

REPRINT FROM  
*Calif. Fish and Game*, 62(1): 73-78. 1976.

## THE ROCK WRASSE, *HALICHOERES SEMICINCTUS*, AS A CLEANER FISH<sup>1</sup>

EDMUND S. HOBSON

Southwest Fisheries Center  
 National Marine Fisheries Service  
 Tiburon Laboratory  
 Tiburon, California 94920

**What may have been one individual rock wrasse, *Halichoeres semicinctus*, was observed over 10 months cleaning other fishes at Santa Catalina Island. Cleaning is an insignificant activity for rock wrasse in general, but was a major activity of the individual involved in each of these observations. Cleaning activity of the rock wrasse is similar in most respects to that of its relative, the señorita, *Oxyjulis californica*.**

### INTRODUCTION

The rock wrasse, *Halichoeres semicinctus*, which is numerous over algal-covered substrata in shallow near-shore waters off southern California, looks much like another wrasse, the señorita, *Oxyjulis californica*, which is even more numerous in the same area. Although the señorita is the predominant cleaner fish in California (Limbaugh 1961; Hobson 1971), the rock wrasse has not been known to clean.

Cleaning, or removing by mouth, ectoparasites and other deleterious materials from the bodies of other animals (Feder 1966), cannot be a major activity of the rock wrasse. During an 18-month field study of cleaning symbiosis at La Jolla, California (Hobson 1971), I failed to see this species clean. Nor did I see it clean during extensive incidental observations over 12 years (1961 to 1973) in areas frequented by this fish. Occasionally I saw other fishes respond to an approaching rock wrasse by hovering motionless in the manner of fishes that solicit cleaning (Feder 1966), but always they were unsuccessful in eliciting service. Furthermore, in other accounts of cleaning symbiosis in California (e.g. Limbaugh 1955; Gotshall 1967) the rock wrasse has remained unimplicated in cleaning symbiosis, either as cleaner or as a client.

Recently, however, I observed the rock wrasse cleaning other fishes, including members of its own species, near Isthmus Cove, Santa Catalina Island. The activity was witnessed on four occasions over 10 months at a single location in 5 m (17 ft) of water along the inner margin of a kelp, *Macrocystis*, forest.

My feeling is that all these observations involved the same individual cleaner. I cannot be positive of this, but two facts lead to this impression. First, the cleaner each time was an adult male, about 150 mm (6 inches) long, and, although the species was numerous throughout the area, males differ markedly in coloration with size, and only a relatively few resembled the cleaner. Second, despite being widespread and frequently observed, this species has only been seen cleaning at this one spot, a circumstance that seems best explained by the one-individual hypothesis.

<sup>1</sup> Accepted for publication May 1975.

## OBSERVATIONS

June 1973

I first observed the rock wrasse cleaning during midafternoon in June 1973. After recognizing that this individual was a cleaner, I followed it for 30 min as it circled slowly back and forth within an area about 10 x 40 m (33 x 132 ft), 1 to 2 m (3 to 7 ft) above the sea floor, and then finally lost contact with it amid the kelp. During the observations, it approached, inspected, and then frequently cleaned, the external body surfaces of a succession of fishes of several species (recounted below). Between cleaning bouts, the cleaner swam slowly from one part of its operating range to another, and during these times picked at drifting debris four times and once inspected an algal-covered rock. Mostly, however, it appeared alert for cleaning opportunities.

Repeatedly during its leisurely meandering, the cleaner abruptly changed course and swam with accelerated movements directly toward a fish that was as much as 5 m (17 ft) away. Individuals of several species were thus approached, all of them at the time active in ways characteristic of their kind. Every time the cleaner neared they abruptly assumed the hovering attitude of fishes that solicit cleaning. The cleaner then swam to each one, made a close visual inspection, and then frequently plucked one or more times at their body surfaces.

During this period, when cleaning was clearly its major activity, the rock wrasse serviced individuals of three species: opaleye, *Girella nigricans*; halfmoon, *Medialuna californiensis*; and black perch, *Embiotoca jacksoni*. Of eight opaleyes approached and inspected, it cleaned four, plucking at their bodies one to three times. It cleaned both halfmoons that it approached and inspected, plucking at each more than 10 times. Of two black perch approached and inspected, it cleaned one, plucking at its body twice.

Several other incidents during the observation period are noteworthy. Once the cleaner swam close to another rock wrasse, which paused and erected its dorsal fin as if to solicit cleaning, but the cleaner then passed by without apparent interest. Another time a garibaldi, *Hypsypops rubicundus*, swam up alongside the cleaner as it attended a halfmoon, and, although the garibaldi hovered head down in soliciting fashion just a few cm away, the cleaner gave no overt response.

