



Distribution of *Spalerosophis diadema diadema* (Schlegel, 1837) in Azad Jammu and Kashmir, Pakistan

Maryam Faiz^{1*} and Samra Irum Farooq¹

1. Department of Zoology, Women University of Azad Jammu and Kashmir, Bagh-Pakistan

*Corresponding author e-mail: maryamfaiz1996@gmail.com

SUMMARY

Snakes are the most criticized with fear by the people in whole Pakistan, and they are frequently killed on sight. This research documents the distribution of *Spalerosophis diadema diadema* in Azad Jammu and Kashmir, Pakistan. Nine specimens of diadem snake are documented from the study areas. Morphometric analysis and photographs of diadem snake are provided. This species of snake are seen in forests along water courses, and open fields, moderately hard soil, crevices, old vacant buildings, neglected natural vegetation, groves, barns, suburban gardens, this species lives in rat holes and birds' nests. The diadem snake is nocturnal, while this species also rarely active during the day time.

Keywords: Snakes, Kashmir, Diadem, Distribution

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INTRODUCTION

Snakes or serpents are the most criticized of animals, generally Supposed by the community as harmful. Almost 2,700 snakes species identified to scientists include approximately 400 venomous species, of which around 200 species are imagined life-threatening to living being. Snakes of the families Viperidae, Elapidae, and Crotalidae are venomous (Bellairs and Underwood, 1951; JF, 2004; Khan, 2006; Vidal *et al.*, 2009).

The diadem snake or royal snake (*Spalerosophis diadema diadema*) has been documented from sea level to 2000 (i.e. KPK, Punjab, Sindh, Gilgit and Baluchistan). This species is extensively distributed in Bangladesh, Sri Lanka and India (Khan, 2006).

Relatively few researches have been documented on wildlife of Azad Jammu and Kashmir, while very fewer researches are linked with the herptiles species of the area (Jablonski *et al.*, 2019). Almost 50 species of terrestrial snakes are reported from Pakistan (Khan, 2006). Khan (2002) conducted an extensive survey for herpetofaunal diversity of various climatic zones in Pakistan.



