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Standard rate of metabolism in the Common Barn-Owl (*Tyto alba*).—A number of studies have examined metabolic rates of owl species in relation to ambient temperature (Graber 1962, Ligon 1969, Coulombe 1970, Gessaman 1972). None, however, has examined standard metabolic rates for any member of the family Tytonidae. Here I present results from a series of measurements estimating the standard metabolic rate of the Common Barn-Owl (*Tyto alba*).

Two adult Common Barn-Owls were obtained from the Center for Birds of Prey, Florida Audubon Society, Maitland, Florida, and housed in an indoor aviary at the University of Florida. Aviary temperature was approximately 25°C. Birds were fed a diet of chicks and rats for 6 days and fasted on the seventh. All experiments were run with birds in a postabsorptive state. Because I was unable to obtain permission to laparotomize the birds, I identified sex by comparing each bird against 95% confidence intervals about mean male and female Common Barn-Owl weights (data from Earhart and Johnson 1970:table 2). Although some overlap in confidence intervals existed, weights of both birds used here (488.2, 578.2 g) were outside the male confidence interval and within that calculated for females.

Prior to each experiment, birds were weighed to the nearest 0.1 g, and body temperature (T_b; °C) was measured by placing a thermister probe into the cloaca. Birds were then placed in an open-system chamber approximately 5 liters in volume, and oxygen consumption measured with an Applied Electrochemistry Oxygen Analyzer (Model S3A). Soda lime and silica gel were used to remove carbon dioxide and water, respectively, from air exiting the chamber. Environmental temperatures were controlled by submersing the chamber containing a bird in a thermoregulated water bath. Oxygen consumption ($\dot{V}_{O_2}$; cm^3O_2/g-h) was calculated from a formula derived by Depocas and Hart (1957). Flow rates ranged from 0.35 to 0.75 liters/min (STPD). Multiple runs at different temperatures were made on each individual bird, and an experiment ended when oxygen consumption was steady for at least 30 min. All experiments were run during the daytime. Birds were weighed to the nearest 0.1 g and body temperature recorded immediately after each experiment. All values are presented as mean ± 1 SD unless indicated otherwise.

The thermoneutral zone (TNZ) of Common Barn-Owls extended from 22.5 to 32.5°C (Fig. 1). Mean oxygen consumption within this zone was 0.604 ± 0.051 cm^3O_2/g-h. This value is significantly greater ($P < 0.001$) than that predicted by Aschoff and Pohl's (1970) relationship for inactive nonpasserine birds, but within the range of values reported for Strigidae owls (Ligon 1969:table 1) and that predicted by Zar's relationship for strigiforms (1968). Below TNZ, $\dot{V}_{O_2}$ was explained by the relationship $1.161 - 0.024(T_a)$ ($r^2 = 0.90$, $P < 0.001$) and extrapolated to zero metabolism at 47.9°C. Body temperatures averaged 37.8 ± 0.6°C across the range of chamber temperatures (Fig. 1).

Use of the slope of the regression below TNZ as a measure of conductance is valid only if the line extrapolates to the mean T_b (McNab 1980). Because the line below TNZ extrapolates to a temperature greater than the mean T_b, it suggests that Common Barn-Owls

