

**Occurrence of *Macroneomys brachygnathus* FEJFAR, 1966
in the British Middle Pleistocene, with a review of the status of
Beremendia fissidens (PETÉNYI, 1864) in Britain
(Mammalia, Lipotyphla, Soricidae)**

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Abstract. Rare isolated mandibular molars of a large soricid recovered from two British Middle Pleistocene deposits at Sugworth, near Oxford and West Runton, Norfolk were originally considered referable to *Beremendia fissidens*. Review of these teeth in the light of recent researches on the European mainland reveals that they pertain in fact to *Macroneomys brachygnathus*. *Beremendia fissidens* is now only known in Britain by one record from the Early Pleistocene (or Late Pliocene) Crag of Norfolk, dependent on the uncertain position of the Plio - Pleistocene boundary (1.8 or 2.5 Ma). Lower molars of the two taxa are here compared in detail.

Key words: Lipotyphla, Soricidae, *Macroneomys*, *Beremendia*, Middle and Early Pleistocene, Britain.

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I. INTRODUCTION

Remains of large soricids are rare in the British Pleistocene. STUART (1980: 89, Fig. 1 c, c¹) recorded three m1 or m2 from Sugworth, near Oxford far larger than any previously known fossil or living British shrew, with black pigmentation extending nearly to the base of the crown and an entire buccal cingulum. These teeth were considered at the time to be referable to *Beremendia*.

HARRISON and CLAYDEN (1993) described an incomplete upper incisor (Fig. 1 in HARRISON and CLAYDEN 1993) from the East Runton foreshore crag and an isolated m2 (Fig. 2 in HARRISON and

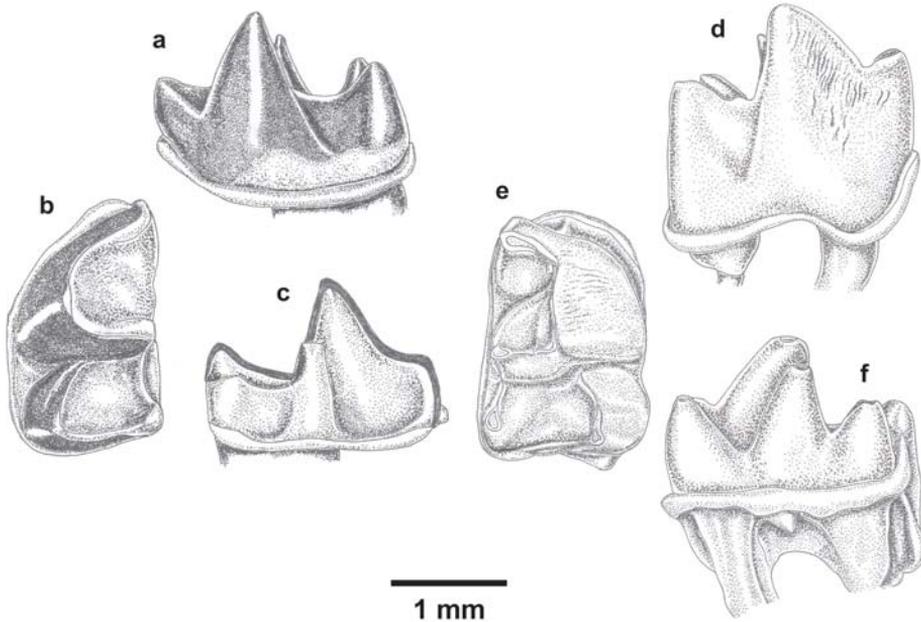


Fig. 1. Left: *Beremendia fissidens* HZM 95.26241, isolated m 1 or 2 sin. in (a) buccal, (b) occlusal and (c) lingual views, Żabia Cave, Podlesice, Poland, Early Pleistocene, c. 1.5 Ma BP. Right: *Macroneomys brachygnathus* HZM 1.32500 m1 dex. in (d) buccal, (e) occlusal and (f) lingual views, West Runton, Cromerian Freshwater Bed (Bed g, WEST, 1980).

