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CHECKLIST OF THE SHOREFISHES OF OUVÉA ATOLL, NEW CALEDONIA

BY

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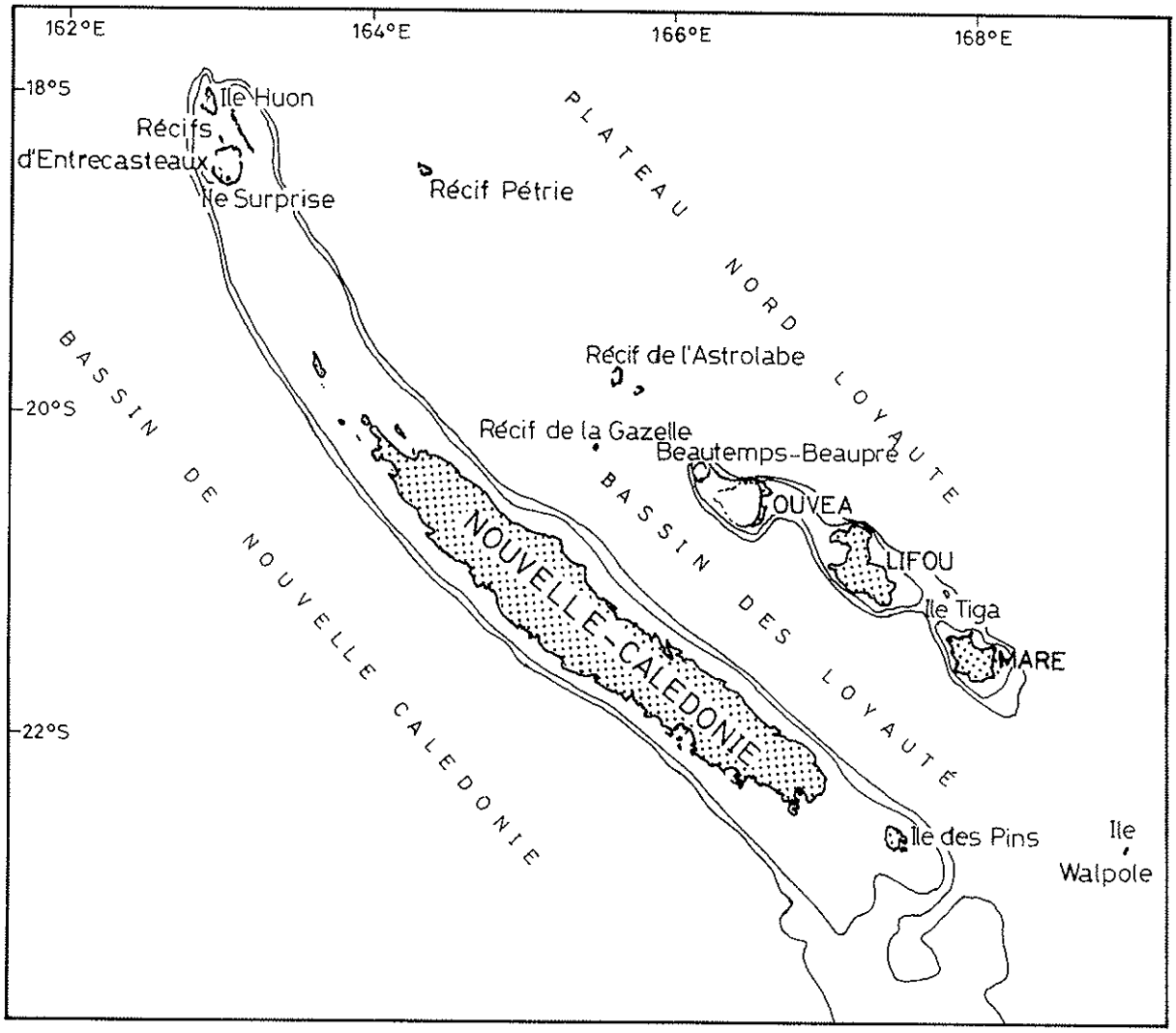

Figure 1. Map of New Caledonia and the Loyalty Islands showing the location of Ouvéa.

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ABSTRACT

The shorefishes of Ouvéa, an isolated atoll in the Loyalty Islands group of New Caledonia, had not been surveyed prior to 1990. An extensive survey was conducted by ORSTOM between 1991 and 1992 to obtain baseline information on the shorefishes. A total of 653 taxa among 72 families are now documented from this area. The most diverse families are the Labridae (69 species), Pomacentridae (58 species), Gobiidae (54 species), Serranidae (39 species), Chaetodontidae (31 species) and Apogonidae (28 species). The absence or very low diversity of some families (Clupeidae, Nemipteridae, Siganidae) or genera (*Abudefduf, Neopomacentrus*) is similar to findings for other isolated islands of the Coral Sea. Of the 653 species recorded from Ouvéa, 51 species have not been reported from New Caledonia, a large high island to the South. Only one endemic species, *Luzonichthys williamsi,* has been recognized among the shorefishes at Ouvéa. A number of Pacific Plate endemic species were recorded at Ouvéa, which is positioned on the Australasian Plate to the south of the edge of the Pacific Plate. *Antennarius duescus*, previously known from three specimens taken at the Hawaiian Islands, is recorded from a single specimen taken at Ouvéa. Another antitropical distribution pattern is exhibited by *Dinematichthys riukiuensis*, which is known to occur at Fiji, Ouvéa and Queensland in the South and from Okinawa.

INTRODUCTION

Our knowledge of shorefishes in the Southwest Pacific has increased significantly in the last two decades with the publication of a number of checklists. Shorefishes of the Great Barrier Reef have been reported from several regions: Russell (1983) and Lowe and Russell (1990) for the southern part, Paxton et al. (1978) for Lizard Island, Allen (1989)

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for the Coral Sea, and Paxton et al. (1989: 1 volume, out of 3 announced, of an encyclopedia of the fishes of Australia, which covers shorefishes). The fish fauna of Lord Howe, Norfolk and Kermadec islands, the southern limit of shorefishes in the Southwest Pacific, was surveyed by Allen et al. (1976) and more recently by Francis (1993) and Francis and Randall (1993). Middleton Reef, a southern reef midway between Australia and New Caledonia, has been investigated by Hutchings (1988), and Kailola (1987 a,b; 1991) published a checklist of fishes from Papua New Guinea. Kailola's list is being updated by Allen. For New Caledonia there are two checklists, one for the main island (Rivaton et al., 1989) and one for the Chesterfield archipelago (Kulbicki et al., 1994; LeBorgne et al., 1994), a group of islands midway between the Great Barrier Reef and New Caledonia. A number of books are now available on the shorefishes of the Southwest Pacific region (Fourmanoir and Laboute, 1976, for New Caledonia and Vanuatu; Randall et al., 1990, for the Coral Sea; Allen and Swainston, 1992, for Papua New Guinea; Allen and Swainston, 1988, for Western Australia). Despite these recent efforts, the fish fauna of many areas of the Southwest Pacific remains poorly known. One such area is the Loyalty Islands, which comprise five islands, Maré, Tiga, Lifou, Ouvéa and Beautemps-Beaupré. The first three are high islands with very sparse coral reef development. The latter two are atolls, Ouvéa (900 km^2) being much larger than Beautemps-Beaupré (120 km^2). These atolls are located on the edge of the Australasian plate near its boundary with the Pacific plate between New Caledonia and Vanuatu (figure 1), and are the only true atolls within a 1500 km radius.

Only two scientific cruises conducted studies at Ouvéa prior to 1991. Allen, in June 1973, studied the Pomacentridae of Ouvéa. ORSTOM, a French scientific organization, organized a cruise to Ouvéa in November 1979, but issued no cruise report because a cyclone considerably limited their study. A few specimens were collected and sent to the Paris Museum and the Bishop Museum (Hawaii). We are unaware of any other samples taken from Ouvéa. Carpenter and Allen (1989) report that *Lethrinus* "sp.2" occurs at the Loyalty Islands, but they do not provide collection data for the material they examined.

In 1991, ORSTOM was asked to evaluate the fish resources of Ouvéa Atoll. During this survey, data were also collected on the atoll's physical characteristics (water masses, geomorphology, sedimentology), the plankton, and the benthos (Chevillon, 1994; Clavier et al., 1992; Clavier and Garrigue, 1993; Kulbicki et al., 1993a, 1993b, 1994; LeBouteiller et al., 1993). A summary of these works is also available (Kulbicki, 1995). The checklist of the shorefishes of Ouvéa Atoll presented here is compiled from data gathered during the 1973 and 1979 visits and the authors' sampling program conducted during their 1991 survey.

MATERIAL AND METHODS

Fish were visually censused along transects and/or collected using rotenone and SCUBA. Some specimens were caught with handlines. Visual censuses took place on the lagoon floor down to 25m, and on the outer reefs surrounding the atoll. No censuses or

collections were performed on the outer slope of the barrier reef or on the eastern side of the main island in the atoll. The locations of the stations are plotted on the map in figure 2. Thirteen collecting stations utilized rotenone (figure 2), the amount of rotenone used at each station was between 2 and 6 liters of solution containing 8% active rotenone.

