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CHAPTER 11

HERMATYPIC CORALS OF THE COCOS (KEELING) ISLANDS: A SUMMARY

BY

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ABSTRACT

Ninety nine species of reef corals are recorded from Cocos (Keeling) Atoll. Of these, all but twelve are known from Western Australia. Nine species are not recorded elsewhere in the eastern Indian Ocean and two (one being taxonomically doubtful) are possibly endemic.

This account is a summary only of *Re-examination of the reef corals of Cocos (Keeling) Atoll* (Veron 1990a)

SYSTEMATIC ACCOUNT

FAMILY Astrocoeniidae Koby

Genus *Stylocoeniella* Yabe and Sugiyama

Stylocoeniella guentheri (Bassett-Smith)

Records: Wells (1950), Veron (1990a)

Notes: Found on most reef slopes. Inconspicuous. Usually dark green, encrusting to submassive. Septa strongly alternate. Primary septa do not reach the boss-like columella.

Stylocoeniella armata (Ehrenberg)

Records: Veron (1990a)

Notes: Rare, inconspicuous. Septa clearly alternate. Primary septa reach the columella which is thin, style-like.

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Stylocoeniella cocosensis Veron 1990

Record: Veron (1990b)

Notes: Corallites are irregularly exsert. Septa are in two sub-equal cycles, fine. Columellae are very small. Coenosteum spinules very fine. Each corallite has a prominent style.

FAMILY Pocilloporidae Gray

Pocillopora is abundant in almost all coral communities, *Seriatopora* is usually uncommon. The other genera, notably *Stylopora*, have not been recorded.

Genus *Pocillopora* Lamarck

Pocillopora damicornis (Linnaeus)

Records: Ridley and Quelch (1885) (as *P. brevicornis*), Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Uncommon but found in a wide range of environments. Usually pink in colour. Indistinguishable from mainland Australian colonies.

Pocillopora verrucosa (Ellis and Solander)

Records: Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Common on most upper reef slopes. Yellow or pinkish in colour. Indistinguishable from mainland Australian colonies.

Pocillopora meandrina Dana

Records: Vaughan (1918), Wells (l950), (both as *P. elegans* Dana), Veron (1990a)

Notes: Common on most upper reef slopes. Distinguished from *P. verrucosa* by having smaller verrucae and as described by Veron and Pichon (1982).

Pocillopora woodjonesi Vaughan

Records: Vaughan (1918) with the Cocos (Keeling) Islands as type locality, Wells (1950), Veron (1990a)

Notes: Uncommon. Difficult to distinguish from *P. eydouxi*. Colonies identified as *P. woodjonesi* in situ did not have the species specific skeletal characters described by Vaughan (1918) and Wells (1950) and used by the present author. The `taxonomic status of this species requires further study.

Pocillopora eydouxi Edwards and Haime

Records: Vaughan (1918), Veron (1990a)

Notes: Common in most coral communities. Indistinguishable from mainland Australian colonies.

Genus *Seriatopora* Lamarck

Seriatopora hystrix Dana

Records: Vaughan (1918), Wells (1950) (both as *S. angulata* Klunzinger), Veron (1990a)

Notes: The few colonies observed during the present study were small and isolated. Indistinguishable from mainland Australian colonies.

Family Acroporidae Verrill

Genus *Montipora* de Blainville

Montipora monasteriata (Forskal)

Records: Veron (1990a)

Notes: Common in a wide range of environments. Indistinguishable from mainland Australian colonies.

Montipola tuberculosa (Lamarck)

Records: Veron (1990a)

Notes: Common. Indistinguishable from mainland Australian colonies.

Montipora lobulata Bernard

Records: Wells (1950), Veron (1990a)

Notes: Has not been recorded elsewhere in Australia.

Montipora mollis Bernard

Records: Veron (1990a)

Notes: Probably uncommon. Indistinguishable from mainland Australian colonies.

Montipora peltiformis Bernard

Records: Veron (1990a)

Notes: Common on some reef slopes.

Montipora capricornis Veron

Records: Veron (1990a)

Notes: Uncommon except in the atoll lagoon where this species is an early coloniser of denuded areas.

