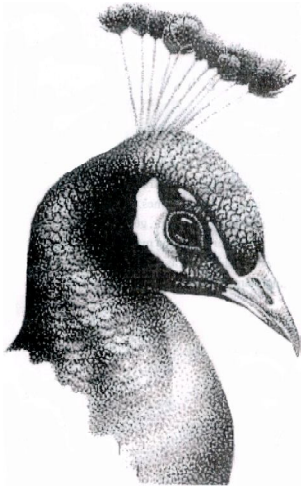
Mor

Newsletter of World Pheasant Association - India



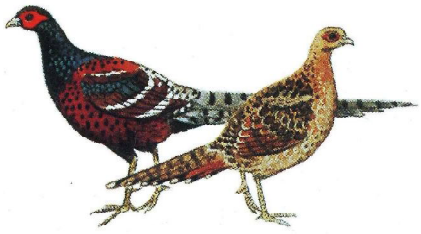
Indian Peafowl
Pavo cristatus
National Bird
&
Odisha State Bird

Himalayan Monal
Lophophorus impejanus
Uttarakhand State Bird

Western Tragopan
Tragopan melanocephalus
Himachal Pradesh State Bird

Blood Pheasant
Ithaginis cruentus
Sikkim State Bird

Blyth's Tragopan
Tragopan blythii
Nagaland State Bird



Hume's Pheasant
Syrmaticus humiae
Manipur and Mizoram
State Bird

Pheasants as National & State Birds

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Editorial

Dear Readers,

Let's start with a positive note. Coronavirus lockdowns globally have given parts of the natural world a rare opportunity to experience life with hardly any humans around. Animals in urban areas have explored emptied streets, and delighted human inhabitants.While many of these are not unique sightings, the human restrictions due to the coronavirus pandemic seem to have given animals the confidence to go deeper into our cities and stay for longer.Others such as pheasants have enjoyed intheir natural habitat, and some officials report a boom in wildlife while tourists are away from reserved parks and sanctuaries.

The other side of the coin is that incidents of wildlife poaching in India have more than doubled during the COVID-19 lockdown according to the reports. Reports of poaching incidences for consumption and local trade have become more than doubled during lockdown although there was no evidence of stockpiling of wildlife products for future trade. In this issue we have one article on illegal trade of Galliformes in India before emergence of COVID-19.

In this issue of MOR we have shared an article on genomic study of Red Junglefowl which concludes that people in northern Southeast Asia or southern China domesticated a colourful pheasant sometime after about 7500 B.C.E. Afterwards migrants and traders carried the bird across Asia and on to every continent except Antarctica. Another genetic study from India on Red Junglefowl provided evidence that landscape features do not act as a barrier to gene flow and the distribution pattern could not be explored due to physical sharing or exchange of wild birds in the past when forests were continuous across Junglefowl range in India.

Now we want to hear from you, send us a letter or an email. Let us know how we are doing and tell us what you would like to see. Do take care of yourself and your loved ones.

Dr. M. Shah Hussain, Hon. General Secretary

Galliformes in illegal wildlife trade in India: A bird's eye view

Galliformes, commonly referred to as Gamebirds", are ground feeding, heavy bodied birds that have had the closest relationship with humans of any bird species. For example, the domestic chicken originating from Red Junglefowl *Gallus gallus* found in India has been long in demand for its meat and other products. Similarly, all over the world, Galliformes like turkeys *Meleagris sp*., Helmeted Guineafowl *Numida meleagris*, pheasants Phasianidae and quails *Coturnix sp*. are unrivaled among other birds for their use by humans. The birds and their eggs are a protein rich meal for which the birds are domesticated or wild birds snared, shot or otherwise caught. Some species, such as pheasants, are also popular ornamental birds due to their spectacular colours. The order Galliformes is represented by 85 genera and 290 species (Madge et al 2002) and are found worldwide. In India, there are only two families namely Megapodiidae represented by only one species endemic to the islands of Nicobar, the Nicobar Megapode *Megapodius nicobariensis*, and Phasianidae represented by 22 genera and 46 species, of which seven are endemic while the global status of 12 species is threatened. They include the **"Critically Endangered"** Himalayan Quail *Ophrysia superciliosa*. This family is represented by partridges, francolin, quails and snowcocks accounting for 27 species and pheasants accounting for 18 species (Madge et al., 2002).

