

Opportunistic usage of Abandoned Nests by Secondary Cavity Nesting Birds

Mahesh Veera, Suseela L.

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ABSTRACT

This review will show that most of the birds make nests for breeding. Almost all the forest birds make nests except few species. Night Jars lay eggs on open ground. Construction of nest is a phenotypic behavior of the birds. Each species has its own specificity and vary with species with regard to composition, structure and function. Nests are made by various materials at various stages and finally soft materials are used to make cup for providing thermal insulation. The nests are made in a selected secured place to protect the eggs and nestlings from predators. Once the breeding activity is completed and when the fledglings left the nest, it becomes abandoned. Some of the secondary cavity nesting birds are opportunistic to use such abandoned nests. House Sparrow, Silver-billed Munia, Grey tit are some of the examples for such opportunistic bird species. House sparrows use the abandoned nests of stork. The concept of secondary cavity nesting can be used for the conservation studies, because such birds can use the available cavities for breeding. This behavior helps in

the conservation of secondary cavity nesters like House Sparrow by providing nest boxes. Several organizations worked for conservation of House sparrow by the installation of nest boxes.

Keywords House sparrow, Silver-billed munia, Secondary cavity, Nesting birds, Grey fit.

INTRODUCTION

Birds are the most brilliant builders among the animals. Most of the birds make nests for breeding. Almost all the forest birds make nests except few species like Night jars and Penguins. Night jars lay eggs on open grounds and rare the young ones. They build nests considering several points in order to keep their eggs in safe conditions, to incubate the eggs, to raise the chicks, to protect their nestlings from predators and to protect from weather conditions.

Bird nests are the bio-engineered structures. They build nests with various materials; all the components play their structural significance of the nest as whole (Lucida *et al.* 2018). They use all sort of materials such as plant origin, animal products and anthropogenic materials (Hansell 2000). During the nest construction, they select materials to suit various purposes including gender signaling, camouflage, structural support, insulation purpose and also to avoid pathogens (Lucida *et al.* 2018). They select various leaves that contain volatile materials to avoid pest and other pathogens. It is a common phenomenon that nesting materials always reflect the

Mahesh Veera, Suseela L.*
Department of Biosciences and Biotechnology, Krishna University, Machilipatnam, Krishna District, Andhra Pradesh, India
E-mail : susheelalankaku@gmail.com
*Corresponding author



Fig. 1. Night jar – ground nesting (Wikipedia 2021).

local environmental conditions (Briggs and Deeming 2016). Studies by Slagsvold (1989), Hansell (2000), Deeming (2013) explained about the relationship between bird size and the nest size. Larger bird species build larger nests, whereas the smaller bird species build smaller ones. But, always it is not in proportional ratio. The size of the nest and mass of the collected materials vary from species to species and season to season.

Some birds do not construct nests. Grey Partridge (*Francolinus pondicerianus*), Indian Nightjar (*Caprimulgus asiaticus*) lay eggs on open grounds (Fig. 1), called as “ground nesting birds”. They have predation risk and to avoid that they have adapted camouflage mechanism, to match their eggs with soil (Ali 1941). Birds like Red Jungle fowl (*Gallus gallus*) lays eggs in fasciculate grass or stunt bushes,



Fig. 2. Mound nests of Flamingo (<https://focusingonwildlife.com>).



Fig. 3. Nest of purple-rumped sunbird (<http://justfunfacts.com>).

sometimes without liter (Ling Yuan *et al.* 2009). Peafowl (*Pavo cristatus*) make a little shallow indent by scratching ground and line the laid eggs with sticks and leaves. All flying birds make nests. Flamingos (*Phoenicopterus roseus*) make mound nests (Fig. 2). Males use to involve in nest building. They scrape the soil from surrounding area and form bell shaped pile. They involve several hours per day and take several days to complete such nests. Most of the passerine birds make cup nests. They make hemispherical cup inside the nest with a deep depression. The core of the nest is made with soft, thermo resistant fibrous or woolen materials. Sunbirds make purse shaped nests with small twigs by suspending them in the web of spider (Fig. 3). Tailor bird (*Orthotomus sutorius*) builds by stitching the leaves with plant fiber or spider silk to make bassinet like nest (Fig. 4). Kingfishers make nests



Fig. 4. Stitched nest of tailor bird (<https://www.nhm.ac.uk>).

