

Mimicry of Birds

Sanket Raut

Mimicry is considered a special form of adaptation. In this, organisms imitate other species found in their environment. In the living world, imitation (mimicry) appears in many different forms. It can be of voice or of physical appearance. There is a great deal of variety in mimicry. Not only birds, but butterflies and even plants and trees also imitate. In this article, we will look at a form of mimicry in which certain species of birds adopt the color and physical appearance of other birds.

Birds have been an important part of human culture. The wall paintings of birds from the Stone Age testify to this. Mummies of birds have also been found in the pyramids of Egypt. Indian culture has also honored birds as the vehicles of many deities. Until a few centuries ago, the ability of birds to fly greatly fascinated humans. There is no doubt that humans have always been deeply interested in observing birds. Philosophers such as Aristotle also reflected on birds. Around two and a half thousand years ago, the Roman philosopher and naturalist Pliny believed that the koel transforms into a

bird of prey in winter. Doesn't that sound strange to you?

So how would a philosopher like Pliny have arrived at such a belief? Perhaps Pliny had seen a koel that looked like a hawk, or a hawk that looked like a koel. But how can a fruit-eating koel possibly resemble a meat-eating hawk? Have you ever seen a koel that looks like a hawk? Did Pliny exaggerate his claim? In this article, we will try to understand some of such curious observations.

Common Hawk-Cuckoo

(*Hierococcyx varius*)

The Common Hawk-Cuckoo, which signals farmers about the arrival of rain, is found in South Asia and almost all of India. From the word 'cuckoo,' you might have guessed that this bird belongs to the koel family. However, the word 'hawk' is also included in the name of this bird. The word 'hawk' is used for birds of prey such as hawks and falcons. So, why would the name of a bird of prey be used for identifying this koel? To find the answer to this question, look at the pictures of the



Picture 1: a) Shikra, b) Common Hawk-Cuckoo

birds given above.

The first bird shown in the photo is the Shikra (*Tachyspiza badia*), and the second is the Common Hawk-Cuckoo. Look at these two birds carefully. The color of the birds and the pattern on the breast are very similar in both. At first glance, the Common Hawk-Cuckoo looks almost exactly like the Shikra. Thus, birds not only imitate the calls of other birds but, like butterflies, also adopt the colors and patterns of other birds. The Common Hawk-Cuckoo is an example of a mimic bird that may be found around your home. Through this article, we will try to understand how color and physical appearance are imitated in the bird world.

Among birds of prey, the striped pattern seen in the Shikra is also found

in many other species. In fact, this pattern can even be considered an identifying feature of birds of prey. On the other hand, the striped pattern on the breast of the Common Hawk-Cuckoo can also be seen in the female Asian Koel and several other species of koel. We often do not realize that mimicry can be deceptive.

We have seen in articles published in Sandarbh magazine that amidst the struggles of life, imitation (mimicry) is also used as a survival strategy. This deceptive behaviour of birds is now being systematically studied, and many researchers have conducted special experiments on it. Let us now understand, through some examples, the benefits that imitation (mimicry) can bring to these birds.

Benefits of Imitation (mimicry)

It is well known that the koel lays its eggs in the nests of other birds. In animals, this behaviour is called brood parasitism. Reaching another bird's nest and laying eggs there is certainly not an easy task, as the bird may be attacked. The Common Hawk-Cuckoo usually chooses the nest of the Jungle Babbler (*Argya striata*) to lay its eggs. Jungle Babblers are aggressive and are often found in groups of six to ten. Working together, they can easily attack the cuckoo. Moreover, the nest in which the eggs are to be laid should already contain eggs; otherwise, the babblers may detect the cuckoo's intrusion. But if there are already eggs in the nest, there is a higher possibility of at least one member of the babbler pair being present there, making the cuckoo's task even more difficult. This is where imitation can come into play.

Researchers have found that birds like the Jungle Babbler, on seeing the striped pattern on the belly of a cuckoo, may mistake it for a bird of prey. In such a situation, the likelihood of the babbler or other birds fleeing increases, which makes the cuckoo's task easier.

Help in Hiding

Another known feature of the

striped pattern on the bellies of birds of prey is that it can make the bird almost invisible among the branches and leaves of trees. This helps birds of prey to hide and launch sudden attacks. The same pattern can help the Common-hawk Cuckoo conceal itself while searching for a potential nest. This pattern is also found on the belly of the female Asian Koel (*Eudynamys scolopaceus*), which may help her in secretly inspecting a nest. Even so, it is important to remain cautious while doing this. If the imitation is detected, the female could get into trouble. In such cases, the male koel tries to mislead the other birds. The male Asian koel does not have the striped pattern on his belly like the female. Because of this, the male does not get the benefit of imitation, and often the birds of an egg-containing nest attack and chase him away. In the midst of this commotion, the female Asian Koel gets the opportunity to lay her eggs in another bird's nest.

Food or Eater?

Birds from the koel family often become prey for other birds, so resembling birds of prey reduces the chances of them being attacked. In such situations, birds of prey, mistaking the koel for another bird of prey, do not

attack it. Since in this case imitation helps in self-protection, this process is known as protective mimicry.