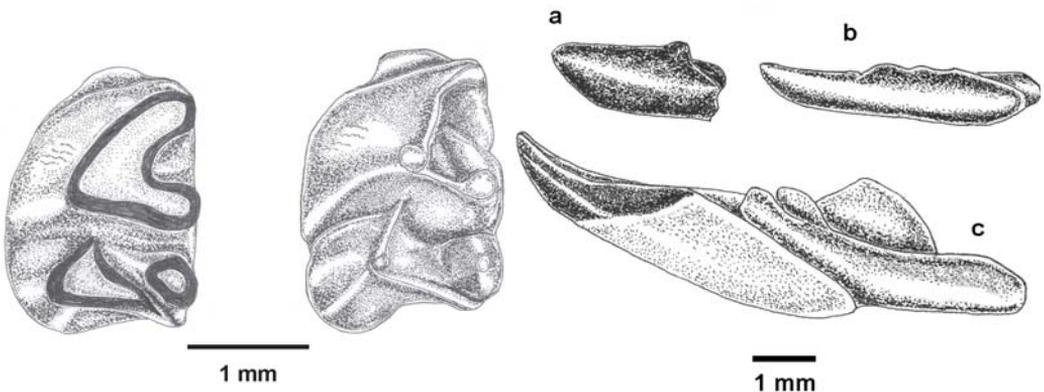


Fig. 2. *Macroneomys brachygnathus*. Left: Isolated m1 sin. Sugworth Sg 768, heavily worn; Right: Isolated m1 sin. Sugworth Sg 770, unworn.

Fig. 3. (a). Fragmentary lower left incisor of ? *Macroneomys brachygnathus*, Sugworth Sg 771; (b) Left lower incisor of *Neomys newtoni* HZM 79.32543, Cromerian Freshwater Bed (Bed g, WEST, 1980), West Runton; (c) Left lower incisor of *Beremendia fissidens* HZM 91.26067, Żabia Cave, Podlesice, Poland.

CLAYDEN 1993) originating from the Freshwater Bed, West Runton, Norfolk, both at the time referred to *Beremendia fissidens*. In the absence of preserved jaws, with the typical neomyine condyle, this lower molar and another m1 found subsequently were erroneously referred to *Beremendia*, and are here re-identified as *Macroneomys brachygnathus*.

All of these lower molar teeth are reviewed in detail below and are confidently referred to *Macroneomys brachygnathus*, which has not hitherto been reported from the British Pleistocene.

A c k n o w l e d g m e n t s. We are much indebted to John CLAYDEN, who obtained the two specimens of *Macroneomys* from West Runton, and to Malcolm PEARCE of the Harrison Institute, who kindly prepared the macrophotographs in Fig. 4 for us. Richard PREECE, (Zoology Museum, Cambridge University) assisted us greatly by arranging the loan of the Sugworth material. Simon PARFITT would like to thank the Leverhulme Trust, which supported his research with grants to the Ancient Human Occupation of Britain project. A. J. STUART gratefully acknowledges a grant from the Leverhulme Trust for the project 'Mammoth, Vertebrate Fauna and Palaeoenvironment of the Cromerian Stratotype' (A. M. LISTER and A. J. STUART). The Harrison Institute received a grant from the Systematics Association for an invaluable Leica stereomicroscope drawing arm. Barbara RZEBIK-KOWALSKA has given invaluable advice and help on review, which is gratefully acknowledged.

