

Birds of Lahore Cantonment

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Abstract.- Lahore Cantonment (LC) is one of the oldest establishments in Lahore. Located about 28 km Northeast of Lahore, it covers about 8950 hectares. Khairy distributory fed by Bumbanwala-Ravi-Badian (BRB) canal passes through the area. This area has many marsh areas along the route from Burki upto BRB canal besides resident birds. A variety of birds visit the Lahore Cantonment during summer and winter seasons. The habitat and the avian fauna were regularly surveyed at different times of the day from 5:00 am to 6:00 pm. The survey of LC was conducted from September 6, 1996 to September 30, 1997. Binocular 12x50 was used to spot and study the birds and Yashica Camera (Electro-35) was used to photograph birds, their nests and different habitats. After the year long survey species diversity and the dominant bird species were recorded. 74 different species belonging to 55 genera, 38 families and 13 orders were recorded. Of these, 44 species are resident, 17 species are winter visitors and 13 species are summer visitors. Amongst the species adapted to diverse habitats in LC black drongo, little green bee-eater, blue cheeked bee-eater, red wattled lapwing, paddy bird, rufous backed shrike, common myna, hoopoe, red vented bulbul and white breasted kingfisher are prominent. Factors causing detrimental effect on birds like poaching and netting have resulted in almost complete extinction of alexandrine parakeet from the area. Shooting done by caretakers at Lahore Airport results in a great loss of avian life. Besides this grazing by livestock in graveyards and other naturally vegetated areas, disturbance of habitat by noise, water and air pollution are probably the factors detrimental to the avian species of LC.

Key words: Lahore cantonment, resident birds, migrant birds, factors affecting population.

INTRODUCTION

Lahore Cantonment (LC) is one of the oldest establishments in Lahore. It was established in 1850-51 with a surface area of 1,320 hectares, now increased upto 8,950 hectares. It is situated 28 km Northeast of Lahore city centre between 31° 34` North latitude and 74° 30` East longitude, 216 m above mean sea level. Boundaries of Lahore Cantonment are as follows:

1. North: Mughalpura area under the control of Metropolitan Corporation.
2. South: Rural areas of District Council Lahore.
3. East: Area of District Council Lahore, starting one km away from BRB canal.
4. West: Model Town and Gulberg under the control of Metropolitan Corporation.

Khairy Distributory and BRB canal pass through the Cantonment area. Climate fluctuates considerably. In April temperature starts rising and two succeeding months are hot and dry. Towards the end of June monsoon starts. Monsoon rains end about the middle of September followed by 2-3

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weeks, when temperature rises during day time from about middle of December to about middle of March, the air is moist and cold, and light to moderate rainfall is received at intervals. About 3% land is used for agricultural purposes. The major crops are wheat, rice, sugarcane, corn and fodder for cattle. Natural/ naturalized/planted flora includes herbs, shrubs and trees like semal, neem, dharek, gulhar, pipal, jamun, bohr and beri. Apart from the natural vegetation the birds exploit the crops raised by man to meet their dietary and habitat requirements. Only during a brief period of monsoon the flora of the area is in its full bloom. Besides the resident birds a diverse fauna of migratory birds visit LC in different seasons.

The main objective of the work done was to record bird species visiting and residing in the area, their behaviour, the possible reason to come here and the factors affecting their population.

The survey continued from September 06, 1996 to September 30, 1997.

MATERIALS AND METHODS

Lahore Cantonment covers an area of 8,950

hectares. The area was surveyed 34 times from September 06, 1996 to September 30, 1997 during dawn and dusk, as this was the maximum activity time for birds, whereas mid day is the rest time. The birds were observed by walking through thick plantation or by driving a motor bike at a very slow speed on the road. The birds were watched and observed by using binoculars 12x50 mm. For immediate identification Woodcock (1990) was followed. The birds observed were identified upto species level by following Ali and Ripley (1987) and Roberts (1991, 1992). Plant species were collected and pasted on herbarium sheets and identified. During survey greater attention was paid to graveyards, marsh areas and agricultural fields. The status was determined by following Roberts (1991) into the following categories:

1. Abundant reveals the greater frequency of a particular bird species met with in the specific habitat on careful observations met with invariably.
2. Common means that the species can invariably be seen by careful observer, visiting the specific habitat or area, during the appropriate season, particularly to that species.
3. Frequent means that the particular species can be observed invariably once out of 3 visits, to that specific habitat or region.
4. Scarce indicates that the observed species is restricted in its area of distribution in less numbers.
5. Rare indicates that the observed species is in small numbers, even in the specific favourable habitat.
6. Vagrant means that its future occurrence is highly unpredictable and it does not occur anywhere in the region on regular basis.

The habitat types

Lahore Cantonment provides diverse type of habitats for avian fauna. Following habitat types were identified:

Urban area

Urban area covers 3,569 hectares which is totally under the control of cantonment board. This urban area comprises of many complexes like:

CMH hospital: In and around this hospital very thick plantation and beautiful small parks have been established. The plantation comprises of trees like shisham, tut, kikar, pipal, semal and various types of ornamental plants. Birds like rose ringed parakeet, collared dove, brown dove, myna, indian pipit and crow use them for roosting and nesting purposes.

