

With my best regards  
Antonio

## Short communication

# Strigiformes from the Neogene of Spain

ANTONIO SÁNCHEZ-MARCO

Departamento de Paleobiología. Museo Nacional de Ciencias Naturales. José Gutiérrez Abascal 2, 28006 Madrid, Spain

Here I report new records of two paleospecies of barn owls (*Tyto balearica* and *T. sanctialbani*) from two Miocene (Toril 3A and Valdecebro 5) and two Pliocene (Layna and Moreda) localities in Spain. This study completes the identification of all the known strigiform bones from the Tertiary of Spain.

The family Tytonidae (*sensu* Howard & Moore 1980) consists of the recent genera *Tyto* and *Phodilus*, and a fossil record comprising a particularly rich variety of insular species (Steadman & Hilgartner 1999). Some of the oldest occurrences of this family are of the genera *Nocturnavis* and *Necrobyas*, from the Middle Eocene to Upper Oligocene of Phosphorites du Quercy (Mourer-Chauviré 1987). *Palaeoglaux artophoron*, of the family Palaeoglaucidae (Peters 1992) or the subfamily Palaeoglaucinae of the family Tytonidae (Mourer-Chauviré 1987), has been recorded from the Middle Eocene of Messel (Peters 1992). The genus *Tyto* occurs in some European localities of Astaracian land mammal age (mammalian biozones MN 6 to 8) onwards (Mlikovsky 1995). In the Iberian peninsula, only one undetermined species of *Tyto* had been described as biostratigraphically high as the Late Miocene (MN 12) of Valdecebro 5 (Sánchez Marco 1995b). *Tyto balearica* has been recorded from Aljezar B (MN12) (Cheneval & Adrover 1993), Layna (MN 15) and Almenara 1 (MN 17) (Mourer-Chauviré & Sánchez Marco 1988).

## SYSTEMATIC PALAEOLOGY

Order Strigiformes Wagler, 1830  
Family Tytonidae Ridgway, 1914  
Genus *Tyto* Billberg, 1828  
*Tyto sanctialbani* (Lydekker, 1893)

This species was described by Lydekker (1893) from the Middle Miocene locality of La Grive-Saint-Alban (MN 7–8). Later, Ballman found new material in this outcrop (Ballman 1969) and in the Pliocene (delle Cave 1995) site of Gargano (Ballman 1973, 1976). In a revision of Tertiary Tytonidae, Mlikovsky (1998) identified more specimens from the type locality as belonging to *T. sanc-*

*tialbani*, reported the occurrence of the species in the Late Miocene (MN 10) site of Kohfidisch (Austria), and ascribed to the same taxon the fossil material of *Tyto campiterrae*, described in the Late Miocene (MN 13) site of Polgárdi 5 (Hungary) by Jánossy (1991). In the same study (Mlikovsky 1998), the material from Gargano is transferred to *T. balearica*.

## New records

**Locality and horizon.** Found in Toril 3A, Daroca village, Zaragoza province (Fig. 1). Biozone MN 7–8 (Bruijn *et al.* 1992), Middle Miocene.

**Material.** Complete right humerus (Fig. 2A & 2B), lacking crista dorsalis and tuberculus ventralis (housed in the Museo Nacional de Ciencias Naturales: To-3A, C-2, 1034). The bone shows the morphological characters of *Tyto*, slightly larger than the recent Barn Owl (*Tyto alba*) and smaller than *T. balearica* (Table 1). A complete humerus of *T. sanctialbani* was unknown until now.

**Description and comparisons.** The humerus of Tytonidae differs from Strigidae in having the distal end relatively less laterally expanded. The configuration of the proximal end of the humerus of the recent *Phodilus badius* differs from *Tyto* in having a very narrow bicipital surface and a very large bicipital furrow (Mourer-Chauviré 1987).

