

PASSER DOMESTICUS- A DISAPPEARING SPECIES DUE TO INCREASING EFFECTS OF ELECTRO MAGNETIC RADIATIONS (EMRS).

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Received 28 June 2013; Revised 05 July 2013; Accepted 15 July 2013

ABSTRACT

House sparrows, '*Passer domesticus*'¹, do not live in jungles, deserts or places where humans are not present. The sparrow is a species that has evolved with humans and is always found in and around human habitations². The house sparrow is a confirmed hanger on to man ever since human habitation started depending on agriculture.

The population of house sparrow, the small bird that lives in nest colonies close to human habitats, is threatened by proliferation of mobile phone towers³. This avian species can still be spotted at over two-thirds of the world's land surface⁴. But reports are pouring in from all over India and around the world of rapid decline in the populations of these once abundant birds. Birds are known to be sensitive to magnetic radiation⁵. Microwaves can interfere with their sensors and misguide them while navigating and preying⁶. This report is about to analyze the current condition of sparrows and finding out the reasons behind their decline.

India is not the only place where the sparrows have disappeared from the cities. The sparrow, once the exemplar of a commonplace bird, is becoming increasingly rare in France and other European countries also⁷. There has been an even sharper fall in urban populations in Germany, the Czech Republic, Belgium, the Netherlands, Italy and Finland⁸.

The root cause of the disappearance of these birds is massive development work which leads to cutting of trees and mangroves, besides radiation that is troubling many other species also⁹. The increasing numbers of mobile service providers and so the increasing numbers of mobile towers has led this drastic situation of loosing sparrows and other birds¹⁰. The things that can help in saving endangered birds from electromagnetic radiation and providing them favorable environment must be recommended.

KEYWORDS: house sparrows, *Passer domesticus*, effects of Electro Magnetic Radiations, mobile towers, mobile service providers, endangering fate of disappearance.

INTRODUCTION:

Birds are the most speciose group of land vertebrates. Being a social bird, the sparrow thrived around human beings and where grain was abundant. Despite being derided as 'avian rat' in the late 19th century (for damaging cereal and other crops), the sparrow steadily 'colonized' a number of countries¹¹. The demise of vast numbers of this spunky bird is all the more shocking since it is a survivor; sparrows have been found breeding high up in the Himalaya and down below in Yorkshire coal mines.

The ancient Romans introduced the house sparrow to Europe from North Africa and Eurasia. Human exploration and migration then took the bird to many

other parts of the globe, including North and South America, South Africa, India, Australia and New Zealand¹².

House Sparrow (*Passer domesticus*) is a common bird that millenniums ago originated in the Mediterranean and came into Europe and Asia with the spread of agriculture. It was the most widely distributed species of the world¹³. Today it is suddenly disappearing in the urban environment. What this translates into is that the modern urbanization has reached a level where it can trigger the extinction of a species. In the past, when the cities were small and there were villages around, with agricultural land around them, these were vast lungs of open spaces that separated the urban and the rural, constantly replenished the air.

The wireless telecom revolution is catching on at the expense of a tiny winged creature the house sparrow. The tiny birds are fast disappearing from cities "contaminated" with electromagnetic waves arising out of increased number of mobile telephone handsets¹⁴.

India is one of the fastest growing mobile telephony industries in the world¹⁵. It is estimated that by 2013, 1 billion plus people will be having cell phone connection in India¹⁶. To support this growth of cell phone subscriber in the country, there has also been a tremendous growth of infrastructure in the form of mobile phone towers. Today, in absence of any policy on infrastructure development and location of cell phone towers, large numbers of mobile phone towers are being installed in a haphazard manner across urban and rural areas including other sparsely populated areas in India¹⁷.

As in Britain, where sparrow numbers are believed to have fallen by 90 per cent in the past 15 years, continental ornithologists can find no coherent explanation for the sudden decline¹⁸. The mystery is especially deep in Paris, which is believed to have lost 200,000 sparrows – maybe one in 10 of the population – in the past 17 years¹⁹. Rapid urbanization and increasing pollution is spelling doom for the small ubiquitous sparrow, which was earlier found in large numbers in the city²⁰.

The transmission towers are based on the electromagnetic waves, which over prolonged usage have adverse impacts on humans as well as on other fauna. The adverse effects of electromagnetic radiation from mobile phones and communication towers on health of human beings are well documented today²¹. However, exact correlation between radiation of communication towers and wildlife, are not yet very well established.

Electromagnetic waves travel through the air to the cell-phone masts located above tall buildings in the cities. These waves then travel between the handset and the tower while one is using the handset and this result in increased electromagnetic contamination in the air.

The rapidly increasing number of cell-phone subscribers is resulting in higher concentration levels of electromagnetic waves in the air, which clashes with the earth's electromagnetic field²².

Along with the growth of phone towers and subscribers, India is also witnessing a rapid population growth²³. To feed and support this rapidly growing population the agricultural security and the factors influencing them should be of concern. However, the population of many species such as honey bees, which is one of the most important pollinator and important factor for agricultural productivity, has seen a drastic population drop²⁴. Unfortunately we do not have much data about the effects of EMR (Electro Magnetic Radiation) available for

most of our free-living floral and faunal species in India. Therefore, there is an urgent need to do further research in this area before it would be too late.

