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Study on Nest Land Sites and Nest Material of Blue Rock Pigeon (*Columba Livia Domestica)* in Railway Junctions from Thiruvarur to Chidambaram

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ABSTRACT

Blue Rock Pigeon (*Columba livia domestica)* are notable for development of different sorts of railway platform. It is a sense conduct. For security against downpour, natural temperature contrast, to mind the brood, a piece of reproducing process winged creature's builds homes. Building Structure, plans and materials utilized in home development are species explicit. The explicitness likewise found in settling site determination, shirking of predication chance and simple approach to safeguard from the railway station. Present examination on ten types of nearby winged animals and their home structure, home material utilized uncovers that 54.40 % locally accessible material was utilized by these species that incorporates plant materials principally. The manufactured materials, soil, sediment, mud and the materials of creature cause like human hair, arachnid net strings, and dropped plumes of feathered creatures were utilized in home development. Most various determination of home material was by Indian Common Blue Rock Pigeon though least sort of material utilized by railroad station stage shed were adequately utilized by the feathered creatures in non-settling period as safe platform buildings. The brightness and pliancy of winged creatures was astounding for endurance of fittest with existing conditions. Itemized study on every specie railway was prescribed to comprehend and anticipate their protection significance.

Keywords: Blue Rock Pigeon (columba livia domestica), Nest Material, Railway Station.

INTRODUCTION

Avian community are widely recognized as a good bio-indicators. Because birds constitute one of the common fauna off the all habitat types, and because they are responsive to change, their diversity and abundance can reflect ecological trends in other biodiversity (Furness &Green Wood ,1993). Because of their highly, specific habitat requirements, birds become increasingly intolerant of even slight ecosystem disturbance (Schwartz & Schwartz, 1951). Bird are also regarded as good subjects for exploring a number of questions of ecological and conservation significance (Urfi *et al*.,1995). Asia supports a large number of resident and migratory bird population of both terrestrial and water birds. The Indian subcontinent, a part of the vast oriental biogeographic regions, is very rich in biodiversity. Out of more than 9000 birds of the world, the Indian subcontinent contain 1,300 species, or over 13% of the world's birds population (Grimmett *et al*., 1998). This subcontinent, rich in avifauna aslo boasts of 48birds families out of the total 75 families in the world. The geographical ramifications of southeast Asia, the tangled patterns of mountain chains, river drainage system and a long period of stable climate season to have been ideal for evolution of a wide array of species of birds (Ali and Ripley, 1987). Ali and Ripley 1987, consider 176 species of birds endemic (local) to the Indian subcontinent Grimmett *et al*.,(1988) have shown that the Indian peninsula is home to many birds families where the majority of the species of the families where the majority of the species of the family or group are found in this subcontinent for instance, 71% of tree creepers (Certhiinae) 62% of accentors (Prunellinae), 55% of laughing thrushes (Garrulacinae) and 50% of ioras (Aegithirinae) are found in the Indian subcontinent. Likewise, 37% of the barbet and 38% of the drongo species of the global square measure in India. Several conservation organizations use population decline along as a criterion for determining whether species need conservation attention or not. It we need a reliable estimate or index population size of particular species in a given area, then we must undertake a survey. There may be a number of reasons for wishing to do this It may simple be that, as the owner of nature reserve, we wish to know how many individual of area or a species, that is poorly known in most of the village and rural pockets. Birds survey data are also used to assers whether the land undergo any habitat destructions. Information on population size of individual. Species can also be used to set priorities, allowing conservation effort to be focused on those species, most in need of attention (Richard *et al*.,2004). Birds are ideal bio-indicators and useful models for studying a variety of environmental problems hence the condition of local landscape must be investigated to identify crucial determinants of the bird community structure for via conservation (Kattan and franco,2004; Newton *et all*.,1987). The information on checklists and nest site selection of birds in railway track are scattered. Apart from reports that exit (Gokula &Lalitha vijayam,1996). Nest construction for egg laying brood care is natural instinct in survival bird species. A bird nest is a made by the bird or used as naturally available place to lay and incubate egg till hatch of young ones. Although the term popularly refers to a specific structure made by the birds lay their eggs directly on the ground as like Lapwings (Shivaji *et all*.,2016). Or rocky edges, while brood parasites like cuckoo species especially Indian koel lay their eggs in the nest