Army barracks: Army barracks have been constructed over a large proportion of the area. Around them dharek, neem, sufeda, shisham, bamboo and various types of ornamental plants have been planted. This type of plantation provides the best habitat for birds like rose ringed parakeet, common myna, bank myna, pied myna, white wagtail, large pied wagtail, shrike, etc.

Army housing schemes: Various schemes have been completed by the army council, whereas some housing schemes are still in their infancy. Various types of trees like kikar, pipal, mango, gulhar, shisham, poplar etc. have been planted on both sides of the roads in these schemes. Due to the establishment of housing schemes many naturally vegetated areas have been destroyed and the urban area is increasing day-by-day. Because of this various preferred avian habitats have been destroyed. Roads have been carpeted in these areas and because of heavy traffic on them pollution is increasing day-by-day, which is the cause of various diseases and marked increase in the incidences of death to various bird species like vulture, kite, blue rock pigeon, crow, etc. Anyhow small parks and vegetated areas have been established in these schemes which provide limited habitat to some bird species with in houses/large bungalows, where they find some refuge and feed as well.

Army ammunition and shooting centers: Army has selected places for these centers, that were far away from human habitation; mostly near large graveyards. As a result of shooting and free use of ammunition most avian species have left these areas. Sometimes they even throw their young ones from their nests because of which the population of young birds is decreasing. The plantation recorded here is nothing except wild grasses and Bamboo.

Army officers mess: Various types of trees and ornamental plants have been planted in small lawns/parks in the army mess establishments, which

provide good roosting places for various birds like red vented bulbul, black drongo, dove, owlet, etc. The trees recorded here are eucalyptus, bottle brush, rubber plant, cuban royal palm, fan palm, gondani, pipal and many others. Various species of exotic birds and animals have been engaged here for recreational purposes like golden pheasant, lady amhrest pheasant, green pheasant, silver pheasant, ring necked pheasant, java green peafowl, black shouldered peafowl, white peafowl, etc.

Research centers: Research centers like Army Research Center, Veterinary Research Institute are thickly planted by various types of trees like semal, shisham, neem, gulhar, pipal, arjun, fig, jamun, beri, anar. This type of plantation provides habitat for birds like golden oriole, koel, dove, drongo, parakeet, myna, kite, wagtail.

Agricultural fields

About 3% of the land of LC is used for agricultural purposes. Besides fulfilling the food requirements of human population they serve as food stores for the avian species and animals inhabiting the area. Natural vegetation is insufficient to fulfill their food requirements and they have to depend upon artificially raised crops like maize, rice, wheat, pulses, fodder and vegetables. These crops are also inhabited by small passerine birds like Indian robin, black drongo, myna, sparrow, weaver, munia, babbler.

However misuse or overuse of insecticides, pesticides and chemical fertilizers on crops by local farmers is adversely affecting the avian life as well as human health.

Roads

The major roads in Lahore Cantonment are: Major Aziz Bhatti Road, Sarfraz Rafiqi Road, Tufail Road, Ghazi Road and Abdul Rehman Road. On both sides of these roads trees like pipal, rubber plant, bohr, banyan, gulhar, kikar, shisham, mango, dharek, neem, mulberry, eucalyptus, beri, semal, dhak, arjun, bahera have been planted.

Birds like rose ringed parakeet, alexandrine parakeet, common myna, bank myna, pied myna, paddy bird, red wattled lapwing, pariah kite, house crow, shrike, weaver bird, babbler, pigeon, dove, black drongo etc. use the trees for roosting and

nesting purposes.

Tombs

There are many tombs in Lahore Cantonment but the most important are the following three: a) Mazar Sharif near Garrison Boys School; b) Mazar Sharif of Hazrat Shah Wali near CMH; and c) Tomb of Major Aziz Bhatti Shaheed near BRB Canal. The former two tombs are about 800 years old and the third one is about 32 years old. There are old trees like banyan, pipal, beri, shisham, kikar, khajur. Grasses, herbs and shrubs occurring here include *Digitaria* sp. (grass), *Cenchrus biflorus* (grass), puth ekcanda, jamal ghoti, dhatura (*Datura innoxia*), dhatura (*Datura stumarium*), gutta, bathu, euphorbia, khoob kalan, kawar gandal.

The birds recorded at these tombs included blue rock pigeon, green pigeon, dove, pariah kite, House crow, rose ringed parakeet, alexandrine parakeet, koel, wood pecker, sparrow, weaver bird, myna, indian robin, spotted owl, hoopoe, etc. Some of these birds have made their nests on various trees and some use them for roosting purposes.

Graveyards

Graveyards are the major natural areas in Lahore Cantonment where various types of birds reside and some visit them in different seasons. The most important of these are: Sadar Bazar Graveyard, R.A. Bazar Graveyard, Cavalry Ground Graveyard, and Christian Graveyard, Nishat Colony.

These graveyards have a wide variety of natural vegetation and a large number of trees. The major shrubs are: shoe flower, puth kanda, *Dolichos* sp., gutta, sour boti, jamal ghoti, dhatura, palak, *Dicanthium annulatum*, *Digitaria* sp. (grass), *Cenchrus biflorus* (grass), niazbo etc; the herbs are bathu, *Malvestrum tricuspidatum*, *Eclipta alba*, dodak, euphorbia, khoob kalan, jungli kulfa, dhania, kawar gandal, etc.

