

**DISTRIBUTION OF *MONSPELIENSINA PSEUDOTEPIDA* IN
NORTH-WESTERN GERMANY AND ADJACENT COUNTRIES
(FORAMINIFERA, TERTIARY, LATE MIOCENE-PLIOCENE)**

by

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The benthonic foraminifer *Monspeliensina pseudotepida* van Voorthuysen, 1950), hitherto known from the Late Neogene of France, the United Kingdom, Belgium, The Netherlands and the southern North Sea off-shore region, is described here as occurring in many samples from shallow wells in the Emsland area of Lower Saxony. The stratigraphic age (Late Miocene-Pliocene) and the position within the hitherto known sequences of north-western Germany is discussed.

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SAMENVATTING

Verspreiding van *Monspeliensina pseudotepida* in noordwest Duitsland en aangrenzende landen (Foraminifera, Tertiair, Laat Mioceen-Pliocéen).

Van de benthonische foraminifeer *Monspeliensina pseudotepida* (Van Voorthuysen, 1950), tot op heden bekend uit het Laat Neogeen van Frankrijk, het Verenigd Koninkrijk, België, Nederland en het zuidelijk offshore-gedeelte van de Noordzee, wordt het voorkomen beschreven in vele monsters uit ondiepe boringen in het Emsland-gebied in Nedersaksen. De stratigrafische ouderdom (Laat Mioceen-Pliocéen) en de relatie tot reeds bekende secties in NW Duitsland worden besproken.

INTRODUCTION

At several places, covering a wide area in the Emsland region of Lower Saxony, glauconitic marine silts and silty clays have been drilled, which yield a peculiar microfauna. The general aspect of these assemblages does not differ much from the complex of the so-called Late Miocene microfauna of Staesche & Hiltermann (1940) or the same of Spiegler (1974). As uvigerinids are absent, the attribution to one of the zones described by von Daniels & Spiegler (1977, 1979) is impossible. The presence of the epistomariid foraminifer *Monspeliensina pseudotepida* (van Voorthuysen, 1950) in these samples gives a first indication on the age.

PREVIOUS KNOWLEDGE

Monspeliensina pseudotepida was initially described from a pre-war borehole at Den Haag, as a dwarfed variety of "*Streblus*" *beccarii* (Linné). It has been encountered in the meantime in Late Neogene beds of a wide areal distribution. The stratigraphic position mentioned in the original paper was "Poederlian-Scaldisian".

Margerel (1968) identified the species in the crag-like lithologies of the Redonian in France (Basse Loire), on both sides of the Loire estuary. It is also known from the clay and sand sequence of Bosc d'Aubigny of the Cotentin Peninsula (Margerel, 1970, 1972).

In Great Britain, the species is described and figured from the clays of the St. Erth Beds in Cornwall and from the Coralline Crag of Norfolk by Hughes & Jenkins (1981). The St. Erth Beds are considered to be younger than the Coralline Crag and both are placed into the Pliocene (Jenkins, 1987).

The Antwerpen area of Belgium, with crag layers in sandy sequences, and the western Netherlands, with beds of the same lithology, are further occurrences of *Monspeliensina pseudotepida*, as known since van Voorthuysen (1958) and van Voorthuysen & Toering (1969). Their lithostratigraphic position can be described as the Kattendijk Sand Formation of Belgium and the Upper Breda or Lower Oosterhout Formation of The Netherlands.

In the meantime, the stratigraphic position of these beds can also be indicated in terms of modern biostratigraphic zonation. The Belgian equivalent is the BFN 4 Zone of Doppert, Laga & de Meuter (1979), originally described by de Meuter & Laga in 1976 as *Florilus boueanus*-*Monspeliensina pseudotepida* Assemblage Zone. In the Netherlands beds with this foraminifer are placed into the subzone FC 1 and the zone FB of Doppert (1980). In the southern North Sea the species indicates the NSB 14 Zone of King (1983).

The assemblages of the Redonian from the type area near Rennes in France are highly diverse, with an abundance of taxa known to be connected with the phytal environment, or generally indicating shallow water. Other peculiarities of the western sediments with *Monspeliensina pseudotepida* are the presence of *Faujasina* species and the genus *Alliatina*.