August 1973

During my next visit to the same location, 1 month later, I again saw a rock wrasse cleaning. This time the cleaner was attending another member of its own species that hovered in a regular horizontal attitude, except that its dorsal fin was erected. The cleaner plucked at the base of this fin once, then swam off. Immediately it moved to another rock wrasse nearby, but, though this one stopped swimming and erected its dorsal fin, the cleaner passed by after only a brief inspection. Two more essentially identical encounters followed in succession, seconds apart, each with a different rock wrasse. Then the cleaner approached a garibaldi, which failed to respond, and then a kelp bass, *Paralabrax clathratus*, which also failed to respond. At this point, only 4 min after the observations had begun, I lost track of the cleaner amid a stand of kelp. Although I searched the area for an additional 25 min, I saw no further cleaning.

---

## February to March 1974

Six months later, on February 14, 1974, James R. Chess (Tiburon Laboratory, National Marine Fisheries Service) was diving in the same location and saw a male rock wrasse about 150 mm (6 inches) long cleaning a garibaldi (pers. commun.). This prompted me to follow up the observations I had made during the previous summer. The earlier observations had been incidental to other work, but now I visited the same area once during each of the following 5 weeks specifically to look for cleaning by the rock wrasse. On the first visit (1200 hr, February 26), underwater visibility was so reduced by suspended material that the effort was abandoned after 10 min of fruitless search.

On the next visit (1300 hr, March 4), conditions were better and after only 5 min in the water I spotted a rock wrasse cleaning a garibaldi. During the next 17 min, I followed the cleaner as it meandered over a relatively large area, about 20 x 75 m (72 x 248 ft) swimming about 1 m (3 ft) above the sea floor. Its course brought it within about 5 m (17 ft) to 16 garibaldis, and every time but once the cleaner swam to the garibaldi, which then invariably assumed the attitude of a fish soliciting cleaning. After a brief visual inspection, the cleaner plucked at the body of each garibaldi 1 to 3 times, then continued on its way. During this time, the cleaner passed close to many other fishes (including individuals of all species previously noted being cleaned by the rock wrasse), but failed to show interest in any of them. Three times it plucked at drifting debris, and once it inspected, but did not pluck at the benthos; otherwise, it seemed interested only in cleaning garibaldis. Finally, I lost contact with the cleaner amid benthic vegetation.

The remaining visits were less fruitful. I looked unsuccessfully for the cleaner on the third and fifth visits (1430 to 1500 hr on March 11, and 1215 to 1245 hr on March 20), even though visibility underwater exceeded 15 m (50 ft). However, after 15 min in the water on the fourth visit (1300 to 1345 hr on March 14), I spotted a rock wrasse inspecting a garibaldi. This time I carried a camera, intending to photograph the activity. As I approached to within close range, however, the rock wrasse, still inspecting the garibaldi, abruptly withdrew without cleaning. I kept the rock wrasse in view for 6 min before losing contact, and during this time it approached and inspected 5 garibaldis. As it closed in on each of these fish, I approached closely for the photo, and each time the rock wrasse broke away without cleaning, probably in alarm at my close approach. Although it did not actually clean, it approached only garibaldis, showing no overt interest in the many other species present.

## REMARKS

## Cleaning as a Characteristic of Only Certain Individuals

Whether or not one shares my feeling that just one individual cleaner performed during these events, the observations complement, and to an extent suggest modifying, some of my previous thoughts on cleaning symbiosis in California.

My earlier report on California cleaners (Hobson 1971) distinguished between habitual and incidental cleaners. Cleaning is a widely acknowledged major activity of all those species considered to be habitual

---

cleaners. In citing the señorita as an example, I pointed out that while most señoritas apparently do not clean, at least not at any given time, those that do are nevertheless relatively numerous and widespread. On the other hand, the species considered to be incidental cleaners have only rarely been seen cleaning, even though they are well-equipped to pluck tiny organisms from a substrate, and include some of the most frequently observed fishes in southern California. Among species considered incidental cleaners were pile perch, *Damalichthys vacca*, rainbow perch, *Hypsurus caryi*, and white perch, *Phanerodon furcatus*. These species had been identified as cleaners by Limbaugh (1955, 1961), Gotshall (1967), and Hobson (1971). Sightings of cleaning by these species have been rare, it was reasoned, because to them cleaning is just an infrequent incidental adjunct to their regular foraging. Based on the cleaning activity of the rock wrasse, however, the infrequency of these observations may relate, at least in some instances, to there being relatively few cleaning individuals among these species, rather than to the species members in general cleaning infrequently. Far from being an occasional, incidental event, cleaning may at times be the major activity of these particular individuals, as important to them as to any of those others earlier distinguished as habitual cleaners.

One wonders how many frequently practiced activities of individuals are in fact uncharacteristic of other members of their species. The cleaning rock wrasse was noticed apart from other rock wrasse only because cleaning is so obvious. It seems probable that every individual exhibits certain behaviors, perhaps more subtle than cleaning, that set it apart from others of its kind, a fact that deserves more attention.