The major trees are pipal, paper mulberry, semal, dharek, neem, kikar, jamun, bottle brush, gulhar, fig, banyan, gondani, beri, khajur, anar, etc.

Resident birds include bulbul, babbler, pigeon, dove, wood-pecker, parakeet, weaver bird, myna, black drongo etc. Some birds visiting in different seasons are black redstart, magpie robin, pied

bushchat, purple sunbird, coppersmith, brown chaff, etc.

These birds eat fruits and seeds of various plants and grains spread by people there. Graveyards also provide the best breeding place both for resident and summer migrant birds.

Airport

Airport of Lahore Cantonment is the living graveyard of birds because the death-adders (persons shooting birds) move all the day around the runway. They kill every bird that enters in their territory and destroy nests that are built by them. One day the senior author got a chance to spend a full day in the company of a caretaker at the airport. In a day he killed 10 rose ringed parakeets, 5 brown doves, 12 house crows, 1 grey hornbill, 7 common mynas, 14 sparrows, 2 blue rock pigeon and 7 pariah kites. It is difficult even to estimate the number of birds losing their lives at the hands of these death-adders daily. The civil aviation authorities in collaboration with the Wildlife and Parks Department try to make plans and make arrangements to keep the birds away from the airport to avoid any hazards. However, such arrangement have not proved successful so far.

Marsh area

Marsh areas have developed on both sides of Ghazi Road. Different birds species find a good residential habitat here and some visit during winters and summers. Such birds include paddy bird, night heron, cattle egret, little egret, intermediate egret, common sandpiper, wood sandpiper, red wattled lapwing and black winged stilt. white breasted king fisher and little cormorant are the frequent visitors. There is a profused growth of plant species like: kana, gul bakauli, *Conyza ambigua* and *Euphorbia pilulifera*. Birds like streaked weaver and baya weaver use kana plants to construct their nests.

Bridges

There are three important bridges in Lahore Cantonment: Mianmir Bridge, Khairy Distributory Bridge, and BRB Bridge. The last two are of great importance from defense point of view for Lahore. Many birds use bridges as their nesting place like

blue rock pigeon, sparrow, common myna, etc. Bridge 2 and 3 are used by Indian cliff swallows, hundreds of nests of Indian cliff swallows were recorded under BRB Bridge.

RESULTS

Flora

A rich flora exists in Lahore Cantonment – 137 species of plants belonging to 55 families were collected and identified from the area (Table I).

Bird species

After a year long survey 74 birds species belonging to 55 genera, 38 families and 13 orders were recorded from Lahore Cantonment. Of these 44 species are resident, 17 species are winter visitors and 13 species are summer visitors (Table II).

DISCUSSION

Lahore Cantonment with 8,950 hectares (89.5 km²) area, supports diverse types of habitats such as urban areas, hospitals, army barracks, housing schemes, messes, roads, tombs, graveyards, airports and bridges. These habitats support a wide variety of vegetation (Table I). Many trees are used by birds for roosting and nesting purposes and are also an important source of food for them *viz.*, ficus berries, fruit of neem, mulberry, jamun etc. These habitats are also rich in undergrowth and grasses, and serve as important nesting sites of birds like babblers. Moreover, each species has a preference for a particular kind of plantation *viz.* shrikes and bulbuls like mulberry, pipal is the best habitat for crows, doves, and eucalyptus for arboreal birds like parakeets.

Due to diverse habitats this area supports a varied avian fauna that belongs to Oriental, Palearctic and Ethiopian regions. Majority of resident species are of Oriental region. Roberts (1991) stated that this proportion increased in summer and monsoon by summer migrants, probably being attracted by the post monsoon abundance of insect life and green vegetative shelters. A host of Palearctic winter visitors to Indian Subcontinent and Ethiopian visitors like hoopoe, golden oriole from South Africa are also attracted to this area (Robert, 1991).

During the survey 74 different species in specific habitat types occurring in that area, 17 belonging to 55 genera, 38 families and 13 orders were recorded. Out of these 44 species are resident

Table I.- Plant species: 140 species of plants belonging to 56 families were recorded from Lahore Cantonment. September 6, 1996 to September 30, 1997.

