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MONILIFORMIS MONILIFORMIS INCREASES CRYPTIC BEHAVIORS IN THE COCKROACH *SUPELLA LONGIPALPA*

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ABSTRACT: We measured the behavioral responses of the domiciliary pest cockroach *Supella longipalpa* to infection by the archiacanthocephalan *Moniliformis moniliformis*. In black-and-white behavioral mazes, infected animals spent significantly less time on white horizontal surfaces than did controls. Use of black horizontal

dividual cockroaches between 1 and 3 hr after scoto- analysis to determine whether movement was affected

TABLE I. Distance traveled, percentage of time active, and average velocity for control and parasitized *Supella longipalpa* under red and white light. Standard deviations are given in parentheses, and sample sizes are given in brackets.

	% Time active	Distance traveled (cm)	velocity (cm/sec)
Control, red light	27.75 (30.72) [27]	337.26 (381.11) [27]	1.33 (0.43) [19]
Parasitized, red light	36.94 (30.93) [24]	435.10 (361.42) [24]	1.35 (0.53) [17]
Control, white light	4.77 (13.64) [27]	58.31 (169.31) [27]	1.22 (0.62) [5]
Parasitized, white light	0.78 (3.16) [24]	6.70 (27.8) [24]	0.93 (0.09) [2]

time on white vertical surfaces. Under white light, these animals spent the most time on black horizontal surfaces and showed a significant shift away from white horizontal surfaces ($F_{1,48} = 6.66$; $P < 0.05$). The use of black vertical surfaces was not affected by light or parasitism.

DISCUSSION

Under simulated daylight conditions, *S. longipalpa* is a remarkably quiescent animal. For instance, under white light, *S. longipalpa* is active less than 5% of the time (Table I). This inactivity may have important consequences for the extent to which *S. longipalpa* behavior may be modified by parasitism.

In the case of response to light, for example, freeze times exceeded 4 min for half of the control animals and three quarters of infected ones. These freeze times are substantially longer than those of any species examined to date (Moore, 1983; Carmichael and Moore, 1991; Gotelli and Moore, 1992). In *S. longipalpa,* parasitism does not alter the average freeze time; it does decrease the probability that animals will move when exposed to sudden light. This may not have ecological significance, however, because the majority of animals that moved in both treatments were stationary for at least 30 sec. Under these

manica is 10–15 mm long, of African origin, and

TABLE II. Effect of *Moniliformis moniliformis* para-