

ported to date in Europe and the northernmost in Catalonia. An association between the distribution of alluvial deposits and the location of nesting colonies of this species is apparent.

Key words: *Riparia riparia*, New colony, Cerdanya, Catalonia.

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OCCURRENCE OF EUROPEAN MINK (*MUSTELA LUTREOLA*) IN CATALONIA

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According to YOUNGMAN (1982), there are three possible explanations for the occurrence of *Mustela lutreola* in a large isolated nucleus in the western extremity of Europe. Two of these explanations assume that the species appeared suddenly around the 18th century, as a result of either introduction by man or westward expansion of its range, and then became extinct in central Europe. The third one would imply that the European mink has always been a member of the fauna, but had been overlooked until last century in France, and the present century in Spain.

In 1951, RODRÍGUEZ DE ONDARRA (1955) discovered that this species was present in the Iberian peninsula. Subsequently, the European mink has been found, almost radially, in

other locations in the northern part of the peninsula (PUENTE-AMESTOY, 1956; RODRÍGUEZ DE ONDARRA, 1963; BLAS-ARITTO, 1970; PURROY, 1974; SENOSIAIN & DONAZAR, 1983). Today it occurs, in a very localized way, in the Basque region, Navarre and Santander (only one indirect report in the 1960s). According to CAMBY (1990), the sudden appearance of this species in the peninsula would support the hypothesis that the species spread, supposedly colonizing it, around 1940. However, the lack of previous reports does not necessarily mean that the species was not present there before.

In June 1989, a male mink was found dead in a crab net in the Ebro delta. The net was set in the sea about 150 metres from shore in the

Table 1. External features of the mink studied (MS), and of males of *M. lutreola* and *M. vison* in Europe according YOUNGMAN (1982), FAIRLEY (1980) and CAMBY (1990). CC. Head and body length (mm); T. Tail length (mm); F. Hind foot length (mm); W. Weight (gr).

MS	<i>Mustela lutreola</i>								<i>Mustela vison</i>
	France (n=28-33)			U.R.S.S. & Finland (n=9-10)				Ireland (n=?)	
	\bar{X}	Min.	Max.	\bar{X}	Min.	Max.	S	\bar{X}	
CC	385	385	360	410	376.1	284	440	43.81	429
T	185	159	140	180	153.6	124	200	22.43	176
F	62	63.5	60	66	-	-	-	-	66
W	960	892	650	1120	-	-	-	-	1260

inner part of Punta de la Banya (Ebro delta). This area is quiet, shallow and not excessively salty. The mouth of the net was about 75 cm from the surface. The nearest land consists of salt marshes and sandy ground with small dunes; the vegetation is predominantly psammophilous and halophilous.

The absence of the species in Catalonia (RUIZ-OLMO, 1990) and, in particular, in the Ebro delta where the mastofauna is particularly well known (GOSÁLBEZ, 1977), the great possibility of confusion with the American mink (*Mustela vison* Schreber) and the rarity of comparative specimens of *M. lutreola* from the western nucleus (western France and northern Spain), made a detailed study of the specimen necessary.

The coloration of the body and the presence of white spots, on both the upper and lower mandible, are typical of the species (see CAMBY, 1990). However, since *M. vison* may occasionally display this feature, the lips of 249 American minks from the nearest farm were examined for the presence of white spots. Only 1.2% of these exhibited the markings of *M. lutreola*; 8.8% showed very small traces of spots on the upper mandible (impossible to confuse with *M. lutreola*), while the rest (90%) had spots only on the lower mandible. Table 1 shows the external measurements and weight of the specimen studied, and adjusts these for both *M. lutreola* and *M.*

vison. The testicles measured 18 x 12 mm which could indicate some degree of sexual activity (CAMBY, 1990).

Unlike the previous features, the morphology (fig. 1) and dimensions of the skull made it possible to identify with certainty the individual studied (an adult specimen). Table 2 shows the main cranial measurements. The cranium was donated to the collection of the Animal Biology Department of the University of Barcelona.

The measurements of the studied specimen fall within the range of *M. lutreola*, although they somewhat exceed those of the specimens from France. Nevertheless, there are some differences with the measurements of American mink in Europe, since the ones related to dentition are smaller than the minimum reported, particularly P4LL and P4LI (see YOUNGMAN, 1982).