No.	Scientific name	Common name		Family	Life form
1.	<i>Ficus religiosa</i>	Pipal	1	Moraceae	Tree
2.	<i>Ficus elastica</i>	Rubber plant			Tree
3.	<i>Morus alba</i>	White mulberry			Tree
4.	<i>Ficus carica</i>	Fig			Tree
5.	<i>Ficus benghalensis</i>	Banyan			Tree
6.	<i>Coronopus didymus</i>	Jungli halon	2	Brassicaceae	Herb
7.	<i>Brassica campestris</i>	Sarsoan			Herb
8.	<i>Tropaeolum majus</i>	Garden Nasturtium	3	Tropaeolaceae	Herb
9.	<i>Chenopodium album</i>	Bathu	4	Chenopodiaceae	Herb
10.	<i>Chenopodium anthelminticum</i>	Worm seed			Herb
11.	<i>Catharanthus roseus</i>	Sada bahar	5	Apocyanaceae	Shrub
12.	<i>Plumeria obtusa</i>	Gulchean			Shrub
13.	<i>Thevetia peruviana</i>	Peeli kaner			Shrub
14.	<i>Beaumontia grandiflora</i>	Herald's trumpet			Wood vine
15.	<i>Tabernaemontana coronaria</i>	Chandni			Shrub
16.	<i>Nerium oleander</i>	Oleander kaner			Shrub-small
17.	<i>Livistona chinensis</i>	Fan palm	6	Palmae	Tree
18.	<i>Roystonea regia</i>	Cuban royal palm			Tree
19.	<i>Malva sylvestris</i>	Mallow	7	Malvaceae	Herb
20.	<i>Hibiscus rosa-sinensis</i>	Shoe flower			Shrub
21.	<i>Alcaea rosea</i>	Gule-khera			Shrub
22.	<i>Malvastrum coromandelinum</i>	Prickly malvastrum			Herb
23.	<i>Malva parviflora</i>	Sonchal			Herb
24.	<i>Sida cordifolia</i>				Shrub
25.	<i>Albutilon indicum</i>	Pili buti			Shrub
26.	<i>Ocimum basilicum</i>	Niazbo	8	Labiatae	Shrub
27.	<i>Rosa spp.</i>	Rose	9	Rosaceae	Shrub
28.	<i>Achyranthes aspera</i>	Puth kanda	10	Amarantaceae	Shrub
29.	<i>Alternanthera sessilis</i>	-			Shrub
30.	<i>Amaranthus viridis</i>				Herb
31.	<i>Melia azedarach</i>	Dharek	11	Meliaceae	Tree
32.	<i>Cedrela toona</i>	Tun			Tree
33.	<i>Azadirachta indica</i>	Neem			Tree
34.	<i>Dolichos lablab</i>		12	Leguminosae	Shrub
35.	<i>Desmodium sp.</i>	Telegraph plant			Shrub
36.	<i>Lathyrus odoratus</i>	Phul matter			Climbing herb
37.	<i>Acacia nilotica</i>	Kikar			Tree
38.	<i>Cicer arietinum</i>	Chana or chick peas			Shrub
39.	<i>Cassia occidentalis</i>	Kasumba			Shrub
40.	<i>Butea frondosa</i>	Dhak & palash			Small tree
41.	<i>Meliolotus indica</i>	Senji			Shrub
42.	<i>Acacia modesta</i>	Phulai			Tree
43.	<i>Tagetas spp.</i>	Gutta	13	Compositae	Shrub
44.	<i>Eclipta alba</i>				Herb
45.	<i>Sonchus asper</i>	Dodak			Herb
46.	<i>Helianthus annuus</i>	Sun flower			Shrub
47.	<i>Tridax procumbens</i>				Shrub
48.	<i>Ageratum conyzoides</i>	-			Herb
49.	<i>Conzya ambigua</i>				Shrub
50.	<i>Echinops echinatus</i>	Brugh			Shrub

51. *Aster* sp. Shrub

Continued

No.	Scientific name	Common name	Family	Life form
52.	<i>Xanthium strumarium</i>	Sour buti		Shrub
53.	<i>Cichorium intybus</i>	Kasni		Shrub
54.	<i>Ricinus communis</i>	Arind	14 Euphorbiaceae	Shrub or small perennial tree
55.	<i>Euphorbia pilulifera</i>	Dodak		Herb
56.	<i>Putranjiva roxburghii</i>	Childlife tree		Tree
57.	<i>Euphorbia helioscopia</i>	Chandni booti		Herb
58.	<i>Croton tiglium</i>	Jamal ghota		Shrub
59.	<i>Euphorbia prostrata</i>			Herb-Shrub
60.	<i>Solanum nigrum</i>	Mako	15 Solanaceae	Herb
61.	<i>Petunia alba</i>			Herb
62.	<i>Datura innoxia</i>	Dhatura		Shrub
63.	<i>Datura strumarium</i>	Dhatura		Shrub
64.	<i>Ipomoea</i> sp.		16 Convolvulaceae	Shrub
65.	<i>Convolvulus arvensis</i>	Hiran khuri		Weed (Shrub)
66.	<i>Cyperus</i> sp.		18 Cyperaceae	Herb-Shrub
67.	<i>Ficus glomerata</i>	Gulhar	19 Urticaceae	Tree
68.	<i>Lathyrus sativus</i>	Mattar	20 Papilionaceae	Shrub
69.	<i>Clitoria ternatea</i>	Butterfly pea		Shrub
70.	<i>Dalbergia sissoo</i>	Shisham		Tree
71.	<i>Cassia fistula</i>	Amaltas	21 Caesalpineaceae	Tree
72.	<i>Cassia nodosa</i>	Pink cassia		Tree
73.	<i>Delonix regia</i>	Flamboyant		Tree
74.	<i>Sisymbrium irio</i>	Khoob kalan	22 Cruciferae	Herb
75.	<i>Coronopsis didyma</i>			Herb
76.	<i>Bombax ceiba</i>	Semal	23 Bombacaceae	Tree
77.	<i>Delphinium ajacis</i>		24 Ranunculaceae	Shrub
78.	<i>Tribulus terresteris</i>		25 Zygophyllaceae	Shrub
79.	<i>Terminalia bellirica</i>	Bahera		Tree
80.	<i>Terminalia arjuna</i>	Arjun	26 Combreaceae	Tree
81.	<i>Peristrophe bicalyculata</i>	-	27 Acanthaceae	Shrub
82.	<i>Mangifera indica</i>	Mango	28 Anacardiaceae	Tree
83.	<i>Adenophyllum</i> sp.	Nag-phalli	29 Bignoniaceae	Tree
84.	<i>Kigelia pinnata</i>	Gul-a-faanous		Tree
85.	<i>Tecomella undulata</i>	Lahura		Tree
86.	<i>Albizia lebbek</i>	Kala siris	30 Mimosaceae	Tree
87.	<i>Callistemon citrinus</i>	Bottle brush	31 Myrtaceae	Tree
88.	<i>Callistemon lanceolatus</i>	Bottle brush		Tree
89.	<i>Eucalyptus citriodora</i>	Sufeda		Tree
90.	<i>Syzygium cumini</i>	Jamum		Tree
91.	<i>Psidium guajava</i>	Amrud		Tree
92.	<i>Ehretia acuminata</i>	Brown ceda	32 Boraginaceae	Tree
93.	<i>Cordia obliqua</i>	Gondani		Tree
94.	<i>Cuscuta reflexa</i>	Amarbel	33 Convolvulaceae	Parasite Climber
95.	<i>Ziziphus nummularia</i>	Katha baer	34 Rhamnaceae	Tree
96.	<i>Ziziphus mauritiana</i>	Beri		Tree
97.	<i>Pterospermum acerifolium</i>		35 Sterculiaceae	Tree
98.	<i>Bougainvillea spectabilis</i>		36 Nynaceae	Climbing shrub
99.	<i>Phoenix dactylifera</i>	Khajur	Palmae	Tree
100.	<i>Aloe vera</i>	Kawar gandal	37 Liliaceae	Herb
101.	<i>Asparagus</i> sp.			Climber
102.	<i>Tradescantia</i> sp.			Shrub
103.	<i>Cerastium vulgare</i>	Mouse ear chick weed	38 Caryophyllaceae	Shrub
104.	<i>Stellaria media</i>	Gandel		Herb

