

**OXYGEN CONSUMPTION OF REEF FISHES DURING  
QUIESCENT PERIODS OF THEIR CIRCADIAN  
ACTIVITY CYCLES**

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*Purpose:* Measure oxygen consumption of reef fishes (Report No. 78-8b).

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*Accomplishments:* The standard or resting metabolic rate of fishes has proven difficult to measure under laboratory conditions. Fishes unaccustomed to visual restrictions, particularly during active segments of diel behavioral rhythms, tend to elevate oxygen consumption through spontaneous random and directed movement. The introduction of the fish, then, into an enclosure with water of a strange chemical milieu, would significantly increase the metabolic rate above basal levels. The decreased handling, transport, and acclimation procedures made available by field measurements, and the assurance of water with a familiar chemical milieu, temperature, and pressure, would perhaps lend itself to a more accurate measure of standard metabolism. Oxygen consumption of diurnally active and nocturnally active fishes was measured using their corresponding quiescent periods. Fishes were captured and placed in the respirometer several hours before measurements were begun. Oxygen consumption was calculated. At the conclusion of the test, fishes were removed, preserved, and weighed. Water samples were analyzed for dissolved oxygen by the Winkler Method. Data for the bicolor damselfish (*Eupomacentrus partitus*) show a weight-oxygen consumption regression. Respiration values for larger fish

are similar to those reported in the literature for tropical species. However, the data for smaller fish are not as well correlated. In general, cardinal fishes demonstrate a much higher level of awareness and activity during quiescent periods than diurnally active species. Individual variation among cardinal fishes appears to be quite high and, at this point, unpredictable.