The Netherlands

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Contents

Introduction

This chapter concerns Neogene (Miocene and Pliocene) insectivores from The Netherlands. The same biogeographical and tectonical realm, i.e. the southeastern part of the North Sea Basin, also has several sites in the western part of Germany, but these localities are discussed in the chapter on Germany (Ziegler *et al.*, 2005).

Most of the region concerned was covered by (often shallow) seas during most of the Neogene. A late Miocene coastline can be reconstructed as running in a SW-NE direction from Antwerp (Belgium), Liessel (The Netherlands, province of Noord-Brabant), Uedem/Kevelaer (Germany, Land Nordrhein-Westfalen), to Miste/Winterswijk (The Netherlands, province of Gelderland) by the finds of glauconitic greensand-deposits containing shells and the skeletons of (beached?) whales (e.g. Hampe, 1996; Bol, 2000; Peters & Monteiro, 2005, and literature therein). No continental deposits are to be expected northwest if this line. Only during Late Pliocene and Pleistocene times the coastline recedes in a northwestern direction, in times leaving the North Sea more or less dry during climate-induced regressions (e.g., during the Late Weichselian).

As far as I can reconstruct, the oldest fossil insectivores from The Netherlands were found in the late 1830's after a well was drilled in the town of Gorinchem (Schreuder, 1941). There, some postcranials and a fragmentary mandible of *Desmana* were brought to light from a depth of 109 m. The remains were originally described as *Viverra* [= *Galerix*] *exilis* (Harting, 1853), but were recognized as a desman by Schreuder (1941). Since that time, Neogene fossils from The Netherlands were restricted for a long period of time to material from the clay pits in the Tegelen area (Kortenbout van der Sluys & Zagwijn, 1962; Freudenthal *et al.*, 1976; Reumer, 1984; Rümke, 1985; Roders, 1987). It needs to be noted that in most literature Tegelen is considered of Pleistocene age, due to the tendency of many Dutch stratigraphers to place the Plio/Pleistocene boundary at *c.* 2.5 Ma. Based on international standards Tegelen needs to be considered as latest Pliocene and thus to be included in the present overview. From the western part of the country, a few borings brought scant material to light (e.g., Schreuder, 1939, 1943; Van der Meulen & Zagwijn, 1974). Only during the last decades have Neogene fossil mammals (including

insectivores) been found in greater abundance in the Oosterschelde dredgings as the result of the invention of the 'Van Veen tube' by Mr Joop van Veen of Teylers Museum in Haarlem (Reumer *et al.*, 1998, 2005, see also De Vos *et al.*, 1998), and especially in the Zuurland boreholes that were so skillfully drilled by the amateur geologist Mr Leen Hordijk (Hordijk, 1988; Reumer, 2003).

The acronyms used in this article are:

IvAU	Instituut voor Aardwetenschappen Utrecht (faculty of Geosciences), Utrecht
LH	Collection Mr. Leen Hordijk, Brielle
NMR	Natuurmuseum Rotterdam, Rotterdam
NNM	Naturalis, National Museum of Natural History, Leiden
TM	Teylers Museum, Haarlem.

Insectivore faunas in the Neogene of The Netherlands

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Brielle

Location – borehole near the city of Brielle, province of Zuid-Holland, some 30 km W of Rotterdam, at 65-66 m below surface.

Stratigraphy – Tiglian.

Literature – Van der Meulen & Zagwijn (1974).

Insectivores – Soricidae: *Beremendia fissidens* (Pétenyi, 1864).

Taxonomic descriptions – Van der Meulen & Zagwijn (1974) gave a short description of the single tooth found.

Storage of material – NNM.

Dordrecht

Location – Borehole number 16, Bildersteeg, in the city of Dordrecht, province of Zuid-Holland, at 113.8-115.10 m below surface.

Stratigraphy – most probably Tiglian.

Literature – Schreuder (1943).

Insectivores – Talpidae: *Desmana thermalis* Kormos, 1913.

Taxonomic description – See Schreuder (1943) for a short description, there as *Desmana tegelensis*.

Storage of material – NNM.

