



## Short Communication

# The Amphibians and Reptiles Collected from Different Habitat Types in District Kasur, Punjab, Pakistan

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## ABSTRACT

The current study extended from January, 2014 to December, 2014 was conducted in all the four tehsils of district Kasur. A total of 60 amphibian specimens representing 3 species, 3 genera and 2 families while 71 reptilian specimens representing 15 species, 14 genera and 10 families were captured from the study area. Amphibian species captured from cultivated land included *Bufo stomaticus*, *Hoplobatrachu stigerinus* and *Euphlyctis cyanophlyctis*, while reptiles included *Varanus bengalensis*, *Amphiesma stotatum*, *Ptyas mucosus*, *Echis carinatus*, *Calotes versicolor*, *Bungarus caeruleus*. *Lycodon aulicus* was the only reptilian species captured from uncultivated land. Human habitations provided habitat to a single amphibian species *Bufo stomaticus*, while the reptiles included *Bungarus caeruleus*, *Varanus bengalensis*, *Hemidactylus flaviviridis*, *Ablepharus grayanus*, *Lycodon aulicus*, *Typhlops ductuliformes*, *Eryx johnii*, *Lissemys punctata andersoni*, *Ablepharus grayanus*, *Eutropis macularia*, *Amphiesma stotatum*, *Lycodon aulicus*, *Eryx Johnii* and *Typhlops ductuliformes*. Three amphibian species *Bufo stomaticus*, *Hoplobatrachus tigerinus* and *Euphlyctis cyanophlyctis* and four reptilian species were captured from water catchment areas viz. *Lissemys punctata andersoni*, *Varanus bengalensis*, *Xenochrophis piscator* and *Kachuga smithii*.

## Article Information

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## Authors' Contribution

AJ designed and supervised the work. WA collected the animals. GJ identified the animals. WA and HA wrote the article. SMH helped WA in analyzing and interpreting the data.

## Key words

Common krait, common Indus valley toad, bull frog, cultivated land.

Amphibians and reptiles are important bio-indicators of climate change and are found in a variety of habitats throughout the world except some isolated islands. Their diversity and abundance is also linked with some avian and mammalian species. However, like many other species survival of herpetiles is under continuous threat due to deforestation, habitat loss, fragmentation, urbanization and pollution (Petrov, 2004).

Herpetiles have important position in food pyramids, they control population of many insects and pests, and themselves are source of food for many predators. Both, the amphibians and reptiles play significant role in transferring nutrients from aquatic to terrestrial ecosystems and their absence from any ecosystem may affect algae communities, invertebrate populations, predator dynamics, leaf litter decompositions and nutrient cycling (Christie *et al.*, 2008).

In Pakistan, arid to semi-arid climatic conditions prevail that make it, an amphibian poor country however, humid riparian conditions in the Indus valley, streams in the northern Himalayan sub-mountainous region and water channels in the western Baluchistan highlands are

home to some 24 amphibian species that belong to four families viz. Bufonidae, Megophryidae, Microhylidae and Ranidae (Khan, 2011). The reptilian fauna of the country is represented by 195 species belonging to 23 families viz. Cheloniidae, Dermochelyidae, Emydidae, Testudinidae, Trionychidae, Crocodylidae, Gavialidae, Agamidae, Chameleonidae, Eublepharidae, Gekkonidae, Lacertidae, Scincidae, Uromastycidae, Varanidae, Leptotyphlopidae, Typhlopidae, Boidae, Colubridae, Elapidae, Hydrophiidae, Viperidae and Crotalidae (Khan, 2004, 2006). Nine amphibian and 13 reptilian species are endemic to Pakistan (Khan, 2004).

The herpetiles received less attention of scientific community hence remained unexplored in many parts of Pakistan. Most of the studies carried out so far are limited to Sind and Baluchistan provinces (Minton, 1966; Mertens, 1969; Khan, 2006). Daniel (2002) and Khan (2006) are the only authentic sources of information on herpetiles of Pakistan. There is paucity of data on diversity and distribution of amphibians and reptiles of Punjab which is most densely populated province of the country. The present study was therefore planned to explore the herpetofauna diversity of district Kasur.