BIOSTRATIGRAPHY OF THE EMSLAND OCCURRENCES

Contrary to the high diversity of the assemblages from France and the United Kingdom, the beds of the Emsland region contain no *Faujasina*, *Alliatina*, *Rosalina*, *Glabratella* or *Planorbulina*. The only

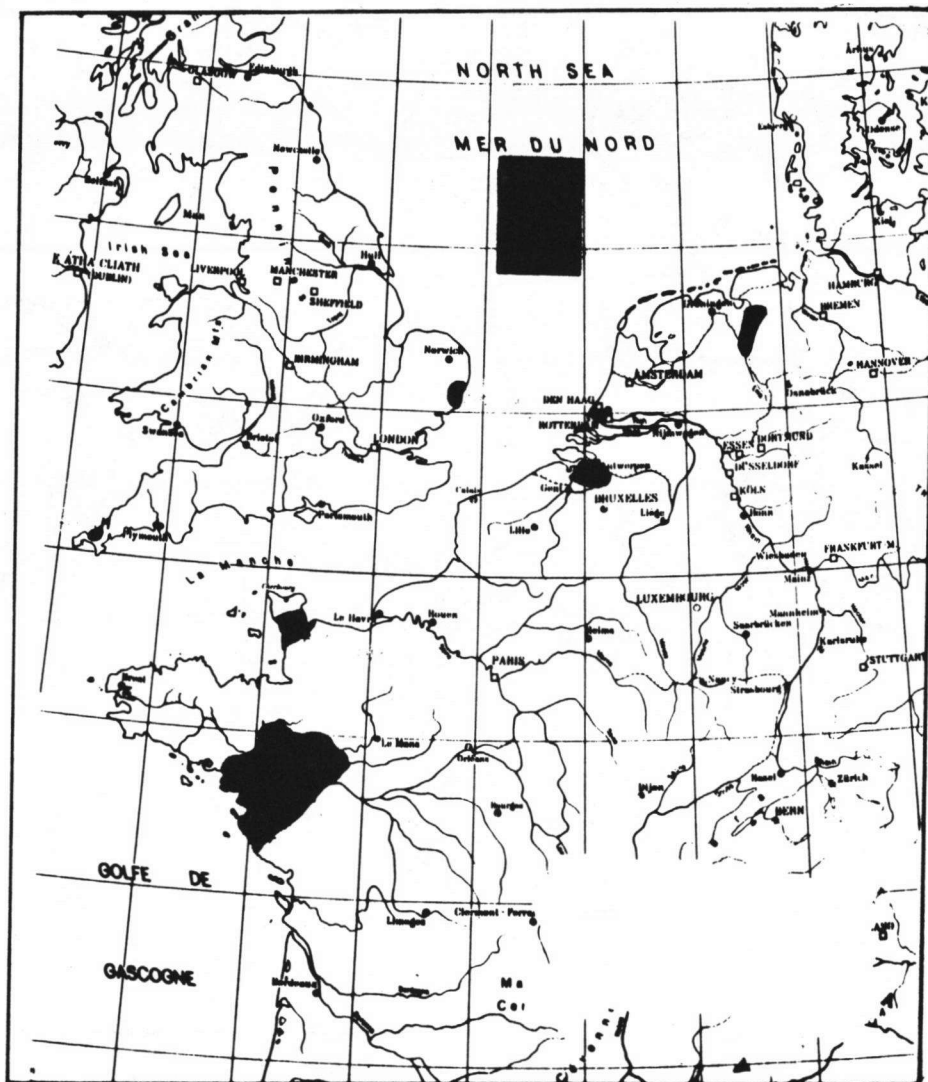


Fig. 1. Occurrence of *Monspeliensina pseudotepida* van Voorthuysen, 1950 in NW-Europe; approximate areas in black.

peculiar taxon is a large *Pyrgo*, which is not unknown from the other occurrences. It is present for instance in the Cotentin Peninsula (Margerel, 1970) and was already figured in ten Dam & Reinhold (1941) as *Pyrgo bradyi* (Schlumberger) from the "Scaldisian". Presence of rather well-developed *Ammonia beccarii* (Linné, 1758) indicates near-shore conditions. The same is known from most of the assemblages with *Monspeliensina pseudotepida*, also outside Germany.