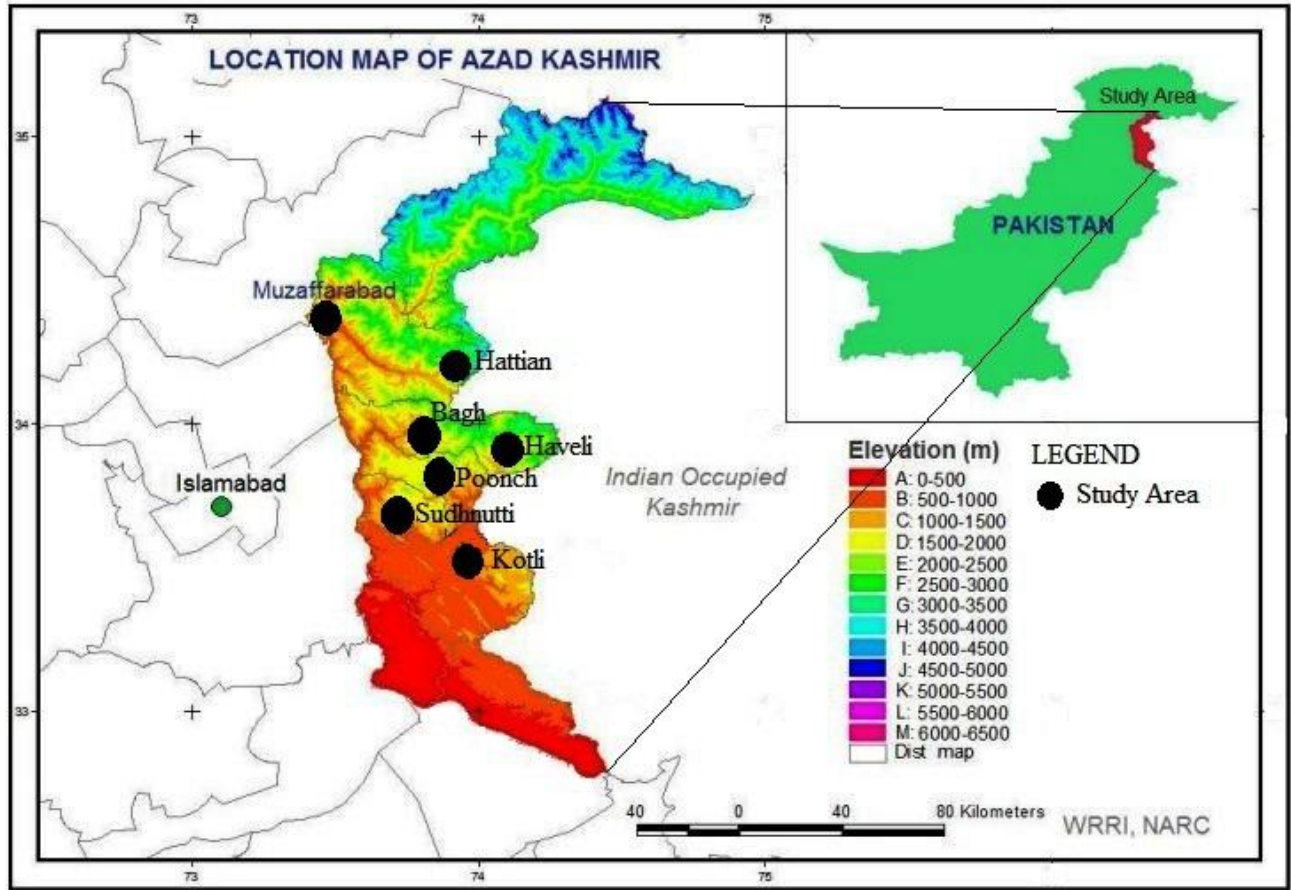


Figure 1: Map of the study area.

In present research, 2 specimens were documented from Muzaffarabad, Azad Jammu and Kashmir (Table 1 and Figure 1), this city is the capital of the AJK and located at “73.22°” longitude and “34.24°” latitude. The climate of this city falls under subtropical highland type. The forest types of this city include “Dry Sub Tropical Scrub Forests” and “Sub Tropical Pine Forests”. The temperature ranges from 3°C to 42°C, and average annual rainfall in this city varying between 1000-1300 mm. The city topography is mountainous. This city is on the banks of Neelum and the Jhelum rivers (Termizi and Chaudhry, 2001; GOP, 2004).

Table 1: Records of the nine specimens of *Spalerosophis diadema diadema* observed specimens from Azad Jammu and Kashmir, Pakistan.

District	Year	Specimen
Muzaffarabad	2020	2
Hattian Bala	2017	1
Bagh	2018	2
Haveli	2020	1
Poonch	2018	1
Sudhnoti	2017	1
Kotli	2019	1

During present research, one specimen was documented from Hattian Bala District. This city is bounded on the east by district Baramulla and the north by the district Kupwara, on the west by district Muzaffarabad and on the south by the district Bagh. The population of this city is 230,529 (The-Nation, 2017).

In present research, two specimens were noted from Bagh (Table 1 and Figure 1). Bagh is present 80 km distance from the district Muzaffarabad, Azad Jammu and Kashmir; and 160 km from the district Islamabad. The district Bagh has mountainous landscape, has slope from northeast toward south-west. This region present in the lesser Himalayas. The elevation is from 1500 to 2500 m above sea level. The mountains are covered with coniferous forests. Nala Mahl and Betar Nala are two main streams. However, many other rivulets flow are present in this district (Tanvir *et al.*, 2014).

