



Status of Family Columbidae: Leach, 1820 (Pigeons and Doves) in District Mirpur khas, Sindh, Pakistan

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Abstract. Pigeons and doves have adaptive nature to variety of habitats and they are commonly seen everywhere in wild as well as close to human settlements. Their population is generally observed in district Mirpur khas but there were no scientific studies about their definite identification, ecological conditions and conservation status, hence a study was proposed to determine the status of diverse species of Family Columbidae (Order: Columbiformes) considering in mind their important for food, pollination, and ecosystem. Field surveys were carried out from January to December, 2021 in different types of habitat from early morning to late evening for the observation of species in question. The species were identified using identification keys and taxonomic literature. The pigeons including: *Columba livia*, *Columba livia domestica* and *Treron pheonicopterus* whereas doves viz: *Streptopelia decaocto*, *Streptopelia risoria* and *Streptopelia senegalensis* were recorded to exist in the study area. Present study recorded maximum distribution of *C. livia*, in urban and suburban areas, whereas abundant populations of *S. decaocto* were recorded from rural areas especially in agricultural fields. Immense number of roosting and nesting sites of pigeons were observed near human settlements, whereas doves were usually observed roosting on trees near to water and food availability. Population of *C. livia* was found denser than other species of family Columbidae. It was also recorded that the population of pigeon and doves are vulnerable due to massive hunting in the study area where trade of these birds is very common at high frequency.

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Keywords: Diverse species, Family Columbidae, Distribution, Habitats, Protection, Sindh

Running title: Status of Doves and Pigeons

INTRODUCTION

Pakistan become a remarkable ecological part of the world because of its dynamic geological history, huge latitudinal spread and wide altitudinal area that is grant with a broad variation of habitats and climatic conditions which attract an huge diversity of birds (Levi, 1977a). Phylum vertebrata have a very special and highly notable class known as Class Aves. It is most successful class of group tetrapods in numbers, with approximately ten thousand living species, passerines are more than half of them, passerines some times are also called perching bird (Allen & Barbara, 2009).

Pigeons and doves belongs to a bird family Columbidae of Order Columbiformes. They are stout-bodied birds with small slender beaks, and small necks

and in some species fleshy ceres is also present. Seeds, fruits, and plants are their primary food. The family columbidae consists of 344 species divided into 50 genera. Out of 344 species, extinct species are thirteen (Damian, et al., 2016). There is no strict division between pigeons and doves because they have common certain characteristics (Capoccia, et al., 2018).

The pigeons are often called larger species and the dove are called smaller species, although they contain same morphology (Damian, et al., 2016; Lack, 2003; Kramer, 1952). The members of family columbidae (pigeons and doves) are breeds for meat purpose normally known as squab and harvested from young birds (Blechman & Andrew, 2007). For research, domestic pigeons are often used in laboratory experiments in biology, medicine and cognitive science

(Papi, 1986). Other uses of pigeons and doves include the harvesting of guano (droppings) for use as a fertilizer. The member of family columbidae support healthy habitat by eating food that is disposed of as litter by humans and cleaning up our wastes. Pigeons do not compete with native animals for shelter and food and therefore they do not harm other useful species. Some bird species act as vectors for spreading diseases, like salmonellosis, campylobacteriosis and giardiasis etc, but the pigeons are extremely rare for the spreading of diseases to humans (Gargiulo, et al., 2014, Osman, et al., 2013).

Genus *Columba* is one of the highly diverse genera of family columbidae, consisting of approximately 35 pigeon species (Capoccia, et al., 2018). The members of the family columbidae are considered as pests, while some pigeons are also considered as invasive species. A large number of pigeons and doves live in small area may be nuisance to farmers (Johnson, et al., 2001).

For the determination of diversity, distribution, ecology and conservation status of pigeons and doves, a comprehensive study was proposed to establish their status in scientific manner for the first time as there was no record of such study previously. Present study focused on various threats to pigeons and doves possibly occurring in the study area.

