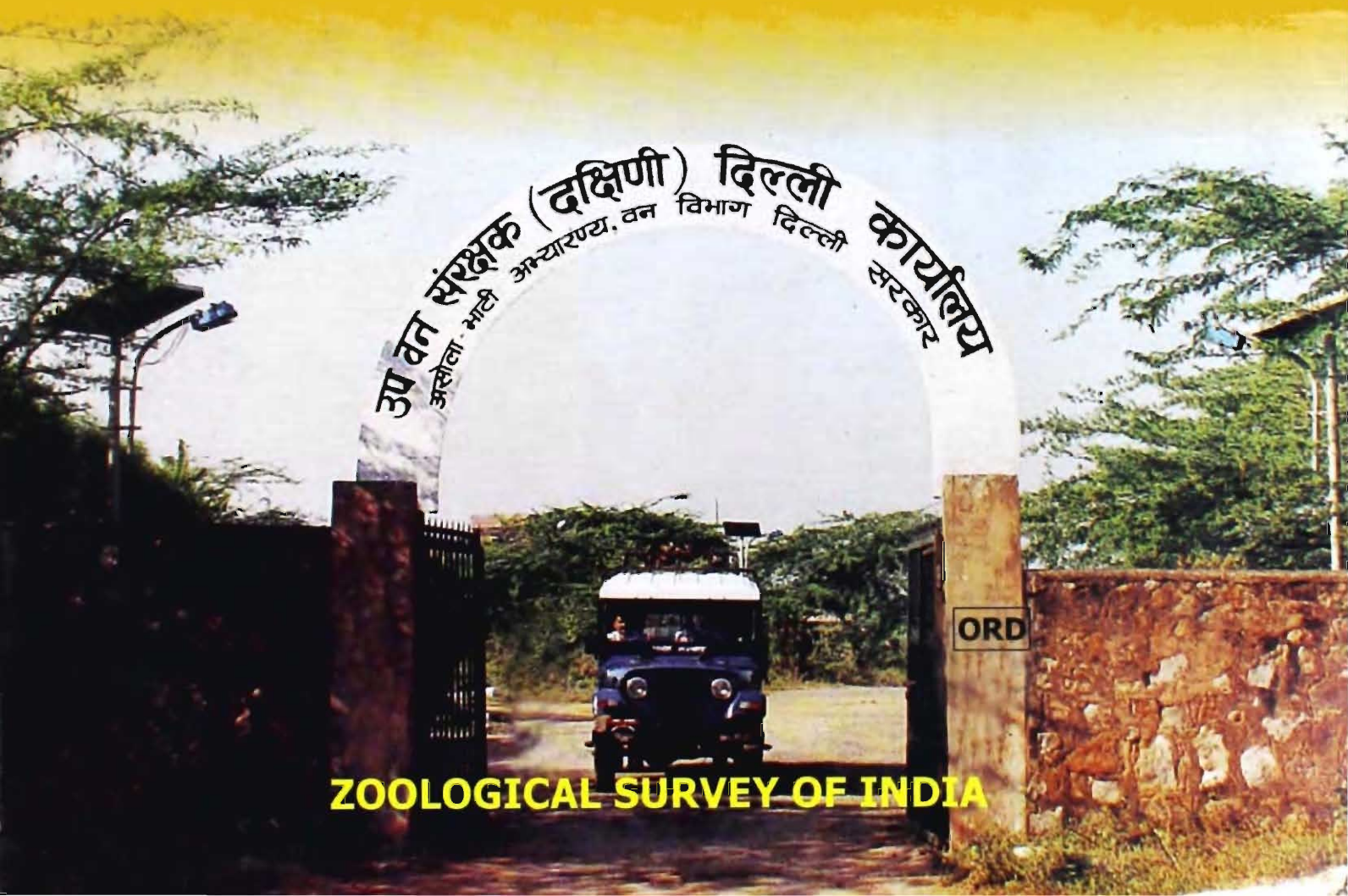


SOME SELECTED FAUNA
Of
ASOLA-BHATTI WILDLIFE SANCTUARY
(DELHI)



ZOOLOGICAL SURVEY OF INDIA

Fauna of Conservation Area No. 16

SOME SELECTED FAUNA
of
ASOLA-BHATTI WILDLIFE SANCTUARY

Edited by the Director, Zoological Survey of India, Kolkata.



Zoological Survey of India
Kolkata

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PREFACE

The Asola-Bhatti Wildlife Sanctuary is the only manmade sanctuary, which represents northeastern flat-topped hill form of country's oldest hill ranges—the Aravalli. The sanctuary is quite different from the popular perception of the protected area mainly because of its use and abuse by ever increasing anthropogenic pressures mainly for extraction of quartzite commonly known as Badarpur or Bajri by mining communities; livestock grazing; fuel wood collection; transportation of truck loads of Badarpur sand; fodder collection etc. and for conservation and propagation of exotic and native species of plants and animals.

Various agencies had been working in revitalizing the biological and ecological potentials of Asola-Bhatti Wildlife Sanctuary during the recent past. Kalpavriksh (1991) has documented the fauna and flora of Delhi ridge followed by Sawarakar and Hussain (1997) and Kumar and Khanna (1997). Zoological Survey of India (1997) published fauna of Delhi covering also the Asola-Bhatti Wildlife Sanctuary. As these studies were covering the broader area of ridge and other ecological areas of Delhi, it was taken in to account that to decipher the existing biodiversity of the area, its past potential and possible re-introduction or rehabilitation of the species lost earlier due to dismal degradation, erosion, mining and other human interference over the time.

The conservation areas provide ideal sites for the conservation and management of the faunal and floral elements. Delhi being a metropolitan city with terminal fringes of the Aravalli ranges remaining partly visible in four patches, the creation of the Asola-Bhatti Wildlife Sanctuary, the only known man made sanctuary, has provided, besides conservation, a site for green Delhi and a carbon sink for city sour Delhites.

The present document covers inventorying of some selected faunal elements belonging to invertebrates and vertebrate groups covering nearly 310 species, which includes their systematic position, material examined, locality records etc., with distribution within park vis-a-vis in India. Remarks and status in case of mammals and a list of threatened mammals and birds has also been provided. Photographs of some of the faunal components, habitat and satellite imagery of the sanctuary have been provided.

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They are further thankful to Dr. Arun Kumar, Additional Director & Officer-in-Charge, Northern Regional Station, Dehra Dun, for responding his faith in our capability and assigning us the onerous and challenging task of coordinating and providing ideal guidance during the tenure of the project and also in submission of the document within allotted time-frame. Beyond doubt, the difficult task would not have been possible without his active support, supervision, foresightedness and long-term planning.

We shall be failing in our duties if we do not acknowledge the authorities of Asola-Bhatti Wildlife Sanctuary, Delhi and New Delhi Municipal Corporation, for extending various facilities and support to the scientists in the field surveys. It would not be out of place to record our grateful thanks to Dr. K. G. Ghorpade, Kalpavriksh - a Delhi based NGO, and scientists of Wildlife Institute of India for providing basic inputs.

Our sincere thanks are also due to various survey parties, their leaders and their associated respective teams, in having surveyed the sanctuary area thoroughly well during various seasons and coming out with fruitful results, the fallout of which is the present document.

Thanks are also due to the scientists of the Northern Regional Station, Dehra Dun for minutely studying the material, consulting literature critically and submitting their reports in the desired format efficiently.

We would not let the opportunity go without having acknowledged the help of our various colleagues in the technical and administrative sections at Northern Regional Station. Our special thanks are also due to our two staff car drivers, namely Shri Nag Chand and Shri Siddhartha Mondal for their all time preparedness to enter into the woodland during the surveys.

J. P. Sati and Vinod Khanna

**SOME SELECTED FAUNA OF
ASOLA-BHATTI WILDLIFE SANCTUARY
CONSERVATION AREA SERIES**

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ASOLA-BHATTI WILDLIFE SANCTUARY—AN OVERVIEW

VINOD KHANNA AND J. P. SATI

Zoological Survey of India, Northern Regional Station. Dehra Dun - 248 195

INTRODUCTION

The City of Delhi straddles across a disconnected flat-topped hill known as 'ridge', which is the northernmost terminal of Aravalli hills, one of the oldest mountain systems of the world. The ridge enters Delhi from Gurgaon (Haryana) in the south and breaks into four disk spurs, now known as the Northern or Old Delhi ridge (87 ha), Central or New Delhi ridge (864 ha), South-central ridge (4266 ha) and Southern ridge (6200 ha). The total forest area of these four reserves is 7777 ha while the other forested area declared protected in Delhi is 674 ha. The north and the central ridges were notified as reserved forests in 1942 but the status of the southern ridge remained uncertain till 1986 when Asola Wildlife Sanctuary was carved from the community land of three villages.

Asola-Bhatti Wildlife Sanctuary, located on the southeastern part of south ridge is a man-made sanctuary. The **Asola Sanctuary** (Area : 4707 Acres)- was declared as a protected area in 1986 and subsequently **Bhatti Area** (2107 Acres) too came in this category under the Section 18 of Wildlife (Protection) Act, 1972 and collectively came to be known as a Asola-Bhatti Wildlife Sanctuary.

The Asola-Bhatti Wildlife Sanctuary serves the purpose of :

- A potential green lung and carbon sink.
- Conservation, education and nature interpretation programme.
- A shelterbelt against advancing aridity.
- Conserving indigenus flora and fauna.
- A nature's foremost line of defence against soaring mercury for the Delhites and by passers.
- A barrier to dust and desertification.
- As an effective buffer to absorb noise pollution.
- Providing immense potential for environment educational programs for the learning of the children and ultimately it is a home to a number of non-human living creatures, which have as much a right to live as human does.

The above functions are achieved in this artificially created sanctuary through innovations in the phased manners such as :

- Soil and moisture conservation measures like trenching, check damming, construction of small ponds etc.
- Natural regeneration-cum-enrichment planting for habitat development to achieve multi-storied and multi-layered forest area.
- Setting up of natural education trail.
- Nature's interpretation center to increase education and aesthetic value of the area.
- Setting up of walk-in aviary.

Out of 489 Wildlife Sanctuaries and 89 National Park in India, at present, the Asola-Bhatti Wildlife Sanctuary is the only area, which represents northeastern flat-topped hill form of country's oldest hill ranges - the Aravalli. The sanctuary is very different from the popular perception of the protected area mainly because of its use and abuse by ever increasing anthropogenic pressures mainly for extraction of quartzite commonly known as Badarpur or Bajri by mining communities; livestock grazing; farming along its fringes; dumping of degradable and non-degradable garbage; fuel wood collection; collection of non-wooded forest produce like Ber, for personal and commercial use as well; transportation of truck loads of Badarpur sand; fodder collection; collection of medicinal plants, in addition to biodiversity conservation and propagation of exotic and native species of plants and animals. The other most important feature is the construction of a high wall around the sanctuary and its encroachment by the local people.

Notifications

In order to putrefy to the already heavily degraded, scarred and impoverished land, the Asola and Bhatti areas were declared by the Government of Delhi as Wildlife Sanctuary under Sanction 18 of the Wildlife (Protection) Act, 1972, in the year 1986 and 1991 respectively, as detailed below, to safeguard its biological potential and ecological functions.

Asola Wildlife Sanctuary : Notification No. F.3 (116)/CWLW/84/897 dated 9th October 1986; Area : 4707 Acres.

Bhatti Wildlife Sanctuary : Notification No. F.2 (19)/DCF/90-91/1382-91 dated 15th April 1991. Area : 2166.28 Acres.

The geographic area of Delhi is 1,483 km², of which 26 km² is recorded as forest, which constitutes 1.7% of the total geographical area while the forest cover of Asola-Bhatti Wildlife Sanctuary (2750 ha) constitutes 32.54% of Delhi's total forest cover (8451 ha, which includes 7777 ha of four reserve forests, 614 ha of 40 protected and other forest areas, and 60 ha of two city forests).

Objectives of Creating the Sanctuary

In addition to its sufficient ecological functions, floral, faunal and geomorphologic significance, the sanctuary may also function :

1. To enrich already impoverished Aravalli ecosystem and contribute to the city's life support system.
2. To improve the environment by functioning as an alternate green lung/Green Buffer by:
 - i) Acting as a carbon and other pollutant sink.
 - ii) Creating a barrier and act as shelter against advancing desert sand and dust.
 - iii) Acting as a thermo-regulator by creating its evaporation regime.
3. By providing the vital benefits of maintaining ground water regime, especially in the areas in and around Delhi suffering acute water shortage.
4. To provide a lesson in conservation and nature interpretation programs across the existing and recovering vegetation on the ridge from the greens to presently desolate sites.
5. To serve as a learning center for management of degraded sites, for restoration of potentials.
6. Once developed the sanctuary will cater to recreation and aesthetic values vital for restoring efficiency of citizens as also the restoration of biological potentials and ecological functions again with the underlying idea to revive the lost grandeur of the world's oldest mountain range.

Physiography

The part of the Asola-Bhatti Wildlife Sanctuary falls under tropical thorn forest zone; the natural regeneration would, therefore, lead a xerophytic higher density forest over moist sites. However, the area of sanctuary is barren, dry and honey combed with pits and roads and grasses coming up diffused with xerophytic plants.

The 230 m contour line of ridge, situated between the co-ordinates 28°24' N and 77°12' E, is the western boundary of gangetic plains, east of which are the vast sedimentary flats of Indo-gangetic plains. The sanctuary falls under the Kohi or the Pahari (hillside) physiographic division, which represents highly rocky and undulating landform (Kalpavriksha 1991). The land is characterized by weathered plateau, the highest point being 320 m ASL at Bhatti. The area is broken into spurs and is dominated by exposed, irregularly disturbed boulders of the pre-Cambrian quartzite rock base. The soil is thin, dry and sandy with high porosity and low humus status supporting sparse vegetation of scrubby nature (Sawarkar and Hussain, 1996). The extensive weathering of these quartzite rocks yield high quality silica sand locally known as Badarpur sand Bajri.

Climate

Typically continental climate characterized by cold winter months and hot and dry summer months. Cool oceanic air is able to penetrate the area only during the months of July, August and September i.e. during monsoons. The SW monsoon has a major impact as most of the precipitation is received during this period and effects both vegetation and fauna of the area. The Thar Desert to the west and gangetic plains to the east also influences the general climate.

Hydrology

The abandoned mining pits have become a source of water accumulation and are used by aquatic fauna to survive. About 27 water pits have been developed for providing water to wildlife, most of them do not, however, retain water during summers. The perennial natural water bodies, streams and springs do not exist in the sanctuary. The water table is very low at least 600 ft below surface (WWF, 1995).

The surface runoff of the water is very low on account of principally sandy nature of the area. The water quickly seeps down and gets trapped in underlying rocks. The water table depth varies from 35-40m in Bhatti. The ground water is used for irrigation and drinking purposes in the plains and flat areas adjoining the sanctuary.

Biodiversity Profile

Vegetation : Maheswari (1963) describes the vegetation as semi-arid thorny scrub while Champion and Seth (1968) designate it as northern tropical thorn forest. Open canopied thorny appendages, wax coated, succulent and tomentose leaves. In spite of the tremendous anthropogenic pressures the sanctuary displays sufficient samples of the native floral and faunal communities necessitating reinforcement of its conservation. *Acacia nilotica*, *A. leucophloea*, *A. catechu* and *A. modesta* are some of the native vegetation in addition to *Butea monosperma*, *Cassia fistula* and *Salvadora persica*. A few scattered trees like *Anogeissus pendula* are seen besides shrubs like *Capparis sepiaria*, *C. decidua*, *Tribulus terrestris*, *Zizyphus aenoplia*, *Croton sparaiflorus*, *Tephrocia purpurea*. *Prosopis juliflora* - an exotic species (of Mexico) planted some times back has established on barren de-vegetated area and areas near human settlements. These form the chief vegetal cover in the sanctuary. The common herbaceous flora is *Calotropis procera*, *Withania somnifera*, *Achyranthes aspera*, *Aerva scandens*, *Tridax procumbens*, *Alysicarpus vaginalis*, *Euphorbia hierta*, *Pupalia lappacea* and *Peristrophe bicalyculata*. The soil commonly supports good variety of grasses in the protected areas and species like *Cenchrus ciliaris*, *Aristida spp.*, *Eragrostis poaeoides*, *Saccharum spontaneum* and *Vitiveria zizanoides* are a common sight. After the declaration of the area as sanctuary and stopping of mining - both legal and illegal, the habitat once extensively damaged and eroded started showing signs of recovery of some natural and exotic vegetation.

