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Invertebrates and vertebrates fauna of district, Karak, KP, Pakistan

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Abstract

The basic aim of the present study was to find out the vertebrates and invertebrate fauna of Khaisaridam (Ghundi Shahbaz Khan) of district Karak, Khyber Pakhtunkhwa province of Pakistan. A study was conducted from March 2017 to October 2017. Khaisari dam has all the vertebrates, like fishes, amphibians, reptiles, birds and mammals. Fishes include *Cyprinus carpio*, *Labeo rohita*, *Cirrhinus cirrhosus*, *Hypophthalmichthys molitrix*. Amphibians include *Duttaphrynus Melanostictus*, *Ranatigrina*, *Euphlyctis cyanophlyctis*. Reptiles include *Chamaeleo zeylanicus*, *Xantusia vigilis*, *Lampropeltis getula*. Birds include *Passer domesticus*, *Acridotheres tristis*, *Anas crecca*, *Grus grus*, *Pavo cristatus*, *Pycnonotus barbatus*, *Pycnonotus barbatus*, *Cairina moschata* and mammals include *Canis adustus*, *Canis lupus*, *Feluscatus*, *Capra hircus*, *Ovis aries*, *Equus assinus*. Invertebrates include *Hirudo medicinalis*, *Solenopsis invicta*, *Vespa velutina*, *Pandinus imperator*, *Sympetrum flaveolum*.

Keywords: fauna, domesticus, fish, vertebrate, khaisari dam

Introduction

Invertebrates are those animals which lack vertebral column. Most invertebrates are a good source of food for human beings. For example, honey bee, shrimps and grasshoppers^[1, 2]. Invertebrates are an important component of biodiversity^[3-6]. Due to their great abundance, diversity and functional importance the invertebrates act as a powerful monitoring agent in environmental management^[7-9]. According to Cairns and Pratt the invertebrates are used to assess the environmental condition of an aquatic ecosystem^[10]. Those animals having a vertebral column are called vertebrates. They got the name vertebrates because of the presence of vertebrae which make their vertebral column. Among vertebrate fishes are most abundant and show variation in habitat, morphology, structure and also in physiology. Fishes can live in all types of aquatic habitat, i.e. both in fresh water and marine water. Fishes can tolerate salty water because of their well-developed body system. Fishes are very important for human beings because they provide food which is chiefly consist of fats and proteins^[11]. Fishes are the Poikilothermic, aquatic vertebrates and their appendages are modified as fins. The respiratory organs of fishes are the gills and the body of fishes is usually covered with scales^[12]. The fish population is decreasing all over the world due to pollution, change in environmental condition and illegal hunting^[13, 14]. The word amphibians have been derived from the Greek word "amphibious" which means "double life". Amphibians begin life as aquatic larva and emerge into terrestrial adults through the process of metamorphosis^[15]. Amphibians live in both habitats that is aquatic and terrestrial, any change in one or both habitats affects the diversity of amphibians^[16]. Adult amphibians are carnivores and larval amphibians are herbivorous. The amphibians teeth are periodically shed and replace. The tongue is usually used for food handling^[17, 18]. The granular glands in the amphibian's skin secrete different types of compounds, including toxins, pheromones, and antimicrobial substance. The toxic compound protects the amphibians against predators and the antimicrobial compounds give protection against bacterial as well as fungal infection^[19]. The heart of amphibian consists of three chambers, which include two atria and a single ventricle. The lymphatic system of amphibians is highly developed which has lymph hearts that beat independently of the cardiovascular system's heart^[20]. In the blood of the healthy amphibians ratio of leukocytes to erythrocytes ranges from 1:20 to 1:70^[21]. Today throughout world 7,044

