

BEHAVIORAL ECOLOGY AND EVOLUTION I

Abstracts

THE EFFECT OF EXPERIENCE WITH A FEMALE ON MALE MATING BEHAVIOR IN THE PARASITOID WASP *SPALANGIA ENDIUS*

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In the parasitoid wasp *Spalangia endius* males are often observed backing up quickly from recently mated females. Such experienced virgin males as well as mated males subsequently show a reduced eagerness to mate compared to inexperienced virgin males. In contrast to the effect of experience with a female, experience with a male does not have an effect on male eagerness to mate. We examined the effect of male experiences more closely. 1) The observed decreased eagerness to mate was short lived in both experienced virgin males and mated males, lasting less than one day and thirty minutes, respectively. 2) Experience with a virgin female decreased eagerness to mate if the male was removed with forceps after mounting, but not if he was removed prior to mounting and without forceps. 3) The reduced eagerness of mated males occurs with or without any female behavioral input.

Key words: *experience, male mating behavior, parasitoid wasp, eagerness to mate*

DIFFERENCES IN COURTSHIP BEHAVIOR DISTINGUISH *Drosophila melanogaster* RACES AT AN INCIPIENT STAGE OF SPECIATION

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The Zimbabwe (Z) and Cosmopolitan (M) races of *D. melanogaster* show signs of incipient speciation, including asymmetric premating isolation (Hollocher et al, 1997). It is known that Z females mate preferentially with Z males and only rarely with M males. Here, we show indications of M female choice as well, notably delayed receptivity to Z males and active rejection of Z males during copulation. We show that the courtship behavior of Z and M males differs in several characters, including licking and wing vibration duration. Use of chromosome substitution lines in mating behavior experiments reveals a large role for the third chromosome in determining behaviors that differentiate Z and M lines. Intercross lines will permit finer mapping of these characters. Use of our *desaturase2* transgene lines (Greenberg et al, 2003) in mating behavior experiments should elucidate the role of cuticular hydrocarbons (contact pheromones) in Z-M behavioral isolation.

Keywords: *speciation, sexual selection, mating behavior, Drosophila*

DEVELOPMENT-RELATED EFFECTS OF AN ACANTHOCEPHALAN PARASITE ON PAIRING
SUCCESS OF INTERMEDIATE HOST, *CAECIDOTEA INTERMEDIUS* (ISOPODA)

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The acanthocephalan parasite, *Acanthocephalus dirus*, undergoes larval development in the aquatic isopod, *Caecidotea intermedius*, before completing its life cycle in the intestine of a fish (e.g., sunfish). Inside *C. intermedius*, the parasite develops through non-infective acanthor and acanthella stages and into the cystacanth stage, which is infective to definitive hosts. Previous work has shown that individual *A. dirus* induce phenotypic changes in *C. intermedius* that increase conspicuousness to definitive hosts and that the level of modification is most pronounced when the parasite has developed into the cystacanth stage. We examined whether development into the cystacanth stage also correlated with changes in mating behavior of the host. Using a field survey, we quantified the pattern of development of larval *A. dirus* to identify specific time-periods when either infective (cystacanth) or non-infective (acanthor, acanthella) stages dominated. We then compared the infection status of paired and unpaired males during these periods and found that males infected with cystacanth stage larvae had lower pairing success than males infected with larvae in the non-infective stages. To identify the behavioral mechanisms underlying this relationship (i.e., male response to females, female resistance), we used a field-based experiment to examine the relationship between parasite development and mating interactions between males and females. We found that cystacanth-infected males were less likely to initiate mating attempts with females than acanthor/acanthella-infected males and that this effect could explain the population-level mating pattern.