There are two indexes that make it possible to distinguish between the two species of mink. The first one, proposed by YOUNGMAN (1982), correlates postpalatal length (PPL) and lingual lobe length ($MI = MILL + MILM$) in *M. lutreola*. The specimen studied clearly falls into the 95% confidence region of the European mink (fig. 2). The second index is that proposed by MAZAK (1964), which correlates condylobasal length (CBL) and tympanic bulla length (LB). In *M. lutreola*, this index is less than 3.60, while in *M. vison* is high-

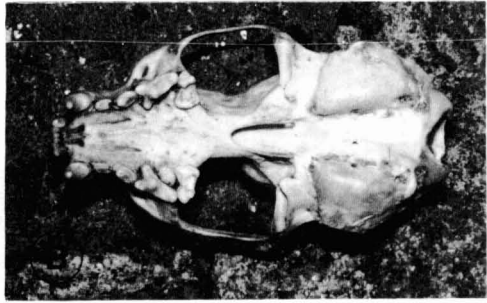
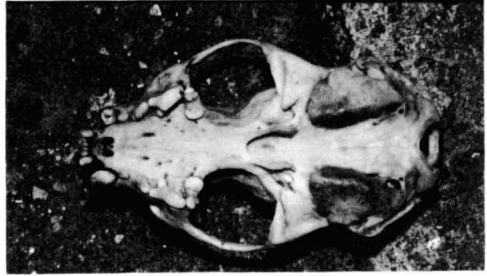
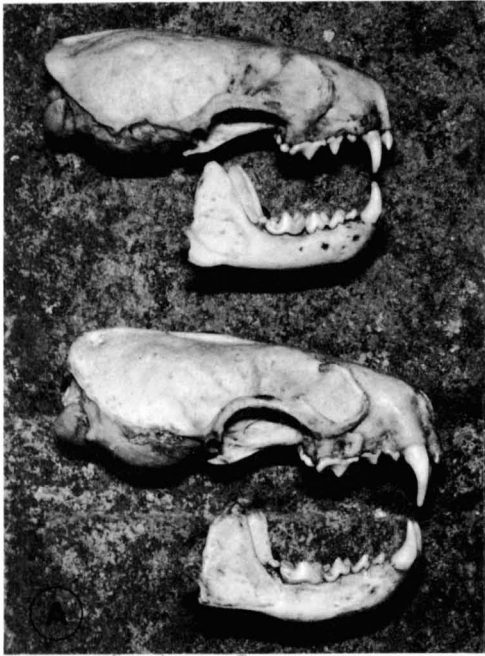


Fig. 1. Skull of the studied specimen of European Mink (*Mustela lutreola*, 89060001 ♂) and of a male of American Mink (*M. vison*, 89050001 ♂) from Catalonia. A. Lateral view; B. Ventral view; C. Dorsal view. *Mustela lutreola*: upper part of all pictures.

Table 2. Cranial features of the mink studied (MS), and of males of *M. lutreola* and *M. vison* in Europe, according YOUNGMAN (1982). CBL. Condylobasal length; ZB. Zygomatic breadth; MB. Mastoid breadth; BCB. Bicondylar breadth; PL. Palatal length; PPL. Postpalatal length; ML. Mandible length; MILL. Upper molar length, lingual; MILM. Upper molar length, middle; P4LL. Upper carnassial length, lingual; P4LB. Upper carnassial length, buccal; P4LI. Upper carnassial length, inner; P4B. Upper carnassial breadth; m1L. Lower carnassial length; m1B. Lower carnassial breadth. (Measurements in mm).

