



A general overview: on Indian vulture species

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Abstract:

Vultures were a very common bird in the Indian subcontinent, but in today's scenario, the vulture population is diminishing day by day. In India, we can find seven different vulture species. Vultures are scavenger species. They generally feed on dead animals and helps to prevent the spread of deadly viruses. Many vulture species show peculiar feeding habits. Building a nest, protecting the young from predators, and taking care of babies are significant tasks for vultures. Their bodies are responding fatally to diclofenac toxicity, and as a result, their population is in great danger. Habitat destruction is one of the fatal causes of the diminishing vulture population. Collapsing vulture populations directly influence human mortality. Different governments and private organizations are taking different initiatives to prevent their own extinction.

Keywords: Egyptian vulture, Inhabitant, Critically endangered, Diclofenac etc.

1. Introduction:

In India, vultures were among the most often observed birds. They are the inhabitants of the air. Our country once had a large number of this scavenger species but with the passage of time there number is diminishing vigorously. Leading causes of vulture population depletion includes damage of residence, less sustenance availability, communicable diseases, pollution in surroundings, planned poisoning of domestic animal causes passive poisoning of Vultures [22]. Purposeful killing of Vultures by airport authorities to encumber airplane accident is a major reason for collapse of Vultures population. Just a few thousand of them remains in India as of July 2024 survey[24]. In the past, vultures have been associated with dominance in catholic culture. In different manuscript of history we can see the references to vultures in several era. In

ancient Egypt Vulture were represented as flag bearer of holiness, motherhood and our life cycle from birth to death. In an Indian epic “**Ramayana**” we can find references of a vulture character named “Jatayu”. In other myths Vultures are also define as deadly spirit. In Roman history ,there body was thought to contain numerous mediclinal value [25, 42].Similarly, in Tibetan tradition, human remains are bestowed to vultures or dakinis. Vultures are mentioned in various contexts in Buddhism [26]. As vulture is a scavenger species they play a significant role in cleaning the surroundings. They maintain clean environment by picking up garbage, decaying materials and feces[27]. Vultures can help passively to reduce water pollution, air pollution by consuming carcasses. Eating carcasses not only reduce pollution but also prevent spreading of different livestock diseases like rabies,bubonic plague, tuberculosis etc [28]. Vultures can eat 90% of dead materials very efficiently. They serve up as excellent exponent of ecological purity [30].

2.Classification of vulture:

2.1Classification: *New World Vultures:*

Domain: Eukaryota

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Falconiformes

Family: Cathartidae

(Lafresnaye, 1839)

2.2 Classification: *Old World Vultures:*

Domain: Eukaryota

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Falconiformes

Family: Accipitridae

Subfamily: Aegypiinae

(Learner and Mindell 2005)

In the world scenario, 22 different species of vultures exist, which includes 7 new worlds and 15 old worlds. India is home to nine different vulture species, both migratory and permanent [29]. Vultures from the old and new worlds are an illustration of “adaptive convergence.” Old World vultures belong to the Accipitridae family of vultures. New world vultures have close proximity to storks. Since the Miocene, civilization has been acquainted with both European and North American vultures, but they disappeared with time, and smaller black vultures replaced them as the predecessors of new world vultures. One of the earliest known forms of the Old World Vulture is the extinct species *Neogyps*.

*[What is special about falconiformes? They have curved beak that helps them to abrupt prey fleshes,they have sharp claws which help them to gripping ,piercing and hunting the prey. Dynamic wings help them to fly in high altitudes. They have strong eye sight.]

- **Table 1: Vulture species**

		
<p>Long-billed vulture (<i>Gyps indicus</i>) Source: https://www.snmcpn.org/birds-conservation/vultures/long-billed-vulture.</p>	<p>Himalayan Griffon vulture (<i>Gyps himalayensis</i>) Source: https://ebird.org/species/himgri1?siteLanguage=en_IN.</p>	<p>Egyptian vulture (<i>Neophron percnopterus</i>) Source: https://www.isafiri.com/attraction-profiles/Kenya%20Wildlife%20Services/conservancy/egyptian-vulture.</p>

		
<p>White-backed vulture (<i>Gyps bengalensis</i>) Source: https://birdsoftheworld.org/bow/species/whbvul1/cur/introduction.</p>	<p>Bearded vulture (<i>Gypaetus barbatus</i>) Source: https://4vultures.org/blog/farewell-to-an-extraordinary-bearded-vulture-hanneke-the-captive-bred-legend/</p>	<p>Eurasian Griffon vulture (<i>Gyps fulvus</i>) Source: https://vajiramandravi.com/upsc-daily-current-affairs/prelims-pointers/eurasian-griffon-vulture/</p>

Table 1 figure: Vulture species found in India

3. Behavioral pattern of vulture :

Vulture shows different behavioral patterns. Egyptian vultures show a strange behavioral pattern; they feed on their intrinsic excrement. They love to soak up the midday sun. Sometimes they do nothing while standing motionless at the feeding spot. Many vulture species are grazing the ground to find food. They always observe their surroundings as if there were any danger or unavoidable circumstances. They bring food in its beak for young one [19]. They play a rolling game in dust to get rid of ectoparasites. [5, 7]. A study showed that inhabitants and migratory vultures Shown mutability in the space exercise. Over the course of a day and month, the Indian vulture travels more than any individual of other resident vultures. In comparison to Indian vultures, whiterumped vultures travel less distance per day [29].