Distribution: In India, Galliformes occur from coastal areas to high altitudes, including mangrove forests in West Bengal and Odisha to the alpine forests of the Himalayas. Some are highly localised to a particular habitat, such as the Manipur Bush Quail *Perdicula manipurensis* while a few species have the margins of their geographical distribution in India, such as the Tibetan Eared-pheasant *Crossoptilon harmani*, White Eared-pheasant *C. crossoptilon*, Sclater's Monal *Lophophorus sclateri*, Green Peafowl *Pavo muticus*, Buff-throated Partridge *Tetraophasis szechenyii* and Chinese Francolin *Francolinus pintadeanus* (Ali and Ripley 1983, Rasmussen and Anderton 2005).

Legal Status: All Galliformes species in India are listed under the Wildlife (Protection) Act, 1972, including 18 pheasant species listed in Schedule I of the Act, one species Grey Junglefowl *Gallus sonneratii* listed in Schedule II and all the remaining species listed in Schedule IV. The Act provides protection against hunting, trade and other forms of exploitation including destruction of nest sites.

In the case of bird species listed in various schedules of the Wildlife Protection Act, 1972., trade of live birds, meat, eggs and even destroying their habitat is punishable with a maximum punishment of 3–7 years rigorous imprisonment.

Threats: India has a rich diversity of francolins, partridges, pheasants and quails found throughout the country. However, habitat degradation and loss, combined with poaching for illegal wildlife trade, has pushed 11 species into a threatened category of the IUCN Red list. India was one of the largest exporters of wild birds in the world from 1970–1980, with nearly 14.8 million birds exported prior to an export ban, including nine species of Galliformes (Inskipp 1983). Land-use changes for large infrastructure

S.No	Common Name	Scientific Name	WPA, 1972	CITES	IUCN
1	Blood Pheasant	*Ithaginis cruentus*	I	II	Least Concern
2	Blyth's Tragopan	*Trogopan blythii*	I	I	Vulnerable
3	Cheer Pheasant	*Catreus wallichii*	I	I	Vulnerable
4	Grey Peacock-Pheasant	*Polyplectron bicalcaratum*	I	II	Least Concern
5	Himalayan Monal	*Lophophorus impejanus*	I	I	Least Concern
6	Himalayan Quail	*Ophrysia superciliosa*	I		Critically Endangered
7	Indian Peafowl	*Pavo cristatus*	I	III	Least Concern
8	Kalij Pheasant	*Lophura leucomelanos*	I	III	Least Concern
9	Mountain Bamboo Partridge	*Bambusicola fytchii*	I		Least Concern
10	Mrs Hume's Pheasant	*Syrmaticus humiae*	I	I	Near Threatened
11	Nicobar Megapode	*Megapodius nicobariensis*	I		Vulnerable
12	Satyr Tragopan	*Trogopan satyra*	I	III	Near Threatened
13	Sclater's Monal	*Lophophorus sclateri*	I	I	Vulnerable
14	Temminck'sTragopan	*Trogopan temminckii*	I	I	Least Concern
15	Tibetan Eared-pheasant	*Crossoptilon harmani*	I		Near Threatened
16	Tibetan Snowcock	*Tetraogallus tibetanus*	I	I	Least Concern
17	Western Tragopan	*Tragopan melanocephalus*	I	I	Vulnerable
18	White Eared-pheasant	*Crossoptiloncrossoptilon*	I	I	Near Threatened
19	Grey Junglefowl	*Gallus sonneratii*	II	II	Least Concern
20	Black Francolin	*Francolinus francolinus*	IV		Vulnerable
21	Blue-breasted Quail	*Synoicus chinensis*	IV		Least Concern
22	Buff- throated Partridge	*Tetraophasis szechenyii*	IV		Least Concern
23	Chestnut- breasted Partridge	*Arborophila mandellii*	IV		Vulnerable
24	Chinese Francolin	*Francolinus pintadeanus*	IV		Least Concern
25	Chukar	*Alectoris chukar*	IV		Least Concern
26	Common Quail	*Coturnix coturnix*	IV		Least Concern
27	Green Peafowl	*Pavo muticus*	IV	II	Endangered
28	Grey Francolin	*Francolinus pondicerianus*	IV		Least Concern
29	Hill Partridge	*Arborophila torqueola*	IV		Least Concern
30	Himalayan Snowcock	*Tetraogallus himalayensis*	IV		Least Concern
31	Japanese Quail	*Coturnix japonica*	IV		Near Threatened
32	Jungle Bush Quail	*Perdicula asiatica*	IV		Least Concern
33	Koklas Pheasant	*Pucrasia macrolopha*	IV		Least Concern
34	Manipur Bush-quail	*Perdicula manipurensis*	IV		Endangered
35	Painted Bush Quail	*Perdicula erythrorhyncha*	IV		Least Concern
36	Painted Francolin	*Franco linuspictus*	IV		Least Concern
37	Painted Spurfowl	*Galloperdix lunulata*	IV		Least Concern
38	Rain Quail	*Coturnix coromandelica*	IV		Least Concern
39	Red Junglefowl	*Gallus gallus*	IV		Least Concern
40	Red Spurfowl	*Galloperdix spadicea*	IV		Least Concern
41	Rock Bush Quail	*Perdicula argoondah*	IV		Least Concern
42	Rufous- throated Partridge	*Arborophila rufogularis*	IV		Least Concern
43	Snow Partridge	*Lerwa lerwa*	IV		Least Concern

