



Bill deformities in House Crows *Corvus splendens*, Large-billed Crow *C. macrorhynchos* and Yellow-billed Blue Magpie *Urocissa flavirostris* in India

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In this paper we report recent records of bill deformities recorded in some Indian corvids. They are the Common Crow *Corvus splendens*, the Large-billed or Jungle Crow *Corvus macrorhynchos* and the Yellow-billed Blue Magpie *Urocissa flavirostris*. The authors posted the information about sightings of the bill deformities on the various bird groups on the internet eliciting response and information about similar records of bill deformities from all over the country. These reports are included in the present paper.

Bill deformity in House Crows *Corvus splendens*:

Gandhi Sagar Tank, Nagpur:

On 17th June 2009 when the authors (RK, AJ) were watching birds at a small city tank, namely, Gandhi Sagar tank, at Nagpur (21°08'N and 79°05'E, altitude: 332m), Maharashtra, they noticed a House Crow with an abnormally long and down-curved maxilla. The second author successfully photographed the House Crow. It was found that the maxilla was very much elongated than the mandible (Photograph no.1). This particular House Crow behaved normally and other con-specifics behaved normally with this particular crow. After some time the authors located a nest of this crow on a nearby *Ashoka* (*Polyalthya longifolia*) tree.

When the second author (AJ) was trying to photograph this particular crow he located and photographed another crow with a deformed bill. Bill of the second crow was longer than the normal crow and the maxilla was hooked. Also this particular crow had back side of the head slightly bald and looked sick. It had white feathers on the right flank.

After some time the authors observed that the crows were feeding on dead fish floating in the tank. The fish might have been dying because of the pollutants the tank received through the gutter water which was directly flowing into it.

It is worth mentioning that the water of this city tank was polluted and it even emitted a filthy odour. In the year 2008 thousands of fish in the tank had died presumably because of the high level of pollutants in the water. When counted the total number of House Crows staying at this tank were approximately 50.

On 21st June 2009, the authors again visited the location and found that both the crows with deformed bills were there. It was also observed that these and all other House Crows

here were hawking the dead fish floating in the tank water and then consuming these fishes.

On this day the authors located atleast three House Crows with brownish feathers without the shining jet black colour of the primaries.

On 15th October 2009, the first author visited the Gandhi Sagar tank again. He sighted two House Crows with hooked bills on this day. The two crows were photographed in a single frame (photograph no.2) while feeding on pieces of "roti" (wheat bread).

Khamla Mutton Market, Nagpur:

On 22nd June 2009, the first author (RK) found another House Crow with a similar bill deformity near the Khamla Mutton Market (21°06'N and 79°03'E, altitude: 335m), in Nagpur city, Maharashtra. This particular crow also had an abnormally elongated and downcurved bill and also it had a white chest patch and whitish rump. It had somewhat an ungainly look and looked to be sick or malnourished.

This crow was seen with another crow (presumably its mate) nearby the author's house. They were actively chasing away Asian Koels (*Eudynamys scolopaceus*), which are known to lay their eggs parasitically in the nests of House Crows (Ali and Ripley, 1987). The next day, this particular House Crow was photographed near the author's (RK) house by a birder friend, Mr. Anuj Kale. These two crows were seen collecting nesting material and building a nest on a tree behind one of the meat shops in the market.

On 23rd June 2009, we (RK, AJ) again visited the Khamla Mutton Market and found another House Crow with a slightly elongated and hooked bill. This crow with a hooked bill was seen visiting a nest on a Nilgiri tree in the same market.

On 24th June 2009, the authors again sighted both the House Crows with the bill deformities in the same market.

On 10th July 2009, Mr. Gopal Thosar, Honorary Wildlife Warden, Nagpur district, noted that the House Crow with the elongated and downcurved bill had a normal bill now. The reason could be that the bill was broken by its attempts at pulling at nesting material which included iron wires. The crow could be identified because of the nest on a tree just behind a meat shop and also because it had a white chest

patch. This bird stayed near a nest in which another crow was seen sitting for quite sometime.

Nests of both the crows were observed intermittently. But no eggs or nestlings were seen in the nests and after some days both the pairs abandoned the nests. Presumably, nesting of both pairs had failed.

On 5th October 2009, the author (RK) found only the crow with the hooked bill near the meat shops feeding on the carrion. It was perched with another crow and was leaning its head in front of another crow and probably begging for allo-preening of the nape feathers.

To add to the information, around 40-50 House Crows are regularly sighted at this market along with few Large-billed Crows.

