



Just about everyone hates mosquitoes. Besides being annoying pests, the diseases they carry, such as malaria, account for an estimated 3 percent of all deaths worldwide. So knowing that bats eat mosquitoes should make bat conservation a lot easier. In fact, it's not quite so simple.

Many scientists dismiss long-standing claims that bats can significantly help control mosquitoes or reduce mosquito-related diseases. While research shows that many bats will indeed eat mosquitoes, it also suggests that the tiny mosquitoes constitute only a small proportion of a bat's diet.

University of Michigan graduate students Michael Reiskind and Matthew Wund designed an elaborate experiment to test bats' mosquito-control potential. Their results offer preliminary support for the idea that, under certain circumstances, bats can reduce mosquito populations. They said they hope their efforts encourage additional research on the subject, and provide new ammunition to those working to conserve the world's bats.

They focused on female mosquitoes of a species (*Culex restuans*) that can carry the West Nile Disease virus. Only female mosquitoes spread disease-causing organisms by feeding on blood before each episode of egg production. This suggested that attacking mosquito populations at the point of egg laying would be an efficient means of limiting disease transmission.

The team's previous research found that this mosquito could be readily attracted to a specific artificial aquatic habitat – a plastic tub filled with water and decaying hay – to lay their eggs. They used these habitats to bring large numbers of mosquitoes into contact with bats inside outdoor flight cages.

Reiskind and Wund captured northern myotis and built field enclosures that allowed mosquitoes and other flying insects to enter, but prevented the bats from escaping. At each of three sites in a Michigan nature preserve, they placed two enclosures about 165 feet (50 meters) apart.

At each site, they designated one enclosure as the bat cage and the other as a control. They placed an artificial egg-laying habitat in each enclosure. A third habitat was placed outside, equidistant between the two enclosures. This allowed the research to measure egg-laying rates independent of the enclosure treatments.

They released bats into the bat cages on 18 separate nights, and every morning for a total of six weeks, they counted the number of egg-clutches laid in the containers by naturally occurring female mosquitoes.

They found that significantly fewer egg-clutches were laid in enclosures with bats than in enclosures without them. There were, in fact, 32 percent fewer eggs-clutches when bats were present. This reduction occurred only within flight cages and not in containers just outside the enclosures, confirming that female mosquitoes were present and that the bats were eating many of those that entered the cages.

There was no difference in the number egg clutches between the control and bat enclosures on nights when bats were not released.

Reiskind (now at Oklahoma State University at Stillwater) and Wund (at The College of New Jersey) concede that

their experiment was not a perfect reflection of reality. But, they conclude, “what we have demonstrated, however, is that given a high density of bats and a high density of mosquitoes, the conventional wisdom may very well be accurate: bats can reduce mosquito populations.”

(This research was originally reported in the Journal of Medical Entomology.) BCI Members can read the full story of Bats and Mosquitoes in the Spring 2010 issue of BATS magazine. If youâ€™re not a member, join today:

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