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General palaeontology, systematics and evolution (Vertebrate palaeontology)

New data on the origin of *Nesiotites* (Soricidae, Mammalia) in Menorca (Balearic Islands, Spain)*Nouvelles données sur l'origine de Nesiotites (Soricidae, Mammalia) à Minorque (Îles Baléares, Espagne)*Guillem Pons-Monjo^a, Salvador Moyà-Solà^b, Marc Furió^{a,*}^a Institut Català de Paleontologia M. Crusafont, Edifici ICP, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, 08193 Barcelona, Spain^b ICREA at Institut Català de Paleontologia M. Crusafont, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, Barcelona, Spain

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ABSTRACT

The presence of the shrew *Nesiotites* in Menorca is not yet adequately explained. Some authors consider that its ancestor arrived during the Messinian Salinity Crisis, as happened in Mallorca. Other authors consider that fossil populations in Menorca are the result of a later migration from Mallorca. In this work, several biometrical and morphological characters of abundant fossil populations from both islands have been studied. The results indicate that Early Pleistocene populations in Mallorca and Menorca are rather indistinguishable. Therefore, an early post-Messinian (Pliocene) isolation of *Nesiotites* in both islands is quite unlikely.

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R É S U M É

La présence de la musaraigne *Nesiotites* à Minorque n'est pas encore bien expliquée. Certains auteurs considèrent que son ancêtre est arrivé pendant la Crise de Salinité du Messinien au même moment que la colonisation de Majorque. D'autres auteurs considèrent que les populations fossiles de Minorque ont immigré ultérieurement depuis Majorque. Dans ce travail, divers caractères biométriques et morphologiques, d'abondantes populations fossiles provenant des deux îles, ont été étudiés. Les résultats indiquent que les populations du Pléistocène inférieur de Majorque et Minorque sont difficiles à distinguer. Par conséquent, un isolement précoce post-Messinien (Pliocène) de *Nesiotites* dans les deux îles semble peu probable.

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1. Introduction

Nesiotites Bate, 1944 is an extinct genus of shrews that inhabited the Mediterranean islands of Mallorca, Corsica and Sardinia. It was originally described by Dorothea

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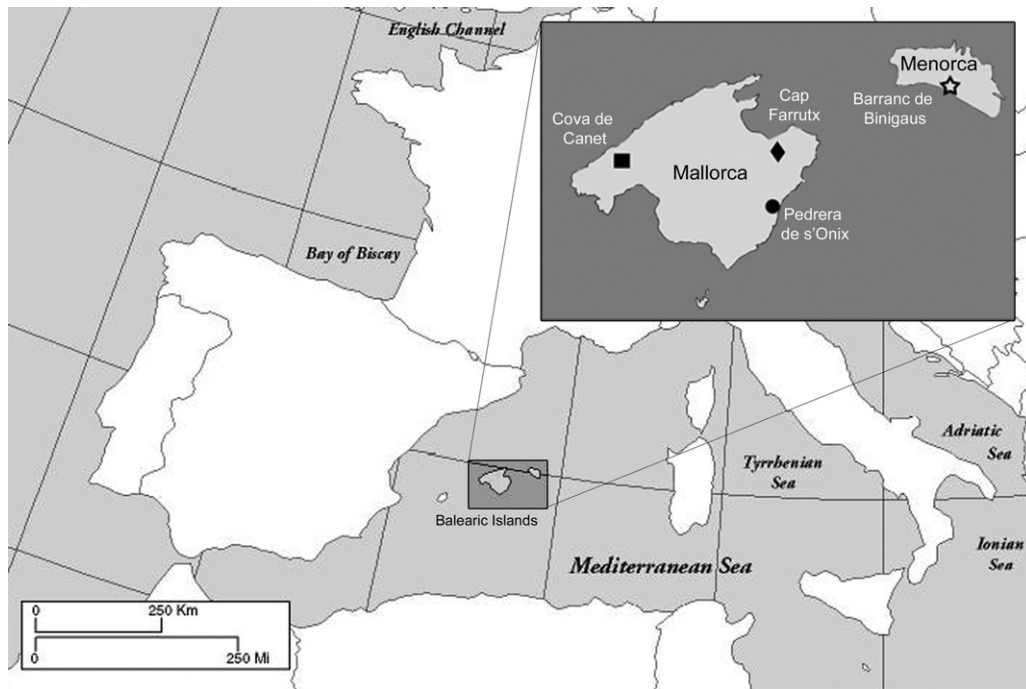


Fig. 1. Map of the Mediterranean area and the Balearic Islands, showing the placement of the three different sites under study and Cap Farrutx.