Sawarkar and Hussain (1997) have reported that according to an unpublished report of the herbarium section of the Wildlife Institute of India, Dehra Dun there are about 150 species of plants in Asola-Bhatti Wildlife Sanctuary, Delhi, including native ones some of which are listed below :

- | | |
|--|---------------------------------------|
| 1. <i>Accacia nilotica</i> (Linn.) | 2. <i>A. leucoploea</i> Wild |
| 3. <i>A. catechu</i> (Linn.) | 4. <i>A. modesta</i> Wall |
| 5. <i>Butea monosperma</i> (lam.) | 6. <i>Cassia fistula</i> Linn. |
| 7. <i>Salavadora persica</i> Linn. | 8. <i>Anogeissus pendula</i> Edgew |
| 9. <i>Capparis sepiaria</i> Linn. | 10. <i>C. deciduas</i> (Forsk) |
| 11. <i>Tribulus terrestris</i> Linn. | 12. <i>Zizyphus oenoplia</i> Linn. |
| 13. <i>Croton sparaiiflorus</i> Linn. | 14. <i>Tephrocia pumila</i> (Lam.) |
| 15. <i>Prosopis juliflora</i> | 16. <i>Calotropis procera</i> Ait.f. |
| 17. <i>Withania somnifera</i> (Linn.) | 18. <i>Achyranthus aspera</i> Linn. |
| 19. <i>Aerva sanguinolenta</i> (Linn.) | 20. <i>Tridax procumbens</i> |
| 21. <i>Alysicarpus vaginaliis</i> DC | 22. <i>Euphorbia hierta</i> Linn. |
| 23. <i>Pupalia lappacea</i> (Linn.) | 24. <i>Peristrophe bicalyculata</i> |
| 25. <i>Cenchrus cilliaris</i> Linn. | 26. <i>Ariostida</i> sp. |
| 27. <i>Ergostis poaeodes</i> Beauv | 28. <i>Saccharum spontaneum</i> Linn. |
| 29. <i>Vetiveria zizanioides</i> (Linn.) | |

Pant *et al.* (1997) classified the forest of Asola-Bhatti Wildlife Sanctuary, Delhi into the following categories :

1. *Prosopis juliflora* : Closed Forest (40%) - commonly known as Vilayati Kikar.
2. *Prosopis juliflora* : Open forest (50%).
3. *Anogeissus pendula* : Dominated open forest along eastern boundary amidst loose boulders and patches of rock out crops.
4. Scrub/Shrub : Comprising *Capparis sepiaria*, *C. decidua*, *Croton sparaiiflorous*, *Tephrosia purpurea*, *Zizyphus* spp., *Belanites aegyptica*, *Acacia leucophloea*, etc.

Faunal Profile : The main faunal element includes Nilgai, Jungle Cat, Small Indian Civet, Ruddy Mongoose and Small Indian Mongoose, Rufous Tailed hare, Porcupine, Spiny tailed lizard and about 200 species of resident and migratory birds. Hyaena, Leopard, Wolf and Chinkara, reported in the Gazetteer of Delhi, have not been sighted after 1940.

While various agencies are engaged in revitalizing the biological potentials and ecological functions of Asola-Bhatti Wildlife Sanctuary, it becomes obligatory to decipher the existing biodiversity of the area, its past potential and possible re-introduction or rehabilitation of the species lost earlier due to dismal degradation, erosion, mining and other human interference over the time. Kumar and Khanna (1997) published a faunal profile of ABWLS based on the work of Kalpavriksha (1991), Sawarkar and Hussain (1997) and Zoological Survey of India (1997). The comprehensive and updated faunal profile provided incorporated inventory of 246 species of fauna spreading over 3 species of Mollusca, one species of Thysaneura, one of Odonata, nine of Orthoptera, four of Isoptera, 4 of Coleoptera, one Diptera, 4 Lepidoptera, 5 Hymenoptera, 3 Chilopoda amongst invertebrates, and 2 species of Amphibia, 3 species of Reptilia, 196 species of Aves and ten species of Mammalia amongst vertebrates, as listed below :

Invertebrata

1. MOLLUSCA

1. *Succinea elegantior* Annandale
2. *Zootecus pullus* Gray
3. *Allopeas gracile* (Hutton)

2. ARTHROPODA : INSECTA

Order THYSANEURA

4. *Ctenolepisma ciliata* (Dufour)

Order ODONATA

5. *Panatala flavescens* (Fabricius)

Order ORTHOPTERA

6. *Acrida exalta* (Walker)
7. *Caloptenopsis glaucopsis liturifer* (Walker)
8. *Cyracanthacris tatraca* (Linn.)
9. *Acheta domesticus* Linn.
10. *Gryllus bimaculatus* De Geer
11. *Plebeiogryllus guttiventris* (Walker)
12. *Gryllodes sigillatus* (Walker)
13. *Gryllopsis* sp.
14. *Spathesternum prasiniferum prasiniferum* (Walker)

Order ISOPTERA

15. *Trinervitermes biformis* (Wasmann)
16. *Rhinocoris marginatus* (Fab.)

17. *Ranatra elongata*
18. *Laccotrepes rubber*

Order COLEOPTERA

19. *Eretes sticticus* Linn.
20. *Hydaticus luzonicus aube*
21. *Coccinella septempunctata* Linn.
22. *Mylabris phalerata* (Pall)

Order DIPTERA

23. *Promachus duvaucelii*

Order LEPIDOPTERA

24. *Catopsillia pomona* (Fab.)
25. *Tetias laeta* Boisduwal
26. *Danaus chrysippus* (Linn.)
27. *Hypolimnas missipus* Donahue

Order HYMENOPTERA

28. *Parapsammophilia erythrocephalus* (Fab.)
29. *Stzus vespifrons* (Fab.)
30. *Anochetus* sp.
31. *Messor barbarus* (Linn.)
32. *Camponotus compressus* (Fab.)

Class CHILOPODA

Order SCOLOPENDROMORPHA

33. *Scolopendra morsitans* Linn.
34. *Scolopendra nudus* (Jangi and Dass)
35. *Asanada indica* (Jangi and Dass)

Vertebrata

Class AMPHIBIA

36. *Rana cyanophlyctes* Schneider
37. *Rana tigrina* Daudin

Class REPTILIA

38. *Sitana ponticeriana* Cuvier
39. *Hemidactylus brooki* Gray
40. *Uromastix hardwickei* Gray

Class AVES

41. *Podiceps ruficollis*
42. *Fulica atra*
43. *Pterocles indicus indicus*
44. *Hirundo concolor*
45. *Tringa tetanus*
46. *Phalacrocorax niger*
47. *Ardea cineria*
48. *Ardeola grayii*
49. *Bubulcus ibis*
50. *Egretta garzetta*
51. *Mycteria leucocephala*
52. *Anas poecilorhyncha*
53. *Sarkidiornis melanots*
54. *Elanus caeruleus*
55. *Pernis ptilorhynchus*
56. *Milvus migrans lineatus*
57. *Mivus migrans govinda*
58. *Accipiter badius*
59. *A. nisus*
60. *Buteo rufinus*
61. *Butio hamilasius*
62. *Butasor teesa*
63. *Aquila heliaca*
64. *A. rapax vindhiana*
65. *A. rapax nipalensis*
66. *A. clanga*
67. *Sercogyps calvus*
68. *Gyps indicus indicus*
69. *G. bengalensis*
70. *Neophron pernopterus*
71. *Circus cyaneus*
72. *C. pygargus*
73. *C. aeruginosus*
74. *Spilornis cheela*

75. *Felco peregrinus*
76. *F. subbuteo*
77. *F. chequera*
78. *F. tinnunculus*
79. *Francolinus francolinus*
80. *F. pondicerianus*
81. *Coturnix coturnix*
82. *Pavo cristatus*
83. *Amaurornis phoenicurus*
84. *Gallinula chloropus*
85. *Vanellus indicus*
86. *V. malabaricus*
87. *Tringa ochropus*
88. *T. glareola*
89. *Burhinus oedcnemus*
90. *Treron phoenicoptera*
91. *Columba livia*
92. *Streptopelia orientalis*
93. *S. decorata*
94. *S. tranquebarica*
95. *S. chinensis*
96. *S. senegalensis*
97. *Psittacula eupatria*
98. *P. krameri*
99. *P. cyanocephala*
100. *Clamour jacobinus*
101. *Cuculus varius*
102. *C. canorus*
103. *Eudynamus solopacea*
104. *Taccocus leschenaultii*
105. *Centropus sinensis*
106. *Tylo alba*
107. *Otus scops*
108. *O. bakkamoena*
109. *Bubo bubo*
110. *B. coromandus*

111. *Athene brama*
112. *Caprimulgus indicus*
113. *C. macrurus*
114. *C. asiaticus*
115. *C. affinis*
116. *Apus affinis*
117. *Ceryle rudis*
118. *Alcedo atthis*
119. *Halcyon smyrensis*
120. *Merops superciliosus*
121. *M. orientalis*
122. *Coracias benghalensis*
123. *Upupa epops*
124. *Tockus birostris*
125. *Anthracoceros malabaricus*
126. *Megalaima zeylanica*
127. *M. hymocephala*
128. *Jynx torquilla*
129. *Dinophium bengalense*
130. *Picoides mahrattensis*
131. *Mirafra erythroptera*
132. *Galerida cristata*
133. *Alauda gulgula*
134. *Riparia paludicola*
135. *Hirundo rustica*
136. *H. fluvicola*
137. *H. darurica*
138. *Lanius excubitor*
139. *L. vittatus*
140. *L. cullourio*
141. *L. schach*
142. *Oriolus oriolus*
143. *Dicrurus adsimilis*
144. *D. leucophaeus*
145. *Sturnus pagodarum*
146. *S. contra*

147. *S. rosus*
148. *S. vulgaris*
149. *Acridotheres tristis*
150. *A. ginginianus*
151. *Dendrocitta vagabunda*
152. *Corvus splendens*
153. *C. macrorhynchus*
154. *Tephrodornis pondicerianus*
155. *Coracina novahollandae*
156. *Pericrococtus flammeus*
157. *P. brevirostris*
158. *P. ethologus*
159. *P. cinnamomeus*
160. *P. erythropygus*
161. *Aegithina nigrolutea*
162. *Pycnotus jacostus*
163. *P. leucogenys*
164. *P. cafer*
165. *Hypsipetus agaskariensis*
166. *Chrysoma sinense*
167. *Turdoides caudatus*
168. *T. malcolmi*
169. *T. straiatus*
170. *Musicapa striata*
171. *M. parva*
172. *M. superciliaris*
173. *M. rubecoloides*
174. *M. thalassina*
175. *Culicappa ceylonensis*
176. *Rhipidura aureola*
177. *Trepesiphone paradisi*
178. *Cisticola juncidus*
179. *Prinia hodgsonii*
180. *P. buehleri*

181. *P. subflava*
182. *P. socialis*
183. *P. flaviventris*
184. *Orthoptomus sutorius*
185. *Acrocephalus stentorius*
186. *A. dumetorum*
187. *A. agricola*
188. *Hippolaris caligata*
189. *Sylvia hortensis*
190. *S. cummunis*
191. *S. curruca*
192. *Phylloscopus collybita*
193. *P. tyleri*
194. *P. affinis*
195. *P. griseolus*
196. *P. pulcher*
197. *P. inornatus*
198. *P. suviridis*
199. *P. magnirostris*
200. *P. trochiloides*
201. *P. trochiloides*
202. *P. occipitalis*
203. *Erithacus svecicus*
204. *Copsychus saularis*
205. *Phoenicurus ochruros*
206. *Cercomela fusca*
207. *Saxicola torquata*
208. *S. caprata*
209. *Saxicoloides fulicata*
210. *Monticola cinclorhynchus*
211. *Zoothera citrina*
212. *Turdus unicolor*
213. *T. rufficolis*
214. *Sitta castanea*

215. *Anthus hodgsoni*
216. *A. trivialis*
217. *A. simiilis*
218. *Motacilla flava*
219. *M. citreola*
220. *M. caspica*
221. *M. alba*
222. *M. madraspatensis*
223. *Dicaeum agile*
224. *Nicterina asiatica*
225. *Zosterops palpebrosa*
226. *Passer domesticus*
227. *Patronica xanthocollis*
228. *Ploceus philippinus*
229. *Estrida amandava*
230. *Lonchura malabarica*
231. *L. punctulata*
232. *M. malacca*
233. *Caprodacus erythrinus*
234. *Emberzia stewarti*
235. *E. buchhanani*
236. *Melophus lathami*

Class MAMMALIA

237. *Macaca mulatta*
238. *Canis aureus*
239. *Herpestes auropunctatus*
240. *Boselaphus tragocamelus*
241. *Lepus nigricolis*
242. *Herpestis smithi*
243. *Viverricula indica*
244. *Felis chaus*
245. *Hystrix indica*
246. *Funambulus pennanti*

During the course of surveys presently undertaken from 1997-1999 (Table 2) by the Zoological Survey of India, additional records of 64 more species studied/observed, in various groups, have been reported in the present document, as appended in the Table 1 below :

Table 1 : Faunal Status of the various groups of animals

Faunal Groups	No. of species already known (Kumar and Khanna, 1997)	No. of species recorded/observed during present surveys	No. of species added to the known fauna of Asola-Bhatti Wildlife Sanctuary	Latest status of the animal group in Asola-Bhatti Wildlife Sanctuary
Invertebrata				
Mollusca	3	*		3
Arthropoda				
Insecta				
Thysaneura	1	*		1
Odonata	1	12	11	12
Orthoptera	9	*		9
Isoptera	4	*		4
Coleoptera	4	*		4
Diptera	1	*		1
Lepidoptera	4	25	23	27
Hymenoptera	5	11	8	13
Chilopoda	3	4	2	5
Vertebrata				
Pisces	0	3	3	3
Amphibia	2	5	3	5
Reptilia	3	4	4	7
Aves	196	82	2	198
Mammalia	10	18	8	18
Total	246	164	64	310

Note : *: Fauna collected but not identified and reflected in the present document

Table 2 : Schedule of Field Surveys :

	Party	Dates of surveys	Duration
1.	Dr. N. K. Sinha and party	1.viii.1997-10.viii.1997	10 days
2.	Dr. S. K. Gupta and party	26.ii.1998-7.iii.1998	10 days
3.	Dr. Vinod Khanna and party	23.x.1998-1.xi.1998	10 days
4.	Sh. J. P. Sati and party	17.xii.1999-25.xii.1999	09 days

THREATENED FAUNA

The following table lists the threatened species reported from ABWLS, as listed in the Red Data Book (RDB) of the Zoological Survey of India (ZSI) and International Union for Conservation of Nature and Natural Resources (IUCN) respectively, vis-a-vis their status as assigned in the Indian Wildlife (Protection) Act, 1972, their designation in the appendices of Convention on International Trade in Endangered species of Fauna and Flora (CITES).

	Species	Red Data Book ZSI, 1994	W(P) Act 1972	CITES
A. Mammalia	1. <i>Macaca mulatta</i>	—	Sch. II	—
	2. <i>Canis aureus</i>	—	Sch. II (I)	—
	3. <i>Viverricula indica</i>	—	Sch. II (II)	App. III
	4. <i>Herpestes edwardsii</i>	—	Sch. IV	App. III
	5. <i>Herpestes smithi</i>	—	Sch. IV	App. III
	6. <i>Canis hyaena</i>	—	Sch. III	—
	7. <i>Felis chaus</i>	—	Sch. II (II)	App. II
	8. <i>Antelope cervicarpa</i>	Vu	Sch. I	App. III
	9. <i>Manis crassicaudata</i>	Vu	Sch. I	App. II
B. Aves	10. <i>Pavo cristatus</i>	Vu	Sch. I	App. I

PROBLEMS OF MANAGEMENT AND CONSERVATION

Certain environmentalist groups feel that the Asola-Bhatti WLS though designated as a sanctuary, is actually a misnomer (WWF, 1995) since the only wildlife to be seen would be

Nilgai (Blue Bull) and couple of recently introduced Blackbucks, besides birds. It is further apprehended that since the water are a scarce commodity and the water table being 600 ft below the surface with the area full of mica, the chances of carnivores making the sanctuary a home, are little. In addition, the immigration possibilities of other dry habitat species are remote since there are no corridors left that might connect the protected area to the large patch of scrub forest (Sawarkar and Hussain, 1997).