Montipora spumosa (Lamarck)

Records: Vaughan (1918) and Wells (1950)

Notes: Possibly now extinct at Cocos (Keeling).

Montipora danae (Edwards and Haime)

Records: Veron (1990a)

Notes: Uncommon. Indistinguishable from mainland Australian colonies.

Montipora angulata (Lamarck)

Records: Vaughan (1918) (as M. *cocosensis* Vaughan, with Cocos (Keeling) Island as type locality), Veron (1990a)

Notes: Uncommon. Found only on reef flat or sub-tidal sand flats with *M. digitata*. Thick branches becoming columnar, with conspicuous open corallites.

Montipora digitata (Dana)

Records: Ridley and Quelch (1886) (as *M. laevis* Quelch), Wells (1950) (as *M. laevis* Quelch *M. ramosa* Bernard and *M. rubra* Quoy and Gaimard), Veron (1990a)

Notes: Forms extensive monospecific stands on intertidal sand flats. Intermixed with *Montipora* sp. Indistinguishable from mainland Australian colonies.

Montipora sp.

Records: Veron (1990a)

Notes: A sub-arborescent species similar to *M. digitata*, primarily distinguished by high reticulum ridges between corallites and flattened branch tips with few corallites.

The present specimens do not belong to any previously recorded or described species known to the author.

Montipora efflorescens Bernard

Records: Veron (1990a)

Notes: Indistinguishable from mainland Australian colonies.

Montipora grisea Bernard

Records: Veron (1990a)

Notes: Indistinguishable from mainland Australian colonies.

Montipora informis Bernard

Records: Vaughan (1918), Veron (1990a)

Notes: Rare. Indistinguishable from mainland Australian colonies.

Montipora foliosa (Pallas)

Records: Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Uncommon.Indistinguishable from mainland Australian colonies.

Montipora aequituberculata Bernard

Records: Veron (1990a)

Notes: Common on some outer slopes. Usually dark grey or brown. Indistinguishable from mainland Australian colonies.

Genus *Anacropora* Ridley

Anacropora forbesi Ridley, 1884

Records: Ridley (1884), with Cocos (Keeling) Atoll as type locality

Notes: Many now be extinct at Cocos (Keeling).

Genus *Acropora* Oken

One of the most distinctive characters of Cocos (Keeling) Island corals is the low diversity and, usually, the low abundance of *Acropora*. The only extensive stands of living

Acropora are on reef flats. Very extensive stands of dead arborescent species, mainly *pulchra* and *formosa,* occur in the lagoon and extensive dead tabular colonies, no longer identifiable, occur at North Keeling Island.

Acropora palifera (Lamarck)

Records: Vaughan (1918), Veron (1990a)

Notes: Seldom common. Both reef slope and lagoon colonies are similar in growth form and corallite structures and represent only a small part of the variation described by Veron and Wallace (1984).

Acropom ocellata (Klunzinger)

Records: Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Uncommon. This species belongs with the *A. humilis* group, with a growth form similar to *A. humilis* (Dana). Axial corallites are similar in size and shape to those of *A.monticulosa* (Bruggemann). Radial corallites are large, round, irregular, some immersed, others large and elongated, becoming incipient axials. Living colonies are pale brown with white branch tips.

Acropora robusta (Dana)

Records: Wells (1950) (as *A. pinguis,* described as a new species from Cocos (Keeling) Atoll), Veron (1990a)

Notes: Very rare.

Acropora danai (Edwards and Haime)

Records: Wells (1950) (as *A. irregularis,* described as a new species from Cocos (Keeling) Atoll), Veron (1990a)

Notes: Rare. Growth form is the same as mainland Australian colonies. Corallites near branch tips may become relatively elongate.

Acropora sp. 1

Records: Vaughan (1918), Wells (1950) (as *A. pharaonis* Edwards and Haime), Veron (1990a)

Notes: Sometimes common in shallow water. Colonies are arborescent, forming thickets in shallow water where some branches may be fused. Branches are mostly straight and tapered. Radial corallites are of two sizes, the larger arranged in rows. They are similar in structure to those of A. *valenciennesi.*

Acropora formosa (Dana)

Records: Wells (1950), Veron (1990a)

Notes: Uncommon except on some reef flats. Reef flat colonies have short branches with proliferous sub-branches. No colonies with long undivided branches were seen. Mostly yellowish in colour.