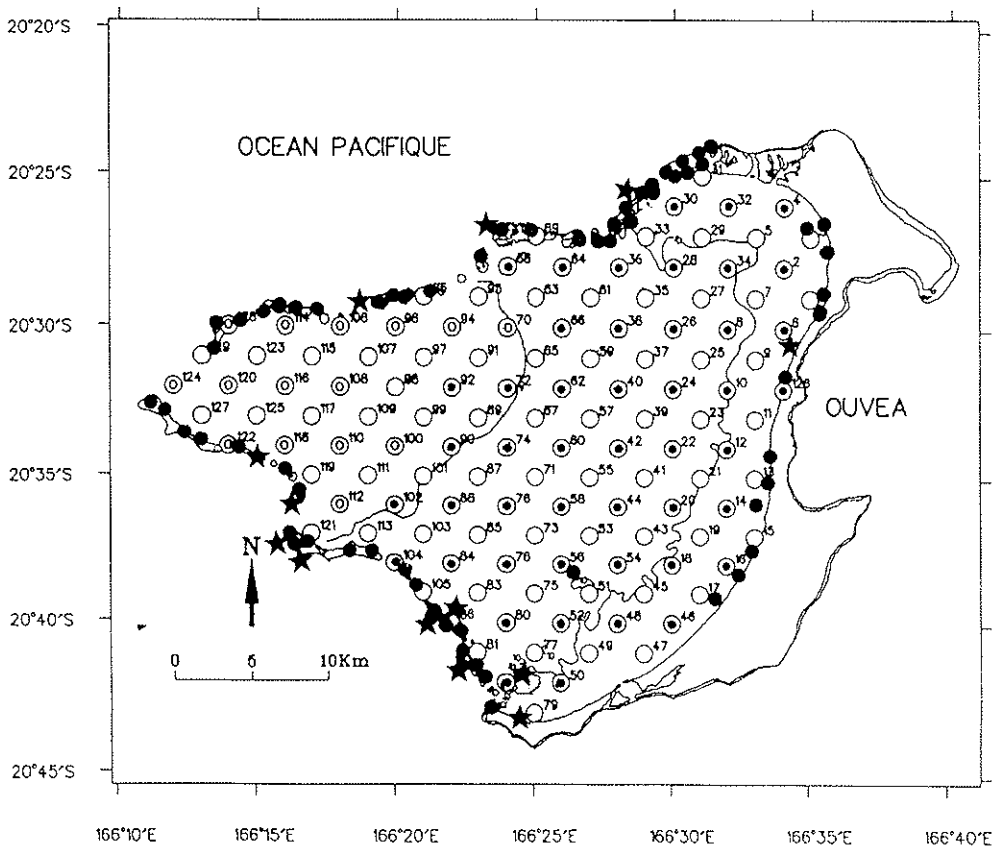

Figure 2. Location of sampling sites (open circles = handline fishing; dark circles = dives; stars = rotenone).

RESULTS AND DISCUSSION

A checklist, totaling 653 taxa distributed among 72 families, is presented in Table 1. There are about 300 fewer species known from Ouvéa than from nearby New Caledonia, where more than 950 reef-fish species have been recorded (Rivaton et al., 1989). The number of taxa known from Ouvéa is closer to the 795 species recorded from the Chesterfield archipelago (Kulbicki et al., 1994), another isolated area at a similar latitude, than to the 425 species recorded from Rotuma (Zug et al., 1989), a small cluster of islands about 450 km north of the Fiji Islands. Because our sampling (only 13 rotenone stations) at Ouvéa is limited and we have not sampled the eastern side of the atoll, we believe the total number of shorefish species may actually be as high as 800-900 species.

Most of the species in this list have been reported from nearby New Caledonia, however 51 taxa have not been recorded from New Caledonia. *Serranocirrhitus latus* has not been listed in the New Caledonian checklists, but was reported from New Caledonian reefs and the Loyalty Islands as "*Dactylanthias mcmichaeli*" by Fourmanoir and Laboute (1976). Most of the new records are Anguilliformes, Scorpaenidae or Gobiidae, which are usually taken only in rotenone collections. There are specimens in the Ouvéa collections representing 33 taxa that could not be identified to species. Many of these are juveniles, but 15 of these taxa are currently known to be undescribed species. Most of the 15 undescribed species are known from other localities. Their descriptions, thus, will not greatly increase the number of endemic species known from the Loyalty Islands. The only endemic species described from Ouvéa is *Luzonichthys williamsi* (Serranidae, Anthiinae).

One specimen of *Antennarius duescus* was taken at Ouvéa. This distinctive species is unique in having the opercular opening situated halfway between the base of the pectoral lobe and the origin of the anal fin. It was previously known from only three specimens from the Hawaiian Islands (Pietsch and Grobecker, 1987). Its presence in the Loyalty Islands is possibly indicative of an antitropical distribution pattern. *Trimma unisquamis* and *Gymnothorax eurostus* have a similar antitropical distribution pattern, with a northern population at Hawaii. *Dinematichthys riukiuensis* exhibits an antitropical distribution pattern, but has its northern population at Okinawa and its southern population at the Great Barrier Reef, Ouvéa, and Fiji.

A number of Pacific plate endemic species (Springer, 1982) are recorded herein from Ouvéa. These records could be described as plate margin occurrences. Pacific plate endemics taken at Ouvéa include the following taxa: *Minysynchiropus laddi, Myripristis amaenus, Schismorhynchus labialis, Brotula townsendi, Centropyge nigriocellus,* and *Centropyge loriculus*.

Two species, *Alticus sertatus* and *Neoglyphidodon carlsoni*, were previously thought to be Fijian endemics. The presence of *Alticus sertatus* at Ouvéa provides the first record of this species west of the Fiji Islands. An undescribed species of *Alticus* occurs at New Caledonia, but was not collected at Ouvéa. Likewise, *Alticus sertatus* has not been collected from New Caledonia. The occurrence of *Neoglyphidodon carlsoni* at Ouvéa is the first record outside of Fijian waters.

A comparison of the diversity of the major families within several areas of the southwestern Pacific is given in Table 2. An interesting analogy with the Chesterfield archipelago (LeBorgne et al., 1994) and Rotuma (Zug et al., 1989) is the low number or lack of *Abudefduf* spp., *Neopomacentrus* spp., Clupeidae and Siganidae (Table 2). A preliminary list of fishes from Osprey Reef, off the Great Barrier Reef, based on the fish collection at the Australian Museum (Leis, pers. communication) entirely lacks these genera and families. Similarly, Norfolk, Lord Howe and Kermadec islands also have few or no members of these taxa, but have five species of *Abudefduf*. A survey of Elizabeth

and Middleton Reefs (Hutchings, 1988), located further south in the Coral Sea, indicates the presence of 3 species of *Abudefduf*, one species of Siganidae, but no *Neopomacentrus* or Clupeidae. These genera and families are well represented elsewhere in the Coral Sea and New Caledonia (Table 2). At Ouvéa, the lack of suitable habitat is not a likely reason for the low number of these species, except possibly for the Clupeidae. Indeed, the habitats where these species are found in New Caledonia are apparently present at Ouvéa (Kulbicki et al., 1993a). The early life history traits (type of egg, length of larval life, shape of the larvae, size of the larvae at recruitment on reefs) of *Abudefduf* and *Neopomacentrus* (Table 3) do not differ significantly from those of other Pomacentridae that are present at Ouvéa, Rotuma, the Chesterfield Islands, or Osprey Reef. Victor (1991), in a review on settlement strategies and biogeography, noted that duration of the larval stage rarely accounted for the geographic range of a species. The short distance between Ouvéa and the main island of New Caledonia (60 km) and the direction of the major surface currents (Kulbicki et al., 1993a; Kulbicki, 1995) would not seem to present a major obstacle to the colonization of Ouvéa by species from New Caledonia (figure 3).

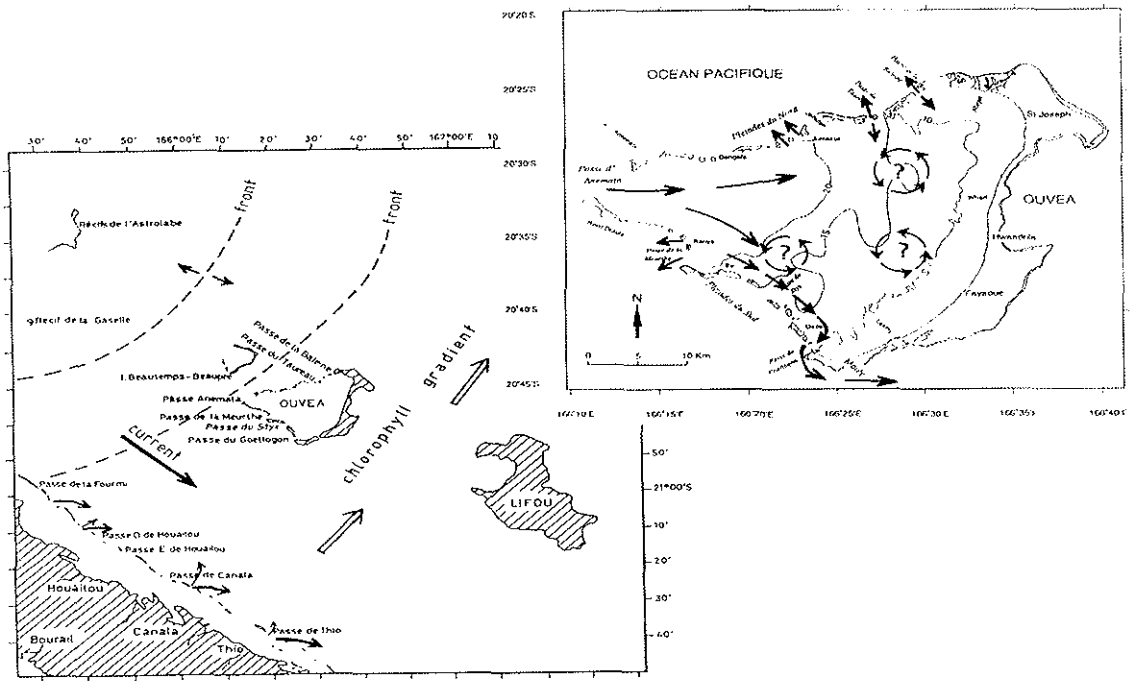

Fig. 3. Major currents in the vicinity of Ouvea (from Kulbicki et al., 1993a).