The Chief Conservator of Forests (Delhi Division) in a press note (Sachdeva, 1997, Times of India dated 10th Feb, 1997) said that “though not akin to Sariska National Park we intend to create Asola-Bhatti Wildlife Sanctuary, Delhi in to a deer or a tiger safari within five years when the habitat is sufficiently improved with a plan to introduce some carnivores later” The statement sounds tempting but as on date nothing seems moving in that direction, neither the “so called” safaris nor any sign of introduction of carnivores or the improvement in the habitats.

There are, however, a number of problems to overcome this before the dream is realized like,

1. The illegal mining still continues in the Bhatti part of the sanctuary. It has been recently reported that Delhi State Mineral Development Corporation (DSMDC) commenced mining next to Bhatti mines. The mining still continues in Haryana side. When mining was closed in 1991 various operators including DSMDC left about 210 pits of various sizes open.
2. The sanctuary is also facing problems in demarcation of its boundary.
3. There are numerous settlements already existing around the fence of the sanctuary and the new ones coming up unchecked.
4. The boundary of the Wildlife Sanctuary is broken at various places.
5. Movements of cattle inside the sanctuary are very common.
6. The use / abuse of the premises of the Wildlife Sanctuary for defecation, easement and various other purposes like cattle grazing, extraction of fuel and firewood or medicinal plants etc. by the residents around Wildlife Sanctuary.

As a ‘Wildlife Sanctuary’ it is very different from the popular perception of the ‘term’ because of being heavily degraded on account of its continuous use and misuse during all these years. The natural area though declared to serve for ‘public use’ has a very restrictive choice. Wilderness recreation may threaten the ecological integrity of the protected area. Wildlife entertainment is not going to be its strong point.

The immigration possibilities of other dry habitat species are remote since there is no corridors left that might connect the protected area to a large patch of scrub forest under reasonable status of management.

As an aid to the recovery of the heavily degraded habitat the plantation activity requires to be given a top priority but the cattle / livestock grazing should be checked completely to protect the area so as to reduce the pressure also.

The wall around the sanctuary is broken at many points, which as a result has become the local source of illegal and unchecked entry of poachers and offenders. This may be looked into for proper conservation and management of the area.

Recent installation of the wireless set at both the gates of the sanctuary at Tughlakabad and Sanjay Nagar, including providing the guards and rangers with walkie talkie or wireless handsets has been a constructive approach towards the management.

THREATS AND DISTURBANCE

The ever-increasing anthropogenic pressure in the last fifty years has resulted in substantial loss of the area of wild habitat. Among the wild ungulates (Chinkara and Blackbuck) that were once native to the environs of Delhi, only Nilgai has managed to survive in the fragmented habitat while the others have locally extirpated. At the same time the livestock is increasing day by day and trespasses is in plenty. Sawarkar and Hussain (1997) estimated a figure of 38 individuals of Nilgai, 8077 goats and 2207 cattle. Thus the protected area of only 27.81 square km was found to be under tremendous pressure from livestock. The chances of further addition to this high number of domestic cattle cannot be ruled out.

The other perceptible threats are :

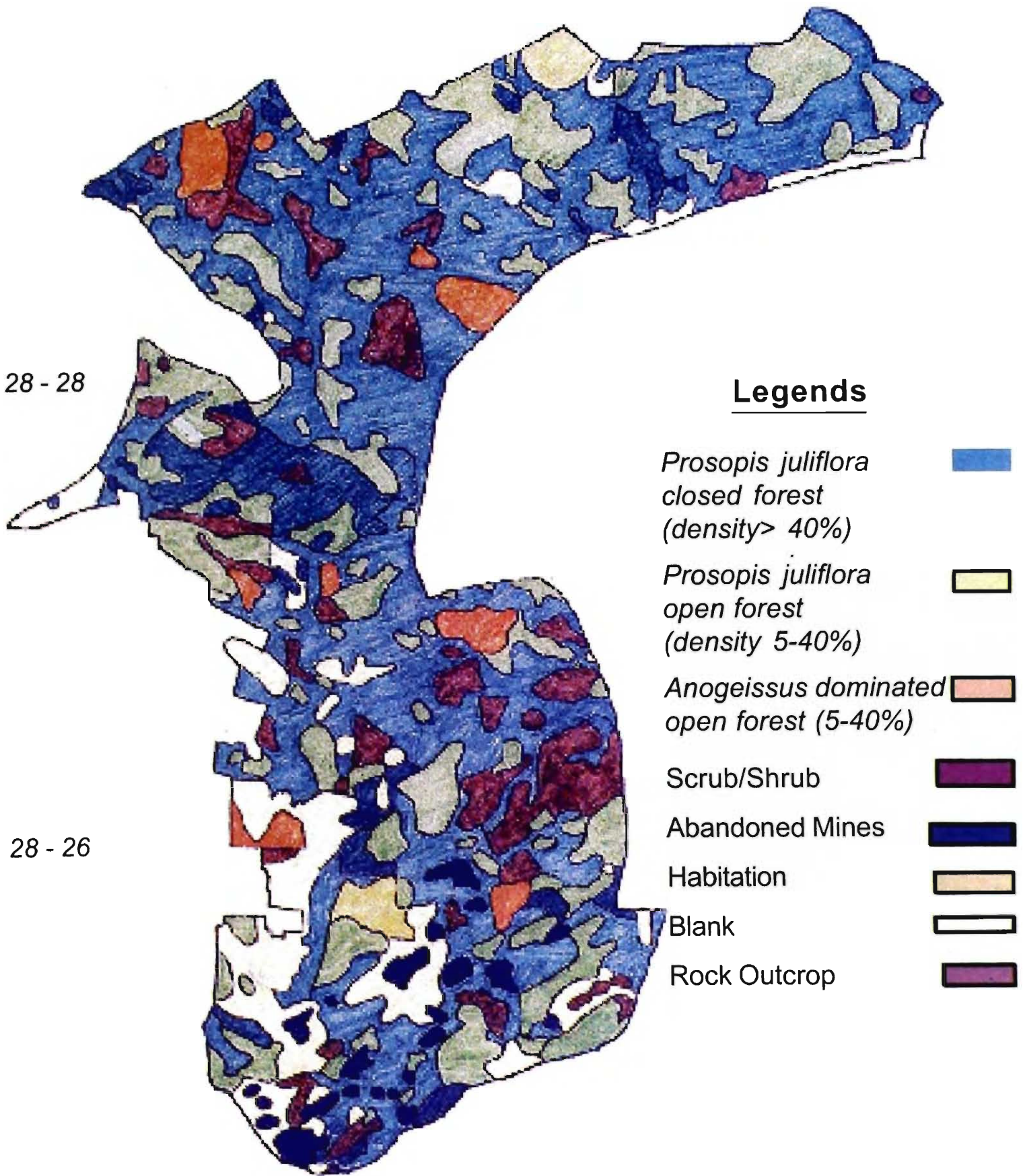
- The competitive superiority of stray cattle against the wild ones (Nilgai etc.) using their biomass may lead them to migrate elsewhere or to exterminate also instead of the anticipated recovery of the site;
- The presence of privately owned farmlands on the north-eastern and northern periphery of the sanctuary where the encroachment is imminent;
- Dumping garbage and use of the sanctuary area around Sanjay Vihar by locals for shitting, collection of fire and fuel wood is a perpetual threat to the existence of wildlife;
- Its use and abuse by ever increasing pressures mainly for extraction of quartzite commonly known as Badarpur or Bajri by mining communities;
- Farming along its fringes;
- Collection of non wooded forest produce like Ber for personal and commercial use as well;
- Transportation of truckloads of Badarpur sand; fodder collection; collection of medicinal plants etc.

CONSERVATION EFFORTS

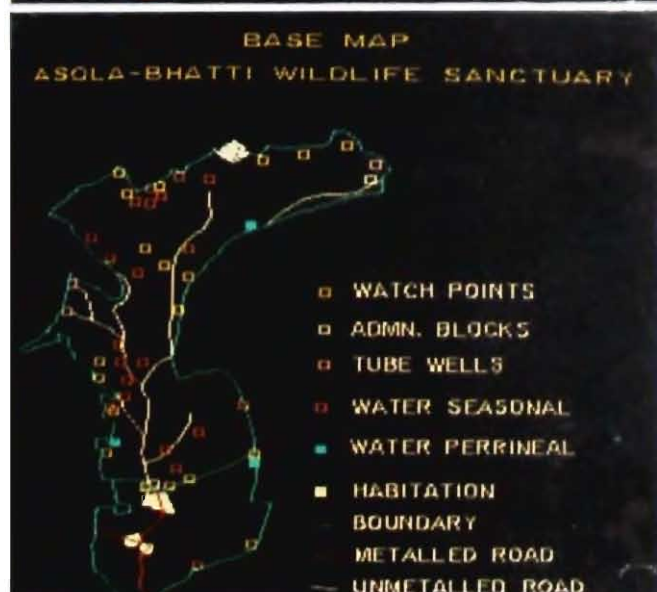
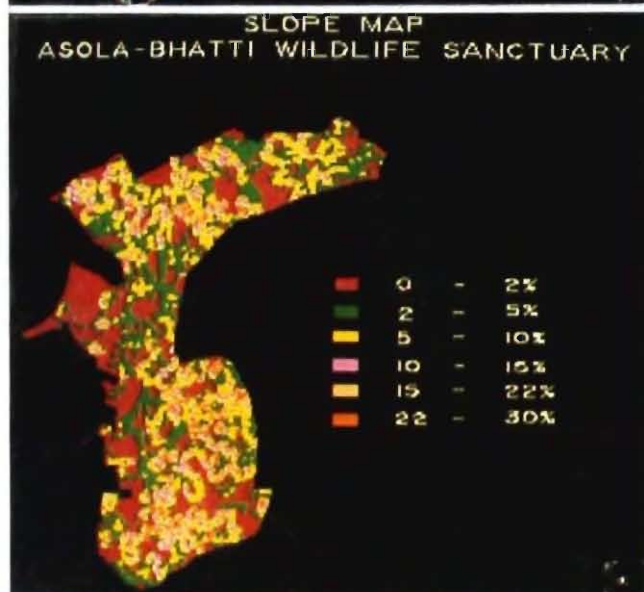
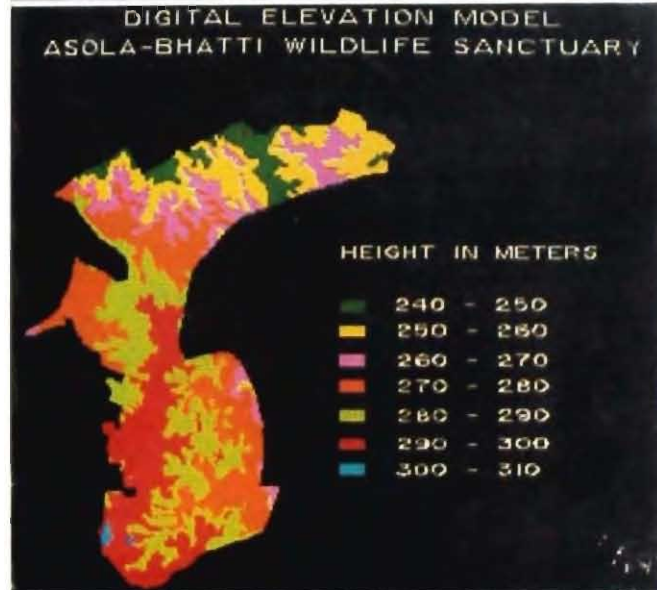
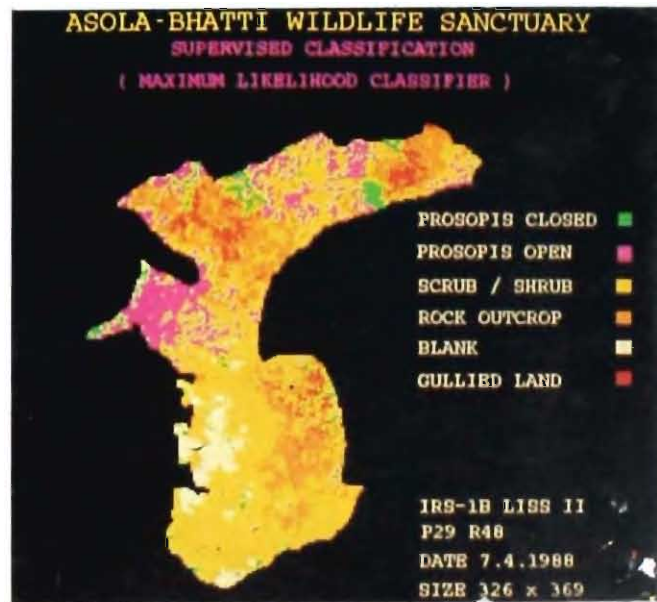
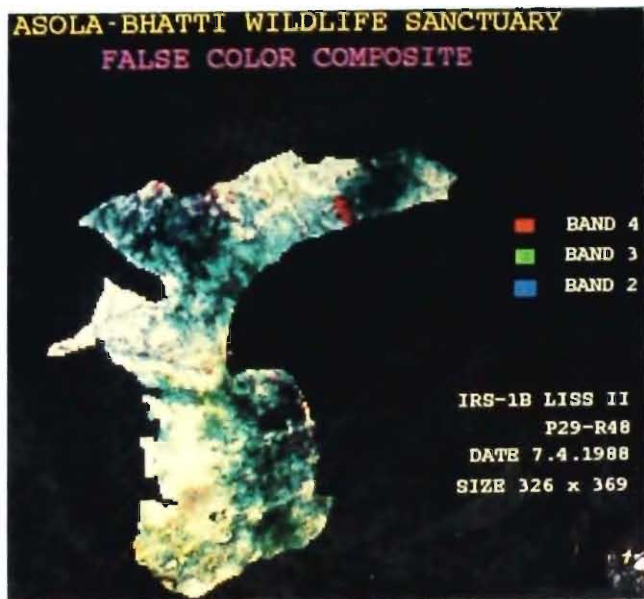
The forest managers and environmentalists who assessed the biological potential of the area, on finding the soil active, opined that it may restore its lost potential, if properly and strategically protected, specially since the water quality is excellent (Sawarkar *et. al.*, 1996). Recently the forest department managing Asola-Bhatti Wildlife Sanctuary, Delhi has re-introduced some Blackbucks within a fence for their rehabilitation and resurrection.

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Vegetation Cover Map of Asola-Bhatti WLS : Based on Visual Interpretation of IRS-1B, LISS-II Data



KHANNA AND SATI : *ABWLS* : An overview



A typical *Prosopis* vegetation, an ideal habitat for Nilgai or Blue Bull



A view of the abandoned open cast mines



A panoramic view of Pit No. 9 filled with water



A Centipede, *Scolopendra amazonica* (Bucherl)



Rufous-backed Shrike, *Lanius schach erythronotus*



Brownbacked Indian Robin, *Sexicoloides fulicata*



Peafowl, *Pavo cristatus*



Rhesus Macaque, *Macaca mulatta*

KHANNA AND SATI : *ABWLS* : *An overview*



Nilgai or Blue Bull, *Boselaphus tragocamelus*

CHILOPODA **(Scolopendromorpha : Scolopendridae)**

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INTRODUCTION

Scanning of literature on the fauna of Delhi revealed the mention of references like Gravely (1910), Jangi and Dass (1975, 1977, 1978, 1980a and 1980b), Khanna (1997) and Kumar and Khanna (1997), incorporating the records of eleven species of Scolopendrid centipedes from the environs of Delhi. While Khanna (l.c.) has enumerated the centipedes of entire Delhi area, Kumar and Khanna (l.c.) in the biodiversity profile have listed the centipedes from Asola-Bhatti Wildlife Sanctuary.

