

Rabbit on the run? A hitherto overlooked museum specimen of European rabbit *Oryctolagus cuniculus*, collected in Helsinki, Finland, in 1921

Henry Pihlström

Pihlström, H., Physiology and Neuroscience, Department of Biosciences, P.O. Box 65 (Viikinkaari 9), FI-00014, University of Helsinki, Finland, henry.pihlstrom@helsinki.fi

The European rabbit *Oryctolagus cuniculus* is an invasive species in Finland. It is, however, highly localized and populations are only found in urban and suburban areas in Helsinki and a few other larger cities. The current Finnish rabbit population originates from pets that escaped or were set loose. It is believed that feral rabbits did not become established in Helsinki until around the year 1985. Here is reported a rabbit specimen, consisting of a skin and a skull, which was collected in Helsinki in 1921. The specimen, which is housed in the Finnish Museum of Natural History, Helsinki, has been overlooked for nearly a century, due to the fact that it was originally misidentified as a European hare *Lepus europaeus*. The historical significance of this specimen is discussed.

Introduction

The mammalian fauna of Finland includes three species of lagomorphs. The mountain hare *Lepus timidus* was presumably among the first species of terrestrial mammals that spread to the geographical area of current-day Finland after the retreat of the late Pleistocene glaciers (e.g., Ukkonen 1993). The brown or European hare *Lepus europaeus* is a much later arrival. It colonized Finland only in the 19th century, partly with human assistance, and did not become widespread until rather late in the 20th century (Tiainen & Pankakoski 2000). Finally, there is the European or common rabbit *Oryctolagus cuniculus* ('rabbit' from here on), which is an even later addition to Finland's fauna. The rabbit's known history as a wild-living animal in this country does

not extend beyond the late 20th century (Huldén 2010, Leikas & Rautiainen 2010). It is also far less widespread in Finland than either of the two hare species.

Although its foothold in Finland is still somewhat tenuous, globally speaking the rabbit has been a remarkably successful invasive species. Its nearly world-wide distribution is a result of human involvement. The fossil record shows that the rabbit was widespread in Europe during the Pleistocene; however, during the Holocene, the rabbit was endemic and essentially restricted to the Iberian Peninsula until Roman times (Dobson 1998; Lees & Bell 2008). Since then, rabbits have later been deliberately transplanted to new areas, for the sake of their meat and, to a lesser extent, their fur. In this way, the rabbit has become established in large parts of Europe, north-western Af-



Figure 1. The skin of specimen KN 3096. Photo H. Pihlström.



Figure 2. The skull of specimen KN 3096. Photo H. Pihlström.

rica, parts of South America, Australia, New Zealand, and many oceanic islands (Flux & Fullagar 1983).

A limiting factor in the success of such introduced rabbit populations is climate. Rabbits do not tolerate cold winters very well, and this restricts their survival in the northernmost parts of their range. Therefore, northern European countries, such as Finland, have largely been impervious to colonization by rabbits. The only exception to this are the populations of rabbits which are found within certain larger cities and which

have originated from pet rabbits that escaped or were set loose on purpose. The current Finnish feral rabbit population probably became established circa 1985 (Huldén 2010, Leikas & Rautiainen 2010). For several years, the animals remained restricted to a very small area in Helsinki, but in the late 1990ies, rabbits started rapidly dispersing throughout the city. By the year 2008, they had spread beyond the limits of Helsinki, especially towards the west. As noted, however, the distribution of feral rabbits in Finland remains strongly tied to human proximity. They are vir-

tually confined to urban and suburban environments, and have not been able to spread to the countryside or to woodlands to any significant extent. Hence, they are colloquially often referred to as "city rabbits" in Finland.

Even though current evidence suggests that the Finnish feral rabbit population originated only as recently as in the mid-1980ies, it is not impossible that other populations may have temporarily existed even earlier, either in Helsinki or in other cities. If they were small and geographically restricted, such ephemeral rabbit populations might have gone undetected and unrecorded by scientists and members of the general public, especially if there was a possibility that the animals might on sight be confused with hares (either mountain or European).

Description of the specimen

Here is reported the discovery of a rabbit specimen, presumably of Finnish origin, that was collected many decades earlier than the current feral rabbit population in Finland is known to have become established. The specimen was, however, originally misidentified as a European hare and has therefore been effectively overlooked.

