

Wuest D., Kitchener A., Ghoddousi A., Gerngross P., Barashkova A., Lanz T., Sliwa A., Krivopalova A., Shakula G., Breitenmoser-Würsten C. & Breitenmoser U. 2021. Expediency of photographs to study the distribution of wildcats in South-west Asia. *Cat News* 72, 40–44. Supporting Online Material.

SOM 1. Wildcat Catalogue → [www.wildcatalogue.epizy.com](http://www.wildcatalogue.epizy.com)

## SOM 2.

### A phenotypic guide to the Wildcat group

Compiled by Dina Wuest

#### Introduction

Wildcats occur across Europe, Asia and Africa, and consist of three species (*Felis silvestris*, *F. lybica*, and *F. bieti*) and their respective subspecies (Kitchener et al. 2017). The European wildcat *F. s. silvestris* occupies much of western Europe. The Caucasian wildcat *F. s. caucasica* occupies Anatolia and the Caucasus. The Asiatic wildcat *F. l. ornata* occupies southwestern and central Asia, Afghanistan, Pakistan, India, Mongolia and China. The African wildcat *F. l. lybica* occupies eastern, western and northern Africa, the Arabian Peninsula, the Middle East, as well as Corsica, Sardinia and Crete. The South-African wildcat *F. l. cafra* occupies southern Africa, but the exact border to *F. l. lybica* is unclear. The Chinese mountain cat *F. bieti* occupies the provinces of eastern Qinghai, northern Sichuan and possibly Gansu, China (He et al. 2004). The domestic cat *Felis catus* is present all over the world, overlapping with each of the wildcats to varying degree (Ottoni et al. 2016). All wildcat species have the potential to hybridise with one another, as well as with the domestic cat (Driscoll et al. 2007). All of these cats possess different physical features, but visual comparisons among the entire group and schematics for identification are lacking in the literature or exist only for some regions, e.g. the European wildcat (Ragni & Possenti 1996, Kitchener et al. 2005).

In order to identify the different cats from digital photographs, I compiled the phenotypic descriptions of each wildcat species or subspecies from the literature. Additionally, I designed a simplified schematic for each species/subspecies (Fig. 8), with the intention for them to be used as a support for identifying wildcats (Wuest et al. 2020).



Drawing of Asiatic Wildcat © Dina Wuest

## Phenotypic guide wildcat group

### European Wildcat - *Felis silvestris silvestris*

The European wildcat (Fig. 1) is often described as being larger and more robust than the domestic cat *Felis catus* (Velli 2015; Fig. 7), and having a bushy tail with a broadly rounded black tip, with at least two aligned dark rings in the final third that encircle the entire tail (Ragni & Possenti 1996, Kitchener et al. 2005, Gündogdu et al. 2018, Bellani 2020, Maronde et al. 2020). The muzzle is tipped with a red nose pad and long white whiskers, and they often have an off-white patch on their chin (Kitchener et al. 2005). Four to five black occipital stripes often cover the back of the neck, and one stripe on each shoulder (Ragni & Possenti 1996, Kitchener et al. 2005, Maronde et al. 2020). They have a uniform colour pattern on their ears, and three clear dark stripes decorate the cheeks (Ragni & Possenti 1996, Kitchener et al. 2005, Velli 2015). A black dorsal line runs along the entire back but stops at the base of the tail (Ragni & Possenti 1996, Kitchener et al. 2005, Bellani 2020). Although this is a very distinguishing trait, it is sometimes difficult to see in photographs (Maronde et al. 2020). The fur colour of the European wildcat varies, but is often described as tawny, brown, ochre yellow, or light grey (Devillard et al. 2013, Gündogdu et al. 2018, Maronde et al. 2020). Their flanks are covered in lateral stripes, that are not linked to the backline. The extent of lateral stripe contrast varies in different regions. In Switzerland they are described as having a low contrast between lateral stripes and background fur colour (Maronde et al. 2020), but the Scottish wildcats are described as having a high contrast between lateral stripes and the background fur colour (Kitchener et al. 2005).