EFFECTS OF RADIATION- A PRESENT SCENARIO:

A lot of research seems to be on though, to find out the reasons for the disappearing sparrow. One thing is clear – sparrows are susceptible to effects of microwave radiation and other pollutions²⁵. In fact all birds are affected by the virulent effects of radiation and industrial pollution. There have been studies using birds as a biomonitor to detect urban metal pollution. Humans may get diseases because of radiation, but birds seem to dying off. Cockroaches and rats proliferate though because they are not that severely affected by radiation (as birds).

The National Research Council of Canada did lots of studies on the non-thermal effects of microwave radiation on birds in the 1960s, before the wireless industry took control of the science. They found that bird feathers acted as dielectric receptors. Birds that had been plucked under anesthesia showed no reaction to radiation until the 12th day, when their feathers started to grow back²⁶.

Studies also showed altered EEG patterns, escape behavior, other signs of stress in the form of vocalization, defecation and initiation of flight. Parakeets chose an un-radiated feeder over a radiated one. Domestic fowl [Leghorns] increased egg production by 13.7% under radiation. Unfortunately, the mortality rate of the radiated colony was double that of the control colony. Their exposures ranged from 0.2uW/cm² to 360uW/cm². Young chicks exposed to 25mW/cm² collapsed on the floor of the cage and remained in that position until the radiation was turned off. Time to collapse ranged from 5 to 20 seconds²⁷.

Scientific peer reviewed and archived laboratory controlled studies done by the NRC of Canada demonstrate conclusively the harmful effects of electromagnetic Radiation²⁸, on living systems. These studies are available through the NRC archives or on their website at www.nrc.ca/cisti.

A sample of 20 people was taken across the Lucknow (India), and different kinds of questions were asked from them regarding their knowledge and thinking about this issue. For this a questionnaire was made and then marked the answers accordingly; (see table no. 01)

EFFECT ON 'HOUSE SPARROWS':

House Sparrow (*Passer domesticus*) is associated with human habitation and it is one of the indicator species of urban ecosystems²⁹. A declining population of the bird provides a warning that the urban ecosystem is experiencing some environmental changes unsuitable for living in the immediate future. Electromagnetic radiation

may be responsible, either by itself or in combination with other factors, for the observed decline of the sparrows in European cities.

Research in Spain proved that the microwaves released from these towers are harmful to House Sparrows and the increase in the concentration of microwaves results into decrease in House Sparrow. Reproductive and co-ordination problems and aggressive behavior has also been observed in birds such as sparrows³⁰. General methodology used for such study was, from each area, all sparrows were counted in addition to the mean electric field strength.

In similar studies in India, population of *Passer domesticus* was found fast disappearing from areas contaminated with electromagnetic waves arising out of increased number of cell phones, in Bhopal, Nagpur, Jabalpur, Ujjain, Gwalior, Chhindwara, Indore and Betul³¹. It was also observed that when 50 eggs of House Sparrow, exposed to electromagnetic radiation (EMR) for durations of five minutes to 30 minutes, all the 50 embryos were found damaged in a study carried out by the Centre for Environment and Vocational Studies of Punjab University³². Male sparrows were seen at locations with relatively high electric field strength values of GSM base stations, providing evidence of how long-term exposure to higher levels of radiation negatively affects the abundance or behavior of House Sparrows in the wild. Thus, electromagnetic signals are associated with the observed decline in the sparrow population in urban areas.

BRIEF RELEVANT EXTRACTS FROM THE VARIOUS RESEARCH STUDIES:

Today the reasons for the sparrows' decline are largely electromagnetic radiation from mobile phones and lack of insect food due to excessive use of pesticide in urban gardens³³. But most certainly, it is the loss of habitat that drives any species towards extinction.

As per a study the mobile phone towers emit a frequency of 900-1800 MHz, continuous penetration of EMR (electromagnetic radiation) through the body of birds would affect their nervous system and their navigational skills. They become incapable for navigation and foraging. The birds which nests near towers are found to leave the nest within one week³⁴.

A scientific research study led by Dr. J Bigu, 1973, titled; "Interaction of electromagnetic fields and living systems with special reference to birds", revealed that during the initial stabilizing period the egg production of each colony was the same, but following the onset of radiation the egg production of the radiated colony increased to a higher level at which it remained essentially constant³⁵.

In terms of the total number of eggs produced the difference amounts to an increase of 13.7% - an increase that could be of economic significance in raising poultry provided other and undesired, interaction effects do not appear. However the mortality rate of the radiated colony was almost double that of the control colony through each of phases A and B.

Extract from the research study led by Dr. J A Tanner, 1969, titled; "Effects of microwave radiation on Parakeets in Flight", concluded that microwave radiation has an aversive effect on birds in flight comparable to that previously observed in caged birds. This leads the way to a possible solution of the bird hazard problem in aviation³⁶.

