



HOUSE SPARROW JESSIE WALTON

## Do city-nesting birds use cigarette butts for pest control?

New environments pose new challenges, and new challenges demand innovations. Birds provide many striking examples of innovative behaviours: at some point an Egyptian Vulture must have been the first of its kind to use a stone to break an ostrich egg, and a New Caledonian Crow first used a stick to extract an otherwise inaccessible beetle larva from a log. In each case, the benefit conferred by this innovative behaviour was significant enough for it to spread through the population, eventually becoming a characteristic trait of a species.

A study published late in 2012 may have uncovered a startling example of avian innovation in an environment that – in evolutionary terms – is very new indeed: human cities.

It has been known for several decades that city-nesting bird species sometimes incorporate cigarette butts in their nests, but the new findings reveal that the presence of the butts may go far beyond a matter of birds simply mistaking them for natural nest-building materials. Instead, the birds may be using the butts (or more to the point, the chemicals contained in the butts) for pest control, in the same way that some birds line their nests with aromatic plant material.

Researchers collected used House Sparrow and House Finch nests on the campus of the National University of Mexico immediately after chicks fledged. They then counted the mites and other ectoparasites in each nest, and measured the percentage of nest material that consisted of cellulose fibres from cigarette butts. There was a clear relationship between these variables, with the number of ectoparasites markedly decreasing with an increasing fraction of nest material made up of cigarette-butt fibres. Nests that contained less than three per cent cellulose fibre were typically infested with more than 25 unwanted tenants apiece (and in some cases more than 80), whereas nearly all nests with more than five per cent cellulose fibre hosted fewer than 10 parasites each.

To verify that the nicotine and other noxious chemicals in the butts were responsible for these results, the researchers conducted a second experiment in which ectoparasites were captured using miniature heat traps that simulated the body heat produced by a bird in the nest. Traps containing filters removed from unsmoked cigarettes attracted between two and three times more ectoparasites than those containing filters from smoked cigarettes. These results confirmed that the

chemicals released when the cigarettes were smoked, and not the cigarettes themselves, reduced parasite numbers.

Intriguing as these findings are, the authors of the study are careful to note that they do not provide direct evidence that birds are consciously choosing butts in preference to other nesting material. For this reason, their findings do not meet the criteria required for evidence of 'self-medication'. Demonstrating that the birds are deliberately using butts on account of their chemical properties would require examination of the preferences of nest-building birds offered choices between smoked butts and other nest material. Should it turn out that the birds are indeed preferentially choosing the butts, with consequent direct benefits for breeding success, this will provide a stunning example of avian innovation in a rapidly changing world.

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*Reference: Suárez-Rodríguez, M., López-Rull, I., and García, C.M. 2012. 'Incorporation of cigarette butts into nests reduces nest ectoparasite load in urban birds: new ingredients for an old recipe?' Biology Letters 9: 20120931. <http://dx.doi.org/10.1098/rsbl.2012.0931>*