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Short Communication

Characterizing Rare Domestic Pigeon Breeds (*Columba livia domestica*) from Bharokey, Sialkot: A Pathway to Bio-Entrepreneurship

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Abstract. The objective of the present study is to investigate the rear domestic breeds of pigeons in Pakistan. The pigeons of Bharokey (Sialkot), Pakistan are taken as model research because this village is known for rearing the pigeon for gaming, selling and meat purpose. Different breeds of domestic pigeons have varying economic values in terms of bio-entrepreneurship. Raising domestic pigeons requires a low initial cost and yields a significant income. The differences in eye pattern, overall colour, beak and claw colour and feather colour among domestic breeds were investigated. Seven different domestic pigeon breeds were identified based on the researched features. Local names of these seven breeds are 1 = Chuhay pigeons, 2 = Batera pigeons, 3 = Aliwaley pigeons, 4 = Lal-Motiyonwaley pigeons, 5 = Chattwaley pigeons, 6 = 35 waley pigeons and 7 = Jonsirey pigeons. Google apps like google lens, google scholar, youtube videos also reported references helps a lot during research period.

Keywords: domestic breeds, pigeon breeds, pigeon characteristics, bio-entrepreneurship, bharokey, Sialkot, rear breeds, Pakistan

Different varieties of domestic pigeons are common in Pakistan's urban and rural areas. Domestication is the process of raising animals for human consumption. In Pakistan different people from different areas kept pigeons as pets and raising them for having their interest and different purposes like racing, fighting etc. Domestication of pigeons occurred as early as 10,000 years ago (Blechman, 2007). Families and bigger groups were able to create communities by creating domesticity, moving away from a nomadic hunter-gatherer lifestyle that depended on foraging and hunting for subsistence. Pigeon keeper observes their breeding behaviour, nesting behaviour, navigational skills, changing in their body according to their growth stages during domestication.

The domestic pigeon belong to the phylum chordate and a member of the “columbidae” family of birds. About 300 species of pigeons that make up the family "Columbidae" are kept as pets, the phrase "domestic pigeon" mainly refers to breeds of *Columba livia*, often known as the rock pigeon. Domestic pigeons are now commonly raised for racing, fighting, exhibition and meat purposes. Pigeons live in both tropical and temperate zones (Gompertz, 1957; Goodwin, 1960). In both times of peace and war, pigeons have served as constant messengers (Kabir, 2015). Pigeons have different unique names due to their uniqueness in Pakistan.

Pigeons contribute to the welfare and advancement of civilization by bringing in a significant amount of money through competitions. Pigeons contribute to environmental cleanup by feeding on leftover food, seeds and vegetables that have gone bad that people have thrown away. Great homing skills are possessed by pigeons. It has been found that pigeons are not the only birds that can homing navigate: starlings, swallows, warblers, hawks, albatrosses and seagulls (Wallraff, 2005).

Rural populations still engage in animal-related activities in manners close to those of the Mughal royalty in order to satisfy their passions, establish their dominance over others, rise in the eyes of their peers and perpetuate masculinities (Kavesh, 2018).

Depending on the availability of food supplies, populations may grow, decline or remain stable. Pigeon farming is a delightful and beneficial activity for farmers since people enjoy eating pigeon, especially squab meat, which is delicious, nourishing and restorative. It is generally perceived that bio-entrepreneurship is the

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essential driver of job creation, economic growth and wealth for any nation. (Kim *et al*., 2018; Thurik and Wennekers, 2004; Oviatt and McDougall, 1997; Bates and Dunham, 1993).

Raising pigeons is considered as a reliable source of revenue for villagers in difficult times, especially for impoverished women and educated but unemployed youth. It also creates job chances for villages (El-Hanoun *et al*., 2008). Because of their meat's exquisite flavour and abundance of minerals, including proteins, vitamins, calcium and iron, pigeons are highly sought after poultry (Bhuyan *et al*., 1999).

Pigeon farming can undoubtedly be determined to be a source of revenue and a significant factor in Bangladesh's economic development. Pigeon farming occurs on the rooftops of homes and businesses in both urban and rural regions. This job is a pigeon business-man's life (Kabir, 2013).

Despite its potential benefits to growth, bio-entrepreneurial activity remains limited in Pakistan. Since the business of selling pigeons begins on a small scale, pigeon keeping appears to play a crucial part in bio-entrepreneurship. In terms of their selling prices, pigeons have diverse economic values.

