



## Short communication

# A comparison of methodologies used in the detection of the Pyrenean desman *Galemys pyrenaicus* (E. Geoffroy, 1811)

By J. GONZÁLEZ-ESTEBAN, IDOIA VILLATE, and E. CASTIÉN

Sociedad de Ciencias Aranzadi, San Sebastián and Servicio de Conservación de la Naturaleza, Gobierno de Navarra, Pamplona, Spain

Receipt of Ms. 09. 12. 2002

Acceptance of Ms. 27. 02. 2003

**Key words:** *Galemys pyrenaicus*, live trapping, scat sampling

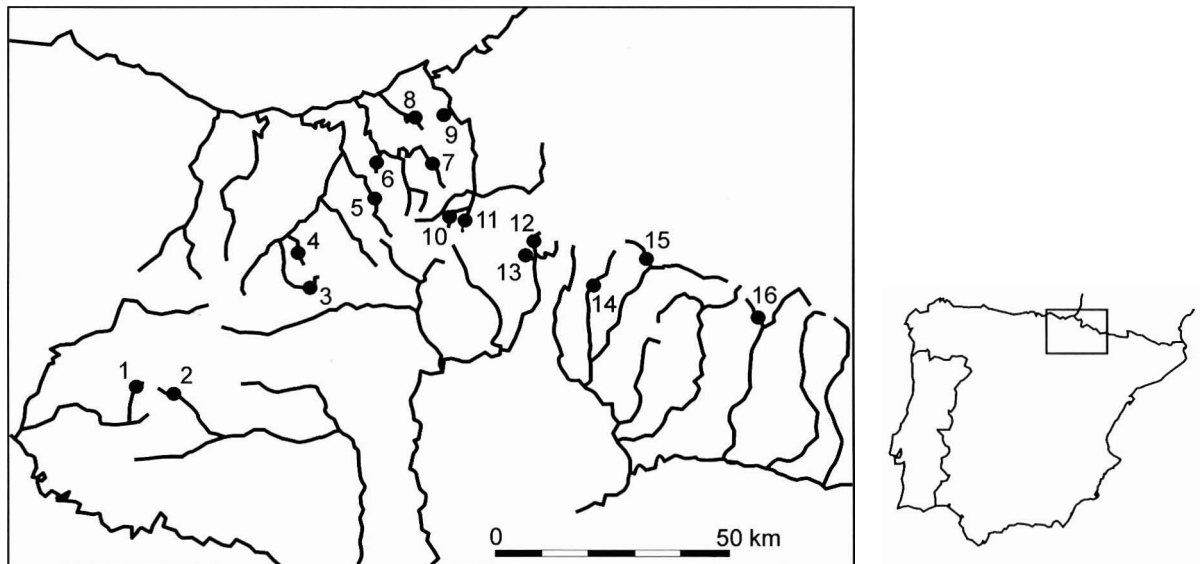
The Pyrenean desman *Galemys pyrenaicus* is a small insectivore mammal endemic to Europe which is probably in a state of regression in most of its distribution area (QUEIROZ 1999). Studies on the distribution of this species have employed two methods of detection: scat sampling (NORES et al. 1993; QUEIROZ et al. 1998; AYMERICH et al. 2001) and live trapping (RICHARD 1976; JUCKWER 1990; CASTIÉN and GOSÁLBEZ 1992).

At the present time the agencies in charge of the management of this species are developing conservation efforts based on the results of both techniques. However, the suitability of the two detection methods has not been compared. The objectives of this study were to compare the ability to detect the presence of desmans by means of live trapping and scat sampling and to analyse their possible utility in monitoring the change of the distribution area of this species.

This study was performed in 16 streams in the north of Spain where this species had been observed in recent years (CASTIÉN and MENDIOLA 1985; CASTIÉN and GOSÁLBEZ 1992) (Fig. 1). Desmans were captured in wire-mesh traps placed partially submerged in the streams during the hours of

darkness. They were unbaited and were checked every three hours. The distance between traps ranged between 150 and 250 m. In 16 of the samplings, the traps were kept active for three nights in a row. The remainder of the samplings were completed the night the first desmans were captured (Tab. 1). Samplings where no animals were caught were repeated at a one month interval.

After trapping was completed, two members of the research team covered the stretch of the stream sampled on foot in search of desman scats. The distance covered along each stream section sampled was 800 m at minimum. In all the samplings the stream sections surveyed included the places where desmans had been caught. Scat sampling was done at a rate of approximately 200 m/h and focused on places that might serve as a base or refuge for the animals (rocks, tree roots), on both the banks and in the stream bed. Sampling was carried out after a period of at least one week without rain, to ensure optimum conditions for the conservation of the animal excrement. In the sections where no scats were found, the sampling was repeated a week later. We considered only scats containing fur from the animal itself, which



**Fig. 1.** Distribution of the stream stretches sampled (circles). The numeration of the streams is the same as in table 1. The figure on the right presents a square of the area of the Iberian Peninsula sampled.

the desman probably ingests when cleaning the fur. Desman hairs were identified according to the indications given by PODUSCHKA and RICHARD (1985).