## Materials and methods

This one year study extending from January through December, 2014 was conducted in four tehsils of district

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Kasur namely Pattoki, Chunian, Kot Radha Kishan and Kasur. The district lies 150 to 200 m above sea level and experiences extreme hot weather during summer (April - September) to severe cold in winter (November - February). Average annual rainfall is 500 mm. Water logging and salinity has affected large area of the district making underground water brackish. District Kasur is located between two rivers of the Punjab province, namely river Ravi and Sutlej and is bounded by India from east (Anwar, 2012). The tanneries, Changa Manga plantations, plant/flower nurseries and head Baloki made district Kasur more prominent in the country. Total area of the district is 981702 acres, out of which 807711 acres are cultivated while 173991 acres are uncultivated land.

Important vegetation of the area include simbal (*Bombax ceiba*), sukhechain (*Pongamia pinnata*), neem (*Azadirachta indica*), bakiain (*Melia azedarach*), desi kikar (*Acacia nilotica*), bohr (*Ficus benghalensis*), peepal (*Ficus religiosa*), tutsiah (*Morus nigrz*), safaida (*Eucalyptus citriodora*), bairi (*Ziziphus mauritiana*) and sheesham (*Dalbergia sissoo*) etc. (Zereen and Khan, 2012).

For collection of various amphibian and reptilian species the study area was divided into four habitat types (i) Cultivated land, areas where water is available and conventional crops like rice, wheat, cotton, sugarcane and floriculture crops especially gladiolus are cultivated. The water source may tube well or canal water (ii) Uncultivated land, areas where inland water is brackish or these lands are not cultivable, (iii) Human habitations, the houses, buildings, ruins, factories, schools and the street parks including the nearby debris materials and (iv) Water bodies, catchments areas of rivers, canals, waste disposal ponds, irrigation water channels and fisheries ponds.

Field surveys were conducted during dawn and dusk hours and the specimens were collected with the help of hand nets, drag nets and snake sticks. Pit falls with drift fences were also used for collection of amphibians and reptiles of the study area (Baig *et al.*, 2008; Masroor, 2011).

The collected specimens were euthanized, preserved in 10% formalin (Bora *et al.*, 2009). Each specimen was measured and identified using identification keys of Smith (1943), Minton (1962) and Khan (2006).

Each captured specimen was weighed using digital weighing balance SF-400. The external body measurements snout to vent length (SVL), snout length (SL), eye diameter (ED), horizontal tympanum diameter (HTYD), vertical tympanum diameter (VTYD), head length (HL), hand length (HAL) and foot length (FL) were taken by using vernier caliper and scale for amphibians according to Chanda (1994).

For snakes SVL, tail length (TAL), HL, head width (HW), body width (BW), trunk length (T) and total length (TL) were taken using tailor's measuring tape according to Dowling (1951), Vitt (1987) and Oliveira (2003). For lizards SVL, TAL, HL, HW, BW, inter limb length (IIL), fore claw length (FC), hind claw length (HC), hind limb span (HLS), fore limb span (FLS), hind limb longest finger (HLF), forelimb longest finger (FLF) and TL was taken using measurement tape following Velasco and Herrel (2007). For turtles carapace length (CL), plastron length (PL), shell height (SH) and carapace width (CW) were taken using measurement tape according to Hammer (1968) and Ernst *et al.* (1994).

### Results and discussion

During present survey, 60 amphibian specimens representing 3 species, 3 genera and 2 families while 71 reptilian specimens representing 15 species, 14 genera and 10 families were captured from the study area.

Table I shows the amphibians and reptiles with the preferred habitat.

The morphometric measurements of various amphibian and reptilian species captured during present study are mentioned in supplementary Tables I-IV.