Gorkum (Gorinchem)

Location – A borehole made around 1835-1837 in the centre of the city of Gorinchem ('Gorkum', province of Zuid-Holland), maximal depth 182.4 m below surface (178.9 m b.s.l.).

Stratigraphy – From a depth between 109 and 121 m, probably Tiglian.

Literature – Schreuder (1941, 1943).

Insectivores – Talpidae: *Desmana thermalis* Kormos, 1913.

Taxonomic descriptions – Schreuder (1941) described the scant remains, including a fragmentary mandible with p2.

Storage of material – NNM.

Oosterschelde

Location – A deep gully of c. 30-35 m depth below the water level, in the Oosterschelde estuary, province of Zeeland.

Stratigraphy – Early Tiglian?

Literature – Reumer *et al.* (1998, 2005), de Vos *et al.* (1998).

Insectivores – Talpidae: *Galemys kormosi* (Schreuder, 1940). Soricidae: *Beremendia fissidens* (Petenyi, 1864), *Sorex* (*Drepanosorex*) *praearaneaus* Kormos, 1934.

Taxonomic descriptions – Reumer *et al.* (1998, 2005) described the insectivore material from the gully.

Storage of material – TM.

Remarks – The material is collected using a fishing-vessel, fitted with metal pipes ("van Veen tubes") hung onto dredge-nets.

Tegelen

Location – Clay-pit Russel-Tiglia-Egypte, near the town of Tegelen, province of Limburg [N 51°21' E 6°10'].

Stratigraphy – Tiglian, correlated to pollen zone TC5.

Literature – Kortenbout van der Sluys & Zagwijn (1962), Freudenthal *et al.* (1976), Reumer (1984), Rümke (1985), Roders (1987), Van den Hoek Ostende & de Vos (submitted).

Insectivores – Talpidae: *Galemys kormosi* (Schreuder, 1940), *Desmana thermalis* Kormos, 1913, *Talpa minor* Freudenberg, 1914. Soricidae: *Sorex* (*Drepanosorex*) *praearaneus* Kormos, 1934, *Sorex minutus* Linnaeus, 1766, *Beremendia fissidens* (Pétenyi, 1864), *Petenyia hungarica* Kormos, 1934.

Taxonomic descriptions – Reumer (1984) gave descriptions for Soricidae; Rümke (1985) described the Desmaninae, and Roders (1987) described *Talpa minor*.

Storage of material – NNM.

Wassenaar

Location – Boring no. 10, Groot Berkheide, Wassenaar (province of Zuid-Holland), at a depth of 86 - 88.5 m below surface (77 - 79.5 m b.s.l.).

Stratigraphy – Unknown, probably Tiglian.

Literature – Schreuder (1939, 1943).

Insectivores – Talpidae: *Desmana* aff. *D. thermalis* Kormos, 1913.

Taxonomic descriptions – Schreuder (1939) described and illustrated the scant remains.

Storage of material – NNM.

Zuurland

Location – A series of boreholes made by Mr. Leen Hordijk, near the city of Brielle, province of Zuid-Holland, some 30 km W of Rotterdam, at 14.75 - 100.00 m below surface. There are several layers with different stratigraphic context (Tiglian - Holocene). Here, we only mention taxa from layers of clearly Pliocene age (i.e., Tiglian), omitting the Cromerian and younger layers.

Stratigraphy – Late Tiglian.

Literature – Hordijk (1988), Reumer & Hordijk (1999), Reumer (2003) for stratigraphic inferences.

Insectivores – Talpidae: *Galemys kormosi* (Schreuder, 1940), *Desmana thermalis* Kormos, 1913, *Talpa minor* Freudenberg, 1914, *Talpa* sp. indet. Soricidae: *Sorex* cf. *S. casimiri* Rzebik-Kowalska, 1991, *Sorex minutus* Linnaeus, 1766, *Sorex* (*Drepanosorex*) *praearaneus* Kormos, 1934, *Beremendia fissidens* (Petenyi, 1864), *Petenyia hungarica* Kormos, 1934.

Taxonomic descriptions – Reumer & Hordijk (1999) described the insectivores from Zuurland.

Storage of material – LH; will ultimately be housed in NMR.

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