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Study of diversity, distribution and cultural uses of house mouse (*Mus musculus*) in district Bagh, Azad Jammu and Kashmir-Pakistan

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ABSTRACT

Introduction: *Mus musculus* is relatively small and very energetic rodent. House mouse are found in wide range of man-made areas including houses, farm outbuildings, other types of buildings, even frozen meat stores and coal mines. House mouse tends not to be found in forests and deserts. The main objectives of the study are that to know the diversity, distribution and the human-*Mus musculus* interaction from the district Bagh.

Materials and Methods: The data were collected August 2017 to January 2018. Linear count survey (LCS) was used; which consists of six transect lines, while each transect line consists of 1 km long selected. Both direct (i.e. physical count and sounds) and indirect methods (i.e. burrows carcasses and body parts) were used for the observation of distribution and cultural uses of *Mus musculus*.

Results: During the surveys noted that house mouse adopted the disturbed habitats especially urban and rural ecosystems. It is also noted that this species is damaged to textile, leather, food and books. Respondents told that they are used different preventive measures to reduce the diversity of the *Mus Musculus* i.e. cat, trap, red rat killer, trap cage, poison and fire. Fat of *Mus musculus* is also used for medicinal purposes as; joint pain and wound healing.

Conclusion: This species like to prefer near the human; also prefer to live anthropogenic impacted areas. This species have importance and used in medicine.

Key words*: Mus musculus,* Urban, Rural, Medicine

INTRODUCTION

Mus musculus is originally a Palearctic species, but through its close association with humans. It has been widely introduced across the globe (Musser and Carleton, 2005). The species is widespread all continents, where human present (Roberts, 1997; Macholán, 1999).

This species is native in the following countries i.e. Yugoslav, Yemen, Uzbekistan, Turkmenistan, Ukraine, Turkey, Tunisia, Tajikistan, Syria, Switzerland, Sweden, Spain, Slovakia, Slovenia, Serbia, Russia, Romania, Portugal, Poland, Pakistan, Palestinian, Oman, Norway, Netherlands, Nepal, Morocco, Montenegro, Mongolia, Monaco, Malta, Moldova, Macedonia, Luxembourg, Lithuania, Liechtenstein, Lebanon, Libya, Latvia, Kyrgyzstan, Korea, Jordan, Kazakhstan, Japan, Italy, Israel, Ireland, Iraq, Iran, India, Iceland, Hungary, Herzegovina, Greece, Gibraltar, Germany, Georgia, France, Finland, Faroe Islands, Eritrea, Estonia, Emirates, Egypt, Denmark, Croatia, Bulgaria, Bosnia, Belgium, Bahrain, Belarus, Azerbaijan, Austria, Armenia, Andorra, Algeria, Albania, Afghanistan. This species population is stable, common, widespread and abundant except in some extreme habitats (Macholán, 1999).

House mouse are found in wide range of man-made areas including houses, farm outbuildings, other types of buildings, even frozen meat stores and coal mines. Occasionally it is wild in ranges where it has been introduced, and in some parts of its natural range it retains wild populations in outdoor territories such as arable land, meadows, coastal sand dunes, salt marshes, and scrubby road verges (Macholán, 1999; Wilson and Reeder, 2005). House mouse tends not to be found in forests and deserts. *Mus musculus* is usually found frequenting cracks and ruptures below wall of buildings in village sand cities alike. They have been surrounded throughout Pakistan including the mountainous areas, in which last areas they are mostly in connotation with human habitations (Roberts, 1997; Macholán, 1999).

Mus musculus mostly perform the activity in night-time and omnivorous in feeding habits. They are not mainly sociable but surely more than one individual will operate the same burrow system. While the forms which reside crop land perhaps feed mostly on seeds and vegetable material, they eat insects and all types of human food such as meat, cooked rice, leather and soap. They have been noted as feeding on human wastes in villages, and they are vectors of injurious diseases such as scrub typhus. Because of their lesser size they do not cause such extensive harm to food grains as, for example, *Rattus rattus*, but they may rarely transfer seeds and fruit into their alternative burrows for storing and they surely harm and abolish more food than they really ingest (Roberts, 1997). The main objective of the study is that to know the diversity, distribution and the human-house mouse interaction from the district Bagh.