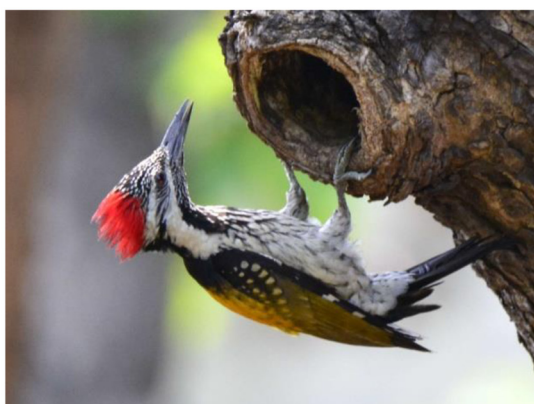


Fig. 5. Cavity nest of woodpecker (sagar Adhurya 2020).

in burrows and some times in the burrows of rabbit. Wood peckers, Parrots, Hornbills are some of the birds that make cavities by excavating the trunks of trees to build nests (Figs. 5 and 6). They are called as primary cavity nesting birds.

Some birds use available cavities for nesting and are called as secondary cavity nesters. They use either naturally available cavities on trees or between stones or the left-over cavities of the primary nesting birds. Some birds are opportunistic and use the leftover nests.

Observations

Ash-throated Flycatcher (*Myiarchus cinerascens*) is the most wide spread secondary cavity nester found in the lower Colorado River Valley (Brush 1983) (Fig. 7). Studies by Aitken *et al.* (2002) explained the reuse of cavity nests in the forests of British Columbia by performing 402 studies over a period of five years. Among them, 48% of cavities were used by secondary cavity nesting birds. Studies by Karen *et al.* (2020) states that the European starlings (*Sturnus vulgaris*) and Red breasted nuthatches (*Sitta canadensis*) prefer new cavities. This could be due to the fact that the physical properties of old cavities may change by aging of trees, decay in the cavity. Birds like Mountain Blue birds (*Sialia currucoides*) and Tree swallows (*Tachycineta bicolor*) uses older cavities for several times.

Studies conducted by Hardin *et al.* (2020) explain



Fig. 6. Cavity nest of great pied horn-bill (www.orientalbirdimages.org).

the nesting success by the secondary cavity nesters with reference to Golden-fronted Woodpeckers nests. Their study was conducted at San Antonio Viejo of South Texas. According to them, the Golden-fronted Woodpeckers make cavities in the trees with low decay. Their results also suggested that the secondary cavity nesting birds shows higher rate of breeding success when compared to the birds that use natural cavities (primary nesters) with regard to nest built. They also studied that there was relatively more biomass around the nest site location selected by Golden-fronted Woodpeckers. It has positive correlation on nesting success of secondary cavity nesters.

In our study of House sparrow conservation by using artificial nest boxes, we have observed the usage of used old nest boxes by other species. We have installed nest boxes for house sparrows in our study area at Jangareddigudem of Andhra Pradesh, India. At one nest box, a pair of Indian Silverbilled Munia (*Euodice malabarica*) made nest in July 2021, they also make nests of abandoned nests of Baya weaver (Fig. 8). Other nest boxes were used by Indian Robin (*Copsychus fulicatus*).

Interactions between secondary cavity nesters

Potential competition was noticed for secondary cavity nesters at Colorado River Valley. Ash-throated Flycatchers are the potential competitors for Gila Woodpecker (*Melanerpes uropygialis*), Ladder-backed Woodpecker (*Picoides scalaris*), Brown-crested Flycatcher (*Myiarchus tyrannulus*) and European



Fig. 7. Nestlings of ash-throated flycatcher at a left over cavity (www.birdwatchingdaily.com).

Starling (*Sturnus vulgaris*) (Timothy 1983). Such interactions have been observed for nest boxes by House Sparrows (*Passer domesticus*), Great Tits (*Parus major*). It also affected the breeding activity of Grey Tits by the dominant behavior of House Sparrow (Charter *et al.* 2013).

Roosting activity

Abandoned nests and vacant cavities of primary nesting birds are used by some birds to protect themselves from extreme conditions. Some birds use to roost in cavities for warmth to escape from severe cold conditions. Studies conducted by Tobolka (2010) in agricultural landscapes of Poland, during the winter seasons of 2005-2006 and 2006-2007 showed that secondary cavity nesters like House Sparrows and Tree sparrows (*Passer montanus*) use such abandoned nests of White Storks (*Ciconia ciconia*) during winter nights for roosting to survive from extreme cold conditions in Poland. Irrespective of the age of the nest they use it for roosting 71% of the nests are used by House Sparrows at once where as 27% of the nests by Tree Sparrows.