Toering & van Voorthuysen (1973) described Early Pliocene foraminiferal faunae from the eastern provinces Overijssel and Gelderland of The Netherlands. Unfortunately they did not give complete lists, but noted only peculiarities. Among these, *Lagena costairregularis* Toering & van Voorthuysen is no foraminifer, but a *Bolboforma* (algae; see Spiegler, 1987). It has been found also in the Emsland area, so probably the *Monspeliensina pseudotepida* beds of the Emsland are the easternmost continuation of these strata from the north-eastern Netherlands.

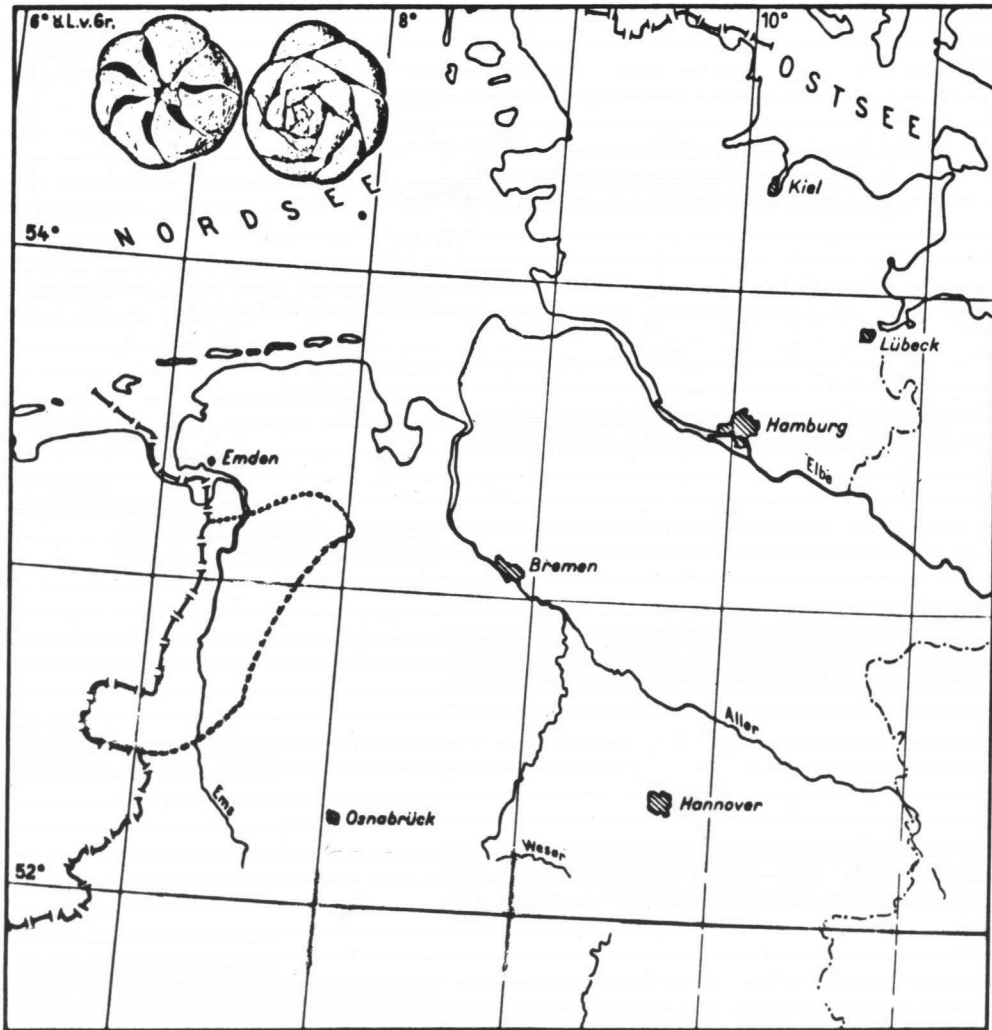


Fig. 2. Approximate area of *Monspeliensina pseudotepida* beds in the Emsland region of Lower Saxony.

