Abundance and clonal replication in the tropical corallimorpharian *Rhodactis rhodostoma*

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**Abstract.** The corallimorpharian *Rhodactis rhodostoma* appears to be an opportunistic species capable of rapidly monopolizing patches of unoccupied shallow substrate on tropical reefs. On a fringing coral reef at Eilat, Israel, northern Red Sea, we examined patterns of abundance and clonal replication in *R. rhodostoma* in order to understand the modes and rates of spread of polyps across the reef flat. Polyps were abundant on the inner reef flat (maximum 1510 polyps m⁻² and 69% cover), rare on the outer reef flat, and completely absent on the outer reef slope at >3 m depth. Individuals cloned throughout the year via 3 distinct modes: longitudinal fission, inverse budding, and marginal budding. Marginal budding is a replicative mode not previously described. Cloning mode varied significantly with polyp size. Approximately 9% of polyps cloned each month, leading to a clonal doubling time of about 1 year. The rate of cloning varied seasonally and depended on day length and seawater temperature, except for a brief reduction in cloning during midsummer when polyps spawned gametes. Polyps of *R. rhodostoma* appear to have replicated extensively following a catastrophic low-tide disturbance in 1970, and have become an alternate dominant to stony corals on parts of the reef flat.

**Additional key words:** Cnidaria, coral reef, sea anemone, asexual reproduction, Red Sea

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Soft-bodied benthic cnidarians such as sea anemones and soft corals may form aggregations or colonies that occupy large areas of hard substrate and thus compete for space with stony corals on tropical reefs (Sebens 1976; Benayahu & Loya 1977; Langmead & Chadwick-Furman 1999a,b). Sea anemones occurring on hard substrates on coral reefs include two distinct types of organisms, the actiniarians (or true sea anemones) and the corallimorpharians. The latter differ from true sea anemones in that they lack muscles on the pedal disk, and their internal morphology and nematocysts are more similar to those of scleractinian corals (Carlsgren 1949; den Hartog 1980). In molecular phylogenetic analyses, corallimorpharians appear to fall either within the Scleractinia (Fautin & Lowenstein 1992) or within a separate group that includes the Actiniaria (Chen et al. 1995a).

Some corallimorpharians undergo clonal replication to form large aggregations on hard marine substrates in temperate kelp forests (Chadwick 1991) and on tropical coral reefs (den Hartog 1980, 1994; Langmead & Chadwick-Furman 1999a). Replication rate has been shown to vary >10-fold between clones of the temperate corallimorpharian *Corynactis californica* (Chadwick & Adams 1991). In the tropical corallimorpharian *Rhodactis indosinensis*, replication rate also varies between clones, and depends on seasonal changes in seawater temperature (Chen et al. 1995b). Polyps of *R. indosinensis* vary their size and sex depending on whether they occur on the edge or in the center of clonal aggregations (Chen et al. 1995c). Patterns of clonal replication have been quantified in only these 2 species of corallimorpharians, despite the ecological importance of this group in some marine habitats.

Clonal replication in corallimorpharians involves several distinct modes per species, including pedal laceration, fission (den Hartog 1980), and budding (Chen et al. 1995b). In contrast, any one species of actinian sea anemone generally uses only one of these clonal modes (Chia 1976). In pedal laceration, the margin of the pedal disk constricts into small pieces that separate from the disk (Chia 1976). These small lacerated pieces eventually regenerate a mouth and tentacles, thus forming new polyps. In longitudinal fission, the entire polyp elongates longitudinally, the mouth splits and
the column pinches in along the plane of fission. The polyp then divides in the center to form 2 or more equal-sized daughter polyps (Chadwick & Adams 1991; Chen et al. 1995b). Although several types of budding occur in cnidarians (Chia 1976), only one type, inverse budding, has been described for corallimorpharians. In inverse budding, part of the margin of the pedal disk separates from the substrate, rises up, and becomes folded over the oral disk of the polyp (Chen et al. 1995b). Then the area connecting the bud to the maternal polyp constricts, and the bud separates and floats away as a detached propagule (Chen et al. 1995b). Little is known about the relative importance of each of these modes of cloning in corallimorpharians.

