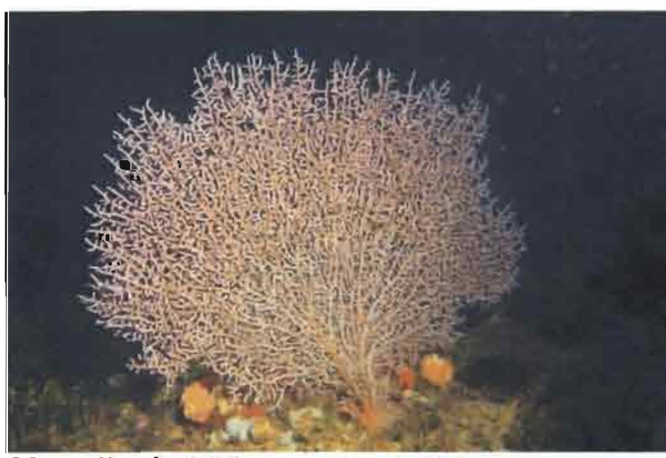
Astrogorgia dumbea
© IRD/Georges Bargibant


Echinogorgia noumea
© IRD/Georges Bargibant


Guaiagorgia anas
© IRD/Georges Bargibant


Melithaea caledonica
© IRD/Georges Bargibant


Muricella plectana
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Paracis caecilia

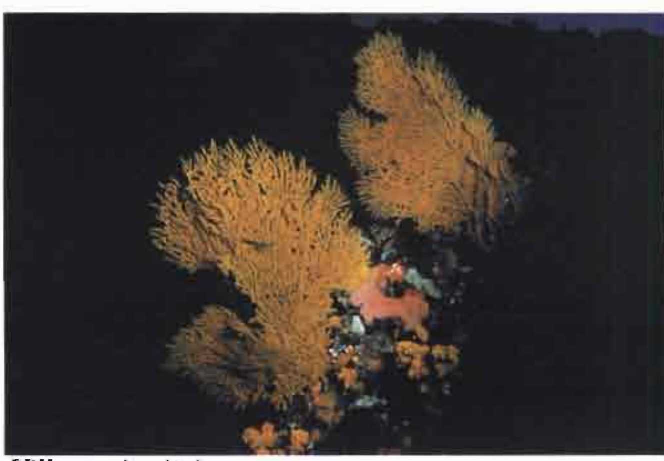
Plumigorgia schuboti

Pteronisis provocatoris

Pterostenella anatole

Trimuricea caledonica

Verucella corona



Villogorgia citrina

Viminella crassa

Anacropora forbesi

Leptoseris tenuis

Fungia (cycloseris) sinensis

Fungia (pleuractis) moluccensis

Alveopora catalai

Barabattoia amicorum

Blastomussa wellsi

Scolymia vitiensis

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Scolymia vitiensis

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Echinophyllia orpheensis

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Plerogyra simplex

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Catalaphyllia jardinei

© IRD/Pierre Laboute

Turbinaria heronensis

© IRD/Jean-Louis Menou

Blastomussa merleti

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Euphyllia (Fimbriaphyllia) sp.

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Favia rotundata

Ceratosoma sp.

Rubropulosa sp.

Cutoma kanga sp.

Chromodoris kunei

Marionopsis rubra

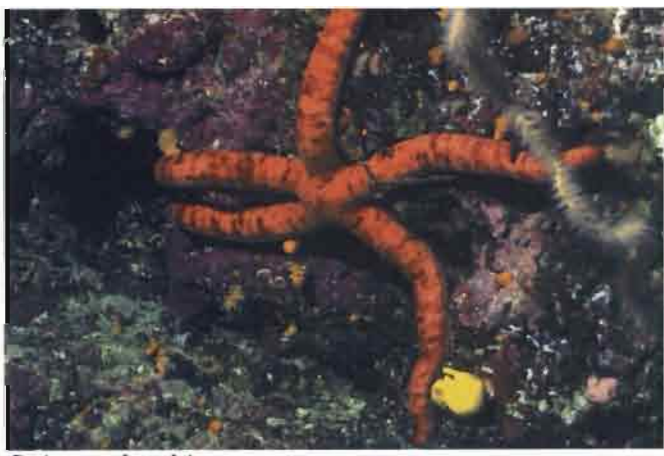
Halgerda sp.