of other birds. In most species, the female does most or all of the construction, though the male often helps but in some polygamous species like weavers (Plocius sp.) and Tits the male does most or all of the nest building whereas the female select the best nest and add some finishing touch. In order to mate successfully, lay the eggs, incubate and then produce a new generation of birds, each bird species is having an appropriate scheme of the nest construction or shelter use. Some birds fly around the world to find safe place that rich in food and favorable environment for the new generation to come. For the purpose they migrate for nesting and breeding for few 1000 km or across the continent. The species like pigeon (*Columba liva domestica*) simply use a little depression in the ground to lay their egg (Chavan *et all*.,2016). Some birds never built nest either for the shelter or for brood care. The majority of the nests are differentiated structures that are constructed from variety of material which can generally classified as being either structural material or lining material. Structural support for parents and offspring (Hilton *et all*.,2004). The exact function of structural material yet fully understood. An inter-specific investigation of birds that build cup shaped nests recommended that structural support to the eggs and incubating parents was the primary factor in nest design other studies have shown that structural materials provides thermoregulatory benefits. Many bird species line their nest with feathers which is advantageous as insulating materials. It was found that the feathers provide the most insulation to nest where as grasses provide least (Hilton, *et al*.,2004). The most comprehensive studies on the function of feathers as a nest lining material was carried out in tree swallows (Mark Mainwaring, *et all*.,2014). Nest studies are essential to understand the environment and evolution of species. The data on nest building in birds is widely scattered. Studies on material use, mechanics of arrangement of nest materials and evolution in nest building is essential requirements for reproduction and provides significant clues to find out ecological relationship of a bird species. Nest building is permanent behavior record of a bird species (frozen behaviour). Since ancient time the nest building in birds especially nests of pigeon (*Columba liva domestica*) as correlated with the onset of monsoon rain and quantity of rain in a particular year in India. This research was also planned to find out the nesting needs of birds that will guideline in colored nest preparation (Gering and Blair,1999).

METHODOLOGY: -

The study was carried out from January to march 2023 Thiruvarur to Chidambaram railway station. The survey was carried out by walking along transect (railway track) with point count method, each station considered as one point. There were 13 station (point) selected for the survey, a binocular (7×12) was used to watch the bird. The temperature and humidity data were collected using thermometer and hygrometer. MS Excel sheet used for statistical calculation.

STUDY AREA :-

Study area start from Chidambaram railway station to Thiruvarur railway station (a total of 80 km) width 13 points.

- Chidambaram
- Vallampadukai
- Koolidam
- Srikazhi
- Vaitheshwarankoil
- Nidur
- Annathandavapuram
- Mayiladuthurai
- Manganallur
- Peralam
- Poonthotam
- Nannilam
- Thiruvarur

STUDY PERIOD :-

January 2023 to March 2023.

Fig 1: The graph shows my study area

Table 1: This table shows the station name and active & in active nest of pigeon Columba liva domestica during the study period.

SL.NO	NAME OF THE STATION	NESTS	
		ACTIVE NESTS	INACTIVE NESTS
1	CHIDAMBARAM	0	0
2	VALLAMPADUCAI	0	0
3	KOLLIDAM	0	0
4	SIRKAZHI	17	0
5	VAITHESHVARANKOVIL	0	0
6	NIDUR	0	0
7	ANNANDANDAVAPURAM	0	0
8	MAYILADUTHURAI	0	0
9	MANGANALLUR	0	0
10	PERALAM	0	0
11	POONTHOTAM	0	0
12	NANNILAM	15	1
13	THIRUVARUR	29	0