Several of the estimated 18 species in the tropical corallimorpharian genus *Rhodactis* ( = *Discosoma*) (Milne Edwards & Haime 1851) are known to replicate clonally (Carlgren 1949; den Hartog 1980). All members of this genus possess endosymbiotic zooanthesllae, and are limited to shallow marine substrates, usually associated with coral reefs (den Hartog 1980). Individuals of *R. indosinensis* form small to large aggregations via clonal replication on intertidal coral reefs in Taiwan (Chen et al. 1995b). Polyps of a congener, *R. rhodostoma* (Ehrenberg 1934), form patchy aggregations on shallow reef flats in the Indian Ocean and Red Sea (Langmead & Chadwick-Furman 1999a and references therein). In *R. rhodostoma*, polyps along the edges of the aggregations kill the tissues of some neighboring stony corals, and then overgrow their exposed skeletons by moving onto them and replicating (Langmead & Chadwick-Furman 1999b). Polyps of *R. rhodostoma* thus potentially compete with reef-building corals and may replicate clonally to overgrow them.

Understanding clonal processes in *R. rhodostoma* is important in estimating potential rates of spread of this species across the reef. We describe here the abundance and replicative patterns of polyps of *R. rhodostoma* on a reef flat at Eilat, Israel, northern Red Sea. We describe a unique mode of clonal replication in this species, estimate the doubling time for polyps, and discuss their current abundance in relation to recent changes in the community structure of this reef. In a companion paper, we show that sexual reproduction in this corallimorpharian involves the annual spawning of large planktonic eggs that allow dispersal to distant reef habitats (Chadwick-Furman et al. 2000).

Methods

This project was conducted from September 1996 to July 1998, on the shallow reef flat of the Japanese Gardens fringing reef at Eilat, northern Red Sea (29°30′31″N, 35°55′22″E). This site contains large aggregations of polyps of *Rhodactis rhodostoma* (Fig. 1), and the benthic community structure and recent history of this reef have been well documented (Fishelson 1970; Loya 1990 and references therein).

The flat, wide polyps of *R. rhodostoma* are up to 8 cm in diameter at this site. The oral disk is covered with short, curly discal tentacles, surrounded by thicker marginal tentacles that may be induced to form bulbous white acrospheres upon contact with certain cnidarian competitors (Langmead & Chadwick-Furman 1999b). The species identification of polyps was confirmed by taxonomic experts (D.G. Fautin and J.C. den Hartog).

Preliminary observations on reefs at Eilat indicated that members of this species were patchy in occurrence and limited to areas <3 m deep. We studied a reef site with dense aggregations of *R. rhodostoma* (Fig. 1), so reported values probably represent maximal abundances for this species at Eilat. Within the study site, a reef flat area with high abundance of polyps of *R. rhodostoma* was selected for placement of sampling transects. All transects were placed parallel to shore, along the same area of shoreline. One 10×2 meter belt transect was deployed in each of 5 shallow reef zones: reef patches in the lagoon, inner reef flat, middle reef flat, outer reef flat, and shallow reef slope at 2.5 m depth. Within each of the 20 square meters of each transect, all polyps of *R. rhodostoma* were counted and their percent cover estimated.

We then randomly selected 3 aggregations, one each on the inner, middle, and outer reef flat. Within these aggregations, we assessed variation in polyp size and cloning rate with 3 factors: (1) aggregation (located on inner, middle, or outer reef flat), (2) position within aggregation (center or edge), and (3) orientation within aggregation (horizontal or vertical) (modified after Chen et al. 1995c). We defined as central those polyps that were completely surrounded by conspecifics, and as edge the polyps that were only partly surrounded by other polyps, or were isolated from conspecific contact. Horizontal polyps were defined as those attached to horizontal substrate, with their oral disks facing upwards. Vertical polyps were defined as those on vertical walls of substrate, with their oral disks facing sideways (modified after Chadwick-Furman & Loya 1992).

Each month, we examined 25 polyps in each of 4 categories within each of the 3 aggregations: horizontal central, horizontal edge, vertical central, and vertical edge (N = 100 polyps per month per aggregation). All polyps were measured within a randomly selected area of each category, until 25 polyps had...
been sampled for each category each month. For each polyp examined, we measured the longest and shortest oral disk diameter and calculated a mean diameter (after Lin et al. 1992; Chen et al. 1995b). We also checked the polyp for evidence of fission or budding, such as elongation or constriction of the polyp margin, and described and photographed replicating polyps in the field. In total, 6900 polyps were examined over almost 2 years of field observations (300 polyps month\(^{-1} \times 23\) months).