One possible reason for the lack of certain species at Ouvéa could be related to its being a low island and New Caledonia a high island. Causal factors leading to the absence of certain taxa at Ouvéa remain speculative.

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REFERENCES

Allen, G.R. 1989. *The Fishes of the Coral Sea.* Tech. Report Australian National Parks and Wildlife Services. Canberra. 151 pp.

Allen, G.R. 1991. *Damselfishes of the World.* Mergus Press, Melle, Germany. 272 pp.

Allen, G.R., D.F. Hoese, J.R. Paxton, J.E. Randall, B.C. Russell, W.A. Starck, II, F.H. Talbot, and G.P. Whitley. 1976. Annotated checklist of the fishes of Lord Howe Island. *Records of the Australian Museum* 30 (15):365-454.

Allen, G.R., and R. Swainston. 1988. *The Marine Fishes of North-Western Australia. A Field Guide for Anglers and Divers.* Western Australia Museum. 201 pp.

Allen, G.R., and R. Swainston. 1992. *Reef fishes of New Guinea. A field guide for divers, anglers and naturalists.* Publication of the Christensen Research Institute 8:1-132.

Allen, G.R, and F.H. Talbot. 1985. Review of the snappers of the genus *Lutjanus* (Pisces: Lutjanidae) from the Indo-Pacific, with the description of a new species. *Indo-Pacific Fishes* 11:1-87.

Blaber, S.J.M, D..A. Milton, and N.J.F. Rawlinson. 1993. *Tuna Baitfish in Fiji and Solomon Islands: Proceedings of a Workshop, Suva, Fiji, 17-18 August 1993.* Australian Center International Agriculture Research Proceedings 52: 136 pp.

Brothers, E.B., D. McB. Williams, and P.F. Sale. 1983. Length of larval life in twelve families of fishes at "One Tree Lagoon," Great Barrier Reef, Australia. *Marine Biology* 76:319-324.

Carpenter. K.E. 1987. Revision of the Indo Pacific fish family Caesionidae (Lutjanoidea), with description of five new species. *Indo-Pacific Fishes* 15:1-56.

Carpenter, K.E. 1988. FAO Species Catalogue. Vol. 8. Fusilier fishes of the world. *FAO Fisheries Synopsis No.125*, Vol. 8:1-75.

Carpenter, K.E., and G.R. Allen. 1989. FAO Species catalogue. Vol. 9. Emperor fishes and large-eye breams of the world (Family Lethrinidae). *FAO Fisheries Synopsis No.125*, vol. 9:1-118. 8 color plates.

Chevillon, C. 1994. Sédiments récents du lagon d'Ouvéa *in* Evaluation des ressources en poissons du lagon d'Ouvéa: 2ième partie: L'environnement physique, la biosédimentologie, les caractéristiques physiques. *Rapport Convention Sciences de la Mer ORSTOM Nouméa* 10:1-44.

Clavier, J., and C. Garrigue. 1993. Etude du benthos de l'atoll d'Ouvéa *in* Evaluation des ressources en poissons du lagon d'Ouvéa: 1ère partie: L'environnement biologique: le macrobenthos, le megabenthos et le plancton. *Rapport Conventions Sciences de la Mer ORSTOM Nouméa* 8:1-36.

Clavier, J., C. Garrigue, G. Bargibant, A. Di Matteo, P. Hamel, M. Kulbicki, and R. Urbain. 1992. Etude quantitative du benthos dans le lagon d'Ouvéa. Liste taxonomique, densité et biomasses du macrobenthos, ATP, pigments photosynthétiques et matière organique dans le sédiment. *Rapports Scientifiques et Techniques Sciences de la Mer Biologie marine ORSTOM Nouméa* 64:1-70.

Dawson, C.E. 1985. *Indo-Pacific Pipefishes (Red Sea to the Americas).* Gulf Coast Research Laboratory, Ocean Springs Miss. USA. 229 pp.

Eschmeyer, W.R. 1990. *Catalog of the Genera of Recent Fishes.* California Academy Press, San Francisco. 697 pp.

Fourmanoir, P., and P. Laboute. 1976. *Poissons de Nouvelle Calédonie et des Nouvelles Hébrides.* Les Editions du Pacifique, Tahiti. 376 pp.

Francis, M.P. 1993. Checklist of the coastal fishes of Lord Howe, Norfolk and Kermadec islands, Southwest Pacific Ocean. *Pacific Science* 47:136-170.

Francis, M.P., and J.E. Randall. 1993. Further additions to the fish faunas of Lord Howe and Norfolk islands, Southwest Pacific. *Pacific Science* 47:118-135.

Hutchings, P. 1988. *A Survey of Elizabeth and Middleton Reefs for Australian National Parks and Wildlife Service.* Australian National Parks and Wildlife Service Report. 173 pp.

Kailola, P.J. 1987a. The fishes of Papua New Guinea: a revised and annotated checklist. Vol. 1 Myxinidae to Synbranchidae. *Department of Fisheries and Marine Resources Research Bulletin* 41:1-194.

Kailola, P.J. 1987b. The fishes of Papua New Guinea: a revised and annotated checklist. Vol. 2 Scorpaenidae to Callyonimidae. *Department of Fisheries and Marine Resources Research Bulletin* 41:195-418.

Kailola, P.J. 1991. The fishes of Papua New Guinea: a revised and annotated checklist. Vol. 3 Gobiidae to Molidae. *Department of Fisheries and Marine Resources Research Bulletin* 41:419-572.

Kulbicki, M. 1995. The marine resources of Ouvéa Atoll (New Caledonia), a summary of the work performed by ORSTOM from 1991 to 1994. *Joint FFA/SPC workshop on the management of South Pacific Inshore Fisheries. Nouméa New Caledonia.* B.P. 77, 1-40.

Kulbicki, M., G. Bargibant, C. Garrigue, J.L. Menou, and G. Mou Tham. 1993a. Répartition du mégabenthos dans le lagon d'Ouvéa. in Evaluation des ressources en poissons du lagon d'Ouvéa: 1ère partie: l'environnement biologique: le macrobenthos, le mégabenthos et le plancton. *Conventions Sciences de la Mer ORSTOM Nouméa* 8:37-97.

Kulbicki, M., G. Bargibant, J.L. Menou, G. Mou Tham, P.Thollot, L. Wantiez, and J.T. Williams. 1994. Evaluations des ressources en poissons du lagon d'Ouvéa. in Evaluation des ressources en poissons du lagon d'Ouvéa: 3ème partie: les poissons. *Convention Sciences de la Mer ORSTOM Nouméa* 11:1-448.

Kulbicki, M., S. Dupont, C. Dupouy, G. Bargibant, P. Hamel, J.L. Menou, G. Mou Tham, and P. Tirard. 1993b. Caractéristiques physiques du lagon d'Ouvéa. in Evaluation des ressources en poissons du lagon d'Ouvéa: 2ème partie: l'environnement physique: sédimentologie, substrat et courants. *Convention Sciences de la Mer ORSTOM Nouméa* 10:47-150.

LeBorgne, R.A., M. Kulbicki, J.E. Randall, and J. Rivaton. 1994. Checklist of the fishes of the Chesterfield islands (Coral Sea). *Micronesica* 27(1/2):1-43.

LeBouteiller, M. Rodier, C. Garrigue, and B. Richer de Forges. 1993. Etude del'hydrologie et du plancton du lagon d'Ouvéa, en Septembre 1992. Observations sur la macrofaune benthique. *in* Evaluation des ressources en poissons du lagon d'Ouvéa: 1ère partie: l'environnement biologique: le macrobenthos, le mégabenthos et le plancton. *Rapport Conventions Sciences de la Mer ORSTOM Nouméa* 8:99-215.

Lowe, G.R., and B.C. Russell. 1990. Additions and revisions to the checklist of fishes of the Capricorn-Bunker Group, Great Barrier Reef. *Great Barrier Reef Marine Park Authority Technical Memorandum* GBRMPA-TM-19:1-27.

Paxton, J.R., D.F. Hoese, G.R. Allen, and J.E Hanley. 1989. Pisces, Petromyzontidae to Carangidae. *Zoological Catalogue of Australia* 7:1-663.

Paxton, J.R., D.F. Hoese, and H.K. Larson. 1978. *Preliminary Checklist of Lizard Island Area Fishes.* Australian Museum Mimeo Report (Sydney, Australia), 30 pp.

Pietsch, T.W., and D.B. Grobecker. 1987. Frogfishes of the world. Systematics, Zoogeography, and Behavioral Ecology. Stanford University Press, Stanford, California. 420 p.

Randall, J.E., G.R. Allen, and R.C. Steene. 1990. *Fishes of the Great Barrier Reef and Coral Sea.* Crawford House Press, Bathurst, Australia. 507 pp.

Randall, J.E., and P.C. Heemstra. 1991. Revision of Indo-Pacific groupers (Perciformes: Serranidae: Epinephelinae), with descriptions of five new species. *Indo-Pacific Fishes* 20:1-323.

Rivaton, J., P. Fourmanoir, P. Bourret, and M. Kulbicki. 1989. Catalogue des poissons de Nouvelle Calédonie et Dépendances. *ORSTOM Nouméa Catalogue* 2:1-170.

Russell, B.C. 1983. Checklist of fishes, Great Barrier Reef Marine Park, Capricornia Section. *Great Barrier Reef Marine Park Authority Special Publication* series 1:1-184.

Russell, B.C. 1990. FAO Species catalogue, Vol. 12. Nemipterid fishes of the world. *FAO Fisheries Synopsis No.125*, Vol. 12:1-149, 8 color plates.

Springer, V.G. 1982. Pacific plate biogeography, with special reference to shorefishes. *Smithsonian Contributions to Zoology*, number 367:1-182.

