

## DIVERSITY & BIOLOGY OF HOUSE SPARROW: REVIEW

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### ABSTRACT-----

*The House Sparrow was introduced into Brooklyn, New York, in 1851. By 1900 it had spread to the Rocky Mountains. Two more introductions in the early 1870s, in San Francisco and Salt Lake City, aided the bird's spread throughout the West. House Sparrows are now common across all of North America except Alaska and far northern Canada. Mankind is a rapidly increasing, social species whose industrial abilities allow the colonization of virtual wilderness and the building of sprawling metropolises. Humans live virtually everywhere on earth and wherever they settle the humans significantly transform the natural habitat. Human populations in India are alarmingly increasing in urban and rural areas. In 1700, only 14 cities with populations of more than 200,000 people existed. By 1900, 42 cities of four continents had such populations, and by 2000, 171 cities of five continents had a population of greater than 2,00,000. In 1900, only 10% of humans lived in cities; by 2000 nearly 50% did and nearly 70% are expected to do so by 2050. Thus by 2050 nearly as many humans are expected to live in cities (6.5 billion) as occupy all of earth today (Ramachandra and Sudhira, 2011)*

Widespread and abundant in cities, neighbourhoods and farms. Avoids dense woods. Flocks cluster in dense bushes, bustling around and chattering to one another. Males have smart bibs, bright rufous napes, and stunningly patterned wings with brilliant buffs and browns. Underparts are pale pearly-gray. Females are plain brown with cute face and lighter eyebrow. Native to Eurasia; introduced to much of the rest of the world. The House Sparrow takes frequent dust baths. It throws soil and dust over its body feathers, just as if it were bathing with water. In doing so, a sparrow may make a small depression in the ground, and sometimes defends this spot against other sparrows.



The house sparrow is widespread across the world, inhabiting every continent, except Antarctica, China and Japan. It is native to Eurasia and North Africa, and was introduced to South Africa, North and South America, Australia, New Zealand, Middle East, India and Central Asia, where its population thrived under a variety of environmental and climatic conditions. Within India, it is found throughout the country, up to the Assam valley and lower parts of the Assam hills. Towards the eastern Himalayas, the species is replaced by the Eurasian tree sparrow. It is known to stay close to human habitations, and is therefore among the most commonly found bird species in urban cities. Flocks of sparrows are a common sighting near residential colonies, gardens, farms, agricultural fields, office buildings, and even highways with fast-moving traffic.

The House Sparrow prefers to nest in manmade structures such as eaves or walls of buildings, street lights, and nest boxes instead of in natural nest sites such as holes in trees. Due to its abundance, ease to raise and general lack of fear towards humans, the House Sparrow has proved to be an excellent model organism for

many avian biological studies. To date, there have been almost 5,000 scientific papers published with the House Sparrow as the study species. House Sparrows aggressively defend their nest holes. A scientist in 1889 reported cases of House Sparrows attacking 70 different bird species. House Sparrows sometimes evict other birds from nest holes, including Eastern Bluebirds, Purple Martins, and Tree Swallows. House Sparrows in flocks have a pecking order much the way chickens in a farmyard do. You can begin to decipher the standings by paying attention to the black throats of the males. Males with larger patches of black tend to be older and dominant over males with less black. By wearing this information on their feathers, sparrows can avoid some fights and thereby save energy. House Sparrows have been seen stealing food from American Robins and piercing flowers to drain them of nectar. The oldest recorded House Sparrow was a female, and at least 15 years, 9 months old when she was found in Texas in 2004, the same state where she had been banded.

### **DIVERSITY OF BIRDS**

Bhattacharya et al. (2011) affirmed that birds are the best monitors of an environmental change. Today no elbow room is practically left for the birds due to the spreading of urbanization and modern technology. Therefore, big question arises regarding the ecological balance. The population is generally concentrated in urban areas with the development of modern civilization. The ecosystem may or may not be stable. The distribution of species may change with the local scale processes. Hence, local birds will act as an indicator of the ecological status of that area. As far as bird diversity is concerned, India is a blessed country. It has more than 1200 bird species which is over 13% of the world bird species. But unfortunately, India is third among the countries having the largest number of rare and threatened species followed by Brazil and Indonesia. Habitat loss is the greatest threat to most of the Indian birds (Rahmani, 2008).

In India there are 35 bird protected areas in contrast to more than 500 protected areas in the past decades. In the last decades, fast disappearing of vultures across the country was reported. Today, many environmentalists and forest officials' fear that the pesticides responsible for their decline are not banned and we may altogether lose the species in about in one year. Food and Agricultural Organisation (FAO) predicted that 12% of Indian birds are facing extinction. The Bird Life International and International Union for Conservation of Nature and its Resources (IUCN) listed 12 species in India are critically endangered (the highest and immediate risk of extinction). These are in the dire need of conservation. It may not be possible to conduct a census for house sparrow, but there are growing indications that their numbers are declining (Anjan et al., 2010).