In current research, single specimen was reported from district Haveli (Table 1 and Figure 1). This city is located 162 km from Muzaffarabad, this is capital city of Azad Jammu and Kashmir. Haveli is 250 km from Islamabad, this is capital of Pakistan. Topographically, the whole district Haveli is a hilly area, mostly inclined from “north-east” to “south-west”. This area is situated in the “lesser Himalayas” region. The central range in the city is “Pir- Panjal”. The “Haji-Pir” is located at the elevation of 3421 meters above from level of sea. The overall altitude is from 1500 to 2500 meters above sea level. The peaks are usually covered with coniferous woodlands. The study area is located in the damp region in the approach of monsoon. There is lot of deviation in rainfall and moistness in the different parts of study area with the variances in altitude. Winter is severely cold while summer is moderate. The winter is followed by the spring, in which blooming of plants and vegetation happens. Day temperature is up to 37°C in summer but during May and June it rises. Throughout the winter season, the maximum temperature drops down to 04°C which results in snowfall at high altitude. Sometimes snowfall also expected in the areas of low altitude. Average rainfall had been 150 mm which has optimum intensity in the months of July and August ” (Khan *et al.*, 2017)

In this study, one specimen observed from district Poonch (Table 1 and Figure 1). It is located in “Pir Panjal Range”. This city is present at 33°51 N, 73° 45'34 E and Elevation is 5374 feet above from sea level. Rawalakot is almost 76 km from Kahuta. It is connected with Rawalpindi and Bagh. (Hussain *et al.*, 2016; Khalid *et al.*, 2017). During present research, one specimen was documented from Sudhanoti district (Table 1 and Figure 1). This city is linked on the east and north by Poonch District, on the south by the Kotli district, and on the west by the Rawalpindi district of Pakistan's Punjab Province. It is located 90 kilometers from city of Islamabad; this city is capital of Pakistan. It is linked with Islamabad and Rawalpindi via the Azad Pattan Road (Khan *et al.*, 2004; Ishtiaq *et al.*, 2015).

In this study, one specimen observed from district Kotli (Table 1 and Figure 1). It is bounded with Poonch and Sudhanoti, Mirpur, Bhimber and Rawalpindi district. It is the largest city of AJK by population and the second largest by landscape (Amjad and Arshad, 2014; Amjad *et al.*, 2017).

Dorsals is 27 to 31, ventrals is 232 to 254, subcaudals is 96 to 114, snout-vent length is 1220 to 1230 mm, tail is 328 to 232mm, infralabials is 11 to 14, and supralabials is 10 to 13. Color is changed with age, young snakes have row of dark

brown rhomboidal blotches on body. There is an oblique stripe from behind the eye and dark bar between eyes. Adult snakes are yellow dorsum, thick bodied with scattered sooty black or dark brown spots. Head either entirely sooty black or blood red (Figure 2) (Khan, 2006).



Figure 2: Photos of *Spalerosophis diadema diadema* specimens from Azad Jammu and Kashmir, Pakistan.

This species of snake were seen in forests along water courses, and open fields, moderately hard soil, crevices, old vacant buildings, neglected natural vegetation, groves, barns, suburban gardens, this species lives in rat holes and birds' nests. The diadem snake is nocturnal, while it this species also rarely active at the day time. This snake diet is birds, eggs, frogs, rats, and lizards. This snake breeds between March and September (Khan, 2006).

The fauna of Pakistan is “Oriental”, “Ethiopian”, and “Palearctic” in nature, with many endemic species. In Pakistan the variety of habitats are present like, rivers, lakes, food plains, oceans, swamps, sand and rocky deserts, arid plains, tropical thorn, subtropical dry, tropical dry deciduous, subtropical arid, dry and moist temperate sub-alpine forests, subtropical pine, cold deserts and grassy tundra (Roberts, 1997; Altaf, 2016). However, most of the natural habitats are heavily impacted by human activities which negatively impact the fauna of this country (Akite, 2008; McKinney *et al.*, 2010; Altaf, 2016; Boivin *et al.*, 2016; Altaf *et al.*, 2018).

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