II. SYSTEMATIC PALAEOLOGY

Family **Soricidae** FISCHER VON WALDHEIM, 1817

Subfamily **Soricinae** FISCHER VON WALDHEIM, 1817

Tribe **Neomyini** MATSCHIE, 1909

Genus ***Macroneomys*** FEJFAR, 1966

Macroneomys brachygnathus FEJFAR, 1966

Material from West Runton, Norfolk. Cromerian Freshwater Bed (Bed g, WEST, 1980). These specimens are located in the Harrison Institute, registered as follows: HZM 1.32500 m1 dex. (Fig. 1 d-f); HZM 16. 22451 m1 sin (Fig. 4 c-e).

Material from Sugworth, Berkshire. Cromerian. A.J.S. Collection. Zoology Museum, Cambridge University, registered as follows: Sg 770 m1 dex. (Fig. 2.); Sg 768 m1 sin. (Fig. 2.); Sg 769 m1 sin.; Sg 771 tip of left lower incisor (Fig. 3a).

III. DESCRIPTION

Comparison of isolated lower molars of *Macroneomys brachygnathus* with *Beremendia fissidens*.

The two lower molars from West Runton conform well to descriptions of lower molars of *Macroneomys brachygnathus* from Poland given by RZEBIK-KOWALSKA (1991) and from Germany by MAUL and RZEBIK-KOWALSKA (1998)

The left mandibular fragment from Kozi Grzbiet, Poland described by RZEBIK-KOWALSKA (1991: Fig. 6) shows that the m2 is distinctly smaller than the m1. MAUL and RZEBIK-KOWALSKA (1998: 84) gave comparative measurements of all m1 and m2 so far known from the European mainland (CL m1 2.10–2.30 mm, n = 6; CL m2 1.70–1.95 mm, n = 6). All the British lower molars are as large or even larger and it is therefore considered most probable that they are all m1's and no m2's have yet been found. (Table 1).

Table I

Measurements of British lower molars (m1) of *Macroneomys brachygnathus*. CL = Crown length; TRI W = Trigonid width; TAL W = Talonid width; TRI L = Trigonid length; TAL L = Talonid length. The latter two measurements are taken from the point of attachment of the cristid obliqua, mesially and distally respectively

Specimen	CL [mm]	TRI W [mm]	TRI L [mm]	TAL W [mm]	TAL L [mm]
HZM 1.32500	2.30	1.47	1.34	1.47	0.77
HZM 16.22451	2.37	1.60	1.34	1.54	0.70
Sg 770	2.21	1.60	1.44	1.54	0.70
Sg 768	2.24	1.50	1.38	1.47	0.86
Sg 769	2.46	–	1.38	–	1.09

Comparison of the West Runton teeth has been made with a jaw of *Beremendia fissidens* from Żabia Cave, Podlesice, Poland (HZM 25.23731) which has the entire dentition *in situ* and well preserved (see Fig. 4 a, b). The Żabia Cave is an Early Pleistocene site, Phase Q1 Betfia / Mokra 1.5 Ma BP.

The West Runton teeth of *Macroneomys* appear massive and bulbous and the trigonids particularly ‘exoedaenodont’ (Figs 2 and 4). No pigmentation of the cusp tips can be discerned, the teeth appearing uniformly black in colour as is usual with soricid teeth from the Freshwater Bed.

Both teeth have a blunter, more rectangular outline than *Beremendia* m1 and 2, the paraconids are less prominent and the paracristids shorter; the trigonid basins are less widely open. The buccal cingula are much more prominent mesially than in *Beremendia*, ascending to form low, blunt projections on the buccal side of the paraconids.

The talonids are distinctly shorter than the *Beremendia* m1 and 2, but the entoconids are by contrast notably tall and conical, with the pre-entoconid cristids very reduced, virtually absent. The postcristids are separated from the entoconids by a narrow fissure in *Macroneomys*, which is absent in *Beremendia*. Both West Runton specimens have a minute mesoconid on the cristid obliqua midpoint. This does not appear to be present in the Voigtstedt m2 (MAUL and RZEBIK-KOWALSKA 1998; Fig. 4) The significance of this is not clear at present and may represent just a local or even individual variant. The buccal surface of the trigonids has distinct vertical wrinkles, a feature shared with the Voigtstedt tooth but absent in *Beremendia*.