### **DIVERSITY OF HOUSE SPARROWS**

Birds are often common denizens of the ecosystem and have been considered as an indicator species of inhabited areas. Studies showed that depressed population of various bird species in most parts of the world today, especially in urban areas, is of particular concern as many cities are growing rapidly both in area and population. Among the various species of birds, the house sparrow *Passer domesticus* (Passeriformes: Ploceidae) is one of the familiar species that has followed man everywhere and is inseparable from human habitations. The non migratory sparrows are widely distributed in the Indian subcontinent and occur worldwide (Blair, 1999). House sparrow (*Passer domesticus*), although named "sparrow," this ubiquitous bird is actually a member of the weaver family, a large group of Old World birds. House sparrows have spread from Eurasia, and can now be found living with humankind around the globe. People introduced them in North America between 1850 and 1886 in an attempt to control insect pests, particularly the elm spanworm caterpillar. At first, the bird was called the "English sparrow," because most imports were brought from England. The house sparrow has a historical commensal relationship with man and has followed his colonisation of the majority of the earth. Through the introduction to islands and continents it would otherwise not have reached, it has become one of the most widely distributed land birds in the world. It is only absent from the areas such as China, Indochina, Japan and areas of Siberia and Australia to the east and tropical Africa and northern areas of South America to the west (Smith, 1988).

The house sparrow is native to all the Indian states. A non-migratory species, house sparrows are closely tied to human activity. The sparrow is usually absent from extensive woodlands and forests and from grasslands and deserts. House sparrows are typically present only in the vicinity of human habitations. In agricultural areas, an average of 60 percent of its food comes from livestock feed, 36 percent from weed seeds, and 4 percent from insects. In urban areas, bird feeders provide more food for house sparrows (Joshi, 2009).

Two subgroups of house sparrows are currently recognized; the domesticus subgroup which contains five subspecies with a natural range covering Siberia, Europe, North Africa and the Middle East; and the indicus subgroup containing six subspecies confined to Asia.

The domesticus group is typically larger, with grey cheeks and under parts and the indicus group is generally smaller, with a smaller bill, white cheeks and under parts and a richer colour on the upperparts (Smith, 1988). It would be expected that, with man's dominance of the world, the future would be bright for the house sparrow, but it is now becoming evident that, this is not the case, particularly in the highly developed region of urban and semi urban areas (Laet and Smith, 2007).

### **BIOLOGY/BIONOMICS OF HOUSE SPARROW**

The house sparrow is a member of the family Passeridae and it is one of the larger sparrows, with a length typically of 160-165mm and a wingspan of 210-255mm. It is rather a large headed, heavy billed and robust passerine. The sexes are dimorphic with the male being boldly patterned. The male is brown above, with a grey crown and nape. It has grey cheeks and grey under parts with black round the eyes. The mantle and scapulars are boldly streaked black, chestnut and buff and the tail is dark brown. The bib has black feathers with white tips that are gradually abraded so that by the beginning of the breeding season the bib becomes uniformly black. The female is rather featureless with a grey brown crown, a pale-buff super cilium, two wing bars and an unmarked throat and breast. The bill becomes darker during the breeding season and a few birds have a completely black bill (Lowther and Cink, 1992).

House sparrow, *Passer domesticus indicus* belongs to Passeriformes order and Passeridae Family. It has worldwide distribution and lives in all continents and many of oceanic Islands. Some of the ecologists believe that mentioned bird is a symbiotic species with human, hence recognizing and identified as bird species depended on human environments. It is an essential bird species with equilibrant factors in ecosystems which has educational, recreational, economical and aesthetic values. The sparrow has even been mentioned in most of our Mythologies and Folklores, along with the common crow, eagles and other such birds, which used to exist in close proximity to human dwellings (Ghosh et al., 2010).

The house sparrow received more attention in urban areas. They can play vital role in conservation of natural ecosystems health. The nest is build around the human habitation, in wall holes, roof spaces, undisturbed locations in the house, specially windows, or any such places found suitable for nesting around the human house and apartments. It feeds on variety of grains, seeds, insect, nectars, and cooked food left over by man (Yahaghi et al., 2011).

Birds are common inhabitants of our ecosystem. House sparrows are distributed widely in India and abroad. As they are generally associated with human habitation, they tend to stay in the region with structures built with many holes under the tiles. These sites may use for nest construction and feeding. According to the latest report by various environmental organizations, there has been decline in their numbers (80%) during the past decades in India. Their recent decline around the world has put them in the Red list of the International Union for the Conservation of Nature (IUCN, 2000).