Acropora microphthalma (Verrill)

Records: Veron (1990a)

Notes: Common on reef flats and some reef slopes. Indistinguishable from mainland Australian colonies.

Acropora exquisita Nemenzo

Records: Possibly Wells (1950) (as *A. irregularis* (Brook), Veron (1990a)

Notes: Uncommon. Indistinguishable from more robust colonies from mainland Australian North-west shelf reefs. Pale colours.

Acropora aspera (Dana)

Records: Vaughan (1918) (possibly as *A. spicifera*), Wells (1950) (as *A. hebes*), Veron (1990a)

Notes: Mostly uncommon and only found on reef flats. Reddish-brown in colour. Indistinguishable from mainland Australian colonies.

Acropora pulchra (Brook)

Records: Vaughan (1918), Veron (1990a)

Notes: Formerly very abundant throughout much of the southern lagoon, forming very extensive stands often over 20 m across. Now common on some reef flats and also found on some reef slopes. Indistinguishable from mainland Australian colonies.

Acropora cytherea (Dana)

Records: Veron (1990a)

Notes: Uncommon. The largest colonies observed were < 1 m diameter. Indistinguishable from mainland Australian colonies.

Acropora paniculata Verrill

Records: Veron (1990a)

Notes: Rare. It appears that this is a distinct geographic sub-species of *A. paniculata,* but as the latter is know in the Indian Ocean from only a single specimen (from Ashmore Reef, Veron and Marsh, 1988), no definite conclusion is possible.

Acropora hyacinthus (Dana)

Records: Veron (1990a)

Notes: Rare. Only stunted reef flat colonies were found.

Acropora latistella (Brook)

Records: Veron (1990a)

Notes: Rare, found only on reef flats. This species was not found as large tabular colonies. Branchlets are thinner than usual for shallow-water mainland Australian colonies.

Acropora nana (Studer)

Records: Wells (1950), Veron (1990a)

Notes: Found only on outer reef flats and upper slopes. Colonies are relatively small, otherwise indistinguishable from mainland Australian colonies.

Acropora subulata (Dana)

Records: Veron (1990a)

Notes: Rare. Nothing is known of environment-related growth form variation.

Acropora valida (Dana)

Records: Vaughan (1918) and Wells (1950) (as *A. variabilis* (Klunzinger)), Veron (1990a)

Notes: Rare, Gibson-Hill records this species from several reef flat localities (Wells 1950). Corallites are smaller and have thinner walls than usual for the species, but nothing is known of environment-related variation. Coralla from Cocos (Keeling) illustrated by Vaughan (1918, pl. 80) have the characters of the species more clearly developed. Gibson-Hill (and this author) records the colour as "dirty-white, with faint lavender-blue tips" (Wells 1950).

Acropora sp. 2

Records: Veron (1990a)

Notes: Rare. Colonies are irregularly arborescent. Corallites are very irregular, some being *valida*-like and strongly oppressed. The species was not sufficiently abundant for detailed study and nothing is known of environment-related skeletal variation.

Acropora schmitti Wells

Records: Wells (1950), described as a new species from Cocos (Keeling) Atoll, Veron (1990a)

Notes: Not found during the present study. Gibson-Hill notes, "This coral, which is rather similar to [*A. valida*] in both colour and form, occurs in shallow pools on the middle section of the barrier, and on part of its seaward edge. It is not very plentiful, but it seems to be most numerous at the back of Pulo Tikus, where [five] specimens were taken" (Wells 1950). Wells (1950) notes that "the distinctive character of this species is the extraordinary thickness of the outer lip of the radial corallites, which gives them the appearance of hemispherical bowls attached to the branch by one side or by a very short thick handle".

Genus *Astreopora* de Blainville

Astreopora myriophthalma (Lamarck)

Records: Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Common in a wide range of environments. Indistinguishable from mainland Australian colonies. Colours vary from dark purple to cream and pale pink.