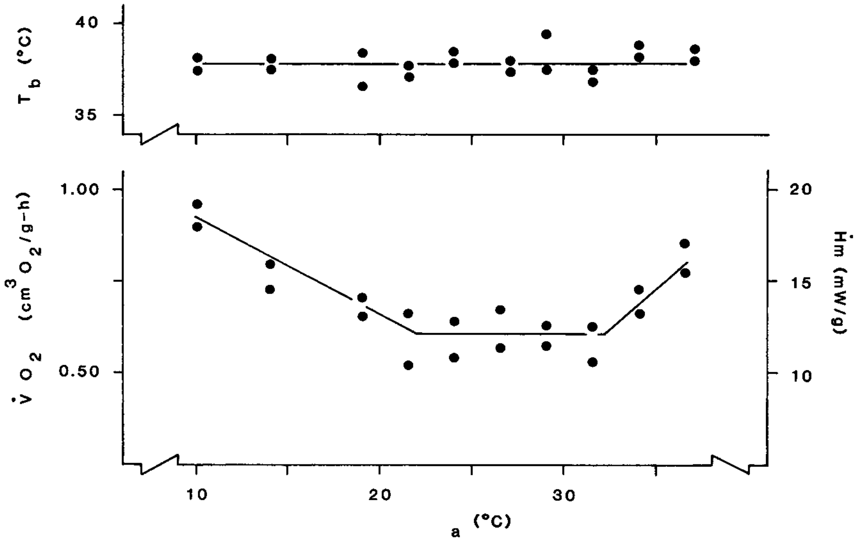

FIG. 1. Relation of body temperature (T_b), oxygen consumption ($\dot{V}_{O_2}$) and metabolic heat production (H_m) to environmental temperature (T_a). H_m was estimated by assuming 20.08 kJ heat produced per liter of O_2 consumed (after Hayworth and Weathers 1984).

respond to a decrease in T_a by increasing heat production and simultaneously decreasing conductance. A more accurate measure of conductance under these circumstances is obtained from the equation, $C = \dot{V}_{O_2}/(T_b - T_a)$, where C is conductance in cm^3O_2/g-h°C (McNab 1980). Mean minimal conductance calculated from this relationship was −0.037 ± 0.004 cm^3O_2/g-h°C, a significantly steeper ($P < 0.001$) slope than that generated by simple regression.

Oxygen consumption by Common Barn-Owls differs little from values reported for other owls. Whether or not metabolic rates of other owls in Tytonidae (e.g., Grey Sooty Owl [*T. tenebricosa*], Eastern Bay Owl [*Phodilus badius*]) constitute a cluster distinct from Strigidae owls is unknown, and can be determined only by further work.

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Vocalizations of female Red-winged Blackbirds inhibit sexual harassment.—Breeding female Red-winged Blackbirds (*Agelaius phoeniceus*) are frequently vocal in the vicinity of their nests, where they typically utter chatter-like vocalizations when arriving and departing as well as while flying through their mates' territories. Beletsky and Orians (1985) identify these vocalizations as "Type 1" songs, thought to be used by females primarily for intrapair communication (Beletsky 1983). They suggest that the function of these vocalizations, when given around nests, is to identify females and their breeding statuses to their mates. One suggested benefit of frequent vocal identification in these situations is sexual noninterference by males, who regularly pursue, often for long distances, females that fly into their territories. If resident females were pursued in this manner, their abilities to build nests, incubate, and feed nestlings could be impaired. Beletsky and Orians (1985) support this suggestion with data showing that female Yellow-headed Blackbirds (*Xanthocephalus xanthocephalus*), which also usually vocalize when leaving and approaching their nests, are chased by their mates significantly more often if they depart silently than if they vocalize when leaving. Here we present similar data for Red-winged Blackbirds.

The breeding biology of Red-winged Blackbirds is described in detail by Orians and Christman (1968) and Orians (1980). Our observations were made during May 1986 at a marsh in the Columbia National Wildlife Refuge, Grant County, Washington. The marsh contained 12 territorial male Red-winged Blackbirds and more than 30 breeding females. All males and most females were color banded for individual identification. We observed female movements and male behavior from a 6-m high cliff overlooking the marsh. For each arrival at and departure from a nest, we recorded whether the female vocalized and whether she was chased by her mate. All females monitored during this study, and previously (Beletsky and Orians 1985), vocalized near their nests.

We observed 47 departures and 44 arrivals of females at their nests. More than 10 different females were observed. For all arrivals, females were returning from foraging off the territories of their mates. None of the departing females that vocalized was chased (0/37), whereas 40% (4/10) of females departing silently were chased. Three percent (1/33) of females that vocalized while arriving were chased, whereas 36% (4/11) of those arriving silently were