105.	<i>Lantana camara</i>		39	Verbenaceae	Shrub
106.	<i>Clerodendrum umbellatum</i>				Shrub

Continued

No.	Scientific name	Common name		Family	Life form
107.	<i>Verbena</i> sp.				Shrub
108.	<i>Clerodendrum inerme</i>				Climber
109.	<i>Portulaca oleraceae</i>	Jungli kulfa	40	Portulacaceae	Herb
110.	<i>Rumex dentatus</i>	Jungli palak	41	Polygonaceae	Herb-Shrub
111.	<i>Pteris vittata</i>		42	Pteridaceae	Shrub
112.	<i>Thalypteris</i> sp.		43	Rutaceae	Small tree
113.	<i>Citrus medica</i>	-	44	Rutaceae	Small tree
114.	<i>Dicanthium annulatum</i>		45	Poaceae	Grass
115.	<i>Settaria</i> sp.	Kangni			Grass
116.	<i>Eleusine</i> sp.				Grass
117.	<i>Saccharum spontaneum</i>	Kana			Grass
118.	<i>Saccharum officinarum</i>	Gunna			Grass
119.	<i>Triticum vulgare</i>	Gandum, Wheat			Crop
120.	<i>Avena sativa</i>	Oat javi			Crop
121.	<i>Digitaria</i> sp.	Katran			Grass
122.	<i>Cenchrus biflorus</i>	Dhaman			Grass
123.	<i>Bambusa arundinacea</i>	Bamboo (Bans)			Grass
124.	<i>Coriandrum sativum</i>	Dhania	46	Umbelliferae	Herb
125.	<i>Salvia splendens</i>		47	Labiatae	Shrub
126.	<i>Ocimum basilicum</i>	Niazbo			Shrub
127.	<i>Araucaria</i> sp.		48	Araucariaceae	Tree
128.	<i>Punica granatum</i>	Anar	49	Lythraceae	Tree
129.	<i>Veronica</i> sp.		50	Scrophulariaceae	Herb-Shrub
130.	<i>Galium</i> sp.		51	Rubiaceae	Herb
131.	<i>Eicchornia crassipes</i>	Gul bakaauli	52	Potendriaceae	Aquatic plant
132.	<i>Luffa aegyptiaca</i>	Gia torri	53	Cucurbitaceae	Herb
133.	<i>Quisqualis indica</i>	Rangoon creeper	54	Combretaceae	Climber
134.	<i>Agava americana</i>		55	Agavaceae	Shrub
135.	<i>Adiantum</i> sp.	Ferm			Shrub
136.	<i>Populus</i> sp.	Poplar	55	Salicaceae	Tree
137.	<i>Salix tetrasperma</i>	Willow			

species are winter visitors and 13 species are summer visitors. While studying the habitat types 137 species of plants belonging to 55 families were also recorded.

Among residents house crow, house sparrow, common myna, bank myna, blue rock pigeon, brown dove, pariah kite, white backed vulture, Indian cliff swallow, jungle babbler, rufous backed shrike, baya weaver, red vented bulbul and white cheeked bulbul were recorded in large numbers. Whereas alexandrine parakeet, spotted owlet, coucal, large gray babbler, common babbler, gray hornbill and night heron were recorded in less numbers and they had small scattered families.

Ali and Ripley (1987) had recorded Little green bee-eater, red wattled lapwings and black drongo as

resident but they exhibited local movements.