projects and agriculture, including shifting cultivation or jhum cultivation in forested areas, are some of the major drivers affecting habitats for Galliformes species. Accompanied by these changes are forest management practices (Datta 2000, Fernandes 2015), anthropogenic pressures on habitat such as livestock grazing and fuel and fodder collection, which are known negatively to affect Galliforme populations (Khaling et al., 1998; Bhattacharya et al., 2009; Kidwai 2013).

Every year a large number of Galliformes enter illegal trade in India. For many years they have been trapped for food, the pet trade, sport (cock-fights), their feathers, taxidermic reasons, medicinal purposes and for aviculture across the country. Sometimes the eggs of smaller quails and francolins are collected from the wild, either for consumption or to raise chicks that are then hatched under domestic hens/domestic pigeons (Ahmed 2004). It is a common practice among many tribes of central and northeast India to trap wild male junglefowls to enhance the vigor of the local domestic breeds (Pers. Obs.).

Decoy call birds (birds trained to lure other birds into a snare by repeated calling), drive nets, a variety of nooses and bamboo-traps are all used for capturing Galliformes for the organised bird trade. Furthermore, many local people in hill states capture, hunt and snare Galliformes for their local consumption and for sale in village markets (Aiyadurai 2011; Bhupatiet et al., 2013; Chutia and Solanki 2013; Longchar et al., 2013; Velho and Laurance 2013).

The effects of direct exploitation of Galliformes are high and common across India although few authors have detailed its intensity (Hilaluddin et al., 2005; Aiyadurai 2011; Gubbi and Linke 2012). Field surveys and secondary information suggest that hunting and snaring of Galliformes are common practices across India (Kaul et al., 2004; Velho et al., 2012).

Galliformes in zoos and other captive breeding facilities also face issues. One of the areas of concern has been the non-maintenance of stud-books for Galliformes despite them being used for captive breeding purposes and the keeping of hybrid junglefowls in enclosures used in breeding programmes (Mukesh et al., 2013). Aside from native Galliformes, a number of exotic (non-native) pheasants, such as Golden Pheasant *Chrysolophus pictus*, Lady Amherst's Pheasant *C. amherstiae* and Silver Pheasant *Lophura nycthemera*, are bred in captivity and traded for aviculture collections in India. This reflects traders becoming more aware about the legal implications of engaging in trade and displaying protected India bird species. Other farm bred non-native galliformes such as Helmeted Guineafowls and turkeys are also traded as poultry by bird and meat sellers in several Indian bird markets.

Despite 18 Galliformes species being given the highest status of protection (Schedule I) in India, there have been few seizures of quails, partridges and francolins, while most Indian Peafowl seizures and cases are related to the feather trade. This has been an area of contention due to a provision within the Act whereby domestic trade is permitted for naturally shed tail feathers of this species. It is widely believed that many wild birds are killed for extraction of their tail feathers taking advantage of this clause. The protection level of Grey Junglefowl was raised due to excessive trade in their hackle

feathers. Previously, trapping for meat was considered sustainable for self consumption and as a means to meet protein requirements, while there was no commercial trade of the species. In the recent past there has been a gradual shift whereby illegally captured birds are being sold in a clandestine manner in local markets and villages.