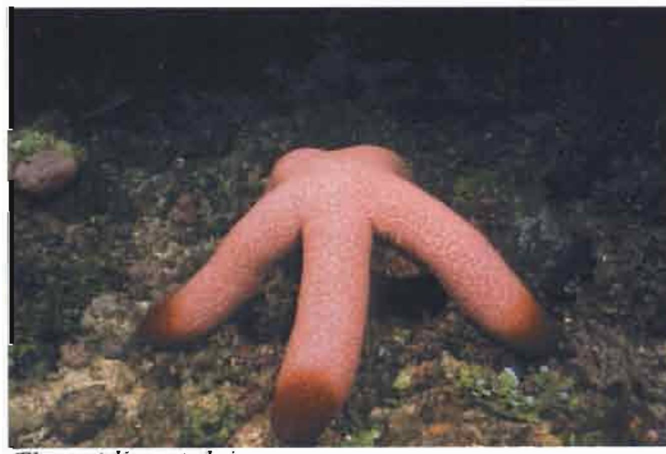
Noumea catalai

Tambja affinis


Fromia indica


Gomophia watsoni

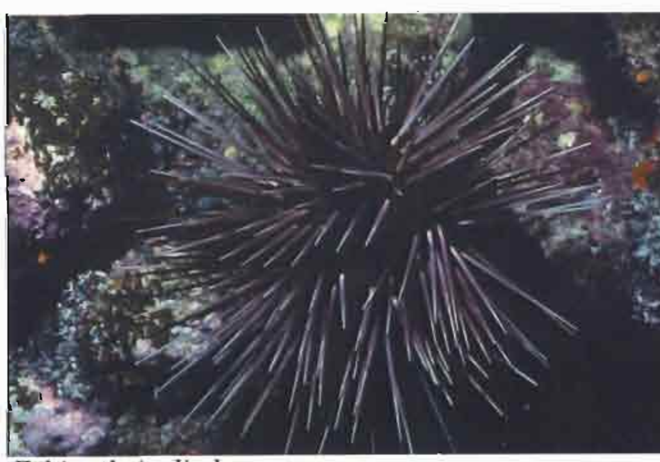

Leiaster leachi


Thromidia catalai


Macrophiothrix sp.


Ophiarthrum sp.


Ophiarachnella snelliusi


Echinothrix diadema

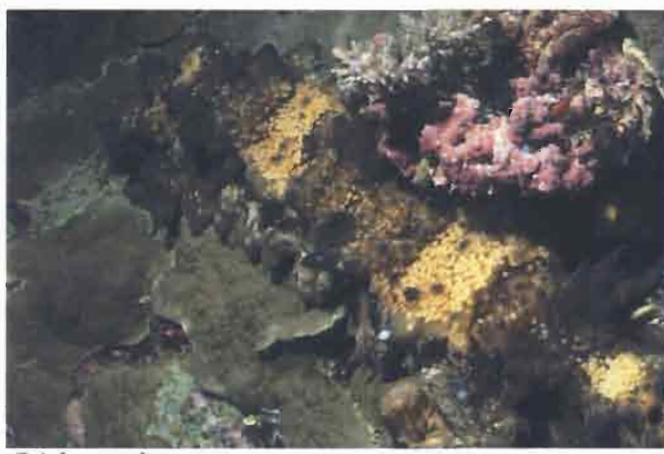
Echinothrix calamaris

Echinometra mathaei

Prionocidaris bispinosa

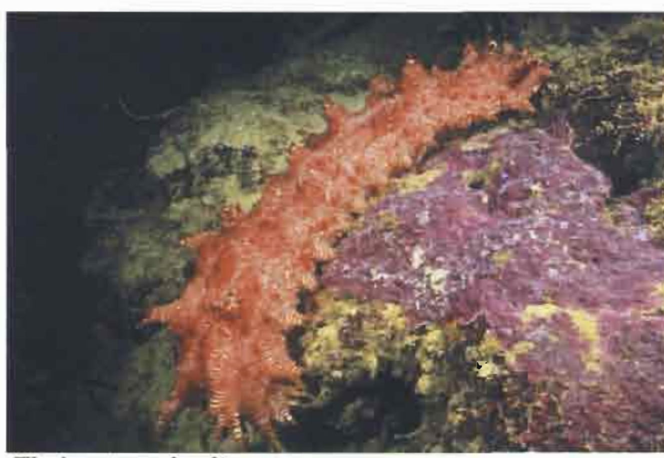
Salmacis sp.