Sakkardara Tank, Nagpur:

On 1st July 2009, the authors (RK, AJ) saw another House Crow with one normal leg and the second leg up to the knee near Sakkardara Tank in Nagpur city. However, the bill of this crow was normal. Around 25-30 crows were counted here.

Pardi area, Nagpur:

On 21st July 2009, the author (RK) saw yet another House Crow with a short and blunt bill near Mutton Market at Pardi area of east Nagpur. Both the bills of this crow were only approximately half its length and obtuse and not pointed. It was seen feeding on the tit bits of meat near the meat shops. This crow looked slimmer and weaker than other crows. Also the flight of this crow was clumsier compared to other crows. It had lot of white feathers on its chest and rump. Around 15-20 crows were counted here.

Bill deformity in Large-billed Crow *Corvus macrorhynchos*:

The third author (SM) sighted a Large-billed Crow with an abnormally elongated and down-curved bill while he was studying birds in the Parambikulam Wildlife Sanctuary in Kerala (10°28'N and 76°50'E; altitude: 2616 feet). He photographed this particular crow with a deformed bill (Photograph no. 3). It was on 9th November 2008. It was noted that this particular crow was foraging only in forest habitat. There was no human habitation nearby. Once it was seen sipping the nectar from a *Bombax* tree in the same forest habitat.

Bill deformity in a Yellow-billed Blue Magpie *Urocissa flavirostris*:

On 11th May 2009, a Yellow-billed Blue Magpie *Urocissa flavirostris* was sighted and photographed by Mr. Kshitij Sahani at Manali (32°14'N and 77°11'E; altitude: 6187 feet) in Himachal Pradesh. At 1330hrs they sighted this colourful corvid in human habitation near a trout fish culture farm which also sold fish. The bird was feeding on tit bits of fish meat lying around the fish culture farm. This particular bird had a severely crossed bill. The maxilla was turned to its right and the mandible was turned to its left (Photograph no.4).

More reports of bill deformities from other parts of India:

Kolkata, West Bengal:

The first author (RK) visited Kolkata (22°32'N and 88°20'E; altitude: 35 feet) on 21st and 27th October 2009. On 21st October 2009, he sighted a House Crow with a hooked bill feeding on the garbage bin near the famous Kali Mata temple where hundreds of goats are sacrificed every year. On these two days he observed a total of 150 House Crows at various tourist places.

New Jalpaiguri, West Bengal:

On 26th October 2009, the first author (RK) visited New Jalpaiguri (26°40'N and 88°26'E, altitude: 368 feet) railway station on his way back to Howrah from Gangtok (Sikkim). His son Master Vedant Kasambe drew his attention towards a House Crow with a prominently hooked bill. This Crow was pulling softened "roti" pieces from the polluted sewage water flowing between the railway platforms. Another House Crow had a slightly hooked bill. He observed total five House Crows here.

Kolhapur, Maharashtra:

Mr. Gopal Thosar informed the first author (RK) that he had seen a Large-billed Crow with an abnormally elongated and downcurved upper bill near Panhala Fort, District Kolhapur, Maharashtra on 26th April 1991. The crow was sighted near a village and it might have been feeding on the carrion in the village. The location of Panhala Fort is 16°48'N and 74°07'E and the altitude is 2671 feet.

Sangli, Maharashtra:

Ms. Suvarna More informed the author (RK) about sighting of a House Crow with a elongated and downcurved bill on 19th and 20th March 2008 and again on 11th April 2008 at Kawthe Mahakal town (17°02'N and 74°51'E; altitude: 2179feet) in Sangli district of Maharashtra. This crow was regularly seen feeding on the carrion near the college canteen of Vasant Dada College in the town where Ms. Suvarna worked as a lecturer. Surprisingly the (same?) crow with the bill deformity was again seen by her on 8th March, 2nd April and 3rd April in 2009 at the same place.

Noida, Uttar Pradesh:

Mr. Jose Louies working for Wildlife Trust of India informed the author (RK) on 25th June 2007 that he had seen a crow with a elongated and down curved bill near his guest house at Noida in Uttar Pradesh (28°34'N and 77°19'E; altitude: 669 feet). This was about a week before and the elongated, down curved bill was very much visible. Unfortunately Jose was not able to photograph as the crow had vanished by the time he returned with his camera.

Kottayam, Kerala:

Mr. Prasanth Narayanan informed the author (RK) on 26th June 2009 that he had seen a House Crow with elongated and down curved bill at Kottayam in Kerala. In 2003-2004 he

used to watch a House Crow near Medical College Hospital, Kottayam in Kerala (09°35'N and 76°31'E; altitude: 78 feet) with extra-ordinarily elongated and down curved bill.