The song of the house sparrow consists of cheep or chirrup notes repeated over and over. The birds sing year-round, although less frequently in August and on cold and rainy days. Both sexes cheep, the females most frequently when they are without a mate. Most vocalizations are associated with the nest site. Although house sparrows are quite gregarious and nest in loose knit colonies, they defend a small territory immediately surrounding the nest. Males defend these territories from other males, and females from other females. Holes are preferred as nest sites, but nooks and crannies in outbuildings and open sites in trees and shrubbery are also used. The young form flocks soon after fledging, and most disperse from the natal colony. Large post breeding flocks roost in trees or brush near grain fields in agricultural areas or in cities, from which they fly to feeding areas. After arriving at the congregation site, the birds often engage in communal singing for up to an hour (Vincent, 2005).

Birds are sensitive to environmental changes and hence, can act as an indicator of ecological balance of a particular habitat. House sparrow, *Passer domesticus*, a small bird locally known as 'Chittu kuruvi' is closely associated with human habitation. The nest is built in holes of structure under the tiles or around roof area of houses. It feeds on grain, insects, weeds seeds, fruit buds, etc. They usually form colonies having 10 to 20 pairs and do not spread far from their colony. The sparrows are the brown and fluffy birds which are always around us but rarely noticed. They are omnipresent in our lives and are almost everywhere. They share our homes and share our food. The sparrow is the most widely distributed and common avian species of India, they affect almost all habitats. Whole of the country covered, including the desert areas and the cold region (Chamberlin et al., 2007).

House sparrows form monogamous pairs for each breeding season. Nests are built from dried vegetation, feathers, strings and paper. Eggs are laid at any time in the nesting period. One to eight eggs can be present in a clutch, with the possibility of four clutches per nesting season. Incubation begins after all the eggs have been

laid. Both males and females incubate the eggs for short periods of a few minutes each. Incubation lasts for 10 to 14 days. After the eggs are hatched, both males and females feed the young (Joshi, 2009).

In large areas of apparently suitable habitat, house sparrows tend to breed in small colonies, usually of 10 – 20 pairs rather than spreading uniformly and are probably better described as clumped rather than a colonial breeder. Outside the breeding season, house sparrows are normally found in flocks that associate in many activities, ranging from communal roosting to feeding, dust and water bathing, and ‘social singing’ when the birds collect in bushes and call together (Smith, 1988). House sparrows are extremely sedentary birds, the majority living out their lives with an ambit of 1-2 km. Moreover, evidence from ringing both recoveries of birds with numbered rings and also sightings of colour ringed ones, the farmland birds and those living in built-up areas (Smith, 2003). The house sparrow is primarily a seedeater, in rural areas specialising on the seeds of cultivated grain crops such as oats, wheat, barley, corn, and maize. The other major food source is the seeds of annual herbs such as grasses (Graminae), rushes (Juncidae), goosefoot (Chenopodium), docks (Polygonaceae) and chickweed (Stellaria spp.). Birds living in built up areas, supplement their diet of natural vegetable matter with a variety of household scraps, deliberately put out by humans. The use of feeders in gardens by house sparrows is well known and found that the house sparrow was by far the commonest species at feeders using them throughout the year in London. In contrast, nestlings are fed almost exclusively on insects and other invertebrates (both in the larval and adult form), with the prey species varying with season. The most important taxa being aphids (Aphidoidea), spiders (Arachnida), beetles (Coleoptera), weevils (Curculionidae), grasshoppers (Orthoptera) and caterpillars (Lepidoptera) (Wilson et al., 1999). House sparrows, like many bird species, change their diet during ontogeny. Adult house sparrows are mostly granivorous and nestlings are fed primarily on insects during the first 3 days of their life and plant material becomes gradually more important afterwards (Anderson, 2006).

House sparrows tend to forage for food on the ground, using a hopping movement when not in flight. Their flight is direct, with continued flapping and no periods of gliding. House sparrows aggressively protect a small territory just around their nesting site. This is believed to be strictly a protection of the nest site, and not of any feeding areas. Sparrows have been observed to threaten, and if necessary, attack 70 species of birds that have come into their nesting territory. These attacks seem to be intra-sexual; males attack males and females attack only females. House sparrows occur in and around human habitation, as well as cultivated areas and some wooded country. They usually stay in the same region all year round, but may be partially migratory in some areas (Joshi, 2009).