We calculated the doubling time for \textit{R. rhodostoma} as the time to double the number of polyps in a clone of this species, from field observations of clonal replication (after Chadwick \& Adams 1991). Statistical analyses were performed using the SAS program, version 6. Before application of parametric tests, data were examined for normality and homogeneity of variances. Unless otherwise indicated, data are presented as means $\pm 1$ standard deviation.

**Results**

**Distribution and abundance**

On a large scale, polyps of \textit{Rhodactis rhodostoma} were patchy in occurrence, in that there were many aggregations at the study site, and few observed at other reef areas in Eilat. Within the study site, the polyps occurred at low percent cover on reef patches in the lagoon (Fig. 2A). They attained a maximal abundance of $678 \pm 561$ polyps m\(^{-2}\) ($29 \pm 23\%$ cover) on the inner reef flat, decreased in abundance toward the outer reef flat, and were absent on the outer reef slope (Fig. 2A). They formed small to large aggregations that were distributed patchily on the substrate, as demonstrated by their large variation in percent cover and abundance between each square meter along the inner flat transect (Fig. 2B). They occurred at a maximum density of $69\%$ cover and $1510$ polyps m\(^{-2}\) (Figs. 1, 2B).

**Modes of cloning**

During monthly surveys, 625 polyps were observed to replicate clonally (9.1\% of all polyps, N = 6900). They used 3 distinct modes of cloning: longitudinal fission and inverse budding, which have been described previously (see above and Chen et al. 1995b), and marginal budding, which is described here for the first time.

Longitudinal fission was the most common mode of
Marginal budding occurred in 25.6% of replicating polyps. In this mode of cloning, which has never before been described, a small area along the margin of the polyp, including part of the pedal disk, column, and oral disk, constricted into one or more buds that eventually separated from the parent polyp (Fig. 3E,F). Mouths, initially lacking in the buds, developed after separation from the parent polyp. Marginal budding led to the production of 2 or more unequal-sized polyps.

Inverse budding occurred in only 1.1% of replicating polyps. Initially, part of the pedal disk detached from the substrate, rose up, and hung free in the water (Fig. 3G). Then the tissue constricted between this raised area and the rest of the polyp, resulting in a bud attached to the polyp by a narrow region of tissue (Fig. 3H). The upper part of the column connecting the bud to the parent polyp then contracted, so that the bud hung upside down over the oral disk of the parent. The bud finally separated completely from the parent polyp and floated away. This type of cloning produced small polyp buds that were not initially attached to the substrate.

Seasonality of cloning

The frequency of clonal replication in R. rhodostoma, by all 3 modes together, varied widely between months (Fig. 4A). However, it did not vary significantly between the 2 years examined (t-test, t = 0.139, p = .31). During the first year (Sept.1996-Aug.1997), 9.0 ± 3.2% (N = 12 months) of polyps replicated each month, and during the second year (Sept.1997-July 1998), 9.1 ± 2.9% (N = 11 months) of polyps replicated each month.

During both years, replication was maximal during late spring (16.7% of polyps in May 1997 and 11.3% in April 1998) and early fall (10.7% in October 1996 and 14.0% in September 1997) (Fig. 4A). The lowest frequencies of replication were during winter (4.0% of polyps in February 1997 and 6.3% of polyps in January 1998) and mid-summer (7.3% of polyps in July 1997 and 5.3% in July 1998). Taken overall, the mean monthly values for replication rate did not correlate significantly with those for either day length or seawater temperature (Fig. 4B) (Pearson's correlation test: r = .24 and p = .26, r = .25 and p = .24, respectively). However, the decline in cloning during mid-summer coincided with the annual spawning of gametes, and when the months immediately before and after the annual spawning event (Fig. 4A) were excluded from analysis, cloning rate correlated significantly with both day length and seawater temperature (Pearson's correlation test: r = .49 and p<.05; r = .68 and p<.01.
Cloning in a corallimorpharian

Fig. 3. Modes of cloning in the corallimorpharian *Rhodactis rhodostoma*. Diameter of each polyp, 4–6 cm. (A) Polyp elongation at the start of longitudinal fission. (B) Separation of 2 mouths on the elongated oral disk during fission. (C) Constriction of the column and oral disk to complete separation of daughter polyps during fission. Note exposed mesenteries at center. (D) Three-mouth fission, resulting in 3 daughter polyps of about equal size. Mouth (m). (E,F) Marginal budding: areas of constriction (b) along the polyp margin lead to the formation of new polyps. (G) Inverse budding: bud formation after detachment of part of the pedal disk from the substrate. (H) Inverse budding: bud raised up over the oral disk of a parent polyp.

respectively). Day length explained more of the variation in replication rate than did seawater temperature (multiple regression test, partial $r^2 = .46$ and .21 respectively). The annual cycle for fission was similar to that for total replication, with maxima in both April/May and September. The frequency of marginal budding peaked only in April/May each year, and no seasonal frequency peaks were observed for the rare mode of inverse budding.