The specimen was (re-)discovered fortuitously by the author in July 2016, during a general taxonomical survey of the mammalogical collections at the Finnish Museum of Natural History, Helsinki. The specimen, which consists of a (non-mounted) skin and a skull, has the collection number KN 3096 ("KN" stands for "kotimaiset nisäkkäät", i.e., "native mammals") (Figures 1–2). The original, hand-written label attached to the specimen has the text "*Lepus europaeus* Pall. [,] Kottby[,] 14. X. 1921[.] Ostettu". "Kottby" (or "Käpylä" in Finnish) is the Swedish name of a part of Helsinki, which is geographically situated approximately in the centre of the city. The Museum's records contain the additional specifying information that the locality is indeed situated in Helsinki. The last word written on the label, "ostettu", is Finnish for "(has been) purchased". The Museum's published annual report of accessions of zoological specimens for the year 1921–22 contains the same, above-mentioned information (Välikangas 1922)

The specimen was identified as a rabbit on the basis of its size, colouration, and general morphology. It first caught the author's attention by being noticeably smaller than the skins of adult European hares, among which the specimen was originally located. Its body proportions, especially its relatively short and slender limbs, ruled out the possibility of it being a juvenile *Lepus*. That the individual is indeed an adult was subsequently confirmed when its skull was located. Furthermore, the specimen lacks large, distinct black markings on the tips of its ears, which are conspicuous in hares but only moderately developed in *Oryctolagus* (Siivonen 1977, Macdonald & Barrett 1995, Aulagnier *et al.* 2009). Dorsally, the specimen's overall colouration is brownish grey; there is a distinctly more rufous patch in the neck region, as is typical of *Oryctolagus cuniculus*. The ventral side of the animal is white, and there are no white patches anywhere else on the body, as is often the case among feral rabbits in the present-day Helsinki population (Leikas & Rautiainen 2010). The individual's cause of death is unknown, but there is no damage to the skin that suggests it was shot. Small portions of the skull, particularly in the back part, have been broken off, but this damage seems to have happened post-mortem; some of the detached skull portions have been preserved and show no signs of catastrophic damage consistent with having been shot at with a firearm.

Selected measurements of the skin and the skull are presented in Table 1.

Table 1. Selected measurements of *Oryctolagus cuniculus* specimen KN 3096 in the collections of the Finnish Museum of Natural History, Helsinki. Measurements are in millimeters.

Head and body length	460.00
Tail length	80.00
Ear length	90.00
Hind foot length	80.00
Greatest skull length	80.78
Condylbasal length	70.59
Zygomatic width	39.47
Interorbital width	15.55
Rostrum width	11.31
Mandible length	56.63

The origin of the specimen

Specimen KN 3096 has previously been referred to in the literature (Välrikangas 1922, Haapanen 1999), but its identity as *Lepus europaeus* has not been questioned until now. It would be interesting to know why this rabbit was originally misidentified as a hare. In the absence of any further information surrounding the circumstances of its collection, it is only possible to speculate about the reason. However, the individual's general pelage colouration is slightly but notably more reddish than is typical of the current feral rabbit population in Helsinki (Leikas & Rautiainen 2010). This might conceivably be one reason why the specimen was thought to be a European hare, which usually has a brown rather than grey pelage colouration. Furthermore, the specimen was collected in mid-October, at a time of the year when mountain hares in Finland usually have begun changing into their white winter pelage (whereas European hares, and rabbits, do not similarly change their colour for winter).

A plausible reason for the misidentification may indeed be the collector's unfamiliarity with lagomorphs other than the mountain hare. In 1921, the European hare was established in some parts of Finland but still a great rarity in the Helsinki region (Haapanen 1999, Tiainen & Pankakoski 2000). There is no information about who was the person at the Museum who originally identified the skin as that of a European hare. It is likely, however, that this person would have been sufficiently familiar with mountain hares to be able to notice that this particular lagomorph specimen did not belong to that taxon. Perhaps its identification as a *Lepus europaeus* was arrived at by such a process of elimination, and the possibility of it being a rabbit, a species supposedly not occurring anywhere in Finland, was not even suspected at the time?

There is no reason to believe that this specimen represents a genuinely wild, relict population of *Oryctolagus cuniculus*, living thousands of kilometres away from the rabbit's known native range in southwestern Europe. Ultimately, the presence of a rabbit in northern Europe must therefore be the result of introduction by humans. But was this particular individual a domestic pet living under human care, or a feral animal that

had been living in the wild? This question, too, cannot be answered with certainty, because of the limited amount of information available about the specimen. However, the comment on the original label about the animal having been "purchased" suggests that whoever acquired the specimen for the Museum thought it to be of sufficient scientific value to justify the expenditure. In 1921, a specimen of *Lepus europaeus* that had been collected in Helsinki would certainly have been considered zoologically notable. Thus, the person who added specimen KN 3096 to the Museum's collections presumably *believed* that it was a wild-caught individual.

This, obviously, still does not prove beyond doubt that KN 3096 actually *was* a feral specimen, as the person who sold it could have been insincere and/or mistaken about the animal's origin. However, in the specimen's morphology there is a subtle indication that it had indeed lived at least for some time at liberty. The claws on all its feet are well-worn, suggesting heavy usage. The claws of domestic rabbits, especially if kept in traditional rabbit huts, frequently grow to excessive length and sharpness.