Astreopora gracilis (Bernard)

Records: Veron (1990a)

Notes: Usually uncommon. Indistinguishable from mainland Australian colonies. Colours are cream and pale pinkish-purple.

Family Poritidae Gray

Goniopora and *Alveopora* have not been recorded from Cocos (Keeling) Atoll.

Genus *Porites* Link

Porites solida (Forskal)

Records: Vaughan (1918) and Wells (1950), Veron (1990a)

Notes: Uncommon. Two specimens studied were indistinguishable from mainland Australian coralla.

Porites lobata Dana

Records: Veron (1990a)

Notes: Indistinguishable from mainland Australian colonies.

Porites australiensis Vaughan

Records: Veron (1990a)

Notes: Corallites have a very distinct wall formed by lateral fusion of denticles.

Porites somaliensis Gravier

Records: ?Guppy (1889) (as *P. clavaria*), Vaughan (1918), Veron (1990a)

Notes: The most abundant massive *Porites* on some reet flats. Colonies from shallow water usually have a knobbly growth form. Corallites are closest to *P. stephensoni* but the present species appears to be distinct from any mainland Australian species. The triplet is sometimes fused and columellae are laterally compressed in the line of the directive septa forming a conspicuous line.

Porites cf. *evermanni* Vaughan

Records: Veron (1990a)

Notes: Rare, but very distinctive. Indistinguishable from specimens of this species recorded from Australia, the Philippines (Veron and Hodgson 1989) and elsewhere.

Porites cylindrica Dana

Records: Guppy (1889) (as *P. palmata*), Ridley and Quelch (1885) (as *P. levis Dana*), Vanghan (1918) (as *P. nigrescens*), Wells (1950) (as *P. nigrescens* and *P. gibsonhilli*). Cocos (Keeling) atoll is the type locality of *P. gibsonhilli* Wells. *Porites cocosensis* Wells, described from two specimens from Cocos (Keeling) Atoll, may also be a synonym of *P. cylindrica*

Notes: The most common species of intertidal reef flats and forms extensive stands on some upper reef slopes. Indistinguishable from mainland Australian coralla.

Porites lichen Dana

Records: Vaughan (1918)

Notes: Indistinguishable from mainland Australian coralla.

Porites rus (Forskal)

Records: Veron (1990a)

Notes: Common. Forms extensive flat plates with short, irregular columns and branches. Usually fawn or brown.

Porites sp.

Records: Veron (1990a)

Notes: Forms plates and irregular branches and columns. Corallites are essentially similar to those of *P. rus* and *P. latistellata* Quelch, but are smaller than both. The species appears to be undescribed. Usually brightly coloured: green, blue or yellow.

Family Siderastreidae Vaughan and Wells

Pseudosiderastrea and *Coscinaraea* have not heen recorded from Cocos (Keeling).

Genus *Psammocora* Dana

Psammocora digitata Edwards and Haime

Records: Wells (1950) (as *P. togianensis* Umbgrove)

Psammocora superficialis Gardiner

Records: Vaughan (1918) (as *Psammocora* sp.), Veron (1990a)

Notes: Uncommon. Indistinguishable from mainland Australian colonoies. Colonies are encrusting and may be over 1 m diameter. These large colonies have relatively coarse skeletal characters. Colour is very uniform within colonies, mostly battleship grey, rarely bright green.

Psammocora profundacella Gardiner

Records: Vaughan (1918) and Wells (1950) (as *P. haimeana*), Veron (1990a)

Notes: Very common in a wide range of environments. Indistinguishable from mainland Australian colonies. It may form coralliths. Usually pale pink or green, but may be dark green. Sometimes with blue centres. Gibson-Hill,

referring to reef-flat colonies, notes that "it is a pearl-grey colour" (Wells 1950)

Family Agriciidae Gray

Genus *Pavona* Lamarck

Pavona cactus (Forskal)

Records: Wells (1950), Veron (1990a)

Notes: Common only in small isolated patches. Indistinguishable from mainland Australian colonies

Pavona frondifera Lamarck

Records: Veron (1990a)

Notes: Common only in small isolated patches intermixed with *P. cactus*. Colonies are partly encrusting and have small, irregular, upright fronds. Dark greenish-brown with pale fronds.