**Polyp size**

The mode of cloning varied significantly with polyp size (model II one-way ANOVA, df = 2, 297, $F = 8.05$, $p < .001$), as measured during May 1997 when cloning frequency was maximal (Figs. 4A, 5). Polyps that underwent fission (diameter = 34.9 ± 8.8 mm) did not differ significantly in size from non-cloning polyps (35.1 ± 9.4 mm), but budding polyps (44.3 ± 7.0 mm) were significantly larger than those in the other 2 categories (multiple comparisons t-test, $t = 1.86$, LSD = 4.53, Fig. 5). Polyps initiated fission only if >16 mm diameter ($N = 32$), and budded only if they were >30 mm diameter ($N = 17$, Fig. 5).

Polyp size varied significantly with 2 other factors examined (Table 1, model II 3-way ANOVA test). Vertical polyps were significantly larger than horizontal polyps, and central polyps were larger than edge polyps (Fig. 6A, Table 1). Polyp size did not vary significantly among the 3 aggregations examined (Fig. 6A, Table 1). Cloning frequency also did not vary significantly with any of the 3 factors examined (aggregation, position, or orientation within aggregations) (Chi-
Fig. 4. Seasonal variation in physical factors and in cloning rate of the corallimorpharian Rhodactis rhodostoma. (A) Proportion of cloning polyps as measured for 3 aggregations (N = 100 polyps per aggregation). Arrows indicate the timing of annual broadcast spawning of gametes (Chadwick-Furman et al. 2000). (B) Day length and seawater temperature at 3 m depth, from daily measurements at Eilat (source: Israeli Meteorological Service, Beit Dagan).

squared 4-way frequency test, p > .05 for all variables, Fig. 6B).

Doubling time of polyps
To estimate the doubling time for polyps of R. rhodostoma, we assumed an initial aggregation size of 100 polyps. We then used the mean percent of polyps that replicated each month during the first year, since there was no significant between-year variation (see above). We assumed that each replication event required 1–2 months for completion (after Chen et al. 1995b). If each replication event required one month or less, and 9.0% of the polyps replicated each month (see above), the aggregation became 2.8× larger each year, and if each division event required 2 months, the aggregation became 1.7× larger each year. The total number of polyps counted within transects on the Eilat reef flat was 27,480 polyps in 80 m² of substrate area, or 343 polyps m⁻². This number of polyps could have been produced from 10 initial recruits within 7 to 14 years, depending on the duration of each replication event.

Discussion

Distribution and abundance
We demonstrate here that polyps of the corallimorpharian Rhodactis rhodostoma occur at high abundance on a reef flat at Eilat, northern Red Sea. We also reveal a strong cross-reef zonation pattern for members of this species. Polyps occurred at high densities on the inner reef flat, decreased toward the outer reef flat, and were absent on the reef slope (Figs. 1, 2). The higher abundance of polyps on the inner vs. outer reef flat (Fig. 2A) leads us to propose that conditions are more favorable for members of this species on the inner reef flat, possibly due to relatively low levels of water motion.

Corallimorpharians in the genus Rhodactis form aggregations of varying size on shallow reefs throughout the tropics (den Hartog 1980, 1994), and deserve further study of their spatial extent and ecological importance. Large aggregations of Rhodactis (= Discosoma) polyps have been reported on coral reefs in the Caribbean (den Hartog 1980; Elliot & Cook 1989), Seychelles (den Hartog 1994), Malaysia (Ridzwan 1993), and Taiwan (Chen et al. 1995b). In a previous study at Eilat, we also documented dense aggregations of polyps of R. rhodostoma on the reef flat (Langmead & Chadwick-Furman 1999a). At nearby Ras Abu Galum, south of Eilat in the Egyptian Red Sea, individuals of R. rhodostoma similarly dominate the substrate on the protected inner reef flat, forming an almost continuous carpet of polyps over > 100 m² of reef area (N.E. Chadwick-Furman, unpubl. obs.).