During the course of present series of surveys exclusively in the Asola-Bhatti Wildlife Sanctuary, Delhi the author has come across the collection of 200 odd specimens of scolopendridae from Asola-Bhatti Wildlife Sanctuary, which on identification has been found to be referable to four species *viz.*,

1. *Scolopendra morsitans* Linnaeus
2. *Scolopendra amazonica* (Bucherl)
3. *Asanada indica* Jangi & Dass and
4. *Asanada brevicornis* (Meinert)

Out of the four species mentioned above, *Scolopendra moricitans* Linnaeus and *Asanada indica* are the two species already known from Asola-Bhatti Wildlife Sanctuary, along with *Scolopendra nudus* (Kumar and Khanna, l.c.). The present record of *Asanada brevicornis* and *Scolopendra amazonica* from Asola-Bhatti Wildlife Sanctuary is not only a first record from the conservation area but from the National Capital Territory region of Delhi also. The author could not get the specimens of *Scolopendra nudus* (Jangi and Dass) in the present lot. With the present studies the number of known species of scolopendrid centipedes from Delhi has been raised from eleven to thirteen, and from Asola-Bhatti Wildlife Sanctuary, to five from earlier three.

SYSTEMATIC ACCOUNT

Class	CHILOPODA
Order	SCOLOPENDROMORPHA
Family	SCOLOPENDRIDAE
Subfamily	SCOLOPENDRINAE
Tribe	SCOLOPENDRINI

1. *Scolopendra morsitans* Linnaeus, 1758

1758. *Scolopendra morsitans* Linnaeus, *Syst. Nat.* ed. 10 : 638.

Material Examined : Asola-Bhatti Wildlife Sanctuary : Imliwala, 6 exs., 30.x.1998, Coll. Vinod Khanna and party : 3 exs., 4.iii.1998, Coll. S. K. Gupta and party; Deoli, 3 exs. 28.x.1998, Coll. Vinod Khanna and party; 6 exs., 3.iii.1998, Coll. S. K. Gupta and party; Tughlakabad, 4 exs., 27.x.1998, Coll. Vinod Khanna and party; 1ex., 23.xii.1999, Coll. J. P. Sati and party; 4 exs., 24.xii.1999, Coll. J. P. Sati and party; Pipalwala, 6 exs., 25.x.1998, Coll. Vinod Khanna and party; Maidangarhi, 6 exs., 29.x.1998, Coll. Vinod Khanna and party; 7 exs., 3.iii.1998, Coll. S. K. Gupta and party; 2 exs., 20.xii.1999, Coll. J. P. Sati and party; Bhatti Mines area, 2 exs., 1.iii.1998, Coll. S. K. Gupta and party; Satbari, 3 exs., 29.x.1998, Coll. Vinod Khanna and party; Dudhawali Khan, 1 ex., 6.iii.1998, Coll. S. K. Gupta and party; Sahurpur, 1 ex., 22.xii.1999, Coll. J. P. Sati and party.

Distribution : Cosmopolitan species.

Remarks : The species often occurs sympatically, without hybridization, with its sibling *Scolopendra amazonica* (Bucherl), with whom it only differs in the presence / absence of tarsal spur on 20th pair of walking legs.

2. *Scolopendra amazonica* (Bucherl)

1946. *Scolopendra morsitans amazonica* (Bucherl), *Mem. Inst. Butantan*, 19 : 135-137.

Material Examined : Asola-Bhatti Wildlife Sanctuary : Bhatti Mines Pit No. 9, 3 exs., 26.x.1998; 4 exs., 30.x.1998, Coll. Vinod Khanna and party; 9 exs., 1.iii.1998, Coll. S. K. Gupta; 8 exs., 19.x.1999, Coll. J. P. Sati and party; Khajurwala, 8 exs., 24.x.1998, Coll. Vinod Khanna and party; 8 exs., 27.ii.1998, Coll. S. K. Gupta and party; Pipalwala, 23 exs., 28.ii.1998, Coll. S. K. Gupta and party; Imliwala, 10 exs., 30.x.1998, Coll. Vinod Khanna and party; Tughlakabad, 8 exs., 27.x.1998, Coll. Vinod Khanna and party; 4 exs., 23.xii.1999, Coll. J. P. Sati and party; Sanjay Nagar, 4 exs., 27.ii.1998, Coll. S. K. Gupta and party; Satbari, 2 exs., 29.x.1998, Coll. Vinod Khanna and party; Sahurpur, 8 exs., 5.iii.1998, Coll. S. K. Gupta and party; Dudhawali Khan, 4 exs., 6.iii.1998, Coll. S. K. Gupta and party; Asola Block, 7 exs., 2.iii.1998, Coll. S. K. Gupta and party.

Distribution : Andaman and Nicobar Is., Goa, Gujarat, Kerala, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Uttranchal and Uttar Pradesh.

Remarks : First record from Delhi from the Asola-Bhatti WLS.

3. *Scolopendra nudus* (Jangi and Dass)

1980. *Trachycormocephalus nudus*, Jangi and Dass, *Ent. Mon. Mag.*, 116 : 67-70.

Type Locality : Delhi Ridge.

Material Examined : Not available in the present lot of species, however, was recorded earlier by Khanna (l.c.) from Asola-Bhatti Wildlife Sanctuary.

Distribution : India : Delhi.

Remarks : Since the genus *Trachycormocephalus* Kraepelin has been relegated as a junior synonym of *Scolopendra* by Lewis (1986), Khanna and Yadav (1996) treated all Indian species of the genus *Trachycormocephalus* transferred to the genus *Scolopendra* as new combinations, and also provided a revised key to the identification of Indian species of the genus *Scolopendra*.

Tribe ASANADINI

4. *Asanada indica* Jangi and Dass

1984. *Asanada indica*, Jangi and Dass, *J. Scient. Indl. Res.*, 43 (2) : 38-39.

Type Locality : Urlikanchan, Pune, Maharashtra.

Material Examined : Asola-Bhatti Wildlife Sanctuary : Sanjay Nagar, 2 exs., 3.iii.1998, *Coll. S. K. Gupta and party*; Deoli, 1 ex., 3.iii.1998, *Coll. S. K. Gupta and party*; Maidangarhi, 2 exs., 20.xii.1999, *Coll. J. P. Sati and party*.

Distribution : Delhi, Haryana, Himachal Pradesh, Kerala, Maharashtra, Rajasthan, Uttar Pradesh and Uttranchal.

Remarks : Previously recorded from Asola-Bhatti Wildlife Sanctuary by Khanna (1997).

5. *Asanada brevicornis* Meinert

1886. *Asanada brevicornis*, Meinert, *P. Amer. phil. Soc.*, 23 : 189.

Type Locality : Kulu (Himachal Pradesh).

Material Examined : Asola-Bhatti Wildlife Sanctuary : Tughlakabad, 1 ex., 23.xii.1999,

Coll. J. P. Sati and party; Satbari, 1 ex., 29.x.1998, Coll. Vinod Khanna and party; Khajurwala, 1 ex., 27.ii.1998, Coll. S. K. Gupta and party.

Distribution : Andaman and Nicobar Is., Haryana, Himachal Pradesh, Gujarat, Rajasthan and Maharashtra.

Remarks : First record of the species from Asola-Bhatti Wildlife Sanctuary and from Delhi. The species of the genus *Asanada* are observed to be widely occurring in the entire Aravalli range (Khanna, unpublished record), reporting of *Asanada indica* and *Asanada brevicornis* from Asola-Bhatti Wildlife Sanctuary, the tail spur of Aravalli ending in Delhi, can not be taken as surprise.

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ODONATA

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INTRODUCTION

The undulating landscape with highest and lowest altitudes ranging between 310 M and 240 M respectively is having numerous storm water drains but no permanent natural water body except for 27 water pits developed by excavating the land for mining purposes.

The present study is based on the collection of Odonata collected from Asola-Bhatti Wildlife Sanctuary. Altogether 12 species belonging to 12 genera and 2 families are reported.

SYSTEMATIC ACCOUNT

Order	ODONATA
Suborder	ZYGOPTERA
Family	COENAGRIIDAE

1. *Ischnura aurora aurora* (Brauer)

Material Examined : Pit No. 9/10, 3 M, 26.x.1998, *Coll. Vinod Khanna and party.*

Distribution : India : Himachal Pradesh, Uttranchal, West Bengal. *Elsewhere* : Australia, Borneo, Malaysia, Philippines, Samoa, Sondaic Archipelago, New Guinea and South Asia.

Suborder	ANISOPTERA
Family	LIBELLULIDAE

2. *Cratil lineata calverti* (Forster)

Material Examined : Pipalwala, 5 M, 25.x.1998; 2 M, 30.x.1998, *Coll. Vinod Khanna and party.*

Distribution : India : Uttranchal, West Coast of India, West Bengal. *Elsewhere* : Myanmar, Sri Lanka.

3. *Orthetrum sabina sabina* (Drury)

Material Examined : Pipalwala, 1 M, 25.x.1998; Bhatti, Pit. No. 10/11, 1 M, 26.x.1998, Coll. Vinod Khanna and party.

Distribution : India : Himachal Pradesh, Uttaranchal. *Elsewhere* : African Continent, Angola, Australia, Egypt, Java, Myanmar, Nepal, Oceania, Sri Lanka, Thailand, Samoa, Somaliland, Sumba, Timor, New Guinea.

4. *Diplacodes lefebvrei* (Rambur)

Material Examined : Pipalwala, 1 F, 18.xii.1999, Coll. J. P. Sati and party.

Distribution : Chandigarh, Rajasthan and along West Coast, Kerala. *Elsewhere* : Africa.

5. *Crocothemis servilia servilia* (Drury)

Material Examined : Northern Asola-Bhatti, 1 M, 9.viii.1997, Coll. N. K. Sinha and Party; Khajurwala, 2 M., 24.x.1998; Pipalwala, 1 M., 25.x.1998; Bhatti Mines, 2 M, 30.x.1998; Tughlakabad, 5 M, 27.x.1998; Deoli, 1 M, 1 F, 28.x.1998; 1 M, 18.x.1998; Satbari, 4 M, F, 29.x.1998; Bhatti Mines, 1 M, 1 F, 30.x.1998; Coll. Vinod Khanna and party.

Distribution : India : Himachal Pradesh, Uttaranchal, Madhya Pradesh, Bihar, West Bengal. *Elsewhere* : Australia, Japan, Myanmar, Nepal, Philippines, Sri Lanka, Sumba, Tropical Asia, Southwards to Sundaic Archipelago.

6. *Trithemis aurora* (Burmeister)

Material Examined : Southern Asola-Bhatti, 1 F, 4.viii.1997, Coll. N. K. Sinha and party.

Distribution : India : Himachal Pradesh, Uttaranchal, through India. *Elsewhere* : Borneo, Celebes, Java, Malaya Moluccas, Myanmar, Nepal, New Guinea, Pakistan, Penang, Philippines, Sri Lanka, Sumatra, Sumba, Taiwan, Timor.

7. *Trithemis festiva* (Rambur)

Material Examined : 1 M, 26.x.1998; 2 M, Bhatti Mines Pit No. 9/10, 26.x.1998; Imliwala, 2 M, 30.x.1998, Coll. Vinod Khanna and party.

Distribution : India : Assam, Himachal Pradesh, Maharashtra, Uttaranchal. *Elsewhere* : Celebes, Java, Malaysia, Myanmar, Nepal, Penang, Philippines, Singapore, Sri Lanka, Sumatra, Taiwan, Lesser Sunda, New Guinea.

8. *Trithemis pallidinervis* (Kirby)

Material Examined : Bhatti Mines, 2 M, 30.x.1998, *Coll. Vinod Khanna and party.*

Distribution : India : Andhra Pradesh, Bihar, Himachal Pradesh, Karnataka, Maharashtra, Tamil Nadu, Uttranchal, West Bengal. *Elsewhere* : Celebes, Lesser Sunda, Malaysia Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Taiwan.

9. *Tholymis tillarga* (Fabricius)

Material Examined : Pipalwala, 2 M, 25.x.1998, *Coll. Vinod Khanna and party.*

Distribution : India : Throughout. *Elsewhere* : Africa, Australia, Bali, Borneo, Java, Lombok, Myanmar, Nepal, Penang, South Asia, Sumba, Micronesia, Sri Lanka.

10. *Pantala flavescens* (Fabricius)

Material Examined : Northern Asola-Bhatti, 3 M, 2.viii.1997; 1 M, 9.viii.1997; Southern Asola-Bhatti, 3 M, 4.viii.1997, *Coll. N. K. Sinha and party*; Pipalwala, 1 M, 25.x.1998; Bhatti, 2 M, 29.x.1998; Tughlakabad shooting range, 1 M, 27.x.1998; Satbari, 9 M, 29.x.1998; Maidangarhi, 3 M, 29.x.1998; Imliwala, 9 M, 30.x.1998, *Coll. Vinod Khanna and party.*

Distribution : India : Throughout the monsoon belt. *Elsewhere* : Bali, Borneo, Circumtropical and sub tropical, Java, Malaysia, Micronesia, Morocco, Myanmar, Nepal, Penang, Sri Lanka, Sumatra, Thailand, Tibet.

11. *Traemea basilaris burmeisteri* Kirby

Material Examined : Northern Asola-Bhatti, 2 M, 2.viii.1997. *Coll. N. K. Sinha and party*; Bhatti Mines, Pit No. 9/10, 1 M, 26.x.1998; Tughlakabad shooting range, 1 M, 27.x.1998; Bhatti Mines, 5 M, 30.x.1998, *Coll. Vinod Khanna and party.*

Distribution : India : Bihar, Himachal Pradesh, Karnataka, Madhya Pradesh, Uttranchal, Tamil Nadu, West Bengal. *Elsewhere* : Malayasia, Myanmar, Nepal, Sri Lanka.

12. *Traemia virginea* (Rambur)

Material Examined : Deoli, 1 M, 28.x.1998; Bhatti, 2 M, 30.x.1998, *Coll. Vinod Khanna and party.*

Distribution : India : Himachal Pradesh, Uttranchal, throughout India. *Elsewhere* : China Borneo, Carolina Islands, South Japan and Taiwan.

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HYMENOPTERA : ACULEATA

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Zoological Survey of India, Northern Regional Station. Dehra Dun - 248 195

INTRODUCTION

Gupta (1997) recorded 62 species belonging to aculeate Hymenoptera, except family Formicidae, from Delhi. This included two species viz., *Parapsammophilia erythrocephalus* (Fabricius), and *Stizus vespiformes* (Fabricius), from the area falling under the sanctuary. While, Tiwari (1997) recorded 19 species of the family Formicidae from Delhi including three species, viz., *Anochetus* sp., *Messor barbatus* (Linnaeus) and *Camponotus compressus* (Fabricius), from the areas falling under the sanctuary.

The present study is based on the material collected by the scientists of Zoological Survey of India, Dehra Dun from the sanctuary. This records eight more species belonging to six families of aculeate Hymenoptera. Thus a total of 13 species are now known from the sanctuary.

SYSTEMATIC ACCOUNT

The systematic account deals with 11 species of aculeate Hymenoptera belonging to six families.

I. Family SCOLIIDAE

1. *Campsomeriella collaris collaris* (Fabricius)

Material Examined : Asola-Bhatti Wildlife Sanctuary, Khajurwala, 1 F, 24.x.1998, *Coll. Vinod Khanna & party.*

Distribution : Throughout India. *Elsewhere* : Bangladesh, Sri Lanka and Nepal.

II. Family VESPIDAE

2. *Vespa orientalis* Linnaeus

Material Examined : Asola-Bhatti Wildlife Sanctuary, Asola FRH, 1 M, 1.iii.1998, *Coll. S. K. Gupta & Party.*

Distribution : India : Widely distributed in Indo-gangetic plains. *Elsewhere* : Pakistan, Egypt, Middle East and Mediterranean Region.

III. Family EUMENIDAE

3. *Delta dimidiatipennis* (Saussure)

Material Examined : Asola-Bhatti Wildlife Sanctuary, 1 M, 2.viii.1997, Coll. N. K. Sinha & party.