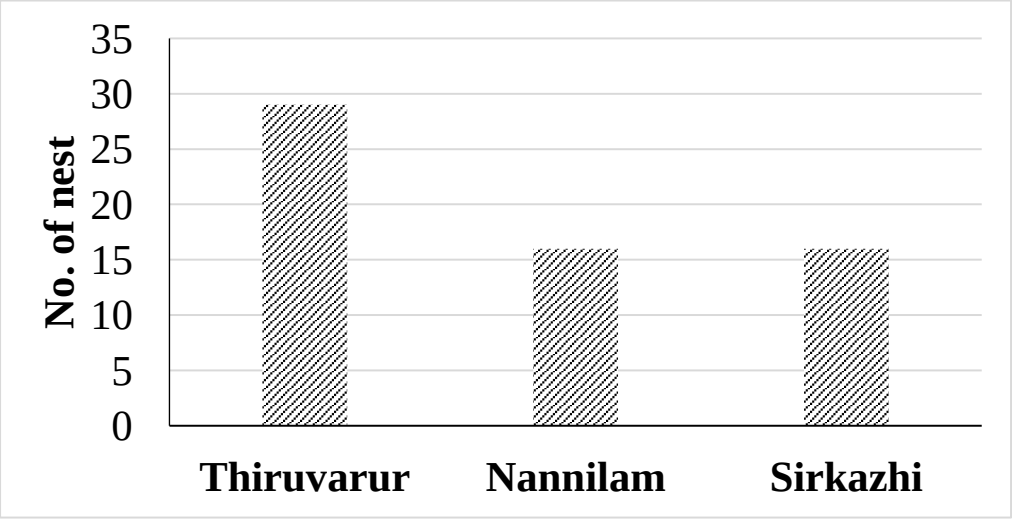

Fig.1. Number of active nest in the study area during the study period.

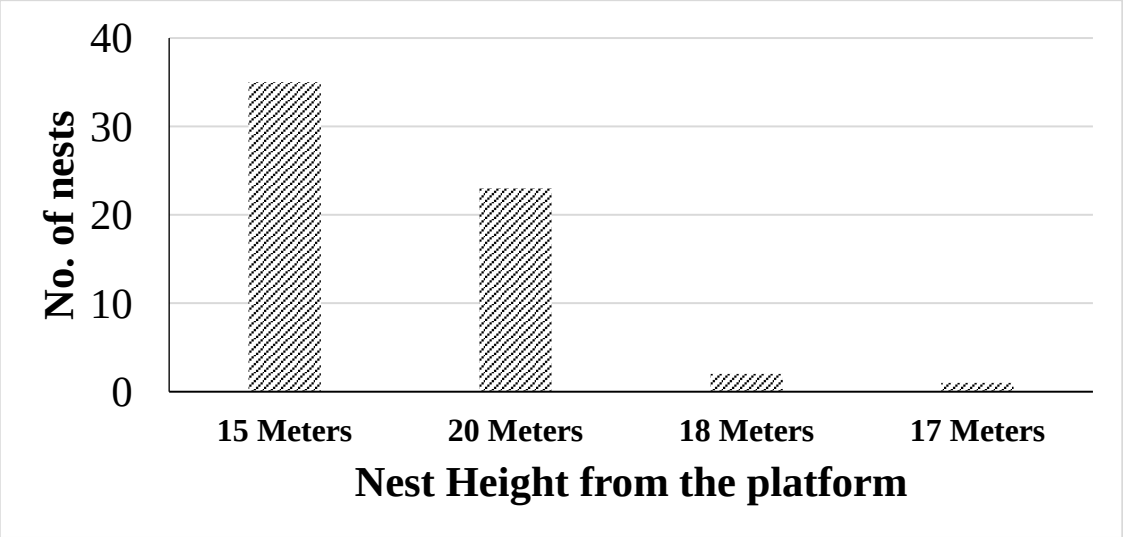

Fig.2.The graph shows nest height from the platform of the study area.

PLATE 1

Pigeon in railway track nest material

Nannilam station collecting

Nest with two egg

Nest with single egg

Pigeon drinking water in the study point

A view of hatched chick

RESULT

Among the only 3 points used for construction nest by Blue Rock Pigeon *Columba liva domestica*. remaning study points where not used by this bird the point (Nannilam station) the point Nannilam have only one in active nest. The point Srikazhi, Nannilam and Thiruvarur have only active nest (Table-1). Among the 3 study station has highest number of active nest (29 No). followed by Srikazhi (17) nest and Nannilam (15) nest. (Table-1) (Fig-2).