Pavona decussata (Dana)

Records: Vaughan (as *P. danai* (Edwards and Haime), Wells (1950), Veron (1990a)

Notes: Known from two reef flat colonies only. Coralla are colllposed of highly anastomosed plates, a growth form common on reef flats. Skeletal detail is indistinguishable from mainland Australian coralla.

Pavona explanulata (Lamarck)

Records: Veron (1990a)

Notes: Usually uncommon but conspciuous. Colonies are massive or columnar. Pale or dark brown in colour. Plate-like colonies common in Australia, were seldom seen.

Pavona minuta Wells

Records: Veron (1990a)

Notes: Common on some exposed reef sites. Colonies are massive or columnar, rarely encrusting. All colonies observed were < 0.5 m. Grey in colour.

Pavona varians Verrill

Records: Vaughan (1918), Veron (1990a)

Notes: Very common in a wide range of reef slope environments. Forms large encrusting plates under overhangs. Very dark colours except in niches exposed to strong sunlight.

Pavona venosa (Ehrenberg)

Records: Veron (1990a)

Notes: Septa are very coarse making the single specimen found very distinctive.

Pavona maldivensis (Gardiner)

Records: Vaughan (1918), Veron (1990a)

Notes: Rare. Indistinguishable from mainland Australian colonies.

Pavona sp.

Records: Veron (1990a)

Notes: Rare. Colonies are flat unifacial plates. Corallites are very small similar to those of *P. bipartita* Nemenzo, but with smaller calice centres and tendency to become subplocoid.

Genus *Leptoseris* Edwards and Haime

Leptoseris papyracea (Dana)

Records: Veron (1990a)

Notes: Forms an extensive carpet of some hundreds of square metres at one lagoonal site. Indistinguishable from fine, highly compact mainland Australian colonies. Pale pinkish-brown in colour.

Leptoseris explanata Yabe and Sugiyama

Records: Veron (1990a)

Notes: Rare. The single specimen studied is indistinguishable from mainland Australian colonies.

Leptoseris mycetoseroides Wells

Records: Veron (1990a)

Notes: Rare. Indistinguishable from mainland Australian colonies.

Genus *Gardineroseris* Scheer and Pillai

Gardineroseris planulata (Dana)

Records: Veron (1990a)

Notes: Uncommon although found in a wide variety of habitats. Colonies flat or dome-shaped, up to 1 m high, pale brown in colour. Indistinguishable from mainland Australian colonies.

Genus *Pachyseris* Edwards and Haime

Pachyseris speciosa (Dana)

Records: Veron (1990a)

Notes: Forms very extensive monospecific stands south of 'Boat Passsage'. Indistinguishable from mainland Australian colonies.

FAMILY Fungiidae Dana

Genus *Fungia* Larnarck

Fungia fungites (Linnaeus)

Records: Wells (1950), Veron (1990a)

Notes: Uncommon. Indistinguishable from mainland Australian coralla.

Fungia concinna Verrill

Records: Veron (1990a)

Notes: This is the only record of the species. The single specimen collected is indistinguishable from mainland Australian coralla.

Fungia granulosa Klunzinger

Records: Veron (1990a)

Notes: This is the only record of the species. Indistinguishable from mainland Australian coralla.

Fungia scutaria Verrill

Records: Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Common on reef slopes. Indistinguishable from mainland Australian coralla except for colour. Usually cream with blue or white tentacular lobes, occasionally pink.

Genus *Herpolitha* Eschscholtz

Herpolitha limax Houttuyn

Records: Vaughan (1918) (as *H. crassa* Dana), Wells (1950), Veron (1990a)

Notes: Seen, but not examined by the author.

Genus *Sandalolitha* Quelch

Sandalolitha robusta (Quelch)

Records: Veron (1990a)

Notes: Usually rare. Colonies are up to 0.5 m diameter, flattened. Small colonies are oval, larger ones are contorted according to irregularities in the substrate. The flattened irregular appearance combined with wide corallum margins free of centres, suggests a different species from that found in Australia is involved. There are, however, no skeletal details which reliably distinguish Cocos (Keeling) coralla from those of Australia. *Sandalolitha dentata* Quelch may be a distinct species with the growth form of the present species, but this has yet to be established.

