



Diversity of cats in Quetta city, Balochistan, Pakistan

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Abstract

This study was conducted to determine the diversity of cats in Quetta city. All cats belonged to the family Felidae, genus *Felis*. These cats are considered only domesticated species in the family Felidae that's why often referred to as the "domestic cat" to distinguish it from wild members of the family. The study was carried out from March to December 2019 in Quetta city. During the study period, 1000 cats were documented randomly from Quetta city which resulted in the enumeration of different cats such as Mackerel Tabby cat, Classic Tabby cat, Ticked Tabby cat, Spotted Tabby cat, Persian cat, Bombay cat, Oriental short hair cat, Turkish van cat and Main coon cat, Calico cat and Tortoiseshell cat. Identification of cat was done on the basis of physical characteristics such as coat pattern, coat color and hair (fur) length. The most diverse and abundant cat was tabby cats, recorded 74.2% represented by observing four coat patterns. Mackerel tabby coat patterned cats were found 37.7% followed by Spotted tabby patterned cats 26%, Ticked tabby patterned cats were 6% and classic tabby patterned cats were found 4.5%. While among various breeds of cats, the most dominant breed was persian cats (8.8%) followed by Bombay cat (4.8%), Turkish van cats (2.8%), Maine coon cats (1.2%) and least was observed Oriental short hair cats (1%) in the study area. While Calico cats were recorded 5.6% and Tortoiseshell or tortie cats were found 1.8%.

Keywords: cats, breeds, quetta, balochistan

1. Introduction

The cat (*Felis catus*) is a small carnivorous mammal ^[1]. The domestic cat is a member of the Felidae family which had a common ancestor about 10–15 million year ago ^[2]. The genus *Felis* diverged from the Felidae around 6–7 million year ago ^[3].

It was long thought that cat domestication was initiated in Egypt, because cats in ancient Egypt were venerated since around 3100 BC ^[4]. The earliest known indication for a tamed African wildcat (*F. lybica*) skeleton was excavated close by a human grave in southern Cyprus, Scientists therefore assume that African wildcats were attracted to early human settlements in the Fertile crescent by rodents, in particular the house mouse (*Mus musculus*), and were tamed by Neolithic farmers. This commensal relationship between early farmers and tamed cats lasted thousands of years. As agricultural practices spread, so did tame and domesticated cats ^[5]. Wildcats of Egypt contributed to the maternal gene pool of the domestic cat at a later time ^[6].

During domestication, cats have undergone only minor changes in anatomy and behaviour, however they are still capable of surviving in the wild. The cat is a cosmopolitan species and occurs across the world ^[7]. It can live on the highest mountains and in the hottest deserts. It is adaptable and now present on all continents except Antarctica. The domestic cat's ability to thrive in almost any terrestrial habitat has led to its designation as one of the world's most invasive species. Cat can live in forests, grasslands, tundra, coastal areas, agricultural land, scrublands, urban areas, and wetlands ^[8].

Cats are similar in anatomy to the other felid species, with a

strong flexible body, quick reflexes, sharp teeth and retractable claws adapted to killing small prey. They are predators who are most active at dawn and dusk (crepuscular). Cats can hear sounds too faint or too high in frequency for human ears, such as those made by mice and other small animals. Compared to humans, they see better in the dark or even near total darkness and have a better sense of smell, but poorer colour vision. Cats are able to tolerate quite high temperatures. Humans generally start to feel uncomfortable when their skin temperature passes about 38°C (100°F), but cats show no discomfort until their skin reaches around 52°C (126°F) and can tolerate temperatures of up to 56°C (133°F) if they have access to water. Cats conserve heat by reducing the flow of blood to their skin and lose heat by evaporation through their mouths. Cats have minimal ability to sweat, with glands located primarily in their paw pads ^[9].