The current study is to observe the various domestic pigeon breeds in Bharokey (Sialkot), Pakistan, compare them from various perspectives and understand how they play a part in bio-entrepreneurship. Using domestic pigeons as a model, the current study is the first representation of Pakistan in the field of bio-entrepreneurship.

Study area. The study was conducted in a village Bharokay in Sialkot district, Punjab province of Pakistan. This area features a humid subtropical climate with four seasons. The average temperature is between 75.2 °F (24 °C) and 49.8 °F (9.9 °C). June and July are the hottest months. The minimum temperature during winter may drop to -2 °C (28 °F). The average annual rainfall is about 1000 mm, whereas the average amount of precipitation is about 990 mm.

Sampling. The duration of the study span was 9 months. Study was begun at the start of December 2022 to August 2023. The main objective of this research was to observe domestic pigeon breeds. The village Bharokey was chosen as a model for this study. Data of 17 pigeon keeping homes were collected. Almost all houses set up cages on their roofs, which could be easily visited and viewed. Seven types of breeds were observed in the village Bharokey (Sialkot) on the basis of eye pattern, overall body colour, Beak and claws colour and feather colour. Equipment's consists of cameras and techniques of interviews with pigeon keepers, while google apps *e.g*, google lens, google scholar, youtube videos also reported references helps a lot.

In present study flying and utility seven domestic pigeon breeds were observed. These were renowned breeds of the area Bharokey (Sialkot), Pakistan. The pigeon breeds present in 17 under studied homes were reported in Table 1. *i.e*, their number of total pigeons in the houses, number of male pigeons, number of female pigeons and number of squabs. Qualities of the studied breeds are given under 1 = Chuhay pigeons, 2 = Batera pigeons, 3 = Aliwaley pigeons, 4 = Lal-Motiyonwaley pigeons, 5 = Chattwaley pigeons, 6 = 35waley pigeons and 7 = Jonsirey pigeons. Figures in Table 2 shows the seven domestic breeds (1 = Chuhay pigeons, 2 = Batera pigeons, 3 = Aliwaley pigeons, 4 = Lal-Motiyonwaley pigeons, 5 = Chattwaley pigeons, 6 = 35waley pigeons and 7 = Jonsirey pigeons). Characteristics of all seven breeds are compared in the Table 2. on the basis of different resources. Total number of assessed pigeons were 1138, total number of males pigeons were 529, total number of female pigeons were 432, the number of squabs were 177 and the number ranges from pigeons in all homes were 8-200. Because of their economic selling rates these breeds are supposed to play important role in terms of bio-entrepreneurship in Pakistan. Seven breeds had reported in Table 2 about different bio-entrepreneur value in different areas of Pakistan. In the investigated area, the selling prices of the seven domestic pigeon breeds couple (male and female) vary mentioned in Table 3.

Characteristics of observed seven domestic pigeon breeds. In the current study, domestic pigeons of seven distinct breeds were observed. Chuhay pigeons (breed no.1) were given their name because their completely black eyes resemble mouse fur (Fig. 2c). Compared to other pigeon breeds, this breed was found to be less in weight. They show shyness in their behaviour. According to results of this study, female Chuhay pigeons are more slender than male Chuhay pigeons. The interesting finding of this study was that pigeons' beak and claw colours are always the same. Chuhay pigeons have black claws and a black beak. The eyes of Batera pigeons (breed no. 2) have rings and big lenses. This breed occasionally has two different types of rings in their eyes, one that is black and the other that is white in

colour (Fig. 2a). Batera pigeons exhibit aggressive behaviours. Even after flying, they save their stamina for later use. They fly for about 16 h per day. Aliwaley pigeons (breed no. 3) were observed as best high-flying and extremely intelligent breed. Their eyes have all of the rings that set them apart from other

Table 1. The number of pigeons breeds present in 17 under study homes

Home no.	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17
Total no. of pigeons	25	8	100	20	55	80	70	25	40	150	55	20	95	200	35	130	30
Male pigeons	10	4	60	12	25	35	35	10	15	65	25	8	45	90	15	60	15
Female pigeons	10	4	40	8	20	30	25	10	15	55	20	7	40	75	13	50	10
Squabs	5	0	0	0	10	15	10	5	10	30	10	5	10	35	7	20	5