FAMILY Pectiniidae Vaughan and Wells

This family is represented only by *Oxpora lacera*

Genus *Oxypora* Saville-Kent

Oxypora lacera (Verrill)

Records: Veron (1990a)

Notes: Rare. Indistinguishable from mainland Australian colonies.

FAMILY Mussidae Ortmann

This family is represented only by *Lobophyllia hemprichii*

Genus *Lobophyllia* de Blainville

Lobophyllia hemprichii (Ehrenberg)

Records: Veron (1990a)

Notes: Usually uncommon but very conspicuous. Indistinguishable from mainland Australian colonies and shows the full range of the species except that very large colonies were not found. Often brick red in colour.

FAMILY Merulinidae Verrill

This family is represented only by *Hydnophora microconos*.

Genus *Hyndophora* Fischer de Waldheim

Wells (1950) lists *H. exesa* (Pallas) as recorded from Cocos (Keeling) by Vaughan (1918). This appears to be a mistake.

Hydnophora microconos (Lamarck)

Records: Vaughan (1918), Veron (1990a)

Notes: Uncommon but occurs in a wide range of habitats. Indistinguishable from mainland Australian colonies.

FAMILY Faviidae Gregory

Genus *Favia* Oken

Favia stelligera (Dana)

Records: Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Common in most communities with moderate diversity. Indistinguishable from mainland Australian colonies.

Favia pallida (Dana)

Records: Vaughan (1918) (as *F. speciosa*), Veron (1990a)

Notes: Colonies are small submassive to encrusting. They are mostly mottled dark colours.

Favia matthaii Vaughan

Records: Veron (1990a)

Notes: Uncommon. Corallites are smaller than those of eastern mainland Australian colonies but similar in size to those from equatorial localities. Skeletal detail is similar throughout this range.

Genus *Barabattoia* Yabe and Sugiyama

Barabattoia amicorum (Edwards and Haime)

Records: Veron (1990a)

Notes: Rare. Indistinguishable from mainland Australian colonies. All specimens observed were dark brown in colour.

Genus *Favites* Link

Favites abdita (Ellis and Solander)

Records: Vaughan (1918), Veron (1990a)

Notes: Usually uncommon. Colonies are small, usually encrusting. Corallites of colonies in high energy environments may have greatly thickened walls.

Favites pentagona (Esper)

Records: Vaughan (1918) (as *F. melicerum* Ehrenberg), Veron (1990a)

Notes: Common. Coralla have most of the range of corallite characters described by Veron et al. (1977) except that all have exsert irregular septa and no ecomorphs associated with very strong wave action were found. The size of corallites overlaps with those of eastern mainland Australian colonies, but most are slightly smaller.

Genus *Leptoria* Edwards and Haime

Leptoria phrygia (Ellis and Solander)

Records: Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Usually uncommon. Always a uniform dark grey. Indistinguishable from mainland Australian colonies.

Genus *Montastrea* de Blainville

Montastrea curta (Dana)

Records: Veron (1990a)

Notes: Usually uncommon. Colonies are small, encrusting, pale coloured. Corallites are small (most <6mm diameter with calices <3mm) and are uniform in size. This identification is tentative only because the species is very variable and lacks conservative character and also because no colonies were found on reef flats where it would be expected to be most abundant.

Genus *Plesiastrea* Edwards and Haime

Plesiastrea versipora Edwards and Haime

Records: Vaughan (1918), Veron (1990a)

Notes: Rare. Colonies are pale cream, submassive to encrusting. Skeletal structure is indistinguishable from mainland Australian colonies.

Genus *Leptastrea* Edwards and Haime

Leptastrea transversa Klunzinger

Records: Veron (1990a)

Notes: Uncommon. The characters of the species are better defined than in most mainland Australian coralla. Corallites are of relatively uniform size, with well-defined walls.

Leptastrea pruinosa Crossland

Records: Veron (1990a)

Notes: Uncommon. Indistinguishable from mainland Australian colonies. Usually brightly coloured.