Little emphasis has been given to illegal trade in Galliformes, with few offenders apprehended and prosecuted: most attention has been given to more charismatic species.

In light of this, there a strong need to understand and highlight the extent of illegal trade in Galliformes species in India. Enforcement agencies and the judiciary need to be sensitised about this issue while parallel efforts need to be made with local communities especially in the hilly areas where poaching is considered widespread.

Source: TRAFFIC Newsletter, Issue No. 29, May 2018.

Kivikhu village donates Blyth's Tragopan to Forest Department

DIMAPUR, MAY 31 (MExN): Kivikhu village under Zunheboto district donated a rescued juvenile male Blyth's Tragopan *(Tragopan blythii)* to the Forest Department on May 29.

A press release from the Wildlife Warden, Tokaho H Kinimi, IFS, informed that Kivikhu village with its Community Conserved Area (CCA) which is also part of Tizu Valley Biodiversity and Livelihood Network (TVBLN) have been staunch activists of conservation for many years.

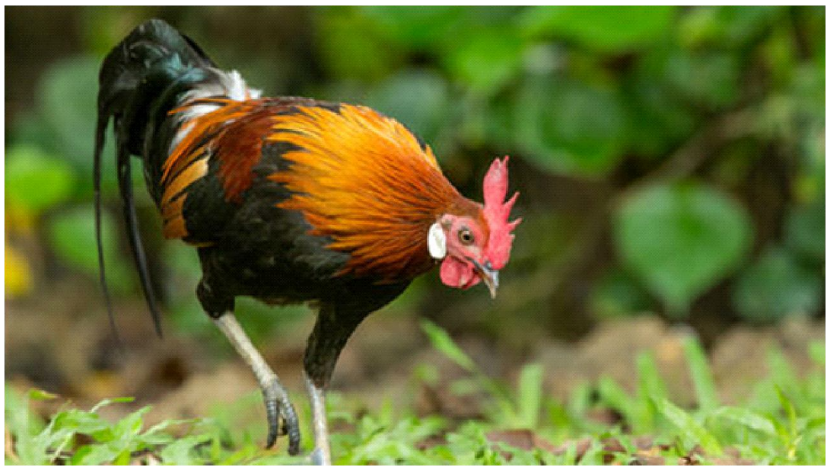
The department further recalled the tragic story of Late ToikaZhimo, a volunteer who was shot and killed by poachers on February 14, 2020 during forest patrol as per village council directive.

In the light of all events, the Wildlife Warden, Dimapur, Tokaho H Kinimi, IFS on behalf of the department of Environment, Forests and Climate Change, Nagaland expressed gratitude to the people of Kivikhu village for the donation and for remaining unnerved and upholding their resolve towards conservation and protection of the environment.

The rescued bird is now safely relocated to the Tragopan Conservation and Breeding Centre, Kohima where it can further strengthen the efforts of conservation breeding of the species.

Source: The Morung Express, May 31, 2020.

The chicken first crossed the road in Southeast Asia, 'landmark' gene study finds



The red jungle fowl's exotic plumage—and fierce fights among cocks—may have helped make the bird attractive to the early farmers who domesticated it.

It is the world's most common farm animal as well as humanity's largest single source of animal protein. Some 24 billion strong, it outnumbers all other birds by an order of magnitude. Yet for 2 centuries, biologists have struggled to explain how the chicken became the chicken.

Now, the first extensive study of the bird's full genome concludes that people in northern Southeast Asia or southern China domesticated a colorful pheasant sometime after about 7500 B.C.E. Migrants and traders then carried the bird across Asia and on to every continent except Antarctica.

"Our results contradict previous claims that chickens were domesticated in northern China and the Indus Valley," researchers led by Ming-Shan Wang from the Chinese Academy of Sciences's Kunming Institute of Zoology write in a paper published today in Cell Research. They also found that the modern chicken's chief ancestor is a subspecies of red jungle fowl named *Gallus gallus spadiceus.*

"This is obviously a landmark study," says Dorian Fuller, an archaeologist at University College London who was not involved in the effort. He adds that the results could shed light on the emergence of agriculture and early trade networks, and what features of the bird made it so attractive to people.