MATERIALS AND METHODS

Study area: Bagh is located 80 km from Muzaffarabad, and 160 km from Islamabad. Topographically, the Total district Bagh is a mountainous landscape, usually sloping from northeast to south-west. The area situated in the lesser Himalayas zone and elevation is between 1500 and 2500 m above sea level. The mountains are covered with coniferous forests. The Mahl Nala and the Betar Nala in the Bagh and Haveli districts respectively, are the two main streams (Figure 1). However, numerous other rivulets flow in this district (Bibi *et al.*, 2013).

Methodology: The data were collected August 2017 to December 2017. Linear count survey (LCS) was used; which consists of six transect lines, while each transect line consists of 1 km long selected. Both direct (i.e. physical count and sounds) and indirect methods (i.e. burrows carcasses and body parts) were used for the observation of ecology, behavior, ethnozoology and anthropogenic impacts on the diversity and distribution of *Mus musculus*. “The Mammals of

Pakistan" (Roberts, 1997) was used for identification of *Mus musculus*. Human impacts and interaction were studied.

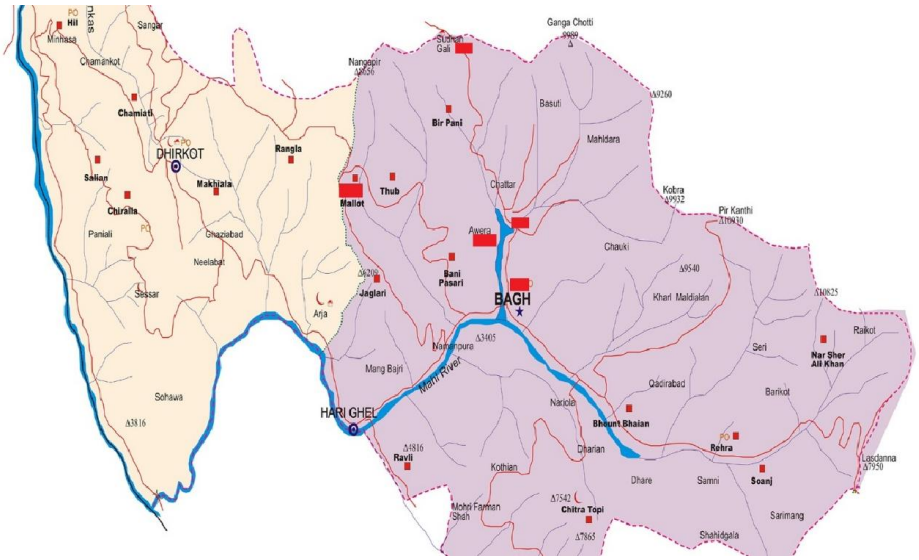

Figure 1: Study sites of district Bagh.

RESULTS AND DISCUSSION

Data collected from the male (47) and female (53) respondents, all are Muslims. They having different occupations i.e. house wife (21), Government employee (13), labor (22), student (22), teacher (15) and business (7) from the study area and belong to Mughal (72), Thakyal (2), Quresh (4), Rajpoot (1), Sudhen (5), Baig (1), Raja (4), Soduzai (2), Batla (6), Syed (1), Khan (1) and Khawaja (1) families (Figure 2).

According to the people response, 98% people respond that *Mus Musculus* diversity is increasing, while 2% people said that population of this species is declining (Figure 3). According to the respondents, *Mus Musculus* mostly damage the crops but somehow also damage the textile, leather, food and books (Figure 4). According to the respondents, different preventive measures are made to reduce the diversity of the *Mus musculus*; while mostly cat is

used to remove the house mouse and also used as traps, traps cages, poison and fire (Figure 5). During the research noted that high population of house mouse is present in the urban and rural landscape; while its population is absent from the forest (Figure 6). Altaf (2016) is also reported similar finding in Punjab, Pakistan.

There is no product use of *Mus Musculus* in this area, not use for food because Muslims are prohibited. This species is not use for hunting. According to the respondents, some of the medicinal uses are as; joint pain and wound healing. Some of the superstitious are as; if juvenile house mouse is present in houses than these cause death, if the new married couple goes out without eat than number of House mouse increase in house, if large number of house mouse present in houses than this will be harmful (Table 1). Altaf *et al.* (2017) is also used similar medicine use in Punjab, Pakistan.