Leptastrea bottae (Edwards and Haime)

Records: Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Common over a wide range of environments. Colonies are submassive or encrusting. Corallites are relatively uniform in size, circular, with well defined walls. Septa are thin, with little ornamentation. Colonies from exposed environments are mostly creamy coloured with very dark calices.

Genus *Cyphastrea* Edwards and Haime

Cyphastrea serailia (Forskal)

Records: Wells' (1950) record of *C. chalcidicum* (Forskal) appears to be this species. Veron (1990a)

Notes: Common in a wide range of environments. Indistinguishable from mainland Australian colonies.

Cyphastrea microphthalma (Lamarck)

Records: Vaughan (1918), Veron (1990a)

Notes: Common. Indistinguishable from mainland Australian colonies.

Cyphastrea agassizi (Vaughan)

Records: Veron (1990a)

Notes: Uncommon. Colonies are encrusting with widely spaced, exsert, corallites. Colonies are nearly uniform white in colour. May form coralliths.

Genus *Echinopora* Lamarck

Echinopora lamellosa (Esper)

Records: Ridley and Quelch (1885), Vaughan (1918), Wells (1950), Veron (1990a)

Notes: Only three small colonies were observed *in situ*. Indistinguishable from mainland Australian colonies.

FAMILY Dendrophylliidae Gray

Genus *Turbinaria* Oken

Turbinaria reniformis Bernard

Records: Veron (1990a)

Notes: Usually rare but forms very extensive monospecific stands at 2-20 m depth north of 'Boat Passage'. Indistinguishable from mainland Australian colonies and has the same yellow polyps as Great Barrier Reef colonies. Polyps were extended during the day.

BIOGEOGRAPHIC AFFINITIES

Many common and widespread Indo-Pacific taxa have not been recorded from Cocos (Keeling) and are almost certainly absent. There are no Oculinidae or Caryophylliidae. The Pectiniidae, Mussidae and hermatypic Dendrophylliidae are represented by only one species each. There are no recorded *Stylophora, Goniopora, Alveopora, Coscinaraea, Cycloseris, Polyphyllia, Lithophyllon, Podabacia, Goniastrea, Platygyra* and many minor east Indian Ocean genera.

Of the genera that are present, only *Sandalolitha* does not have a distribution range crossing the Indian Ocean (Veron 1986).

At species level, the isolation of the atoll from Australia is reflected in:

(a) the number of species which are known from western Australia but are absent from the atoll: (223 species or 70 % of the western mainland Australian total of 318 species).

(b) the number of species which are present but have not been recorded from anywhere in Australia (12 species: *Stylocoeniella cocosensis*, *Montipora lobulata*, *Montipora* sp., *Acropora ocellata*, *Acropora* sp. 1, *Acropora* sp. 2, *Acropora schmitti*, *Porites somaliensis*, *Porites* sp., *Pavona Frondifera*, *Pavona* sp., *Cyphastrea agassizi*), and

(c) the substantial proportion of species (perhaps 30 %) which are present but show points of difference from their western mainland Australian counterparts (e.g. differences in colour, habitat preferences as well as skeletal and growth form differences).

It may be noted that of the 12 species not recorded from Australia ('b' above), 3 have been recorded from the Philippines (Veron and Hodgson 1989). The remaining 9 have not been previously recorded from any eastern Indian Ocean locality, but only *Stylocoeniella* sp. (a doubtful species), *Porites* sp. and *Pavona* sp. have not been previously recorded anywhere. Although it is possible that the latter are endemic, the corals of Indonesia are poorly known and they, along with most or all Cocos (Keeling) species, may well occur in Indonesia.

The principal difference between the corals of Cocos (Keeling) and Christmas Islands, is in the much greater number of species of *Montipora* at Cocos (Keeling) and the greater genetic richness of Christmas Island. The latter however, is a high island with a very restricted range of habitats, especially sheltered ones. The presence or absence of corals is therefore likely to be as much a function of habitat diversity as geographic isolation or relative dispersal ability. The only general observation of this data made here is that there is no clear evidence that Christmas Island has acted as a 'stepping stone' for the dispersal of corals to Cocos (Keeling).

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