lagoon and channel margins where it was observed resting near the bases of coral heads or among the branches of the soft coral *Sinularia* sp. Larger specimens were observed and photographed at a depth of 3 m on the coral-encrusted mast of the shipwreck *Fujikawa Maru* in Truk lagoon, and along the outer dropoff of Ngemelis reef at a depth of approximately 10 m in Belau. *Paracirrhites arcatus* or *P. forsteri* were present and generally found resting on or near the tops of heads of various species of scleractinian corals in all of these areas, with the exception of the shipwreck in Truk lagoon where they may have been present, but were not noted. *Cirrhitichthys oxycephalus* inhabits *Pocillopora* spp. corals where the above-mentioned cirrhitids are absent. One of us (TJD) observed numerous adult and juvenile *C. oxycephalus* between coral head branches in shallow water (2–3 m) near Shepherd's Rocks, Cabo San Lucas, Baja California Sur, Mexico in 1982. Thresher (1984) reported that *C. oxycephalus* inhabited such coral heads in the Gulf of California and that spawning between males and haremic females occurred above these corals.

The specimen of *Cirrhitichthys oxycephalus* reported herein extends the known distribution of this species to Guam, Mariana Islands, where it is apparently rare. The morphological and perhaps behavioral and ecological similarities of this species with others of its genus, particularly *C. falco* Randall, *C. serratus* Randall, and *C. aprinus* (Cuvier), may contribute towards misidentification of this species in many areas. Additionally, on Guam at least, it is known only from a habitat that periodically experiences a high degree of wave activity, rendering access difficult. Further collections in such areas throughout the Mariana Islands should produce additional specimens of this interesting species.

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REPRODUCTIVE STATUS OF SOME GUAM CORALS

There has recently been renewed interest in the sexual reproduction of scleractinians. The hypothesis that external fertilization and development is the most common mode of reproduction in corals (Kojis and

Quinn, 1982) is now strongly supported (Harrison *et al.*, 1984).

Release of gametes is the culmination of several months' gametogenesis for many species and often occurs during a restricted period of the year (Babcock, 1984; Harriot, 1983), most commonly in the warmer months (Krupp, 1983; Harrison et al., 1984; Szmant-Froelich *et al.,* 1980; Fadlallah, 1983). Sampling corals during the late spring or early summer increases the chance of finding some species in a mature reproductive condition. Consequently, in the absence of published data for the area, corals were collected from the reefs around Guam so that their reproductive status during the early summer might be assessed.

Coral specimens were collected every second day between the 12th and 26th of June, 1984, from Pago Bay, immediately below the University of Guam Marine Laboratory. *Fungia fungites* were collected from Apra Harbour on the 11th and 22nd of June. Colonies of *Acropora valida* were also examined in the field on the seaward side of Cocos Island on June 24th.

Colonies were fractured *in situ* with a hammer and chisel. Those polyps bisected along the fracture line were examined by eye, or with the aid of a 10x hand lens, for the presense of oocytes. When a species was obviously fertile, five to ten colonies were collected and transported to flow-through aquaria at the laboratory.

A piece of each colony was immediately fixed in 10% formalin-seawater. The remaining live portion was examined within 12 hours of collection.

Live colonies were fractured and examined under a stereo dissection microscope. The color and general appearance of the oocytes was noted. If testes were present, these were dissected out and fresh squashes examined with a high power microscope. The maturity of testes was assessed by qualitative criteria such as sperm head appearance, flagellum presence and motility.

The fixed portions of each colony were decalcified in 10% HCl-5% formalin. Subsequently, the soft tissues were dissected and the oocytes measured on two diameters. Fifty oocytes were measured for each species.

Reproductive status varied between the species but was consistent within each population at Pago Bay. Species with quite mature testes tended to contain colored oocytes (Table 1). In *Acropora valida,* bright red oocytes were associated with advanced testes in colonies collected from Pago Bay. However, specimens sampled at Cocos Island contained white oocytes. Unfortunately it was not possible to prepare testes squashes from the Cocos Island colonies.

The arrangement of gonads and the number of oocytes per gonad were notably consistent in the genus *Acropora*. Polyps of *Acropora* spp. possessed four

Table 1. Sexual status of corals on June 25th. Relative maturity of the testis was assigned as follows: 1–no condensed sperm head structures and no evidence of motility; 2–less than 50% of the sperm with a condensed head structure and mostly non-motile flagella; 3–very mature: condensed, well defined sperm heads common, with highly motile, long flagella.

Species	Oocyte Color	Testis State	Sex	Oocyte Diameter $\bar{x}$(mm)
Acropora cerealis	white	1–2	H	.38
A. hystrix	pale orange	2–3	H	.44
A. irregularis	white	2	H	.52
A. smithi	white	1–2	H	.44
A. valida	orange-red	3	H	.52
A. variabilis	white	2	H	.55
Favia mathaii	pink	1–2	H	.32
Favites abdita	pink-orange	1–2	H	.30
Favites flexuosa	white-pink	2–3	H	.29
Goniastrea edwardsi	pink	3	H	.22
Leptoria phrygia	pink	1–2	H	.25
Platygyra pini	yellow	1	H	.30
Porites lutea	white	2	D	.13

male and four female mesenteries alternating in pairs of like sex. Each female mesentery contained between two and five oocytes, but more usually three, which formed a string along the oral-aboral axis just behind the mesenterial filament. In contrast the oocytes of *Favites mathaii* formed clusters at the aboral end of each mesentery and there were between 200 and 500 oocytes per polyp, depending on polyp size. These oocytes were smaller than those of *Acropora* spp. (Table 1).

Most species investigated contained oocytes and testes in the same polyp. The exceptions to simultaneous hermaphroditism appeared to be the species *Porites lutea* and *Fungia fungites* in which only either testes or oocytes were detected.

In many species of coral which have external fertilization, testes develop rapidly and oocytes often become colored in the final stages of maturation (Kojis and Quinn, 1981; Harrison *et. al.,* 1984). The most dramatic changes in the appearance of the gonads occur during the month prior to spawning (Harrison, pers. comm.). Although no data are presented here regarding the mode of reproduction, this study indicates that many species are in the latter stages of a gametogenic cycle. Coloring of the oocytes is mostly associated with more mature testes. However not all species are equally mature (Table 1). It is likely that most of the species considered here will spawn in the summer or early fall and that different species will spawn at different times. Indeed, a survey of *Acropora valida* and *Acropora irregularis* in early September (Paul Gates, pers. comm.) indicated that both species had already spawned.

In Australia (Harrison *et al.,* 1984), the Red Sea (Loya, pers. comm.) and Hawaii (Krupp, 1983) spawning occurs about the time of either the new or full moon. Abe (1937) reported that *Goniastrea aspera* spawned at the time of the new moon in October–November at Palau. No species were observed to spawn in Guam around the full moon in June. Future investigation of reproduction in Guam corals would be most profitable during July, August and September. Long term studies are required to determine whether gametogenesis is annual or more frequent and to what degree populations around the island are synchronized.

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FOOD PREFERENCES AND FEEDING BEHAVIOR OF THE LAND CRAB *Cardisoma carnifex*

ABSTRACT—Observations were made of food preferences and feeding behavior of *Cardisoma carnifex,* a common Pacific land crab. The major portion of the diet of these crabs is made up of detritus, but they also eat leaves, fruits, and seeds of some plant species.