A tentative classification of the Eurasian Paleogene and Neogene Muridae above the species level

by
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Introduction

It is with great hesitation that I set myself the task to re-group the overwhelming diversity of Eurasian Paleogene and Neogene murid genera. This presumptuous enterprise, which is, as regards the genera, largely based on the murid section in the monumental work of McKenna and Bell (1997), is meant to initiate a discussion on the recognition of higher categories within the Muridae. In order to standardise the entry of data into databases an, at least temporarily, widely accepted set of taxonomical units above the genus level is essential.. In the recognition of genera and synonymies I generally have followed McKenna and Bell (1997). It will be indicated where I follow my personal judgement. There are two main reasons that make the scheme presented by these authors unsatisfactory: 1) The recognition of three categories (subfamily, tribe and sub tribe) within a family where the phylogenetic affinities between many genera are obscure, 2) The in my opinion underestimation of convergent evolution in the dentitions of species from different lineages, time-slices and geographical areas.

Between the family and genus level I recognise one category only, the subfamily. This alone makes my grouping of genera essentially different from that suggested by McKenna and Bell. Reasons for my choices will not be discussed, because that would be beyond the aim of this paper and make it unnecessarily long. Some of the twentyfive subfamilies recognised (i.e. Cricetinae) are impossible to diagnose because they embrace genera with very different dentitions. The alternative solution, however, would lead to the definition of a large number of mono-generic subfamilies. A procedure that, in my opinion, should be avoided because it disguises the problems. Genera with dental characteristics that are very similar to those of one of the formally recognised subfamilies, but that are for stratigraphical and/or geographical reasons obviously not phylogenetically affiliated to that subfamily will be listed as “incertae sedis” at the end of the list of genera with that subfamily in order to facilitate ecological grouping.

Literature references follow those given in the compilation of McKenna and Bell (1997). Later entries have been added. The sequence in which the subfamilies are listed is based on a combination of first occurrence and supposed phylogenetical affiliation.

List of the Eurasiatic Paleogene and Neogene subfamilies of the Muridae

Pappocricetodontinae Tong, 1997
Paracricetodontinae Mein & Freudenthal, 1971
Eucricetodontinae Mein & Freudenthal, 1971
Pseudocricetodontinae Engesser, 1987
Adelomyarioninae Ünay-Bayraktar, 1989
Tachyoryctoidinae Schaub, 1958
Melissiodontinae Schaub, 1925
Heterocricetodontinae Ünay-Bayraktar, 1989
Cricetopinae Matthew & Granger, 1923
Platacanthomyinae Alston, 1876

Eumyarioninae Ünay-Bayraktar, 1989
Anomalomyinae Schaub, 1925
Spalacinae Gray, 1821
Copemyinae Jacobs & Lindsay, 1984
Megacricetodontinae Mein & Freudenthal, 1971
Cricetodontinae Schaub, 1925
Cricetinae Fischer von Waldheim, 1817 (including Trilophomyidae Kretzoi, 1969)
Lophiomyinae Milne-Edwards, 1867
Murinae Illiger, 1811
Arvicolinae Gray, 1821
Microtoscoptinae Kretzoi, 1955
Myospalacinae Lilljeborg,1866
Rhizomyidae Winge, 1887
Gerbillinae Gray, 1825
Myocricetodontinae Lavocat, 1961

List of the murid genera included in each subfamily

Pappocricetodontinae Tong, 1997
Pappocricetodon Tong, 1992
(= /or including *Raricricetodon* Tong, 1997)
Palasiomys Tong, 1997
Witenia de Bruijn, Ünay, Saraç & Yilmaz, 2003

Paracricetodontinae
Paracricetodon Schaub, 1925
Trakymys Ünay-Bayraktar, 1989

Eucricetodontinae Mein & Freudenthal, 1971
Eucricetodon (*Eucricetodon*) Thaler, 1966
Eucricetodon (*Atavocricetodon*) Freudenthal, 1996
Incertae sedis:
Muhsinia de Bruijn, Ünay, van den Hoek Ostende & Saraç, 1992

Pseudocricetodontinae Engesser, 1987
Pseudocricetodon Thaler, 1969
(= /or including *Allocricetodon* Freudenthal, 1994)
Cincamyarion Agusti & Arbiol, 1989
Lignitella Ünay-Bayraktar, 1989

Adelomyarioninae Ünay-Bayraktar, 1989
Adelomyarion Hugueney, 1969
Kerosinia Ünay-Bayraktar, 1989

Tachyoryctoidinae Schaub, 1958

Tachyoryctoides Bohlin, 1937
(=/or including *Aralomys* Archyropulo, 1939)
Argyromys Schaub, 1958
Eumysodon Archyropulo, 1939