Palakkad, Kerala:

Mr. R. V. Balasubramanian informed the author (SM) that he sighted and photographed a House Crow with an elongated and downcurved bill at Alathur Taluk, Palakkad District, Kannambra Panchayat in Kerala on 16th April 2009. The geographical location of Palakkad is 10°46'N and 76°38'E and the altitude is 308 feet.

Kozhikode, Kerala:

An adult crow with a crooked upper bill was recently spotted at Mankavu near Kozhikode in Kerala (11°15'N and 75°46'E; altitude: 50 feet) (Internet Ref.1). The bird was photographed by Dr. T.V. Sajeev, an entomologist of the Kerala Forest Research Institute.

Bengaluru, Karnataka:

Prof. Ulhas Rane (Moderator, Maharashtra pakshimitra web group) informed the author (RK) on 22nd July 2009 that he saw a House Crow with a broken leg, hopping on pavement near a shop in Indira Nagar in Bengaluru, Karnataka (12°58'N and 77°35'E; altitude: 2993 feet). It was perhaps looking for some food. On closer observation it was noticed that the crow had a deformed and hooked bill, as described earlier.

Dehra Dun, Uttarakhand:

Mr. Prateek Panwar informed that he saw a Jungle Crow on 23rd July 2009 with a hooked bill drinking water from the bird bath at his house in Dehra Dun, Uttarakhand (30°20'N and 78°02'E; altitude: 2261 feet) at about 7.30 am and when he returned with a camera it had fled. In June 2009 also he sighted a House Crow with a hooked bill at his friend's house in Dehra Dun in Uttarakhand. This particular House Crow was seen for quite some days in the same campus.

Mr. Jafar Palot, senior scientific assistant of the Zoological Survey of India Western Ghats Field Research Station, Kozhikode, has also spotted such crows (Internet Ref.1).

Ms. Kiran Poonacha informed the author (RK) on 25th June 2009 that she had sighted a Greater Coucal (*Centropus sinensis*) with a similar elongated and downcurved bill.

Discussion:

There are many published references of bill deformities in the corvids as well as other bird species belonging to various taxa. The important one include: Allard, 1930; Arendt & Arendt, 1986; Barlow, 1967; Brown, 1976; Carothers & Balda, 1970; Craves, 1994; Easterla & Todd, 1971; Easterla & Wauer, 1972; Flanigan, 1976; Fox, 1952; Gochfeld, 1972; Goertz & Mowbray, 1969; Hicks, 1934; Hodges, 1952; Johnson, 1929; Morton, 1963, Mutchler, 1976; Parkes, 1969; Pomeroy, 1962; Prescott, 1968; Riggins & Riggins, 1976; Sharp & Neill, 1979; Steffee, 1968; Taylor & Anderson, 1972 and Thompson & Terkanian, 1991.

The majority of deformities included elongated and downcurved maxilla and crossed bills. Notably most of the references are from the North American countries and Europe.

Large numbers of wild birds are developing gross bill deformities and the cause is still a mystery. More than 2,500 birds of 102 species exhibiting maxillary and mandibular overgrowth of the keratin layer with varying degrees of abnormal curvature and crossing have been documented. Parrids, corvids and raptors are the most frequently reported birds with such deformities, but a wide variety of other taxa are also afflicted. The reports have been concentrated in Alaska and the Pacific Northwest, although birds with similarly deformed bills have been reported from across North America and Europe.

Bill deformities cause difficulties in feeding and preening, resulting in increased rates of mortality. Deformities affect both males and females but prevalence appears higher among adults. Testing of Black-capped Chickadees, the species with the highest reported rate, has revealed no evidence yet of disease, parasites, or contaminants (Internet Ref. 1).

According to Craves (1994) "possible reasons for bill deformities include genetic or developmental causes, injury or disease. Several researchers (Fox, 1952; Pomeroy, 1962; Sharp & Neill, 1979) could not produce conclusive evidence to support any of these causes. In fact, some evidence seems contradictory. For example, if bill deformity were genetic in nature, some abnormality in bony structure might be expected. Yet typically, the abnormality was due to the excessive growth of the dermotheca and rhamphotheca; the underlying bony structure was normal (Thompson and Terkanian, 1991; Fox, 1952; Taylor and Anderson 1972; Easterla & Todd, 1971). Bill deformities due to injuries might be expected to produce scars on the underlying bony structure, but again, bone has appeared normal. Additionally, if injury was the cause, then uniform, correlated growth to each mandible would not be expected (Fox, 1952).