The humerus from Toril 3A is somewhat larger than any of those measured by Langer (1980) in the species *Tyto alba* (Table 1). Both the proximal and distal humeral widths of the fossil fall within the range of the recent Barn Owl. *Tyto gigantea*, *T. robusta*, *T. balearica* and *Basityto rummeli* are larger than the *Tyto* from Toril 3A (Table 1). In palmar view, the pattern composed by the bicipital furrow, the bicipital surface and the ligamental furrow of the owl from Toril 3A is the same as in *Tyto*. Also, this genus shows a sharp edge between the bicipital furrow and the bicipital surface (Mourer-Chauviré 1987).

The genus *Palaeotyto* is only known from one coracoid of the species *P. cadurcensis*, from the Phosphorites du Quercy (Mourer-Chauviré 1987). In any case, the measurements of this bone show that this species greatly exceeds *T. sanctialbani* in size. The same is true of *Palaeobyas cracrafti*, described by Mourer-Chauviré (1987) on a tarsometatarsus from the same locality, which is also far larger than the barn owl of Toril 3A. All *Necrobyas* species are based on tarsometatarsi (Milne-Edwards 1863, Mourer-Chauviré 1987). Three different groups can be distinguished on the size of their tarsometatarsi: *N. edwardsi* and *N. arvernensis* (large), *N. harpax* and *N. rossignoli* (medium-sized), and *N. medius* and *N. minimus* (small) (Mourer-Chauviré 1987). Mlikovsky *et al.* (1985) interpreted the two first groups as two paleospecies and therefore synonymized them, while considering the last group as belonging to the genus *Prosybris*. The humerus of *Tyto sanctialbani* differs from *Necrobyas harpax* and *N. edwardsi* in its greater size, excepting the proximal width of *N. edwardsi* (Table 1).

Email: antoniosm@mncn.csic.es

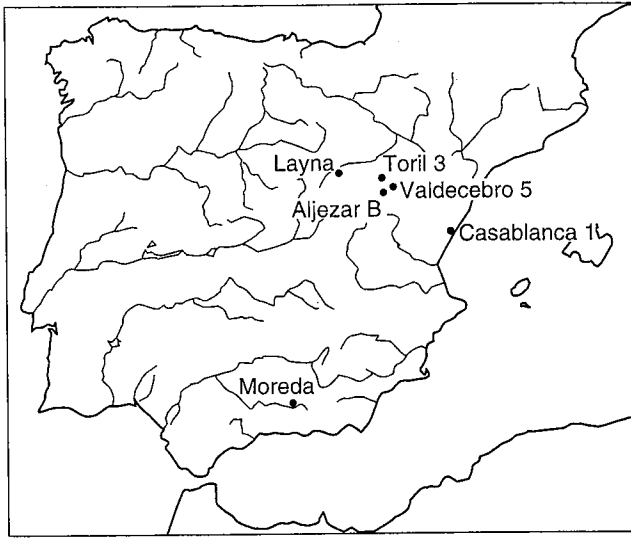


Figure 1. Tertiary Iberian localities with remains of Strigiformes.

The proximal extreme of *Tyto* is clearly distinguishable from *Necrobyas* (Mourer-Chauviré 1987), as *Necrobyas* has the bicipital surface smaller and its bicipital furrow is bigger and connected to the ligamental furrow. The distal end of the humerus of *Palaeoglaux perrierensis*, from the Upper Eocene of France (Mourer-Chauviré 1987), is similar in width to *T. sanctialbani*, but in *P. perrierensis* the internal condyle, in palmar view, is greatly reduced and the ectepicondylar prominence projects externally more than in *Tyto. Nocturnavis incerta*, found as *P. perrierensis* in

the Phosphorites du Quercy (Mourer-Chauviré 1987), is larger than *T. sanctialbani* (Table 1). Moreover, in palmar view, the entepicondyle of *N. incerta* is much less prominent than in *T. sanctialbani*.