3.1 Feeding behaviour of vulture :

Vultures feed on the remains of deceased creatures. It plays a significant role in cleaning the surroundings. Their stomach acid is very strong, which helps them digest transited dead bodies, so we can say they have a strong digestive system. The strong acid content can help digest corpses in 24 hours. Vultures have poor bill strength, so their food must be partially decomposed [1]. Vulture ingestion includes dead mammals, different avian species, reptiles, etc. Diet explicitness is related to their reproduction [7]. Except for dead organisms, they also feed on through out food and fecal matter; unusually, they sometimes feed on alive organisms [12].

3.2 Nesting behaviour of Vulture:

Making a nest for infants is a very natural process to protect infants and provide shelter. Indian white-backed vulture species generally nest on different trees, and the area is dense with trees, likely banyan, peepal, mango, Indian rose wood, etc. [7]. Egyptian vultures use different materials to make their nests, like human waste, cow manure, different fabrics, cotton, etc. Strong and intense materials are most impactful for nest building. Making a nest is a very time-consuming and difficult process, so they can use it more than twice [24].

3.3 Breeding behaviour of Vulture:

Breeding is very important component for any animals reproductive success. Among the behaviour associated with breeding Vulture encircle aerial display, choice of nesting ground, meal arrangement for the checks etc [27]. In case of mate selection they prefer having only one mate at a time (monogamous). Building a nest is the first priority of the breeding process. Vultures can construct there nests atop trees, cliffs, and historical structures. The griffons natural habitats are arid, sparsely forested environments, specifically high hills and plateaus. A peculiar aerial display of the genus gyps consists of birds flying in tandem one over another; these formations are known as “tandems[1]. While some vultures, like the Egyptian vulture, may lay two eggs per year, other species of vultures generally lay one egg per year. So for the survival of the species, its reproductive capabilities are very important. From mid-November to March, eggs are deposited. Both sexes take part in the 45–52-day incubation period, which is the typical duration. After hatching, they show a poikilothermic nature; it takes time to activate their thermoregulating nature [2]. As soon as the nestlings are five weeks old, they are fed on predigested food. Afterward, they bring up swallowed food that has been stored in the crop and take it as food. A griffons chick requires 598.7 g on average per day from hatching to fledgling. The griffon baby’s daily food

intake crests at 12 weeks of After giving birth, juveniles spend three to five months in the nest. After that, the youngster ponders the other eight to ten weeks as nonflying birds. They spend hours in one spot while constantly moving close to the egg. It takes them another few months to learn to fly and navigate food materials. Reproduction is directly related to food availability [3]. It takes seven to eight months to complete a breeding cycle. Some vultures, like cinerious vultures, will give up their nests if they get a slight disturbance. Young adults get quality parental care from their parents. Vultures become adults at the age of five. In it's natural habitats, vultures live 40–50 years [13].

4. Ecology:

4.1 Morphology based on feeding habit:

The vulture's body is well built in accordance with its eating preferences. They have bare heads, scruff, and lack Because of this versatile character, vultures may entirely insert their heads into a decaying body without running the risk of exposing their bodies to deadly microorganisms, so the microorganisms can't colonize the body of the vulture [12]. The beaks are big and curved, which helps to preserve dead bodies. They have strong lower jaw muscle, which helps to cut off Several vulture species have tangible tongues that support the extraction of bone marrow and soft decaying meat [8]. The vulture's digits are infirm, and they have a slightly oblique talon. Compared to hawks, vultures legs are more like the legs of turkeys. They generally don't feed on alive organisms; they prefer dead, decaying organisms. They use their feet to tear the flesh [9]. They have a sloping metabolic ratio. They can survive without sustenance for a long time. They can reserve a massive amount of meat. A flock of Himalayan Griffons can consume departed yak within an hour [10]. They can shatter any kind of microorganism found in their food as they possess strong digestive enzymes. The stomach acid breaks down the food particles before any microorganisms can transit into the body (stomach acid pH 1–2) [11]. This stomach acid can safeguard them from predators; when predators come in close proximity, they spew stomach acid. They possess a large wing, which helps them to fly high; they can fly in high-altitude areas with good efficiency; they can inhibit the loss of ATP during flying as they can detect air current [20]. They show a thermoregulating mechanism where they discharge urine on their food to keep them soothing. Vultures are tacit birds. Vultures have very weak vision; that's why they can't locate food easily in dense areas. They consume 400-500 g of dead materials each day [13, 37].

