

# SEA ANEMONES (ACTINIARIA AND CORALLIMORPHARIA) OF MADANG PROVINCE<sup>1</sup>

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## ABSTRACT

*Eighteen species of Actiniaria and four of Corallimorpharia have been identified from waters less than 30 m deep in Madang Province. These include eight actinians host to nine species of anemonefishes.*

## INTRODUCTION

During four and a half months (October-December 1985, August-November 1987), I identified twenty-two species of sea anemones in Madang Province. These included eighteen species of Actiniaria (sea anemones in the strict sense) and four species of Corallimorpharia (coral-like sea anemones), all previously known from the marine biogeographical province of which Papua New Guinea is a part, if not from Papua New Guinea specifically. I have seen representatives of some of these taxa near Port Moresby. Thus it is likely that most or all of the listed species occur throughout Papua New Guinea in appropriate habitats.

This list is not intended to be exhaustive. For one thing, observations were made intertidally and by skin- and scuba-diving at depths no greater than 30 m. For another, these were in the lagoon or on the barrier reef just north of Madang city (5°05-13'S, 149°48-50'E), at Rempi (5°02'S, 149°48'E), around Laing Island, Hansa Bay (4°11'S, 144°52'E), and near Christmas Bay, Bagabag Island (4°49'S, 146°12'E). Thus most benthic areas of Madang Province were not studied. Moreover, I am in the process of identifying specimens of several other actiniarian and corallimorpharian species, some of which may be new to science.

For each species, I provide information on taxonomy, abundance, physical characteristics, typical habitat, and other noteworthy biological features, especially symbiosis. Nine of the twenty-six species of anemonefishes (Pomacentridae) and all ten species of host actinians occur in Madang Province, the greatest diversity of both known in any one place. For those species, I have amended and extended my previous table (Dunn, 1981) indicating which combinations of fishes and anemones occur together in Madang Province (Table 1).

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Sea anemones of Madang Province

Table 1: Matrix of all clownfishes (*P. ennas* and *Amphiprion*) and their host anemones recorded from Madang Province. X indicates previously known combinations of fish and anemone that have been observed in Madang. N indicates a combination found in Madang that had not been previously reported. O indicates a combination known from elsewhere that I have not seen in Madang.

	CA	EQ	HA	HC	HM	HU	MD	SG	SH	SM
<i>P. biaculeatus</i>		X								
<i>A. chrysopterus</i>		N	O	X	O				O	X
<i>A. clarkii</i>	O	X	X	X	X	X	O	X	X	X
<i>A. leucrokranos</i>				X						X
<i>A. melanopus</i>		X		X	O					
<i>A. percula</i>				O	X		X			
<i>A. perideraion</i>				X	X		O	X		
<i>A. polymnus</i>				O					X	
<i>A. sandaracinos</i>				X						X

- CA = *Cryptodendrum adhaesivum* Klunzinger, 1877  
 EQ = *Entacmaea quadricolor* (Rueppell and Leuckart, 1828)  
 HA = *Heteractis aurora* (Quoy and Gaimard, 1833)  
 HC = *Heteractis crispa* (Ehrenberg, 1834)  
 HM = *Heteractis magnifica* (Quoy and Gaimard, 1833)  
 HU = *Heteractis malu* (Haddon and Shackleton, 1893)  
 MD = *Macrodactyla doreensis* (Quoy and Gaimard, 1833)  
 SG = *Stichodactyla gigantea* (Forsskal, 1775)  
 SH = *Stichodactyla haddoni* (Saville Kent, 1893)  
 SM = *Stichodactyla mertensii* Brandt, 1835

## ORDER ACTINIARIA

### Family Actiniidae

#### *Actinogeton sesere* (Haddon & Shackleton, 1893)

Locally abundant intertidally. Small (oral disc diameter 15-20 mm) clonal anemones that occur in tightly packed groups of several to tens of individuals. White column seldom seen because gravel is attached to numerous green verrucae (adhesive warts) on it. Short (5 mm or so) greenish or brown tentacles at edge of green oral disc, around the outer edge of which are conspicuous white marginal ovoid pseudospherules.