species of amphibians exist in three orders [22]. The climate of Pakistan is not too much favorable for amphibian fauna. Pakistan has infrequent amphibian fauna because in both villages and cities, water ponds are removed to eliminate mosquitoes for controlling Malaria which negatively affects amphibian population [23]. To increase crop production certain pesticides are used which is another serious hazard for amphibian populations [24]. Amphibians are economically important as they are a source of food for human being [25, 26], medical resource in some regions [27], and as an important latent source of future pharmaceutical drugs [28]. The apparent role of amphibians is noted to be of particular importance in tropical forests, where in acting as both predator and prey species, they also play a key role in trophic dynamics [29, 30]. Reptiles are cold-blooded animals and except cold regions they are found in all other parts of the world. Reptiles were considered as the first truly land vertebrates. Most diverse reptilian fauna are found in arid regions of the world such as North American deserts [31]. Pakistan has 179 species of reptiles including snakes, lizards, gavia, tortoises, crocodile and turtles [32]. In Pakistan the dominant group of reptile is lizards (Suborder Sauria) [33]. Some reptiles act as an important sources of protein for human beings such as crocodylians, snakes, lizards, turtles, and tortoises [34]. Live snakes (and their body parts) are demanded for use in traditional medicine which led to reductions in their populations in most parts of the world [35]. Some reptiles are also sold as pets or memento like iguanas are imported to the United States from other countries [36]. It has been noted that among the animal species, reptiles are more frequently used in traditional folk medicine, and their use is just due to their healing power and prevention of illnesses [37-44]. For instance, in India, products derived from the land monitor are used to treat hemorrhoids, rheumatism, body pain and burns etc [45]. Among terrestrial vertebrates birds are the most successful group as they have 28 orders, 166 families and 8800 species. Modern birds lack teeth. Birds share many characters with reptiles such as they lay eggs, which have amniotic membranes and have scales on their lower legs [46-47]. Among animals the birds are most easily recognized categories. The unique characters of birds are the presence of feathers, forelimbs of birds are modified into wings, which are mostly used for flight and they have feathered tail which helps in balancing, and lifting [48, 49]. Most species of birds are restricted to particular regions and habitats, whereas others are present throughout the world [50]. During the winter season a large number of birds migrate from Europe and Central Asia toward wetlands of Pakistan [51]. Birds are most important component of the environment because they help in the pollination of flowers, dispersal of seed from one place to another and breaking seed dormancy [52]. Populations of birds are decreasing day by day throughout the world (Birdlife International, 2007). The most common hazard that birds face is overheating, accidental death [53] pollution (including oil spills and pesticide use), competition and climatic changes [54]. Mammals are diverse group having different shapes,

habitats and behaviors [55, 56]. Mammalian fauna of Pakistan consist 195 species belonging to 10 orders [57, 58]. Among these mammalian species 5 are endemic to Pakistan, 12 are critically Endangered (1 endemic), 12 Endangered (3endemic), 20 Vulnerable, 32 Near Threatened (1endemic), 71 Least Concern, 38 Data Deficient, 8Regionally Extinct and 2 are Not Evaluated (IUCN, 2003). Like birds, mammals also play an important role in the ecosystem because they carry pollen grains from flower to flower and also control various diseases [59-61]. The aim of the current research work was to find out the Invertebrates and Vertebrates Fauna of district, Karak, KP, Pakistan.

Materials and Methods

Fishes were collected from the different sites of the Khaisari dam with the help of local fishermen from March 2017 to October 2017 [62]. Just after collection the fishes were directly preserved in 70% alcohol and 10% formalin solution. Formalin was injected to the abdominal region and other body parts of the larger fishes to avoid bacterial infection. After that the collected fishes were brought to the lab for identification [63]. In the laboratory, on the basis of the color pattern, specific spots or marks on the surface of the body, shape of the body, the structure of various fins etc. the fishes were identified [64-66]. In Khaisari dam the amphibians and reptiles were observed, during daytime and both were identified by using the identification keys of Khan, 2004 and 2006 [67, 68]. The bird survey were conducted on a daily basis at daytime. The identification of birds was done through slander literature of community [69-75]. If any doubt was there about the bird identification, then the birds were later identified by consulting experts [76, 77]. The mammalian fauna of the dam was studied by direct physical observations [78]. During the present study of Khaisari dam invertebrates were also observed. For their identification various identification keys were used [79, 80].

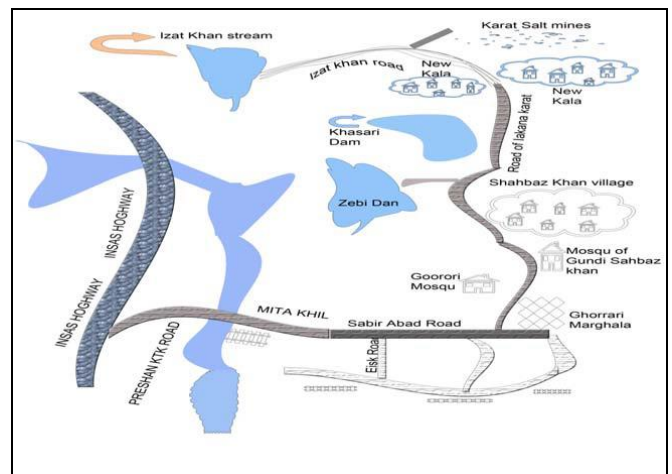


Fig 1: Map of Khaisari Dam

Results

Table 1: Species of fishes found in Khaisari dam

S. No.	Class	Order	Family	Genus	Species
1	Actinopterygii	Cypriniformes	Cyprinidae	Cyprinus	<i>C. carpio</i>
2	Actinopterygii	Cypriniformes	Cyprinidae	Labeo	<i>L. rohita</i>
3	Actinopterygii	Cypriniformes	Cyprinidae	Cirrhinus	<i>C. cirrhosus</i>
4	Actinopterygii	Cypriniformes	Cyprinidae	Hypophthalmichthys	<i>H. molitrix</i>