Fig. 1. Carte de la zone méditerranéenne et des îles Baléares, montrant l'emplacement des trois sites compris dans l'étude et Cap Farrutx.

M.A. Bate to combine several species found in these islands. Hitherto, five different species of this genus have been described: *Nesiotites hidalgo* Bate, 1944 from Mallorca, *Nesiotites corsicanus* Bate, 1944 from Corsica, and *Nesiotites similis* (Hensel, 1855) from Sardinia (originally described as *Sorex similis*). Later, two new species were described in the Balearic Islands: *Nesiotites ponsi* Reumer, 1979, the smallest and oldest species from Mallorca, and *N. meloussae* Pons-Moyà and Moyà-Solà, 1980 from Menorca. Reumer (1981) noted the presence of an intermediate form between the two species from Mallorca, making reference to it as *Nesiotites ex. interc. ponsi-hidalgo*.

Within the Balearic species of *Nesiotites*, the main character to differentiate them was the general size (Alcover et al., 1981; Reumer, 1979). *Nesiotites ponsi* is the smallest species, *N. hidalgo* is the largest one, and *N. meloussae* is intermediate between both. Almost all the dentognathic elements follow this relationship proportionally. Reumer (1982) noticed that the size of the upper molars of *N. meloussae* was similar to that of *N. ponsi*, and that the lower ones matched within the range of *N. ex. interc. ponsi-hidalgo*. According to this author, both species were equivalent and thus *N. meloussae* did not deserve the status of a separate species. Apart from the immediate nomenclatural problem created, such discrepancy acquired paleogeographic significance (Pons-Monjo et al., 2010). If *N. meloussae* represents a real case of endemism in Menorca, it evidences an independent evolutionary history in both islands. If, on the contrary, *N. meloussae* and *N. ex. interc. ponsi-hidalgo* were synonyms, it means that both islands were somehow connected, thus permitting

the genetic flow, or that the two fossil populations of *Nesiotites* are close in age to the moment of split, and they had no time enough to develop autapomorphic traits.

Other than the criterion of size, the definition of *N. meloussae* was based on some other morphological traits found in the fourth upper antemolar, the mandibular condyle, the secondary cuspules in m1 and m2, and the length of the rostrum (Pons-Moyà and Moyà-Solà, 1980). In this work, we review the validity of these traits in order to elucidate the phyletic relationships between the Balearic forms of *Nesiotites*.

2. Location and age of the sites

The *Nesiotites* remains studied in the present work belong to the Joan Pons Collection stored at the Institut Català de Paleontologia (ICP). This material comes from three different karstic deposits (Fig. 1): Cova de Canet and Pedrera de s'Ònix (Mallorca), and Binigaus (Menorca). Canet yielded remains of *N. hidalgo* and it has been dated as Holocene (Alcover et al., 1981; Reumer, 1980b). The fossils studied herein come from the Level B, dated at 7200 BC (Pons-Moyà and Coll Conesa, 1986) and they are associated to remains of *Myotragus balearicus* (Bover et al., 2010; Moyà-Solà et al., 2007). Pedrera de s'Ònix is a Plio-Pleistocene site, and it has provided fossils attributed to *Nesiotites ex. interc. ponsi-hidalgo* by Reumer (1981, 1982) (*Nesiotites aff. ponsi* in Alcover et al., 1981). The karstic site of Binigaus is the type locality of *N. meloussae*, with an estimated age older than Middle Pleistocene, probably Early Pleistocene (Moyà-Solà

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