

Preconceived Residency Advantages in the Territorial Common Baskettail Dragonfly, *Epitheca cynosura*

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**Abstract:**

The main question addressed in this experiment is whether or not the residency effect influences the territorial behavior of the male common baskettail dragonfly. To examine this question, male common baskettail dragonflies were observed and the number of chases was recorded for each dragonfly territory. Then the resident male was captured, held for 2 min and then released. Observations were made as to whether or not the original resident male returned and if a new male took over the area. Since no males returned to their initial territories, the collected data indicated that there was no significance between the number of chases by resident males whose territory was taken over and the number of chases by resident males whose territory was not taken over.

**Introduction:**

In many animal mating systems, males control a high demand area, or territory, to attract potential mates. In dragonflies, the males establish a territory and defend it from other sexually mature males. According to the residency effect, these territorial males, known as residents, will almost always win a territorial contest against intruding male competitors (Gribbin & Thompson, 1990). The resident males exhibit a wide variety of defensive behaviors to defend their territory from the other males. Often times a violent clash occurs involving approaching the intruding male and then chasing it out of the area (Corbet, 1980). Male common baskettail dragonflies (*Epitheca cynosura*) were used in this experiment because of

species abundance and territoriality observed before trials were performed. The question addressed in this experiment is whether or not the residency effect influences the territorial behavior of the male common baskettail dragonfly. We hypothesize that the greater number of chases by a resident male (demonstrating extent of territoriality) will result in a return to their initial territory after being removed from the area, regardless of the presence or absence of a new resident. Additionally, we hypothesize that males who do not return to their territory in the absence of a new resident are those that display a low number of chases.

### **Methods:**

Naturally occurring common baskettail dragonfly territories around Lake Itasca, MN were located. Territorial males were observed for two min and quantified the number of territorial defense chases. These individuals were then caught with aerial nets and held for 2 min during which their wings were labeled using Sharpie® permanent markers of varying colors for identification purposes. Territories that had been taken over by new resident males were recorded. The labeled individuals were released and observed for two min to determine whether or not they returned to their previous residence. These data were then analyzed using the Microsoft® Excel computer software program.

### **Results:**

The results of the two- tailed t- test indicated that there was no significant difference between the frequency of chases between the group that had a new resident and the group that did not ( $t= 2.2$ ,  $df= 3$ ,  $p= 0.115$ ; Fig.1). There were no returns of original residents to their territory, so the data was unable to be analyzed.

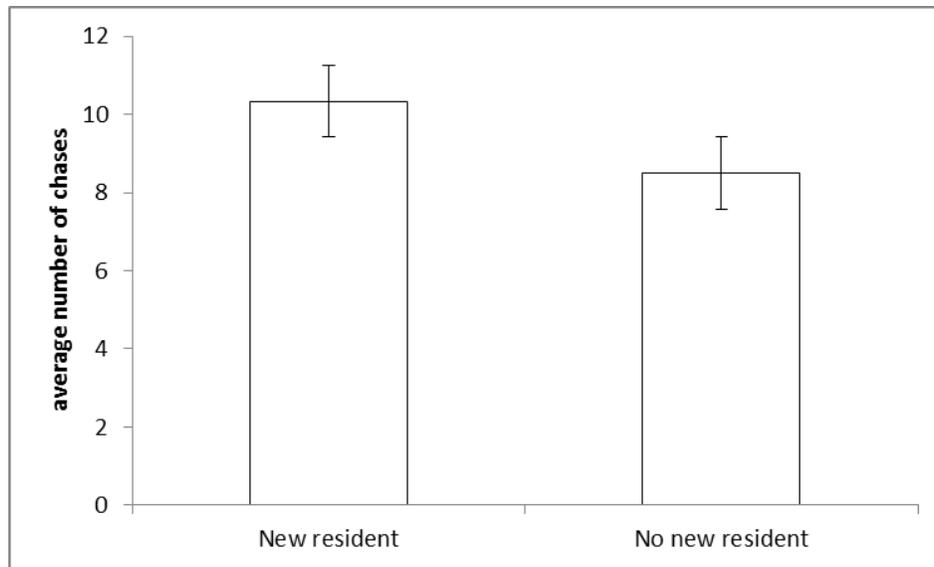


Figure 1. The average number of chases (with  $\pm 1$  SE) within each group of original resident: those whose territory was taken over and not.

### Discussion:

These data show that there is no significant difference between the frequency of territorial displays of males that had their original territory taken over by a new male and those that did not. The complete absence of male returns to their previous territories suggests that male common baskettail dragonflies typically do not resume a residence after being removed by outside forces (a strong wind for example). It is possible that because common baskettail dragonflies are highly aggressive when defending their territories they have very low energy reserves. Thus, the high energy cost of attempting to retake their initial residency outweighs the benefits (Switzer, 2004). If this is the case, then it is reasonable to conjecture that males removed from their territories benefit more greatly from immediately seeking new territory to establish residence than they do from returning to their previous territories. This proposes that the initial resident has a preconceived inclination that its previous territory has been inhabited

by a new resident that, according to the residency effect, now has the territorial advantage. Additional exploration of these possibilities is necessary to evaluate the legitimacy of these ideas.

**References:**

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