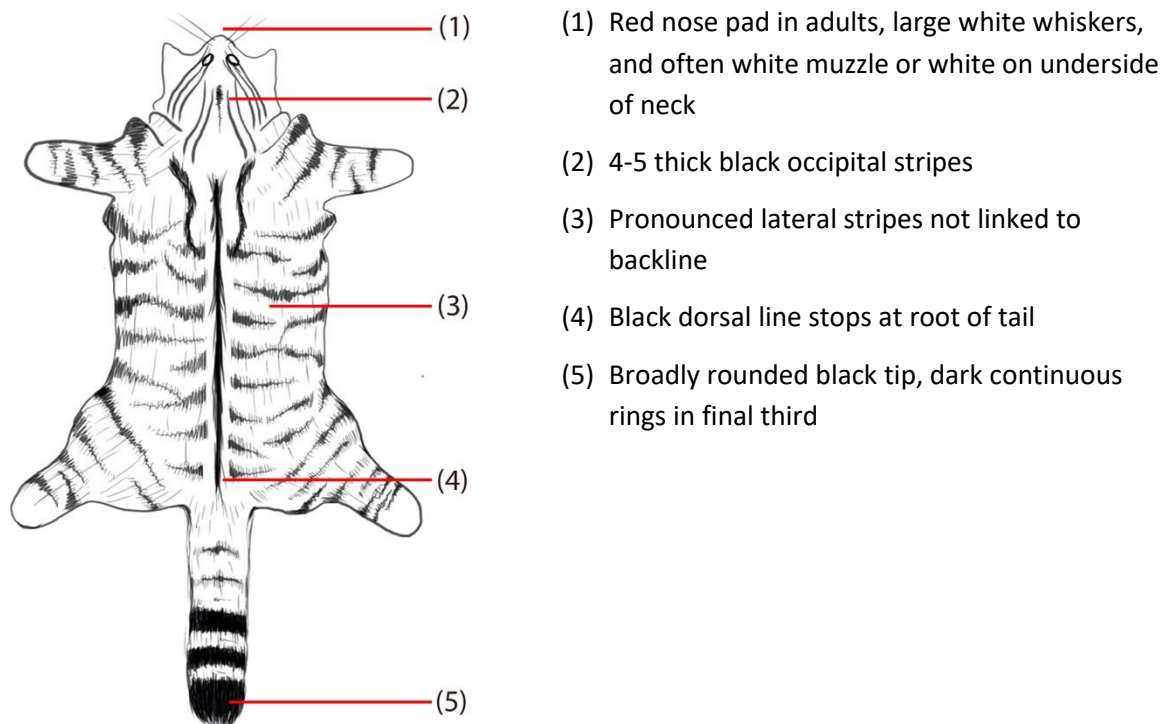


Figure 1. Key diagnostic traits for *Felis silvestris silvestris*

**Caucasian Wildcat** – *Felis silvestris caucasica*

The Caucasian wildcat (Fig. 2) is often described only at the species level, where the description mostly resembles that of the European Wildcat (Fig. 1). Individuals from populations in Anatolia and the Caucasus are supposedly less striated than those in Europe according to Bellani (2020) and Kitchener (pers. comm). The most distinguishing factor between the Caucasian and European wildcats however, is their geographic area (P. Gerngross, D. Mengulluoglu, pers. comm).

