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Note

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NOTE

Record of a 10-year old European Wildcat *Felis silvestris silvestris* Schreber, 1777 (Mammalia: Carnivora: Felidae) from Mt. Etna, Sicily, Italy

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Information on longevity is key to the understanding of population biology of a species (Healy et al. 2014) and is being collected by researchers across taxa (Cutler 1979; Wilkinson & South 2002; De Magalhaes & Costa 2009; Gonzalez-Lagos et al. 2010; Tidiere et al. 2016). Longevity data of wildlife can be collected through long-term monitoring programs (Smith et al. 2017), but is often difficult to apply to rare and elusive species, such as small carnivores. Alternatively, longevity data can also be collected both from dead animals by using cementum annuli to estimate the age of death (Kamler & Macdonald 2006) and from species held in captivity, although it is well-known that captive animals generally live longer than those in the wild (Ricklefs & Cadena 2007; Tidiere et al. 2016).

Within the Felidae there is a consistent bias in the scientific community to study larger species rather than smaller ones (Brodie 2009; Macdonald et al. 2010; Anile & Devillard 2015, 2018), and hence scientific data on life history traits for smaller species are lacking. Given the aforementioned constraints, knowledge of longevity of small carnivores in the wild is rare. To our knowledge, the only longevity study of European Wildcats is that of Hartmann (2005) in Switzerland, where captive animals attained 12–16 years of age. Here we report our recent finding of a European Wildcat recaptured by camera traps after nine years on Mt. Etna in Sicily, Italy.

Our study area was located on Mt. Etna in Sicily, Italy (Fig. 1A), the highest active volcano in Europe and a World Heritage Site by UNESCO in 2013 (UNESCO World Heritage Center 2019). Extensive descriptions of our study area are reported elsewhere (Anile et al. 2014, 2019).

We have been using camera traps to survey the Wildcat population on Mt. Etna since 2006 (Anile et al. 2009, 2010, 2012a,b, 2014, 2019). Extensive details about the methods and materials used in the surveys related to the present study are reported in Anile et al. (2012b) (Fig. 1B) and in Anile et al. (2019). With respect to the methods reported in Anile et al. (2019), the 2018 survey was conducted from 30 May 2018 to 14 November 2018, with fewer cameras (n = 76 across seven line transects) and with a reduced trap-days effort (n = 1,985) due to the reduced availability of camera traps (Fig. 1B).

In the first photograph dated 26 May 2009 (Image

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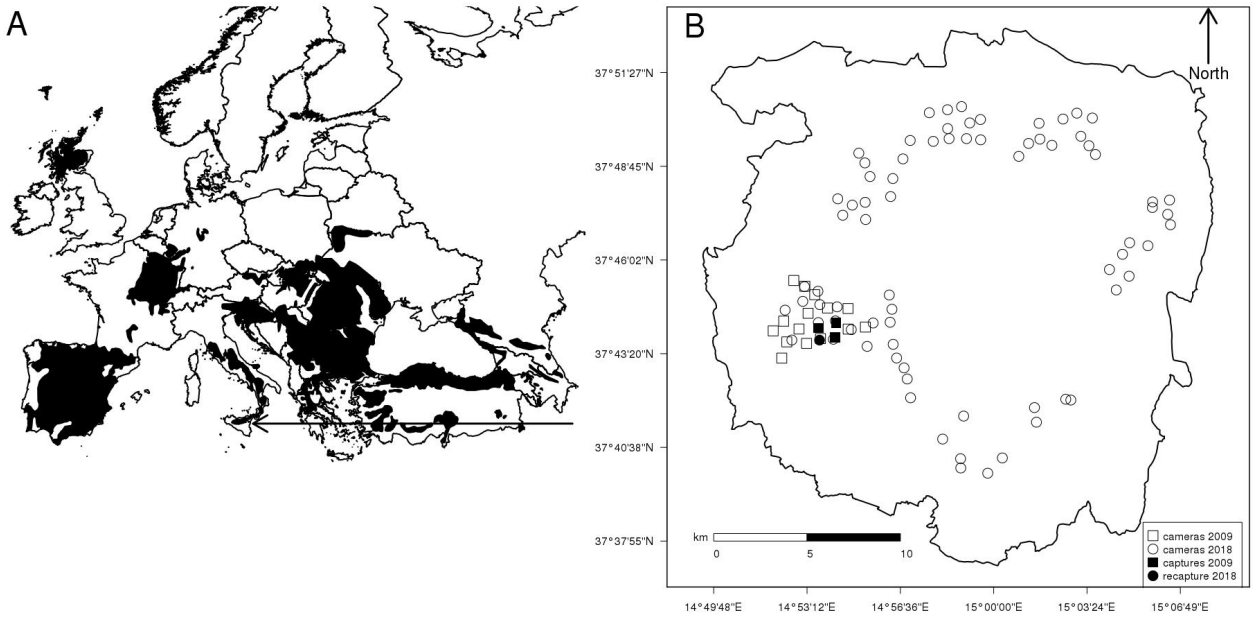