Charles Darwin argued the chicken descended from the red jungle fowl because the birds resemble each other and can make fertile offspring; he speculated that domestication happened in India. But five varieties of the pheasant inhabit a broad arc extending from the jungles of Indonesia to the Himalayan foothills of Pakistan. Which variety led to the chicken, and where, was uncertain. Based on presumed chicken bones, archaeologists claimed, variously, that people domesticated the bird 9000 years ago in northern China and 4000 years ago in Pakistan.

DNA studies promised to resolve the issue, but researchers had few samples from the bird's wild relatives. So Jianlin Han, a geneticist at the Joint Laboratory on Livestock and Forage Genetic Resources,

embarked on a 20-year project to sample indigenous village chickens and wild jungle fowl near more than 120 villages across Asia and Africa.

Wang's team sequenced the full genomes of 863 birds and compared them. The results suggest modern chickens descend primarily from domesticated and wild varieties in what is now Myanmar, Laos, Thailand, and southern China. "This region is a center of domestication," says co-author and geneticist Olivier Hanotte of the University of Nottingham. The results confirm a hypothesis put forward in 1994 by Japan's Crown Prince Akishino, an ornithologist, on the basis of mitochondrial DNA data. Wang's team did find some evidence for a South Asian contribution: A jungle fowl native to the Indian subcontinent may have interbred with the chicken after its initial domestication in Southeast Asia, the team says.

The new DNA data link domesticated chickens most closely to the Southeast Asian subspecies *G. g. spadiceus*, however. They suggest the lineage that became the modern chicken branched off from the jungle fowl between 12,800 and 6200 years ago, with domestication occurring sometime after the lineages split. Fuller doubts the bird was fully domesticated before the arrival of rice and millet farming in northern Southeast Asia about 4500 years ago. Hanotte acknowledges that "we need the help of archaeologists" to understand the human events that triggered domestication.

But Jonathan Kenoyer, an archaeologist and Indus expert at the University of Wisconsin, Madison, remains skeptical that the chicken arose in Southeast Asia. "They need to get ancient DNA" to back up their claims, he says, because genomes of modern birds may provide limited clues to early events in chicken evolution.

Nor does the DNA show what first enticed people to tame the bird. Early varieties were far scrawnier and produced fewer eggs than today's industrial varieties, and their predators were legion. Some researchers suggest the bird was initially prized for its exotic plumage or for cockfighting. Selling prize fighting cocks remains a lucrative business in Southeast Asia, and the birds' high value may have spurred traders to carry them long distances.

Smithsonian Institution archaeozoologist Melinda Zeder calls the new paper "fascinating" and says it shows "the domestication and dispersal story is more complicated than we thought." She urges combining genetic and archaeological data to flesh out the tale. Archaeologists are now gathering chicken bones that suggest farmers in southern China and Southeast Asia first domesticated the bird some 3500 years ago—findings that bolster the genetic work.

Han's group, meanwhile, is creating a massive data set based on more than 1500 modern chicken genomes from Asia, Europe, and Africa. The researchers plan to analyze chicken dispersal into Europe and Africa, as well as the genetic variations behind traits such as the ability to withstand disease or produce more eggs. "This study opens a whole new page in chicken genomics," Han says.

Source: By Andrew LawlerJun. 24, 2020 , 9:00 PM, American Association for the Advancement of Science.

Understanding the cryptic introgression and mixed ancestry of Red Junglefowl in India

Abstract: Red Junglefowls (RJFs), the wild progenitor of modern day chickens (DCs), are believed to be in genetic endangerment due to introgression of domestic genes through opportunistic matings with domestic or feral chickens. Previous studies from India reported rare hybridization of RJFs in the wild. However, RJF population genetic structure, pattern of gene flow and their admixture with DC populations are poorly understood at the landscape level. We conducted this study with a large sample size, covering the predicted natural distribution range of RJFs in India. We documented strong evidence of directional gene flow from DCs to free-ranging wild RJFs, with the Northeastern RJF population exhibiting the most genetic variants in their nuclear and mitochondrial genomes, indicating it to be the ancestral population from which early radiation may have occurred. The results provide evidence that landscape features do not act as a barrier to gene flow and the distribution pattern could not be explored due to physical sharing or exchange of wild birds in the past when forests were continuous across RJF range in India.