MATERIAL AND METHODS

Surveys were carried out from January to December 2021 in District Mirpur khas situated at 2925 km² area and lying between 25°31'23.57" N and 69°00'30.36" E of 2925 km². Urban, suburban and rural areas of sub-divisions of district Mirpur khas viz: Digri, Hussain Bux Mari, Jhuddo, Kot Ghulam Muhammad, Mirpur khas, Shujabad and Sindhri were surveyed monthly for exploration of doves and pigeons (Figure 1). Information from local people was collected about the presence of species in question. Their distribution, extent of their colonization and types of their preferred habitats was recorded during each surveys. Nesting and roosting sites of family Columbidae were marked and observed regularly from early morning (sunrise) to late evening (sunset). It was also aimed to estimate their density by observations and by assessing the area occupied by the species.

The scientific literature (Gibbs, David 2010, Levi, 1977a, Gargiulo, et al., 2014, Osman, et al., 2013) was used for the methodology of surveys and identification of diversity of birds in question. The populations of pigeons and doves are affecting by human encroachments such as habitat destruction, hunting, illegal trade etc., in this context present study delved thoroughly into all the potential environmental factors affecting doves and pigeons in all kinds of habitats in district Mirpur khas (Figure 1).

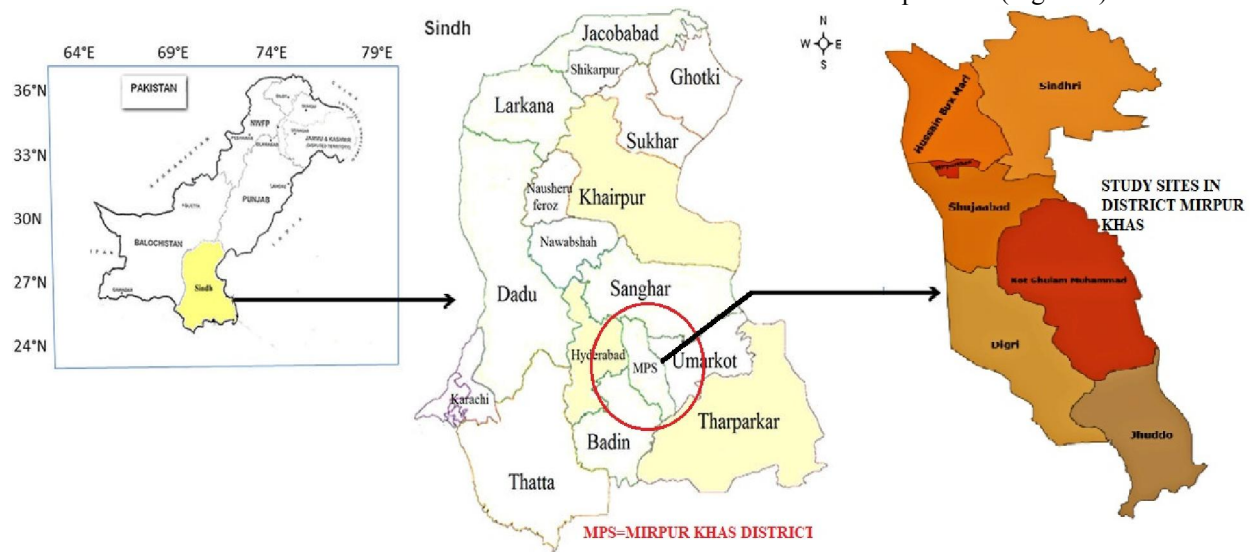


Figure 1 – Map of District Mirpur Khas with indication of study sites.

RESULTS

Present study explored the diverse species of family Columbidae and recorded pigeons including *Columba livia* (rock pigeon), *Columba livia domestica* (domestic pigeon) and *Treron pheonicopterus* (yellow-footed green pigeon) and the species of dove viz:

Streptopelia decaocto (eurasian collared dove), and *Streptopelia risoria* (barbary dove) and *Streptopelia senegalensis* (laughing dove) randomly distributed in different sites of District Mirpur khas (Figure 2-6). Status of recorded species is detailed in Table 1.