Distribution : India : Maharashtra, Punjab, Uttar Pradesh, Uttranchal, Delhi and Gujarat. *Elsewhere* : Pakistan, Arabia and Africa.

IV. Family SPHECIDAE

4. *Chalybion bengelense* (Dahlbom)

Material Examined : Asola-Bhatti Wildlife Sanctuary, Bhatti Mines, 2 F, 26.x.1998, Coll. Vinod Khanna & party.

Distribution : India : Throughout. *Elsewhere* : Oriental Region, Mozambique, Seychelles, Socotra, Mauritius, Australia, Johnston, Gilberts, Marianas, Solomons and Hawaii.

5. *Parapsammophila erythrocephalus* (Fabricius)

Material Examined : Asola-Bhatti Wildlife Sanctuary, 1 M, 12.ix.1994, Coll. J. P. Sati & party.

Distribution : India : Throughout.

6. *Stizus vespiformes* (Fabricius)

Material Examined : Asola-Bhatti Wildlife Sanctuary, Deoli, 2 F, 28.x.1998, Coll. Vinod Khanna & party.

Distribution : India : Punjab, Delhi and Madras.

V. Family APIDAE

7. *Apis (Micrapis) florea* Fabricius

Material Examined : Asola-Bhatti Wildlife Sanctuary, Administrative Block, 9 workers, 2.iii.1998, Coll. S. K. Gupta & party.

Distribution : India : widely distributed. *Elsewhere* : Myanmar, Sri Lanka, Malaysia, Nepal and Indonesia.

8. *Apis (Megaspis) dorsata* Fabricius

Material Examined : Asola-Bhatti Wildlife Sanctuary, Bhatti Mines. 6 workers, 6.iii.1998, Coll. S. K. Gupta & party.

Distribution : India : Throughout. *Elsewhere* : Sri Lanka, Nepal, Pakistan, Malaysia, Myanmar, China and Indonesia.

VI. Family FORMICIDAE

Subfamily DORYLINAE

9. *Dorylus orientalis* Westwood

Material Examined : Asola-Bhatti Wildlife Sanctuary, Asola FRH, 1 M, (at light), 3.iii.1998, Coll. S. K. Gupta & party.

Distribution : India : Delhi, West Bengal, Orissa, Maharashtra and Tamil Nadu. *Elsewhere* : Myanmar, China, Malaya Peninsula, Nepal, Sri Lanka and Indonesia.

Subfamily FORMICINAE

10. *Myrmecocystus setipes* Forel

Material Examined : Asola-Bhatti Wildlife Sanctuary, Bhatti Mines, 1.iii.1998, 31 workers, Coll. S. K. Gupta & party.

Distribution : India : U.P., Delhi, Punjab, Haryana. *Elsewhere* : Pakistan & Iraq.

11. *Camptonotus compressus* (Fabricius)

Material Examined : Asola-Bhatti Wildlife Sanctuary, Deoli, 17 workers (Major & Minor) Bhatti Mines area, 35 workers (major & Minor), 3.iii.1998, Coll. S. K. Gupta & party.

Distribution : India : Widely distributed. *Elsewhere* : Sri Lanka, Nepal and Malayan subregion, Russia, Arabia and Africa.

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LEPIDOPTERA : RHOPALOCERA

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INTRODUCTION

Mondal, *et. al.* (1997) recorded 19 species, while Gupta (1997) recorded nine species of Lepidoptera (Rhopalocera) from Delhi. These included four species from the area falling under Asola-Bhatti Wildlife Sanctuary. Kumar, *et. al.* (1997) provided a list of 90 species belonging to five families i.e., Pieridae, Danaidae, Nymphalidae, Lycaenidae and Satyridae, based on the study of the material collected by the scientists of Northern Regional Station, Zoological Survey of India, Dehra Dun from Delhi, including Asola-Bhatti Wildlife Sanctuary.

SYSTEMATIC ACCOUNT

The systematic accounts deals with 25 species of butterflies under 5 families.

Family PIERIDAE

1. *Anaphaeis aurota* (Fabricius)

The Pioneer

Material Examined : Asola-Bhatti Wildlife Sanctuary, Shooting range, Tughlakabad, 1 ex., 2.viii.1997; near Sahurpur, 1 ex., 7.viii.1997, *Coll. N. K. Sinha & party*; Asola, FRH, ca 2 km towards Khajurwala, 1 ex., 27.ii.1998, *Coll. S. K. Gupta & party*; Deoli, 2 exs., 21.xii.1999, *Coll. J. P. Sati & party*.

Distribution : India : Delhi, rest of the mainland except Assam, Andaman & Nicobar Islands. *Elsewhere* : Sri Lanka : Extending to Middle East and Africa.

2. *Cepora nerissa phryne* (Fabricius)

The Common Gull

Material Examined : Asola-Bhatti Wildlife Sanctuary, Shooting range, Tughlakabad, 2 exs., 27.x.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Throughout peninsular India, Delhi, Jodhpur in Rajasthan. *Elsewhere* : Pakistan.

3. *Ixias marianne* (Cramer)

The White Orange Tip

Material Examined : Asola-Bhatti Wildlife Sanctuary, near Pit No. 2, Southern Part, 1 ex., 4.viii.1997, near Sahurpur, 2 exs., 7.viii.1997. *Coll. N. K. Sinha & party*; Khajurwala, 1 ex., 24.x.1996; Pipalwala, 1 ex., 25.x.1998; Shooting range, Tughlakabad, 3 exs., 27.x.1996; Deoli, 3 exs., 28.x.1998; Maidangarhi, 1 ex., 29.x.1996; Satbari, 1 ex., 29.x.1996; Imliwala, 2 exs., 30.x.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Delhi, Throughout Peninsular; West and N. W. Himalaya. *Elsewhere* : Sri Lanka, Pakistan and Nepal.

4. *Ixias pyrene* (Linnaeus)

The Yellow Orange Tip

Material Examined : Asola-Bhatti Wildlife Sanctuary, Shooting range, Tughlakabad, 1 ex., 2.viii.1997; near Sahurpur, 1 ex., 7.viii.1997, *Coll. N. K. Sinha & party*.

Distribution : India : Delhi, Peninsular India to Saurashtra and Bengal, N. W. Himalaya to Assam. *Elsewhere* : Pakistan, Sri Lanka, Myanmar and Nepal.

5. *Eurema brigitta* Stoll

Small Grass Yellow

Material Examined : Asola-Bhatti Wildlife Sanctuary, near Sahurpur, 1 ex., 7.viii.1997, *Coll. N. K. Sinha & party*; Sahurpur, 2 exs., 5.iii.1998, *Coll. S. K. Gupta & party*; Bhatti Mines, Pit No. 2, 2 exs., 19.xii.1999, *Coll. J. P. Sati & party*.

Distribution : India Throughout. *Elsewhere* : Sri Lanka, Myanmar and Nepal.

6. *Eurema hecabe* (Linnaeus)

The Common Grass Yellow

Material Examined : Asola-Bhatti Wildlife Sanctuary, Shooting range, Tughlakabad, 1 ex., 2.viii.1997; near Pit No. 2, 1 ex., 4.vii.1997, *Coll. N. K. Sinha & party*; Khajurwala, 3 exs., 24.x.1998; Bhatti Mines, Pit no. 10-11, 2 exs., 26.x.1998; Satbari, 2 exs., 29.x.1998; Imliwala, 1 ex., 30.x.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Delhi. Throughout rest of mainland, Andaman & Nicobar Islands; Lakshadweep. Elsewhere : Throughout Ethiopian and Indo-Australian region; North wards to Korea and Japan.

7. *Eurema laeta* Boisduval

The Spotless Yellow

Material Examined : Asola-Bhatti Wildlife Sanctuar, near Sahurpur, 1 ex., 7.viii.1997, *Coll. N. K. Sinha & party*; Maidangarhi, 1 ex., 29.x.1998; Imliwala, 1 ex., 30.x.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Delhi. Throughout plains and the hills of the main land. *Elsewhere* : Sri Lanka, Myanmar, North to China; Japan and Amur; also south to Hainan, Vietnam, Java, Philippines and Timor to Kei Islands.

8. *Catopsilia pomona* (Fabricius)

The Lemon Emigrant

Material Examined : Asola-Bhatti Wildlife Sanctuary, Shooting range, Tughlakabad, 1 ex., 27.xii.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Delhi, rest of the main land, Andaman & Nicobar Islands. *Elsewhere* : Myanmar, Pakistan, Sri Lanka, South China to Australia and the Pacific.

9. *Catopsilia pyranthe* (Linnaeus)

The Mottled Emigrant

Material Examined : Asola-Bhatti Wildlife Sanctuary, near Sahurpur, 2 exs., 7.viii.1997; near Administrative block, DCF's Office, 1 ex., 9.viii.1997, *Coll. N. K. Sinha & party*; Khajurwala, 1 ex., 27.ii.1998, *Coll. S. K. Gupta & party*.

Distribution : India : Common throughout India. *Elsewhere* : Pakistan.

10. *Catopsilia florella* (Fabricius)

The African Emigrant

Material Examined : Asola-Bhatti Wildlife Sanctuary, Shooting range, Tughlakabad, 1 ex., M, 4.viii.1997, *Coll. N. K. Sinha & party*; Bhatti Mines, Pit No.10-11, 1 ex., 26.x.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Delhi, rest of the mainland; Andaman & Nicobar Island. *Elsewhere* : Pakistan, Sri Lanka, Myanmar to Indo-China, Hainan to South China, Africa to Arabia and Iran.

11. *Colotis etrida* (Boisduval)

The Little Orange Tip

Material Examined : Asola-Bhatti Wildlife Sanctuary, Deoli, 1 ex., 21.xii.1999, *Coll. J. P. Sati & party.*

Distribution : India : Delhi and throughout mainland. *Elsewhere* : Pakistan and Sri Lanka.

12. *Colotis fausta* (Olivier)

The Large Salmon Arab

Material Examined : Asola-Bhatti Wildlife Sancturay, Shooting range, Tughlakabad, 1 ex., 24.xii.1999, *Coll. J. P. Sati & party.*

Distribution : India : Delhi. Throughout peninsular India. *Elsewhere* : Palestine to Arabia, Turkistan, Egypt, Somaliland, Iran, Afghanistan, Pakistan and Sri Lanka.

13. *Appias libythea* (Fabricius)

The Striped Albatross

Material Examined : Asola-Bhatti Wildlife Sanctuary, near Administrative Block, ca 3 km south of Asola, 1 ex., 2.iii.1998, *Coll. S. K. Gupta & party;* Deoli, 1 ex., 28.x.1998, *Coll. Vinod Khanna & party.*

Distribution : India : Delhi, Rajasthan, Punjab and Peninsular India. *Elsewhere* : Pakistan.

Family DANAIIDAE

14. *Danaus chrysippus* (Linnaeus)

The Plain Tiger

Material Examined : Asola-Bhatti Wildlife Sanctuary, near Sahurpur, 2 exs., 7.viii.1997, *Coll. N. K. Sinha & party;* near Administrative Block, Tughlakabad, 1 ex., 2.iii.1998; Deoli, 4 exs., 3.iii.1998, *Coll. S. K. Gupta & party;* Bhatti Mines, 1 ex., 26.x.1998; Shooting range, Tughlakabad, 1 ex., 27.x.1998, *Coll. Vinod Khanna & party.*

Distribution : India : Delhi, throughout the mainland. *Elsewhere* : Widespread in the Oriental, Palaearctic, Ethiopian and Australian regions.

Family NYMPHALIDAE

15. *Cynthia cardui* (Linnaeus)

The Painted Lady

Material Examined : Asola-Bhatti Wildlife Sanctuary, Imliwala, 1 ex., 30.x.1998, *Coll. Vinod Khanna & party.*

Distribution : India : Throughout. *Elsewhere* : Sri Lanka, Myanmar, widely distributed except South America.

16. *Hypolimnias bolina* (Linnaeus)

The Great Eggfly

Material Examined : Asola-Bhatti Wildlife Sanctuary, Bhatti Mines, 1 ex., 26.x.1998; Maidangarhi, 1 ex., 29.x.1998; Bhatti Mines, 2 exs., 30.x.1998; Imliwala, 1 ex., 30.x.1998, *Coll. Vinod Khanna & party.*

Distribution : India : Throughout. *Elsewhere* : Myanmar, Sri Lanka, Pakistan.

17. *Phalanta phalanta phalanta* (Drury)

The Common Leopard

Material Examined : Asola-Bhatti Wildlife Sanctuary, near Pit No. 2, 1 ex., 4.viii.1997; near Administrative Block, ca 3 km S. W. DCF's Office, 1 ex., 9.viii.1997, *Coll. N. K. Sinha & party*; Shooting range, Tughlakabad, 1 ex., 27.x.1998; Deoli, 1 ex., 28.x.1998; Maidangarhi, 1 ex., 29.x.1998, *Coll. Vinod Khanna & party.*

Distribution : India : Throughout India including Nicobar Islands. *Elsewhere* : Sri Lanka, Myanmar and Pakistan.

18. *Precis almana almana* (Linnaeus)

The Peacock Pansy

Material Examined : Asola-Bhatti Wildlife Sanctuary, Shooting range, Tughlakabad, 1 ex., 27.x.1998, *Coll. Vinod Khanna & party.*

Distribution : India : Throughout India except Andaman & Nicobar Islands. *Elsewhere* : Sri Lanka and Myanmar.

19. *Precis hierta* Fabricius

The Yellow Pansy

Material Examined : Asola-Bhatti Wildlife Sanctuary, near Pit No. 2, 1 ex., 4.viii.1997; near Sahurpur, 1 ex., 7.vii.1997; near DCF's Office, 1 ex., 9.viii.1997, *Coll. N. K. Sinha & party*; Shooting range, Tughlakabad, 1 ex., 27.x.1998; Satbari, 2 exs., 29.x.1998; Imliwala, 1 ex., 31.x.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Throughout. *Elsewhere* : Sri Lanka and Myanmar.

20. *Precis orithyia swinhoei* (Butler)

Blue Pansy

Material Examined : Asola-Bhatti Wildlife Sanctuary, Pipalwala, ca 2 km from Asola FRH, 1 ex., 28.ii.1998; Bhatti Mines, ca 2 km Asola FRH, 3 exs., 1.iii.1998, *Coll. S. K. Gupta & party*; Pipalwala, 1 ex., 25.x.1998; Deoli, 1 ex., 28.x.1998; Maidangarhi, 1 ex., 29.x.1998; Satbari, 2 exs., 29.x.1998; Imliwala, 2 exs., 30.x.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Delhi, Kashmir to Kumaon, Assam, West Bengal, Rajasthan, South India. *Elsewhere* : Myanmar, Sri Lanka and Pakistan.

21. *Precis lemonias lemonias* (Linnaeus)

The Lemon Pansy

Material Examined : India : Delhi, Asola-Bhatti Wildlife Sanctuary, near Sahurpur, 1 ex., 7.viii.1997, *Coll. N. K. Sinha & party*; Shooting range, Tughlakabad, 1 ex., 27.01.1998, Deoli, 1 ex., 28.10.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Delhi, Kashmir to Kumaon, Assam, West Bengal, Rajasthan, South India. *Elsewhere* : Myanmar, Sri Lanka and Pakistan.

Family LYCAENIDAE

22. *Zizeeria otis* (Murray)

The Lesser Grass Butterfly

Material Examined : Asola-Bhatti Wildlife Sanctuary, Imliwala, 1 ex., 28.02.1998; Bhatti

Mines areas, 1 ex., 1.ii.1998, *Coll. S. K. Gupta & party*; Imliwala, 1 ex., 30.x.1998, *Coll. Vinod Khanna & party*.

Distribution : India : Throughout. *Elsewhere* : Sri Lanka, Myanmar and Nepal.

23. *Zizeeria maha maha* (Kollar)

The Pale Grass Blue

Material Examined : Asola-Bhatti Wildlife Sanctuary, Bhatti Mines area, 2 exs., 1.iii.1998, *Coll. S. K. Gupta & party*.

Distribution : India : Throughout. *Elsewhere* : Myanmar, Pakistan (Baluchistan).