Thresher, R.E., and E.B. Brothers. 1989. Evidence of intra- and inter- oceanic regional differences in the early life-history of reef- associated fishes. *Marine Ecology Progress Series* 57:187-205.

Victor, B.C. 1991. Settlement strategies and biogeography of reef fishes. Pages 231-260 *in* P.F. Sale (ed.). *The Ecology of Fishes on Coral Reefs*. Academic Press, NY.

Wellington, G.M., and Victor, B.C. 1989. Planktonic larval duration of one hundred species of Pacific and Atlantic damselfishes (Pomacentridae) *Marine Biology* 101(4):557-567.

Whitehead, P.J.P. 1985. FAO Species catalogue, Vol. 7. Clupeoid fishes of the world, part 1, Chirocentridae, Clupeidae, Pristigasteridae. *FAO Fisheries Synopsis No.125*, Vol. 7:1-303.

Whitehead, P.J.P., G.J. Nelson, and T. Wongratana. 1988. FAO Species catalogue, Vol. 7. Clupeoid fishes of the world, part 2, Engraulididae. *FAO Fisheries Synopsis No.125*, Vol. 7:305-575.

Woodland, D.J. 1990. Revision of the fish family Siganidae with description of two new species and comments on distribution and biology. *Indo-Pacific Fishes* 19:1-136.

Zug, G.R., V.G. Springer, J.T. Williams, and G.D. Johnson. 1989. The vertebrates of Rotuma and surrounding waters. *Atoll Research Bulletin* No. 316: 1-25.

Table 1. List of the shorefish taxa known from Ouvéa atoll. Taxa which were not previously known from New Caledonia are marked by * and are in bold typeface. Families are ordered according to Eschmeyer (1990).The letters used in the column "Method" mean the following:

V: visual census R: rotenone L: line fishing A: Allen (1975 and pers. comm.) O:1979ORSTOM cruise

Scientific name	Author and date	Method
GINGLYMOSTOMATIDAE		
Nebrius ferrugineus	(Lesson, 1830)	VL
CARCHARHINIDAE		
Carcharhinus albimarginatus	(Rüppell, 1837)	VL
Carcharhinus amblyrhinchos	(Bleeker, 1856)	VL
Carcharhinus melanopterus	(Quoy & Gaimard, 1824)	V
Galeocerdo cuvier	(Peron & LeSueur,1822)	VL
Triaenodon obesus	(Rüppell, 1837)	VL
DASYATIDIDAE		
Dasyatis kuhlii	(Müller & Henle, 1841)	VL
MORINGUIDAE		
Moringua species		R
CHLOPSIDAE		
Kaupichthys species		R
Kaupichthys atronasus	Schultz,1953	R
Kaupichthys hyoproroides	(Stromann,1896)	R
MURAENIDAE		
Anarchias cantonensis	(Schultz,1943)	R
Echidna polyzona	(Richardson,1844)	R
Echidna unicolor	Schultz, 1953	R
Gymnothorax buroensis	(Bleeker,1857)	R
Gymnothorax chilospilus	Bleeker,1865	R
Gymnothorax eurostus	(Abbott, 1861)	R
Gymnothorax fuscomaculatus	(Schultz,1953)	R
Gymnothorax javanicus	(Bleeker, 1859)	V
Gymnothorax margaritophorus	Bleeker,1865	R
Gymnothorax marshallensis	(Schultz,1953)	R
Gymnothorax melatremus	(Schultz,1953)	R
Gymnothorax pindae	Smith,1962	RO
Gymnothorax rueppelliae	(McClelland,1845)	R
Gymnothorax thyrsoides	(Richardson,1845)	R
Gymnothorax zonipectis	Seale,1906	R
Uropterygius fuscoguttatus	Schultz,1953	R
Uropterygius makatei	Gosline,1958	R
OPHICHTHIDAE		
Leiuranus semicinctus	(Lay & Benett, 1839)	R
Muraenichthys gymnotus	Bleeker, 1850	R
Muraenichthys sp.		O
Schismorhynchus labialis	(Seale, 1917)	R
Schultzidia johnstonensis	(Schultz & Woods, 1949)	R
CONGRIDAE		
Conger cinereus	(Rüppell, 1828)	R
Heteroconger hassi	(Klausewitz & Eibl-Eibesfeldt, 1959)	R
CLUPEIDAE		

Herklotsichthys quadrimaculatus	(Rüppell,1837)	VR
Spratelloides delicatulus	(Bennett, 1831)	VR
CHANIDAE		
Chanos chanos	(Forsskal, 1775)	V
SYNODONTIDAE		
Saurida gracilis	(Quoy & Gaimard, 1824)	R
Synodus binotatus	Schultz, 1953	R
Synodus dermatogenys	Fowler, 1912	VR
Synodus jaculum	Russell & Cressey, 1979	R
Synodus hoshinonis	Tanaka, 1917	V
Synodus variegatus	(Lacépéde, 1803)	VRO
OPHIDIIDAE		
Brotula multibarbata	Temminck & Schlegel,1846	R
***Brotula townsendi**	Fowler,1900	R
BYTHITIDAE		
Brosmophyciops pautzkei	Schultz, 1960	R
***Dinematichthys randalli**	Machida, 1994	R
***Dinematichthys riukiuensis**	Aoyagi, 1952	R
ANTENNARIIDAE		
Antennarius coccineus	(Lesson,1831)	R
***Antennarius duescus**	Snyder,1904	R
Antennarius nummifer	(Cuvier, 1817)	R
GOBIESOCIDAE		
Diademichthys lineatus	(Sauvage,1883)	R
Discotrema crinophila	Briggs,1976	R
***Pherallodichthys species**		R
***Pherallodus species**		R
ATHERINIDAE		
***Atherinomorus duodecimalis**	(Valenciennes,1835)	R
Atherinomorus lacunosus	(Schneider,1801)	VR
***Atherion elymus**	Jordan & Starks,1901	R
Hypoatherina barnesi	Schultz,1953	R
HOLOCENTRIDAE		
Myripristis amaena	(Castelnau, 1873)	V
Myripristis berndti	Jordan & Evermann,1903	R
Myripristis kuntee	Cuvier,1831	VR
Myripristis murdjan ?	(Forsskal, 1775)	V
Myripristis pralinia	Cuvier,1829	VR
Myripristis violacea	Bleeker,1851	R
Neoniphon argenteus	(Valenciennes, 1831)	V
Neoniphon opercularis	(Valenciennes, 1831)	V
Neoniphon sammara	(Forsskal,1775)	VR
Plectrypops lima	(Valenciennes,1831)	R
Sargocentron caudimaculatum	(Rüppell,1835)	VR
Sargocentron diadema	(Lacépéde,1801)	VR
Sargocentron melanospilos	(Bleeker,1858)	R
Sargocentron punctatissimum	(Cuvier,1829)	R
Sargocentron rubrum	(Forsskal, 1775)	V
Sargocentron spiniferum	(Forsskal,1775)	VRL
Sargocentron tiere	(Cuvier,1829)	R
Sargocentron violaceum	(Bleeker, 1853)	V
AULOSTOMIDAE		
Aulostomus chinensis	(Linnaeus,1758)	VR
FISTULARIIDAE		

Fistularia commersonii	Rüppell, 1838	V
CENTRICIDAE		
Aeoliscus strigatus	(Günther, 1860)	V
SYNGNATHIDAE		
Corythoichthys amplexus	Dawson & Randall,1975	R
Corythoichthys nigripectus	Herald,1953	R
Corythoichthys schultzi	Herald,1953	R
Doryrhamphus dactyliophorus	(Bleeker,1853)	R
Doryrhamphus excisus excisus	Kaup,1856	R
****Phoxocampus diacanthus***	(Schultz,1943)	R
SCORPAENIDAE		
Dendrochirus brachypterus	(Cuvier, 1829)	V
Dendrochirus species		V
Pterois antennata	(Bloch,1787)	R
Pterois radiata	Cuvier,1829	R
Scorpaena species		R
Scorpaenodes albaiensis	(Evermann & Seale,1907)	R
****Scorpaenodes corallinus***	Smith,1957	R
****Scorpaenodes hirsutus***	(Smith,1957)	R
Scorpaenodes kelloggi	(Jenkins,1903)	R
Scorpaenodes parvipinnis	(Garrett,1863)	R
Scorpaenodes scaber	(Ramsay & Ogilby,1886)	R
Scorpaenopsis species		R
Scorpaenopsis gibbosa	(Schneider,1801)	R
Scorpaenopsis neglecta	(Temminck & Schlegel,1844)	R
Sebastapistes species		R
Sebastapistes cyanostigma	(Bleeker,1856)	R
****Sebastapistes mauritiana***	(Cuvier,1829)	R
Sebastapistes strongia	(Cuvier,1829)	R
Sebastapistes tinckhami	(Fowler,1946)	R
Setarches species		R
CARACANTHIDAE		
Caracanthus maculatus	(Gray,1831)	R
Caracanthus unipinna	(Gray,1831)	R
APLOACTINIDAE		
****Neoaploactis tridorsalis***	Eschmeyer & Allen,1978	R
SERRANIDAE		
Anyperodon leucogrammicus	(Valenciennes,1828)	VR
Aporops bilinearis	Schultz,1943	R
Belonoperca chabanaudi	Fowler & Bean, 1930	O
Cephalopholis argus	Bloch and Schneider, 1801	V
Cephalopholis miniata	(Forsskal,1775)	VRL
Cephalopholis sonnerati	(Valenciennes,1828)	VLR
Cephalopholis urodeta	(Schneider,1801)	VR
Epinephelus caeruleopunctatus	(Bloch, 1790)	V
Epinephelus coioides	(Hamilton, 1822)	V
Epinephelus cyanopodus	(Richardson, 1846)	VL
Epinephelus fasciatus	(Forrskal,1775)	VLR
Epinephelus hexagonatus	(Forster,1801)	VR
Epinephelus macrospilos	(Bleeker, 1855)	VL
Epinephelus maculatus	(Bloch,1790)	VLR
Epinephelus merra	Bloch,1793	VLR
Epinephelus polyphekadion	(Bleeker, 1849)	VL
Epinephelus rivulatus	(Valenciennes, 1830)	L