Little green bee-eater is resident and recorded in large numbers during summers, but in small numbers during winters, only from localities near BRB canal. This is in conformity with Roberts (1991) that from Northern Punjab most of the little green bee-eaters disperse southwards to warmer regions during winter where insect food is available.

Hoopoe has a resident population in Lahore Cantonment and also migrant breeding population which probably winters in East Africa (Roberts, 1991). Large gray babbler is resident here. Ali and Ripley (1987) have not recorded it from Lahore while Roberts (1991) has reported it from Lahore and Jallo Park. Common babbler and Jungle babbler are resident and were recorded in large numbers

throughout the survey period confirming the observation of Ali and Ripley (1992). Spotted munia was recorded locally frequently by Roberts (1992), while in Lahore Cantonment it was locally rare.

Among residents Pied myna was not recorded by Roberts (1992), but Mirza (1982) reported small

Table II.- Birds species: 74 species of birds belonging to 55 genera, 38 families and 13 orders were recorded in Lahore Cantonment area. September 6, 1996 to September 30, 1997.

Order	Family	Scientific name	Common name
1. Pelecaniformes	1 Phalacrocoracidae	1 <i>Phalacrocorax niger</i>	1 Little Cormorant**
2. Ciconiformes	2 Ardeidae	2 <i>Ardeola grayii</i>	2 Paddy bird/Indian Pond Heron*
		3 <i>Bubulcus ibis</i>	3 Cattle egret*
		4 <i>Egretta garzetta</i>	4 Little egret**
		<i>Egretta intermedia</i>	5 Intermediate egret**
		5 <i>Nycticorax nycticoax</i>	6 Night Heron*
3 Accipitriformes	3 Accipitridae	6 <i>Elanus caeruleus</i>	7 Black shouldered kite@
		7 <i>Gyps bengalensis</i>	8 Oriental white backed vulture*
		8 <i>Milvus migrans</i>	9 Pariah Kite*
4 Galliformes	4 Phasianidae	9 <i>Coturnix coturnix</i>	10 Common quail@
5 Charadriiformes	5 Charadriidae	10 <i>Vanellus indicus</i>	11 Red wattled lapwing*
	6 Recurvirostridae	11 <i>Himantopus himantopus</i>	12 Black winged stilt**
	7 Rostratulidae	12 <i>Rostratula bengalensis</i>	13 Painted snipe**
	8 Scolopacidae	13 <i>Tringa glareala</i>	14 Wood sandpiper**
		<i>Tringa hypoleucos</i>	15 Common sandpiper**
6 Columbiformes	9 Columbidae	14 <i>Columba livia</i>	16 Blue rock pigeon*
		15 <i>Streptopelia decaocto</i>	17 Collared dove*
		<i>Streptopelia senegalensis</i>	18 Little brown dove*
		<i>Streptopelia tranquebarica</i>	19 Red turtle dove@
		16 <i>Treron phoenicoptera</i>	20 Green pigeon*
7 Psittaciformes	10 Psittacidae	17 <i>Psittacula eupatria</i>	21 Alexandrine parakeet*
		<i>Psittacula krameri</i>	22 Rose ringed parakeet*
8 Cuculiformes	11 Cuculidae	18 <i>Centropus sinensis</i>	23 Coucal/Crow pheasant*
		19 <i>Clamator jacobinus</i>	24 Pied crested cuckoo@
		20 <i>Eudynamis scolopaceae</i>	25 Koel@
9 Strigiformes	12 Strigidae	21 <i>Athene brama</i>	26 Spotted owl*
10 Apodiformes	13 Apodidae	22 <i>Apus affinis</i>	27 House swift*
11 Coraciiformes	14 Alcedinidae	23 <i>Halcyon smyrnensis</i>	28 White breasted kingfisher*
	15 Bucerotidae	24 <i>Tockus birostris</i>	29 Common grey hornbill*
	16 Coraciidae	25 <i>Coracias bengalensis</i>	30 Indian rollers@
	17 Meropidae	26 <i>Merops orientalis</i>	31 Little green bee-eater*
		<i>Merops superciliosus</i>	32 Blue cheeked bee-eater@
	18 Upupidae	27 <i>Upupa epops</i>	33 Hoopoe*
12 Piciformes	19 Capitonidae	28 <i>Megalaima haemacephala</i>	34 Coppersmith**
	20 Picidae	29 <i>Dendrocopos mahrattensis</i>	35 Mahratta woodpecker*
		30 <i>Dinopium benghalense</i>	36 Golden back woodpecker*
13 Passeriformes	21 Campephagidae	31 <i>Tephrodornis pondicerianus</i>	37 Common wood shrike**
	22 Corviidae	32 <i>Corvus splendens</i>	38 House crow*
	23 Dicruridae	33 <i>Dicrurus adsimilis</i>	39 Black drongo*
	24 Estrildidae	34 <i>Lonchura malabarica</i>	40 Spotted munia*
		<i>Lonchura punctulata</i>	41 White throated munia*
	25 Hirundinidae	35 <i>Hirundo fluvicola</i>	42 Indian cliff swallow*
		<i>Hirundo rustica</i>	43 Common swallow**
	26 Laniidae	36 <i>Lanius schach</i>	44 Rufous backed shrike*
		<i>Lanius cristatus</i>	45 Brown shrike**
		<i>Lanius vittatus</i>	46 Bay backed shrike*
	27 Monarchidae	37 <i>Terpsiphone paradisi</i>	47 Paradise fly catcher@
	28 Motacillidae	38 <i>Anthus novaeseelandiae</i>	48 Indian pipit* / Richards pipit/