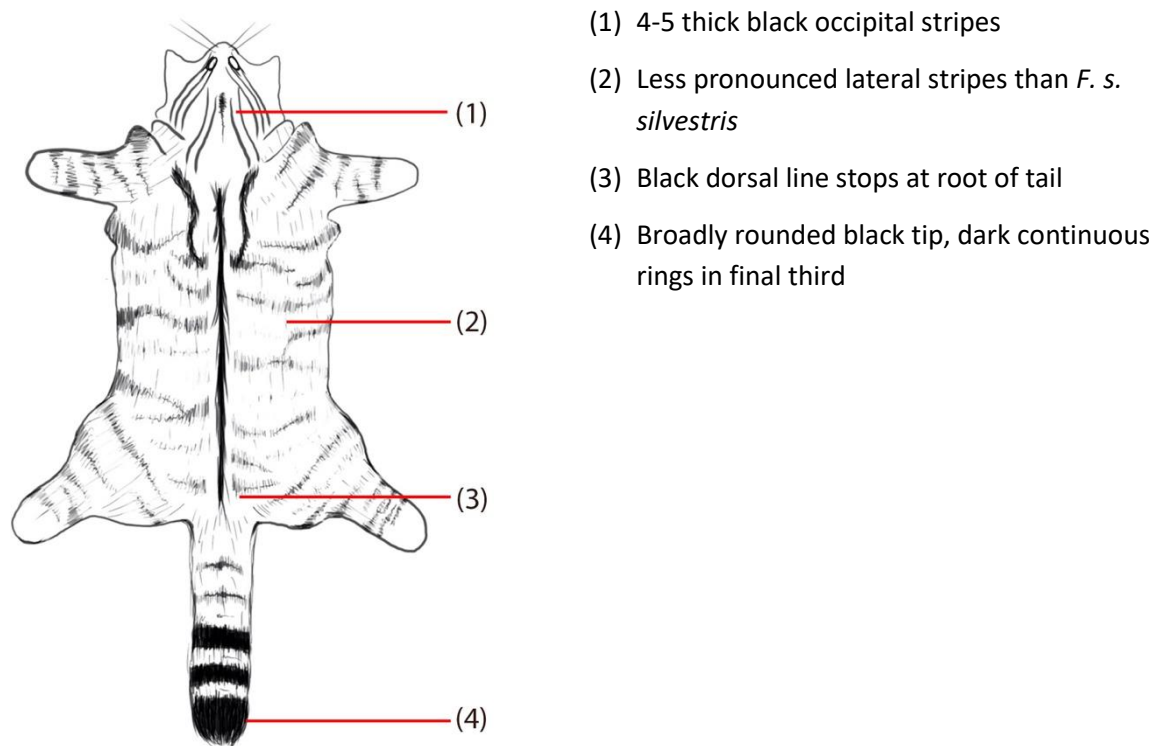


Figure 2. Key diagnostic traits for *Felis silvestris caucasica*

## Phenotypic guide wildcat group

### African Wildcat – *Felis lybica lybica*

The African wildcat (Fig. 3) is described as having a slim tapered tail, with the terminal part always ringed with a dark tip (Yamaguchi et al. 2004). Its fur colour is described as tawny grey to duller or brighter ashy grey (Pocock 1994a), or light sandy to dark grey (Wisemann et al. 2000), and never particularly hairy (Bellani 2020). It may have some inconspicuous stripes on the body, but this is always less pronounced than in the European wildcat (Fig. 1), and in drier regions, even less so (Yamaguchi et al. 2004). In some areas the patterns on the upper side may even break up into faint spots (Pocock 1994a). The face of the African wildcat is said to be well pigmented, with no white (Pocock 1994a, b), and the neck may be ringed with one or two bands, often deep red brown in colour, but this trait is not always present (Pocock 1994b, Ragni & Possenti 1996). The back of the ears are tinted rusty brown to rich red, which may darken towards the tips (Pocock 1994a, b, Wisemann et al. 2000, Yamaguchi et al. 2004). The African wildcat has proportionately longer legs than the domestic cat *F. catus* (Fig. 7), which is noticeable in the gait, as well as the upright posture when sitting (Wisemann et al. 2000). The legs may also be striped (Bellani 2020). The overall build of the African wildcat is smaller and slimmer than *F. silvestris* (Fig. 1), with a noticeably slender body (Bellani 2020).

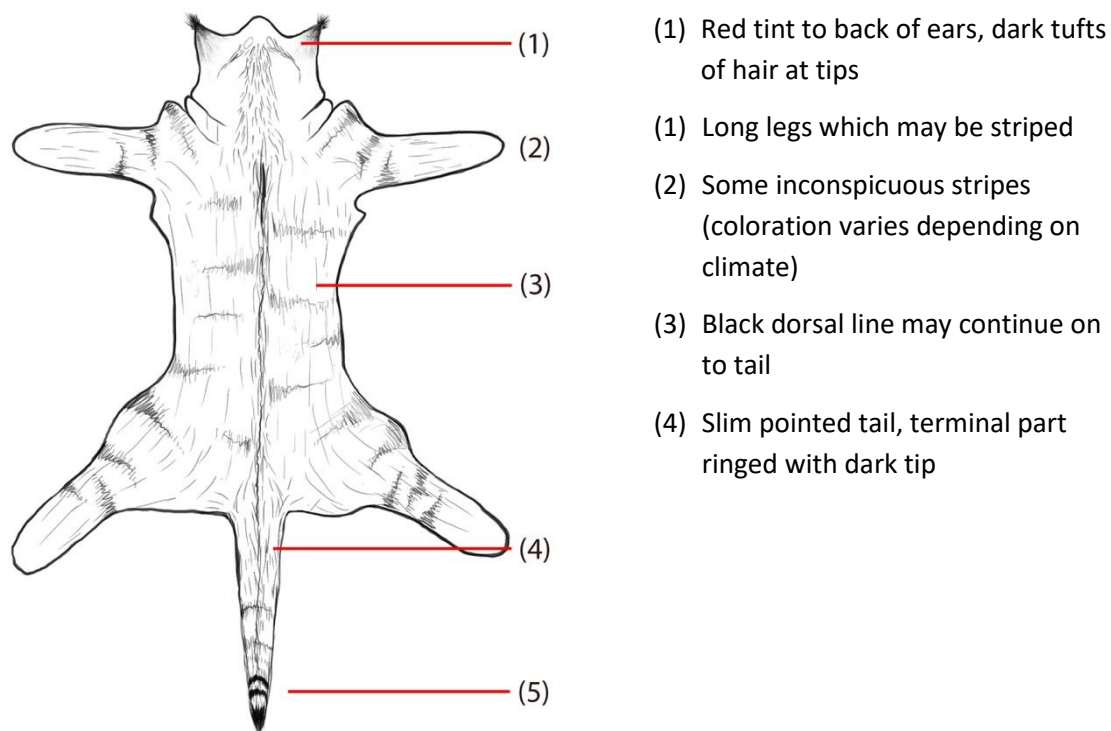


Figure 3. Key diagnostic traits for *Felis lybica lybica*

**Southern African wildcat – *Felis lybica cafra***

The southern African wildcat (Fig. 4) is described as having a thin and pointed tail, which is always ringed in the final third, with a black tip (Bellani 2020). Characteristically, rust-red or brown streaks decorate the hips, and horizontal stripes the limbs (Bellani 2020). Its fur colour may vary from grey to yellowish, but is generally lighter in colour than the other wildcat subspecies. Additionally, there may be some individual variation in the presence of vertical streaks on the body (Bellani 2020). It has a relatively small head with pointed ears that are always a deep rust red on the back (Wisemann et al. 2000, Bellani 2020). Its legs are considerably longer than those of the domestic cat, *F. catus* (Fig. 7), and its overall build is very slim.

