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Nest Construction

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Synonyms

Animal Architecture; Nest Building

Definition

Nests are structures built by animals, typically for the purpose of holding the animal's eggs or live offspring.

There is considerable diversity in nest construction across species. Nesting occurs in a wide variety of species, and there is great variety in how nests are constructed within phyla and even within genera. Dinosaurs built nests that often consisted of simple depressions in the ground, and in which eggs were laid and incubated (Chiappe et al. 2004; Norell et al. 1995). Birds are the living descendants of dinosaurs and, although some living species do construct ground nests (Angelstam 1986; Manolis et al. 2002), there are many different strategies of nest building among the various bird species. As seems to be the case in dinosaur nests, bird nests typically function as structures for keeping eggs, and later chicks, safe from predation (Heenan and Seymour 2011).

Because bird nests function to keep eggs and chicks safe from predation and environmental hazards such as rain, there is a sense in which natural selection has shaped the structures and building materials of nests. Dawkins (1982) argued that various aspects of nest construction may be best understood as extended phenotypic effects. Dawkins suggested that, whereas the forces of natural selection directly act on the physical characteristics of a given nest, the downstream consequence is that those genes responsible for more well-constructed nests become more abundant in the gene pool. Hansell (2007) extended Dawkins's argument, suggesting that by imposing selective pressures on populations of nest builders over time, natural selection is responsible for the wide variety in the materials used to build nests, as well as the differences in the architectural designs of nests among closely related avian species. Those individuals that build stronger nests, nests better at insulating eggs and chicks, or nests that better protect against predation will have more surviving offspring. In this sense, natural selection acts on both the physical composition of different nests and the behavior responsible for nest construction. Zebra finches may even use information about past breeding success to inform subsequent decisions about nesting materials (Camacho-Alpizar et al. 2021), and a separate study of zebra finches found that experimental manipulation of early-life

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exposure to different colored nesting material influenced the materials preferred by adolescents during the construction of their first nest (Breen et al. 2020).

Sexual selection may also play a role in nest construction for some species. Male weaver birds build nests that will eventually hold eggs without the assistance of the female, and in fact, male weavers construct these nests before they are even chosen as a mating partner. It seems that male weavers construct their nests, at least in part, to display their quality as a mate. Indeed, one study of baya weavers observed that the number of female visits to an incomplete nest predicted whether that nest would eventually be completed (Quader 2005). The same study also observed that females were more likely to choose nests that were built higher up, connected to thinner branches, and that were more neatly woven. The results of this study provide evidence that, at least for this species of weaver, nest construction is subjected to sexual selection, with better nest builders being more likely to attract a mate.

Nest building also occurs in many non-avian species, including several primate species. One study of nesting behaviors in chimpanzees (*Pan troglodytes*) found that chimpanzees preferred to nest above 1000 m, under dense canopies, and in relatively less humid areas (Koops et al. 2012). A study of nesting materials in western lowland gorillas reported a preference for specific species of plant, with individuals using an average of 4.9 different species per nest, but no seasonal shifts in preferences for different materials (Willie et al. 2014). Similar to avian species, nest-building primates also show preferences for certain nest characteristics, including both material and location, suggesting that in both aves and primates, selective pressures have likely shaped nest building behaviors.

Despite the large degree of variation in species that construct them, nests almost universally appear to serve a similar purpose: holding and protecting eggs and offspring. And although nests serve similar purposes, there is considerable variation in the materials used to construct nests, and in the architectural designs of the nests.

Cross-References

- ▶ Aves (Birds)
- ▶ Brooding
- ▶ Clutch
- ▶ Dinosaurs

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