39	<i>Motacilla alba dukhunensis</i>	49	Paddyfield pipit. White wagtail**
	<i>Motacilla citreola</i>	50	Yellow-headed wagtail**

Continued

Order	Family	Scientific name	Common name
		<i>Motacilla flava</i>	51 Yellow wagtail**
		<i>Motacilla maderaspatensis</i>	52 Large pied wagtail*
29	Nectarinidae	40 <i>Nectarinia asiatica</i>	53 Purple sunbird [@]
30	Oriolidae	41 <i>Oriolus oriolus</i>	54 Golden oriole [@]
31	Passeridae	42 <i>Passer domesticus</i>	55 House sparrow*
32	Ploceinae	43 <i>Ploceus benghalensis</i>	56 Black throated weaver*
		<i>Ploceus manyar</i>	57 Streaked weaver*
		<i>Ploceus philippinus</i>	58 Baya weaver*
33	Pycnonotidae	44 <i>Pycnonotus cafer</i>	59 Red-vented bulbul*
		<i>Pycnonotus leucogenys</i>	60 White-cheeked bulbul*
		<i>leucotis</i>	
34	Rhipiduridae	45 <i>Rhipidura aureola</i>	61 White browed fantail flycatcher*
35	Sturnidae	46 <i>Acridotheres ginginianus</i>	62 Bank myna*
		<i>Acridotheres tristis</i>	63 Common myna*
36	Sylviidae	47 <i>Sturnus contra</i>	64 Pied myna*
37	Timallidae	48 <i>Phylloscopus collybita</i>	65 Brown chiff chaffs**
		49 <i>Alcippe castaneceps</i>	66 Chestnut headed tit babbler*
38	Turdidae	50 <i>Turdoides caudatus</i>	67 Common babbler*
		<i>Turdoides malcolmi</i>	68 Large grey babbler*
		<i>Turdoides striatus</i>	69 Jungle babbler*
		51 <i>Copysychus saularis</i>	70 Magpie robin [@]
		52 <i>Phoenicurus ochruros</i>	71 Black redstart*
		53 <i>Prinia subflava</i>	72 Indian prinia*
		54 <i>Saxicola caprata</i>	73 Pied bush chat**
		55 <i>Saxicoloides fulicata</i>	74 Indian robin*

*Resident = 44 (59.46%); **Migratory winter visitor= 17 (22.97%); Summer visitor = 13 (17.37%)

flocks near Lahore. It was recorded in large numbers during summer while in winter it was recorded only from village Dograkhurd upto BRB Canal.

Alexandrine parakeet recorded as rare in Lahore by Lillah (1991), is getting almost extinct in Lahore Cantonment because of excessive netting and picking of young birds fledgling from the nest. Green pigeon is resident and rare in Lahore Cantonment confirming the observation of Lillah (1991). Indian cliff swallow is resident. According to Roberts (1992) this bird has a patchy distribution in Punjab plains. Among residents Rufous backed shrike was recorded throughout the survey period while the bay backed shrike only in winter season. This is in agreement with Baig (1992).

Among summer visitors black shouldered kite, red collared dove, koel, common quail, blue cheeked bee-eaters, Indian roller, purple sunbird,

golden oriole, paradise fly catcher, white browed fantail flycatcher, pied crested cuckoo, magpie robin and chestnut headed tit babbler were recorded. Red turtle dove, coppersmith and white browed fantail flycatcher are oriental in origin. According to Ali and Ripley (1987) red turtle dove is resident, but found to be summer visitor in agreement with Roberts (1992) White browed fantail flycatcher was recorded in small numbers as observed by Roberts (1992). Black shouldered kite is a summer visitor to Lahore Cantonment while Chaudhary *et al.* (1992) have recorded it as resident. According to Ali and Ripley (1987) this bird has patchy distribution in Punjab parts of Pakistan and is resident here. Koel and Pied crested cuckoo are summer visitors in Lahore Cantonment. Brood parasitic tendencies are highly developed in members of Family Cuculidae. According to Lillah (1991) and Ali and Ripley (1987) pied crested cuckoo and koel are brood

parasites. 71% of jungle babbler nests, 38.7% of the Common babbler nests were parasitized by pied crested cuckoo. According to Roberts (1992) koel is also brood parasitic on house crow in Pakistan.

Golden oriole, a summer visitor, has maximum population from May to September and this confirms the observations of Lillah (1991). According to Roberts (1992) golden oriole has maximum population from May to August, wintering in E. Africa and breeding in inner Himalayas arriving in Lahore in the last week of March.

Blue-cheeked bee-eater is a common summer visitor to Lahore Cantonment. It is Oriental in origin occurring widely in S.E. Asia, migrates from India, S.E. China and Indo-China, wintering in the Philippines and Celebes, is summer visitor to Punjab and N.W. Pakistan (Ali and Ripley, 1987; Roberts, 1991).

Paradise flycatcher is a rare summer visitor in Lahore Cantonment in agreement with Lillah (1991). Roberts (1992) has also recorded breeding pairs in Gulberg, Lahore. According to Ali and Ripley (1987) it is a common summer visitor to Punjab.