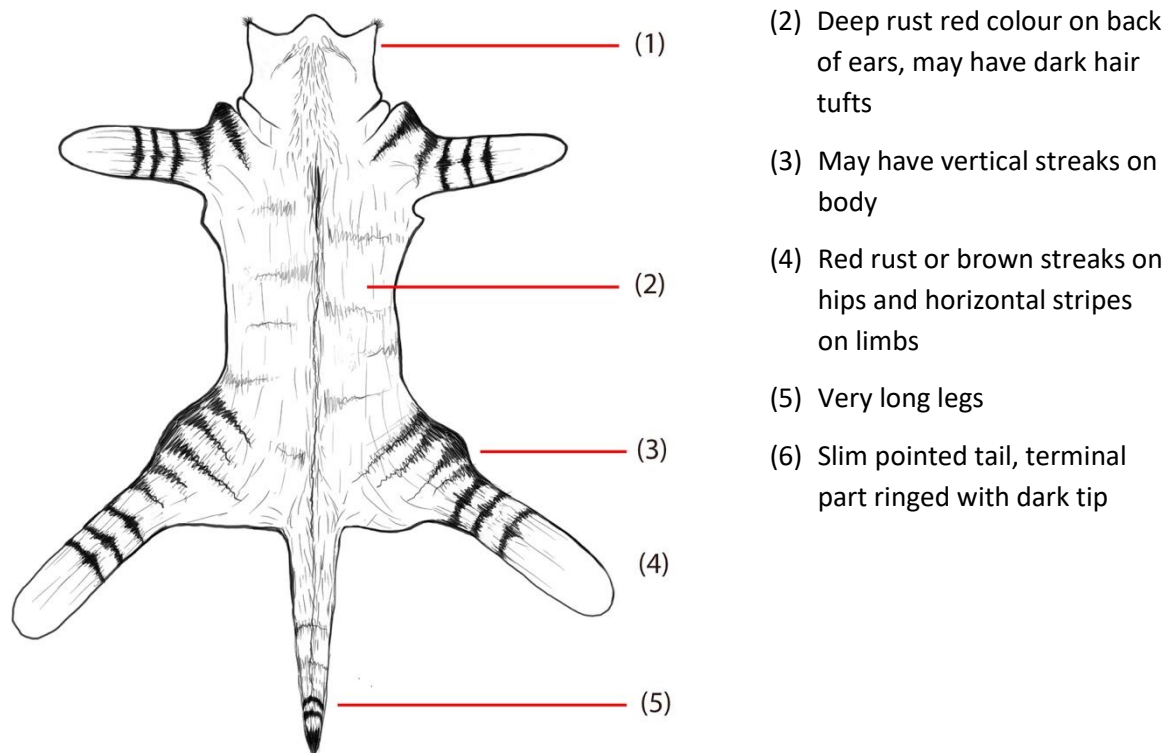


Figure 4. Key diagnostic traits for *Felis lybica cafra*

## Phenotypic guide wildcat group

### Asiatic wildcat – *Felis lybica ornata*

The Asiatic wildcat (Fig. 5) is described as having a slim ringed tail with a black tip (Gündogdu et al. 2018, Ghimirey et al. 2019, Abdukadir & Khan 2013), some stripes, and many irregular dark spots on flanks, head and limbs, which may also fuse into stripes (Nowell & Jackson 1996, Yamaguchi et al. 2004). Its relatively thin coat (Yamaguchi et al. 2004) is often pale, sandy brown to tawny grey in colour, but may vary according to habitat (Ghoddousi et al. 2016). It can often be distinguished by its pointed ears with deep brown tufts of hair on the tips (Ghoddousi et al. 2016, Bellani 2020). Another distinguishing feature is the presence of horizontal streaks on the upper parts of limbs (Gündogdu et al. 2018, Bellani 2020), and two distinct parallel black bars on the inside of each forearm (Gupta et al. 2009, Pande et al. 2013). Its overall build is slim, relatively similar to *F. catus* (Fig. 7), although with longer legs and a longer tail (Abdukadir & Khan 2013).