In order to determine whether or not stream morphology had any effect on the ability to detect scat, the streams were divided into two types. The first type includes streams with narrow beds and steep banks formed mostly by slopes of earth and rock. These streams have stable banks providing a wealth of possible refuges for the desman. The second type includes streams whose banks are highly unstable, comprised primarily of boulders that shift repeatedly during the flooding that happens regularly throughout the year. The latter stream type offers fewer places of refuge for the animals. In all the stretches of the streams sampled, the granulometry of the stream bed is dominated by small and medium-sized boulders (with a diameter ranging between 25 and 100 cm).

A total of 77 desmans were caught during the 26 samplings. All the animals were released unharmed. Firstly, we found that it was possible to capture desmans all year round. Furthermore, in all the samplings where desmans were caught at least one capture took place during the first night

(Tab. 1). Only in 5 samplings scats were found (Tab. 1), all occurring in streams whose banks are comprised mainly of boulders. Finally, we would like to point out that in all the samplings where scats were found, desmans were caught. However, in 11 samplings of desman capture no excrements were later found.

The results indicate that the animals are caught quickly during the first two nights, probably attracted by the trap as a new object in their environment. This behaviour agrees with studies performed in captivity (RICHARD 1986).

RICHARD (1986) reported that in the French Pyrenees, desmans remained in one section of the stream during the whole year. He also indicated that he caught twice the number of animals from December to May compared with the period from June to November. Our findings did not confirm a seasonal variation in number of captures, but they assured that desmans can be caught at any time of the year.

As regards scat sampling, this method underestimated the distribution range of the desman. The results of this study would suggest that the likelihood of finding scats may be related to the structure and composition of the banks. Scat sampling has provided a

**Table 1.** Characteristics of the samplings carried out and the results obtained. T: type, A, streams with stable banks, B, streams with unstable banks; L: length of stretch (m); NT: number of traps; 1N: first night; 2N: second night; 3N: third night; 1S: first sampling; 2S: second sampling; + presence of scats, - absence of scats.

Stream	Date	T	L	NT	No. of animals captured				Scats	
					Total	1N	2N	3N	1S	2S
1 Ayuda	October/2001	A	1 600	10	0	0	0	0	-	-
	November/2001		1 900	12	0	0	0	0	-	-
2 Berroci	October/2001	A	2 200	10	0	0	0	0	-	-
	November/2001		2 200	10	0	0	0	0	-	-
3 Aia-Iturrieta	August/2001	A	1 500	10	1	1			-	-
4 Amundarain	September/2001	B	1 300	8	1	1			-	-
5 Leitzaran	August/2001	B	2 900	15	1	1			-	-
6 Urruzuno	August/2001	B	2 000	12	0	0	0	0	-	-
	September/2001		2 000	12	0	0	0	0	-	-
7 Elama	August/2002	B	2 000	12	7	7			+	
8 Tornola	August/2001	A	2 600	14	0	0	0	0	-	-
	September/2001		2 600	14	0	0	0	0	-	-
9 Endara	September/2001	B	2 700	14	0	0	0	0	-	-
	October/2001		3 000	16	0	0	0	0	-	-
10 Ameztia	July/1998	A	3 700	21	13	10	3	0	-	-
	October/2001		1 000	8	2	2			-	-
	March/2002		1 000	8	2	2			-	-
11 Ezpelura	February/1998	A	2 300	15	10	5	5	0	-	-
	March/1999		2 300	15	12	9	3	0	-	-
	August/1999		2 300	15	10	9	1	0	-	-
	June/2000		2 300	15	7	7	0	0	-	-
12 Olazar	November/1996	B	1 500	10	1	1			-	-
13 Sasoaran	March/1997	B	3 200	21	4	4	0	0	+	
14 Urrobi	October/2001	B	2 100	10	4	4			+	
15 Legartza	May/2002	B	800	6	1	1			+	
16 Uztarroz	May/2002	B	1 600	10	1	1			+	

wealth of information on the distribution of the desman in Portugal (QUEIROZ et al. 1998), France (QUEIROZ et al. 1996) and in some regions of Spain (AYMERICH et al. 2001). However the sampling surveys carried out in 29 Spanish provinces in 1991 and 1992 only detected the presence of desmans in 3 provinces (NORES et al. 1993), despite the fact that the current distribution of the desman in Spain has been verified as being much more widespread (QUEIROZ 1999). These contradictions along with the findings of this study would advise against implementing large-scale monitoring pro-

grams based only on scat sampling. Live trapping might be considered an inefficient method of detection (QUEIROZ et al. 1996; AYMERICH et al. 2001), yet the results would argue for the opposite.

