Researchers show increased risk of predators can evoke adaptive response in birds

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A juvenile Eurasian Sparrowhawk in Betuwe, Netherlands. Image credit: Wikipedia.

(PhysOrg.com) -- Evolutionary ecologists Michael Coslovsky and Heinz Richner of the University of Bern in Switzerland, have published a study in Functional Ecology where they show that when a female bird is exposed to more stress from predators, such as hawks, when ovulating, they tend to produce offspring that are smaller, which isn't a surprise as stressed offspring in many species wind up smaller than average; the surprise is that the smaller offspring also grew their wings both faster and longer than what would be considered normal for their species.

To get these results, Coslovsy and Richner went out into Bremgartenwald forest, near Bern and chose a group of great tits to use as a study group. They then exposed part of the group of mothers (during

ovulation) to stuffed sparrow hawks and audio recordings of their calls; the control group was exposed to song thrushes. Two days after the nestlings hatched, they (both groups) were captured, tagged and carted off to another part of the forest to be raised by adoptive parents. As they grew, they were all monitored and it was then the researchers discovered that the offspring of stressed mothers were in fact smaller, as expected, but they also grew their wings at an unusually brisk pace, and grew them longer (1.8 millimeters on average) than other birds from the control group.

Prior to this research, it's been assumed that smaller growth in bird offspring is generally a negative effect brought about by a buildup of the stress hormone corticosterone. Now, with the news that smaller offspring also produce wings at an earlier age, and grow them longer, it might be argued that all three changes are nature's way of helping the nestlings survive in a more hostile than normal environment; less weight, combined with longer wings at an earlier age, would seem to increase the nestling's ability to fly away at a younger age, and to do so more speedily to ward off attacks.

Of course, the results shown by Coslovsy and Richner are just one study, and have only been done on one species of bird; many more field trials will have to be made before any definitive conclusions can be drawn.

More information: Predation risk affects offspring growth via maternal effects, Michael Coslovsky, Heinz Richner, *Functional Ecology*, Article first published online: 1 March 2011. DOI: 10.1111/j.1365-2435.2011.01834.x
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