Keywords: *Caecidotea intermedius*, *Acanthocephalus dirus*, *sexual selection*, *mating interacting*

REPRODUCTIVE INVESTMENT AND ITS CONSEQUENCES IN FEMALE WOLF SPIDERS
(ARANEAE, LYCOSIDAE)

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Reproduction can be costly for females. For female spiders, the production of young often involves a substantial increase in mass without a concomitant increase in support structures such as carapace and legs, which are fixed in size at adulthood. This increase in mass may require greater foraging to acquire and may result in reduced mobility and, thus, greater risk of predation. If encounters with males are rare, then females may delay mass accumulation until after mating to avoid an unnecessarily high predation risk. The purpose of this study was to test if female wolf spiders delay reproductive investment until after mating and to examine if reproductive investment may be costly to females. We tested these hypotheses using the wolf spider *Hogna helluo*, which typically occurs at low densities in agricultural fields throughout the Midwestern US. Mated females gained significantly more mass than virgin females even though both were fed the same amount of food. In nature, this increase in mass may be even greater because mated females were faster to attack prey items than virgin females. The increased mass of mated females resulted in lower mobility. Mated females had a lower speed and lower endurance than virgin females. Despite greater mass, both mated and virgin females had similar starvation tolerance, which suggests that the increased mass of mated females was allocated to reproduction (e.g. eggs or ovaries) and could not be utilized for energy. Our results support the

idea that female wolf spiders delay reproductive investment until they mate to avoid potential costs.

Keywords: *mobility, reproduction, wolf spider*

HOME RANGE, HABITAT USE, AND FRACTAL DIMENSION OF MOVEMENT PATHWAYS IN THE RACCOON (*Procyon lotor*).

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To investigate optimal foraging strategy in raccoons at Prairie Ridge State Natural Area, 10 individuals (6 females and 4 males) were fitted with radio-collars and tracked during 12-hour nocturnal foraging bouts, with locations recorded every half hour. Our research questions were: (1) does home range size differ between the sexes and among seasons? (2) are there seasonal shifts in the use of core areas within home ranges? (3) how are raccoons actually moving through the landscape?, and (4) can fractal analysis be a useful tool for interpreting movement pathways? Results show that males have larger home ranges than females, and that both sexes shift their core home ranges between seasons. Riparian and residential habitats were used more frequently in the winter and spring than other habitats, whereas agricultural and riparian habitats were used more frequently in the summer and fall by both sexes. Preliminary fractal analysis suggests differences in movement patterns between the sexes and among seasons. It appears as if males and females pursue unique optimal foraging strategies that maximize individual fitness in this fragmented, agricultural landscape.

Keywords: *Procyon lotor, habitat use, fractal dimension, movement pathway*

IMPACT OF EXOTIC ROUND GOBY ON THE FORAGING BEHAVIOR OF YELLOW PERCH IN MACROPHYTE AND DREISSENID HABITATS

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The round goby, (*Neogobius melanostomus*), a small benthic fish native to the Black and Caspian Seas, was introduced through ballast water discharged from Eurasia into the Great Lakes in the early 1990s and has since spread to all five of the Great Lakes and several of their tributaries. Some of the reasons for its success include its tolerance for a wide range of environmental conditions, its diverse diet and aggressive behavior. These characteristics of round gobies make them potential competitors with other native benthic fish in the Great Lakes. Previous research has found that juvenile round goby and yellow perch (*Perca flavescens*), have similar diets and habitat requirements and are likely to be potential competitors. In a previous laboratory experiment, we found that the presence of another perch resulted in lower growth than the presence of a round goby in a macrophyte habitat and the presence of a perch or a goby competitor had similar effects on the growth of perch in dreissenid colonies. In this laboratory study, we examined whether yellow perch (63.3 +/- 4.3 mm) aggressively interact more with conspecifics or round goby (63.6 +/- 4.3 mm) and if aggressive interactions differ between macrophyte and dreissenid habitats. There appeared to be more aggressive interactions between two perch than between a perch and a goby. Our results do not provide evidence in

support of a strong competitive interaction between juvenile yellow perch and juvenile round goby in a macrophyte habitat. Further studies should consider interactions among other yellow perch and round goby size classes.

Keywords: *round goby, yellow perch, lake Erie, aggressive interactions*