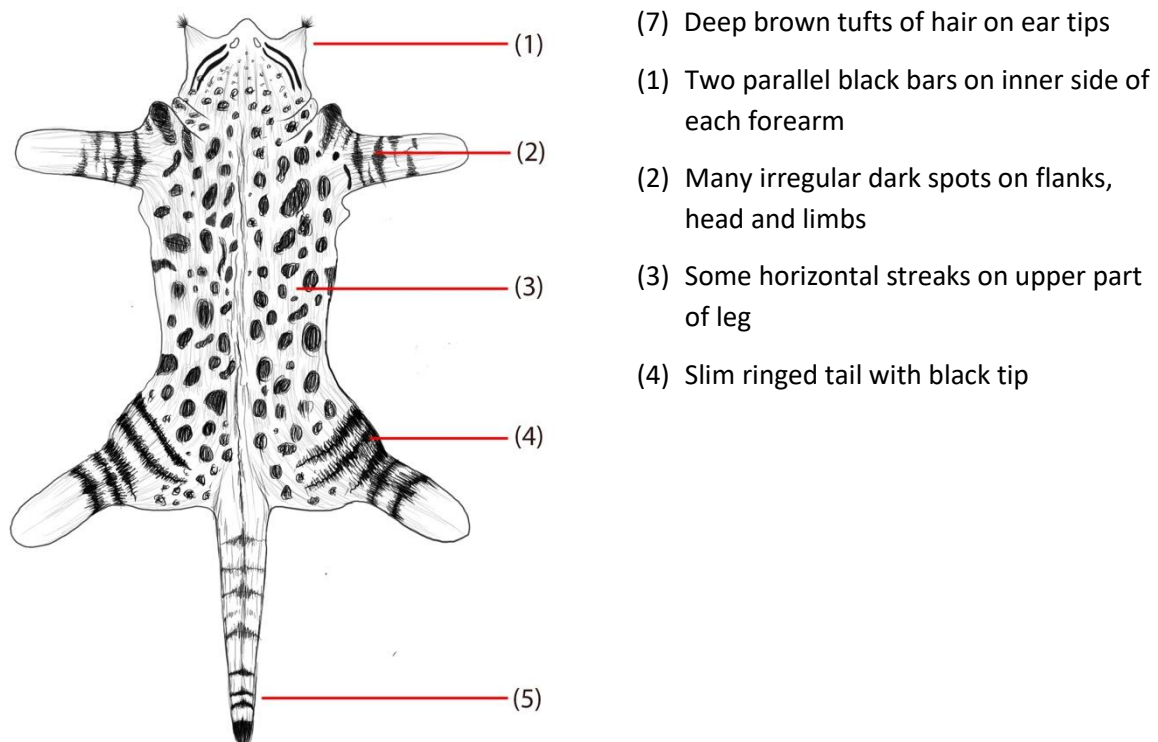


Figure 5. Key diagnostic traits for *Felis lybica ornata*

**Chinese mountain cat – *Felis bieti***

The Chinese mountain cat (Fig. 6) is also known as the Chinese desert cat and the Chinese steppe cat. This wildcat has slightly shorter legs than *F. silvestris* (Fig. 1), but is overall larger (Bellani 2020). It typically has a bushy tail, ringed with dark grey bands and a black tip (Nowell & Jackson 1996). Its fur is long and thick, and changes colour seasonally, going from light grey-brown in winter to golden-brown in the summer. Light but dense red-rust/brown streaks cover the sides of the body (vertically), legs and cheeks (horizontally; Nowell & Jackson 1996, Bellani 2020). Additionally, the cheeks are surrounded by dense fur, giving the face a flat and rounded appearance (Bellani 2020). Its ears are long and triangular in shape, with distinct tufts of red hair on the tips (He et al. 2004). The most striking feature of the Chinese mountain cat however is the blue irises, which is unique among wild cats (Han et al. 2020).