STUDY POINT SRIKAZHI

The study site Srikazhi include Platform1,2 Platform 1has 13 active nest. (Table-2). The nest number 1,6,7,9 and have 2 hatched chicks the nest 3,4 and 13 have 1 chick in each nest The nest number 3,4,5,6,8,9,10 and 11have 2 eggs. A nest number 1,2,7,12 and have one egg. The nest number 1,3,4,6,7,9,12 and 13 have hatched chicks and un hatched egg also. The platform 2 have 4 active nest but theres no egg and chick only adult birds were regared.

Table.2: This shows the platform number, number of nests, number of eggs, number of chicks, number of adult, and vegetation of study point Srikazhi.

S.no	Platform number	Nest number	Number of Eggs	Number of chick	Number of adult	Vegetations around the study point		
						Tree	Herb	shrub
1	1	1	0	2	1			
2	1	2	2	0	1			
3	1	3	0	1	1			
4	1	4	1	1	2			
5	1	5	2	0	2			
6	1	6	0	2	2			
7	1	7	0	1	3			
8	1	8	2	0	2	60	30	15

9	1	9	0	2	2			
10	1	10	2	0	2			
11	1	11	2	0	2			
12	1	12	0	2	1			
13	1	13	0	1	1			
14	2	14	1	0	1			
15	2	15	2	0	1			
16	2	16	0	0	1			
17	2	17	0	0	1			

STUDY POINT NANNILAM :-

The study site Nannilam include platform 1,2 platform 1has 8 active nest. (Table-3). The nest number 6,7and 8 have 1chick in each nest. The nest number 3 have 1 egg. And nest 4 have 2 eggs. The nest 1,2and 5 have only adult birds. The platform 2 have 7 active nest. The nest number 3,4 and 7 have 2 chicks. The nest number 1 and 6 have 1 chick in each nest. The nest number 3 and have only adult birds. The point has only one abandon nest (inactive nest).

Table.3: This shows the platform number, number of nests, number of eggs, number of chicks, number of adult, and vegetation of study point Nannilam.

S.no	Platform number	Nest number	Number of eggs	Number of chick	Number of adult	Vegetations around the study point		
						Tree	Herb	Shrub
1	1	1	0	0	2	100	20	25
2	1	2	0	0	2			
3	1	3	1	0	1			
4	1	4	2	0	1			
5	1	5	0	0	2			
6	1	6	0	1	2			
7	1	7	0	1	2			
8	1	8	0	1	2			
9	2	9	1	0	2			
10	2	10	2	0	2			
11	2	11	0	1	2			
12	2	12	0	1	2			
13	2	13	2	0	2			
14	2	14	1	1	1			
15	2	15	0	2	2			

