WINE: putting the fossil insectivores on record

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Introduction

In their report of a meeting at Reisensburg, the RCMNS working group on fossil mammals presented ranges of Neogene mammal genera (De Bruijn *et al.*, 1992). However, no erinaceid, talpid or shrew can be found in the tables. The working group concluded (p. 70); " The omission of all the insectivores is regretted, but the participants of the Reisensburg meeting consider this order insufficiently known at this moment." In 1990, this position was justifiable if not justified. Mammal studies up until then had focused on the stratigraphical position of the various faunas. The insectivores, far less numerous than the rodents, usually played a minor role in these studies and were either identified provisionally or not included at all. Detailed descriptions of insectivores were usually furnished in monographs (e.g. Doben-Florin, 1964; Müller, 1967; Repenning, 1967; Engesser, 1975; Ziegler, 1983; Reumer, 1984; Rümke, 1985). However, already in the 1970s and 1980s, some palaeontologists were specializing in insectivores, resulting, for example, in a complete series on the Pliocene and Pleistocene insectivores from Poland (Rzebik-Kowalska, 1971, 1975, 1976, 1981, 1989, 1990a, b, 1991), and overviews from insectivores from Spain (Gibert, 1974, 1975) and Anatolia (Engesser, 1980).

Around the time of the Reisenburg conference, a change was taking place in mammal palaeontology. As it became clear that our climate was changing, palaeontologists focused more and more on environmental changes in the past. In mammal palaeontology, this implied that not just taxa that were interesting as stratigraphical markers needed to be studied, but also faunas as a whole. This, together with the rise of a new generation of specialists, gave new opportunities for the study of insectivores. Probably the best-studied area for insectivores is southern Germany, on which a large number of papers appeared by the hand of Ziegler (1985, 1989, 1990a, b, 1994, 2000, 2003a, b, 2005a; Ziegler & Fahlbush, 1986), who later turned his attention also to Austria (Ziegler, 1998,

2003c, 2005b). Van den Hoek Ostende (1992, 1995a, b, 1997, 2001a-d) published a series on the insectivores from the Lower Miocene of Anatolia and continued to work on Spanish insectivores (Van den Hoek Ostende, 2003a, b; Van den Hoek Ostende & Doukas, 2003). In Greece, the excavations at Aliveri and Maramena resulted in papers on insectivores (Doukas, 1986, Doukas *et al.* 1995), and the insectivores were described as an integral part of a new mammal zonation in Switzerland (e.g., Bollinger, 1992; Bollinger *et al.*, 1993; Kälin & Engesser, 2001).

This list, far from being extensive, shows that at the end of the 1990s our knowledge on the group had increased considerably. This is also clear from the first overviews on European insectivores (Engesser & Ziegler, 1996; Ziegler, 1999). Moreover, the promise of insectivores as palaeoenvironmental markers had been shown. Van Dam (1997) and Van den Hoek Ostende (2001d, 2003a) used simple abundance of insectivores as a proxy for humidity, and Van Dam (2004) demonstrated that the occurrence of Anourosoricini in Spain correlated with isotope events. Nevertheless, the role of insectivores in palaeontological studies remained a minor one, as became clear during the ESF-funded project 'Environments and Ecosystem Dynamics in the Eurasian Neogene' (EEDEN). As before, small mammal studies in this project focused on rodents.

It is by no means a coincidence that the first meeting leading to the present publication was held as an offshoot of the EEDEN meeting of November 2002 at the Senckenberg Natural History Museum in Frankfurt am Main, Germany. At the initiative of Constantin Doukas, specialists in fossil insectivores met to discuss how to improve the profile of their favourite animals in (mammal) palaeontology. This resulted in an informal cooperation in the Workinggroup on Insectivores from the Neogene of Eurasia, WINE for short. At the meeting was it decided that the first step would be to present the fossil record of insectivores as we know it. The purpose of this is two-fold. On one hand, presenting the fossil record will make the data of specialists available to model makers. On the other hand, it can be used for specialists to recognise where material from specific geographical and/or stratigraphical ranges can be found.