Help in gathering food

Birds also use imitation to obtain food. When other birds flee out of fear of predators, it becomes easier for the koel to take control of the food source. To study this, researchers in England set up several bird feeders. Bird feeders are used to provide food and water for birds. Two species that are commonly found at these feeders are the Great Tit and the Blue Tit. Since the koel's primary diet consists of fruits and insects, these tit species were not its specific target.

Researchers placed straw-filled models of the Common Cuckoo around these feeders and recorded the behavior of the tit species. They also placed straw-filled models of pigeons near the feeders. A female Common Cuckoo (*Cuculus canorus*) has a striped pattern on its belly, similar to that of birds of prey. The researchers painted the same striped pattern on the bellies of some pigeon models as well.

In this experiment, it was found that as long as the model cuckoos had the striped belly pattern, the tits appeared uneasy. However, they were not afraid of the pigeons, even when the pigeons

had the same striped pattern. When the stripes were removed from the cuckoo models too, the tits ignored them just like they ignored pigeons. This means that birds do not identify birds of prey solely by their striped belly patterns. If they did, they would have been equally afraid of the pigeons with stripes. This suggests that there may be other features and cues involved in recognizing birds of prey. Take the Common Hawk-Cuckoo for example it looks like a bird of prey at first glance. Even in flight, it resembles one, and when perched, it moves its tail from side to side just like a hawk. This display confuses other birds and small animals, causing them to raise alarm calls out of fear. Pigeons, on the other hand, neither match the shape of birds of prey nor have a similar flight pattern. So having stripes on the belly alone is not enough, the bird's overall shape should also resemble that of a bird of prey.

Now imagine a cuckoo with a bird-of-prey pattern, but the pattern belongs to a species not found in that geographical region. How would other animals react to such mimicry? Would they think of the cuckoo as a bird of prey? No. Because animals only recognize species from within their own geographic range. That is why a



Picture 2: a) Black Drongo (*Dicrurus macrocercus*), b) Fork-tailed Drongo-Cuckoo, c) Square-tailed Drongo-Cuckoo

mimicking bird needs to adopt the colors, form, and habits of the local birds of prey.

Imitation of who all?

Are only birds of prey imitated? Birds of the koel family do not imitate only birds of prey. The drongo is an aggressive bird and does not hesitate to attack birds much larger than itself. Even big predatory birds stay out of its way. Species of the koel family Fork-tailed Drongo-Cuckoo (*Surniculus dicruroides*) and Square-tailed Drongo-Cuckoo (*Surniculus lugubris*) imitate drongos. Birds that know the aggressive nature of the drongo would also prefer to keep their distance from birds

imitating it. Such imitation of an aggressive bird like the drongo can certainly help in securing a food source, scaring away other host birds, and laying eggs in the nests of other birds.

Other examples of mimic birds

The House Sparrow and the Baya Weaver belong to the finch family. One species from this family, the Cuckoo Finch (*Anomalospiza imberbis*), is found in the African continent. It is a brood-parasitic species of the finch family. Perhaps this is why the word cuckoo appears in its name. The female of this species imitates the female of the Southern Red Bishop (*Euplectes orix*).

However, unlike the koel, which imitates aggressive birds like the Shikra and the drongo, the Cuckoo Finch imitates a bird from within its own finch family.

Unlike the koel that lives in dense trees, birds of the finch family live in open grasslands. Here, the possibility of hiding is very low, as everything is visible to everyone. When predators are nearby, the birds remain extremely alert. In such situations, they avoid any behavior that could easily reveal the location of their nests. A koel can hide itself among the leaves of trees, but this advantage is not available to the Cuckoo Finch living in open grasslands. Since there is no threat from the Southern Red Bishop in the grassy plains, the female Cuckoo Finch can quietly watch its host species while in disguise. I think this is a beautiful example of how imitators can adapt when their habitat changes.

Note that, so far in this article, all the examples of mimicry have been of brood parasitic species. So, can examples of mimicry also be found in bird species other than brood parasites? Let's find out.

Female, disguised as a male

In most bird species, males and females differ greatly in their size and

coloration. Since females play a larger role in raising and nurturing the chicks, their colors are usually dull, which helps them stay hidden. In contrast, the male's role is to attract the female, so its plumage is bright and colorful. This difference is known as sexual dimorphism.

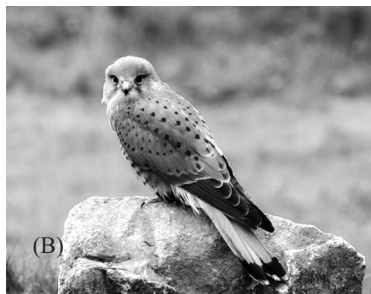
The world's smallest bird, the hummingbird, is also a sexually dimorphic species. The adult male White-necked Jacobin Hummingbird, found in the Americas, has bright blue-and-white plumage, whereas most females are pale green. Interestingly, about 20% of adult females in this species mimic the male's blue-and-white coloring. However, their strength and behavior remain the same as other females. This type of mimicry is called deceptive mimicry.

