

Short Communication

Ecology of House Crow (*Corvus splendens*) in Dir Lower, Khyber Pakhtunkhwa, Pakistan

Sohail Anjum¹, Awais Ahmad¹, Farzana Bibi¹ and Hazrat Ali^{2*}¹Department of Zoology, University of Malakand, Chakdara 18800, Dir Lower, Khyber Pakhtunkhwa, Pakistan²Environmental Chemistry, Ecotoxicology and Applied Ecology Laboratory, Environmental Chemistry Section, Department of Chemistry, University of Malakand, Chakdara 18800, Dir Lower, Khyber Pakhtunkhwa, Pakistan

ABSTRACT

House crow (*Corvus splendens*) is a native species of the Indian subcontinent. It shows greater tractability as it can easily adapt to new environment where food supply and garbage are found in abundance. Their intelligence is also acknowledged duly. They are also obligate to human presence. We can assume that "where there is human, there is house crow essentially". The present article documents the ecology of this bird in Dir Lower, Khyber Pakhtunkhwa, Pakistan. The house crow population has reached a considerable size in the study area. The species has colonized both rural and urban areas and has dispersed throughout the study area. One of the most important factors for its population increase is the increased number of dumping sites in the area.

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Authors' Contribution

HA conceived and designed the study. SA, AA and FB collected the data. HA and SA analyzed the data and wrote the manuscript. HA supervised the research work.

Key words

Dir lower, Ecology, House crow (*Corvus splendens*), Population, Scavenger

Corvids represent the largest family of songbirds which also include house crow (Veit and Nieder, 2013). Of these birds, house crow (*Corvus splendens*) shows a clear increase in population. It has peculiar characters and behavior in nature and has over intelligence parallel to primates. It has many local names including Indian house crow, house crow, Indian crow, grey-necked crow, Ceylon crow and Colombo crow. House crow is a unique bird species which plays a vital role in the environment. It is regarded as a native bird species of the Indian subcontinent (Ali, 2008; Fraser *et al.*, 2015; Khalid *et al.*, 2017). House crow has the highest potential for extending its habitat. It has extended its range to Netherland, Qatar, USA, Indian Ocean Islands, Africa, Americas and more beyond these (Ryall, 1995; Nyári *et al.*, 2006; Ryall and Meier, 2008) from the Indian sub-continent. It has taken migration from land and shores to faraway areas and islands mostly through ships (Cheke, 2008) adapting new behavior of seafaring.

Cibois and Pasquet (1999) have reported that 11 genera of Corvidae family are monophyletic, that is they diverged from the same ancestors. Grimmett *et al.* (2013) have reported seven species of the Corvus genus, namely

Eurasian jackdaw (*Corvus monedula*), rook (*Corvus frugilegus*), carrion crow (*Corvus corone*), large-billed crow (*Corvus macrorhynchos*), brown-necked raven (*Corvus ruficollis*), common raven (*Corvus corax*) and house crow (*Corvus splendens*). House crow has further four subspecies viz., *Corvus splendens splendens*, *C. s. protegatus*, *C. s. maledivicus* and *C. s. zugmayeri* which are documented from the Indian sub-continent (Grimmett *et al.*, 2013). These four subspecies are different from each other with respect to minor alterations in the lightness or dimness of their grey nape band. The house crow has straight, sharp and generalized bill as compared to other species of the family Corvidae.

The house crows gather in very large numbers at certain areas where food is abundant, late in the evening and early in the morning. This behavior is referred to as roosting or more precisely communal roosting because some other species of birds are seen too. This behaviour is well developed in this bird species. Peh (2002) has reported that roosting behavior of house crow is influenced by various environmental variables such as temperature, light intensity, relative humidity and sunset time. Communal roosting appears when different types of scavengers congregate at the same resource of food. The house crow prefers to live in areas where there is a lot of garbage and where urbanization is in progress. In urban areas there is a lot of food supply for the animals which act as scavengers.

* Corresponding author: hazratiali@uom.edu.pk; hazrataliuom@gmail.com
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House crow habitat shows that it prefers commercial and house buildings due to more anthropogenic food stuff (Lim and Sodhi, 2009). All other birds and mammals are subjected to decrease in numbers due to urbanization impact (Kuruvilla, 2014) whereas house crow has the opposite trend which increase in number with increase in urbanization level in its all reported habitats.

With the growing number of dumping and garbage sites, house crow population has increased in the study area. The scavenging role of this bird species cannot be neglected. They do valuable services to the ecosystem as they consume carcasses and refuse, which if accumulated in the ecosystem will greatly cause the microbial fauna and pests to multiply and grow with subsequent disastrous effects on humans and other animals. It feeds upon everything. Avian scavengers such as the house crow always out-compete the ground scavengers/carrion consumers because they have an advantage of flight and therefore reach the carcasses very early than the ground vertebrates (Ruxton and Houston, 2004).

House crow has extraordinary innate reproductive success (Brook *et al.*, 2003).