Table 2. Qualities of local domestic pigeon breeds

Sr. no	Names of local breeds	Eye pattern	Beak and claws	Overall colour plumage	Unique feature	Male	Female
No. 1	Chuhay pigeons	Black eyes resemble with mouse fur	Slate coloured	Full white	Their eyes resemble with mouse fur		
No 2	Batera pigeons	Pigeons Rings present in their eyes	Black colour	Almost white with some black color	Show aggressive behaviour		
No. 3	Aliwaley pigeon	Pigeons All rings are present in their eyes	Dark colour	Multicolor like white, black, ash red and brown	Fly from 5am to 5pm		
No. 4	Lal-motiyonwaley pigeons	Sky blue particles spread in their eyes	Pinkish white	Full white	Red spots on their body		
No. 5	Chattwaley pigeons	White rings are present in their eyes	Brown or grey	Multi-color	Vibrating feathers		
No. 6	35waley pigeons	Sky blue particles in their eyes	Black colour	Full white	Definitely have only one black feather on their one side of wings		
No. 7	Jonsirey pigeons	Stony and sloppy eyes with slate colour eyebrows	Black colour	Full white body	Feathers varies in shapes (round and pointed)		

Table 3. Selling prices of these seven domestic pigeon breeds in Bharokey (Sialkot) Pakistan

Sr. no	Domestic pigeon breeds (male and female)	Selling prices in investigated area (couple price)
No. 1	Chuhay pigeon breed	6000
No. 2	Batera pigeon breed	5000
No. 3	Ali waley pigeon breed	7000
No. 4	Lal-motiyon Waly Pigeon breed	4000
No. 5	Chat waley pigeon breed	6000
No. 6	35 Waley pigeon breed	7000
No. 7	Jonsirey pigeon breed	3000

Table 4. Different types of pigeons, their purpose, economic advantages in terms of bio-entrepreneurship

Types of pigeons	Purpose	Economic advantage
Flying/sporting pigeons	The purpose of these pigeons is racing (competitions), reproduction and convey messaging	Competitions or racing leads to cash prizes up-to $1 Million
Fancy pigeons	Used for exhibitions	People bred these pigeons for their interest like a hobby
Utility pigeons	These pigeons bred for meat purpose	Their meat is transported for consumption from a country to another

breeds (Fig. 2f). Their flying patterns depend on the arrangement of their ninth and tenth feathers, with the ninth feather being larger. These pigeons easily continue to rear into the late spring season. Their beak and nails are dark in hue. Lal-Motiyonwaley pigeons (breed no.4) havesky blue particles and occasionally red rings can be seen in their eyes (Fig. 2g). These pigeons are known as lal-motiyonwaley pigeons because of the red spots on their bodies. They have good flying skills and a nearly white body colour. Chattwaley pigeons (breed no.5) possesses clay eyes (Fig. 2d). This breed's appearance is stunning and their bodies have a velvety smoothness. They have transparent feathers that are necessary to good flight and have vibrating feathers. Their nails and beak are gray in colour. 35 waley pigeons (breed no.6) are high-performance, high-flying birds with sky blue particles in their eyes (Fig. 2a). The distinguishing characteristic of this breed is the presence of a black wing on one side, which is absent in other breeds. Their claws and beak are also black in colour. Jonsirey pigeons (breed no.7) have stony and sloppy eyes with slightly particulate and slate colour eyebrows (Fig. 2b). This breed is all white throughout. Their feathers vary in shape, including round and pointed varieties.

Difference of eyes pattern in seven different domestic breeds. ***Advantages of pigeon in terms bio-entrepreneurship.*** Navigation ability of pigeons is extremely significant in bio-entrepreneurship, especially in fields where accurate and effective navigation is necessary.

One of the most intelligent bird species, pigeons have highly developed cognitive, memory and problem-solving abilities. In bio-entrepreneurship, this intelligence can be used for activities like data collecting, surveillance or environmental monitoring.

Pigeons are quite inexpensive to maintain in comparison to other animals employed in bio-entrepreneurship, such as dogs or horses. They are economically viable options for bio-entrepreneurs with little resources because they require little in the way of food, shelter and medical care.

There are opportunities for bio-entrepreneurs to interact with local communities because pigeon racing is a well-liked pastime and sport in many areas of the world.

Domesticated pigeons can be divided into three main groups, including flying/sporting, fancying and utility pigeons (Levi, 1957) that contribute to the economy and in bio-entrepreneurship (Table 3).

Around the globe, there are between 260 and 400 million pigeons. Over 350 distinct breeds of pigeons are currently recognized and pigeon breeding is a well-liked pastime all over the world. They are currently widespread around the world, mostly in cities (Haag-Wackernageland and Taube, 1998).