One more research carried by Dr. J A Tanner, 1973, co-authored by Dr. Romer o-Sierra, Dept. of Anatomy, Queens' University, Kingston, Ont., titled; "Bird Feathers as Dialectic Receptors of Microwave Radiation.", revealed that depending on many factors the use of microwave radiation can be detrimental or beneficial to humans. One beneficial use of microwave radiation is to reduce the hazards of birds to aircraft. This forms part of an extensive program designed to shed some light on the complex nature of the interaction of microwave radiation with biological systems³⁷.

The studies were broadly classified based on the subject organisms into four categories- Birds, Bees, Other Animals (including wildlife) and humans. Based on the study's findings regarding the impact of EMFs on the subject, each category was further subdivided into three groups- Impact, No Impact or Neutral/ Inconclusive, as given in table 3 below. As noted below majority of the studies reported negative impacts by EMFs.

RECOMMENDATIONS FOR THE PREVENTION OF FATAL EFFECTS OF RADIATION³⁸:

The increasing numbers of mobile service providers and so the increasing numbers of mobile towers has led this drastic situation of losing sparrows and other birds. The things that can help in saving endangered birds from electromagnetic radiation and providing them favorable environment could be as follows:

- a) EMF should be recognized as a pollutant, regular auditing of EMF should be conducted in urban localities, educational, hospital, industrial residential, recreational premises and around the protected areas and ecologically sensitive areas.
- b) Bold signs and messages on the dangers of Cell phone tower and radiation which is emitted from it are displayed in and around the structures where the towers are erected. Use visual daytime markers in areas of high diurnal raptor or waterfowl movements.

- c)** To avoid bird hits, security lighting for on-ground facilities should be minimized and point downwards or be down-shielded.
- d)** Public consultation to be made mandatory before installation of cell phones towers in any area. The Forest Department should be consulted before installation of cell phone towers in and around PAs and zoos. The distance at which these towers should be installed should be studied case by case basis.
- Awareness drive with high level of visibility in all forms of media and regional languages should be undertaken by the Government to make people aware about various norms in regard to cell phone towers and dangers from EMR. Such notices should be placed in all wildlife protected areas and in zoos.
- e)** If new towers must be built, construct them to be above 80 ft and below 199 ft. tall to avoid the requirement for aviation safety lighting.
- f)** Government should make such norms that can control the increasing number of mobile network, providers in a particular region.
- g)** There should be only 3 to 4 network providers in a particular region. It will decrease the rate of increase of mobile towers and can be a limiting factor to their quantities.
- h)** Such technologies should be introduced that can facilitate network providers to operate their service jointly from a single tower. This will also reduce the number of towers in a particular area and so the radiation.
- i)** Buildings and apartments should be made environment friendly that can provide favorable environment to the birds for nesting and breeding.
- Government should introduce the laws and regulations for the prevention of radioactive effects on birds and wildlife to stabilize the ecological balance.

Table 1: Datasheet

Questions asked		No. of people	
		YES	NO
1.	Do you know the bird named sparrow?	20	0
2.	Do you see them in your colony?	2	18
3.	How long before did you see them?		
a)	0 to 6 months before	2	18
b)	6 to 12 months before	4	16
c)	12 to 24 months before	4	16
d)	24 to 36 months before	6	14
e)	Do not remember	4	16
4.	Do you know it is an endangered species?	8	12
5.	What would be the greatest reason among following behind this decline?		
a)	Insufficient food	0	20
b)	Harmful fertilizers	4	16
c)	Inappropriate environment for their breeding	4	16
d)	Mobile radiation	12	8
6.	Do you think that there should be limited numbers of mobile network providers?	12	8
7.	Do you think that there should be limited numbers of mobile towers?	14	6

Table 2: Number of research studies (collected from Open access Bibliographic databases) collected and collated based on the study subjects and results.

Species	Impact	No Impact	Neutral/ inconclusive	Total (n)
Birds	23	3	4	30
Bees	6	1	0	7
Human	459	109	174	742
Other animals (+wildlife)	85(+13)	16(+1)	10(+7)	111(+21)
Plants	7	0	1	8
Total	593	130	196	919



Figure 1: Proportion of study results in Birds, Bees and Wildlife.

CONCLUSION:

We hope that in near future, we can do something about conserving and saving our precious biodiversity, which we are losing at a very fast pace. Studies on impact of Cell phone tower radiation on Birds and wildlife are almost nonexistent from India. There is an urgent need for taking up well designed studies to look into this aspect. Available information from the country on the subject of EMF impacts is restricted to few reports from honey-bees. However, these studies are not representative of the real life situations or natural levels of EMF exposure. There is an urgent need to focus more scientific attention to this area before it would be too late.

ACKNOWLEDGEMENT:

We are thankful to Dr. P. U. Patel, and other co-staff of T. S. Patel College of Pharmacy College for their valuable suggestions. We also thank to Mr. Rasiklal, Chief librarian of T. S. Patel College of Pharmacy for providing us all the facilities for reviewing articles and accessing us internet facility to accomplish this work.

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