Although having bright plumage like males may indeed increase the risk of being spotted by predators, why would one in every five females still imitate the males? To find answers to such questions, researchers observed the behaviour of this species at bird feeders. The study found that hummingbirds often attack members of their own species and try to drive them away from the feeder. In such cases, females are more affected. They are generally unable to withstand male

attacks and therefore fly away. In contrast, males fight back, and this counterattack prevents other males from attacking them. Naturally, females benefit from such mimicry. It has been observed that this mimicry helps females gain access to food. In simple terms, males of this species are stronger and more dominant than females. By adopting male-like plumage, females give the impression that they are equally tough, thereby deceiving males and securing food.

Female Mimicry

Predatory birds are also sexually dimorphic. In these species, the juvenile



male's appearance is similar to that of the female. Like the female, the dull coloration helps the inexperienced male hide from predators until it reaches adulthood. They also do not have to face the aggression or competition from adult males. This is known as the female-mimicry hypothesis (FMH). Some young male predatory birds, such as the European Kestrel (*Falco tinnunculus*), use this female disguise to deceive adult males and mate with females.

How does mimicry protect the mimic from deadly predators?

Mutation has been important in secondary evolution. We can say that the development of imitation begins with mutation. Through this mutation,



Picture 3: a) Female European Kestrel, b) Adult male European Kestrel, c) Young male European Kestrel



Picture 4: Female Downy Woodpecker on the left and aggressive Hairy Woodpecker on the right.

animals that imitate acquire the color and appearance of some other animal. For example, we can consider the striped patterns seen on predatory birds. When such patterns appear on other birds, those birds benefit from them. Because of these patterns, the likelihood of being attacked by predators significantly decreases. As a result, the population of the imitating birds increases, giving them a better chance to pass on their lineage.

In this way, the mutation of the mimicking bird will also increase within that species. So, overall, this is an example of natural selection. However, much research still needs to be done on mimicry.

In reality, the adult male European

Kestrel can recognize female-like young male birds, but they are not interested in attacking them, since they consider them of lower status due to their dull coloration. Even when a female is nearby, the adult males ignore them. Therefore, when the right moment comes, these female-like young males deceive the adult males and take the opportunity to mate with the female. According to one study, in the European Kestrel species, mating between a young male and an adult female is more successful.

Males of some bird species adopt their adult plumage only after mating for the first time. This is called delayed plumage maturation. However, the Marsh Harrier is an extraordinary

predatory bird species. In this species, about 40% of males retain the female-like appearance even after reaching adulthood. In animals, this kind of behaviour is called polymorphism. Although such mimicry is also found in reptiles and fish, in birds, it has so far been documented in only two species.

Another example is the Ruff (*Philomachus pugnax*). Each territorial bird defends its area, and rival males are aggressively driven away. Males in female disguise are often mistaken for actual females and therefore overlooked. This allows them the opportunity to gain access to food resources. Male ruffs in female plumage also take advantage of their appearance to deceive adult males and mate with females.

Similar Species of Woodpecker

Another example of mimicry in the bird world can be seen in woodpecker species. Some species of woodpeckers resemble other woodpecker species, and this phenomenon can be observed worldwide. It has been found that genetically distant woodpecker species

living in the same area also look similar. For example, the Downy Woodpecker of North America resembles the larger and more aggressive Hairy Woodpecker. This resemblance prevents other species from approaching the Downy Woodpecker closely and reduces competition for food resources.

In India, too, there are such examples among woodpeckers. However, it has been found through some studies that the similarity among woodpecker species is linked to their geographical area. Therefore, more research is definitely needed to confirm whether these are examples of mimicry or not.

Life is truly astonishing. It is as beautiful as it is mysterious. Researchers have been trying to unravel this mystery in their own ways. Mimicry is one such mystery. A natural question arises: besides butterflies and birds, is there scope for mimicry in the animal kingdom? Let's find out in the next article.

Sanket Raut is a wildlife lover and actively participates in wildlife studies. Birds and butterflies are the main focus of his interest. He enjoys learning about wild animals and analyzing their behavior. He works in the field of education and is engaged in teaching and training.

Translated from Hindi: Nidhi Solanki

Reference:

1. <https://royalsocietypublishing.org/doi/10.1098/rspb.2015.0795>
2. Adaptive significance of permanent female mimicry in a bird of prey: Audrey Sternalski, Francois Mougeot and Vincent Bretagnolle
3. <https://www.cam.ac.uk/research/news/cuckoos-impersonate-hawks-by-matching-their-outfits>
4. <https://www.psychologytoday.com/intl/blog/lies-and-deception/202311/mulan-mimicry>
5. <https://intobirds.com/study-finds-some-woodpeckers-imitate-a-neighbors-plumage/>
6. Delayed maturation in plumage colour: Evidence for the female-mimicry hypothesis in the kestrel: Harri Hakkarainen, Erkki Korpimäki, Esa Huhta & Päivi Palokangas

Hindi Translation Published in SANDARBH issue 154, September-October, 2024

Sandarbh is a bimonthly resource magazine published by Eklavya Foundation



Common hawk Cuckoo