Epinephelus tauvina	(Forsskal, 1775)	V
Gracila albomarginata	(Fowler & Bean, 1930)	V
Grammistes sexlineatus	(Thünberg, 1792)	V
Liopropoma susumi	(Jordan & Seale, 1906)	RO
Liopropoma tonstrinum	Randall & Taylor,1988	R
Luzonichthys waitei	(Fowler,1931)	R
Luzonichthys williamsi	Randall & McCosker,1992	R
Plectranthias longimanus	(Weber,1913)	R
****Plectranthias nanus***	Randall,1980	R
Plectranthias winniensis	(Tyler,1966)	RO
Plectropomus laevis	(Lacépéde, 1801)	V
Plectropomus leopardus	(Lacépéde, 1802)	VL
Pseudanthias ventralis ventralis	(Randall, 1979)	O
Pseudanthias hypselosoma	Bleeker,1878	VR
Pseudanthias lori	(Lubbock & Randall,1976)	R
Pseudanthias pascalus	(Jordan & Tanaka,1927)	VR
Pseudanthias pictilis	(Randall &Allen, 1978)	R
****Pseudanthias rubrizonatus***	(Randall, 1983)	R
Pseudanthias squamipinnis	(Peters,1855)	VR
Pseudogramma polyacantha	(Bleeker,1856)	R
Serranocirrhitus latus	Watanabe, 1949	RO
Variola louti	(Forsskal, 1775)	VL
PSEUDOCHROMIDAE		
Cypho purpurascens	(De Vis,1884)	RO
Pseudochromis species		R
Pseudochromis cyanotaenia	Bleeker,1857	R
Pseudochromis jamesi	Schultz.1943	R
Pseudoplesiops species		R
Pseudoplesiops howensis	Allen,1987	R
Pseudoplesiops multisquamatus	Allen, 1987	R
Pseudoplesiops rosae	Schultz,1943	R
PLESIOPIDAE		
Plesiops coeruleolineatus	Rüppell,1835	R
ACANTHOCLINIDAE		
Belonepterygion fasciolatum	(Ogilby,1889)	R
KUHLIIDAE		
Kuhlia mugil	(Bloch & Schneider,1801)	R
PRIACANTHIDAE		
Heteropriacanthus cruentatus	(Lacépéde, 1801)	R
Priacanthus hamrur	(Forsskal, 1775)	V
APOGONIDAE		
Apogon species		R
Apogon angustatus	(Smith & Radcliffe, 1911)	R
Apogon apogonides	(Bleeker, 1856)	V
Apogon aureus	(Lacépéde,1802)	VR
****Apogon caudicinctus***	Randall & Smith,1988	R
Apogon coccineus	Rüppell,1838	R
Apogon cyanosoma	Bleeker, 1853	VR
****Apogon diversus***	(Smith & Radcliffe, 1911)	R
Apogon doderleini	Jordan & Snyder, 1901	VR
Apogon doryssa	(Jordan & Seale, 1906)	R
Apogon erythrinus	Snyder, 1904	R
Apogon exostigma	(Jordan & Starks, 1906)	V
Apogon fraenatus	Valenciennes 1832	VR

Apogon fuscus	Quoy & Gaimard, 1824	R
Apogon kallopterus	Bleeker, 1856	VR
Apogon nigrofasciatus	Lachner, 1953	RO
Apogon novemfasciatus	Cuvier, 1828	VR
Apogon trimaculatus	Cuvier, 1828	V
Apogonichthys ocellatus	(Weber, 1913)	R
Cheilodipterus macrodon	(Lacépéde, 1802)	VR
Cheilodipterus quinquelineatus	Cuvier, 1828	VR
Fowleria abocellata	Goren & Karplus, 1980	R
Fowleria marmorata	Alleyne & Macleay, 1877	R
Gymnapogon urospilotus	Lachner, 1953	R
Pseudamiops gracillicauda	(Lachner, 1953)	R
Rhabdamia cypselurus	Weber, 1909	VR
Rhabdamia gracilis	(Bleeker, 1856)	R
Siphamia species		R
SILAGINIDAE		
Sillago species		V
MALACANTHIDAE		
Malacanthus brevirostris	(Guichenot, 1848)	V
Malacanthus latovittatus	(Lacépéde, 1801)	V
ECHENEIDAE		
Echeneis naucrates	Linnaeus, 1758	L
CARANGIDAE		
Alectes indicus	(Rüppell, 1830)	V
Carangoides chrysophrys	(Cuvier, 1833)	L
Carangoides ferdau	(Forsskal, 1775)	V
Carangoides fulvoguttatus	(Forrskal, 1775)	VL
Caranx lugubris	Poey, 1860	V
Caranx melampygus	Cuvier, 1833	VL
Caranx sexfasciatus	Quoy & Gaimard, 1824	VL
Decapterus russelli	(Rüppell, 1830)	VL
Elagatis bipinnulatus	(Quoy & Gaimard, 1825)	V
Gnathanodon speciosus	(Forsskal, 1775)	V
Scomberoides tol	(Cuvier, 1832)	V
Trachinotus bailloni	(Lacépéde, 1801)	V
Trachinotus blochii	(Lacépéde, 1801)	V
LUTJANIDAE		
Aphareus furca	(Lacépéde, 1802)	VL
Aprion virescens	Valenciennes, 1830	VL
Lutjanus argentimaculatus	(Forsskal, 1775)	V
Lutjanus bohar	(Forsskal, 1775)	VLR
Lutjanus fulviflamma	(Forsskal, 1775)	VL
Lutjanus fulvus	(Bloch & Schneider, 1801)	V
Lutjanus gibbus	(Forsskal, 1775)	VL
Lutjanus kasmira	(Forsskal, 1775)	VLO
Lutjanus lutjanus	Bloch, 1790	L
Lutjanus quinquelineatus	(Bloch, 1790)	VL
Lutjanus rivulatus	(Cuvier, 1828)	VL
Lutjanus russelli	(Bleeker, 1849)	VL
Lutjanus vitta	(Quoy & Gaimard, 1824)	VL
Macolor niger	(Forsskal, 1775)	V
CAESIONIDAE		
Caesio caerulaurea	Lacépéde, 1801	V
Caesio cuning	(Bloch, 1791)	V

Caesio teres	Seale, 1906	R
***Gymnocaesio gymnoptera**	(Bleeker, 1856)	R
***Pterocaesio chrysozona**	(Cuvier, 1830)	R
Pterocaesio digramma	(Bleeker, 1865)	V
Pterocaesio pisang	(Bleeker, 1853)	V
***Pterocaesio tessellata**	Carpenter, 1987	R
Pterocaesio tile	(Cuvier, 1830)	VR
Pterocaesio trilineata	Carpenter, 1987	VR
HAEMULIDAE		
Diagramma pictum	(Thünberg, 1792)	VL
Plectorhinchus chaetodonoides	Lacépéde, 1800	V
Plectorhinchus goldmanni	(Bleeker, 1853)	V
Plectorhinchus obscurum	(Günther, 1871)	V
Plectorhinchus picus	(Cuvier, 1830)	V
LETHRINIDAE		
Gnathodentex aurolineatus	(Lacépéde, 1802)	VR
Gymnocranius euanus	Günther, 1879	VL
Gymnocranius grandoculis	(Valenciennes, 1830)	VL
Gymnocranius species		VL
Lethrinus atkinsoni	Seale, 1909	VL
Lethrinus genivittatus	Valenciennes, 1830	VL
Lethrinus harak	(Forsskal, 1775)	V
Lethrinus lentjan	(Lacépéde, 1802)	V
Lethrinus miniatus	(Bloch & Schneider, 1801)	V
Lethrinus nebulosus	(Forsskal, 1775)	VLO
Lethrinus obsoletus	(Forsskal, 1775)	VL
Lethrinus olivaceus	Valenciennes 1830	VL
Lethrinus rubrioperculatus	Sato, 1978	VL
***Lethrinus species**		LRO
Lethrinus variegatus	Valenciennes, 1830	V
Lethrinus xanthochilus	Klunzinger, 1870	VL
Monotaxis grandoculis	(Forsskal, 1775)	VL
NEMIPTERIDAE		
Scolopsis bilineatus	(Bloch, 1793)	V
Scolopsis trilineatus	Kner, 1868	V
MULLIDAE		
Mulloides flavolineatus	(Lacépéde, 1801)	V
Mulloides vanicolensis	(Valenciennes, 1831)	V
Parupeneus barberinoides	(Lacépéde, 1801)	V
Parupeneus barberinus	(Lacépéde, 1801)	V
Parupeneus bifasciatus	(Lacépéde, 1801)	V
Parupeneus ciliatus	(Lacépéde, 1801)	V
Parupeneus cyclostomus	(Lacépéde, 1801)	V
Parupeneus heptacanthus	(Lacépéde, 1801)	V
Parupeneus indicus	(Shaw, 1803)	V
Parupeneus multifasciatus	(Quoy & Gaimard, 1825)	VR
Parupeneus pleurostigma	(Bennett, 1830)	V
Parupeneus spilurus	(Bleeker, 1854)	V
Upeneus species (barbillon blanc)		V
Upeneus species (barbillon jaune)		V
Upeneus tragula	Richardson, 1846	V
PEMPHERIDAE		
Parapriacanthus ransonneti	Steindachner, 1870	VR
Pempheris oualensis	Cuvier, 1831	VR