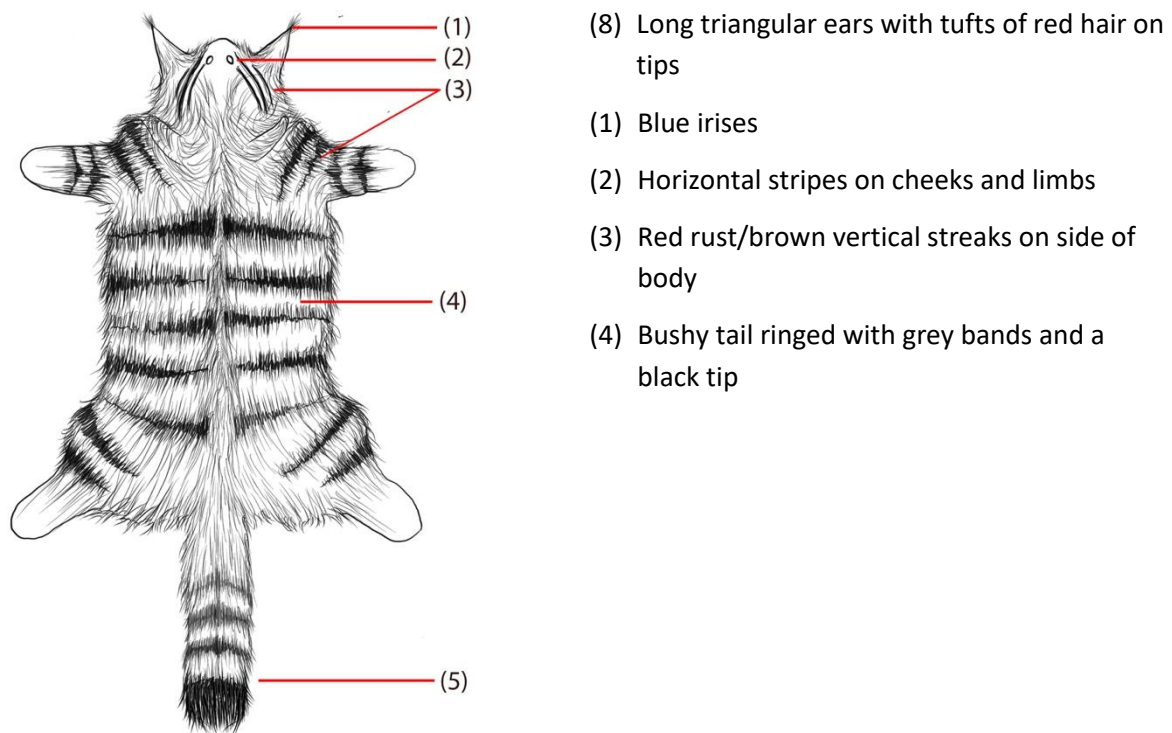


Figure 6. Key diagnostic traits for *Felis bieti*

## Phenotypic guide wildcat group

### Domestic cat – *Felis catus*

The “wild-looking” domestic cat (Fig. 7) is described as having a slim tail with a pointed tip, as opposed to the thick club shape in *F. silvestris* spp. (Fig. 1, 2; Bellani 2020). The tail may also be ringed with incomplete tail bands (Kitchener et al. 2005). Its fur length can vary greatly, from very short to very long, and the pattern can also be highly variable. Generally speaking, domestic cats either possess a dominant coat colour (mackerel tabby), which is similar to the wild species from which it derives, but with a higher contrast (Ottoni et al. 2016), or the recessive coat colour (blotched tabby). The mackerel tabby is characterised by a more stiped coat, and the blotched tabby is described by swirled blotches of colour, often described to look like a marble cake (Bellani 2020). Additionally, any cats possessing a red/ginger-based coat colour can generally be classified as a domestic cat (Maronde et al. 2020). A dorsal stripe in domestic cats is not always present, but when it is, it will extend down the length of the tail (Kitchener et al. 2005, Maronde et al. 2020). Domestic cats generally lack distinctive stripes on the neck and shoulders that are present in *F. silvestris* spp. (Fig. 1, 2), and they may possess small rump spots (Kitchener et al. 2005, Bellani 2020). Their overall size is similar to that of the African (Fig. 3) and Asiatic wildcats (Fig. 5), but smaller and slimmer than the European wildcat (Fig. 1) and Chinese mountain cat (Fig. 6; Bellani 2020).