Introduction: The polyphyletic origins of Domestic Chickens (DCs, *Gallus gallus domesticus*) is a reason to speculate that gene flow between RJFs *(Gallus gallus murghi)* and DCs is widespread and more frequent than supposed by previous studies while domestication may have occurred at multiple locations in South and South-East Asia. However, cryptic introgression from domestic or feral DCs to RJFs or viceversa and the transport of DCs amongst different regions obscure the history of these two species. Several studies have suggested physical mixing and gene flow between RJF in the wild and DC populations. Interestingly, Gering et al. reported feralisation of Kauai chicken through invasive genetics and further raised the issue of 'domestication in reverse'. In general, hybridization in the absence of reproductive isolation is an inevitable phenomenon and cannot be avoided in cases where domestic and wild congenerics are sympatric. The situation gets complex when hybrid offsprings are reproductively viable and participate subsequent mating across the species. Allendorf et al. stated that 5% or less proportion of hybridization in RJFs is an effect of admixture or natural selection whereas another study, based largely on birds reared in captivity and released into the wild, reported rare hybridization between RJFs and DCs in the wild in India. Berthouly et al. postulated that their observation of low genetic exchange might be due to sampling bias and reported a fair gene flow from RJF to local Vietnamese chicken populations.

RJFs in India are widely distributed across 51 x 105 km^2 in 21 States. Further, based on our field observations and monitoring on RJFs in the wild, we often encountered RJFs and DCs feeding in the same flocks in the vicinity of forest habitats. We believe that the threat of hybridization to RJFs with DCs has not been addressed appropriately at a landscape level. In addition, the extent of hybridization between wild RJFs and DCs is stressed to be of importance in the International Union for Conservation of Nature (IUCN) Action Plan for Pheasants (2000). However, IUCN listing of RJFs as "Least Concern",

the non-listing of RJFs on the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) [20], and the present inclusion of RJFs in the Wildlife (Protection) Act, 1972 of India has no provisions to assess the hybridization threat to this species despite a multi-billion dollar poultry industry has evolved through wild RJF. Recent poultry epidemics, such as the one in Hong Kong in 1998 and the 'bird flu' in India and other parts of S.E. Asia, could spell doom to the poultry industry and the only fallback option the poultry farmers would eventually be the 'wild' RJF [18].

Further, one of the primary premises in present-day conservation programs is to maximize the conservation of genetic diversity available for potential future use. If hybridization of RJFs with and DCs occurrs and continues, it would produce populations which may not be valued for future breeding and conservation purposes under the IUCN guidelines. Considering the importance of conservation concern to safeguard the wild ancestor of DCs, we undertook this study to answer two important questions:

1. Whether or not, the threat of hybridization and genetic exchange between RJF and DC in India is significant or rare as documented by earlier studies.
2. If such hybridization occurs or has occurred in India in the past, whether it is localized with specific distribution pattern and how does it affect the current population genetic structure of RJF?

Results: Among the 57 RJF and 79 DC samples collected, there was 68 (32 RJFs and 36 DCs) samples from North, 25 (9 RJFs and 16 DCs) from East, 5 (2 RJFs and 3 DCs) from Central, 5 (4 RJFs and 1 DC) from South East and 33 (10 RJFs and 23 DCs) from Northeast of India. Since, we can trap only a few wild RJFs in Central and Southeast zones; we pooled samples of these zones to create a Cent-Southeast population for further analysis. During analysis, two birds- RJ1 (Cent-Southeast) and RJ9 (Northeast) were excluded due to uncertainty in the GPS locations of their sample points.

We genotyped all samples three times or repeated the process until we generated consensus genotypes for all samples. However, four loci i.e. LEI0192, MCW0014, MCW0183 and MCW0284 exhibited a considerable amount of missing values for few a samples even after multiple repetition, so we removed them from further analysis. We manually checked allelic data, and found no indication of any genotyping error (Data available on the Dryad Digital Repository on https://doi.org/10.5061/dryad.rv38cp4).

Full article available on: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0204351#sec013.

by: Mukesh Thakur, Merwyn Fernandes, Sambandam Sathyakumar , Sujeet K. Singh, Ramesh Kumar Vijh, Jianlin Han, Dong-Dong Wu and Ya-Ping Zhang.

Published: October 11, 2018, https://doi.org/10.1371/journal.pone.0204351 (PLOS ONE).

Status and Distribution of Indian Peafowl *(Pavo cristatus)* in the South Coimbatore, Tamilnadu.