Melissiodontinae Schaub, 1925
Melissiodon Schaub, 1925
Edirnella Ünay-Bayraktar, 1989

Heterocricetodontinae Ünay-Bayraktar, 1989
Heterocricetodon Schaub, 1925

Cricetopinae Matthew & Granger, 1923*
(*Should have been Cricetopsinae?)
Cricetops Matthew & Granger, 1923
Enginia de Bruijn & von Koenigswald, 1994

Platacanthomyinae Alston, 1876
Platacanthomys Blyth, 1859
Typhlomys Milne-Edwards, 1877
Neocometes Schaub & Zapfe, 1953

Eumyarioninae Ünay-Bayraktar, 1989
Eumyarion Thaler, 1966
Mirabella de Bruijn, Ünay, Saraç & Klein Hofmeijer

Anomalomyinae Schaub, 1925
Anomalomys Gaillard, 1900
Prospalax Mehely, 1908

Spalacinae Gray, 1821
Heramys Klein Hofmeijer & de Bruijn, 1985
Debruijnia , Ünay,1996
Pliospalax Kormos, 1932
(=/or including *Sinapospalax* Sarica & Sen, 2003

Copemyinae Jacobs & Lindsay, 1984
(=/or including Democricetodontini Lindsay, 1987)
Democricetodon Fahlbusch, 1964
(=/or including *Fahlbuschia* Mein & Freudenthal, 1971, *Pseudofahlbuschia* Freudenthal & Daams, 1988, *Renzimys* Lacomba Andueza, 1983
Primus de Bruijn, Hussain & Leinders, 1981
Karydomys Theocharopoulos, 2000
Spanocricetodon Li, 1977

Megacricetodontinae Mein & Freudenthal, 1971

Megacricetodon Fahlbusch, 1964

(=/or including *Collongomys* Mein & Freudenthal, 1971)

Cricetodontinae Schaub, 1925

(This name is used here in the restricted sense and includes genera that are considered to be phylogenetically affiliated to the genus *Cricetodon* Lartet,1851.Cricetodontinae consequently includes *Gobicricetodontinae* Qiu, 1996).

Cricetodon Lartet, 1851

(=/or including *Palaeocricetus* Archyropulo, 1938, *Turkomys* Tobien, 1978, *Pararuscinomys* Agusti,1981, *Mixocricetodon* Rummel, 1997)

Hispanomys Mein & Freudenthal, 1971

Ruscinomys Depéret, 1890

(=/or including *Pseudoruscinomys* Mein & Freudenthal, 1971)

Byzantinia de Bruijn, 1976

Gobicricetodon Qiu,1996

Plesiodipus Young, 1927

Rhinocerodon Zazhigin, 2003

Blancomys van de Weerd, Adrover, Mein & Soria, 1977

Incertae sedis:

Tsaganocricetus Topachevsky & Skorik, 1988

Depéretomys Mein & Freudenthal, 1971

Lartetomys Mein & Freudenthal, 1971

Selenomys Matthew & Granger, 1923

Meteamys de Bruijn, Ünay, van den Hoek Ostende & Saraç, 1992

Cricetinae Fischer von Waldheim, 1817

(Including Trilophomyinae Kretzoi, 1969. The generic name *Pannonicola* Kretzoi, 1965 is considered a nomen dubium because it is based on insufficient material).

Cricetus Leske, 1779

Cricetulodon Hartenberger, 1966

Rotundomys Mein, 1965

Microtocricetus Fahlbusch & Mayr, 1975

Ischimomys Zazhigin, 1971

Collimys Daxner- Höck, 1972

Hattomys Freudenthal, 1985

Kowalskia Fahlbusch, 1969

(=/or including *Karstocricetus* Kordos, 1987, *Neocricetodon* Kretzoi, 1951)

Pseudocricetus Topachevsky & Skorik, 1992

Apocricetus Freudenthal, Mein & Mártín Suárez, 1998

Allocricetus Schaub, 1930

(? =/or including *Moldavimus* Samson & Radulesco, 1973

Cricetulus Milne-Edwards,1867
Gromovia Erbajeva, Alexeeva & Khenzykhenova, 2003
Hypsocricetus Daxner-Höck, 1992
Anatolomys Schaub, 1934
Trilophomys Depéret, 1892
Mesocricetus Nehring, 1898
In addition to the genera of the Cricetinae (of which I have seen material and/or adequate figures) listed above there are a number of generic names of uncertain status based on Late Neogene Asiatic material that I have not seen. These are: *Cricetinus* Zdansky, 1928, *Nannocricetus* Schaub, 1934, *Sinocricetus* Schaub,1930, *Paracricetulus* Young, 1927, *Chuanocricetus* Zheng, 1993, *Amblycricetus* Zheng, 1993 *Neocricetodon* Schaub, 1924 and *Tscherskia* Ognev, 1914. In my opinion, which is in part based on figures, the *Cricetinae* have been oversplit.

