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Assessment of behavioral ecology, folklore and medicinal uses of Barn Swallow (*Hirundo rustica*) in district Bagh-Pakistan

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ABSTRACT

Introduction: *Hirundo rustica* breeds in a different climates and altitudinal, preferring buildings in rural, towns and cities and where water is nearby. Both male and female are built cup shape nest, made from mud mixed with horsehair, dry grass, feathers and straw. This species is abundant. Present study was aimed to document the behavioral ecology, distribution, ecology, medicinal uses and cultural value of *H. rustica* used by the local communities of the district Bagh.

Materials and Methods: This study was started from November 2016 to February 2017. Both direct method and indirect method were used for the observation of behavioral ecology, distribution, ecology, folklore uses and medicinal uses of barn swallow.

Results: Throughout the study period barn swallow used greater time in flying followed by sitting, stand, feeding, invigilation time, preening and aggressive time. This species prefer to live in the rural area along with water. This species feathers are used in pillow, decoration, toys; and body is used as taxidermy and also used as traditional medicine.

Conclusion: It is concluded that this is charming bird and prefer to live and fly in the vicinity of human and water reservoir. Local people also like this species, because this species is good omen for them.

Key words: Tradition, Culture, Ethnomedicine, Folklore

INTORDUCTION

In Pakistan barn swallow is a common summer breeding bird in the western and northern mountain areas, central Baluchistan, southern, NWFP, Thar, Kohat, Bannu, Quetta, Chagi, Kalat,, Mansehara, Abbottabad, Hazara, Sawat, Dir, Chitral and Gilgit. In the Indus plains it is a common winter visitor, Sind and Punjab. This species is abundant (Roberts, 1992).

This species native in the following countries; Zimbabwe, Zambia, Yemen, Venezuela, Uzbekistan, United Arab Emirates, Ukraine, Turks, Turkmenistan, Turkey, Thailand, Tanzania, Tajikistan, Syrian Arab Republic, Switzerland, Sweden, Swaziland, Suriname, Sudan, Sri Lanka, Spain, South Africa, Serbia, Senegal, Saudi Arabia, Rwanda , Russian Federation, Romania, Qatar, Puerto Rico, Portugal, Poland, Philippines, Peru, Paraguay, Panama, Palestinian, Palau, Pakistan, Oman, Norway, Nigeria, Niger, Nicaragua, Netherlands, Nepal, Namibia, Myanmar, Morocco, Montserrat, Montenegro, Mongolia, Moldova, Micronesia, Mexico, Mayotte, Mauritania, Martinique, Malta, Mali, Maldives, Malaysia, Malawi, Madagascar, Macedonia, Macao, Luxembourg, Lithuania, Liechtenstein, Libya, Liberia, Lesotho, Lebanon, Latvia, Kyrgyzstan, Kuwait, Korea, Korea, Kenya, Kazakhstan, Jordan, Japan, Jamaica, Italy, Israel, Ireland, Iraq, Iran Indonesia, India, Iceland, Hungary, Hong Kong, Honduras, Herzegovina, Haiti, Guyana, Guinea, Guatemala, Guam, Guadeloupe, Grenada, Greece, Gibraltar, Ghana, Germany, Georgia, Gambia, Gabon, French Guiana, France, Finland, Ethiopia, Estonia, Eritrea, Egypt, Ecuador, Dominica, Djibouti, Denmark, Czech Republic, Cyprus, Cuba, Croatia, Costa Rica, Congo, Comoros, Colombia, China, Chile, Chad, Cape Verde, Canada, Cameroon, Cambodia, Burundi, Burkina Faso, Bulgaria, Brunei Darussalam, British, Brazil, Botswana, Bosnia, Bolivia, Bhutan, Bermuda, Benin, Belize, Belgium, Belarus, Barbuda, Barbados,

Bangladesh, Bahrain, Bahamas, Azerbaijan, Austria, Australia, Aruba, Armenia, Argentina, Antigua, Anguilla, Angola, Andorra, Algeria, Albania and Afghanistan (BirdLife, 2016).

H. rustica breeds in a different climates and altitudinal, preferring buildings in rural, towns and cities and where water is nearby. The breeding season is from the May to the August. Both male and female are built cup shape nest, made from mud mixed with horsehair, dry grass, feathers and straw. Usually nests were built on cliffs or in caves. Clutches size is vary, from two to seven eggs. This species feeds all flying insects (Roberts, 1992; Hagemeijer and Blair, 1997; Møller, 2001; Turner and Christie, 2012).