Abstract: The Indian Peafowls *(Pavo cristatus)* is Least Concern (LC) category on Red list and Schedule I species as per Wildlife Protection Act (1972) in India. Indian Peafowl (*Pavo cristatus)* population status and distribution was studied in South Coimbatore district especially in Polllachi area from August 2017 to January 2018. The study carried out in 13 villages in South Coimbatore including Nchavelampalayam, Chandrapuram, Kollupalayam, Chellampalayam, Marampudungigoundanur, Athanaripalayam, Kotturmalayandipattinam, Vallakundapuram, Vedasanthur, Kanchampalayam, Sangampalayam, Angalankuruchi, Paramadaiyur Village etc. From the present study, 405 direct sighting consists of 1283 Peafowls in 13 villages were recorded. Based on the Group wise of Peafowls showed that Mixed group(MIG) contain 50.37% followed by Male female group(MFG) stand for 40.74%, Female chick group(FCG) contains 4.19%, Female group(FG) with the percentage of 3.95%, and Male group(MG) which constitute of 0.74% were recorded. Based on Peafowls classification, Females Peafowls consist of 59.85% followed by 17.77% of Peacock, 13.09% Peafowls chicks, 9.27% sub adults Peafowls were observed. According to the Peafowls habitat, the study area categorized into mixed forest (MFL) habitat, Agricultural Land (AL) and Coconut farmland (CFL). Maximum of Peafowls observed in Coconut farmland (CFL) comprised of 44.33% followed by the mixed forest land (MFL) habitat consists of 36.20% and very low in Agricultural Land (AL) 19.45% of Peafowls were occupied. As a result of habitat thrashing, absence of predation and easy accessibility of food, climate change influence of Peafowls interested in countryside villages.

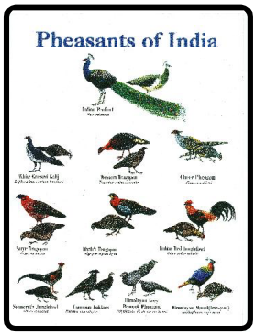
Full article on: https://www.journaljsrr.com/index.php/JSRR/article/view/30207/56678

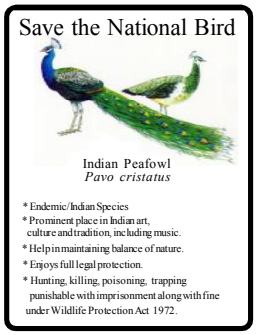
By: M. Yogeshwari and K. Varunprasath, Department of Zoology, PSG College of Arts and Science, Coimbatore, Tamil Nadu, India.

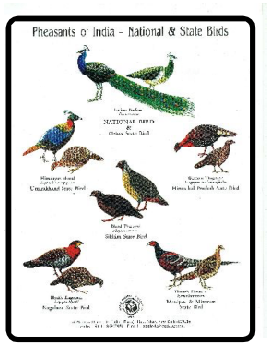
Resource Material - *available on request*

Posters

- Pheasants of India
- Pheasants of Arunachal Pradesh
- Pheasants of Himachal Pradesh
- Pheasants of Uttarakhand
- Pheasants of Assam
- Pheasants of J&K
- Pheasants of Sikkim
- Pheasants of Nagaland
- Pheasants of West Bengal
- National and State Birds
- Save the National Bird
- Himalayan Monal

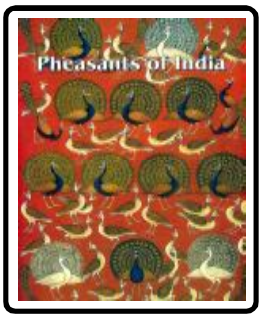


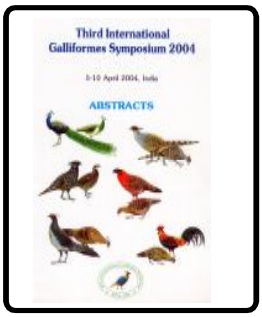


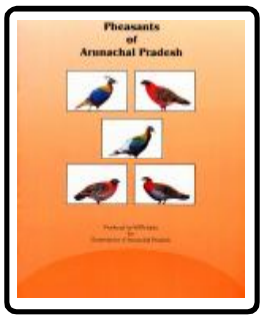


Booklets

- Pheasants of India
- Pheasants of Arunachal Pradesh
- Third International Galliformes
- Symposium Abstracts
- Pheasants of Himachal Pradesh







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