The idea that bill deformities may be due to chemical pollutants such as pesticides is worth exploring. Birds such as gulls, cormorants and some raptors with malformities stemming from chemicals are well-documented. The dietary habits of these birds, high on food chains, make them recipients of concentrating environmental mutagens, a possible cause for deformities. Since passerines tend to be lower in the food chain, the possible connection between environmental causes and bill deformities is not as strong".

Still, some researchers have offered chemical pollutants as a potential explanation for bill deformities in the birds they studied. Sharp and Neill (1979) felt that the deformities they found among blackbirds may have resulted from avicidal chemicals. Brown (1976) also mentioned this possibility as the cause of the numerous deformed Brown Thrashers (*Toxostoma rufum*) in central Florida, a prime agricultural area. The high incidence of specimens of Brown

Thrashers from the late 1960s to the early 1970s, the era of widespread DDT use, also lends credence to this theory.

Gochfeld (1972) urged monitoring of bill deformities to detect if the incidence of and distribution of defects was changed, especially considering the potential mutagenic, teratogenic and carcinogenic effects of chemical pollutants. Yet fewer reports of birds with deformed bills are appearing in the literature; whether this is due to a real decline in occurrence or a lack of interest in reporting is not known.

Gochfeld (1972) feels that bill deformity rates may vary. Bird banders keeping appropriate records can provide basic data on frequency of deformities. Changes in the frequency or degree of morphological deformities suggest concerns for closer looks for possible causes. It may be worthwhile to secure blood and tissue samples from badly deformed birds for analysis, since it is likely that these birds would not survive in the wild.

Alaska Science Centre is working on bill deformities in birds in Alaska. The organisation has maintained a website on the subject (Internet Reference-3). It mentions, "although, we do not yet know what is responsible for the bill deformities observed in Alaska and the Pacific Northwest, there are several possible causes to consider. In general, bill deformities may be influenced by contaminants, nutritional deficiencies, disease, parasites, blunt trauma, or genetic abnormalities. We tested for contaminants, disease, and parasites. We also examined genetic components to determine if deformities are heritable or result from genetic abnormalities. We have some evidence for environmental contaminants as a possible causative factor, but more research is needed. Possible nutritional deficiencies also deserve further study".

As far as the observations in India are concerned, it seems that the "long beak syndrome" or the bill deformities are reported from places wide apart (as much as Himachal Pradesh and Sikkim to Kerala) throughout India. Bill deformities probably have not been reported previously in Indian birds (Burg et. al., 1994). All the corvids mentioned in the present paper did not share similar habitat or feed on similar diet. But most of them were feeding on the carrion. Hence the probability of all the corvids mentioned in the paper eating contaminated food seems remote. Considering the fact that bill deformities reported and studied around the world did not yield any conclusive evidence or the cause, the authors feel that further study only can determine the causes of the bill deformities in the corvids being reported here.

Conclusions:

At present we do not know the exact cause of bill deformities in the corvids being reported here. However, it seems that the bill deformities are more common and needs to be observed by more birdwatchers. The authors feel and request the birders in India to look at all the common birds like House Crows for deformities. Further studies are required to understand the causes and significance of the bill deformities in the corvids.

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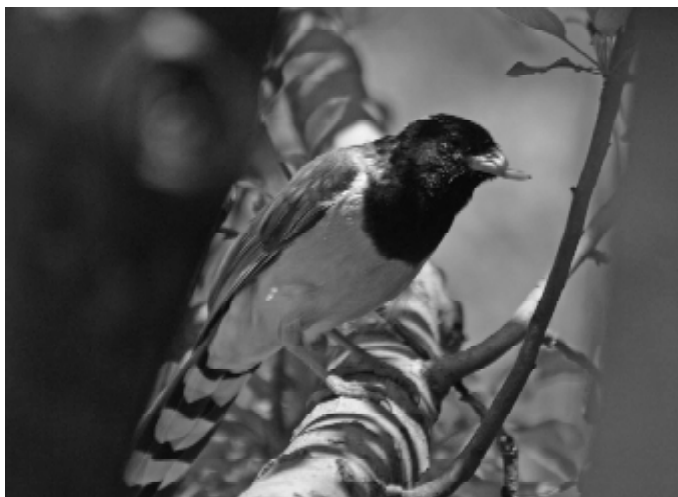
1. House Crow with elongated and down curved bill
Photo by Aditya Joshi



3. Large-billed Crow with elongated and down curved bill
Photo by Sathyan Meppayur



2. Two House Crows with hooked bills
Photo by Raju Kasambe



4. Yellow-billed Blue Magpie with a crossed bill
Photo by Kshitij Sahani

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