In order to make the fossil record open to non-specialists, a consistent classification is imperative. Specialists will recognise for example that *Oligosorex* is used for what other colleagues refer to as *Crocidosorex*, or that *Archaeodesmana* and *Ruemkelia* are both alternative names for the pre-occupied *Dibolia* Rümke, 1985 [*nec* Latreille, 1829]. But to the layman this is not clear, and simply putting data from the literature into a model will give interesting results, sometimes reflecting the preference for a certain classification of scholars working in different areas. Getting the classification used in this volume as consistent as possible was one of the greater challenges for the editors. Since in some cases it means cutting a knot, Burkart Engesser of the Basel Museum was appointed to the difficult task of being the umpire in those cases where the members of the working group were deadlocked. For this, we owe him our thanks, since it can be an ungrateful job. We wish to make it clear that it is not the intent of WINE to present the ultimate classification for fossil insectivores. Progress in the taxonomy of insectivores comes from discussions, and various authors have argued in their contributions why they do not agree with the classification used herein. That this classification is a compromise is perhaps best illustrated by the fact that none of the three editors agree with enclosing the Heterosoricidae within the Soricidae, but we, too, have to abide by the rules laid out beforehand. We admit that, in the end, we did not succeed in getting the classification

completely consistent. For instance, the argument on the generic classification of the species of the shrews *Petenyia* and *Blarinella* (see, e.g., Reumer, 1984; Storch, 1995) is not easily solved, and the use of these names is certainly not consistent. The same may hold true in some other cases, which have slipped the attention of the editors.

The meeting in Senckenberg involved specialists from the Czech Republic, Germany, Greece, The Netherlands, Spain, Switzerland and Ukraine. Shortly after the meeting, colleagues from Austria, Bulgaria, China, Poland and the Slovak Republic joined in. The present volume presents the data provided by these colleagues, mostly from their home country, but also from their research areas abroad. Although the present volume provides a good coverage, particularly of Europe, there are still some notable absentees (France and Turkey, to name just two). Therefore, this is Part 1 of the fossil record of Neogene Insectivores from Eurasia. The editors are still looking for volunteers to contribute to Part 2 and anyone inspired by the present volume is invited to step forward.

Structure

It may be surprising to some that, in this day and age in which databases play an ever-increasing role in palaeontology, we elected to publish our results in a hard-copy format. We chose to do so for two reasons. Firstly, a paper holds much more room for argument than a database and arguments are the basis for scientific progress. Secondly, the main problem of any database is consistency of data. Since the editing process of a volume like this one is far more intense than that for a database, we feel that this improves the quality of the data. Still, as we pointed out earlier, our aim is to contribute to model making. Therefore, the WINE data will also be presented in the Neogene Old World (NOW) database (www.helsinki.fi/science/now/).

Each paper consists of an introduction outlining the history of insectivore research followed by a list of insectivore faunas from the Neogene of the area of interest. Recently, the Neogene has been redefined to include the Pleistocene and Holocene. Herein, however, we use it in its former restricted sense, that is from the Oligocene/Miocene boundary to the Villanyian/Biharian boundary. The lists are organised according to the MN-zonations, with localities listed alphabetically within each zone. Although the MN-zonation has been subject to criticism over the years (e.g., Van Dam *et al.* 2001), we feel there are still no reliable alternatives available at the present. In spite of all the theoretical disadvantages, it still provides the best system for interregional correlation within Europe. For correlation with China, for example, the MN-system becomes tentative; consequently the contribution on China by Qiu and Storch has been organised according to the regional mammal stages.

For each locality six or seven headings have been given. These are:

Location – Here the topography of the locality is outlined. Whenever available, longitude and latitude coordinates are given. In the Swiss contribution the coordinates given reflect those from the geological map of Switzerland.

Stratigraphy – The heading is mainly intended for chronostratigraphical data according to regional zonations, but may also include lithostratigraphical, biostratigraphical and/or palaeomagnetic data.

Literature – Here the background literature for the locality is given.

Insectivores – This is the actual list of insectivores, according to the most up-to-date classification. Usually the data have been taken from literature, but some of the data presented in these contributions are new.

Taxonomic descriptions – The contributions combine data from various sources. The source is important, since it provides also a measure of reliability. A faunal list provided by a layman is more likely to contain errors than detailed descriptions by a specialist. The heading also indicates when the listing includes taxons not mentioned in literature.

Storage of material – From a scientific point of view, the whereabouts of the material is part of the primary data. It allows scientists the ability to restudy material and thus verify or falsify earlier conclusions. Unfortunately, in some cases authors failed to mention the storage, so that these data could not always be provided.

Remarks – The additional field 'remarks' is used for any comment, either on a particular locality or on the classification used.

We are pleased to dedicate this volume to Charles Repenning and Miklós Kretzoi, both pioneers in the study of fossil insectivores.

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