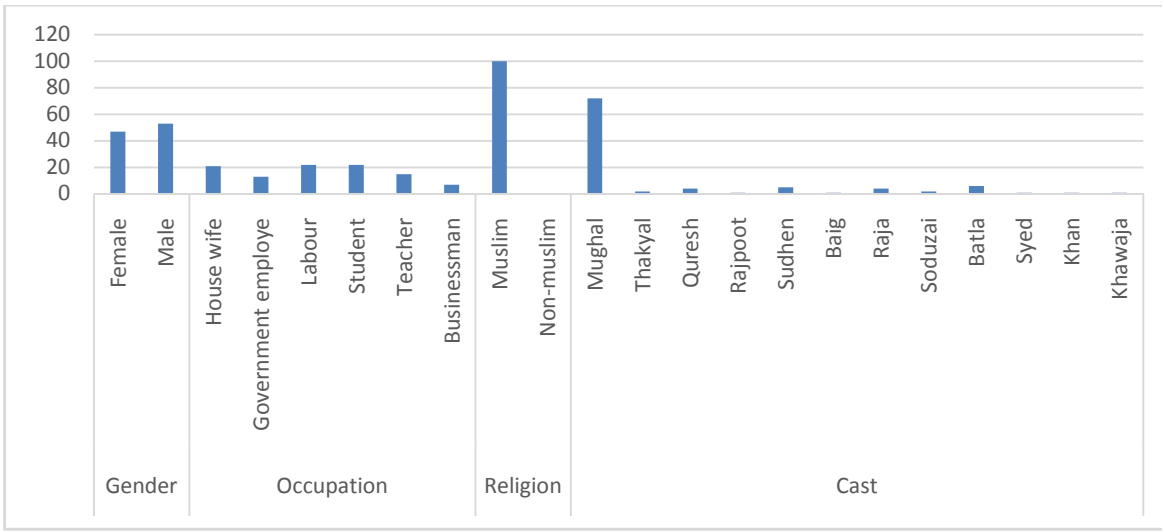

Figure 2: Profile of the respondent of the study area.

Conclusion: This species like to prefer near the human; also prefer to live anthropogenic impacted areas. This species have importance and used in medicine.

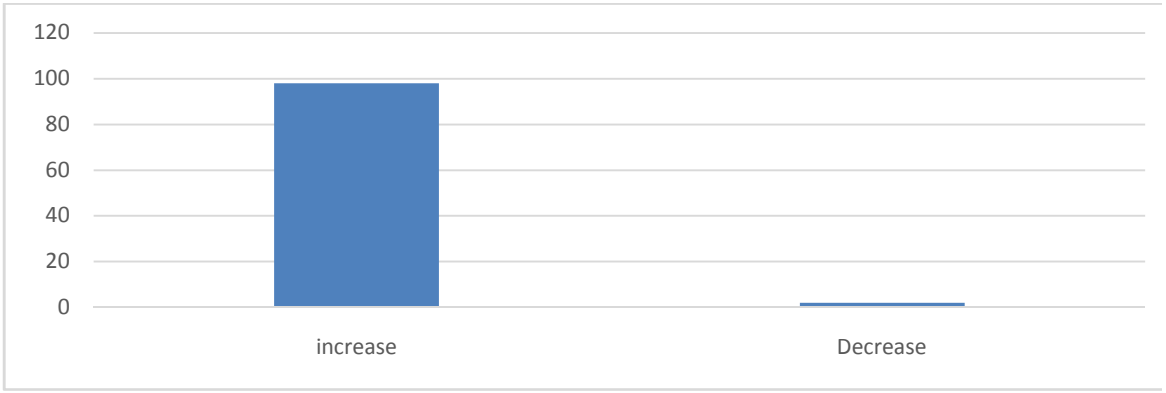

Figure 3: Trend in the study area.

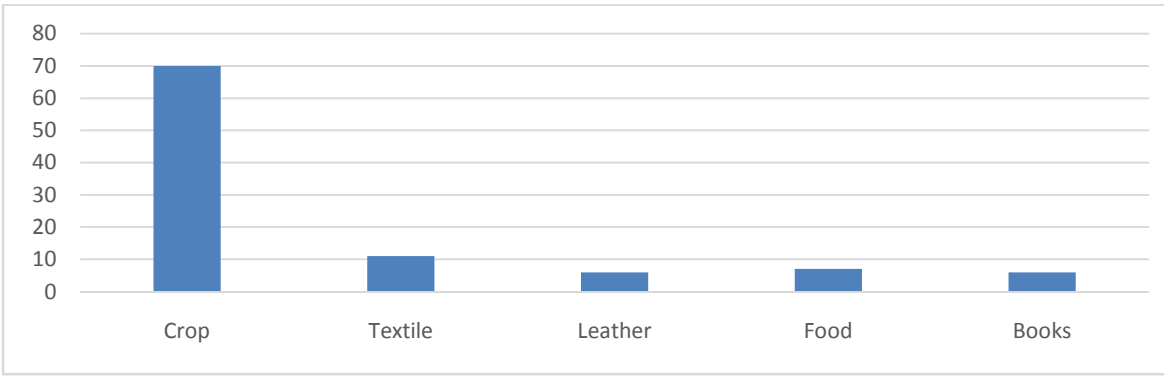

Figure 4: Damages by house mouse in the study area.