Family SATYRIDAE

24. *Ypthima incia* Hewitson

The Lesser Three Ring

Material Examined : Asola-Bhatti Wildlife Sanctuary, Shooting range, Tughlakabad, 1 ex., 02.ii.1998, *Coll. S. K. Gupta & party*.

Distribution : India : Delhi, Punjab to West Bengal, Madhya Pradesh. *Elsewhere* : Pakistan.

25. *Melanitis leda ismene* (Cramer)

Common Evening Brown

Material Examined : Asola-Bhatti Wildlife Sanctuary, Maidangarhi, 1 ex., 29.x.1996, *Coll. Vinod Khanna & party*.

Distribution : India : Throughout. *Elsewhere* : Pakistan.

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PISCES

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INTRODUCTION

The Fish fauna of Delhi has attracted the attention of various workers (Day, 1871, 1876, 1877, 1878, 1889; Majumdar, 1951, 1958; Jayram, 1981; during the past. Recently Husain (1997) explored the fish fauna of the NCT of Delhi thoroughly and added 16 species to the existing records making it 87 species and also observed that many species, earlier recorded, no more occur in the area due to various reasons affecting their habitats. The Asola-Bhatti Wildlife Sanctuary recently carved from Delhi State, bear some water pits in Bhatti mines area only and so the fish life is also scarce. During the present study only three species could be collected from the sanctuary area, of which one is new even to the Delhi.

SYSTEMATIC ACCOUNT

Class OSTEICHTHYES

Order CYPRINIFORMES

I. Family CYPRINIDAE

1. *Puntius sophore* (Hamilton-Buchanan)

Spot-Fin Carb

Material Examined : Asola-Bhatti Wildlife Sanctuary, Pipalwala, ca 2 km from Asola FRH, 82 exs., 28.ii.1998, Coll. S. K. Gupta & party; 37 exs. (18-50 mm), 25.x.1998, Coll. Vinod Khanna & party.

Distribution : Delhi, generally throughout the plains. *Elsewhere* : Pakitan, Nepal, Bangladesh, Myanmar, Sri Lanka and China. First record from the Sanctuary.

Remarks : Inhabits ponds, pools and moving nalas, Omnivorous, feeding both on vegetable

matter and insects. Breeds during monsoon months. Well Known aquarium Fish. Useful in eradication of mosquito larvae.

Order PERCIFORMES

II. Family CHANNIDAE

2. *Ophiocephalus gachua* Hamilton-Buchanan

Brown Snakehead

Material Examined : Asola-Bhatti Wildlife Sanctuary, Pipalwala, 6 Exs. (39-78 mm), 25.x.1998, Coll. Vinod Khanna & party.

Distribution : India Delhi and throughout the plains and base of hills. *Elsewhere* : Afghanistan, Iran, Pakistan, Nepal, Bangladesh, China, Myanmar, Malaysia, Thailand, Sri Lanka and Borneo. First record from the Sanctuary.

Remarks : Inhabits low land water bodies and base of hills. Carnivore, feeding on insects, small fishes and frogs. Breeds during monsoon months. Helps in destroying mosquito larvae.

III. Family POECILIDAE

3. *Gambusia affinis* (Baind & Girar)

Mosquito Fish

Material Examined : Asola-Bhatti Wildlife Sanctuary, Pit No. 9, 1 ex. (46 mm), 19.xii.1999, Coll. J. P. Sati & party.

Distribution : India : Introduced throughout plains. *Elsewhere* : United States of America. Introduced into Pakistan, Nepal, Bangladesh, Sri Lanka, Thailand, Myanmar, Malaysia, Formosa, Hawaii, Italy and Philippines. First record from the Sanctuary and also Delhi.

Remarks : Hardy, small fish, withstanding all types foul water conditions and can tolerate both cold and warm waters equally. Voracious feeder, consuming mosquitoes and other insect larvae almost equal to its own weight per day and hence used in malaria eradication program.

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AMPHIBIA

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INTRODUCTION

The Amphibian Fauna of Delhi received only a little attention of herpetologists during the past except for some general references (Raj & Seghal, 1964; Raza *et. al.*, 1976; Kalpavriksh, 1991; Malik *et. al.*, 1994) and the recent faunistic survey report on the subject by Husain (1997).

During the present study five species belonging to three genera were collected from the sanctuary area, of which four species are being recorded for first time.

SYSTEMATIC ACCOUNT

Order ANURA

I. Family BUFONIDAE

1. *Bufo melanostictus* Schneider

Common Toad

Material Examined : Asola-Bhatti Wildlife Sanctuary, Northern part, 1 ex. (17 mm), 9.viii.1997, *Coll. N. K. Sinha & party*; Bhatti Mines area, ca 2 km from Asola FRH, 2 exs. (34, 56 mm), 1.iii.1998; Dudhawali Khan in Bhatti Mines, 1 ex. (34 mm), 6.iii.1998, *Coll. S. K. Gupta & party*.

Distribution : India : Delhi and generally throughout. *Elsewhere* : Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, Malayasia, China, Hong Kong, Indonesia, Philippines. First record from the Sanctuary area.

Remarks : Inhabit under stones, wooden logs and near water bodies during the breeding season. Nocturnal. Insectivore.

2. *Bufo stomaticus* Lutken

Marbled Toad

Material Examined : Asola-Bhatti Wildlife Sanctuary, Central part, 2 exs., (23, 24 mm), 8.viii.1997, Coll. N. K. Sinha & party.

Distribution : India : Delhi, Punjab, Uttar Pradesh, West Bengal, Assam, Maharashtra. *Elsewhere* : Oman, Pakistan, Nepal, Bangladesh, Sri Lanka and Myanmar. First record from the Sanctuary area.

Remarks : Terrestrial, found near water bodies during the breeding season only. Nocturnal and Insectivore. Husain (1997) reported in the month of February, May and September from Delhi.

II. Family MICROHYLIDAE

3. *Microhyla ornata* (Dumeril & Bibron)

Ornate Frog

Material Examined : Asola-Bhatti Wildlife Sanctuary, central part, 3 exs. (10-12 mm), 7.iii.1997; 1 ex. (13 mm), 8.iii.1997, Coll. N. K. Sinha & party; Dudhawali Khan in Bhatti Mines, 1 ex. (13 mm), 6.iii.1998, Coll. S. K. Gupta & party; Sahurpur, 1 ex. (17 mm), 22.xii.1999, Coll. J. P. Sati & party.

Distribution : India : Delhi and generally throughout. *Elsewhere* : Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan and Southeast Asia.

Remarks : Generally seen around bushy areas, dry leaves on moist soil, banks of water bodies. Nocturnal, sometimes also seen during the daytime. Insectivore : Juveniles have been in the month of February in Delhi (Husain, 1997).

III. Family RANIDAE

4. *Rana cyanophlyctis* Schneider

Skipping Frog

Material Examined : Asola-Bhatti Wildlife Sanctuary, 1 ex. (58 mm), 12.ix.1994, Coll. J. P. Sati & party; southern side of sanctuary, 13 exs. (22-33 mm), 4.viii.1997, Coll. N. K. Sinha & party.

Distribution : India : Delhi and generally throughout. *Elsewhere* : Iran, Saudi Arabia,

Afghanistan, Pakistan, Nepal, Bangladesh, Sri Lanka, Thailand and Malaysia. Earlier recorded from the sanctuary area.

Remarks : Generally found in ponds, ditches and nalas and may tolerate extremely polluted waters. Insectivore. As regards breeding habits, its tadpoles have been reported during the months of February, May, June and December in Delhi (Husain, 1997).

5. *Rana limnocharis* Boie, Cricket Frog

Material Examined : Asola-Bhatti Wildlife, Sanctuary, Central part, 1 ex. (16 mm), 8.viii.1997, Coll. N. K. Sinha & party; Dudhawala Khan in Bhatti Mines, 1 ex. (13 mm), 6.iii.1998, Coll. S. K. Gupta & party; Pit No. 9, 1 ex. (41 mm), 19.xii.1999, Coll. J. P. Sati & party.

Distribution : India : Delhi and generally throughout (including Andaman and Nicobar Islands). Elsewhere : Pakistan, Nepal, Bangladesh, Myanmar, Thailand, Malaysia, Hong Kong, China, Indonesia, Taiwan, Philippines and Japan. First record from the Sanctuary.

Remarks : Commonly occurs in water edges or under stones near water bodies. Insectivore. Their juveniles have been reported in the month of February (Husain, 1997).

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REPTILIA

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INTRODUCTION

The reptilian fauna of Delhi has not been thoroughly worked out during the past except for the basic work of Smith (1943) and some general references like in, Gazetteers of Delhi (Anonymous 1888; 1913; Raza *et. al.*, 1976), Census reports (Raj & Sehgal, 1964); Delhi Ridge Forest. (Kalpavriksh, 1991), Srishti Reports (Malik *et. al.*, 1996, Gaur, 1995), Newsl. IZDA/CZA Report (Anonymous, 1996). Recently Husain (1997) listed 25 species of reptiles belonging to orders Crocodylia, Testudins, Sauria and Serpentes, adding three species, all belonging to Saurian, to the known reptilian fauna of Delhi and Gill (1997) described a new gekkonid, *Cyrtodactylus aravallensis* from the Delhi Ridge area.

During the present study four species of lizards and one snake could be recorded from the sanctuary area of which two are a new find for Delhi and four the first records for the sanctuary itself.

SYSTEMATIC ACCOUNT

I. Family AGAMIDAE

1. *Calotes versicolor* Daudin

Garden Lizard

Material Examined : Asola-Bhatti Wildlife Sanctuary, Sahurpur, 1 ex. (63+160 mm), 5.iii.1998, *Coll. S. K. Gupta*; Bhatti Mines, Pit No. 10/11, 1 ex. (75+238 mm), 26.x.1998, *Coll. Vinod Khanna*; Pipalwala; 1 ex. (66+130 mm), 18.xii.1999; Pit No. 9, 2 exs. (44+120, 51+135 mm), 19.xii.1999, *Coll. J. P. Sati & party*.

Distribution : India : Delhi and generally throughout. *Elsewhere* : Afghanistan, Pakistan, Sri Lanka, Malaysia, Hong King, Indonesia and China. First record from the Sanctuary.

Remarks : Arboreal, occurring in gardens, bushy and shrubby areas. Basically insectivore

also feeds on small birds, nesting, frogs, rodents, vegetative matter like leaves, seeds, flowers, etc. Breeds during summer and rainy season laying upto 25 eggs in different sized clutches in a hole dug by females in soft lower bed.

II. Family GEKKONIDAE

2. *Hemidactylus brooki* (Gray)

Spotted Brook's Gecko

Material Examined : Asola-Bhatti Wildlife Sanctuary, 1 ex., 12.ii.1995; *Coll. J. P. Sati & party*; Southern part, 1 ex. (30, tail broken); 5.viii.1997, *Coll. N. K. Sinha & party*; Pipalwala, ca 2 km from Asola FRH, 2 exs. (31+43, 36+46 mm), 28.ii.1998; Deoli area, 1 ex. (33+38 mm), 3.iii.1998; Dudhawali Khan in Bhatti Mines, 1 ex. (34+36 mm), 6.iii.1998, *Coll. S. K. Gupta & party*; Deoli, 1 ex. (42+52 mm), 28.x.1998; Imliwala, 1 ex. (37+44), 30.x.1998, *Coll. Vinod Khanna & party*; Pipalwala, 2 exs. (37+37, 47+55 mm), 18.xii.1999; Pit No. 9; 2 exs. (29+35, 47+48 mm), 19.xii.1999; Tughlakabad, towards Shooting range; 1 ex. (42+55 mm), *Coll. J. P. Sati & party*.

Distribution : India : Delhi and generally throughout. *Elsewhere* : Pakistan, Sri Lanka, Malaysia, Indonesia, China, Singapore, Africa (northern half) and West Indies. Earlier recorded both from the sanctuary and Delhi (Husain, 1997).

Remarks : Generally seen around pile of stones, bark of dead tree trunks, in crevices, old deserted buildings etc. Basically insectivorous, also feeds on small land molluscs, seeds of wild bushes etc. Breeds during summer period, female lays two small eggs in clutch, which hatch out in about 40 days time.

III. Family LACERTIDAE

3. *Ophisops feidoni* (Blyth)

Snake-Eyed Lacerta

Material Examined : Asola-Bhatti Wildlife Sanctuary, Dudhawali Khan in Bhatti Mines, 1 ex. (20+24 mm), 6.iii.1998, *Coll. S. K. Gupta & party*; Tughlakabad, towards Shooting range; 1 ex. (21+48 mm), 24.xii.1999, *Coll. J. P. Sati & party*.

Distribution : India : Generally throughout. *Elsewhere* : Pakistan. First record from the sanctuary and also Delhi State.

Remarks : Burrowing. Diurnal. Insectivorous.

IV. Family SCINCIDAE

5. *Riopa punctata* Gray**Striped Kink**

Material Examined : Asola-Bhatti Wildlife Sanctuary, ca 3 km south of Asola Administrative Block; 2 exs. (20, 42 mm + tail broken/regenerated), 2.iii.1998; Deoli area, 1 ex. (38-43 mm + tail), 3.iii.1998; Sahurpur, Asola, 2 exs. (45+58, 50+69 mm), 5.iii.1998, Dudhawali Khan in Bhatti Mines, 1 ex. (44 mm + tail), *Coll. S. K. Gupta & party*; Imliwala, 1 ex. (47 + tail), 30.x.1998, *Coll. Dudhawali Khan in Bhatti Mines*, 1 ex. (20 + 24 mm), 6.iii.1998, *Coll. S. K. Gupta & party*.

Distribution : India : Delhi and widely distributed both in plains and hilly terrain. *Elsewhere* : Sri Lanka, Vietnam. First record from the sanctuary area.

Remarks : Prefers moist soil, underneath stones, old bricks or old logs. Insectivorous. Female covers the eggs by soil after laying.

Order SERPENTES

V. Family TYPHLOPIDAE

6. *Typhlops porrectus* Stoliczka**Slender Work Snake**

Material Examined : Asola-Bhatti Wildlife Sanctuary, Sahurpur 1 ex. (80 mm), 22.xii.1999, *Coll. J. P. Sati & party*.

Distribution : India : Punjab, Haryana, Himachal Pradesh, Uttar Pradesh, Bihar, West Bengal, Orissa, Maharashtra, Karnataka and Kerala. *Elsewhere* : Pakistan, Sri Lanka and Myanmar. First record from the Sanctuary and also Delhi.

Remarks : Inhabits burrowing in upper loose soil, around roots of bushes and decayed wooden logs. Nocturnal. Insectivorous. Female lays tiny, elongated, white eggs during summer and rainy seasons. Non-venomous.

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AVES

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INTRODUCTION

A large number of publications pertaining to the birds of Delhi area have appeared in various periodicals and books (Tak and Sati, 1997). The avifauna of Delhi ridge was, perhaps, first dealt by Gaston (1978) and a checklist of 191 bird species for Delhi ridge was provided by Kalpavriksh (1991). The same checklist was used by Savarkar *et. al.* (1996) and Kumar and Khanna (1997) for their studies on Asola-Bhatti Wildlife Sanctuary (ABWLS). However, Sawarkar *et al.* (1996) made five new additions from Asola-Bhatti Wildlife Sanctuary to the existing checklist of the birds of the ridge. These five new additions were Little Grebe (*Podiceps ruficollis*), Coot (*Fulica atra*), Common Redshank (*Tringa totanus*), Painted Sandgrouse (*Petrocles indicus*) and Dusky Crag Martin (*Hirundo concolor*). The present communication is based on two field trips by the authors (10-days each during August, 1997 and December 1999). The nomenclature followed is after Ali & Ripley (1969-78). The subspecific level is included on the basis of the reported range of the subspecies. For convenience, the Handbook number has been given within parenthesis following the common name.

ANALYSIS AND RESULTS

As a result of the present study, two more waterbird species, viz., Common Sandpiper (*Tringa hypoleucos*) and Blackwinged Stilt (*Himantopus himantopus*) are added from Asola-Bhatti Wildlife Sanctuary to avifauna of the ridge. This study also provides locality records for 82 species of birds sighted within the Asola-Bhatti Wildlife Sanctuary, constitutes more than 40% of the total bird species (198) reported from the Delhi ridge.