Pempheris swenkii	Bleeker, 1855	R
KYPHOSIDAE		
Kyphosus vaigiensis	(Quoy & Gaimard, 1825)	V
CHAETODONTIDAE		
Chaetodon auriga	Forsskal, 1775	V
Chaetodon baronessa	Cuvier, 1831	V
Chaetodon benetti	Cuvier, 1831	V
Chaetodon citrinellus	Cuvier, 1831	VR
Chaetodon ephippium	Cuvier, 1831	V
Chaetodon flavirostris	Günther, 1873	VR
Chaetodon kleinii	Bloch, 1790	VR
Chaetodon lineolatus	Cuvier, 1831	V
Chaetodon lunula	(Lacépéde, 1803)	V
Chaetodon melanotus	Bloch & Schneider, 1801	V
Chaetodon mertensii	Cuvier, 1831	VR
Chaetodon ornatissimus	Cuvier, 1831	V
Chaetodon pelewensis	Kner, 1868	VR
Chaetodon plebeius	Cuvier, 1831	V
Chaetodon rafflesi	Bennett, 1830	V
Chaetodon reticulatus	Cuvier, 1831	V
Chaetodon speculum	Cuvier, 1831	V
Chaetodon trifascialis	Quoy & Gaimard, 1824	V
Chaetodon trifasciatus	Park, 1797	V
Chaetodon ulietensis	Cuvier, 1831	V
Chaetodon unimaculatus	Bloch, 1787	V
Chaetodon vagabundus	Linnaeus, 1758	V
Coradion altivelis	McCulloch, 1916	V
Forcipiger flavissimus	Jordan & McGregor, 1898	VR
Forcipiger longirostris	(Broussonet, 1782)	V
Hemitaurichthys polylepis	(Bleeker, 1857)	R
Heniochus acuminatus	(Linnaeus, 1758)	VR
Heniochus chrysostomus	Cuvier, 1831	VR
Heniochus monoceros	Cuvier, 1831	V
Heniochus singularius	Smith & Radcliffe, 1911	V
Heniochus varius	(Cuvier, 1829)	V
POMACANTHIDAE		
Centropyge bicolor	(Bloch, 1787)	VR
Centropyge bispinosus	(Günther, 1860)	VR
Centropyge flavissimus	(Cuvier, 1831)	VR
Centropyge heraldi	Woods & Schultz, 1953	V
Centropyge loriculus	(Günther, 1874)	V
Centropyge multifasciatus	(Smith & Radcliffe, 1911)	R
Centropyge nigriocellus	Woods & Schultz, 1953	R
Centropyge tibicen	(Cuvier, 1831)	V
Centropyge vrolicki	(Bleeker, 1853)	VR
Pomacanthus imperator	(Bloch, 1787)	V
Pomacanthus semicirculatus	(Cuvier, 1831)	V
Pomacanthus sexstriatus	(Cuvier, 1831)	V
Pygoplites diacanthus	(Boddaert, 1772)	V
POMACENTRIDAE		
Abudefduf sexfasciatus	(Lacépéde, 1802)	VRA
Abudefduf vaigiensis	(Quoy & Gaimard, 1825)	VA
Amblyglyphidodon aureus	(Cuvier, 1830)	A
Amblyglyphidodon leucogaster	(Bleeker, 1847)	VA

Amphiprion akindynos	Allen, 1972	VA
Amphiprion clarkii	(Bennett, 1830)	VA
Amphiprion melanopus	Bleeker, 1852	VRA
Amphiprion perideraion	Bleeker, 1855	VA
Chromis acares	Randall & Swerdloff, 1973	R
Chromis agilis	Smith 1960	VRA
Chromis amboinensis	(Bleeker, 1873)	RA
Chromis analis	(Cuvier, 1830)	VA
Chromis atripectoralis	Welander & Schultz, 1951	VA
Chromis atripes	Fowler & Bean, 1928	VRA
Chromis chrysura	(Bliss, 1883)	VRA
Chromis flavomaculata	Kamohara, 1960	VRA
Chromis fumea	(Tanaka, 1917)	V
Chromis iomelas	Jordan & Seale, 1906	VR
Chromis lepidolepis	Bleeker, 1877	RA
Chromis margaritifer	Fowler, 1946	ROA
****Chromis cf nitida***	(Whitley, 1928)	V
Chromis retrofasciata	Weber, 1913	RA
Chromis ternatensis	(Bleeker, 1856)	VA
Chromis vanderbilti	(Fowler, 1941)	VRA
Chromis viridis	(Cuvier, 1830)	VRA
Chromis weberi	Fowler & Bean, 1928	VRA
Chromis xanthochira	(Bleeker, 1851)	R
Chromis xanthura	(Bleeker, 1854)	VA
Chromis sp.		A (deep)
Chrysiptera biocellata	(Quoy & Gaimard, 1824)	RA
Chrysiptera leucopoma	(Lesson, 1830)	VRA
Chrysiptera rex	(Snyder, 1909)	VA
Chrysiptera rollandi	(Whitley, 1961)	VRA
Chrysiptera starki	(Allen, 1973)	VRA
Chrysiptera taupou	(Jordan & Seale, 1906)	VRA
Dascyllus aruanus	(Linneaus, 1758)	VRA
Dascyllus reticulatus	(Richardson, 1846)	VRA
Dascyllus trimaculatus	(Rüppell, 1828)	VRA
Lepidozygus tapeinosoma	(Bleeker, 1856)	VRA
****Neoglyphidodon carlsoni***	(Allen, 1975)	R
Neopomacentrus cyanomos	(Bleeker, 1856)	R
Neopomacentrus violascens	(Bleeker, 1848)	V
Plectroglyphidodon dickii	(Lienard, 1839)	VRA
Plectroglyphidodon imparipennis	(Vaillant & Sauvage, 1875)	A
Plectroglyphidodon johnstonianus	Fowler & Ball, 1924	VRA
Plectroglyphidodon lacrymatus	(Quoy & Gaimard, 1824)	VRA
Plectroglyphidodon leucozonus	(Bleeker, 1859)	RA
****Pomacentrus adelus***	Allen, 1991	A
Pomacentrus amboinensis	Bleeker, 1868	VRA
Pomacentrus bankanensis	Bleeker, 1853	VRA
Pomacentrus brachialis	Cuvier, 1830	A
Pomacentrus chrysurus	Cuvier, 1830	A
Pomacentrus coelestis	Jordan & Starks, 1901	VR
Pomacentrus lepidogenys	Fowler & Ball, 1928	VA
Pomacentrus molluccensis	Bleeker, 1853	VA
Pomacentrus nagasakiensis	Tanaka, 1917	A
Pomacentrus pavo	(Bloch, 1787)	VRAO
Pomacentrus philippinus	Evermann & Seale, 1907	VA

Pomacentrus vaiuli	Jordan & Seale, 1906	VRA
Pomachromis richardsoni	(Snyder, 1909)	OA
Stegastes albifasciatus	(Schlegel & Müller, 1839-44)	A
Stegastes cf apicalis	(De Vis, 1885)	VO
Stegastes fasciolatus	(Ogilby, 1889)	VRA
Stegastes gascoynei	(Whitley, 1964)	VRA
Stegastes nigricans	(Lacépéde, 1802)	VA
CIRRHITIDAE		
Amblycirrhitus bimacula	Jenkins, 1903	R
Cirrhitichthys falco	Randall, 1963	VR
Cyprinocirrhites polyactis	(Bleeker, 1875)	V
Paracirrhites arcatus	(Cuvier, 1829)	VR
Paracirrhites forsteri	(Schneider, 1801)	VR
Paracirrhites hemistictus	(Günther, 1874)	V
OPISTOGNATHIDAE		
Opistognathus new species	Smith-Vaniz, in prep.	RO
LABRIDAE		
Anampses caeruleopunctatus	Rüppell, 1829	V
Anampses geographicus	Valenciennes, 1840	V
Anampses neoguinaicus	Bleeker, 1878	VR
Anampses twistii	Bleeker, 1856	V
Bodianus anthioides	(Bennett, 1830)	V
Bodianus axillaris	(Bennett, 1831)	VRO
Bodianus bilunulatus ?	(Lacépéde, 1801)	V?
Bodianus diana	(Lacépéde, 1801)	V
Bodianus loxozonus	(Snyder, 1908)	V
Bodianus perditio	(Quoy & Gaimard, 1834)	VL
Cheilinus bimaculatus	Valenciennes, 1840	V
Cheilinus chlorourus	(Bloch, 1791)	V
Cheilinus digrammus	(Lacépéde, 1801)	VO
Cheilinus trilobatus	Lacépéde, 1801	V
Cheilinus undulatus	Rüppell, 1835	V
Cheilinus unifasciatus	Streets, 1877	V
Cheilo inermis	(Forsskal, 1775)	V
Cirrhilabrus laboutei	Randall & Lubbock, 1982	V
Cirrhilabrus punctatus	Randall & Kuiter, 1989	VR
Cirrhilabrus species		V (O?)
Coris aygula	Lacépéde, 1801	V
Coris dorsomacula	Fowler, 1908	VR
Coris gaimard	(Quoy & Gaimard, 1824)	V
Coris pictoides	Randall & Kuiter, 1982	V
Coris schroederi	(Bleeker, 1858)	V
Epibulus insidiator	(Pallas, 1770)	VR
Gomphosus varius	Lacépéde, 1801	VR
Halichoeres biocellatus	Schultz, 1960	VR
Halichoeres chrysus	Randall, 1981	VR
Halichoeres hortulanus	(Lacépéde, 1801)	V
Halichoeres margaritaceus	(Valenciennes, 1839)	VR
Halichoeres marginatus	Rüppell, 1835	V
Halichoeres melanurus	(Bleeker, 1851)	V
Halichoeres miniatus	(Valenciennes, 1839)	R
Halichoeres nebulosus	(Valenciennes, 1839)	V
Halichoeres prosopeion	(Bleeker, 1853)	V
Halichoeres trimaculatus	(Quoy & Gaimard, 1834)	VR