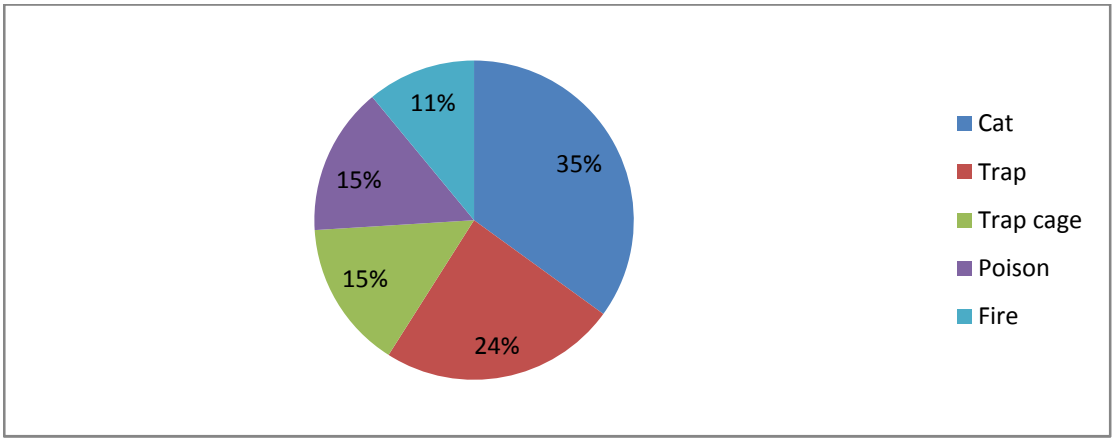

Figure 5: Preventive measures to control the house mouse in the study area.

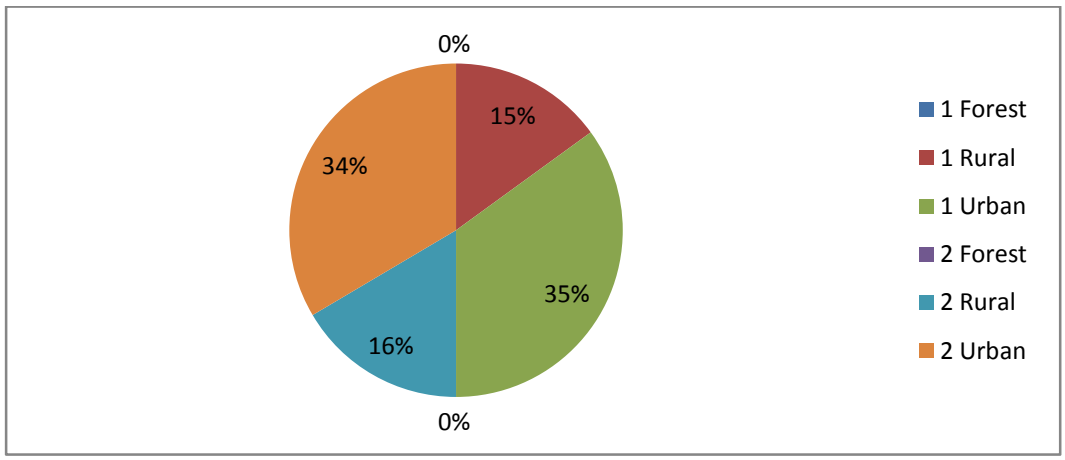

Figure 6: Distribution of *Mus musculus* from selected sub areas of district Bagh.

Table 1: Ethnozoological uses of *Mus Musculus* from selected sites of district Bagh.

Cultural uses	Description
Medicinal	This specie is used for medicinal purposes as; joint pain and wound healing.
Superstitious	1. If juvenile house mouse is present in houses than these cause death. 2. If the new married couple goes out without eat than number of house mouse increase in house. 3. If large number of house mouse present in houses than this will be harmful.

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Availability of data: We have included all relevant data in the manuscript that were collected during the field survey.

Authors' contributions: Manzoor is designed this study and also performed the research; Altaf is helped in data write up. The research article was critically analyzed bt Safeer and Yasrub.

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