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Wild Birds Exposed to Chemicals Sing to a Different Tune: The Effect of PCBs

By Catherine Griffin



Black-Capped Chickadee

It turns out that some songbirds may be singing to a different tune. This isn't due to personal preference, though; scientists have discovered that the inconsistency in the songs could be caused by non-lethal levels of contaminants in the birds' environment.

The Hudson River valley hosts a diverse range of songbird species. Yet this region also has legacy levels of PCBs, which are Polychlorinated biphenyls. These synthetic chemical pollutants are left over from decades of electronics manufacturing upriver and have been shown to have developmental effects on both humans and wildlife.

In order to find out how these PCBs might be impacting songbirds, the researchers non-lethally investigated total PCB loads, congener specific PCB profiles and the songs of black-capped chickadees and song sparrows. Since these songbirds feed their young PCB-contaminated aquatic insects as their main food source, the researchers expected to see at least some PCBs within

the songbirds.

So what did they find? It turns out that song disruption in these birds is tied to specific types of PCBs. There are actually about 209 variations of PCBs, differentiated by the positioning and numbering of chlorine atoms.

"Our results indicate that black-capped chickadees and song sparrows have higher total blood PCBs in regions with higher historic contamination," wrote the authors [in a news release](#). "The two bird species varied substantially in their congener-specific PCB profiles; within sites, song sparrows showed a significantly higher proportion of lower chlorinated PCBs, while black-capped chickadees had higher proportions of highly chlorinated PCBs."

They didn't just find out the birds' PCB loads, though. They also found that the songs varied depending on how many PCBs the birds had been exposed to. It turns out that black-capped chickadees showed a greater variability in song with a change in the "glissando" ratio of the first note of their two-note song, "fee-bee, fee-bee." Song sparrows also showed a change; they created high performance trills that could very well be the result of other types of PCB molecules that are less toxic.

"Effects of PCBs are extremely complicated," said Andre Dhondt, co-author of the new study, [in a news release](#). "What this demonstrates is that most previous PCB studies may not give us the whole picture because they did not look at the specific type of PCB involved but just measured overall levels."

The findings show not only the fact that PCBs can affect songbirds, but also reveal how long-lasting some chemicals can be. The fact that these songbirds are impacted years after PCBs have stopped being used demonstrates how dangerous it is for chemicals to leak into the environment.

The findings are published in the journal [PLOS One](#).