*Tyto balearica* Mourer-Chauviré *et al.*, 1980

This species was described on material from three Balearic localities dated at around the Plio-Pleistocene boundary: Cova de Canet, Pedrera de S'Onix and Binigaus (Mourer-Chauviré *et al.* 1980). Later, specimens belonging to this species were identified in some older sites, both coastal and inland: Layna (Early Pliocene, MN 15, Spain), Sète (Early Pliocene, MN 15, France), Balaruc II (Late Pliocene, MN 16, France), Casablanca 1 (Late Pliocene, MN 17, Spain) (Mourer-Chauviré & Sánchez Marco 1988, Mourer-Chauviré 1995, Sánchez Marco 1995b) and Aljezar B (Late Miocene, MN 12, Spain) (Cheneval & Adrover 1993) (Fig. 1). This species does not differ morphologically from the recent *T. alba*, only in size (Mourer-Chauviré *et al.* 1980).

#### New records

*Miocene locality.* Valdecebro 5, Late Miocene (MN 12) (Adrover *et al.* 1986, Sánchez Marco 1995b) (Fig. 1).

*Material.* One distal right ulna, one distal right tibiotarsus, two distal left tibiotarsi, two proximal left tarsometatarsi, one distal right tarsometatarsus, one small distal tarsometatarsus, one alar phalanx and ten pedal phalanges (housed in the Museo Nacional de Ciencias Naturales, but

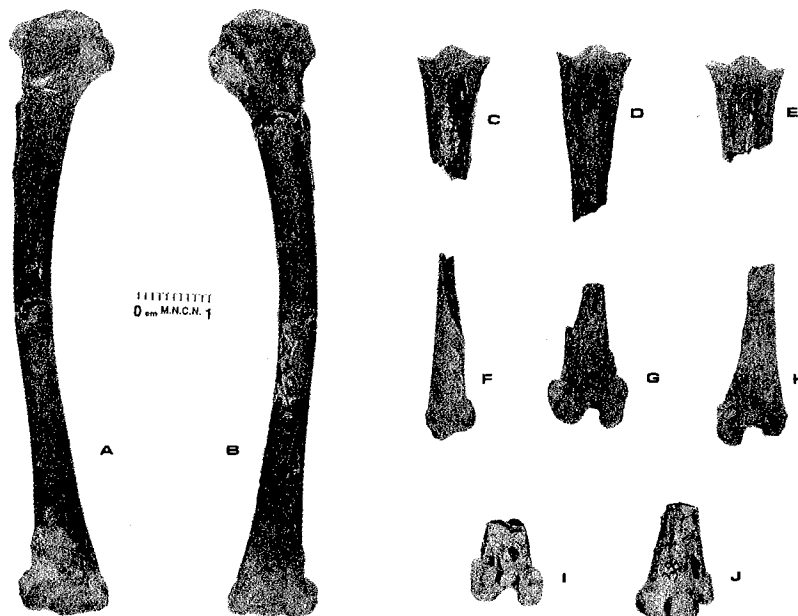


Figure 2. Fossil remains of *Tyto* from Neogene localities in the Iberian peninsula. A, B: *Tyto sanctialbani* from Toril 3A, Middle Miocene; right humerus, anconal (A) and palmar (B) view. C–H: *Tyto balearica* from Valdecebro 5, Late Miocene; proximal left tarsometatarsi (C, D), proximal right tarsometatarsus (E), distal right ulna (F), and two distal right (G) and left (H) tibiotarsi. I–J: *Tyto balearica* from Moreda, Early Pliocene; distal right tibiotarsus (I) and distal left tarsometatarsus (J).

**Table 1.** Measurements (in mm) of humeri of Tertiary Tytonidae and of the recent Barn Owl. Sample size is given in parentheses.