The three isolated lower molars from Sugworth have similar morphology to the West Runton specimens but are variably worn, most evident in Sg 768 in which no cusp tips remain either in the trigonid or talonid. The cusps of this specimen display marked excavation in advanced wear, lending support to the view that *Macroneomys* subsisted on a hard diet, such as molluscs. REUMER (1984, 1997) believed that all shrews with exoedaenodont dentition fed on molluscs. *Macroneomys* certainly lived in a freshwater environment at West Runton and may well have been aquatic, like the molluscivorous *Desmana*, which coexisted there. Enamel wrinkling is apparent on the buccal aspect of the trigonid in all three. No mesoconid is present in the Sugworth teeth, even in the unworn Sg 770.

The Sugworth teeth, like the Freshwater Bed specimens, are preserved jet black in colour, and no indication of original pigmentation of the cusp tips can be seen.

Sg 771 is the broken off tip of the left lower incisor of a large soricid. In comparison with the i1 of *Beremendia fissidens* (HZM 91. 26037 Żabia Cave, Podlesice, Poland) this tooth is thicker, with a blunter tip and appears almost certainly to be *Macroneomys*. The internal surface is flattened, externally it is convex and smooth. The bluntly rounded tip resembles the lower incisor of *Neomys newtoni* in which there is also a proximal elevation of the cutting edge, forming a low cuspule. No

trace of pigmentation remains on the fragment, which is here very tentatively referred to *Macroneomys*, pending discovery of an intact specimen. The entire maxillary dentition of *Macroneomys* remains unknown.