H. rustica has insignificant decrease since 1970s in North America (Butcher *et al.*, 2007). In European population from 1980 to 2013 have been stable (EBCC, 2015). While, by BirdLife (2015) the population size is estimated to be decreasing in Europe in 11.7 years.

The fundamental relation between humans and animals goes behind utilitarian features. Consequently, documentation of traditional knowledge associated with medicinal and cultural uses of the wild and domesticated animal species is essential because the majority of local communities are rapidly losing their socioeconomic and cultural characteristics (Alves and Rosa, 2007). Particularly, birds are known as the most important and extremely fascinating species that is present in people's thoughts and cultural traditions (del Valle *et al.*, 2015). In several human ethnic communities, birds species constitute the major source of protein; used in medicine and in folklore (Alves, 2012; Alves *et al.*, 2012; del Valle *et al.*, 2015; Mesquita and Barreto, 2015). However, ethnomedicinal uses and cultural importance of *H. rustica* in Pakistan have never been documented. Present study was aimed to document the behavioral ecology, distribution, ecology, medicinal uses and cultural value of *H. rustica* used by the local communities of the district Bagh.

MATERIALS AND METHODS

Study area*:* The district Bagh falls in the lesser Himalayas, covered with coniferous forests, and is a mountainous. The elevation is from 1500 to 2500 meters above sea level. The mountains are generally. Mahl Nala and Betar Nala are the 2 main streams. While, many rivulets flow in district Bagh (DRU, 2007).

Methodology: The data were collected November 2016 to February 2017. Linear count survey (LCS) was used; which consists of six transect lines, while each transect line consists of 1 km long selected (Figure 1). Both direct (i.e. physical count as well as sounds of bird) and indirect methods (i.e. nests, feathers, eggs and carcasses) were used for the observation of behavioral ecology, distribution, ecology, folklore uses and medicinal uses of barn swallow. Roberts (1992) and Mirza and Wasiq (2007) were used for identification of *Hirundo rustica.*