Modes of cloning
The use of longitudinal fission as the main mode of cloning in R. rhodostoma is similar to the pattern known for several other corallimorpharians (reviewed in Chen et al. 1995b). Longitudinal fission occurs in an almost identical proportion of polyps in R. rhodostoma (73% of dividing polyps) and R. indosinensis (74% of dividing polyps, Chen et al. 1995b).

Inverse budding (Fig. 3G,H) is relatively rare in R. rhodostoma, and has been reported previously only in R. indosinensis (Chen et al. 1995b). This unusual type of cloning apparently produces detached polyps that float away to colonize other locations. It would be interesting to know if this mode of cloning occurs in any
Cloning in a corallimorpharian

Not replicating (N=251)
Fissioning (N=32)
Budding (N=17)

Fig. 5. Size-frequency distribution for polyps of the corallimorpharian *Rhodactis rhodostoma*, showing variation in size with mode of cloning. Data are from May 1997, when cloning was most common.

of the other 18 known *Rhodactis* (= *Discosoma*) species (Carlgren 1949; den Hartog 1980), and also whether it is limited only to members of this tropical corallimorpharian genus.

The third mode of replication described here, marginal budding, has never been reported previously, either for corallimorpharians (Chen et al. 1995b) or for actinian sea anemones (Chia 1976). While similar to pedal laceration, which likewise involves separation of part of the pedal disk from the parent polyp (reviewed in Chia 1976), marginal budding differs in that it also incorporates part of the column and oral disk in each bud (Fig. 3E,F). Marginal budding may occur in other common corallimorpharians, since it would be relatively easy to mistakenly suppose these marginal buds had been produced by pedal laceration (reviewed in Chen et al. 1995b).

**Seasonality of cloning**

The polyps of many tropical zooxanthellate anthozoans appear to grow and replicate fastest when light and/or temperature levels are highest, thus facilitating maximal photosynthetic energy production by their zooxanthellae (reviewed by Highsmith 1979; Lin et al. 1992; Chen et al. 1995b). Because zooxanthellae often supply 100% or more of the carbon needs of tropical anthozoan species (Tsuchida & Potts 1994 and references therein), seasonal variation in planktonic food availability may be a less important factor than it is for temperate zone anthozoans. Plankton abundance varies seasonally at Eilat, reaching a maximum during the spring each year (March to May, Genin et al. 1995). Both maximal plankton abundance and rising levels of day length and temperature may contribute to high cloning rates in *R. rhodostoma* during the late spring at Eilat (Fig. 4A).

We observed cloning rates drop in midsummer when the polyps spawned gametes (Fig. 4A). Immediately before spawning, female polyps of *R. rhodostoma* are full of eggs, which represent up to 30% of their body mass (Chadwick-Furman et al. 2000). Thus, polyps devote a large proportion of their energy and body space to the production of gametes during the month or two immediately before spawning.

We propose that the observed drop in cloning in this species during mid-summer, when physical conditions appear to be best for photosynthesis and growth (Fig. 4B), is due to a temporary diversion of energy to sexual reproduction. Division may remain low for a month or two after spawning because of tissue repair and reorganization processes following the release of large volumes of gametes from the polyps’ mesenteries. Similarly, with the exception of juveniles, colonies of the stony coral *S. pistillata* also decrease their rate of colony growth during mid-summer at Eilat.

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- Vertical center
- Vertical edge
- Horizontal center
- Horizontal edge

Orientation:
- 60°
- A
- I
- 60°
- B
- I
- I

Location of aggregation on reef flat

**Fig. 6.** Variation in (A) polyp size and (B) percent of cloning polyps with 3 factors: aggregation (located on inner, middle, or outer reef flat), position within aggregation (central or edge), and orientation within aggregation (horizontal or vertical) in the corallimorpharian *Rhodactus rhodostoma*. At the time of peak cloning, in May 1997, 25 polyps were examined from each of the 12 categories (N = 300, 25 per category). Variances in B are expressed as the 95% confidence limit of the proportion of polyps observed to clone in each category, out of 25 polyps observed.

**Polyp size**

Variation in the mode of replication with polyp size (Fig. 5) has been observed in other corallimorpharians (Chen et al. 1995b) and actinian sea anemones (Sebens 1982; Lin et al. 1992). Only budding polyps were larger than average in *R. rhodostoma* (Fig. 5). Thus, large size does not appear to be a necessary prerequisite for fission in *R. rhodostoma*. Our field observations also showed that the relatively large polyps in the center of aggregations and on vertical surfaces did not clone more frequently than those in other positions (compare Fig. 6A and B).