Figure 2 - (A) *C. livia* (B) Nest of *C. livia* (C) Nest of *C. livia domestica* (D) Hatchling of *C. livia domestica*



Figure 3 - *Treron pheonicopterus* (yellow-footed green pigeon) recorded from district Mirpur khas

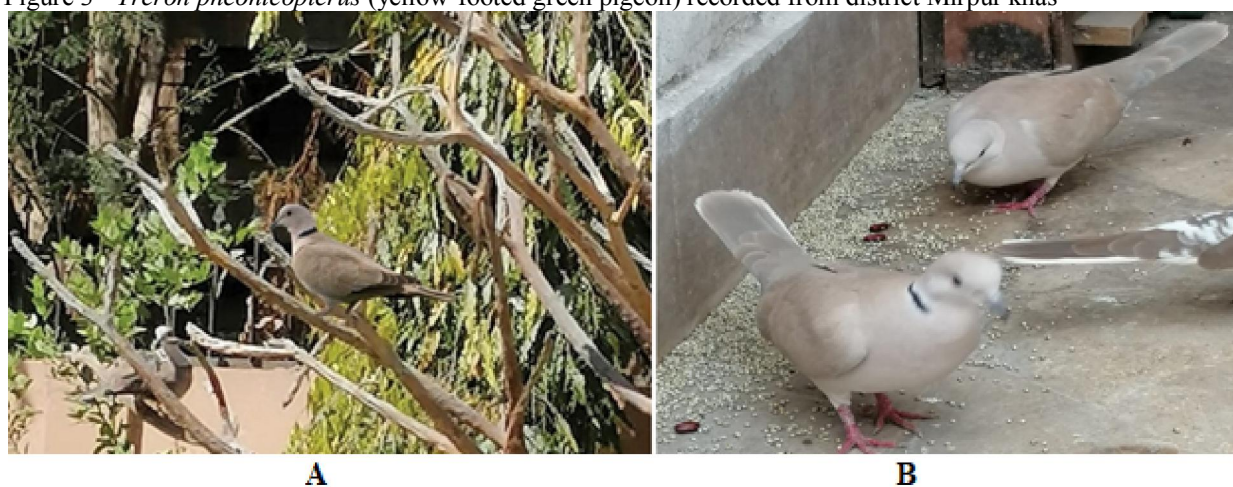


Figure 4 - Eurashian collared dove (A) *S. decaocto* in wild (B) *S. decaocto* domesticated



Figure 5 - *Streptopelia risoria* recorded from study area



Figure 6 - (A) Adult *S. senegalensis* (B) Hatchling *S. senegalensis*

TABLE 1

Status of Family Columbidae (doves and pigeons)							
<i>Scientific name</i>	<i>Common name</i>	<i>Status (Wild/ Domestic)</i>	<i>Conservation status listed by IUCN</i>	<i>Occurrence in district Mirpur khas</i>	<i>Type of habitats</i>	<i>Population status in study area Rare/ abundant</i>	<i>Type of food</i>
<i>Columba livia</i>	Rock pigeon	Wild/ Domestic	LC	In all sub-division	Urban, sub-urban	Abundant	Seeds, grains, bread
<i>Columba livia domestica</i>	Domestic pigeon	Wild/ Domestic	DD	In all sub division	Urban, sub-urban	Abundant	Seeds, grains
<i>Treron pheonicopterus</i>	yellow-footed green pigeon	Wild	LC	Shujabaad, digri	Rural	rare	Fruits, nuts and seeds
<i>Streptopelia decaocto</i>	Eurasian collared dove	Wild	LC	Hussain Bux Mari, Shujabaad, Kot Ghulam Muhaammad, Sindhri	Urban, sub-urban, Rural	Abundant	Seeds, rice, grains, variety of plants, small invertebrat
<i>Streptopelia risoria</i>	Barbary dove	Domestic	DD	Mirpur khas city, hussain bux mari	Urban, sub-urban	Abundant	Seeds, grains, rice
<i>Streptopelia senegalensis</i>	laughing dove	Wild	LC	Shujabaad, Kot Ghulam Muhaammad, Sindhri	Sub-urban, Rural	Abundant	Grains, small ground insect

LC=Least Concern, DD=Data Deficient

DISCUSSION

District Mirpur khas is one of the main agricultural divisions of Sindh province. It offers variety of habitats that are preferred by distinct avifaunal species such as doves and pigeons.