Occasional secondary nesters

Some birds are opportunistic and use the nests of others for breeding though they are capable of making nests. Observations done by Martin and Broekhuysen (1961) on South African birds showed that a pair of Barn Owl (*Tyto alba*) used the nest of Hamerkop (*Scopus umbretta*) and Egyp-



Fig. 8. Abandoned nest of baya weaver used by Indian Silver bill (www.orientalbirdimages.org).

tian Goose (*Alpochen aegyptiaca*) used the nest of Hamerkop. White-rumped Swift (*Apus caffer*) use to make nests in Greater Striped Shallow (*Hirundo cucullata*). A pair of Black Saw-wing Swallow (*Psalidoprocne pristoptera*) used the nesting cavity of Giant Kingfisher (*Megaceryle maxima*).

Threats to cavity nesting birds

Obstructions such as Fire hazards, Firewood consumption, Insect pests and vector spread diseases are some of the causes that move the cavity nesters from their habitats. Activities like salvage logging from the forest burnt, drought areas and cause snagging which are also threats to cavity dwellers. Fire hazards and other activities also reduce the loss of suitable foraging habitat. This results in a negative impact on cavity-nesting bird species.

Conservation attempt

Bran and Balda (1988) conducted experimental studies on secondary cavity nesting bird species at Coconino National Forest, Arizona. Their population density increased from more than double in two plots out of three in Pine and Oak plantation. They installed nest boxes for their study and then observed the response of different bird species under study towards the nest boxes. Among the species they have studied, Violet-green Swallows (*Tachycineta thalassina*), Pygmy Nuthatches (*Sitta pygmaea*), Western bluebirds (*Sialia mexicana*) have shown significant increase in their population than White-breasted



Fig. 9, 10. Conservation of House sparrow by Nest boxes at Jangareddigudem (Mahesh Veera).

Nuthatches (*Sitta carolinensis*), Mountain Chickadee (*Parus gambeli*). It clearly shows the adaptability of secondary cavity nesting birds towards the artificial nest boxes.

Uncontrolled human activities like firewood collection, wild fires, logging and deforestation have negative effect on wood abundance in the forest and biodiversity that in turn impact the perpetuation of cavity nesting birds. Such activities must be counteracted by following various conservation strategies which not only saves the population of the primary cavity nesting birds but also the secondary cavity nesting birds. In order to maintain habitat for cavity nesting birds, long term forest management has to be done. It plays a considerable role in conservation of forests.

Both primary and secondary nesting birds get limited exposure to novel environment in the urban habitats. Sometimes, this results in competition between native and non-native species for nesting cavities. Secondary cavity nesting birds being facilitated by the humans with nest boxes and food sources shows better adaptations to the environmental conditions prevailed in urban areas (Tomasevic and Marzulff 2017).

The behavior of birds that reproduce in secondary cavities can be restored by using nest boxes. As they are adapted to build in the available cavities, they can also use nest boxes. British Trust of Ornithology has succeeded in conserving the secondary cavity nesting birds by introducing nest boxes in various places. They prepared different nest boxes for about 77 bird species. Several organizations in India,

such as Nature forever Society (Nashik), Rajasthan Samagrah Kalyan Sansthan (Ajmer), Eco Roots Foundation (East Delhi), Kallpavriksh Aaranyak (Guwahati), Bird Conservation society (Gujarat), Ecological Research Advisory and Learning (Pondicherry), Indian Bird Conservation Network (Chennai), Crocodile Bank Trust (Ratnagiri), Nature Conservation Foundation (Mysore), Sparrow Protection and rehabilitation organization (Andhra Pradesh), involved in the conservation of House Sparrow by providing Nest boxes. Our conservation attempt for House Sparrow at Jangareddigudem town resulted in raise of the population (Figs. 9 and 10). We have installed more than 500 nest boxes in the study area, for conservation of House Sparrow.

CONCLUSION

Globally the conservation of secondary cavity nesting birds like House Sparrow, Tree Sparrow become a trend by installing Nest boxes in their habitats. Each one of us should have concern towards protecting and preserving the wildlife. One should “Think Globally then Act locally” for conservation of nature for a secured tomorrow.

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