Found in holes and cracks of rocks on some exposed shores.

#### *Anthopleura handi* Dunn, 1978

Uncommon. Column brown, no more than 10-12 mm long, with dark longitudinal stripes and white or yellow verrucae longitudinally arrayed in upper half. Light coloured spherules at top of column.

below white-speckled brown tentacles that may reach 12-15 mm in length. Oral disc brown with dark radial lines. Known to brood its young internally in Malaysia.

Inhabits holes of dead coral and stones at mean tide level in quiet water, often near or in mangroves.

*Entacmaea quadricolor* (Rueppell & Leuckart, 1828)

Abundant, especially on reef tops where column is attached deep in cracks or among branches of coral so that only brown (rarely green or pink) tentacles are seen. They are distinctive, most being bulbous, either at the tip or just below it; bulb often ringed with white and/or green. Generally many small anemones (oral disc diameter 50-100 mm) occur close together as a result of asexual propagation, so a field of tentacles rather than individual animals are apparent.

Many specimens of the anemonefish *Amphiprion melanopus* commonly inhabit such a cluster. Two specimens of the anemonefish *Premnas biaculeatus* may occupy a cluster, but more commonly inhabit larger (oral disc up to 200 mm diameter) solitary anemones, typically in deeper water. Rarely, this species is associated with *A. clarkii* or *A. chrysopterus*. When clownfish are removed, these anemones may be eaten by butterfly fishes.

Located from shoreline to outer side of barrier reef.

*Macrodactyla doreensis* (Quoy & Gaimard, 1833)

Rare. Burrowed into soft, commonly muddy, sediments, oral disc (up to 500 mm diameter) at surface. Disc and long, pointed tentacles held erect above it are brownish, usually with radial white stripes. Column dark above with pale eye-shaped verrucae, light below except for irregular yellow to red streaks.

This anemone is known to occur with the anemonefish *Amphiprion clarkii* in some places, but has never been seen harboring fish in Madang.

Found only in Nagada Harbor.

### Family Actinodendronidae

*Actinodendron ?arboreum* (Quoy & Gaimard, 1833)

Patchily abundant on clean, protected sandy areas, usually below 5 m. Elongate column tan with irregular brown speckles; buried in sand. Short, simple and branched tentacles borne all around 24-48 branches of oral disc (up to 250 mm diameter) that has radial white stripes emanating from mouth. Held erect so animal resembles a sand-colored broccoli or soft coral colony. Upon being disturbed, may completely and rapidly retract into sand. Capable of the most powerful sting of any actinian - hence its common name Hell's Fire Anemone.

At least two species of shrimps occur among the numerous tentacles, and a small crab may be found on the oral disc.

Found on slopes of islands in lagoon.

*Megalactis ?griffithsii* (Saville Kent, 1893)

Rare, found only in deep water. Tan column buried in sediment, with oral disc at surface. Simply branched tentacles borne along sides of 16-24 long (up to 100 mm), narrow extensions of tan oral disc (up to 80 mm) that are spread flat on substratum surface. White stripes around mouth.

Found at 20 m and below on slopes of islands and patch reefs in lagoon.

**Family Boloceroididae**

*Bolocera mcmurrichi* (Kwietniewski, 1898)

Probably abundant but rarely seen. Usually several occur together, attached to dead branching coral below the general surface level of reefs. Average size: body no more than 1-3 mm across and tall; numerous tentacles to 10 mm long. Brownish, unpatterned. The only anemone that swims by coordinated paddling of its tentacles, which can be provoked by prodding.

Found on top of patch reefs.

**Family Phymanthidae**

*Phymanthus* sp.

Locally abundant. Found in clusters attached to beneath branching corals in shallow water. Brown oral disc with radial stripes alternately darker and lighter than itself. In expansion to 60 mm diameter, but contracts greatly upon disturbance. Tentacles mostly on outer part of oral disc; with lateral protuberances, light spots on oral face, and occasionally have mauve tips. Column vase-shaped, with verrucae.