In Bangladesh, the rise in pigeon farming is a result of the country's high unemployment rate. This is a good industry in terms of bio-entrepreneurship to work in for both money and leisure (Kabir, 2013). Some areas in Bangladesh, such the Gulistan area and Tongi, are well known for selling pigeons. When purchasing animals

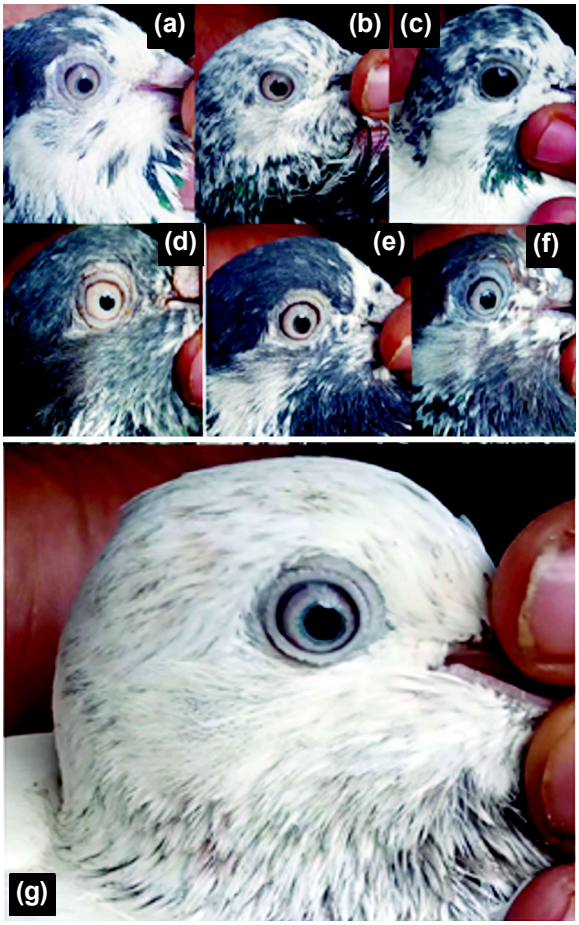


Fig. 2. Taken pigeon's eye pattern pictures from the model study area of Bharokay: **(a)** 35 walay pigeon's eye pattern, **(b)** Jonsirey pigeon's eye pattern, **(c)** Chuhay pigeon's eye pattern, **(d)** Chatwaley pigeons eye pattern, **(e)** Batera pigeon's eye pattern, **(f)** Aliwaley pigeon's eye pattern and **(g)** Lal-motiyonwaley pigeon's eye pattern.

for racing, breeders pay close attention to the animal's eyes, feathers and flying muscles (Kabir, 2014) since pigeon eyes are a focus of this research as well.

According to previous research pigeon eyes had mainly three eye colours: orange, dark brown and pearl white and different variation was observed in eye colour of domestic pigeon breeds (Maclary *et al.*, 2021), in addition, various eye colour should appeal to pigeon consumers more in terms of bio-entrepreneurship. Each pigeon breed has specific characteristics (Erdem *et al*., 2021), those are meant to strengthen the pigeons' popularity and raise their value in the bio-entrepreneurship field.

It was reported that pigmentation and structural colouring, or the presence of materials that diffract light, were both sources of the colour of a bird's eyes, which was typically the colour of the iris (Si *et al*., 2021).

Domestic pigeons are known for having a lot of white on their bodies. Research indicates that this is because predatory birds typically employ these birds as bait, referring to them as easy targets (Brown, 2015).

The majority of domestic pigeons raised in villages for meat production are consistent with earlier research showing that Bangladeshi King Pigeons can be classified as broiler or Table breeds rather than fancy pigeons (Kabir, 2020).

Based on the findings, raising pigeons requires little financial outlay, minimal maintenance, inexpensive feed and affordable housing. Pigeon farming can therefore be a simple, profitable, sustainable and dependable option to generate additional jobs, provide a family with a leisure-time opportunity to work and generate quick cash. (Maity *et al*., 2020).

Present study conducted for the first time in Pakistan and no work done on these rear breeds in terms of bio-entrepreneurship previously.

Conclusion

A frequent and well-liked pastime in rural areas is raising domestic pigeon breeds for their unique traits. Study raises awareness of the special traits and benefits that domestic pigeons have to offer the field of bio-entrepreneurship. Using pigeon rearing as an investment for the future will allow families to use labour during their free time and as a means of generating quick cash. Pigeon rearing is a risk-free, viable and sustainable business venture for rural farmers.

Conflict of Interest. The authors declare that they have no conflict of interest.

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