Hemigymnus fasciatus	(Bloch, 1792)	V
Hemigymnus melapterus	(Bloch, 1791)	V
Hologymnosus annulatus	(Lacépéde, 1801)	V
Hologymnosus doliatus	(Lacépéde, 1801)	V
Labrichthys unilineatus	(Guichenot, 1847)	VR
Labroides bicolor	Fowler & Bean, 1928	V
Labroides dimidiatus	(Valenciennes, 1839)	VO
Labroides pectoralis	Randall & Springer, 1975	V
Labropsis australis	Randall, 1981	R
Labropsis xanthonota	Randall, 1981	VR
Macropharyngodon meleagris	(Valenciennes, 1839)	VR
Macropharyngodon negrosensis	Herre, 1932	V
Novaculichthys taeniorus	(Lacépéde, 1801)	V
Pseudocheilinus evanidus	Jordan & Evermann, 1903	VR
Pseudocheilinus hexataenia	(Bleeker, 1857)	R
Pseudocheilinus octotaenia	Jenkins, 1900	VR
Pseudocheilinus species		R
Pseudocoris yamashiroi	(Schmidt, 1930)	RO
Pseudodax moluccanus	(Valenciennes, 1839)	V?
Pseudojuloides cerasinus	(Snyder, 1904)	R
Stethojulis bandanensis	(Bleeker, 1851)	VR
Stethojulis interrupta	(Bleeker, 1851)	V
Suezichthys gracilis	(Steindachner & Doderlein, 1887)	V
Thalassoma amblycephalum	(Bleeker, 1856)	VR
Thalassoma hardwicke	(Bennett, 1828)	VR
Thalassoma jansenii	(Bleeker, 1856)	VR
Thalassoma lunare	(Linnaeus, 1758)	V
Thalassoma lutescens	(Lay & Bennett, 1839)	VR
Thalassoma purpureum	(Forsskal, 1775)	V
Thalassoma quinquevittatum	(Lay & Bennett, 1839)	VR
Thalassoma trilobatum	(Lacépéde, 1801)	R
Wetmorella nigropunctata	(Seale, 1901)	RO
Xyrichthys pavo	Valenciennes, 1840	V
SCARIDAE		
Bolbometopon muricatum	(Valenciennes, 1840)	V
Cetoscarus bicolor	(Rüppell, 1829)	V
Hipposcarus longiceps	(Valenciennes, 1840)	V
Scarus altipinnis	(Steindachner, 1879)	V
Scarus chameleon	Choat & Randall, 1986	V
Scarus flavipectoralis	Schultz, 1958	V
Scarus forsteni	(Bleeker, 1861)	V
Scarus frenatus	Lacépéde, 1802	V
Scarus ghobban	Forsskal, 1775	V
Scarus globiceps	Valenciennes, 1840	V
Scarus longipinnis	Randall & Choat, 1980	V
Scarus microrhinos	Bleeker, 1854	V
Scarus niger	Forsskal, 1775	V
Scarus oviceps	Valenciennes, 1840	V
Scarus psittacus	Forsskal, 1775	V
Scarus rivulatus	Valenciennes, 1840	V
Scarus rubroviolaceus	Bleeker, 1847	V
Scarus schlegeli	(Bleeker, 1861)	V
Scarus sordidus	Forsskal, 1775	V
Scarus spinus	(Kner, 1868)	V

CREEDIIDAE		
***Chalixodytes chameleontoculis**	Smith, 1956	R
***Chalixodytes tauensis**	Schultz, 1943	R
Limnichthys donaldsoni	Schultz, 1960	RO
PINGUIPEDIDAE		
Parapercis clathrata	Ogilby, 1911	VR
Parapercis cylindrica	(Bloch, 1792)	VR
Parapercis hexophtalma	(Cuvier, 1829)	VR
Parapercis millepunctata	(Günther, 1860)	R
Parapercis multiplicata	Randall, 1984	VR
Parapercis schauinslandi	(Steindachner, 1900)	R
TRIPTERYGIIDAE		
Ceratobregma helenae	Holleman, 1987	R
Ceratobregma striata	Fricke, 1991	R
Enneapterygius elegans	(Peters, 1877)	R
Enneapterygius flavoccipitis	Shen & Wu, 1994	R
Enneapterygius hemimelas	(Kner & Steindachner, 1866)	R
Enneapterygius nanus	(Schultz, 1960)	R
Enneapterygius niger	Fricke, 1994	R
Enneapterygius rufopileus	(Waite, 1904)	R
Enneapterygius tutuilae	Jordan & Seale, 1906	R
Helcogramma cf ellioti	(Herre, 1944)	R
Norfolkia squamiceps	(McCulloch & Waite, 1916)	R
Norfolkia thomasi	Whitley, 1964	R
Springerichthys kulbickii	Fricke & Randall, 1994	R
BLENNIIDAE		
***Alticus sertatus**	(Garman, 1903)	R
Aspidontus dussumieri	(Valenciennes, 1836)	R
Aspidontus taeniatus	Quoy & Gaimard, 1834	R
Blenniella chrysospilos	(Bleeker, 1857)	R
Cirripectes castaneus	(Valenciennes, 1836)	R
Cirripectes stigmaticus	Strasburg & Schultz, 1953	R
Ecsenius bicolor	(Day, 1888)	VR
Ecsenius fourmanoiri	Springer, 1972	RO
Ecsenius midas	Starck, 1969	R
Ecsenius nalolo	Smith, 1959	O
Entomacrodus caudofasciatus	(Regan, 1909)	R
***Entomacrodus decussatus**	(Bleeker, 1858)	R
Entomacrodus striatus	(Quoy & Gaimard, 1836)	R
Exallias brevis	(Kner, 1868)	V
Istiblennius edentulus	(Bloch, 1801)	VR
Meiacanthus atrodorsalis	(Günther, 1877)	VR
Petroscirtes mitratus	Rüppell, 1830	V
Plagiotremus laudandus	(Whitley, 1961)	R
Plagiotremus rhinorhynchos	(Bleeker, 1852)	VR
Plagiotremus tapeinosoma	(Bleeker, 1857)	VR
CALLIONYMIDAE		
Diplogrammus goramensis	(Bleeker, 1858)	R
***Minysynchiropus laddi**	(Schultz, 1960)	R
Synchiropus morrisoni	Schultz, 1960	R
Synchiropus ocellatus	(Pallas, 1770)	R
ELEOTRIDIDAE		
Calumia godeffroyi	(Günther,1877)	R
GOBIIDAE		

Amblyeleotris steinitzi	(Klausewitz, 1974)	VR
Amblygobius phalaena	(Valenciennes, 1837)	V
Callogobius species		R
Callogobius maculipinnis	(Fowler, 1918)	R
Callogobius sclateri	(Steindachner, 1880)	R
Eviota species 1		R
Eviota species 2		R
Eviota afelei	Jordan & Seale, 1906	R
Eviota albolineata	Jewett & Lachner, 1983	R
Eviota cometa	Jewett & Lachner, 1983	R
****Eviota fasciola***	Karnella & Lachner, 1981	R
****Eviota latifasciata***	Jewett & Lachner, 1983	R
Eviota melasma	Lachner & Karnella, 1980	R
Eviota monostigma	Fourmanoir, 1971	R
Eviota prasinia	Klunzinger, 1871	O
Eviota prasites	Jordan & Seale, 1906	R
****Eviota pseudostigma***	Lachner & Karnella, 1980	R
Eviota sparsa	Jewett & Lachner, 1983	R
Eviota zebrina	Lachner & Karnella, 1978	R
****Eviota zonura***	Jordan & Seale, 1906	R
Coryphopterus duospilos	Hoese & Reader, 1985	R
Coryphopterus neophytus	(Günther, 1877)	R
Gnatholepis cauerensis	(Bleeker, 1853)	O
Gnatholepis scapulostigma	Herre, 1953	R
Gobiodon citrinus	(Rüppell, 1838)	R
Gobiodon rivulatus	(Rüppell, 1830)	R
Gobiopsis species		R
Istigobius decoratus	(Herre, 1927)	R
Istigobius rigilius	(Herre, 1953)	VR
Macrodontogobius wilburi	Herre, 1936	R
Paragobiodon lacunicolus	(Kendall & Goldsborough, 1911)	R
Paragobiodon melanosomus	(Bleeker, 1852)	R
Paragobiodon xanthosomus	(Bleeker, 1852)	R
Pleurosicya species		R
Priolepis cincta	(Regan, 1908)	R
****Priolepis compita***	Winterbottom, 1985	R
Priolepis fallacincta	Winterbottom & Burridge, 1992	R
****Priolepis kappa***	Winterbottom & Burridge, 1992	R
Priolepis semidoliatus	(Valenciennes, 1837)	R
****Sueviota lachneri***	Winterbottom & Hoese, 1988	R
Trimma 5 species		R
Trimma caesiura	Jordan & Seale, 1906	RO
Trimma okinawae	(Aoyagi, 1949)	R
****Trimma taylori***	Lobel, 1979	R
Trimma tevegae	Cohen &Davis 1969	O
Trimma unisquamis	(Gosline, 1959)	R
Trimmatom eviotops	(Schultz, 1943)	R
Trimmatom namus	Winterbottom & Emery, 1981	R
Valenciennea puellaris	(Tomiyama, 1956)	VR
Valenciennea strigata	(Broussonet, 1782)	VR
KRAEMERIDAE		
****Kraemeria samoensis***	Steindachner, 1906	R
MICRODESMIDAE		
Nemateleotris magnifica	Fowler, 1928	VR