These 82 species and subspecies of birds belong to 64 genera, 32 families and 15 different orders. A family-wise analysis reveal that the family Muscicapidae (the most crowded family of the passerine or song birds) predominates (15 species), followed by Accipitridae - Hawks and Vultures (6 species), Sturnidae - Starlings and Mynas (5) Charadriidae - Plovers and Sandpipers, Hirundinidae - Swallows, Ploceidae - Weaver birds (4 each), Ardeidae -

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Hérons and Egrets, Phasianidae - Phaesants and Partridges, Rallidae - Rails and Coots, Cuculidae - Cuckoos, Corvidae - Crows, Magpies and Jays, Motacillida - Pipits and Wagtails (3 each) and so on.

A two-fold status terminology, viz., abundance and residential (further divisible into various subcategories) has been used to determine the status of each taxa, as tabulated below.

The abundance status of each species within the sanctuary area was worked out by considering its number of sighting (s). This reveals that out of 82 species, 23 are occasional (sighted only once), 37 uncommon (observed two to three times) and 22 common (recorded more than three times) (Table).

The residential status as given by Kalpavriksh (1991) for Delhi has been used for Asola-Bhatti Wildlife Sanctuary. This reveals that out of 82 species, 56 are resident (R), 16 migrant (M), 6 resident / migrant (R/M) and 4 still lack information on their status (-).

Species such as pond heron, little egret, red-wattled lapwing, blue rock pigeon, rose ringed parakeet, hoopoe, treepie, house crow, redvented bulbul, robin, white wagtail etc. were encountered throughout the sanctuary area during the surveys.

Indian Peafowl, *Pavo cristatus*, (the National Bird) is the only threatened bird observed in the sanctuary. It has been placed under vulnerable (Vu) category by the Red Data Book, Zoological Survey of India (1994); Schedule I of the Wildlife (Protection) Act, 1972; and the Appendix I of the Convention on International Trade in Endangered species of Fauna and Flora (CITES).

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Table-List of Birds Observed During Recent Surveys

	Status in Delhi	Abundance in AB-WLS	Localities within Asola-Bhatti WLS
I. Order PODICIPEDIFORMES 1. Family PODICIPEDIDAE			
1. <i>Podiceps ruficollis capensis</i> Salvadori, Little Grebe or Dabchick (5)	R	UnCom	BMA (Dudhawali Khan), Sahurpur
II. Order PELECANIFORMES 2. Family PHALACROCORACIDAE			
2. <i>Phalacrocorax niger</i> (Vieillot) Little Cormorant (28)	R	UnCom	BMA, Sahurpur
III. Order CICONIIFORMES 3. Family ARDEIDAE			
3. <i>Ardeola grayii grayii</i> (Sykes) Indian Pond Heron or Paddybird (42)	R	Com	BMA, Pipalwala, Khajurwala, Sahurpur, Deoli, NOCA
4. <i>Bubulcus ibis coromandus</i> (Boddaert) Cattle Egret (44)	R	UnCom	Khajurwala, Sahurpur, Maidangarhi
5. <i>Egretta garzetta garertta</i> (Linnaeus) Little Egret (49)	R	Com	BMA, Pipalwala, Sahurpur, Deoli, NOCA
IV. Order FALCONIFORMES 4. Family ACCIPITRIDAE			
6. <i>Elanus caeruleus vociferus</i> (Latham) Blackwinged Kite (124)	R	Occ	Deoli
7. <i>Milvus migrans govinda</i> Sykes Pariah Kite (133)	R	Com	Pipalwala, Khajurwala, Sahurpur, Deoli, NOCA
8. <i>Accipiter badius dussumieri</i> (Temminck) Indian Shikra (138)	R	UnCom	Pipalwala, Maidangarhi, NOCA
9. <i>Gyps bengalensis</i> (Gmelin) Indian Whitebacked Vulture (185)	R	Occ	Maidangarhi
10. <i>Neophron percnopterus percnopterus</i> (Linnaeus) Egyptian Vulture (186)	R	UnCom	BMA, Deoli

	Status in Delhi	Abundance in AB-WLS	Localities within Asola-Bhatti WLS
11. <i>Circus aeruginosus aeruginosus</i> (Linnaeus) Marsh Harrier (193) V. Order GALLIFORMES 5. Family PHASIANIDAE	M	UnCom	Deoli, NOCA
12. <i>Francolinus francolinus asiae</i> Bonaparte Indian Black Partridge (238)	R	UnCom	BMA, Sahurpur, Maidangarhi
13. <i>Francolinus pondicerianus interpositus</i> Hartert North Indian Grey Partridge (245)	R	Com	BMA, Sahurpur, Deoli, NOCA
14. <i>Pavo cristatus</i> Linnaeus Indian Peafowl (311) VI. Order GRUIFORMES 6. Family RALLIDAE	R	Com	Pipalwala, Khajurwala, Sahurpur, Maidangarhi, Deoli, NOCA
15. <i>Amaurornis phoenicurus chinensis</i> (Boddaert) Chinese Whitebreasted Waterhen (343)	R	Occ	Sahurpur
16. <i>Gallinula chloropus indica</i> Blyth Indian Moorhen (347)	R	Occ	BMA
17. <i>Fulica atra atra</i> Linnaeus Coot (350) VII. Order CHARADRIIFORMES 7. Family CHARADRIIDAE	—	Occ	BMA (Bhatti)
18. <i>Vanellus indicus indicus</i> (Boddaert) Redwattled Lapwing (366)	R	Com	BMA, Pipalwala, Khajurwala, Sahurpur, NOCA
19. <i>Tringa totanus totanus</i> (Linnaeus) Common Redshank (393)	—	Occ	Asola (waterhole)
20. <i>Tringa ochropus</i> Linnaeus Green Sandpiper (397)	M	Occ	Sahurpur
21. <i>Tringa hypoleucos</i> Linnaeus Common Sandpiper (401)	M	UnCom	BMA, Sahurpur

	Status in Delhi	Abundance in AB-WLS	Localities within Asola-Bhatti WLS
8. Family RECURVIROSTRIDAE			
22. <i>Himantopus himantopus himantopus</i> (Linnaeus) Indian Blackwinged Stilt (430)	R/M	Com	BMA, Pipalwala, Khajurwala, Sahurpur
VIII. Order COLUMBIFORMES			
9. Family PTEROCLIDIDAE			
23. <i>Pterocles indicus indicus</i> (Gmelin) Painted Sandgrouse (492)	—	Occ	Asola (waterhole)
10. Family COLUMBIDAE			
24. <i>Columba livia intermedia</i> Strikland Blue Rock Pigeon (517)	R	Com	BMA, Pipalwala, Khajurwala, Sahurpur, Maidangarhi, Deoli, NOCA
25. <i>Streptopelia decaocto decaocto</i> (Frisch) Indian Ring Dove (534)	R	Occ	NOCA
26. <i>Streptopelia chinensis suratensis</i> (Gmelin) Indian Spotted Dove (537)	M	UnCom	Khajurwala, Sahurpur, NOCA
27. <i>Streptopelia senegalensis cambayensis</i> (Gmelin) Indian Little Brown or Senegal Dove (541)	R	Com	BMA, Pipalwala, Khajurwala, Deoli, NOCA
IX. Order Psittaciformes			
11. Family Psittacidae			
28. <i>Psittacula krameri manillensis</i> (Bechstein) Roseringed Parakeet (550)	R	Com	BMA, Pipalwala, Khajurwala, Sahurpur, Deoli, NOCA
29. <i>Psittacula cyanocephala bengalensis</i> (Forster) Northern Blossomheaded Parakeet (557)	R	Occ	Pipalwala

	Status in Delhi	Abundance in AB-WLS	Localities within Asola-Bhatti WLS
X. Order CUCULIFORMES			
12. Family CUCULIDAE			
30. <i>Clamator jacobinus serratus</i> (Sparrman) Pied Crested Cuckoo (570)	M	Occ	Deoli
31. <i>Cuculus varius varius</i> Vahl Common Hawk-Cuckoo/ Brainfever Bird (573)	M	UnCom	Sahurpur, Maidangarhi
32. <i>Taccocua leschenaultii sirkee</i> (J. E. Gray) Western Sirkeer Cuckoo (596)	R	UnCom	Sahurpur, Maidangarhi
XI. Order STRIGIFORMES			
13. Family STRIGIDAE			
33. <i>Athene brama indica</i> (Franklin) Northern Spotted Owlet (650)	R	Com	BMA, Pipalwala, Khajurwala, NOCA
XI. Order APODIFORMES			
14. Family APODIDAE			
34. <i>Apus affinis affinis</i> (J. E. Gray) Indian House Swift (703)	R	Com	BMA, Pipalwala, Khajurwala, NOCA
XIII. Order CORACIIFORMES			
15. Family ALCEDINIDAE			
35. <i>Ceryle rudis leucomelanura</i> Reichenbach Indian Pied Kingfisher (719)	R	Occ	BMA
36. <i>Halcyon smyrnensis smyrnensis</i> (Linnaeus) Whitebreasted Kingfisher (735)	R	UnCom	BMA, Sahurpur
16. Family MEROPIDAE			
37. <i>Merops orientalis orientalis</i> Latham Indian Small Green Bee-eater (750)	R	UnCom	Sahurpur, Deoli

	Status in Delhi	Abundance in AB-WLS	Localities within Asola-Bhatti WLS
17. Family CORACIIDAE			
38. <i>Coracias benghalensis benghalensis</i> (Linnaeus) Northern Roller or Blue Jay (755)	R	UnCom	BMA, Pipalwala
18. Family UPUPIDAE			
39. <i>Upupa epops epops</i> Linnaeus European Hoopoe (763)	R/M	Com	BMA, Pipalwala, Khajurwala, Maidangarhi, Deoli, NOCA
19. Family BUCEROTIDAE			
40. <i>Tockus birostris</i> (Scopoli) Grey Hornbill (767)	R/M	Occ	Pipalwala
XIV. Order PICIFORMES			
20. Family Picidae			
41. <i>Dinipium bengalense bengalense</i> (Linnaeus) Northern Goldenbacked Woodpecker (819)	R/M	UnCom	Sahurpur, Maidangarhi
XV. Order PASSERIFORMES			
21. Family HIRUNDINIDAE			
42. <i>Riparia paludica chinensis</i> (J. E. Gray) Indian Greythroated Sand Martin (912)	R	UnCom	BMA, BOCA
43. <i>Hirundo concolor concolor</i> Sykes Dusky Crag Martin (914)	—	Occ	BMA (Bhatti, near mine and scrubs)
44. <i>Hirundo rustica rustica</i> Linnaeus Western Swallow (915)	M	UnCom	Sahurpur, Deoli, NOCA
45. <i>Hirundo smithii filifera</i> Stephens Indian Wiretailed Swallow (921)	R	Occ	Deoli
22. Family LANIIDAE			
46. <i>Lanius schach erythronotus</i> (Vigors) Rufousbacked Shrike (946)	R/M	UnCom	Sahurpur, NOCA

	Status in Delhi	Abundance in AB-WLS	Localities within Asola-Bhatti WLS
23. Family ORIOLIDAE			
47. <i>Oriolus oriolus kundoo</i> Sykes Indian Golden Oriole (953)	M	UnCom	Deoli, NOCA
24. Family DICRURIDAE			
48. <i>Dicrurus adsimilis albirictus</i> (Hodgson) North Indian Black Drongo or King Crow (962)	R	Com	BMA, Pipalwala, Khajurwala, Deoli, NOCA
25. Family STURNIDAE			
49. <i>Sturnus pagodarum</i> (Gmelin) Blackheaded or Brahminy Myna (994)	R	UnCom	Maidangarhi, Deoli
50. <i>Sturnus roseus</i> (Linnaeus) Rosy Starling or Rosy Pastor (996)	M	Occ	Deoli
51. <i>Sturnus contra contra</i> Linnaeus Indian Pied Myna (1002)	R	UnCom	BMA, Sahurpur, Maidangarhi
52. <i>Acridotheres tristis tristis</i> (Linnaeus) Indian Myna (1006)	R	UnCom	Deoli, NOCA
53. <i>Acridotheres ginginianus</i> (Latham) Bank Myna (1008)	R	UnCom	BMA, Pipalwala, Khajurwala
26. Family CORVIDAE			
54. <i>Dendrocitta vagabunda</i> (Latham) Treepie (130/31)	R	Com	BMA, Pipalwala, Khajurwala, Maidangarhi, Deoli, NOCA
55. <i>Corvus splendens splendens</i> Vieillot Indian House Crow (1049)	R	Com	Pipalwala, Khajurwala, Sahurpur, Maidangarhi, Deoli, NOCA
56. <i>Corvus macrohynchos culminatus</i> Sykes Indian Jungle Crow (1057)	R	UnCom	BMA, NOCA
27. Family PYCNONOTIDAE			
57. <i>Pycnonotus leucogenys leucotis</i> (Gould) White-eared Bulbul (1123)	R	UnCom	Sahurpur, Maidangarhi, NOCA
58. <i>Pycnonotus cafer humayuni</i> Deignan Central Indian Redvented Bulbul (1127)	R	Com	BMA, Pipalwala, Khajurwala, Sahurpur, Maidangarhi, Deoli, NOCA

	Status in Delhi	Abundance in AB-WLS	Localities within Asola-Bhatti WLS
28. Family MUSCICAPIDAE			
59. <i>Chrysomma sinense sinense</i> (Gmelin) Yellow-eyed Babbler (1231)	R	Occ	Sahurpur
60. <i>Turdoides caudatus caudatus</i> (Dumont) Common Babbler (1254)	R	Occ	NOCA
61. <i>Turdoides malcolmi</i> (Sykes) Large Grey Babbler (1258)	R	Com	BMA, Pipalwala, Khajurwala, Deoli, NOCA
62. <i>Turdoides striatus sindianus</i> (Ticehurt) Sind Jungle Babbler (1261)	R	UnCom	BMA, Deoli
63. <i>Rhipidura aureda aureola</i> Lesson Northern Whitebrowed Fantail Flycatcher (1451)	R	UnCom	BMA, Pipalwala, Khajurwala
64. <i>Prinia subflava terricolor</i> (Hume) Northwestern Plain Wren-Warbler (1510)	R	UnCom	BMA, NOCA
65. <i>Prinia socialis stewarti</i> Blyth Northern Ashy Wren-Warbler (1515)	R	UnCom	Sahurpur, Deoli, NOCA
66. <i>Orthotomus sutorius guzuratus</i> (Latham) Indian Tailor Bird (1535)	R	Occ	Maidangarhi
67. <i>Phylloscopus collybita tristis</i> Blyth Brown Chiffchaff (1575)	M	Occ	NOCA
68. <i>Phylloscopus affinis affinis</i> (Tickell) Tickell's Leaf Warbler (1579)	M	UnCom	Sahurpur, NOCA
69. <i>Erithacus svecicus</i> Linnaeus Bluethroat (1644/45)	M	Occ	Sahurpur
70. <i>Copsychus saularis saularis</i> (Linnaeus) Indian Magpie-Robin (1661)	R	Com	Pipalwala, Khajurwala, Sahurpur, NOCA
71. <i>Phoenicurus ochruros phoenicuroides</i> (Moore) Kashmir Black Redstart (1671)	M	UnCom	BMA, Deoli
72. <i>Saxicola Caprata</i> (Linnaeus) Pied Bush Chat (1700)	R/M	UnCom	BMA, Deoli

	Status in Delhi	Abundance in AB-WLS	Localities within Asola-Bhatti WLS
73. <i>Saxicoloides fulicata cambaiensis</i> (Latham) Brownbacked Indian Robin (1717)	R	Com	BMA, Pipalwala, Khajurwala, Sahurpur, Maidangarhi, Deoli, NOCA
29. Family MOTACILLIDE			
74. <i>Anthus similis jerdon</i> Brown Rock Pipilt (1866/67)	M	Occ	NOCA
75. <i>Motacilla caspica caspica</i> (Gmelin) Grey Wagtail (1884)	M	UnCom	BMA, Pipalwala,
76. <i>Motacilla alba</i> Linnaeus White Wagtail (1885)	M	Com	BMA, Pipalwala, Khajurwala, Sahurpur, Deoli, NOCA
30. Family NECTARINIIDAE			
77. <i>Nectarinia asiatica asiatica</i> (Latham) Indian Purple Sunbrid (1917)	R	UnCom	BMA, Pipalwala, NOCA
31. Family ZOSTEROPIDAE			
78. <i>Zosterops palpebrosa palpebrosa</i> (Temminck) Indian White-eye (1933)	R	UnCom	BMA, Pipalwala
32. Family PLOCEIDAE			
79. <i>Passer domesticus indicus</i> Jardline & Selby Indian House Sparrow (1938)	R	Com	Pipalwala, Khajurwala, Deoli, NOCA
80. <i>Ploceus philippinus philippinus</i> (Linnaeus) Indian Baya (1957)	R	UnCom	BMA, Deoli
81. <i>Estrilda amandava amandava</i> (Linnaeus) Red Munia or Avadavat (1964)	R	UnCom	BMA, NOCA
82. <i>Lonchura malabarica malabarica</i> (Linnaeus) Whitethroated Munia (1967)	R	Occ	NOCA

Note : **BMA** : Bhatti Mines Area covering Pit Nos. 2/3, 8, 9, 10, 11 and 12. **NOCA** : New Office Complex Area in Northern part of Asola Sanctuary covering about 2 km stretch inside the boundary wall. **R** : Resident, **M** : Migrant, **R/M** : Resident/Migrant, **-** : Information on status lacking.