Found off islands in lagoon.

**Family Stichodactylidae**

*Heteractis aurora* (Quoy & Gaimard, 1833)

Uncommon brownish anemone distinguished by moderate length moniliform tentacles. Basically brown; oral disc usually with radial white stripes, tentacles may be ringed with white or only the bulges may be lighter. Oral disc at surface; lower portion of light-coloured vase-shaped column that is burrowed into sediments may be streaked with red.

Symbiotic with anemonefish *Amphiprion clarkii*.

Found in sediments along shore and some patch reefs.

*Heteractis crispata* (Ehrenberg, 1834)

Common but inconspicuous white/grey anemone living buried in sediment on coral reefs and reef flats. Long, thin, pointed tentacles rise from unpatterned tan or colourless (rarely brilliant green) oral disc (up to 600 mm but commonly no more than half that) at substratum surface. Tentacles usually

white/grey, sometimes tipped with blue, bright yellow/green, or mauve, but rarely entirely that color; those of specimens with one fish or none at all are commonly stubby. Gravel adheres to verrucae in upper part of leathery whitish column.

This anemone, being widely distributed, is host to more species of clownfishes than any other. In Madang, it is also the most popular host, being associated with *Amphiprion chrysopterus*, *A. clarkii*, *A. leucokranos*, *A. melanopus*, and *A. perideraion*.

Found on all patch reefs, islands, and lagoon shores examined; also outer-slope of barrier reef.

### *Heteractis magnifica* (Quoy & Gaimard, 1833)

Common large (oral disc rarely up to 1000 mm diameter, generally no more than half that) anemone. The most conspicuous of those hosting clownfishes, and the most frequently photographed, probably because it often attaches to prominences, it remains open except when greatly disturbed, and its column can be deep red, cerulean blue, avocado green, pink, or white, although often it is chestnut brown. Tentacles of moderate length, uniform diameter, with blunt ends that are sometimes light- or blue-tipped. Verrucae of column may adhere to coral around anemone.

*Amphiprion periderion* and *A. percula* occur with it, the latter more commonly. I twice found *A. clarkii* sharing it with *A. perideraion*. The black and white damselfish *Dascyllus trimaculatus* frequently shares this host with true anemonefishes.

On outer slope of barrier reef and central patch reefs, but absent near shore. Also on Laing and Bagabag Islands.

### *Heteractis malu* (Haddon & Shackleton, 1893)

Rare. Vase-shaped column (like that of *H. aurora* and *H. crispa*) buried in shallow sediments, with oral disc (to 400 mm diameter) at surface. Tentacles shorter than those of *H. crispa*, fawn brown, most marginal. Column brown, wall thinner than that of *H. crispa*, with gravel adherent to verrucae, and occasionally red or yellow splotches near pedal end.

Mostly without symbiotic fish; occasionally harbours a small specimen of *Amphiprion clarkii*.

Seen in Rempi lagoon.

### *Stichodactyla gigantea* (Forsskal, 1775)

Rare. Oral disc (to 500 mm diameter) undulating, covered with short, pointed, often pink or deep blue tentacles that vibrate constantly, and are so extraordinarily sticky that clumps pull off upon being touched. Short column burrowed into sand.

The clownfishes *Amphiprion percula* and *A. perideraion* occur with this anemone, as do small crabs and shimps.

Found in sandy shallows of both coral reefs and lagoons.

### *Stichodactyla haddoni* (Saville Kent, 1893)

Locally common in clean sand below 5 m. Column buried in sand; oral disc (to 500 mm), covered by dense, short tentacles except around mouth, arrayed in deep waves. Tentacles bluntly pointed to

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slightly bulbous, may sting or stick to human hand. Patches of them may differ in colour from others, alternate ones at very edge robust.

*Amphiprion polymnus* is the only clownfish associated with this anemone in Madang, where it resides with no other host. I have seen the female fish enter the mouth of the anemone. Clouds of *Dascyllus trimaculatus* may hover over it. Small shrimps and crabs are common symbionts, too.