The significant variation in polyp size with position and orientation in aggregations (Fig. 6A, Table 1) may relate to differences in environmental conditions between microhabitats. The significantly larger size of polyps in vertical than in horizontal orientations (Fig. 6A) may be due to less exposure to environmental stressors such as ultraviolet radiation and sedimentation on vertical reef surfaces. During extreme low tides, vertical polyps in reef depressions are less susceptible to the drying effects of air than are those exposed on the upper horizontal surface of the reef flat. Similar variation in polyp size with habitat has been documented for intertidal actinians, where polyps increase in size with depth (Francis 1976), and with location in sheltered crevices or rocky depressions (Sebens 1983).

The larger size of polyps of *R. rhodostoma* in the center of aggregations, compared to those on the edges, is similar to the pattern documented for *R. indosinensis* in Taiwan (Chen et al. 1995c). In both species, most central polyps are large and female, while edge polyps are smaller and mostly male (Chen et al. 1995c; Chadwick-Furman et al. 2000). In *R. indosinensis*, polyps change size and sex when cross-transplanted, demonstrating that position within an aggregation influences gonadal development and body size (Chen et al. 1995c).

**Doubling time of polyps**

Our analyses reveal that a high proportion of polyps of *R. rhodostoma* may be replicating at any given time (Fig. 4A), leading to the formation of large clones within a short period on the inner reef flat. It was not possible to determine the duration of or time since each replication event because, in contrast to polyps of *R. indosinensis* (Chen et al. 1995b), those of *R. rhodostoma* do not exhibit clear body scars after fission or budding. However, these processes probably are similar in duration to those in *R. indosinensis*, which requires 1-2 months to complete of each act of fission or budding (Chen et al. 1995b). The highest
proportion of replicating polyps observed in *R. rhodostoma* (16.7% of polyps in May, Fig. 4A) is similar to that recorded for *R. indosinensis* (20.9% of polyps during June–July, Chen et al. 1995b).

The doubling time of about 1 year calculated for polyps of *R. rhodostoma* at Eilat is slower than the 2 month period estimated for the temperate corallimorpharian *Corynactis californica* and for some actinians, but is faster than rates of >1 year estimated for some scleractinian corals (Chadwick & Adams 1991 and references therein). Our calculations for *R. rhodostoma* at Eilat predict a doubling time similar to that estimated for aggregations of *D. dawydoffi* in Malaysia (100–160% increase in number of polyps in 18 months, Ridzwan 1993). This may explain why dense populations of polyps of *Rhodactis* spp. have not previously been reported for these reefs.

Today, on some parts of the inner reef flat at Eilat, aggregations of *R. rhodostoma* have become an alternate dominant (Figs. 1, 2) to the stony corals that were major space occupiers before a recent disturbance event (Loya 1990). This reef was exposed to a catastrophic low tide in 1970, which caused a massive death of stony corals and left most of the reef flat as bare, unoccupied substrate (Loya 1990). The large aggregations of *R. rhodostoma* seen during the present study were not previously reported from this area, despite extensive surveys of soft-bodied anthozoans both before (Fishelson 1970) and after the severe low-tide event (Benayahu & Loya 1977). Thus, polyps of *R. rhodostoma* appear to have been present only in small numbers, and subsequently increased greatly in abundance. This pattern of change is similar to that observed on reefs in Malaysia, where polyps of *D. dawydoffi* became dominant following disturbance to stony corals by the corallivorous sea star *Acanthaster planci* (Ridzwan 1993).

It appears that aggregations of *R. rhodostoma* will remain a dominant component of the reef flat community at Eilat, as long as frequent disturbances continue to damage the shallow stony corals. During January 1998, an extreme low tide again exposed the entire reef flat in Eilat during midday for several days, killing many shallow stony corals, but not causing visible damage to exposed polyps of *R. rhodostoma* (N.E. Chadwick-Furman, unpubl. obs.). Thus, in contrast to stony corals, polyps of *R. rhodostoma* appear able to withstand prolonged exposure to air. The corallimphorarian *R. rhodostoma* may fit the definition of an opportunistic, weedy species, in that it replicates year round, survives well in disturbed areas, and is able to monopolize patches of space on shallow reefs where stony corals have been removed by disturbance.

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