MS	<i>Mustela lutreola</i>								<i>Mustela vison</i>				
	France (n=8)				Rest of Europe (n=61)				Europe (n=54)				
	\bar{X}	Min.	Max.	S	\bar{X}	Min.	Max.	S	\bar{X}	Min.	Max.	S	
CBL	64.6	62.34	60.6	65.2	1.44	63.86	60.5	67.9	2.15	70.76	59.3	76.3	1.30
ZB	37.7	35.24	33.6	39.9	1.35	35.99	32.2	39.9	1.77	41.11	35.2	47.1	1.99
MB	31.7	30.29	29.2	33.3	0.97	31.18	29.5	32.4	1.13	36.46	29.5	40.1	1.73
BCB	17.2	16.40	15.9	17	0.40	17.24	15.8	19.1	0.77	17.90	15.9	19.7	0.78
PL	29.5	27.65	26.9	29.6	0.84	28.36	26.4	31.4	1.19	32.39	25.9	35.2	1.30
PPL	34.8	-	-	-	-	35.50	33.2	38.6	1.14	38.36	35.3	42.1	1.64
ML	37.9	36.75	34	37.8	0.92	37.45	34.1	40	1.52	43.57	34.2	47.7	1.89
MILL	3.4	2.92	2.7	3.2	0.16	3.08	2.7	3.5	0.22	4.44	3.4	5.5	0.43
MILM	2.3	2.09	1.9	2.2	0.09	2.10	1.9	2.3	0.11	2.70	2.3	3.1	0.19
P4LL	6.9	6.67	6.4	7	0.17	6.96	6.4	7.6	0.30	8.45	7.2	9.5	0.44
P4LB	7.2	6.82	6.7	7	0.10	6.97	6.5	7.8	0.27	7.79	6.5	8.6	0.37
P4LI	6.2	6.20	5.6	6.2	0.17	6.18	5.7	6.9	0.26	7.05	6.2	7.9	0.40
P4B	4	3.62	3.4	3.8	0.15	3.63	3.1	4.1	0.22	4.66	3.9	5.3	0.29
m1L	7.7	7.45	7.2	7.8	0.19	7.63	7	8.3	0.26	8.34	7	9.1	0.39
m1B	3.1	2.80	2.7	2.9	0.07	2.88	2.4	3.3	0.21	3.65	3	4	0.39

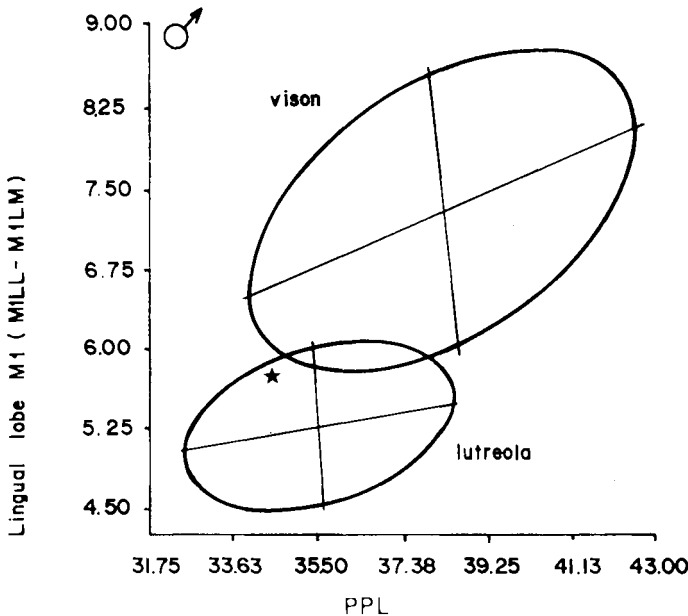


Fig. 2. Relationship between the lingual lobe M1 and the postpalatal length PPL in the studied mink (★), plot in the 95% confidence regions and major and minor axes of *Mustela lutreola* and *Mustela vison* males, from YOUNGMAN (1982).

er than 3.70. In the mink studied, the index is 3.55. In the ten American Mink analysed, the index varies between 3.68 and 4.19.

Moreover, a number of morphological differences between *M. lutreola* and *M. vison* are also found in the specimen in question: (a) the angular process of the mandible is not pointed; (b) the mandibular fossa ends somewhat before the start of the teeth; (c) advanced position of the orbital process; (d) elongated, almond-shaped tympanic bulla; (e) according to our information, pronounced preorbital process, not found in *M. vison*; and (f) wider postorbital constriction than in *M. vison*.

The occurrence of the European Mink on the Mediterranean coast is unusual, especially since no other specimen has been found this far south (see CAMBY, 1990). It seems highly unlikely that it was brought to the area by man, given the lack of specimens in captivity. The most plausible explanation is that this individual migrated, alone or with others, from the upper Ebro basin (where the species is present) to the mouth of the Ebro River. The lack of intermediate reports makes its presence difficult, though not impossible, to explain, as specimens have been found sporadically in unexpected locations far from their usual loaces; for example, a lone specimen in Hungary in 1952 (CAMBY, 1990).

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ABSTRACT

Occurrence of European Mink (Mustela lutreola) in Catalonia.— A specimen of *Mustela lutreola* was found

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in 1989, dead in a crab net in the Ebro Delta. The external and cranial features of this specimen are presented and compared with those of *M. vison*. The indexes of Youngman (1982) and Mazak (1964) are used to confirm that the specimen studied is *M. lutreola*. This record is the most southern one of its distribution.

Key words: European Mink, Catalonia, Southern record.

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