Cats are obligate carnivores. Their physiology has evolved to efficiently process meat, and they have difficulty digesting plant matter, about 20% of a cat's diet must be protein ^[10]. A cat's gastrointestinal tract is adapted to meat eating, being much shorter and having low levels of several of the digestive enzymes needed to digest carbohydrates. These traits severely limit the cat's ability to digest and use plant-derived nutrients, as well as certain fatty acids ^[11]. Cats normally reach sexual maturity at 5–10 month, and males at 5–7 month. This varies depending on breed ^[12]. The average feral adult male weighs 4 kg (9 lb.), and the average adult female 3 kg (7 lb.) ^[13]. Cats average about 23–25cm (9–10 in.) in height and 46cm (18in.) in head/body length (males being larger than females), with tails averaging 30cm

(12in.) in length. The average lifespan of pet cats has risen in recent decades. It was about 15.1 years in 2018. Some cats have been reported as surviving into their 30 years [14]. Hundreds of millions of cats are kept as a pet around the world. Cats have either a mutualistic or commensal relationship with human. Interaction with cats may improve health and reduce physical responses to stress, for example the presence of cats may moderate increased blood pressure [15]. Cat ownership may also improve psychological health by providing emotional support and dispelling feelings of depression, anxiety and loneliness [16]. Their ability to provide companionship and friendship are common reasons given for owning a cat [17].

This study was conducted to identify the local and common cats of Quetta city and the identification was done on the basis of external physical characteristics such as coat color, coat pattern and hair length of cats.

2. Materials and Methods

2.1 Study description

Current study was conducted in Quetta city with the collaboration of “Centre for Advanced Studies in Vaccinology and Biotechnology (CASVAB)” University of Balochistan, and Department of Zoology, Sardar Bahadur Khan Women’s University, Quetta, Balochistan, Pakistan.

2.2 Data collection

A total of 1000 cat’s physical examination and photographs were captured randomly from different areas of Quetta city

during the study period March to December 2019. The photographs were captured during the different timings of day.

2.3 Identification of cats

Only adult cats were documented, and identification of those cats was done on the basis of external physical features such as coat pattern, coat color and hair length by direct visual observations and photographic evidence with the help of webography [18, 19, 20].

3. Results

A total of 1000 random cats were documented from different areas of Quetta city. 11 different cats were recorded that all were belonging to family felidae and genus *Felis* as shown in Table 1. Among the cats (catus felis), the most diverse and abundant cat was tabby cats, recorded 742 (74.2%) which were very common in the study area represented by observing 4 coat patterns. Mackerel tabby coat patterned cats were identified abundantly 377 (37.7%), followed by Spotted tabby patterned cats 260 (26%), Ticked tabby patterned cats 60 (6%) and least found Classic Tabby patterned that was recorded 45 (4.5%), While among various breeds of cats Persian cats 88 (8.8%) was the most dominant breed followed by Bombay cat 48 (4.8%), Turkish van cats 26 (2.6%), Maine coon cats 12 (1.2%) and least was observed Oriental short hair cats 10 (1%) recorded in the study area. While Calico cats were recorded 56 (5.6%) and Tortoiseshell or tortie cats were observed 18 (1.8%).

Table 1: A list of the cats identified from different areas of Quetta city.

S.No	Family	Genus	Cats	No. of individuals	Total % Frequency	
1	Felidae	<i>Felis</i>	Mackerel	Tabby cats	377	37.7%
2	Felidae	<i>Felis</i>	Classic		45	4.5%
3	Felidae	<i>Felis</i>	Ticked		60	6%
4	Felidae	<i>Felis</i>	Spotted		260	26%
Total				742	74.2%	
5	Felidae	<i>Felis</i>	Persian cat	88	8.8%	
6	Felidae	<i>Felis</i>	Bombay cat	48	4.8%	
7	Felidae	<i>Felis</i>	Oriental short hair cat	10	1%	
8	Felidae	<i>Felis</i>	Turkish van cat	26	2.6%	
9	Felidae	<i>Felis</i>	Maine coon cat	12	1.2%	
Total				184	18.4%	
10	Felidae	<i>Felis</i>	Calico cat	56	5.6%	
11	Felidae	<i>Felis</i>	Tortoiseshell or tortie cat	18	1.8%	
Total				74	7.4%	
Grand total				1000	100%	

The common domestic tabby cats were identified on their four unique coat patterns and a common distinguishing facial marking M on their foreheads. The expressive pencil-thin striped markings around the eyes was also noticed.

3.1 Identification of Mackerel Tabby cat

The cats possesses Mackerel tabby coat pattern were identified by their vertical, gently curving stripes on the side of the body. The stripes were seen narrow and continuous or broken into bars and spots on the flanks and stomach. An "M" shape distinctive marking appearance on the forehead, along with dark lines across the cat's cheeks to the corners of its eyes. Mackerels are also called 'fishbone tabbies', because the stripes coming off of the cat’s spine resemble a fish skeleton. The mackerel tabby pattern were observed in variety of color that include brown and gray. Orange, also

known as red, is another very common color the cats commonly seen along with tabby stripes. About 80 percent of orange cats are male. They are named after the mackerel fish and Mackerel is the most common tabby pattern as shown in Figure-1.