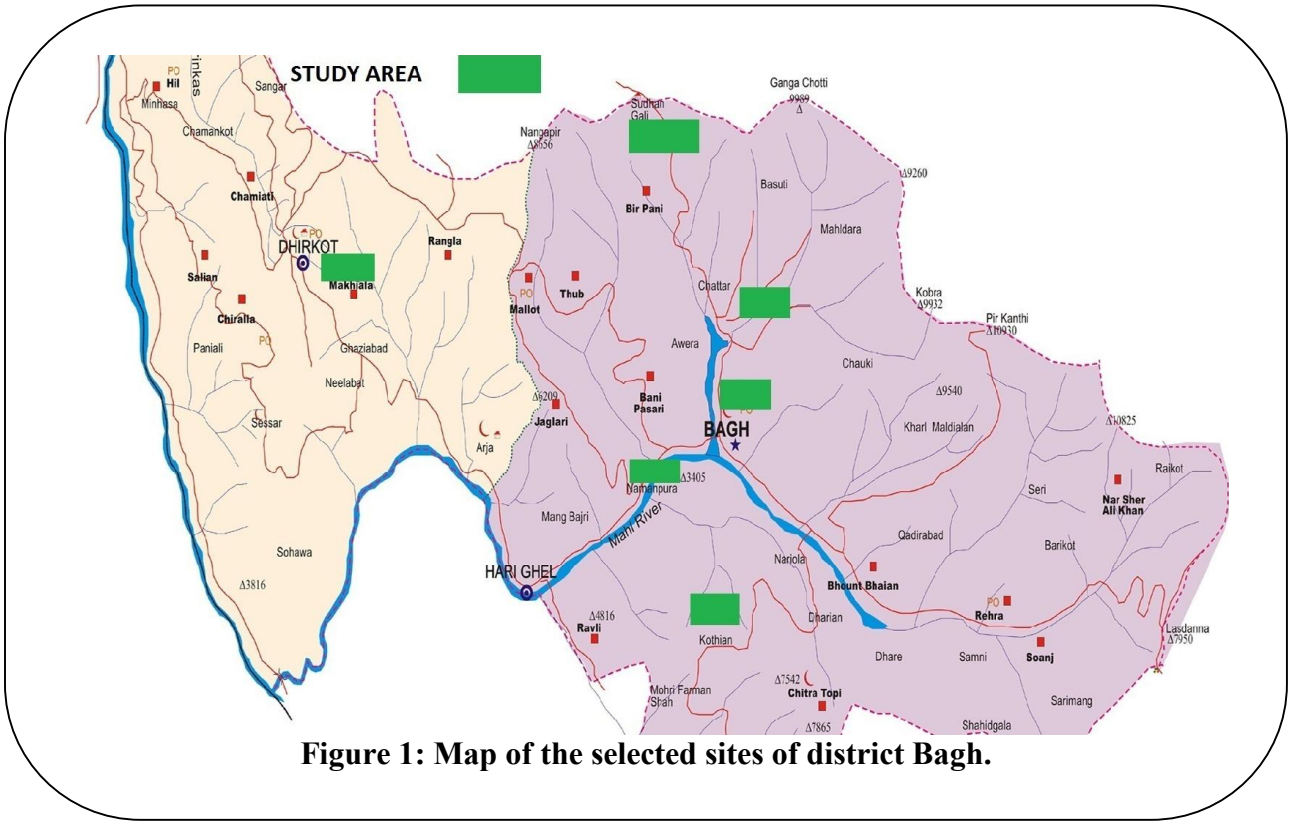

Figure 1: Map of the selected sites of district Bagh.

For the behavioral study following characteristics were noted for one hour for hundred times i.e. invigilation, feeding, flaying time, sitting time, stand time, preening, fight time, aggressive time and walking. Random barn swallow selected each time. Anthropogenic impacts i.e. deforestation and urbanization impacts are noted. For the ecological study following points are noted as; nesting, breeding period, clutch size and broad size. Ethnozoology study consists of following points which were noted; medicine, superstitious, product use and entertainment.

RESULTS AND DISCUSSION

Time budget of barn swallow in natural habitat was recorded. Throughout the study period barn swallow used greater time in flying (23.28%) followed by sitting (21.1%), stand (18.74%), feeding (18.18%), invigilation time (17.785%), preening (0.656566%) and aggressive time (0.015464%) as shown in Table 1. Similar finding recorded by Haider *et al.* (2017) on white cheeked bulbul (*Pycnonotus leucotis*), Hakeem *et al.* (2017) on streak laughingthrush (*Trochalopteron lineatum*) and Rauf *et al.* (2017) on cinnamon tree sparrow (*Passer rutilans*). Barn swallow recorded higher from the rural ecosystem as compared with other habitats (Table 2).

During the study recorded that, barn swallow was started nesting from the March to April in the study area and clutch size was as 3 to 7 eggs and brood size was in one to two (Table 3). During the research noted that barn swallow is beautiful birds; stuffed for decoration and practical work; while feathers are used for pillow, decoration and making toys. This bird is sign hope and opportunities if come in houses. It refers to shyness. Barn swallow is charming and beautiful bird and having charming voice. This species is hunted for feathers, taxidermy and medicine. Soap of barn swallow gives strength the bone and warms the body (Table 4). Altaf *et*

al. (2017) and Altaf *et al.* (2018) was recorded ethnomedicinal uses of bird along river Chenab, Ravi and Jehlum.

Conclusion: It is concluded that this is charming bird and prefer to fly and live in the vicinity of human and water reservoir. Local people also like this species, because this species is good omen for them.

Table 1: Behavioral study of *Hirundo rustica* from the study area.

Behavior	**Time Budget (%)**
Invigilation	17.785
Feeding	18.18
Flying	23.28
Sitting	21.1
Stand	18.74
Preening	0.656566
Aggressive Time	0.015464

Table 2: Distribution of *H. rustica* from the selected sites of district Bagh.

Study areas	Sub areas	Diversity
1	Forest	8
	Rural	20
	Urban	6
2	Forest	5
	Rural	100
	Urban	5

Table 3: The ecological study of the *H. rustica* in the study area.

Ecology	**Description**
Breeding season	Summer (March – April)
Clutch size	3-7 eggs
Broad size	1 to 2 brood Size of this bird

Table 4: Ethnozoological uses of barn swallow from the study area.

Cultural uses	Description
Product use	This species feathers are used in pillow, decoration, toys; and body is used as taxidermy.
Superstitious	This bird is sign hope and opportunities if come in houses. It refers to shyness.
Entertainment	Barn swallow is charming and beautiful bird and having charming voice.
Hunting	This species is hunted for feathers and taxidermy.
Medicinal	Soap of barn swallow gives strength the bone and warms the body.

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

Authors' contributions: Bashir designed this study and also performed the research; Rashid helped in Statistical analysis; Mumtaz, Altaf, Haider, Farooq, Irum, Sozina and Iftakhar critically analysis article and approved as final manuscript.

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