5. Unique features of vulture:

- They feed on decaying bodies [24].
- They have big sack in neck region [26].
- Their beak is anomalously rigid [8].
- Vultures can survive a long period of time without meal [8].
- Some Vultures feed on their own excretory materials [12].
- They have long spanned wings [29].

6. Convergent evolution in vulture:

It has been revealed that the Old World Vultures originated from either a single ancestry or more than one ancestry [33]. It is thought that the subfamily Gypaetinae includes Egyptian, bearded, and palm-nut vultures. The other Old World vultures are adjunct to the subfamily Aegyptiinae, together with the 7 species of downy-headed Griffons in the genus *Gyps* and the other giant vultures that pair with the little Hooded Vultures. Some scholars stated that *Trigonoceps occipitalis* is truly a bird that resides between vultures and eagles and that *Gypaetus barbatus* and *Gypohierax angolensis* are not true vultures [34]. Most scientists consider new-world vultures to be monophyletic. Thoughts and empirical discoveries, however, have different opinions about their extent of resemblance to storks or other raptors. Most DNA-based findings have discovered a strong connection to storks [28].

7. Threats on Indian Vulture species:

Vultures are scavenger species; they prefer to consume dead and rotting bodies. Their lengthy, unsheathed neck and scarcity of feathers allow them to delve deeply into the decaying flesh. Yet the scavenging exercise is under great threat. To prevent the spreading of different diseases causing bacteria and viruses, it is preferred to settle dead decaying bodies and dump them into the soil. As a result, there is less food compatibility, endangering the vulture population. Deforestation is a major cause of their habitat loss and scarcity [4]. Whereas vultures consume decayed animal carcasses that were administered diclofenac just before death, they are exposed to a strong poisonous material that causes kidney failure and several forms of visceral gout [5]. Retaliatory poisoning of vultures happens when a livestock owner poisons the dead body of a domestic animal to prevent a rogue predator. Insecticides and pesticides that accumulate in soil and are washed out into the water can poison vulture species and cause a drastic change in the

vulture population [6]. In the early 1990s, vultures were very common to see in India. Accounted data shows there were 30 to 50 million vultures in India [13]. The population of vultures dropped to 19000 by 2017. In 2024, the mature vulture population declined from 5000 to 15000 in Silvan [14].

● **Table2: Vulture species in India [24]**

Serial No	Vulture species	IUCN status	Resident/Migratory
1	White rumped vulture	Critically endangered	Inhabitant
2	Long-billed vulture	Critically endangered	Inhabitant
3	Slender-billed vulture	Critically endangered	Inhabitant
4	Red-headed vulture	Critically endangered	Resident
5	Cinereous vulture	Endangered	Migratory
6	Himalayan vulture	Near threatened	Inhabitant,Regional Migratory
7	Bearded vulture	Near threatened	Inhabitant
8	Eurasian griffon	Least concern	Migratory
9	Egyptian vulture	Near threatened	Inhabitant

8.Management and recommendation of elevated conservational action :

Different governmental and private organizations are working hard to prevent the loss of the vulture population. In today's scenario, the vulture population is diminishing day by day. Taking appropriate steps towards vulture conservation is very important. The Bombay Natural History Society (B.N.H.S.), gathered different facts to behold the growing mortality rate of vultures. In

2000, different observational strategies were used to examine the population of vultures. B.N.H.S. calls on different bird experts and other nature-related organizations to quantify the reason behind the decline of *Gyps bengalensis* and *Gyps indicus* in India since 1990–1993 [16]. The Indian government took strict action against the use of diclofenac in 2006 [18].

8.1 Step towards conservational action :

We can take different initiative to Stop the extinction of Vultures near future.

1. Preventing death rates:

Using mesh above and below the bird house can detain the damage of egg. Noticing the baby bird that have fallen from the nest and take them to the specialized hospital for animals and release them when they are well can decrease the death rate of infant Vultures. Several things effect baby vultures like predation, variation in weather, lack of nutrition, being attacked by dogs and cats which causes several wound in the body. So we have to take several measurements to avoid this [23].

2. Regulation of observation:

Observation of feeding and resting sides on a regular basis is required. Preservation of all known rest sites is essential for the search for protection. If the natural food source is unavailable, then carcasses should be artificially fed for the survival of the species [23].

3. Establishment of vulture feeding center:

Few test feeding stations for vultures may be set up in case of the obvious lack of meals. Villagers and butchers can be encouraged to donate the carcasses of their livestock to the feeding center. A sufficient food supply will help increase the vulture population [13].

4. Protection of lake ponds and different water sources:

water bodies are essential for Vulture to bathe after feeding on dead bodies. Feeding region in several territories are utilized for farming , construction , mining etc. So we have to create awareness and take legal action against unlawful practices[13].

5. Preventing human inconvenience :

Enacting applicable legislation is essential to stop human disturbances in vulnerable vulture [20].

6. Ban of diclofenac:

To safeguard vultures, the Indian government outlawed the use of the common anti-inflammatory medication diclofenac in veterinary care in 2006 [5].

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