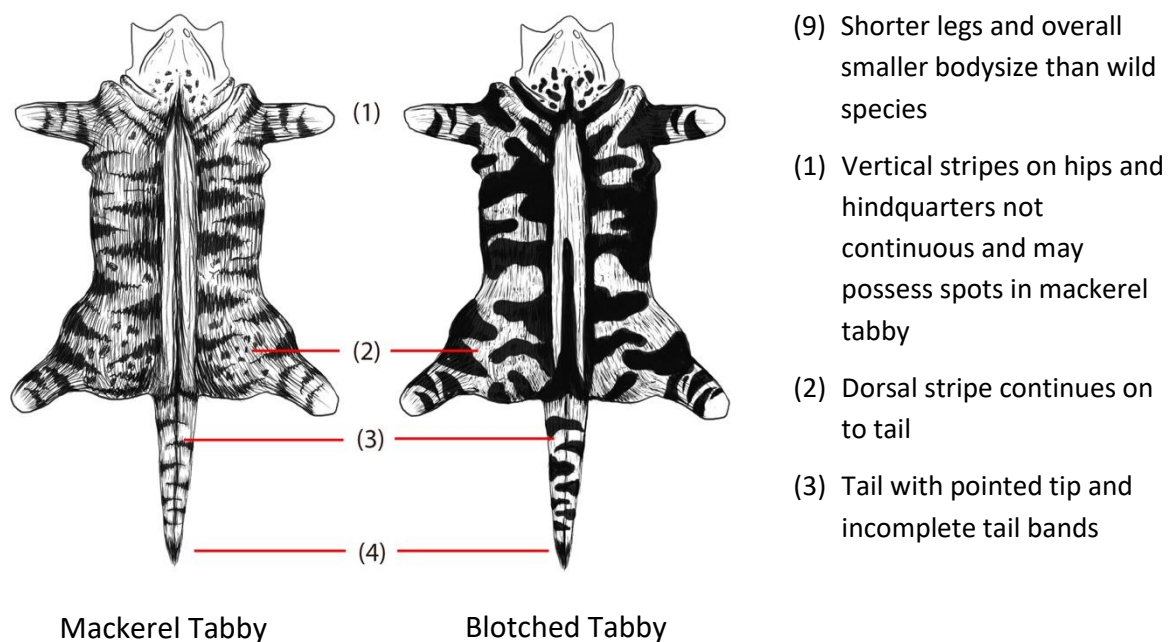
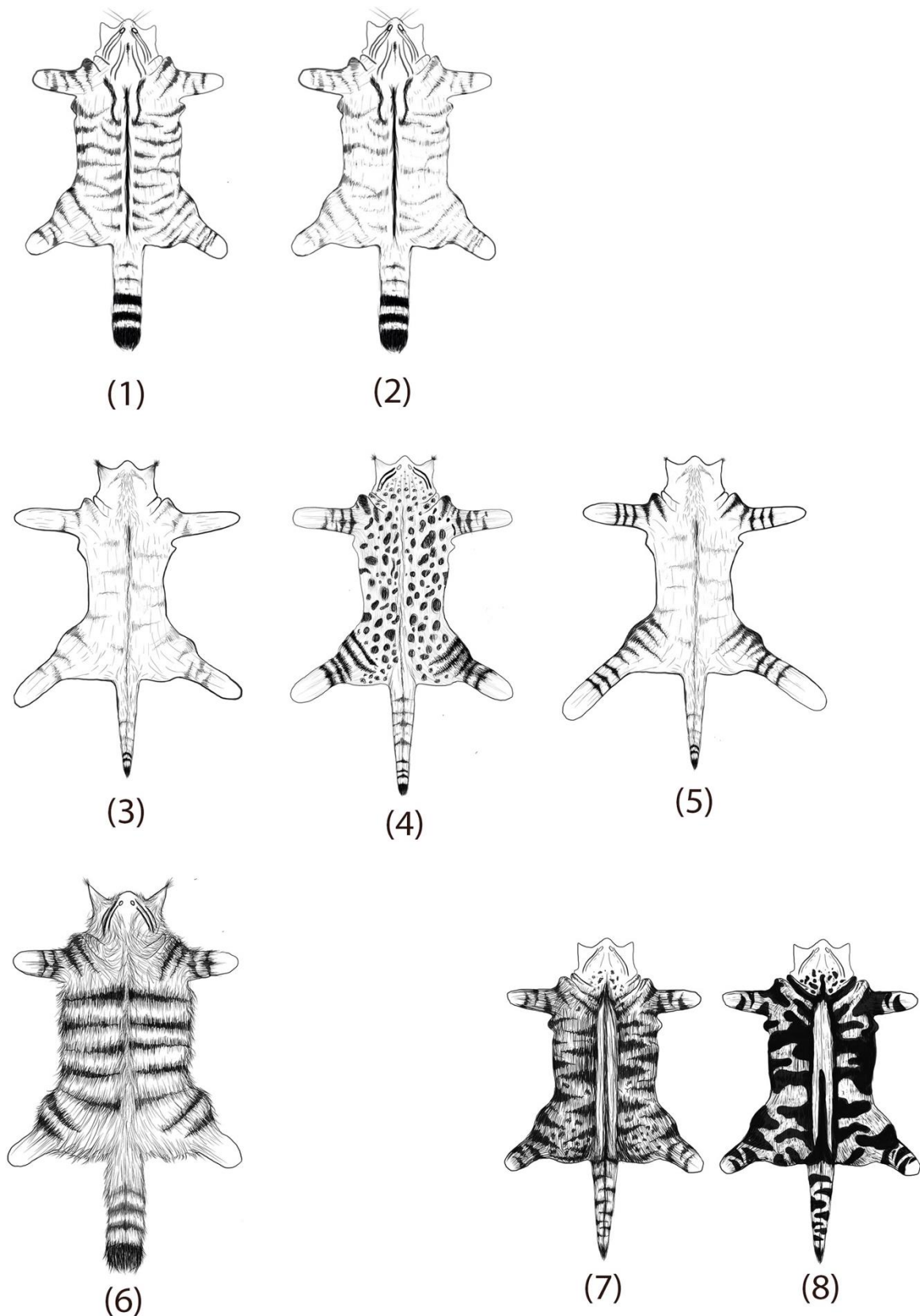


Figure 7. Key diagnostic traits for *Felis catus*





**Figure 8. Diagnostic comparison of entire wildcat group**

(1) *Felis silvestris silvestris* (2) *Felis silvestris caucasica* (3) *Felis lybica lybica* (4) *Felis lybica ornata* (5) *Felis lybica cafra* (6) *Felis bieti* (7) *Felis catus* (Mackerel Tabby) (8) *Felis catus* (Blotched Tabby)