Note: Tree, Herb and shrub in number

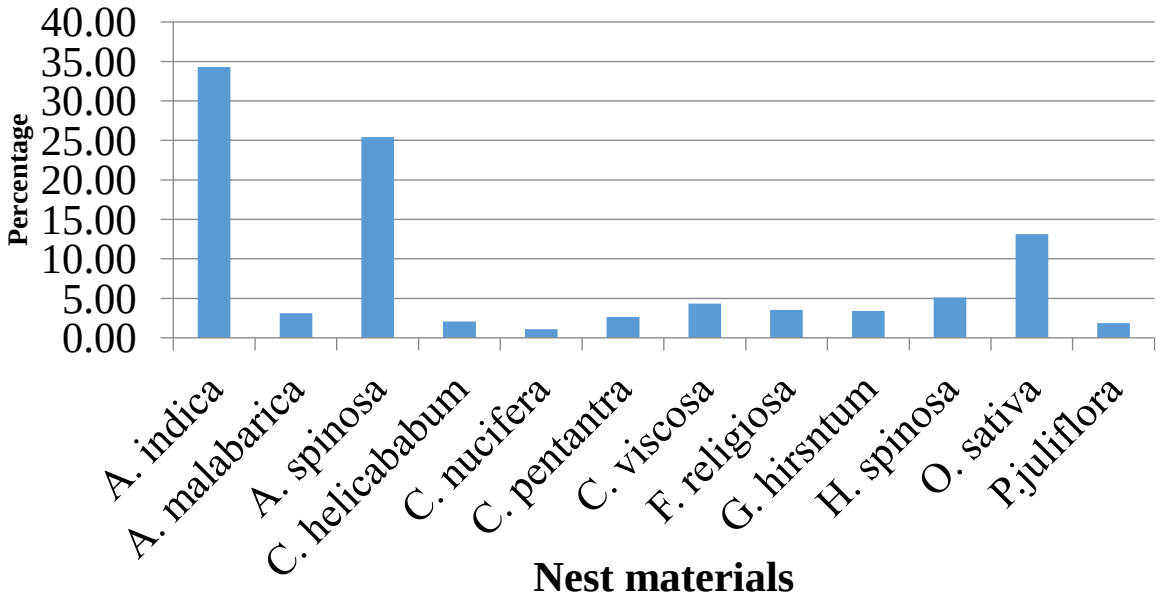

Fig.3. This graph shows the nesting material used by Pigeon *Columba liva domestica* in the study area.

STUDY POINT THIRUVARUR

The study site Thiruvarur have 5 platforms. The platform 1 have 6 active nest. (Table-4). The nest number 5 and 6 have 2 chicks each. The nest number 1 and 2 have 2eggs each nest. The nest number 3 and 4 have only adult birds. The platform number 2 have a highest number of active nest (13) in the study point. Among the 13 nest the nest number 12 has highest number of chicks 2. The nest number 3 and 11 have 1chick each nest. The nest number 1,2,4,5,6,7 and 8 have 2 eggs for each nest. The nest number 10 has only 1egg the remaining 3 has 7 active nest. The nest number 6 has 2 chicks and nest number 4 has 1 chick. The nest number 1,2 and 3have 1egg. Remaining nest are used by adult birds. The platform number 4 have only 1 nest which contain 2 eggs 2 adult birds. The platform number 5 have 2 active nest which also contain 2 adult bird in each nest. The Columba liva domestica construct the nest from15 meters height to 20 meters' height. Most of the birds construct this nest at 15 meters' height followed by 20 meters' height very few birds construct their nest at 18 meters and 17 meters. (The height of the nest was measured from the platform). (Fig-2).

The study point Srikazhi have 14 active nest at 15 meters' height and remaning 3 nest where construct at 20 meters' height from the study site Nannilam has 6 nest at 15-meter height and 9 nest where at 20 meters' height and only 1 nest constructed at a height of 18 meters. The study site Thiruvarur has 16 nest at 15 meters' height followed by 12 nest at the height of 20 meters and only 1 nest at the height of 17 meters. The Blue Rock Pigeon *Columbia liva domestica* use various plant material to construct There are nest they most used the plant like *Azaridirachtaindica, Amaranthusspinosa, Oriza sativa, Hydrophilaspinosa, Cleome viscoa, Ficusreligiosa, Gossypiumhissntum, Anisomelessmalabarica, Candiospermumhelicababum, Cebiapentantra, Acacia milotica, cocusuncifera. Among the nest materials Azaridirachtaindica was mostly used followed by Amaranthusspinosa and Oriza sativa.* (Fig-3).

Table.4: This shows the platform number, number of nests, number of eggs, number of chicks, number of adult, and vegetation of study point Thiruvarur

S.no	Platform number	Nest number	Number of eggs	Number of chick	Number of adult	Vegetations around the study point		
						Tree	Herb	Shrub
1	1	1	2	0	2	49	23	10
2	1	2	2	0	2			
3	1	3	0	0	1			
4	1	4	0	0	2			
5	1	5	0	2	2			
6	1	6	0	2	2			
7	2	7	2	0	2			
8	2	8	2	0	2			
9	2	9	0	1	2			
10	2	10	2	0	2			
11	2	11	2	0	2			

12	2	12	2	0	2			
13	2	13	2	0	2			
14	2	14	2	0	2			
15	2	15	2	0	1			
16	2	16	2	0	1			
17	2	17	2	0	2			
18	2	18	2	0	2			
19	2	19	2	0	2			
20	3	20	2	0	2			
21	3	21	2	0	2			
22	3	22	1	0	1			
23	3	23	0	1	2			
24	3	24	0	0	0			
25	3	25	0	2	2			
26	3	26	0	0	2			
27	4	27	2	0	2			
28	5	28	2	0	2			
29	5	29	0	2	2			

Note: Tree, Herb and shrub in Numbers.

