

Review on Eco-Biology of the House Crow, *Corvus Splendens* (Vieillot, 1816), (Corvidae: Passeriformes)



Zoology

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ABSTRACT

*A concise review of the current status encompassing distribution and bio-ecology of the house crow, *Corvus splendens* (Corvidae: Passeriformes) Vieillot, 1816 in the Indian sub-continent is presented in this article.*

INTRODUCTION

There are more than 9,000 bird species in the world of which 1,300 species or over 13% of the world's bird species belong to the Indian subcontinent (Grimmet *et al.*, 2004). Crows (Corvidae: Passeriformes) are ubiquitous occurring in most climatic zones. They are usually sedentary and do not migrate unless there is shortage of food (Robertson and Don, 2000), they migrate in large flocks (www.shades-of-night.com/aviary). The constant raucous cawing 'caw, cah' sound is the frequently heard sound in the urbanised ecosystem. Crows, especially the Indian common crow or the house crow (*Corvus splendens*) is an indigenous species of the Indian sub-continent including parts of Afghanistan and Thailand and is usually seen in urban cities and it is one of the commonest birds encountered by people in most parts of India. They are well adapted and highly intellectual birds suiting the urban ecosystem. There are four resident crow species in India viz., House Crow, *C. splendens*; Large-billed Crow, *C. macrorhynchos*; Indian Jungle Crow *C. culminatus* and Eastern Jungle Crow *C. levaillantii* (Gadgil, 2001). The five subspecies of *Corvus splendens* are: *C. splendens splendens*, *C. splendens zugmayeri*, *C. splendens protegatus*, *C. splendens maldivicus* and *C. splendens insolens* (www.avibase.bsc-eoc.org). According one estimate the crow population in India is assigned to be around 34 million (Sen, 2011). In this review different aspects of the house crow are briefly dealt.

TAXONOMIC CLASSIFICATION

Kingdom	Animalia
Phylum	Chordata
Class	Aves
Order	Passeriformes
Family	Corvidae
Genus	Corvus
Species	<i>C. splendens</i>
IUCN Status	Least concern

MORPHOLOGY

A detailed description of the external morphology of crows as entailed by Gadgil (2001) is as follows, crows are predominantly black, medium sized birds with tails shorter than the wing and graduated or rounded at the back. Their bills are stout with stiff, straight bristles that reach almost to the middle. The house crow has a dusky gray nape, neck, upper breast and upper back, being glossy black over the rest of the body. The jungle crow is distinguished from the house crow by the absence of any grey on the hind neck and breast. Sexes are alike, with males being slightly larger (Rasmussen and Anderton 2005).

Crows are successful in establishing their population by overlap breeding method. Most of the birds in the Corvidae family are intelligent and it's due to the large brain to body ratio compared to other birds and equal to great apes and a bit lesser compared to humans (www.birding.in). The young ones live with the parents for a long time during which they learn all the skills necessary to survive and since they are co-operative brooders they will learn the skills from any members of the group (Clayton *et al.*, 2005).

GENETICS

The chromosome number of the *C. splendens* is 80 +/- . The sex determination mechanism is of ZZ and ZW (Mittal and Sakhuja, 1980). White crow has been spotted in different locations at different times, e.g. Chennai and Bhubaneshwar (TOI May 21, 2012 and Aug 21, 2013).

BEHAVIOUR

• **Feeding:** Crows are extremely skilled in feeding; they feed on everything and anything that is edible whether alive or dead. The house crows are omnivorous in nature and hence their diet includes fruits, grains, insects, small reptiles, mammals and left over's thrown by humans (garbage). This is the major reason for their establishment in the urban areas. This scavenging bird can be found in cities drinking freshwater from swimming pools and artificial ponds. These birds can be seen near marketplaces and garbage dumps, foraging for scraps. They also feed on carcass (Anil Kumar, 2004). Adult birds regularly travel up to 20 km per day to known feeding areas and needs about 300g of food daily (Sen, 2011)

• **Breeding and brooding:** The breeding/nesting season is from April to June. Nests are located 4m or higher up in trees and dense foliage is preferred. Communal nesting sites are not usual but it appears the house crow is adaptable (depending on locations and conditions). The bird usually lays 4-5 eggs which are pale blue green in colour with brow colour speckles on it. Parental care is observed in both the sexes. As mentioned earlier the young ones stay for a long time with the parents and they exhibit cooperative brooding. The Indian Koel (*Eudynamis scolopacea*) is a brood parasite of the house crow.

• **Intra-specific (Communal roost):** Crows usually build their nest in the trees, buildings or any artificial structures with sticks, wire, nail and coir or any fibre materials. The House crows usually roost with other birds like the Jungle crow and Myna. They are usually benefited as they are protected from predators. Sirsat and Patil (2013) studied the communal roosting behaviour of birds in Vijapur. They reported that the crows roosted along with the Mynas. Gadgil (2001) recorded the communal roosting behaviour of the *C. Splendens* with the Jungle crow and Myna, were the House crows and Jungle crows shifted their roosting site from the Mynas and within four days the Mynas joined them.