Figure 1. The location of Mt. Etna (A) and European Wildcat distribution range. The inset (B) shows the study area with camera stations used during the 2009 and 2018 surveys.

Image 1. A & B—European Wildcat photographed at Mt. Etna on 26 May and 15 June 2009 | C—European Wildcat photographed at Mt. Etna on 10 June 2018. © Stefano Anile.

1A) this Wildcat was clearly identifiable by the absence of the typical black-tipped tail of the European Wildcat (Ragni & Possenti 1996); its tail showed only a clear white ring (Image 1B). In addition, the shape of the dorsal stripe aided to confirm its recapture. During the same survey, two additional photographs of this individual were obtained at two other camera stations. Collectively, three photographs at three neighbouring camera stations were recorded. During the camera trapping survey conducted in 2018, this individual Wildcat was recaptured on 10 June 2018 at one camera station (Image 1C), relatively near to where it was captured during the 2009 survey. The mean distance from the other camera stations where it was previously recorded was 960m. The time between the first and last photograph was 3,302 days (9.04 years). Hence, the likely minimum age of this individual at the time of recapture must have been at least 10 years.

Camera trapping has greatly increased our scientific knowledge on many cat species worldwide. Indeed, many central topics for the proper management of Felidae have been investigated, such as population density estimation (Anile et al. 2014), habitat selection (Lesmeister et al. 2015; Anile et al. 2019), population dynamics (Karanth et al. 2006; Sharma et al. 2014; Duangchantrasiri et al. 2015; Majumder et al. 2017), and

adult sex ratio (Anile & Devillard 2018). Furthermore, recent years have seen an increased collaboration among researchers for sharing camera trapping data, and hence the investigation of ecological patterns at larger scales, i.e., across study areas (Steenweg et al. 2017; Davis et al. 2018; Khwaja et al. 2019).

The Wildcat population dwelling on Mt. Etna has been extensively (n = 41 individuals from 2010–2018) screened for detecting hybridization with Domestic Cats *Felis catus*, but no evidence of hybridization has been detected in this population (Mattucci et al. 2013; Anile et al. 2014, 2019). Hence, we consider more likely that a mutilation occurred at the end of the tail, which was also shorter than the normal size, ~30cm, that caused the loss of the black tip, rather than considering this anomaly in the typical Wildcat marking system pattern due to hybridization.

The Wildcat we recaptured after nine years was surely not a kitten at the time of the first capture, hence we think that 10 years is the minimum reasonable age estimation for this individual. This age estimate still lies at the lower range when compared to ages of captive Wildcats ranging from 12–16 years studied by Hartmann (2005).

Long-term camera trapping studies have been conducted on Tigers *Panthera tigris* and Ocelots *Leopardus pardalis*, however, the maximum ages attained were not reported (Karanth et al. 2006; Duangchantrasiri et al. 2015; Majumder et al. 2017; Satter et al. 2019). On the contrary, Harmsen et al. (2017) reported a maximum age of 14 and 13 years for male and female Jaguars *Panthera onca*, respectively. When comparing the maximum age we recorded with the few other longevity records of cat species from the wild (Hunter 2015), we note that our estimate is considerably high, but still within the range of those reported for the species, especially when considering the small body mass (3.7–4.9 kg; Johnson et al. 2017) of the European Wildcat.

The longevity of an individual European Wildcat might be influenced to some extent by local circumstances, e.g., absence of natural predators and widespread refuges as in our study area. In general, longevity is also shaped by ecological traits such as body mass (Healy et al. 2014), with larger species living longer than smaller ones. Long-term monitoring using camera traps can help understand patterns, which cannot be detected when using a small window in time, but this would require a more sustainable support from funding agencies as the costs involved with this kind of studies are certainly higher than surveys running over a shorter period.

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