Fig 1: Mackerel Tabby cat

3.2 Identification of Classic Tabby cat

The Classic tabby cat were identified by their unique

whirled or swirled body markings (often called a "bullseye") on the cat's sides. A light colored "butterfly" pattern was also noticed on the shoulders and three thin stripes (the center stripe is dark) running along its spine. Like the Mackerel tabby cats classic tabbies possessed "M" pattern on their foreheads and dark bars on the legs, tail, and cheeks. The coat color of classic tabbies were found dark browns, ochres and black except white. The Classic also known as "Blotched" or "Marbled" tabbies as shown in Figure-2.



Fig 2: Classic Tabby cat

3.3 Identification of Ticked Tabby cat

The Ticked tabby cats were identified by their stripe less coat pattern. Ticked tabby coat pattern produce by the agouti hairs. The hairs (agouti) with distinct bands of color on them, breaking up the tabby patterning into a "salt-and-pepper" or "sand"-like appearance. "Barring" were seen on the lower legs, face and belly and at the tail tip, as well as a long dark line running along the back, usually in the spine as shown in Figure-3.



Fig 3: Ticked Tabby cat

3.4 Identification of Spotted Tabby cat

Spotted tabby cats were identified by their spotted coat pattern. These spots were observed all over his sides. The Spotted tabby is considered as the result of modifier gene that breaks up the mackerel tabby pattern and causes the stripes to appear as spots as shown in Figure-4.



Fig 4: Spotted Tabby cat

3.5 Identification of Persian cat

The Persian cat is also known as the "Persian Longhair" in the English-speaking countries. In the Middle East region they are widely known as "Iranian cat" and in Iran they are known as "Shirazi cat". The true origins of Persian cats may remain a mystery, but one popular theory says that an Italian

nobleman named Pietro Della Valle brought eight Persians home to Western Europe after learning about the breed while traveling through Iran. Similar theories say that they were brought to Europe by sailors (who often brought kitties onboard for good luck), merchants, or travelers. The first documented ancestors of the Persian were imported into Italy from Iran around 1620. Persian cat is a medium to large cat. Persian cat one of the most famous and beautiful cat breed in the world due to their large volume of furs, cute face and eyes, sweet voice and pleasant behaviour. Its long, luxuriant, flowing coat comes in a numerous of colours and its pansy-like face with big round copper eyes is open and sweet. It has a short sturdy body and short legs like little tree-trunks to support its massive build. The Persian cat communicates with his expressive eyes and his soft, melodious voice. The Persian cat has a very calm temperament and they do not like loud voices and noises. His kindness makes him an excellent house cat as shown in Figure-5.

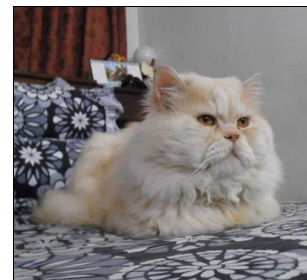


Fig 5: Persian cat

3.6 Identification of Bombay cat

The Bombay cat is a type of short-haired cat. Bombay is the name given to black cats of the Asian group. Bombay cat is also called "mini-panther". The Bombay comes in one color-black; but the deepest, densest black imaginable and with a high gloss sheen. The large eyes are anywhere from a deep, rich gold to copper just like new copper pennies. The gleaming coat is tight and short and hugs the muscular body. They are a medium-sized cat with a robust bone structure to support the powerful muscular body and are surprisingly heavy for their size. The head is rounded with no sharp angles and the large eyes are wide set giving the face a sweet expression. The ears are medium sized, set well apart and sit tilted forward. Bombay cats are typically characterized as having an all-black coat, black soles, black nose and mouth. The close-lying, sleek and glossy black coat is generally colored to the roots as shown in Figure-6.



Fig 6: Bombay cat

3.7 Identification of Oriental short hair cat

Orientials have almond-shaped eyes, a triangular head shape,

large ears, and an elongated, slender, and muscular body. The Oriental short hair has a very short, glossy, close-lying coat. The coat comes in all traditional colors, solids, tabbies, torties, silvers and smokes. Despite their slender appearance, they are athletic and can leap into high places. They prefer to live in pairs or groups and also seek human interaction. as shown in Figure-7.