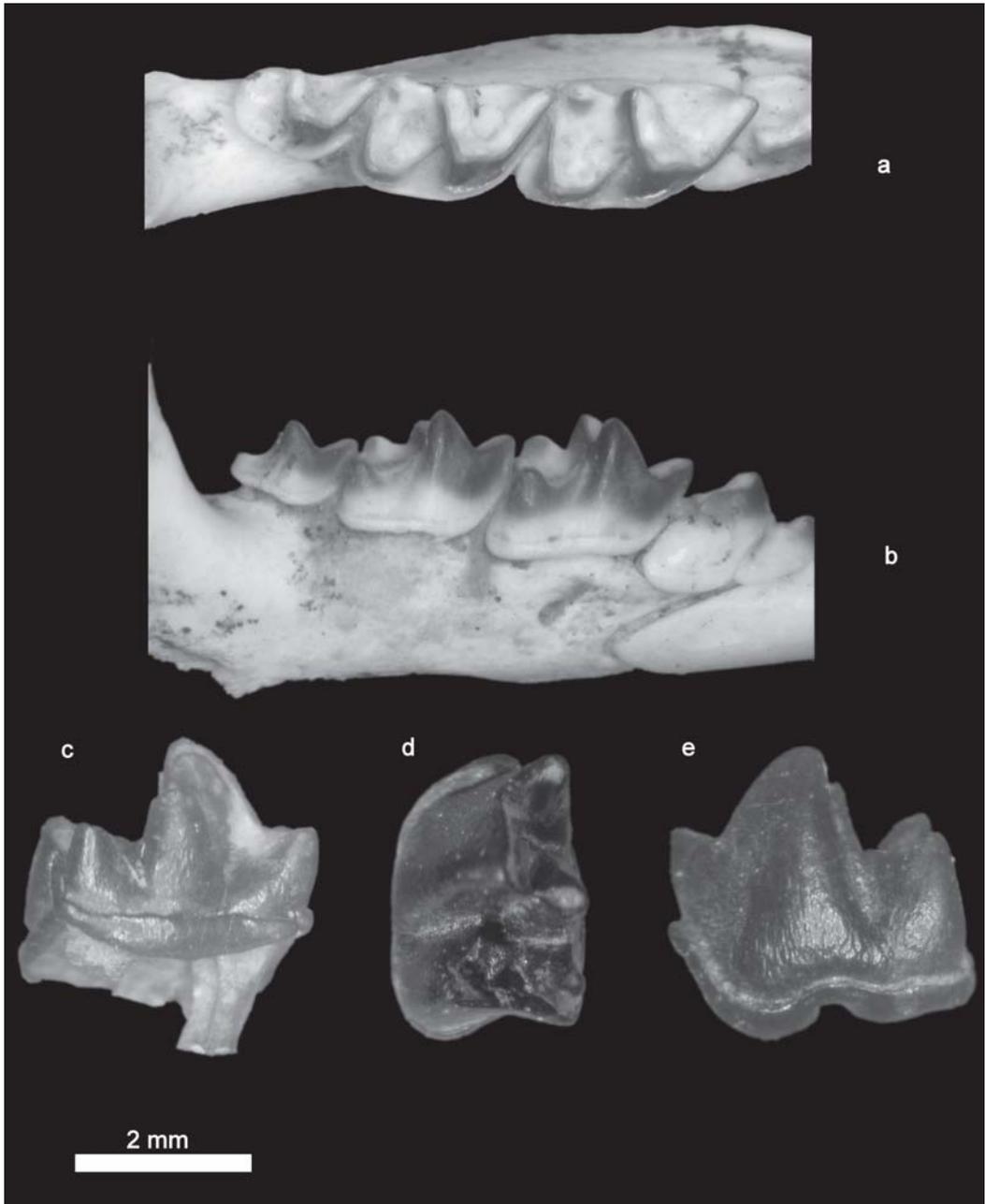


Fig. 4. Above: *Beremendia fissidens* HZM 25.23731, Right mandibular ramus, dentition intact p4-m3 shown. Żabia Cave, Podlesice, Poland, Early Pleistocene c. 1.5 Ma BP in (a) occlusal and (b) buccal views. Below: *Macroneomys brachygnathus* HZM 16.22451, isolated m1 sin., West Runton, Cromerian Freshwater Bed (Bed g, WEST, 1980) in (c) lingual, (d) occlusal and (e) buccal views.

IV. PALAEOECOLOGY

The presence of *Macroneomys* only in Bed g (WEST 1980), which forms the upper part of the Freshwater Bed at West Runton, is noteworthy. Its apparent absence in the very extensive collections which have been made from the lower part of the deposit suggests it may have had special ecological requirements. Both at Sugworth and in Bed g at West Runton it is found in sediments that represent active stream conditions. The sandy nature of Bed g (WEST 1980) contrasts with the deeper organic detritus muds, lacking *Macroneomys*, suggesting that it preferred fast flowing water. In terms of climate, the fossiliferous sediments at Sugworth were deposited during a fully temperate period (STUART 1980) with summer temperatures in excess of those at the present day. West Runton Bed g lacks plant and beetle remains but the rich vertebrate and molluscan assemblages indicate temperate (interglacial) conditions.

Macroneomys is well known from earlier Cromerian sites in Europe. MAUL and KOWALSKA (1998) review its stratigraphic range on the Continental mainland, showing that it extends from the Biharian about 0.8 Ma BP into the Toringian about 0.2 Ma BP. This range embraces the Rodent Biochronology zones of *Mimomys savini* and *Arvicola cantiana*. These specimens extend its range to the British Middle Pleistocene, where it is at present known from the *Mimomys savini* zone at West Runton and Sugworth. The absence of any maxillary elements in the scanty material so far collected of this rare soricid is remarkable.

Tribe **Beremendini** REUMER, 1984

Genus **Beremendia** KORMOS, 1934

Beremendia fissidens (PETÉNYI, 1864)

Beremendia fissidens is now only known in Britain by the incomplete upper incisor described and figured by HARRISON and CLAYDEN (1993; Fig. 1).

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