

## ScienceWatch – An Avian Protection Racket

“You toucha my egg, I breaka your nest!”

Scientists have long wondered why host species accept the costly burden of raising cowbird chicks even when the foreign egg differs greatly from their own. Explanations usually focus on an inability of the host to recognize the parasitic egg and chick as foreign, but have remained unsatisfactory. Now a study, published in the March 5, 2007 online issue of the *Proceedings of the National Academy of Sciences*, shows that brown-headed cowbirds (*Molothrus ater*) act like a Mafia protection racket, trashing the nests of those who refuse to accept their eggs in order to intimidate their warbler hosts into raising their chicks.



Jeffrey Hoover and Scott Robinson of the Florida Museum of Natural History, University of Florida, Gainesville, FL and the Illinois Natural History Survey, Champaign, IL, respectively, have studied cowbird parasitism on prothonotary warbler (*Prothonotaria citrea*) nests in the Cache River watershed in southern Illinois. Over a period of four years they experimentally removed or accepted cowbird eggs and controlled cowbird access to otherwise predator-proof nest-boxes. A total of 182 warbler nests were divided into five categories: 1) cowbird egg removed (ejected), cowbird access always allowed; 2) nonparasitized nest, cowbird access always allowed; 3) cowbird egg accepted, cowbird access always allowed; 4) cowbird egg removed, cowbird access denied thereafter; 5) cowbird access never allowed. When cowbird entry (but not warbler) was denied it was done by decreasing the nest-box entry hole from 44mm to 24 mm. Other predators were kept out by placing all nest-boxes on greased poles.

When cowbird access was allowed, 56 % of all “ejector” nests (category 1) were trashed compared with only 6% of “acceptor” nests (category 3). Trashing occurred during the incubation period and involved damage, destruction or disappearance of most or all of the warbler eggs. When cowbird access was denied either before (category 5) or after (category 4) cowbird parasitism occurred, no nests were trashed,



indicating only cowbirds were responsible for the attacks. Nests that were not parasitized, but still accessible to cowbirds (category 2) were trashed at an intermediate rate of 20%. The nearly 10-fold increase in trashing of ejector nests by cowbirds compared with acceptor nests was dubbed “mafia-like behavior” because it appeared to be retaliatory. It explains why the warblers do not normally reject the cowbird eggs. Evidently, female cowbirds monitor the response of their hosts, forcing them to comply by imposing a steep penalty if they reject the cowbird eggs. Warblers are able to raise, on average, three of their own eggs when they accept a cowbird egg. By contrast, they raise an average of just one of their own if they reject it.

In addition to the “mafia” behavior, Hoover and Robinson cited the case where nests that were not parasitized, but still accessible to cowbirds (category 2) were also trashed but at

a lower rate than ejector nests. They believe that this cowbird behavior, which they call “farming” provides new opportunities for nest parasitism because many of the warbler pairs nest again and begin laying eggs.

In the end it’s cheaper for the warbler parents to pay the protection by accepting the cowbird egg and raising the chick. While we may find the cowbird’s “immoral” behavior distasteful, the warblers have adopted a “get along” policy, which ensures their own survival, and survival is all that counts in nature.

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Photo credit: Jeffrey Hoover and PNAS