Columba livia (Gmelin, 1789) commonly known as rock pigeon/common pigeon was the most abundant specie found in all the habitats (Figure 2). They exhibited huge population density and a large number of its nesting sites were sighted in old buildings and also in human settlements like houses, hospitals, institutions and hotels etc. Their nests were observed mostly in old massive buildings. Roosting sites of this species were found near to water points and food areas of Mirpur khas city, Hussain Bux Mari, Shuja Abad, Sindhri, Digri, Jhuddo, Kot Ghulam Muhammad. Conservation status of *Columba livia* is LC (Least Concern), however its population is decreasing considerably in many parts of world due to competition with potential predators. Their conservation issue increases with poaching and habitat destruction (Rodriguez, et al., 2021). A subspecies of *Columba livia* i.e. *Columba livia domestica* (Gmelin, 1789) was observed with abundant population especially in urban and sub-urban areas, however its low population was recorded in agricultural areas of Mirpur khas city, Digri and Hussain bux mari (Figure 2).

Occurrence of *Treron pheonicopterus* (Latham, 1790) (yellow-footed green pigeon) was recorded in rural areas especially in agricultural fields as it nests on heightened trees (Figure 3). This pigeon was rarely seen in human settlement areas. They were observed flying, nesting, resting in flocks and never seen solitary. Populations of yellow-footed green pigeon were recorded only in the subdivision (Taluka) Shujabaad and Digri. This pigeon was absent in subdivision: Hussain Bux Mari, Jhuddo, Kot Ghulam Muhammad, Mirpur khas city and Sindhri.

Streptopelia decaocto (frivaldszky, 1838) commonly called Eurasian collared dove was frequently recorded from cropland of rural areas, however it was also seen in urban and sub urban areas (Figure 4). Their roosting sites were found close to human settlements due to availability of food although their nests were observed in agricultural areas especially in grain harvesting fields and dense trees. Populations of Eurasian collared dove were recorded in sub-divisions: Hussain Bux Mari, Shujabad, Sindhri and Kot Ghulam Muhammad. *S. decaocto* was absent in Digri, Juddo and Mirpur khas subdivisions of district Mirpur khas.

Streptopelia risoria (Linnaeus, 1758) (Barbary dove) was observed sharing habitats with *S. decaocto*. Its nests were observed in agricultural lands near to urban and suburban zones of district Mirpur khas (Figure 5). Population status of this species was stable in wild as well as domestic. It was found in all areas except Digri, Juddo and Mirpur khas subdivisions. *Streptopelia senegalensis* (Linnaeus, 1766) dwelling in variety of habitats such as arid environment, shrub lands, scrublands and croplands of district Mirpur khas. It was observed that the vegetation rich areas were preferred by laughing dove. Their rich population was recorded in Taluka Shujabad, Sindhri and Kot Ghulam Muhammad (Figure 6).

District Mirpur khas consists of different habitat for avifauna such as croplands, shrub lands, scrublands and dry lands and its climate remains moderate attracting variety of avifaunal species to abide there. Both *C. livia* and *C. livia domestica* being abundantly distributed species were recorded from all the types of habitats all over the district Mirpur khas. Whereas yellow footed green pigeon exhibited less abundant population distributed in few study sites only.

Present study recorded that variety of habitats in district Mirpur khas provide pigeons and doves sufficient harbor to live but human encroachment especially for the purpose of trade affect these wild creatures. Hunting of these birds is very common in all the study sites where doves and pigeons are captured from their wild habitats and are captivated. Some species such as *Columba livia* are used for the production of breeds such as Frill pigeons and Fantail pigeons that are amongst popular breeds of fancy pigeons traded copiously in study area. Their distribution was also determined lesser in wild as compared to birds' commercial markets. Like other pigeons they were also found near feeding places and water points in urban areas.

There is no implementation of conservation measures for the protection of doves and pigeons by any wildlife organization in the study area, therefore, there is need of taking efforts to providing them a stress-free environment in wild. Conservation actions should be implemented to make their natural habitats free from negative anthropogenic activities such as poaching.

CONCLUSION

The diversity of Family Columbidae is rich in district Mirpur khas represented by *Columba livia*, *Columba livia domestica*, *Treron pheonicopterus*, *Streptopelia decaocto*, *Streptopelia risoria* and *Streptopelia senegalensis*, however their natural habitats are utterly destructed and poaching is very

common for the entertainment and trade purpose. Therefore, there is need of implementation of strict conservation rules for saving these avifauna against their possible decline in future.

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