Comparing the assemblages from the Emsland region with the system of Doppert zones, we have to consider the co-occurrence of *Monspeliensina pseudotepida* with *Globobulimina auriculata* (Bailey, 1851), *Valvulineria mexicana grammensis* Langer, 1963 and "*Lagena*" *costairregularis*, which is more in favour of an attribution to the FC 1 Subzone, than to the FB Zone.

The position within the German sequence is difficult to describe. The hitherto youngest microfauna from the Neogene of Germany was figured from the Mica Fine Sand Formation of Sylt by Staesche & Hiltermann (1940). This is the Syltian Stage of Staesche (1930). Its fauna is similar, but contrary to Hinsch (1986) it lacks *Monspeliensina pseudotepida*. Also this assemblage does not contain *Uvigerina* species, but is observed to overlie beds of the *Uvigerina saxonica* Zone. In terms of foraminiferal biostratigraphy the Mica Fine Sand of Sylt is closely related to the other Late Miocene beds of north-western Europe. The benthonic foraminifers from the subsequent Morsumian Stage of Hinsch (1958) are largely unknown, because of intense recrystallization. Probably they are of the same, or slightly older age.

Perhaps the ostracod fauna may yield further evidence. The "Syltian" contains, according to Uffenorde (1981) *Muellerina latimarginata parvipunctata* Uffenorde, 1981, whereas in the beds with *Monspeliensina pseudotepida* the species *Muellerina lacunosa* (Jones, 1857) is present. This latter species was originally described from the Coralline Crag and recognized by Wouters (1979) in the Kattendijk and Lillo formations of the Antwerpen area.

Presence or absence of the foraminifer *Pararotalia serrata* (ten Dam & Reinhold, 1941) is regarded as a criterion differentiating between earlier or later assemblages within the Pliocene of the area, the beds with *Pararotalia*, as for instance those from Bosq d'Aubigny and St. Erth, being the younger. In the Emsland occurrences this form is generally absent. As the species is highly dependant on facies, this seems to be a rather unsafe index. The genus as a whole, however, seems to be closely connected with warm sea-water, as is demonstrated by the occurrences in the Lutetian of the Paris Basin and adjacent areas. A higher temperature is supposed by Jenkins (1987) for the St. Erth planktonic foraminiferal assemblage in comparison with the Coralline Crag.

Though there are only a few planktonic Foraminifera and no short-ranging nannoplankton species available from our German samples, a correlation with the Coralline Crag and the Kattendijk Formation of Early Pliocene age seems to be rather probable.

ORIGIN OF THE SAMPLES

The marker species of the German *Monspeliensina pseudotepida* beds has been identified from a large area in the Emsland region. Most of the occurrences have been recorded from shallow groundwater survey wells. The usual procedure was to penetrate the coarser clastic sequences of the Quaternary by flush-drilling and to core some meters of the subsequent fine-grained Tertiary sediments. Very few wells have also penetrated into the levels below the *Monspeliensina pseudotepida* beds, encountering either Late Miocene of Langenfeldian/Gramian affinities ("Obermiozän" in the sense of Staesche & Hiltermann, 1940), or older strata. At Haselünne, rather fossiliferous marine Middle Eocene deposits were found to occur only some 30 meters below these beds.

The sampling depths vary between 43 m below surface near Wilsum on the 3407 Neuenhaus Nord, and 200 m on the 2910 Papenburg map-sheets. The wells, altogether 49, are distributed on the following sheets of the 1:25,000 topographic map: 2712 Apen; 2809 Bunde; 2810 Weener; 2909 Rhede; 2910 Papenburg; 2911 Burlage; 3010 Wippen; 3108 Rütenbrock; 3109 Lathen; 3208 Hebelmeer; 3209 Haren; 3211 Lähden; 3308 Twist; 3309 Meppen; 3310 Haselünne; 3406 Itterbeck; 3407 Neuenhaus Nord.

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