MAMMALIA

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INTRODUCTION

Sinha and Sati (1997), in a recent publication - the Fauna of Delhi have reviewed the studies so far done on mammals of Delhi. Kalpavriksh (1991) reported 29 species of mammals from the ridge area while Sawarkar *et al.* (1996) working for the Management Plan of Asola-Bhatti Wildlife Sanctuary reported six species, either by direct or by indirect observations from the area. Kumar and Khanna (1997) in their biodiversity profile of Asola-Bhatti Wildlife Sanctuary listed 10 species of mammals.

The present communication based mainly on the observations made during the four field surveys by the Zoological Survey of India Dehra Dun (1996-1999) and the earlier published records, reports 18 species of mammals from the Asola-Bhatti Wildlife Sanctuary area. As far as possible, the locality records for these species within the sanctuary have been given. Besides locality records, the distribution, remarks and status for each species is also given. These 18 species belong to 15 genera, 10 families and 7 orders. The classification followed after Wilson and Reeder (1993) and Alfred *et al.* (2002).

SYSTEMATIC ACCOUNT

Order CHIROPTERA
Family VESPERTILIONIDAE

1. *Pipistrellus coromandra* (Gray)

1838. *Scotophilus coromandra* Gray, *Mag. Zool. Bot.* 2 : 498

Type locality : Pondicherry, India.

Common Name : Indian Pipistrelle.

Material Examined : Sawarkar (1996) reported the species from Asola-Bhatti Wildlife Sanctuary.

Distribution : India : Peninsula of India. *Elsewhere* : Southern China, Laos, Sri Lanka and Vietnam.

Remarks : Easy to recognize by its jerky flight in the late evenings.

Status : CAMP : LRnt (Nationally), DD (Globally).

Order PRIMATES
Family CEREOPITHECIDAE

2. *Macaca mulatta* (Zimmermann)

1780. *Cercopithecus mulatta* Zimmermann, *Geogr. Gesch. Mensch.* 2 : 195.

Type locality : India.

Common Name : Rhesus Macaque.

Material Examined : Sinha & Sati (1997) sighted the species in the sanctuary. Recently it has been reported from BMA, Pipalwala, Deoli and NOCA localities.

Distribution : India : North and East India above Tapti and Godawari. *Elsewhere* : Afghanistan, Bhutan, Nepal, Myanmar, Indo-China, China, Hong Kong, Mongolia, Thailand and Tibet.

Remarks : Most of the time the groups were seen on the periphery of the sanctuary, either feeding, resting or playing.

Status : IWPA : Schedule II; CAMP : LRlc (Nationally), DD (Globally).

Order CARNIVORA
Family CANIDAE

3. *Canis aureas* Linnaeus

1758. *Canis aureas* Linnaeus, *Syst. Nat.*, 10th ed., 1 : 40.

Type locality : Laristan, South Persia (Iran).

Common Name : Asiatic Jackal; Golden Jackal.

Material Examined : Sinha & Sati (1997) reported the species from the sanctuary. During recent surveys they were sighted at BMA, Pipalwala, Khajurwala, Sahurpur, Deoli and NOCA localities.

Distribution : India : Bihar, Gujarat, Haryana, Madhya Pradesh, Orissa, Punjab, Peninsula,

Northeastern States, Uttar Pradesh, Western India and West Bengal. *Elsewhere* : North and East Africa, Southwest Asia, Central Asia, Afghanistan, Southwest Europe, Nigeria, Sri Lanka, Senegal, Thailand, Tanzania and Transcaucasia.

Remarks : Howling often heard in the evening and observed frequently.

Status : IWPA : Schedule II, Part II; Camp : LRlc (Nationally); Convention on International Trade in Endangered species of Fauna and Flora (CITES) : Appendix III.

Family VIVERRIDAE

4. *Viverricula indica* (Desmarest)

1817. *Viverra indica* Desmarest, *Nouv. Dict. N. H.* 7 : 170.

Type locality : India.

Common name : Small Indian Civet or Rasse.

Material Examined : The species was sighted at BMA and NOCA localities.

Distribution : India : Throughout except high Himalaya. *Elsewhere* : South China, further to south-eastern Asia, Bhutan and Myanmar.

Remarks : A Common Mongoose was observed feeding on a dead specimen of civet in NOCA area. The reason of death is not known.

Status : IWPA : Schedule II, Part II; Conventional on International Trade in Endangered species of Fauna and Flora (CITES) : Appendix III; CAMP : LRnt (Nationally), DD (Globally).

5. *Herpestes javanicus* (E. Geoffroy Saint-Hilaire)

1818. *Ichneumon javanicus* E. Geoffroy Saint-Hilaire, *Descrip. de L'Egypte*, 2 : 138.

Type locality : Java, Indonesia.

Common Name : Small Indian Mongoose; Javan Mongoose.

Material Examined : Sinha & Sati (1997) reported from area. Recently sighted at BMA, Pipalwala, Khajurwala and Deoli localities.

Distribution : India : Jammu & Kashmir to West Bengal, Orissa, Assam. *Elsewhere* : Western Asia, Myanmar and Malaya Countries.

Remarks : Commonly seen in the sanctuary.

Status : IWPA : Schedule IV; CAMP : LRlc (Nationally), DD (Globally).

6. *Herpestes edwardsii* (E. Geoffroy Saint-Hilaire)

1818. *Ichneumon edwardsii* E. Geoffroy Saint-Hilaire, *Descrip. de L'Egypte*, 2 : 139.

Type locality : Madras, India.

Common Name : Indian Grey Mongoose.

Material Examined : The species was sighted at Pipalwala, Maidangarhi and NOCA localities.

Distribution : India : Throughout except Himalayas. *Elsewhere* : West Asia, Pakistan, Nepal and Sri Lanka.

Remarks : Once it was seen feeding on Small Indian Civet at NOCA area.

Status : IWPA : Schedule IV; Convention on International Trade in Endangered species of Fauna and Flora (CITES) : Appendix III; CAMP : LRlc (Nationally), DD (Globally).

7. *Herpestus smithii* Gray

1837. *Herpestus smithii* Gray, *Charlesw. Mag. N. H.* 1 : 578.

Type locality : Bombay, India.

Material Examined : Sawarkar (1996) reported the species from Asola-Bhatti Wildlife Sanctuary.

Distribution : India : Kashmir, Rajasthan, West Bengal, Southward to Maharashtra, Karnataka, Andhra Pradesh and throughout Eastern and Western Ghats.

Remarks : Observed once by the first author in the BMA area.

Status : IWPA : Schedule IV; Convention on International Trade in Endangered species of Fauna and Flora (CITES) : Appendix III; CAMP : LRlc (Nationally), DD (Globally).

Family HYAENIDAE

8. *Canis hyaena* Linnaeus

1758. *Canis hyaena* Linnaeus, *Syst. Nat.* 10th ed. 1 : 40.

Type locality : Laristan, Southern Iran.

Material Examined : Sawarkar *et al.* (1996) mentioned the occurrence of the species from the sanctuary.

Distribution : India : Throughout. *Elsewhere* : Southern Russia, Southwestern Asia Minor, Northern Africa, Nepal (Terai).

Remarks : Sawarkar *et al.* (1996) reported the presence of the species from the sanctuary.

Status : IWPA : Schedule III; CAMP : LRnt (Nationally), DD (Globally).

Family FELIDAE

9. *Felis chaus* Schreber

1777. *Felis chaus*. Schreber, Die Säugethiere, 2 (13) : pl. 1101B (1777) : text, 3 (24) : 414 (1777).

Type locality : Terek river, north of Caucasus, Dugestan and C.I.S. Country.

Common Name : Jungle Cat.

Material Examined : Sawarkar *et al.* (1996) reported the presence of the species in Asola-Bhatti Wildlife Sanctuary on the basis of scats. Recently this was reported from Sahurpur area.

Distribution : India : Kashmir to Sikkim in Himalaya, Gujarat, West Bengal, Peninsular India. *Elsewhere* : West coast of Caspian sea to Turkistan, Egypt, Afghanistan, Baluchistan, Nepal, Sri Lanka, Myanmar, China and Thailand.

Remarks : Very rare in the area.

Status : IWPA : Schedule II, Part II; Conservation on International Trade in Endangered species of Fauna and Flora (CITES) : Appendix II; CAMP : LRnt (Nationally), DD (Globally).

Order ARTIODACTYLA

Family BOVIDAE

10. *Boselaphus tragocamellus* (Pallas)

1766. *Antilope tragocamellus* Pallas, *Misc. Zool.* 5.

Type locality : Plains of Peninsular India.

Common Name : Nilgai; Blue Bull.

Material Examined : Herds of eight and twelve Nilgai were seen in the southern and northern localities of the sanctuary respectively.

Distribution : India : Base of Himalaya to Karnataka in south. *Elsewhere* : Bangladesh, Nepal and Pakistan. Introduced into Texas (U.S.A.).

Remarks : Very common and frequently encountered species.

Status : IWPA : Schedule III; CAMP : LR1c (Nationally), DD (Globally).

11. *Antilope cervicapra* (Linnaeus)

1758. *Capra cervicapra* Linnaeus, *Syst. Nat. 10th ed.* 1 : 69.

Type locality : Inland of Thiruananthpuram, Kerala, India.

Common Name : Blackbuck.

Material Examined : Recently a few individuals have been introduced (within fence) in the NOCA area of the sanctuary.

Distribution : India : Punjab East to West Bengal and South to Kanyakumari. *Elsewhere* : Pakistan. Introduced in Nepal, Texas (U.S.A.).

Remarks : The sanctuary authorities in 1999 introduced the animals into the sanctuary, which were abandoned on the roads of Delhi by the local residents.

Order PHOLIDOTA
Family MANIDAE

12. *Manis crassicaudata* Gray

1827. *Manis crassicaudata* Gray, *Grifith et. al., Anim. Kingd.* 5 : 282.

Type locality : India.

Common Name : Indian Pangolin.

Material Examined : The local people have reported the species from BMA & NOCA localities.

Distribution : India : Throughout peninsula upto Kutch and West Bengal; foot hills of Himalaya (Dehra Dun Valley). *Elsewhere* : Sri Lanka.

Remarks : Indirect evidences show their presence in the sanctuary.

Status : IWPA : Schedule I, Part I; RDB : Vu; Convention on International Trade in Endangered species of Fauna and Flora (CITES) : Appendix II; CAMP : LRnt (Nationally), DD (Globally).

Order RODENTIA
Family SCIURIDAE

13. *Funambulus pennanti* Wroughton

1905. *Funambulus pennanti* Wroughton, *J. Bombay. nat. Hist. Soc.*, 16 (3) : 411.

Type locality : Mandhvi, Surat, Gujarat, India.

Common Name : Northern Palm Squirrel.

Material Examined : Frequently seen in BMA, Pipalwala, Khajurwala, Maidangarhi, Deoli and NOCA localities.

Distribution : India : Throughout, except Southern States. *Elsewhere* : Pakistan and Nepal.

Remarks : Very common.

Status : IWPA : Schedule IV; CAMP : LRlc (Nationally), DD (Globally).

Family HYSTRICIDAE

14. *Hystrix indica* (Kerr)

1792. *Hystrix cristata* Kerr, In : *Linnaeus, Anim. Kingd.* : 213.

Type locality : India.

Common Name : Indian Crested Porcupine.

Material Examined : The locals resident have reported their burrow and collected quills from the BMA, Sahurpur and NOCA area.

Distribution : Widely distributed in north, northwestern states and Peninsula. *Elsewhere* : Western Asia, Southern Arabia, Turkiestan, Transcaucaisa, Sri Lanka and Nepal.

Remarks : Shed quills were the evidence of its presence in the sanctuary.

Family MURIDAE

15. *Bandicoota indica* (Bechstein)

1800. *Mus indicus* Bechstein, *Ueber Vierb. Thiere*, 2 : 497.

Type locality : Pondicherry, India.

Common Name : Large Bandicoot Rat.

Material Examined : Once it was seen from BMA, Pipalwala and Khajurwala localities.

Distribution : India : Widely distributed. *Elsewhere* : Israel, Nepal, Sri Lanka and Russian Turkiestan.

Remarks : Common near human habitation.

Status : IWPA : Schedule IV; CAMP : LRlc (Nationally), DD (Globally).

16. *Mus musculus* Linnaeus

1758. *Mus musculus* Linnaeus, *Syst. Nat. 10th ed.* 1 : 62.

Type locality : Uppsala, Sweden.

Common Name : House Mouse.

Material Examined : On many occasions they were seen near Pipalwala, Deoli and NOCA area.

Distribution : India : Throughout. *Elsewhere* : Throughout the World.

Remarks : Commonly seen near human habitation.

Status : IWPA : Schedule V; CAMP : LRlc (Nationally), DD (Globally).

17. *Tatera indica* (Hardwicke)

1807. *Dipus indicus* Hardwicke, *Trans. Linn. Soc. London*, 8 : 279.

Type locality : Between Varanasi (Uttar Pradesh) and Haridwar (Uttranchal), India.

Common Name : Indian Gerbil; Antelope Rat.

Material Examined : The species was observed once from Deoli and NOCA.

Distribution : India : Widely distributed, recorded from Punjab, Rajasthan and Gujarat. *Elsewhere* : Pakistan, Afghanistan, Iran and Sri Lanka.

Remarks : Generally seen northwestern part of sanctuary.

Status : IWPA : Schedule V; CAMP : LRlc (Nationally), DD (Globally).

Order LAGOMORPHA

Family LEPORIDAE

18. *Lepus nigricollis* F. Cuvier

1823. *Lepus nigricollis* F. Cuvier, *Dict. Sci. Nat.* 26 : 307.

Type locality : Malabar, Tamil Nadu, India.

Common Name : Indian Hare, Black-napped Hare.

Material Examined : At BMA, Pipalwala, Sahurpur, Maidangarhi and NOCA localities.

Distribution : India : Throughout. *Elsewhere* : Bangladesh, Pakistan, Nepal, Bhutan, Myanmar, Indonesia and Sri Lanka.

Remarks : Common throughout.

Status : IWPA : Schedule IV; CAMP : LRlc (Nationally), DD (Globally).

Abbreviations Used : **CAMP** : Conservation Assessment Management Plan; **CITES** : Convention on International Trade in Endangered Species of Wild Fauna and Flora; **DD** : Data deficient; **IWPA** : Indian Wildlife (Protection) Act; **LRlc** : Lower Risk least concerned; **LRnt** : Lower Risk nearly threatened; **RDB** : Red Data Book; **Vu** : Vulnerable; **BMA** : Bhatti Mines Area; **NOCA** : New Office Complex Area.

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