#### Some Comparisons With The Señorita

Cleaning interactions involving señoritas and rock wrasse generally are initiated by the cleaners. We might wonder why fishes that receive this cleaning fail to seek out the cleaners, just as many fishes seek out cleaners on tropical reefs (Feder 1966). Obviously señoritas and rock wrasse are welcomed as cleaners, judging from the way fishes that receive them promptly hover motionless with fins erected. It is unlikely these fishes would assume such vulnerable attitudes unless they benefited from the cleaner's actions. Why then do fishes cleaned by señoritas and rock wrasse always wait for the cleaners to identify themselves by making the first move? The explanation offered for situations involving the señorita (Hobson 1971) would seem even more applicable to the rock wrasse. That is, fishes probably are unable to distinguish cleaning rock wrasse from among the many more non-cleaning rock wrasse around them. The tropical fishes that routinely initiate encounters with cleaners generally approach highly specialized forms like the Hawaiian cleaner wrasse *Labroides phthiophagus* (Losey 1971). Generally, these cleaners center their activity around well-defined stations, so that fishes know precisely where to go for service; furthermore, because most individuals of the cleaning species are themselves cleaners, even random attempts to solicit service from individuals in the population at large would have a reasonably good chance for success. This would be untrue of random attempts to solicit cleaning from either the rock wrasse or señorita.

---

Cleaning señoritas tend to clean members of just one species during a given period of activity (Hobson 1971). In attempting to explain this situation, I pointed out that because the señorita generally initiates its cleaning encounters it can select its clients. Each potential client-species differs in appearance and behavior, so that each presents a distinctive target to the approaching cleaner. Although these differences often seem subtle, they probably influence the cleaner's choice of clients.

Applying the same reasoning to the cleaning rock wrasse, it is not surprising that during February and March the rock wrasse approached and cleaned only the bright-orange garibaldi, a fish readily distinguished from all others in its habitat. During the previous June, however, the rock wrasse had cleaned several species in succession: opaleye, half-moon and black perch. These three species are similar, all being deep-bodied, dark-hued fish that often swim close above the sea floor, and so they may be a measure of the extent the cleaner generalizes when selecting clients. Perhaps significantly, the garibaldi that solicited cleaning at this time was ignored. During the August observations, the rock wrasse showed interest in a more diverse assortment of fishes, although only other members of its own species responded to this interest. The significance of this apparent inconsistency is difficult to assess, however, because the session was so brief (4 min).

Although observations made since my 1971 report continue to support the contention that cleaning señoritas tend to clean members of just one species during an undetermined period of time, I have seen a few señoritas clean several dissimilar species in succession. Apparently, the extent to which señoritas generalize in selecting clients, like the incidence of cleaning, varies between individuals.

If, in fact, one individual rock wrasse performed all the cleaning described in the present report, then the observations indicate that, although its concept of a cleaning target remained unchanged over at least 1 month (February 14 to March 14), there had been a change between the previous June and August, and another between August and February.

In the guts of señoritas, ectoparasites that presumably had been taken by cleaning frequently occur in blocks sharply delimited from foods obviously unrelated to cleaning (Hobson 1971). I consider this evidence that these individuals had cleaned intensively for a while, abruptly shifted to other modes of feeding, and then later returned to cleaning. It remains unknown whether or not the cleaning rock wrasse similarly alternates between protracted bouts of cleaning and non-cleaning modes of feeding.

#### ACKNOWLEDGEMENTS

I thank Carl L. Hubbs and Richard H. Rosenblatt, Scripps Institution of Oceanography, for helpful comments on a draft of the manuscript.

---

## REFERENCES

- Feder, H. M. 1966. Cleaning symbiosis in the marine environment, p. 327-380. *In* S. M. Henry (editor), Symbiosis, Vol. 1. Academic Press, New York. 478 p.
- Gotshall, D. W. 1967. Cleaning symbiosis in Monterey Bay, California. *Calif. Fish Game*, 53(1): 125-126.
- Hobson, E. S. 1971. Cleaning symbiosis among California inshore fishes. *U.S. Nat. Mar. Fish. Serv., Fish. Bull.*, 69(3): 491-523.
- Limbaugh, C. 1965. Fish life in the kelp beds and the effects of kelp harvesting. *Univ. Calif. Inst. Mar. Resour., IMR Ref.*, 55-9: 1-158.
- . 1961. Cleaning symbiosis. *Sci. Amer.*, 205(2): 42-49.
- Losey, G. S., Jr. 1971. Communication between fishes in cleaning symbiosis, p. 45-76. *In* T. C. Cheng (editor), Aspects of the biology of symbiosis. Univ. Park Press, Baltimore, 327 p.