Tripneustes gratilla



Stichopus horrens

Thelenota anax



Thelenota rubrolineata

Aplidium protectans

Ascidia glabra

Atriolum robustum

Clavelina detorta

Didemnum molle

Eudistoma sp.

Lissoclinum bistratum

Lissoclinum cf. vareau

Nephtheis fascicularis

Perophora sp.

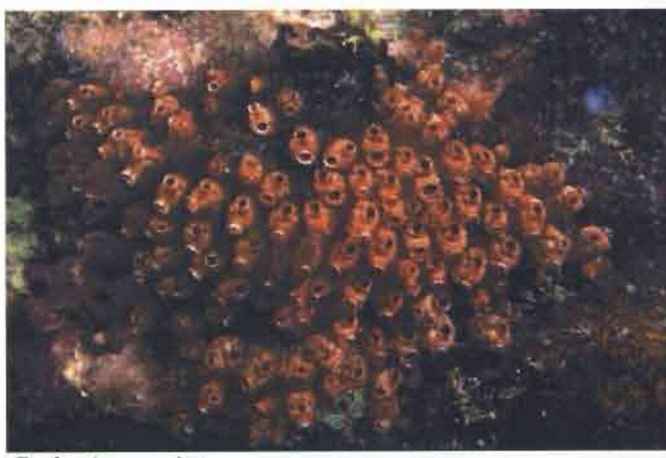
Polycarpa cf. cryptocarpa

Polycarpa cf. pigmentata

Pseudodistoma arborescens

Pseudodistoma cf. digitata

Ritterella circularis



Stolonica variata


Acanthurus olivaceus


Caesio cuning


Chaetodon baronessa


Oxycheilinus bimaculatus


Gymnothorax nudivomer


Lethrinus miniatus


Lutjanus adetii


Manta birostris

Mulloidichthys vanicolensis

Oxymonacanthus longirostris

Paracirrhites forsteri

Parupeneus indicus

Pomacanthus semicirculatus

Sargocentron rubrum

Scarus rubroviolaceus

Stegostoma fasciatus

Acalyptophis peroni

Acalyptophis peroni

Aipysurus duboisi

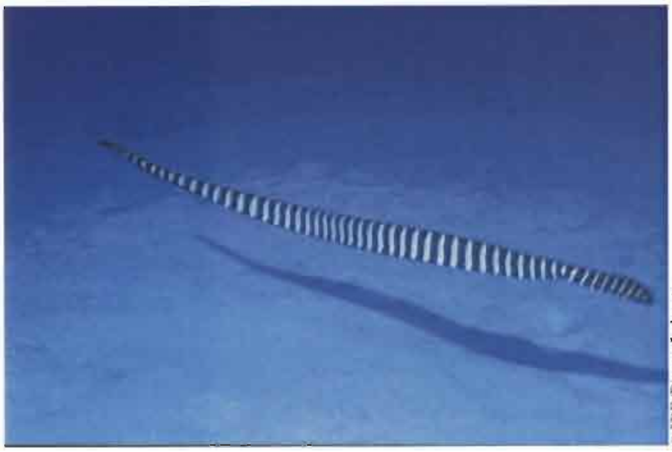
Aipysurus duboisi

Aipysurus laevis

Emydocephalus annulatus

Emydocephalus annulatus

Hydrophis coggeri



Hydrophis laboutei

Hydrophis macdowelli

Hydrophis major

Hydrophis ornatus

Hydrophis ornatus

Laticauda colubrina

Laticauda laticauda

Pelamis platura

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Caretta caretta

© IRD/Catherine Geoffray

Caretta caretta

© SOPTOM

Chelonia mydas

© IRD/Catherine Geoffray

Chelonia mydas

© IRD/Pierre Laboute

Eretmochelys imbricata

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Eretmochelys imbricata

© SOPTOM

Dermochelys coriacea

© SOPTOM

Dermochelys coriacea

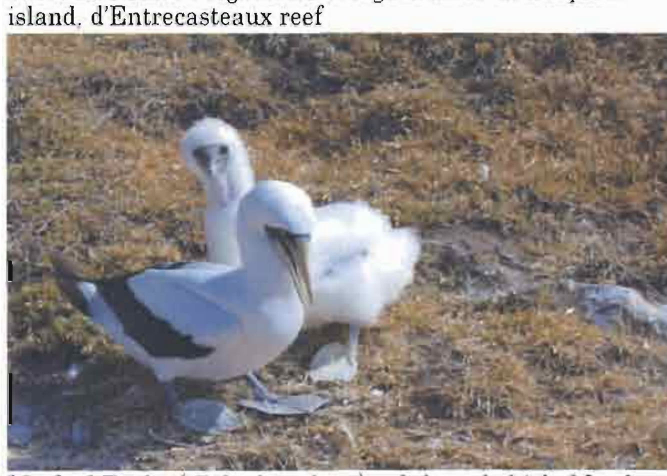