Taxa	Maximum length	Proximal width	Distal width
<i>Tyto sanctialbani</i> (Toril 3A)	86.9	15.3	13.0
<i>Tyto sanctialbani</i> <sup>5</sup>	–	16.0	14.0–14.5 (3)
<i>Tyto alba</i> <sup>1</sup>	73.7–85.3 (28)	13.5–15.6 (29)	11.6–13.5 (28)
<i>Tyto balearica</i> <sup>2</sup>	102	16.8	15.7–17.1 (4)
<i>Tyto robusta</i> <sup>3</sup>	–	26	24.0
<i>Tyto gigantea</i> <sup>4</sup>	185	–	–
<i>Basityto rummeli</i> <sup>5</sup>	175	–	26.5
<i>Nocturnavis incerta</i> <sup>6</sup>	91.0	16.6–18.0 (2)	16.3
<i>Palaeoglaux perrierensis</i> <sup>6</sup>	–	–	13.9
<i>Necrobyas harpax</i> <sup>6</sup>	74.0	13.5	11.1–11.5 (3)
<i>Necrobyas edwardsi</i> <sup>6</sup>	72.3	15.7	12.1–12.8 (3)

<sup>1</sup>Langer (1980); <sup>2</sup>Mourer-Chauviré & Sánchez Marco (1988); <sup>3</sup>Ballman (1973); <sup>4</sup>Ballman (1976); <sup>5</sup>Mlíkovsky (1998); <sup>6</sup>Mourer-Chauviré (1987).

not yet catalogued) (Fig. 2, C–H) (Table 2).

**Pliocene localities.** Layna, Early Pliocene (MN 15) (Bruijn *et al.* 1992, Sánchez Marco 1995b) and Moreda, Late Pliocene (MN 16) (Bruijn *et al.* 1992, Sánchez Marco 1995b) (Fig. 1).

**Material from Layna.** These specimens are additional to those reported by Mourer-Chauviré and Sánchez Marco (1988): one synsacrum, two vertebrae, one distal left humerus, one distal right ulna and one distal right tarsometatarsus (housed in the Museo Nacional de Ciencias Naturales, but not yet catalogued) (Table 2).

**Material from Moreda.** One distal right femur, one distal right tibiotarsus and one distal left tarsometatarsus (housed in the Museo Nacional de Ciencias Naturales, but not yet catalogued) (Fig. 2, I & J) (Table 2).

Perhaps owing to the scarcity of Paleocene and Early Miocene avian localities on the Iberian peninsula (Sánchez Marco 1995a, 1995b), there are no records of taxa from that time period in the family Tytonidae, which is otherwise diverse in Europe (Mourer-Chauviré 1987, Mlíkovsky 1998). In fact, the Iberian record of barn owls – five peninsular and three insular sites (Sánchez Marco 1995b) – consists exclusively of two species of the genus *Tyto*. The first record (*T. sanctialbani*), reported in this paper, is in Toril 3A (Middle Miocene, MN 7–8). Subsequently, *T. balearica* is the only species known to occur in Iberia and the adjacent islands, beginning from

the Late Miocene, MN 12, of Valdecebro 5 and Aljezar B, up to the Pliocene outcrops of Layna (MN 15), Moreda (MN 16), Casablanca 1 (MN 17) and the three final Pliocene (MN 17) Balearic sites: Cova de Canet, Pedrera de S'Onix and Binigaus.

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**Table 2.** Measurements (in mm) of bones of *Tyto balearica* and of the recent Barn Owl. Sample size is given in parentheses.

Taxa and sites	Humerus distal width	Ulna distal width	Tibiotarsus distal width	Tarsometatarsus	
				prox. width	distal width
<i>Tyto alba</i> <sup>1</sup>	11.6–13.5 (28)	6.3–7.1 (26)	8.5–10.0 (29)	8.4–9.9 (29)	9.5–11.2 (28)
<i>Tyto balearica</i> <sup>2</sup>	15.7–17.1 (4)	6.9–7.2 (2)	–	10.5–12.1 (3)	11.3–14.4 (3)
<i>Tyto balearica</i> <sup>3</sup>	–	7.9	11.6	10.6, 11.3, 11.6	–
<i>Tyto balearica</i> <sup>4</sup>	15.2	10.0	–	–	12.9
<i>Tyto balearica</i> <sup>5</sup>	–	–	10.5	–	11.6

<sup>1</sup>Langer (1980); <sup>2</sup>Mourer-Chauviré and Sánchez Marco (1988); <sup>3</sup>Valdecebro 5; <sup>4</sup>Layna; <sup>5</sup>Moreda.

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