Lophiomyinae Milne-Edwards,1867
Microlophiomys Topachevsky & Skorik, 1984
Protolophiomys Aguilar & Thaler, 1987

Murinae Illiger, 1811
Antemus Jacobs, 1978
(=/or including *Potwarmus* Lindsay,1988)
Progonomys Schaub, 1938
Huaxiamys Wu & Flynn, 1992
Karnimata Jacobs, 1978
(This name may not be available because of the possible synonymy of *K. huxleyi* (type species) and *Progonomys woelferi* Bachmayer & Wilson, 1970)
Huerzelerimys Mein, Mártín Suárez & Agusti, 1993
(Replaces *Valerimys* Michaux, 1969)
Micromys Dehne, 1841
Apodemus Kaup, 1829
Rhagapodemus Kretzoi, 1959
Microtia Freudenthal, 1976
Paraethomys Petter, 1968
Castillomys Michaux, 1969
Occitanomys Michaux, 1969
(=/or includes *Centralomys* de Giuli, 1989, *Occitanomys* (*Rhodomys*) Mártín Suárez & Mein, 1991
Hansdebruijnia Storch & Dahlmann, 1995
Orientalomys de Bruijn & van der Meulen, 1975
(=/or includes *Euxinomys* Sen, 1975)
Chardinomys Jacobs & Li, 1982
Parapodemus Schaub, 1938
Castromys Mártín Suárez & Freudenthal, 1994
Stephanomys Schaub, 1938
Anthracomys Schaub, 1938
Mus Linnaeus, 1758
Saidomys James & Slaughter, 1974
Yunomys Qiu & Storch, 1990

Parapelomys Jacobs, 1978
Pelomys Peters, 1852
Dilatomys Sen, 1983
Arvicanthis Lesson, 1842
(Late Miocene, N. Greece, Hordijk & de Bruijn, in press)
Linomys Storch & Ni, 2002
Leilaomys Storch & Ni, 2002

The genera *Wushanomys* Zheng, 1993 and *Niviventer* Marshall, 1976 reported from the Pliocene of China, I have not seen.

Arvicolinae
Promimomys Kretzoi, 1955
Microtodon Miller, 1927
(=/or including *Baranomys* Kormos, 1933, *Bjoernkurtenia* Kowalski, 1992)
Mimomys Forsyth Major, 1902
Villanyia Kretzoi, 1957
Dolomys Nehring, 1898
Pliomys Mehely, 1914
(=/or including *Propliomys* Kretzoi, 1959)
Stachomys Kowalski, 1960
Ungaromys Kormos, 1932
(=/or including *Betfiamys* Terzea, 1973, *Germanomys* Heller, 1936)
Ellobius Fischer von Waldheim, 1814
Synaptomys Baird, 1857

There further are the genera *Aratomys* Zazhigin, 1972, *Kilarcola* Kotlia, 1985 and *Eothenomys* Miller, 1896 of which I have seen neither material nor pictures.

Microtoscoptinae Kretzoi, 1955
Microtoscoptes Schaub, 1934

Myospalacinae Lilljeborg, 1866
Prosiphneus Teilhard de Chardin, 1926

Rhizomyinae Winge, 1887
Prokanisamys de Bruijn, Hussain & Leinders, 1981
Kanisamys Wood, 1937
Eicoryctes Flynn, 1982
Protachyoryctes Hinton, 1933
Rhizomyides Bohlin, 1946
(= *Rhizomyoides* Black, 1972)
Brachyrhizomys Teilhard de Chardin, 1942
Anepsirhizomys Flynn, 1982
Pararhizomys Teilhard de Chardin & Young, 1931

Incertae sedis:
Aralocricetodon Bendukidze, 1993

Gerbillinae Gray, 1825
(Including Taterillinae Chaline, Mein & Petter, 1977)

Pseudomeriones Schaub, 1934
Abudhabia de Bruijn & Whybrow, 1994
Protatera Jaeger, 1977
(=/or including *Debruijnimys* Castillo & Agusti, 1996
Incertae sedis:
Epimeriones Daxner-Höck, 1972

Myocricetodontinae Lavocat, 1961
Myocricetodon Lavocat, 1952
(=/or including *Paradakkamys* Lindsay, 1988
Punjabemys Lindsay, 1988
Sindemys Wessels, 1996
Vallaris Wessels, Theocharopoulos, de Bruijn & Ünay, 2001
Dakkamys Jaeger, 1977
Calomyscus Thomas, 1905
Melallomys Jaeger, 1977
(=/or including *Dakkamyoides* Lindsay, 1988).