• **Interspecific:** Crows are very good at Mobbing (Gadgil, 2001). They are known to attack dogs, cats and birds of prey. They usually mob the predators in groups. They distract the enemy and steal their food. (www.shades-of-night.com/aviary)

GEOGRAPHIC DISTRIBUTION

The house crow has established itself in at least 25 countries. The House crow occurs in agricultural areas, coastland, desert, estuarine habitats, natural forests, planted forests, range/grasslands, riparian zones, ruderal/disturbed, scrub/shrublands, urban areas, wetlands

The two most commonly found species in the urban areas are the house crow and the jungle crow. The House Crow (*C. splendens*), is a common bird of Asian origin but found in many parts of the world. They are closely bound to human settlements and hence are perfectly adapted to urban ecosystem (Goodwin 1976; Feare and Mungroo 1990). Five subspecies have been reported: *C. splendens splendens*, *C. splendens zugmayeri* (southern Jammu and Kashmir, Punjab and western Rajasthan), *C. splendens protegatus* (coastal areas, Kerala, the Maldives, Sri Lanka and nearby islets), *C. splendens maledivicus* (the Maldives) and *C. splendens insolens*. *C. splendens zugmayeri* is also found in the dry parts of South Asia and Iran (Csurhes, 2010)

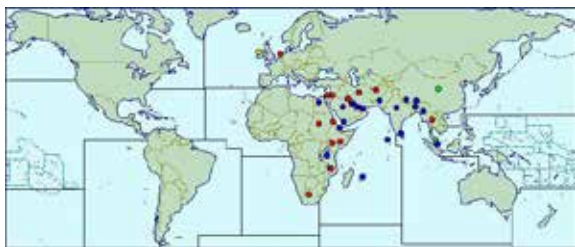


Figure1. Present global distribution of *C.splendens* (CABI, 2014)

● = Widespread ● = Localised
● = Occasional or few reports
● = See regional map for distribution within the country

INTRODUCTIONS AND INVASIONS

They are considered to be a global pest as they are very notorious and cause serious trouble to other fauna, flora and humans. According to GSID (2010) the House crows are considered to be the world's most invasive bird species. In Australia a risk prediction model has been developed to identify the suitable habitats of *C.splendens* (Csurhes, 2010). However, when the crow was introduced in Zanzibar by 1897 they rapidly established in other countries on the East-African coast and almost entire Indian Ocean Island states including Yemen. The house crow's dispersal is associated with accidental introductions through ships and deliberate introductions (Brook et al., 2003; Wells, 2007). The house crows were deliberately introduced into others countries mainly to aid in cleaning the environments especially the garbage (Feare and Mungroo 1990). Nyári et al., (2006) reported the first cases of the species breeding in temperate climatic regions like Arabian Peninsula region, Egypt, Israel and Netherland. They also studied the dispersal potentialities and predicted its establishment in countries like West and equatorial Africa, the Caribbean, Mexico, Central America, and parts of South America. Ryall (1994, 2002) had reported the sightings of individuals occasionally from around the world viz., Australia, Sumatra (Indonesia), B.I.O.T. (UKOT), Tangiers (Morocco), Gibraltar (UKOT), Florida (USA), Barbados, Punta Arenas (Chile). The spread of the house crow has resulted from both inadvertent introductions associated with increased global sea trade and deliberate introductions (Brook et al. 2003). These distributional potential of the house crow may be in the process of shifting, given the current global climate shift, which could broaden the species' distributional potential at the poleward limits (Nyári et al., 2006).

ECONOMIC IMPORTANCE

Pest and nuisance: The house crow has successfully invaded tropical and subtropical regions well beyond its native range,

reaching pest proportions in many areas (Brook et al. 2003). In Japan, crows are considered to be a pest as they rip open garbage bags and take wire coat hangers for their nests. In Himachal Pradesh they were a serious pest on almond crops (Bhardwaj 1991). They prey on the many indigenous species in other countries. The introduced birds are often considered to be a serious problem to that ecosystem by causing ecological damage and pose as a threat to humans and wildlife (Feare and Mungroo 1990). They prey on indigenous birds by attacking and feeding on their chick and eggs. They are a serious agricultural pest as they raid on crops such as Maize and Sorghum (Lim et al., 2003). In some countries they are considered to be a vector carrying major disease causing agents in their intestine, such as *Salmonella sp.*, *Plesiomonas*, enteropathic *Escherichia coli*, *Shigella* and *Aeromonas hydrophila* (Ryall 1992). The birds in the introduced range are a threat to the biodiversity of that place as they become a competitor to the avifauna of that place and also cause decline in the population of the native species due to their rapid population build up (Ryall, 1992). Due to the nest raiding habit in its native range these species enter the species conserved area and pose a threat to them. The Indian Bustard is one such species affected due to the nest raiding habit of the house crow (Ali and Rahmani, 1982-1983). The generic specific name, '*splendens*' is latin translates to brilliant - a difficult adjective to use when talking about crows as they are considered nuisance by many. They also cause a nuisance to tourists and local people with their loud calls and arduous defecation and steel food (ISSG.Org).