## CONCLUSION

The house sparrow is not only among the most commonly found bird species in urban cities, but also the most loved. It is a small brown-coloured bird, not bigger than a tennis ball, with black streaks on its back. The male and female are easily distinguishable, not in size but in coloration. The male is dark brown, with a black bib, grey chest and white cheeks, whereas the female is light brown throughout its body, with no black bib, crown or white cheeks. It is a social species, found in groups of eight to 10, chirping and chattering to communicate with each other. True to its love for urban spaces, the house sparrow is known to nest in buildings, finding crevices and holes in walls, or at best, using the bird houses and nest boxes put out by humans in their gardens. It feeds mostly on seeds, but in the breeding season, adults feed their young with insects. The house sparrow has evolved with humans, known only to live in close contact with us, instead of forests. For years, it has peacefully coexisted with us in our buildings and gardens, but in the last two decades, their population is on the decline in almost every city. The reasons attributed are: rapidly changing cities are no longer a suitable habitat for the house sparrow, as the new and modern designs of infrastructure does not give any room for the sparrow to nest; pollution caused by microwave towers and pesticides; the house sparrow loses its foraging grounds (natural grasslands) as the green spaces in our cities give way to more concrete constructions.

## REFERENCES

1. Anderson, T. R., 1977. *Reproductive responses of sparrows to a superabundant food supply. The Condor*, 79: 205–208.
2. Anderson, T., 1984. *A quantitative analysis of overlap in nestling diets of village populations of sparrows in Poland. Ekologia Polska.*, 32: 693-707.
3. Anderson, T.R., 2006. *Biology of the Ubiquitous House Sparrow: From Genes to Population. Oxford University Press, New York.* 6 -32 p.
4. Anjan, D., Dipak, B. and C. Dibyendu, 2010. *The case of the disappearing house sparrow: a review. Veterinary World*, 3 (2): 97-100.

5. *Bhattacharya, R., Roy, R. and C. Goswami, 2011. Studies on the response of House sparrow to artificial nest. Int. J. Environ. Sci., 1(7): 1574-1580.*
6. *Blair, R.B., 1999. Birds and butterflies along an urban gradient: Surrogate taxa for assessing biodiversity. Ecol. Appl., 9:164-170*
7. *Chamberlin, D.E., Toms, M.P., Cleary, M.R. and A. N. Banks, 2007. House sparrow (*Passer domesticus*) habitat use in urbanised landscapes. J. Ornithol., 148: 453-462.*
8. *Ghosh, S., Kihyun, K. and R. Bhattacharya, 2010. A survey on house sparrow population decline at Bandel, West Bengal, India. Journal of Korean Earth Science Society, 31(5): 448-453.*
9. *IUCN, 2000. Red Book of Threatened Birds of Bangladesh. IUCN Publications, Cambridge. 23-27 p. IUCN, 2012. IUCN Red List of Threatened Species (ver. 2012.1). Available at <http://www.iucnredlist.org>.*
10. *Joshi, D.K., 2009. House sparrow (*Passer domesticus*): The endangered bird. Orissa Review, 53-55 p.*
11. *Laet, J.D and J.D.S. Smith, 2007. The status of the urban house sparrow *Passer domesticus* in North-western Europe: A review. J.Ornithol., 148 (2): 275-278.*
12. *Lowther, P. and C. Cink, 1992. The House Sparrow In: The Birds of North America (Eds. Poole, A., Stettenheim, P. and F.Gill). Published by The American Ornithologists' Union and the Academy of Natural Sciences of Philadelphia. 34-67 p.*
13. *Rahmani, A.R., 2008. Flight to extinction. Spectrum, The Tribune. Available on <http://www.tribuneindia.com>*
14. *Ramachandra T. V. and H. S. Sudhira, 2011. Influence of planning and governance on the level of urban services. IUP Journal of Governance and Public Policy, 6(1): 24-50.*
15. *Smith, S.D., 1988. The Sparrows. T & A D Poyser Pub. Ltd, Calton. 24 p.*
16. *Smith, S.D., 2003. Decline of House Sparrows in Large Towns. British Birds, 93: 256- 257.*
17. *Sudhira, H.S. and K.V.Gururaja, 2013. Of House Sparrows and Human Settlements - Distribution of House Sparrows in Bangalore, India. Published by Gubbi Labs, Bangalore. 1-16 p.*
18. *Vincent, K.E., 2005. Investigating the causes of the decline of the urban house sparrow *Passer domesticus* population in Britain. Ph.D. Thesis submitted for the Degree of Doctoral of Philosophy in De Montfort University.*
19. *Yahaghi, A., Behrouzi-Rad. B., Amininasab. S. and R. Askari, 2011. Determination of number and biometry of House sparrow *Passer domesticus* eggs in public parks of Shushtar in South of Iran (Spring 2010). World Journal of Science and Technology, 1(5): 56-61.*