Indian magpie robin is a common summer visitor to Lahore Cantonment but Ali and Ripley (1987) have reported magpie robin as resident, while Roberts (1992) reported it as scarce. But during the survey it was recorded as common. Chestnut-headed tit-babbler is summer visitor to the area. Roberts (1992) has excluded the chestnut-headed tit-babbler from the checklist of birds of Pakistan but according to Ali and Ripley (1987) it is resident and common. Shahid (1996) reported it from Rawalpindi, Pakistan. Purple sun-bird was recorded only in summer season in agreement with Ali and Ripley (1987) and Roberts (1991).

Among winter visitors to the area little egret; intermediate egret, painted snipe, common sandpiper, wood sandpiper, yellow wagtail, yellow headed wagtail, white wagtail, common swallow, little cormorant, brown shrike, coppersmith, black redstart, pied bush chat, black winged stilt, brown chiff chaff and common shrike were recorded. Black winged stilt was recorded in small large groups from marsh areas from Burki upto BRB Canal. This is in agreement with Ali and Ripley (1987), it is a winter

visitor to N.W. Pakistan and shows local migration under stress of water conditions. Brown shrike was excluded from the checklist of Pakistan by Roberts (1972), but it was recorded as a rare winter visitor favouring Ripley's Revised Synopsis (1982), according to which its range extended to Punjab parts of Pakistan. Brown chiff chaffs is a common winter visitor. According to Roberts (1992) brown chiff chaffs breeds in the former Soviet Union. Coppersmith is Oriental in origin and is common here in agreement with Roberts (1992) who reported it to be a common winter visitor to plains of Punjab. Wood sandpiper and common sandpiper are common winter visitors, in agreement with Ali and Ripley (1987). White wagtail, yellow wagtail and yellow headed wagtail were winter visitors and were recorded from September to February. White wagtail likes the company of large pied wagtail and other wagtails. Little cormorant is rare winter visitor on marsh areas near BRB canal. According to Ali and Ripley (1987) it is resident and shows local movements depending on water conditions. According to Roberts (1992) it spreads out to seasonal swamps; during monsoon season. It is quite rare in Punjab. Common swallow is a common winter visitor in agreement with Roberts (1992). Cattle egret and pond heron were recorded in small numbers. But before the beginning of monsoon and during monsoon their population increased to considerable numbers, large flocks were observed in the fields associated with the monsoon.

In addition to biological check, man itself is a major ecosystem destroyer. Many bird species have been affected by human interventions. Due to unlawful netting of alexandrine parakeet, it is almost extinct. Moreover, destruction of wildlife habitats due to urbanization, shooting and explosions in army training centers, pollution of water by wastes from brick kilns and chemical effluents are major factors that have detrimental effect on the avian fauna of the area. Moreover, the polluted water from BRB canal and Khairy Distributory left by farmers in their fields has resulted in an increase in mortality rate of water loving birds. The rubbish heaps, household garbage and plastic bag's non-degradable toxic material have negative effects on human health as well as on wildlife inhabiting the area. Misuse/overuse of insecticides, pesticides and

chemical fertilizers results into non-degradable toxic chemicals, which are incorporated in food chain. Noise pollution is increasing beyond the audible limits of human beings as well as avian species. Due to this reason a large number of birds have migrated from the area near Army training centers and R.A. Bazar graveyard. Another cause of the decline of avian fauna in Lahore Cantonment is unawareness, lawlessness, limitless netting of birds by people and lack of interest by the Wildlife Department.

RECOMMENDATIONS

1. Grazing by sheep, goats and cattle should be prohibited in graveyards.
2. Small automobiles like rickshaws, taxies and wagons are totally banned in Lahore Cantonment and instead buses should be provided to wagon owners.
3. Indiscriminate cutting and burning of wild grasses and bushes from graveyards should be controlled.
4. Burning should also be not allowed in open places.
5. Visitors should not be allowed to throw away garbage anywhere. A proper cleaning system should be introduced in small parks, gardens, graveyards, green lawns and belts of Lahore Cantonment.
6. Netting of birds should be checked and the violators be punished.
7. Efforts should be made to create awareness in the people, not to throw away garbage in graveyards, in parks and open places, which deteriorate and pollute the environment.
8. To create awareness in farmers about the harmful effects of insecticides, pesticides and chemical fertilizers on human health and avian life; they should be approached to use the new harmless technologies like biocides, etc.
9. Environmental education programmes must be started for the general public, which is also a necessary step for the conservation of wildlife habitats in the affected areas.
10. Many birds like alexanderine parakeet are

endangered and vying for their survival. Ornithological societies should be formed in schools, colleges and at Mohallah levels providing awareness to general public about the importance and conservation of wildlife.

11. There must be some rules and regulations to stop the mass killing of birds in Lahore Airport.

From the above discussion it is concluded that life of many bird species is in danger due to habitat destruction and environmental pollution in Lahore Cantonment.

It is the need of the hour that Environment Protection Agencies and Wildlife Department should work in close collaboration and to take necessary steps against environmental violations. The violators should be punished according to their laws. This is important for the future of wildlife in this area. If we do not act fast there will be a time when nature will not exist and birds would be wiped out not only from this area, but also from the surface of earth.

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