Common pesticides pose threat to seed-eating songbirds

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Video Abstract

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Abstract

A recent study shows that common pesticides could seriously harm and disorient a songbird native to North America. Migratory bird populations across the world are declining. While that trend has been linked to a litany of complex factors, one of the most concerning is the widespread use of common pesticides, namely, organophosphates and neonicotinoids. Neonicotinoids, the more modern of the pair, were originally thought to be less harmful to the human and wildlife nervous system. But mounting evidence suggests that may not be the case. One group of animals susceptible to the brain-altering effects of the pesticides are migratory songbirds. In a recent study, researchers looked at the white-crowned sparrow in particular. The white-crowned sparrow migrates as far as northern Canada during breeding season and as far south as Central Mexico in the winter. Like many other migratory birds, the sparrow relies on the rich farmland in between to rest and refuel. And that's where danger may lie. The seed-eating sparrow could unwittingly be ingesting grains contaminated by neonicotinoid coatings or organophosphate granules posing as food or grit. Researchers showed that both are harmful to the white-crowned sparrow. Normally oriented northward during breeding season, sparrows fed either pesticide appeared to have lost their internal compass—attempting to fly off-axis in orientation trials. While sparrows fed the neonicotinoid recovered their bearings after two weeks, those on the organophosphate did not. Such changes in migratory orientation are problematic because they could alter the ability of the songbird and others like it to successfully reach their breeding or wintering grounds. Ultimately, that could compromise the birds' reproduction and survival. The organophosphate did not appear to affect sparrows in any other profound way. The neonicotinoid, however, had other, more visceral effects. Sparrows fed the pesticide lost significant body mass, up to a quarter of their original mass in only 3 days. And although not statistically significant, some birds on the neonicotinoid were observed to suffer from respiratory stress, lethargy, and even death. No control birds showed any of these effects. The research team plans to leverage advanced tracking technology to determine whether free-living birds suffer a similar fate. Their findings could provide valuable information on how human activity is affecting the livelihood of various migratory bird species.