Ptereleotris evides	(Jordan & Hubbs, 1925)	VR
Ptereleotris hanae	(Jordan & Snyder, 1901)	V
SIGANIDAE		
Siganus argenteus	(Quoy & Gaimard, 1825)	V
Siganus punctatus	(Forster, 1801)	V
Siganus spinus	(Linnaeus, 1758)	V
ZANCLIDAE		
Zanclus cornutus	(Linnaeus, 1758)	V
ACANTHURIDAE		
Acanthurus albipectoralis	Allen & Ayling, 1987	V
Acanthurus blochii	Valenciennes, 1835	V
Acanthurus dussumieri	Valenciennes, 1835	V
Acanthurus guttatus	Forster, 1801	V
Acanthurus lineatus	(Linnaeus, 1758)	V
Acanthurus mata	Cuvier, 1829	V
Acanthurus nigricans	(Linnaeus, 1758)	V
Acanthurus nigricauda	Duncker & Mohr, 1929	VR
Acanthurus nigrofuscus	(Forsskal, 1775)	VR
Acanthurus olivaceus	Forster, 1801	VR
Acanthurus pyroferus	Kittlitz, 1834	VR
Acanthurus triostegus	(Linnaeus, 1758)	V
Acanthurus xanthopterus	Valenciennes, 1835	VR
Ctenochaetus binotatus	Randall, 1955	VR
Ctenochaetus striatus	(Quoy & Gaimard, 1825)	VR
Naso annulatus	(Quoy & Gaimard, 1825)	V
Naso brachycentron	(Valenciennes, 1835)	V
Naso brevirostris	(Valenciennes, 1835)	V
Naso hexacanthus	(Bleeker, 1855)	V
Naso lituratus	(Forster, 1801)	V
Naso tuberosus	Lacépéde, 1802	V
Naso unicornis	(Forsskal, 1775)	V
Paracanthurus hepatus	(Linnaeus, 1766)	V
Zebrasoma scopas	(Cuvier, 1829)	V
Zebrasoma veliferum	(Bloch, 1797)	V
SPHYRAENIDAE		
Sphyraena barracuda	(Walbaum, 1792)	VL
Sphyraena forsteri	Cuvier, 1829	L
Sphyraena putnamie	Jordan & Seale, 1905	L
SCOMBRIDAE		
Euthynnus affinis	(Cantor, 1849)	VL
Grammatorcynus bicarinatus	(Quoy & Gaimard, 1824)	VLR
Gymnosarda unicolor	(Rüppell, 1838)	VL
Katsuwonus pelamis	(Linnaeus, 1775)	VL
Rastrelliger kanagurta	(Cuvier, 1817)	V
Scomberomorus commerson	(Lacépéde, 1800)	VL
BOTHIDAE		
Bothus mancus	(Broussonet, 1782)	VR
Bothus pantherinus	(Rüppell, 1828)	R
PLEURONECTIDAE		
Samariscus triocellatus	Woods, 1966	R
SOLEIDAE		
Soleichthys heterorhinos	(Bleeker, 1856)	VR
BALISTIDAE		
Balistapus undulatus	(Park, 1797)	VR

Balistoides conspicillum	(Bloch & Schneider, 1801)	V
Balistoides viridescens	(Bloch & Schneider, 1801)	VL
Melichthys vidua	(Solander, 1844)	V
Pseudobalistes fuscus	(Bloch & Schneider, 1801)	VL
Rhinecanthus aculeatus	(Linnaeus, 1758)	V
Rhinecanthus rectangulus	(Bloch & Schneider, 1801)	V
Sufflamen bursa	(Bloch & Schneider, 1801)	VR
Sufflamen chrysopterus	(Bloch & Schneider, 1801)	VR
Sufflamen fraenatus	(Latreille, 1804)	VL
MONACANTHIDAE		
Amanses scopas	Cuvier, 1829	V
Cantherines dumerili	(Hollard, 1854)	V
Oxymonacanthus longirostris	(Bloch & Schneider, 1801)	V
Paraluteres prionurus	(Bleeker, 1851)	R
Pervagor janthinosoma	(Bleeker, 1854)	VR
Pervagor melanocephalus	(Bleeker, 1853)	V
OSTRACIIDAE		
Ostracion cubicus	Linnaeus, 1758	VR
Ostracion meleagris	Shaw, 1796	V
Tetrasoma gibbosus	(Linnaeus, 1758)	V
TETRAODONTIDAE		
Arothron hispidus	(Linnaeus, 1758)	VL
Arothron meleagris	(Lacépéde, 1798)	V
Arothron nigropunctatus	(Bloch & Schneider, 1801)	V
Canthigaster bennetti	(Bleeker, 1854)	V
Canthigaster janthinoptera	(Bleeker, 1855)	R
Canthigaster valentini	(Bleeker, 1853)	VR
Lagocephalus sceleratus	(Forster, 1788)	L
DIODONTIDAE		
Diodon hystrix	Linnaeus, 1758	V

Table 2. Shallow water and reef fish species diversity of the major families at Ouvéa and other areas of the Western Pacific. (Footnote sources are in parentheses.)

Family	Ouvéa	New Caledonia	Chesterfield	South GBR	North GBR	PNG	Norfolk, Lord Howe, Kermadec	Fiji	Rotuma
		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Acanthuridae	25	33	26	25	36	33	13	23	12
Apogonidae	27	65	47	34	47	80	10	40	27
Balistidae +Monacanthidae	10 + 6	14+10	9+10	11+11	17+19	17+15	5+10	14+11	6+3
Blenniidae	20	43	22	40	50	63	20	38	32
Caesionidae (1)	10	9	6	4	7	11	2	8	3
Carangidae	13	25	12	32	45	53	23	28	7
Chaetodontidae	31	32	23	32	45	44	23	32	14
Clupeidae (2)	2	10	1	5	10	27	2	11	0
Gobiidae	54	84	55	104	153	161	27	na	54
Haemulidae	5	9	3	8	10	18	4	4	0
Holocentridae	18	21	20	11	25	25	6	22	17
Labridae	69	84	73	69	106	93+	56	64	28
Lethrinidae (3)	17	18	14	9	20	25	5	17	11
Lutjanidae (4)	14	19	10	14	24	31	8	20	22
Mullidae	15	15	12	7	16	14+	10	18	9
Muraenidae	17	25	19	23	30	40	17	24	8
Nemipteridae (5)	2	9	2	7	11	15	1	8	0
Platycephalidae	0	9	10	4	10	17+	1	2	2
Pomacanthidae	13	15	12	15	24	23	7	16	3
Pomacentridae (6)	58	82	54	69	106	105	35	67	37
Abudefduf	2	6	0	6	6	7	5	5	0
Neopomacentrus	2	6	0	2	6?	7	0	1	1
Scaridae	20	26	21	23	27	27	13	22+	3
Scorpaenidae	20	23	27	21	26	34	13	17	10
Serranidae (7)	39	47	29	32	88	73	22	42	23
Siganidae (8)	3	9	2	8	10	13	1	6	1
Syngnathidae (9)	7	29	16	12	18	45	6	32	9
Synodontidae	6	7	7	8	8	12	6	5	4
Tetraodontidae	7	19	10	11	14	23	9	13	5
Longitude (°E)	167	165	159	154	143	140	165	178	177
Latitude (°S)	20	21	19	22	18	10	30	17	12
Rank in Landmass	6	3	8	1	1	2	5	4	7

1: Carpenter 1987,1988 2: Whitehead 1985; Whitehead et al., 1988 3: Carpenter and Allen, 1989
4: Allen and Talbot, 1985 5: Russell, 1990 6: Allen, 1991
7: Randall and Heemstra, 1991 8: Woodland, 1990 9: Dawson, 1985
10: Rivaton et al., 1989 11: LeBorgne et al., 1994 12: Russell, 1983; Lowe and Russell, 1990
13: Allen 1989; Randall et al., 1990, Paxton et al., 1978 14: Kailola, 1987a,b, 1991; Allen and Swainston, 1992
15: Francis, 1993 16: Carlson ms; Blaber et al., 1993 17: Zug et al., 1989

Table 3. Characteristics of the early life history traits of *Abudefduf* and *Neopomacentrus* spp. compared to other Pomacentridae.

Genus	Egg size (mm^3)	Larval duration (days)	Size at settlement (mm)
Abudefduf	.308-.450 (3)	23 (1); 17-20 (2); 22.1-24.2 (3)	10.4 (1); 11.2 (2)
Chromis	.091-.109 (3)	20-26 (1); 18-38 (2); 20.3-28.8 (3)	8.3 (1); 8-14.4 (2); 8.2-8.9 (3)
Chrysiptera	.347-.539 (3)	23-24 (1); 14-24 (2); 17.4-22.0 (3)	10.9 (1); 8.7-11.2 (2); 9.9-10.9 (3)
Dascyllus	.093-.181 (3)	20-28 (1); 16-30 (2); 22.4-24.2 (3)	7.0 (1); 6.4-10.1 (2);7.0 (3)
Neopomacentrus		24 (1); 16-24 (2);18.2 (3)	13.9 (1); 10.5 (2); 13.9 (3)
Paraglyphidodon	.850-.898 (3)	14-28 (2); 14.8 (3)	8.6-9.0 (2)
Plectroglyphidodon	.112-.180 (3)	19-33 (2); 24.3 (3)	
Pomacentrus	.210-.804 (3)	17-85 (1); 14-27 (2); 19.0-26.0 (3)	11.9-22.8 (1); 10.6-14.1 (2); 12.2-15.0 (3)
Stegastes	.112 (3)	19-39 (2); 32.0 (3)	9.5-13.6 (2)

1 - Brothers et al. 1983 2 - Wellington and Victor 1989 3 - Thresher and Brothers 1989