Table 2: Species of amphibian found in Khaisari dam

S. No	Local name	Class	Order	Family	Genus	Species
1	Commantoad	Amphibia	Anura	Bufoidea	Duttaphrynus	<i>D. melanostictus</i>
2	Frog	Amphibia	Anura	Dicroglossidae	Rana	<i>R. tigrina</i>
3	True frog	Amphibia	Anura	Ranidea	Euphlyctis	<i>E. cyanophlyctis</i>

Table 3: Species of reptile found in Khaisari dam

S. No	Local name	Class	Order	Family	Genus	Species
1	Chameleon	Reptilia	Squamata	Chamaeleonidae	Chameleo	<i>C.zeylanicus</i>
2	Desert lizard	Reptilia	Squamata	Xantusiidae	Xantusia	<i>X.vigilis</i>
3	Desert king snake	Reptilia	Squamata	Colubridae	Lampropeltis	<i>L.getula</i>

Table 4: Species of bird found in Khaisari dam

S. No	Local name	Class	Order	Family	Genus	Species
1	Sparrow	Aves	Passeriformes	Passeridae	Passer	<i>P.domesticus</i>
2	Mynah	Aves	Passeriformes	Sturnidae	Acridotheres	<i>A.tristis</i>
3	Common teal	Aves	Anseriformes	Anatidae	Anas	<i>A.crecca</i>
4	Zorye	Aves	Galliformes	Gruidae	Grus	<i>G. grus</i>
5	Moor	Aves	Galliformes	Phasianidae	Pavo	<i>P. cristatus</i>
6	Bulbul	Aves	Passeriformes	Pycnonotidae	Pycnonotus	<i>P.barbatus</i>
7	Teetara	Aves	Galliformes	Numididae	Numida	<i>N.meleagris</i>
8	Duck	Aves	Anseriformes	Anatidae	Cairina	<i>C.moschata</i>

Table 5: Species of mammal found in Khaisari dam

S. No	Local names	Class	Order	Family	Genus	Species
1	Jackal	Mammalia	Carnivora	Canidae	Canis	<i>C.adustus</i>
2	Dog	Mammalia	Carnivora	Canidae	Canis	<i>C. lupus</i>
3	Cat	Mammalia	Carnivora	Felidae	Felis	<i>F.catus</i>
4	Goat	Mammalia	Artiodactyla	Bovidae	Capra	<i>C.hircus</i>
5	Sheep	Mammalia	Artiodactyla	Bovidae	Ovis	<i>O.aries</i>
6	Donkey	Mammalia	Perissodactyla	Equidae	Equus	<i>E.assinus</i>

Table 6: Species of invertebrate found in Khaisari dam

S. No	Local names	Class	Order	Family	Genus	Species
1	Leech	Clitellata	Arynhobdellida	Hirudidae	Hirudo	<i>H.medicinalis</i>
2	Ants	Insecta	Hymenoptera	Formicidae	Solonopsis	<i>S.invicta</i>
3	Wasp	Insecta	Hymenoptera	Vespidae	Vespa	<i>V.velutina</i>
4	Scorpion	Arachnida	Scorpiones	Scorpionidae	Pandinus	<i>P. imperator</i>
5	Dragonfly	Insecta	Odonata	Petaluridae	Sympetrum	<i>S. flaveolum</i>

Discussion

The aim of the present study was to find out the vertebrate and invertebrate fauna of Khaisari dam. Both the vertebrates and invertebrates were explained up to species level and their complete systematic representation was given in tables 1-6 respectively. During this study four species of fishes were identified, these species belongs to one class Actinopterygii, one order Cypriniformes, one family Cyprinidae, four genus Cyprinus, Labeo, Cirrhinus and Hypophthalmichthys and four species *C. carpio*, *L. rohita*, *C. cirrhosus*, *H. molitrix*. Zubia *et al*, did research work at Zebi dam in 2015 during their survey they found total of six species, and all of the six species which were found in the Zebi dam were belonging to the same class Actinopterygii, same family Cyprinidae, Same order Cypriniformes and these species were *Cirrhinus mrigala*, *Hypophthalmichthys molitrix*, *Labeo rohita*, *Carassius auratus*, *Catla catla*, *Ctenopharyngodon idella* and their Genus are *Cirrhinus*, *Hypophthalmichthys*, *Labeo*, *Carassius*, *Catla*, *Ctenopharyngodon* respectively [80]. Yousaf *et al*, in 2016 conducted research work on Chambai dam fish fauna of district Karak and find 3 species of fishes belonging to one class Actinopterygii, one order Cypriniformes, one family Cyprinidae, three genus Labeo, Hypophthalmichthys, Catla and three species *L. rohita*, *H. molitrix*, *C. catla* [81]. Similarly Saqib *et al*, in 2016 work at Khurum dam during his