Fig 7: Oriental short hair cat

3.8 Identification of Turkish van cat

The Turkish Van is an ancient breed thought to have originated in the Lake Van area of Turkey. The Van’s head is wide and moderately wedge shaped. The eyes are shaped something like peach pits and eye color is amber, blue or odd-eyed. The body is long, sturdy and muscular with fur that feels like cashmere and a full, brush like tail. The Turkish Van is one of the larger cat breeds. The cat is moderately long, and its back legs are slightly longer than its front legs. They have large paws and rippling hard muscle structure which allows them to be very strong jumpers. Van markings, which describes a mostly white feline with colored markings that are restricted to its head and tail. This phrase was originally coined to describe the Turkish Van’s unique coloration. The Van’s markings can come in multiple shades including red, cream and black. The Turkish Van is a combination of white and colored patches with the colored patches restricted primarily to the head and tail. The body is a glistening chalk-white and the rich colors are on the head and the long magnificently plumed tail as shown in Figure-8.



Fig 8: Turkish van cat

3.9 Identification of Maine coon cat

The Maine coon is the largest domesticated cat breed. It is considered as one of the “original native cat-breeds” of the United States, the Maine coon cat is known for having adapted to the harsh winters and natural wild environment of the state of Maine. The cold and the distances between human settlements in Maine helped the Maine coon cat breed stay unmixed for hundreds of years. Medium-size to large Maine coon cat has a distinctive physical appearance

mostly has brown tabby coat and furry ringed tail with a well-proportioned body that is muscular and broad-chested. A Maine coon is a big, rugged cat with a smooth, shaggy coat. they were built for just such work in the harsh Maine climate, and their breed standard reflects their heritage. A Maine coon has substantial, medium-length legs and large, round paws, well tufted with fur, to serve as “snowshoes” during winter. A heavy coat is shorter on the shoulders, longer on the stomach and britches (long fur on the upper hind legs), with a ruff in front and a long, furry tail waving a greeting. A medium-width head is slightly longer than it is wide and has a squarish muzzle. Large, well-tufted ears are wide at the base, tapering to a point, and large, expressive eyes are green, gold, greenish-gold or copper. The brown tabby pattern is so common in this breed. Maine coons are found in solid colors that include black, red or white, all tabby colors and patterns, bicolor such as blue and white or red and white, and patterns such as tortoiseshell and calico. They are called the “gentle giants” and the “dogs of the cat world” as shown in Figure-9.



Fig 9: Maine coon cats

3.10 Identification of Calico cat

Calico cats were identified by their three-color coat predominantly white but features distinct patches of two colors often orange and black or the more subdued cream and blue tones. The coat color in cats is a physical characteristic related to gender. The genetic coding for displaying orange or black color is found on the X chromosome. Females have two X chromosomes, so they are able to have two different coat colors plus white to create the calico mix. The rare male calico cat usually has a chromosomal aberration of two X chromosomes and one Y chromosome as shown in Figure-10.



Fig 10: Calico cat

3.11 Identification of Tortoiseshell or Tortie cat

Tortoiseshell or Tortie cats were also identified through unique coat coloration. Like the calico the mix of two colors plus white is found almost exclusively in female cats. The difference between the tortie and the calico is that in the tortie, the coat colors are blended or swirled together rather than being distinct patches. Like the calico, the tortie may also have significant amounts of white. Mixes of orange and black are common, but other combos include chocolate,

grey, blue, and cream as shown in Figure-11.



Fig 11: Tortoiseshell or Tortie cat

4. Discussion

A total 1000 photographs of cats were captured randomly from Quetta city. All cats belonged to family Felidae and genus *Felis* and identified as Mackerel Tabby cats, Classic Tabby cats, Ticked Tabby cats, Spotted Tabby cats, Persian cats, Bombay cats, Oriental short hair cats, Turkish van cats, Maine coon cats, Calico cats and Tortoiseshell or tortie cats. The identification was done on the basis of external physical characteristics such as coat (fur) color, coat (fur) pattern and hair length through physical examination and direct visualization. Out of 1000 cats 742 individuals of cat, were tabby cats and found to be dominant with 74.2% in Quetta city, while five breeds of cats were recorded with 18.4% that includes Persian cats, Bombay cats, Oriental short hair cats, Turkish van cats and Maine coon cats. Whereas Calico cat, Tortoiseshell or tortie cat were recorded 7.4%. It was concluded that Quetta city supports a diversity of cats.

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