Domestic rabbits, although present in small numbers, were not common in Finland before the 20th century (Relander 1916, Ilkka 1942, Mustonen & Helve 1944). The earliest large-scale attempts at rabbit husbandry in Finland begun in 1919-1920, prompted by the meat shortage that the country was suffering from in the aftermath of the First World War and the Finnish Civil War (Mustonen & Helve 1944). Several rabbit farms were started in various parts of Finland during this time period, but most ceased their activities as the country's food industry started to recover. Such an aborted rabbit farming enterprise could be a possible source of origin of KN 3096. It is not known how common rabbit husbandry was in the Käpylä area in Helsinki in the immediate post-war period; it has been recorded, however, that some people there kept domestic rabbits (Schalin et al. 2014).

It is currently not possible to definitely determine whether KN 3096 was a feral, as opposed to a domestic, rabbit. However, as the flourishing of feral rabbit populations in Helsinki in recent decades shows, there is no reason to dismiss the possibility that individual rabbits, or even small

populations, may have persisted for extended periods of time in the wild in Finland in the early 20th century. Thus, KN 3096 may not have been the only one of its kind. It is hoped that this publication stimulates further research on the history of invasive rabbits and other mammals in general (cf. Haapanen 1999). In particular, researchers are encouraged to be mindful of the possibility that early historical records of lagomorphs in Finnish urban areas might represent something else than *Lepus*.

Acknowledgements. KN 3096 was discovered during a general taxonomical survey of the mammalogical collections at the Finnish Museum of Natural History in Helsinki, Finland, carried out during June – October 2016. Financial support for this project was kindly provided by the following foundations: Anna och Signe von Bonsdorffs släktfond, Waldemar von Frenckells stiftelse, and Ella och Georg Ehrnrooths stiftelse. An anonymous reviewer provided helpful comments on the manuscript.

References

- Aulagnier, S., Haffner, P., Mitchell-Jones, A. J., Moutou, F. & Zima, J. 2009: Mammals of Europe, North Africa and the Middle East. — A & C Black Publishers Ltd., London.
- Dobson, M. 1998: Mammal distributions in the western Mediterranean: the role of human intervention. — *Mammal Review* 28: 77–88.
- Flux, J. E. C. & Fullagar, P. J. 1983: World distribution of the rabbit (*Oryctolagus cuniculus*). — *Acta Zoologica Fennica* 174: 75–77.
- Haapanen, E. 1999: Menneisyyden Helsingin eläimet: pääkaupungin nisäkkäät, matelijat ja sammakkoeläimet arkistolähteissä vuosina 1850–1980. — Helsingin Kaupungin Ympäristökeskus, Helsinki.
- Huldén, L. 2010: Den introducerade kaninen – ett svåröst problem. — *Nordenskiöld-samfundets Tidskrift* 69: 23–31.
- Ilkka, M. M. 1942: Kaniinihoito. — Otava, Helsinki.
- Lees, A. C. & Bell, D. J. 2008: A conservation paradox for the 21st century: the European wild rabbit *Oryctolagus cuniculus*, an invasive alien and an endangered native species. — *Mammal Review* 38: 304–320.
- Leikas, P. & Rautiainen, A. 2010: Kanit Helsingissä ja kanivahinkojen torjunta. — Helsingin Kaupungin Rakennusvirasto, Helsinki.
- Mustonen, M. & Helve, Y. 1944: Kaniini. VII edition. — Pellervo-Seura, Helsinki.
- Relander, L. K. 1916: Kaniinihoidosta. II edition. — Werner Söderström Osakeyhtiö, Porvoo.
- Schalin, M., Mentu, S., Protassova, V. & Schalin, M. 2014: Länsi-Käpylän ympäristöhistoriaselvitys. — Kati Salonen ja Mona Schalin Arkkitehdit Oy, Helsinki.
- Siivonen, L. 1977: Pohjolan nisäkkäät. V edition. — Otava, Keuruu.
- Tiainen, J. & Pankakoski, E. 2000: Rusakko (*Lepus europaeus*). — In: Lindén, H., Hario, M. & Wikman, M. (eds.), *Suomalainen riista*, II edition. Edita, Helsinki, 22–25.
- Ukkonen, P. 1993: The post-glacial history of the Finnish mammalian fauna. — *Annales Zoologici Fennici* 30: 249–264.
- Välikangas, I. 1922: Vuosikertomus yleisten eläintieteellisten kokoelmien kasvusta. — *Meddelanden af Societas pro Fauna et Flora Fennica* 48: 230–238.