Vector: Indian house crows are suspected carriers of paramyxoviruses such as PMV 1, which can cause Newcastle disease (Roy et al. 1998). Outbreaks of Newcastle disease experienced in India were often preceded by mortality in Indian house crows (Blount 1949). They also carry *Cryptococcus neoformans*, bacteria that can cause cryptococcosis in humans (Gokulshankar et al. 2004).

Scavenger and predator: Although considered as a pest around the globe they play different ecological roles viz., predators, scavengers and omnivore. They were introduced in many countries just to feed on the garbage; leftovers were lack of cleaning was ignored. They are essential organisms in the food chain. Usually in India a common sighting is the road kills or human killed rat corpses are thrown out on the streets and those corpses are fed by these crows. Thus in a way they keep the surrounding clean. They are very much necessary for our urban ecosystem as they clean the waste which we dump in our streets. In a way they have learnt to survive in the urban ecosystem and are dependent on humans. Despite their scavenger niche, over population of these species can cause serious nuisance. In addition to the ecological damage, the house crow also inflict economic damage by predating chicks and eggs (making free-ranging poultry impossible) and eating crops such as maize (*Zea mays*) and sorghum (*Sorghum vulgare*) (Lim et al. 2003).

Eco-cultural aspects: This species presents great ecological flexibility, as well as an obligate association with human presence, to the extent that no populations are known to live independently of man (Nyári et al., 2006). In mythology, folklore and religion: According to the Sioux (Dakota people of North America) a white crow used to warn the buffalos about the hunters in the area and in turn these buffalos stampede and leave the hunters hungry. So an angry Indian threw the bird into a fire which turned the white bird into black (<http://www.crowbusters.com/facts.htm>). In India crows are being characterized in the general literature and folktales. In Hindu mythology crows are considered as human ancestors, usually during a death anniversary they feed the crows. The origin of river Kaveri is also based on a myth that lord Ganesh transformed into a crow and poured the water from a kamandal of Agastya. The crow is considered to be a chariot of lord Saneeshwara. They are also portrayed in many scenarios of the myth Thulasi Ramayan. According to Buddhism the crows are represented in Dharmapala i.e. they are protector of Dharma (<http://www.sushmajee.com>).

As food and pet: Crows are not a part of the menu in India. They

might be considered as a meat product in some Western countries. But in India there are rare occasions where the crow meat is sold as pigeon meat or mix the meat with that of poultry meat and sell them. Most of the hotels too are involved in the adulteration of meat. Several incidents have been reported, (The Hindu, 2004). A man in Tamil Nadu was arrested for feeding the crows with poisoned beef which he sold as pigeon meat. Similarly in Bhubaneswar two persons were arrested for killing more than hundred crows by feeding them with fish waste mixed with poison and selling them to different fast food centres and dhabas, which used these meats as chicken based items (TBT, 2011). The crows are portrayed well in our Hindu customs, but still they are not considered as pets. May be in certain countries they might be considered as pets. However in India House crows are not on the pet list of animal lovers.

CONSERVATION AND THREATS

In history the crows are considered to be a “despicable predator”. It is also said that King Henry VIII put a public bounty on the crows as the people couldn't bear the crow menace. During World War II these crows were considered as the “black bandits” in America as they were looting the agricultural lands and people shot them down regularly. In 1940 a total of 3, 28,000 crows were killed in Illinois. To limit the crow population they shoot, trap and poison them (www.crowbusters.com/facts.html). The house crow causes problems across a range of areas, including crop and livestock sustainability and poses a risk to native avifauna. The aforesaid threat perception has led to the initiation of eradicating programmes listed below.

Some of the preventive measures practiced in different countries include,

- Avoidance of transport of birds by ship to ports and cities outside its current area.

- Establishment of regular control inspections at vulnerable points of entrance and relevant locations in cities.
- Keeping city environments clean (especially garbage elimination) and modification of micro habitat (e.g. by selection of species of tree used for planting).
- Physical methods like destruction of nests, eggs and nestlings in breeding areas; shooting or trapping is of very limited success as the crows are very social and highly sensitive to direct persecution. Bounty systems have had little significant impact on the control of the species as long term income rather than eradication has been the main motivation.
- Chemical methods include, poisoning of birds with various avicides has given good results when pre-baiting was undertaken and in conjunction with sanitary improvements. However, uncontrolled poisoning operations may affect non-target wildlife, the environment and human resources (e.g. water). The detection and elimination of any survivors (often widely dispersed) is labour intensive and costly but crucial to achieve long lasting results. House Crows are known to be useful in removing pests. They were, in fact, introduced to Malaysia and Oman to control caterpillars and livestock ticks. But, perhaps, the reason they were introduced in the island of Zanzibar to clean up refuse or garbage (Sen, 2011).

From human perspective anything which causes damage or loss are considered as pest. The ubiquitous distribution of the species mirrors its potential to adapt and flourish in different ecosystems. In conclusion, crows are integral part of the ecosystem and they play a critical role in the ecosystem as a predator, scavenger. Hence, it should be allowed to perpetuate like other species each with specific niches in the ecosystem.

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