study six species were identified, the five species belongs to single family Cyprinidae i.e. *Cyprinus Carpio*, *Crossocheilus diplochilus*, *Ctenopharyngodon idella*, *Salmophasia bacaila*, *Aspidoparia morar* and one species belong to family Siluridae i.e. *Ompok Pabda* [82]. During present study we find three species of amphibians belonging to one class Amphibia, one order Anura, three family Bufoidea, Dicroglossidae and Ranidea, three genus Duttaphrynus, Rana and Euphlyctis and three species *D. melanostictus*, *R. tigrina*, *E. cyanophlyctis*. Zaryab *et al*, done research work on vertebrate and invertebrate fauna of Tanga dam of district Karak in 2016 and reported one species of amphibians belonging to class Amphibia, order Anura, Family Dicroglossidae, genus Rana and species *R. tigrina* [83]. In 2016 Saqib *et al*, work on Khurum and Muhabbat Khel dam of district Karak and recorded species of amphibians from Khurum dam which belong from one class Amphibia, one order Anura, three families Dicroglossidae, Ranidea and Bufoidea, three genus Rana, Euphlyctis and Duttaphrynus and three species *R. tigrina*, *E. cyanophlyctis* and *D. melanostictus* and one species from Mohabbat Khel dam which belong to class Amphibia, order A nura, family Dicroglossidae genus Rana and species *R. tigrina* [84]. Three species of reptiles observed in Khaisari dam belong to one class Reptilia, one order Squamata, three families Chamaeleonidae, Xantusiidae and

Colubridae, three genus Chameleo, *Xantusia* and *Lampropeltis* and three species *C. zeylanicus*, *X. vigilis* and *L. getula*. In 2004 Khan and Mahmood collected two species of reptiles belonging to two agamid species from Karachi in Sind^[85]. In our research work we find eight species of birds belonging to one class Aves, three orders Passeriformes, Anseriformes and Galliformes, seven families Passeridae, Sturnidae, Anatidae, Gruidae, Phasianidae, Pycnonotidae, Numididae, eight genus Passer, Acridotheres, Anas, Grus, Pavo, Pycnonotus, Numida, Cairina and eight species *P. domesticus*, *A. tristis*, *A. crecca*, *G. grus*, *P. cristatus*, *P. barbatus*, *N. meleagris*, *C. moschata*. From June 2014 to July 2015 Hameed *et al* worked on the birds fauna of District Karak Khyber Pakhtunkhwa Pakistan and they studied 32 bird species belonging to 26 families and 11 orders from different areas of district Karak^[86]. Awan *et al*, in 2004 conduct research on the birds fauna of Muzaffarabad, Kashmir and Pakistan and studied 59 species of birds out of which 24 were resident, 14 were winter visitor and 11 were summer visitor^[87]. During 2017 Saqib *et al*, worked on district Karak during his survey, 184 different species of the both vertebrates and an invertebrates fauna of the district Karak were observed. Out of which, 28 species of mammals, 6 species of amphibians, 12 species of reptiles, 54 species of birds, 28 species of fishes, and 56 species of invertebrates. It may be concluded that the families Cyprinidae, Ranidae, Agamidae, Phasianidae, Equidae, Bovidae, Libellulidae, Formicidae were very dominant in the district Karak^[88]. During our research work we observed six species of mammals belong to class Mammalia, three order Carnivora, Artiodactyla, Perissodactyla, 4 families Canidae, Felidae, Bovidae, Equidae, 5 genus Canis, Felis, Capra, Ovis, Equus and 6 species *C. adustus*, *C. lupus*, *F. catus*, *C. hircus*, *O. aries* and *E. asinus*. Roberts (1997) in river Chenab studied 23 species of mammal (15 small and 8 large mammalian species) belonging to 20 genera, 11 families, and 6 orders^[89]. In Khaisari dam, we find five species of invertebrates. The identified species belonged to three class Clitellata, Insecta and Arachnida, four orders Arynchobdellida, Hymenoptera, Scorpiones and Odonata, five families Hiruidae, Formicidae, Vespidae, Scorpionidae and Petaluridae, five genus Hirudo, Solonopsis, Vespa, Pandinus and Sympetrum and five species *H. medicinalis*, *S. invicta*, *V. velutina*, *P. imperator* and *S. flaveolum*. The dominant class among invertebrates was the class Insecta.

Conclusion

From the present study it can be concluded that the Khaisari dam provides a suitable environment for both vertebrates and invertebrate fauna.

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