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THE HALFMOON, *MEDIALUNA CALIFORNIENSIS*, AS A CLEANER FISH

Cleaning symbiosis involves an animal feeding upon ectoparasites or other deleterious materials it has removed from the body of another animal (Limbaugh 1961; Feder 1966). Although it cleans other fishes infrequently, the señorita, *Oxyjulis californica*, is by far the predominant cleaner among California inshore marine fishes (Limbaugh 1955, 1961; Hobson 1971; Bray and Ebeling 1975). Other California species have been observed cleaning also, although less frequently: the kelp surfperch, *Brachyistius frenatus* (Limbaugh 1955, 1961; Hobson 1971; Bray and Ebeling 1975); the sharpnose surfperch, *Phanerodon atripes* (Gotshall 1967; Hobson 1971); the black surfperch, *Embiotoca jacksoni*, and pile surfperch, *Damalichthys vacca* (Limbaugh 1955); the rainbow surfperch, *Hypsurus caryi* (Gotshall 1967); the white surfperch, *Phanerodon furcatus* (Hobson 1971); the blacksmith, *Chromis punctipinnis* (Turner, Ebert, and Given 1969); and the rock wrasse, *Halichoeres semicinctus* (Hobson 1976). With the following account, another species is now added to this list: the halfmoon, *Medialuna californiensis*, of the percoid family Scorpididae.

I have observed halfmoon cleaning other fishes on two occasions. The first instance occurred on 14 February 1977. I was scuba diving in 9 m (30 ft) of water at Naples Reef, located about 1.6 km (1 mile) offshore near Santa Barbara. Diving conditions were excellent, with water visibility exceeding 15 m (50 ft) and water temperature 16 C (61 F). At noon, I came upon a pair of common molas, *Mola mola*, each approximately 50 cm (20 inches) long, hovering upright about 1 m (3 ft) apart in midwater. This species is a common host to other cleaners, yet these individuals were being circled closely and actively by four adult halfmoon, each approximately 25 cm (10 inches) long. As I approached, I could see clearly the halfmoon frequently picking at the flanks of the molas. Occasionally, a mola would lift one of its pectoral fins, and a halfmoon would immediately approach and pick at the area which had been covered by the fin. There appeared, however, to be no communicative signals occurring between the fishes as reported by Losey (1971). I observed this behavior for several minutes before resuming other activities, and upon returning to the same location about 15 min later, found no trace of either species.

The second incident was very similar to the first, and occurred at Fry's Harbor,

Santa Cruz Island, on 2 December 1977. Water conditions were nearly identical to those of the previous occasion, visibility was 50 ft and temperature 17 C (63 F). At 1500 hr, my partner and I spotted a mola, approximately 75 cm (30 inches) long, hovering in midwater. Three adult halfmoon, each approximately 25 cm (10 inches) long, were closely circling the mola and picking at its flanks. Characteristic of many cleaner hosts, the mola would occasionally assume head-up posture for several seconds during particularly intense cleaning bouts by the halfmoon.

Although the kelp-bed fish communities at Naples Reef and Santa Cruz Island have been studied continuously and intensively by University of California research divers since the early 1970's, no reports of halfmoon cleaning behavior at these sites have been made. Moreover, since the halfmoon has never before been documented as a cleaner fish, such behavior probably occurs very rarely throughout the range of this species. While the halfmoon possesses a small mouth, which facilitates picking small individual prey such as most ectoparasites (Hobson 1971), this species normally consumes animal-encrusted algae in its kelp-bed habitat (Limbaugh 1955; Quast 1968). Hobson (1971) suggested that such incidental cleaners treat their hosts as simply another food substrate. Indeed, the growing number of California fishes which have been observed cleaning indicates that, under proper circumstances, individuals of nearly any species with the appropriate feeding morphology occasionally will clean another fish.

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