DISCUSSION

Pigeons are also known as rock doves, adapted to a wide variety of habitats especially in human settled areas that allow them to nest and roost. They live in perfect freedom in ledges, fissures and holes of rocks, forts, old buildings and side walls of wells. It prefers to live in those places of towns and cities which have plenty of coarse grain. Thus, their favourite resorts include big buildings, godowns, grain markets, temples, mosques, churches, tombs, railway stations and office buildings (Angold *et al*., 2001; Burgman and Lindenmayer, 1998; Williams and Corrigan, 1994). The iron girders of bridges, ledges off all concrete and brick or stone buildings are the main sources of attraction in the urban environment (Roberts, 1991; Sacchi *et al*., 2002). They never nest on trees (http://www.notesonzoology). Nowadays the old buildings and wells were demolished for new constructions. In current scenario the newly constructed buildings not have any holes and the same time digging of new wells and construction of side wall also reduced. The forts were renewed the pigeon driven away. The big buildings, godowns, grain markets were controlled by private they consider the pigeons as pest (https://museumpests.net) (Haag-Wackernagel, 2000). Compare than those areas the railway stations were very suitable place for them. Here they get protections from enemies, easily get food and water, roosting site. They also got more nesting site in the coverings of the plat farms of the railway station. The ecological factors like roosting sites, nesting sites, food and water points have definite relationship with population of feral pigeon (Murton et al., 1972; Bureleys, 1980; Barbieri and De Andreis, 1991; Hagg, 1995; (railway stations) only 3 points (Sirkazhi, Nannilam and Thiruvarur) were utilized by the pegions. The remaining study point like Chidambaram, Vallampadugai, Kollidam, Vaitheswaran kovil, Nidur, Annathandavaburam, Mayiladuthurai, Manganallur, peralam and Poonthotam were not attract the pegions because of abolishing stations, reconstructions, convert the stations from meter gauge root to broad gauge root. The above stations are also not having enough vegetations cover, food and water sources for their day to day life. (Sacchi *et al*., 2002) sated that higher number of rock pigeons in old buildings, and suggested that (old) historical buildings provided shelter in a large number of roosting and nesting sites to pigeons. The current study also reviled that the railway station has more area for their roost. The highest number of adult was recorded in the study point Thiruvarur railway station (n=49) because this study point has more number of plat forms (n=5). This study site more suitable for Blue Rock Pigeon to roosts and construct more nests. Similar kind of result observed recorded by (Hakkinen *et al*., 1973; Murton *et al*., 1972; Murton *et al*.,1974; Johnston, 1984; Dabert, 1987; Johnston and Janiga, 1995; Hetmanski, 2004; soldatini *et al*., 2006). Similarly, Hetmanski and walk (2005) observed in their studies. A variety of nesting materials being used for nest construction but preferred materials are twigs, sticks, grasses, leaves and some time soft wings and fibers. The blue rock pigeon is a platform nester and build nest with small sticks and fibers (Ali *et al*., 2011). Home structure and its situation relies upon rearing season, accessibility of appropriate home locales, effectively accessible settling materials, nourishment and water source and predator around there. A few social adjustments to urbanization like evasion 6-8 expansion of reproducing season 9 has been talked about by different creators too. Urbanization has solid impact on winged creature networks and their populaces (Chace and Walsh, 2006; Marzluff, 2001; Marzluff et al., 2001;10-12). The present society style changes the first living spaces and decrease accessible regions for reproducing and other related exercises like home site determination and decision of home structure material. This prompts utilization of uncommon home material and increment the settling mortality. The present examination additionally shows fundamentally the same as sort of result they pick just three station for their perch and home development in light of the fact that those regions have more Amaranthus spinose, Oriza sativa, Hydrophila spinose, Cleome viscoa, Ficus religiosa, Gossypium hissntum, Anisomeles malabarica, Candiospermum helicababum, Cebia pentantra, Acacia milotica, Cocus nucifera and Oriza sativa. Home structure and its situation relies upon rearing lability of appropriate home locales, effectively accessible settling materials, nourishment and water source and predator around there. The present investigation shows the examination focuses (railroad stations) all around used by the Blue Rock Pegion, however a long haul study is Warranted to comprehend about Columba livia.

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