## Phenotypic guide wildcat group

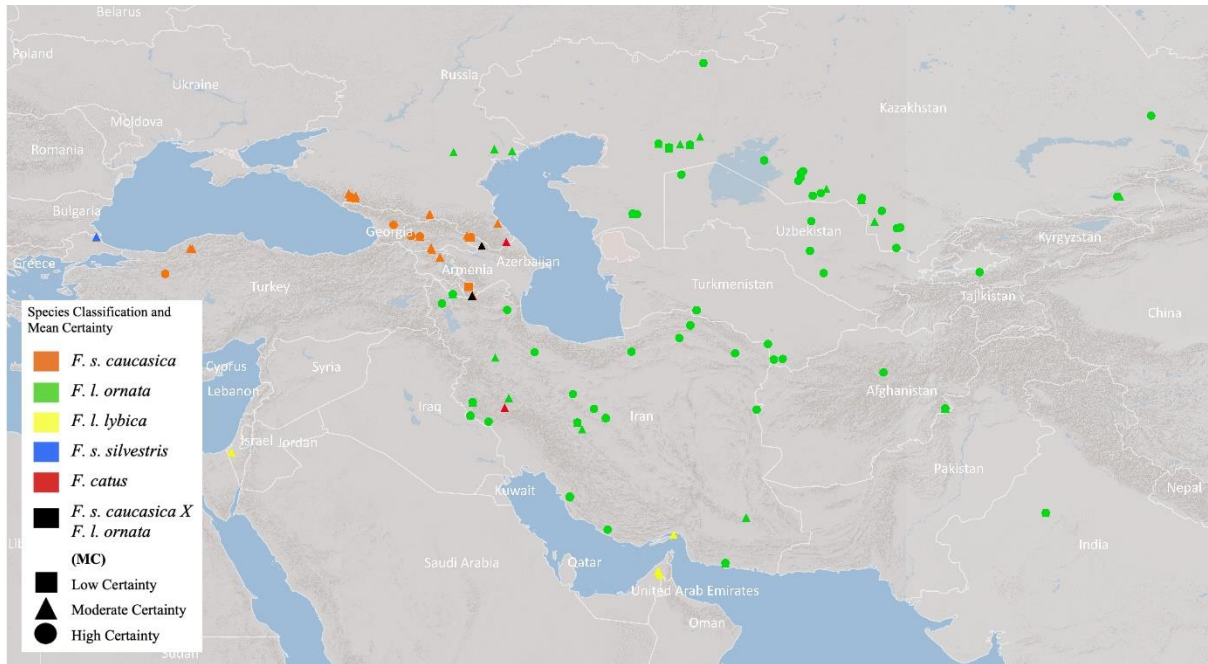
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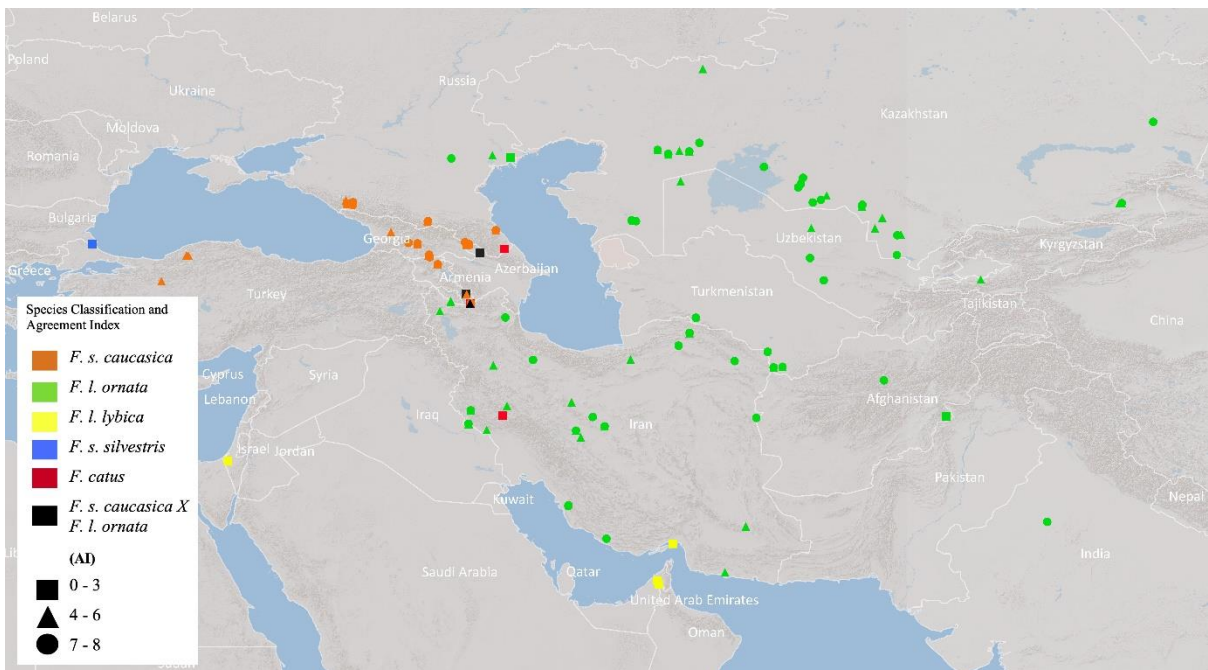
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# Phenotypic guide wildcat group

## SOM 3.



SOM F3a. Higher resolution version of Figure 2



SOM F3b. Most common species classification for each image identified by eight observers. The shapes represent their level of agreement (Agreement Index AI). Squares represent low agreement, with between 0 and 3 observers registering the same species classification. Triangles represent a moderate level of agreement, between 4 and 6 common classifications, and circles represent images with high agreement, where between 7 and 8 observers recorded the same species classification.