Found on slopes of islands in lagoon.

### *Stichodactyla mertensii* Brandt, 1835

Locally common on coral reefs. Thin, broad oral disc (to over 1m - the greatest diameter of any sea anemone) held open by orange verrucae on white upper column adhering to surrounding rocks. Some of the very numerous tentacles covering it except right around the mouth may be white rather than brown, and up to twice as long as the others.

Unlike most anemones, in which an individual hosts anemonefish of only a single species, occasional specimens harbour fish of two species. In Madang, associated fishes are *Amphiprion chrysopterus*, *A. clarkii*, *A. leucokranos*, and *A. sandaracinos*. Also *Dascyllus trimaculatus*.

Found on outer side of barrier reef, patch reefs except those near shore, Bagabag Island.

## Family Thalassianthidae

### *Cryptodendrum adhaesivum* Klunzinger, 1877

Uncommon. Extends from deep rocky holes into which it can rapidly and completely withdraw. When expanded, its oral disc (to 300 mm diameter) lies flat on the substratum. Dense, extremely short tentacles of two sorts - globular in a band near the oral disc edge, branched in its central part. Commonly they are of different colours, and those on the disc may vary in radial patterns. Known combinations are tan and brown, pink and yellow, green and white, tan and blue-grey. They are very sticky - giving rise to the specific name - and may sting. Mouth area may be brightly coloured.

This anemone occurs with the anemonefish *Amphiprion clarkii* in some places, but I have never seen it harbouring fish in Madang.

Found on patch reefs in center of lagoon, outside of barrier reef, and Laing Island; usually deeper than 15 m.

### *Heterodactyla hemprichii* Ehrenberg, 1834

Uncommon. Found mostly attached to and beneath branching corals. Oral disc (to 300 mm diameter) flat in expansion, white, brown, or green; bears two sorts of tentacles. Globes at edge commonly blue with yellow/green spots; hand-shaped tentacles several millimeters long arrayed radially on disc from mouth to edge brown or deep red; at disc edge they may be white. Column vase-shaped, light color, with verrucae.

Found on outer side of barrier reef and patch reefs in center of lagoon.

*Heterodactyla hypnoides* Saville Kent, 1893

Rare. Usually under dead coral. Similar to *H. hemprichii* but smaller, discal tentacles more widely spaced and less colourful.

Found on patch reefs.

ORDER CORALLIMORPHARIA

Family Actinodiscidae

*Amplexidiscus fenestrafer* Dunn & Hamner, 1980

Uncommon. Expanded, tan oral disc (up to 500 mm diameter - the greatest of any corallimorpharian - although typically half that) flat, covered with numerous, sparsely-arrayed short conical tentacles of same colour; edge scalloped, with few, radially pointed marginal tentacles. In contraction, oral disc drawn upward and inward, with white underside visible around central opening; in this posture, animal resembles a draw-string purse.

May be in clusters on outer side of barrier reef; usually solitary on patch reefs.

*Rhodactis howesii* Saville Kent, 1893

Scarce. Expanded flat oral disc to 50 mm diameter. Tentacles mostly light brown, some white or yellow; those at edge simple cones pointing radially; those covering disc right to mouth 2-3 mm long, highly branched, resembling a many-fingered hand. As with most corallimorpharians, mesenterial filaments may emerge through ruptured tips of tentacles when animal is disturbed and/or feeding.

Solitary or in clusters in shallow parts of patch reefs, often in rubble.

*Rhodactis ?rhodostoma* (Ehrenberg, 1834)

Rare. Clonal, with individuals touching one another. Up to 150 mm diameter, entirely translucent brown colour (due to zooxanthellae). Discal tentacles widely spaced, up to 15 mm long with few short and simple branches at distal end. Marginal tentacles simple, point radially.

Seen only near shore at moderate depths.

*Rhodactis* sp.

Rare. Like *R. howesii* except that tentacles (each brown, white, green, or a combination so that oral disc appears variegated) are more widely spaced, and there is a naked zone between discal and marginal tentacles.

Solitary; found on top of patch reefs.

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