*Bufo stomaticus* is distributed throughout the Indian subcontinent (Daniel, 1963a). *Euphlyctis cyanophlyctis* is distributed from Thailand to Nepal, throughout India, Sri Lanka and almost throughout Pakistan below 1800 m (Khan, 1999). *Hoplobatrachus tigerinus* is widely distributed with distribution ranges from Afghanistan, Bangladesh, India, Myanmar, Nepal, Pakistan and Sri Lanka to Madagascar and Maldives. *Typhlops ductuliformes* is reported from Lahore, Hyderabad and Karachi. *Eryx johnii* is distributed throughout central India, Eastern Afghanistan, Iran and in Pakistan it is found in plains of Punjab, Sind and Baluchistan. *Amphiesma stolatum* is widely distributed snake of Southeast Asia (Khan, 2006). *Lycodon aulicus* has been reported from Sind, Lahore and district Jhang (Khan, 1993d). *Ptyas mucosus* is reported from throughout India, Sri Lanka, Afghanistan, Iran, Pakistan and Adaman islands (Khan, 2006). *Xenochrophis piscator* is common in drainage systems in upper and lower Indus valley (Minton, 1966; Auffenberg, 1980b). *Bungarus caeruleus* is reported from throughout Punjab, KPK, Azad Kashmir, Sind and Southern Baluchistan (Khan, 1993d). *Echis carinatus* is distributed throughout Middle East, Russia, Iran, Afghanistan, India, Sri Lanka and Pakistan. *Calotes versicolor* is distributed throughout India, Sri Lanka and Pakistan and from Sumatra to southern China. *Hemidactylus flaviviridis* in Pakistan is reported from human habitations. *Ablepharus grayanus* is distributed throughout Pakistan. *Eutropis macularia* is reported from

**Table I.- The details of amphibians and reptiles captured from different habitat types of the study area (n = number of specimens).**

Species	Specimens captured from cultivated land (n)	Specimens captured from uncultivated land (n)	Specimens captured from human habitations (n)	Specimens captured from water bodies (n)	Total number of specimens (n)
<b>Amphibians</b>					
<i>Bufo stomaticus</i>	4	-	5	11	20
<i>Hoplobatrachus tigerinus</i>	5	-	-	15	20
<i>Euphlyctis cyanophlyctis</i>	7	-	-	13	20
<b>Reptiles</b>					
<b>Snakes</b>					
<i>Bungarus caeruleus</i>	6	-	8	-	14
<i>Amphiesma stolatum</i>	4	-	4	-	8
<i>Lycodon aulicus</i>	-	1	3	-	4
<i>Ptyas mucosus</i>	3	-	-	-	3
<i>Typhlops ductuliformes</i>	-	-	2	-	2
<i>Eryx johnii</i>	-	-	2	-	2
<i>Xenochrophis piscator</i>	-	-	-	4	4
<i>Echis carinatus</i>	1	-	-	-	1
<b>Lizards</b>					
<i>Calotes versicolor</i>	2	-	-	-	2
<i>Varanus bengalensis</i>	4	-	4	1	9
<i>Hemidactylus flaviviridis</i>	-	-	5	-	5
<i>Ablepharus grayanus</i>	-	-	4	-	4
<i>Eutropis macularia</i>	-	-	1	-	1
<b>Turtles</b>					
<i>Kachuga smithii</i>	-	-	-	5	5
<i>Lissemys punctata andersoni</i>	-	-	2	5	7

highlands of salt range, plains, around Karachi and Lasbela (Khan, 2006). *E. macularia* was not recorded from district Kasur prior to present survey and only one specimen of the species was captured from human habitations.

*Varanus bengalensis* occupies variety of habitats i.e. dry deserts, cultivated areas, barren lands and human habitations (Kumar, 1992). *Kachuga smithii* turtle is hard shell species of fresh water and found in lower Sind and Indus delta. *Lissemys punctata andersoni* is a soft shell species of freshwater and widely distributed in Bangladesh, Nepal, India and Pakistan (Khan, 2006).

#### Conclusion

It can be concluded from the present study that use of hand nets and snake sticks are the most efficient ways to sample amphibians and reptiles. During present survey, 3 amphibian and 15 reptilian species were recorded from the study area.

#### Statement of conflict of interest

Authors have declared no conflict of interest.

#### Supplementary material

Supplementary Tables I-IV are available at the weblink: [http://www.zsp.com.pk/pdf48/QPJZ-0296-2015%20\(Supplementary%20Tables\).pdf](http://www.zsp.com.pk/pdf48/QPJZ-0296-2015%20(Supplementary%20Tables).pdf)

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