## Acknowledgements

The authors would like to thank IÑAKI AIZPURU and IÑIGO MENDIOLA (Diputación Foral de Gipuzkoa), MANUEL LAMUELA (Gobierno de Navarra) and JOSEBA CARRERAS (Diputación Foral de Álava) for their assistance.

## References

- AYMERICH, P.; CASADESÚS, F.; GOSÁLBEZ, J. (2001): Distribució de *Galemys pyrenaicus* (Insectivora, Talpidae) a Catalunya. *Orsis* **16**, 93–110.
- CASTIÉN, E.; GOSÁLBEZ, J. (1992): Distribución geográfica y hábitats ocupados por *Galemys pyrenaicus* (Geoffroy, 1811) (Insectivora: Talpidae) en los Pirineos Occidentales. *Doñana Acta Vertebrata* **19**, 37–44.
- CASTIÉN, E.; MENDIOLA, I. (1985). Atlas de los mamíferos continentales de Álava, Vizcaya y Guipuzcoa. In: Atlas de los Vertebrados continentales de Álava, Vizcaya y Guipuzcoa. Ed. by J. ALVAREZ, A. BEA, J. M. FAUS, E. CASTIÉN, and I. MENDIOLA. Vitoria: Gobierno Vasco. Pp. 271–325.
- JUCKWER, E.-A. (1990): *Galemys pyrenaicus* – Pyrenäen-Desman. In: Handbuch der Säugetiere Europas. Ed. by J. NIETHAMMER and F. KRAPP. Vol. 3/1. Wiesbaden. Aula-Verlag. Pp. 79–92.
- NORES, C.; RUANO, A.; OJEDA, F.; VILLATE, I.; GARCÍA, E. H.; CANO, J. M.; GONZÁLEZ, J. (1993): Pyrenean desman survey of Spain: first results. In: Proceedings of the Meeting on the Pyrenean Desman. Ed. by A. I. QUEIROZ. Lisboa, Instituto da Conservação da Natureza. Pp. 53–54.
- PODUSCHKA, W.; RICHARD, B. (1985): Hair types in the fur of the Pyrenean desman (*Galemys pyrenaicus*) Geoffroy, 1811 (Insectivora: Talpidae: Desmaninae). *Sitzungsber. Akad. Wiss. wien.* **194**, 39–44.
- QUEIROZ, A. I. (1999): *Galemys pyrenaicus* (E. Geoffroy, 1811). In: The Atlas of European Mammals. Ed. by A. J. MITCHELL-JONES, G. AMORI, W. BOGDANOWICZ, B. KRYS-TUFEK, P. J. H. REIJNDERS, F. SPITZENBERGER, M. STUBBE, J. B. M. THISSEN, V. VOHRALÍK, and J. ZIMA. London: T and A D Poyser Natural History. Pp. 78–79.
- QUEIROZ, A. I.; BERTRAND, A.; KHAKHIN, G. (1996): Statut et sauvegarde des Desmaninae en Europe. *Sauvegarde de la nature*, 76. Strasbourg: Editions du Conseil de l'Europe.
- QUEIROZ, A. I.; QUARESMA, C. M.; SANTOS, C. P.; BARBOSA, A. J.; CARVALHO, H. M. (1998): Bases para a Conservação da Toupeira-de-água. *Estudos de Biologia e Conservação da Natureza*, 27. Lisboa: Instituto da Conservação da Natureza.
- RICHARD, P. B. (1976): Extension en France du Desman des Pyrénées (*Galemys pyrenaicus*) et son environnement. *Bull. Ecol.* **7**, 327–334.
- RICHARD, P. B. (1986): Le Desman des Pyrénées. Un mammifère inconnu à découvrir. Monaco: Editions Le Rocher.
- STONE, R. D. (1987): The social organization of the Pyrenean desman (*Galemys pyrenaicus*) (Insectivora: Talpidae), as revealed by radiotelemetry. *J. Zool. (London)* **212**, 117–129.

**Authors' addresses:**

JORGE GONZÁLEZ-ESTEBAN and IDOIA VILLATE, Carretera Donamaria, 15, 2<sup>o</sup> izq, E-31740 Santesteban, Navarra, Spain (e-mail: abanades@wanadoo.es); ENRIQUE CASTIÉN, Servicio de Conservación de la Naturaleza, Gobierno de Navarra, Alhóndiga 1, E-31002 Pamplona, Spain