Materials and methods

We studied population biology of house crow in different areas (Supplementary Table I) of Dir Lower, Khyber Pakhtunkhwa, Pakistan. Dir Lower is a northern district of Khyber Pakhtunkhwa province with an area of 1583 km² and a population of 1.436 million individuals (PBS, 2017). Dir Lower includes urban areas of Timergara and Chakdara. Besides this, Dir Lower has hilly areas along with plane areas. The urbanization rate is high in most of the study area where commercial buildings, houses, school buildings and roads are constructed at a high rate.

We surveyed six different study sites (Supplementary Table I) for counting of house crow at different times of the day. We counted birds in morning and evening for roost counts because they assemble at specific places on these times. We also counted birds in noon and afternoon at different dumping sites. At the end we estimated our counts separately for different locations. We intentionally grounded 10 inactive nests to closely examine their composition (Fig. 1). We separated all the components of the nests and then found out their nature. Meanwhile, we closely observed house crows at their nests to know their behavior.

Results

The dumping sites, where they congregate and share resources of the site, were observed to be full of garbage. They picked food and perched on nearby trees. A dumping site visited near University of Malakand was full of smoke

from burning of plastics. The dumping site was surrounded by standing domestic wastewaters with very bad smell. The different materials observed at the site included broken clay cups, broken energy-saver bulbs, plastic spoons, plastic bags, juice packs, tablet spills, jars, chips packs, milk packs, glasses, cloth pieces, peanuts, cigarette packs, pampers, banana stems and animal dung. Small flies were found on the stagnant water. When observed from close, the birds were feeding on fruit residues, vegetables like tomato and potato, wasted meat and chicken pieces, corns and poultry egg pieces. When disturbed, they flew away and waited for peace. One of the study sites in the area was observed with no crow, probably due to the absence of nearby trees, where they could perch, and due to a passageway of people.

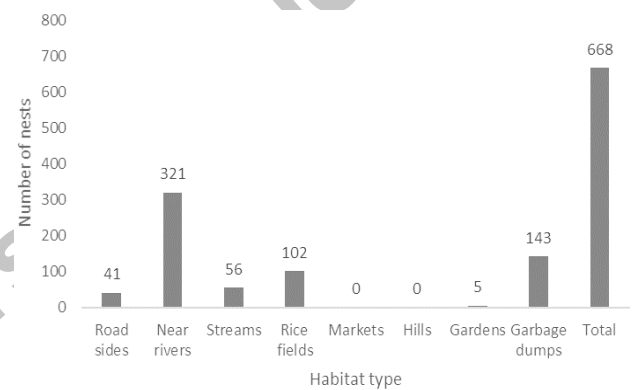


Fig. 1. Habitat preference of house crow (*Corvus splendens*) for nest building in the study area.

Table I. Nest composition of house crow (*Corvus splendens*) observed in the study area.

| Nest material | Number of pieces | Percentage |
|---------------|------------------|------------|
| Wires | 26 | 5.76 |
| Twigs | 150 | 33.25 |
| Plastics | 22 | 4.87 |
| Leaves | 75 | 16.62 |
| Feathers | 57 | 12.63 |
| Roots | 121 | 26.82 |
| Total | 451 | 100 |

The nests were constructed on thicker branches on the tree (Supplementary Fig. 1). The nests of house crow were composed of different materials (Table I). The composition of nest materials of the house crow was nearly the same in the observed nests in the study area. Nests were made of essentially one or two metal wires which were used in the nest base and firmly held the nest to the tree. Small

twigs of trees and grasses were used to seal the nest. Twigs contributed more than other components (33.25%) followed by roots of shrubs (26.82%), leaves (16.62%), feathers (12.63%) and plastic (4.87%).

Figure 1 shows that the house crow preferred rivers to other locations for nest building in the study area. A total of 668 nests were located, the highest number of nests being located at river sides (321) followed by garbage dumps (143) and the least number of nests located in parks (5). No nest was observed in markets and hills.

House crow prefers to nest at high altitudes in trees in contrast to chakor partridge *Alectoris chukar* which nests in shrubs on the ground (Mahmood *et al.*, 2019). The house crow prefers different trees for nesting in different regions of the world. It prefers trees having large crown and at a certain height to prevent accessibility by humans and to see food more easily. However, Shimba and Jonah (2017) have reported that nesting success of house crow does not depend on height, canopy and tree species. In Singapore, they preferred to nest in *Peltophorum pterocarpum* and *Samanea saman* (Soh *et al.*, 2002). In Mombasa, Kenya, *Mangifera indica* and *Azandirachta indica* have been reported as their most preferred nesting trees because of their large crown and height (Chongomwa, 2011). Twelve species of trees have been reported to be used by this bird for nesting in Durban, South Africa (Allan and Davies, 2005). In Kolkata, India, 46 different species of trees have been reported to be selected by house crow for nesting (Dutta and Raut, 2015). In Hazara Pakistan, four different tree species namely Bakain *Melia azedarach*, Chir pine *Pinus roxburghii*, Chinar *Platanus orientalis* and Obhan *Populus euphratica* have been found as nesting sites by this bird (Awais *et al.*, 2015). In this study, we found that house crow used three tree species for nesting *i.e.*, Lombardy poplar *Populus nigra* mostly while mulberry *Morus nigra* and Bakain *Melia azedarach* occasionally. Dutta and Raut (2013) have reported that for maximum survival and protection and for success to get food easily, house crows are habituated to construct nests near humans, without any hesitation. The location of nests of house crow is highly subjected to the source of food in an area (Chongomwa, 2011).