Adult Gould's Petrel (*Pterodroma leucoptera caledonica*) at the entrance of its burrow, Monts Dzumac, Grande Terre

Juvenile Tahiti Petrel (*Pseudobulweria rostrata trouessarti*), shore of Lac Yaté, Grande Terre

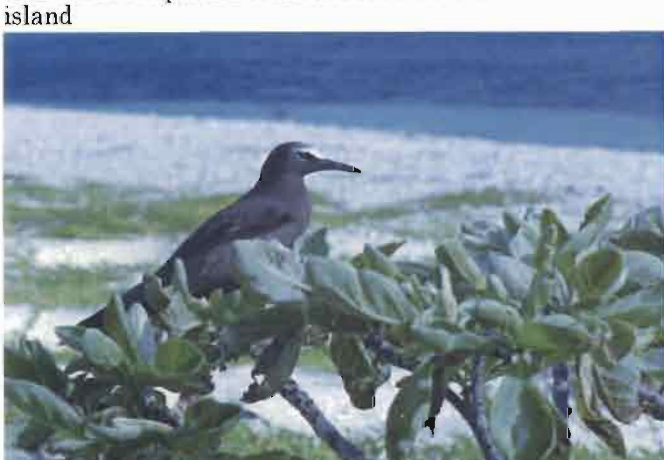
Pair of Wedge-tailed Shearwaters (*Puffinus pacificus*) at Pindai colony, Grande Terre

Juvenile Lesser Frigatebird (*Fregata ariel*) at Surprise island, d'Entrecasteaux reef

Red-tailed Tropicbird (*Phaeton rubricauda*) at Hunter island



Masked Booby (*Sula dactylatra*), adult and chick, Matthew island



Brown Noddy (*Anous stolidus*) at Kouaré islet, southern lagoon

Adult White Tern (*Gygis alba*) nesting on Walpole island

Adult Silver Gull (*Larus novaehollandiae forsteri*), Grande Terre

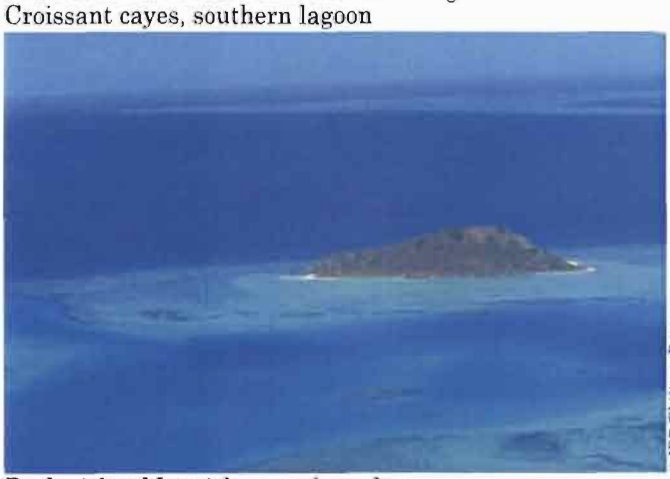
Grey Noddies (*Procelsterna albivitta*) on Matthew island

Roseate Tern (*Sterna dougalli*) on Signal island, southern lagoon

Fairy Tern (*Sterna nereis exsul*), southern lagoon

Dead coral and sand banks devoid of vegetation: Sèche-Croissant cayes, southern lagoon

Low islet of coral sand covered by vegetation: Redika islet, southern lagoon



Rocky islet: Mato islet, southern lagoon

Steep and forested slopes of the central chain of mountains: Koniambo massif, Grande Terre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Pseudorca crassidens


© M. Oremus
Mesoplodon densirostris


© Sabrina Virly
Balaenoptera acutorostrata


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Globicephala macrorhynchus


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Stenella longirostris


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Tursiops truncatus

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