The population of house crow in the study area has increased during the last two decades. Observations show that during this time they seem to be highly successful in the study area. Their numbers increase from year to year as the current conditions favor their feeding behavior. Roost count and total count methods were used during morning and evening to enumerate their population in the study area. The number of crows were the highest in Chakdara (347) and the lowest in Timergara (16).

Conclusions

The house crow is very important organism in the food chain. The roadside killed animals and other dead bodies are scavenged by the house crow and keeps the environment clean from debris and detritus. This bird is beneficial for populated areas as it can consume the waste from dumps, streets, houses and clean the environment and ecosystem. The house crow is an integral part of the ecosystem and it plays a crucial role in the environment as a scavenger.

House crow population has increased in the study area during the last two decades. Its breeding season in the study area starts in April when it builds nests and subsequently lays eggs in May, June and July. They have successively adapted to the study area. They construct nests at heights in trees away from human disturbance; preferring to nest in *Populus nigra* trees. Regarding behavior, this bird is very social and bold.

Supplementary material

There is supplementary material associated with this article. Access the material online at: <https://dx.doi.org/10.17582/journal.pjz/20190716190702>

Statement of conflict of interest

The authors have declared no conflict of interest.

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Supplementary Material

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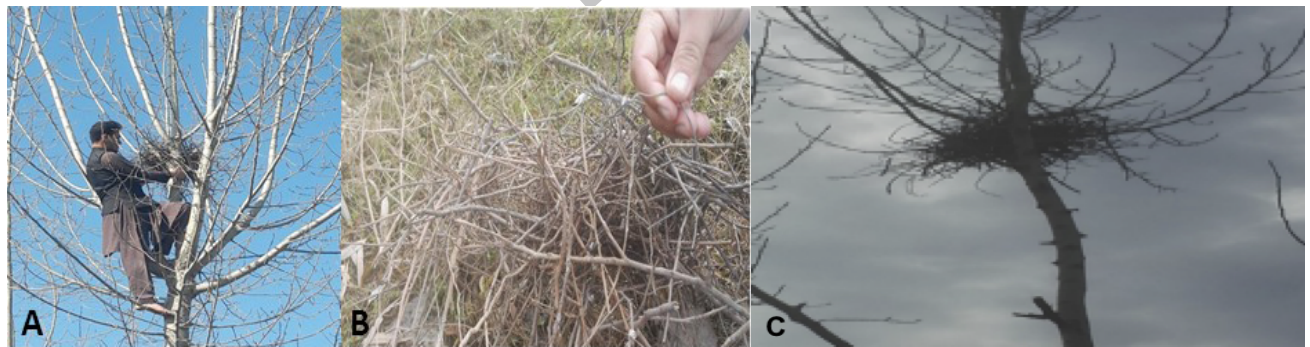
Sohail Anjum¹, Awais Ahmad¹, Farzana Bibi¹ and Hazrat Ali^{2*}

¹Department of Zoology, University of Malakand, Chakdara 18800, Dir Lower, Khyber Pakhtunkhwa

²Environmental Chemistry, Ecotoxicology and Applied Ecology Laboratory, Environmental Chemistry Section, Department of Chemistry, University of Malakand, Chakdara 18800, Dir Lower, Khyber Pakhtunkhwa

Supplementary Table I. Study sites along with their geographical coordinates and dominant vegetation (trees).

| S. No. | Site name | Geographical coordinates | Dominant vegetation (trees) |
|--------|-----------|--------------------------|---|
| 1 | Chakdara | 34.6666° N, 72.0290° E | <i>Populus nigra</i> , <i>Morus alba</i> |
| 2 | Asbanr | 34.8012° N, 72.1575° E | <i>Pinus roxburgii</i> , <i>Morus nigra</i> |
| 3 | Timergara | 34.8278° N, 71.8423° E | <i>Morus alba</i> , <i>Populus nigra</i> |
| 4 | Talash | 34.7415° N, 71.8720° E | <i>Morus alba</i> , <i>Morus nigra</i> , <i>Populus nigra</i> |
| 5 | Badwan | 34.6576° N, 71.9698° E | <i>Populus nigra</i> , <i>Morus alba</i> , <i>Morus nigra</i> |
| 6 | Samarbagh | 34.9117° N, 71.6436° E | <i>Ficus carica</i> , <i>Populus nigra</i> |



Supplementary Fig. 1. (A) One of the authors (Awais Ahmad) inspecting the nest at a height of 9 meters; (B) A grounded nest being inspected; (C) A nest in the *Populus nigra* tree.

* Corresponding author: hazratali@uom.edu.pk;
hazrataliuom@gmail.com
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