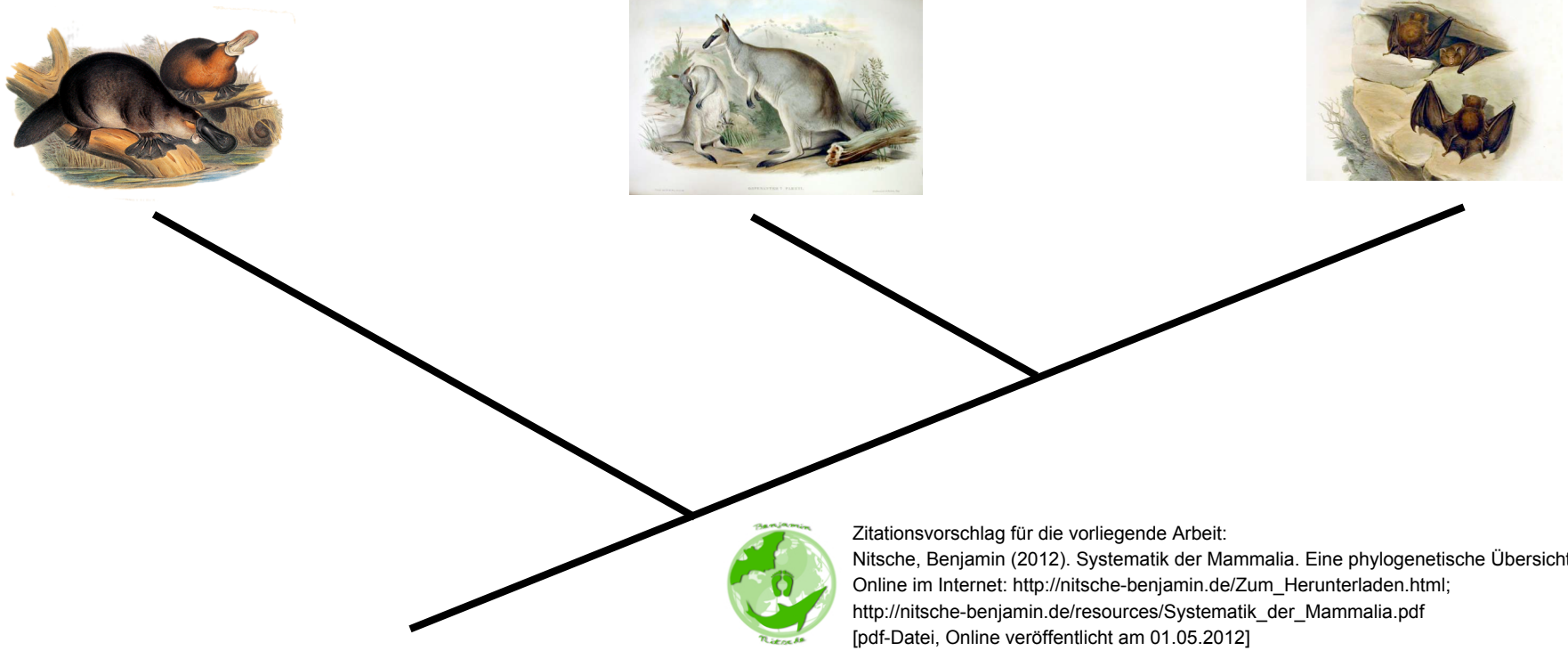
Systematik der Mammalia

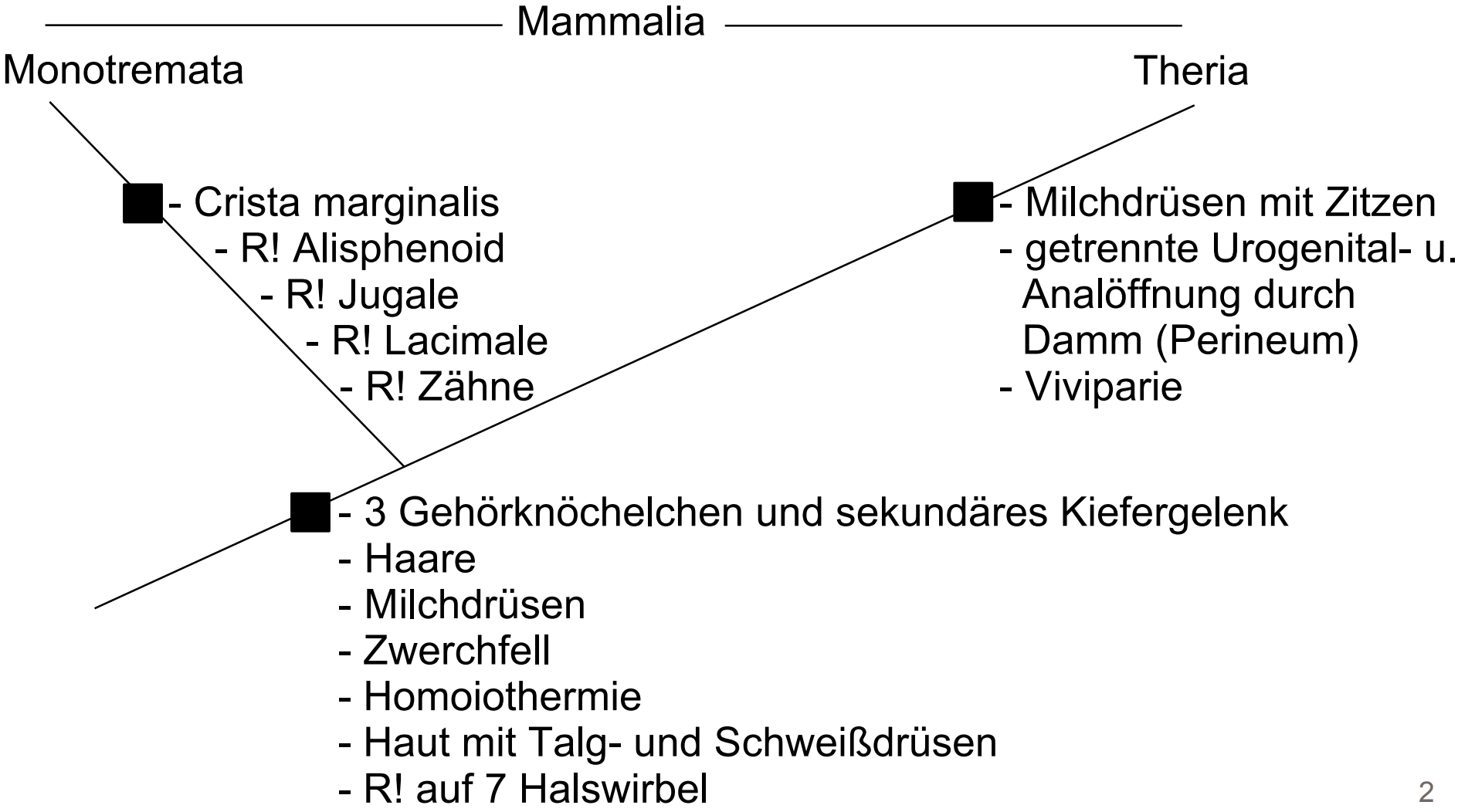
Eine phylogenetische Übersicht

Version 1.0

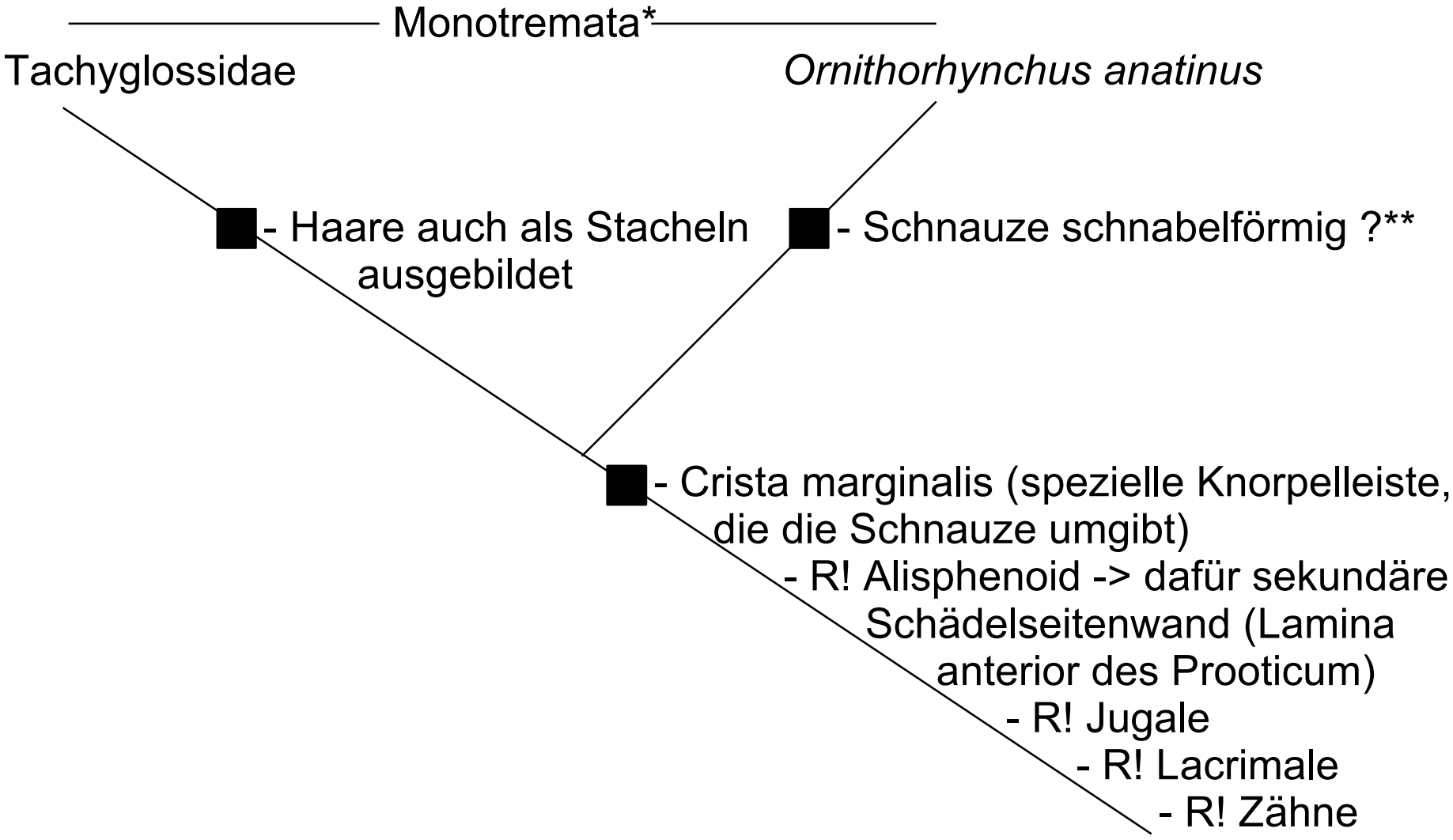


Zitationsvorschlag für die vorliegende Arbeit:
Nitsche, Benjamin (2012). Systematik der Mammalia. Eine phylogenetische Übersicht. Version 1.0. Online im Internet: http://nitsche-benjamin.de/Zum_Herunterladen.html; http://nitsche-benjamin.de/resources/Systematik_der_Mammalia.pdf [pdf-Datei, Online veröffentlicht am 01.05.2012]

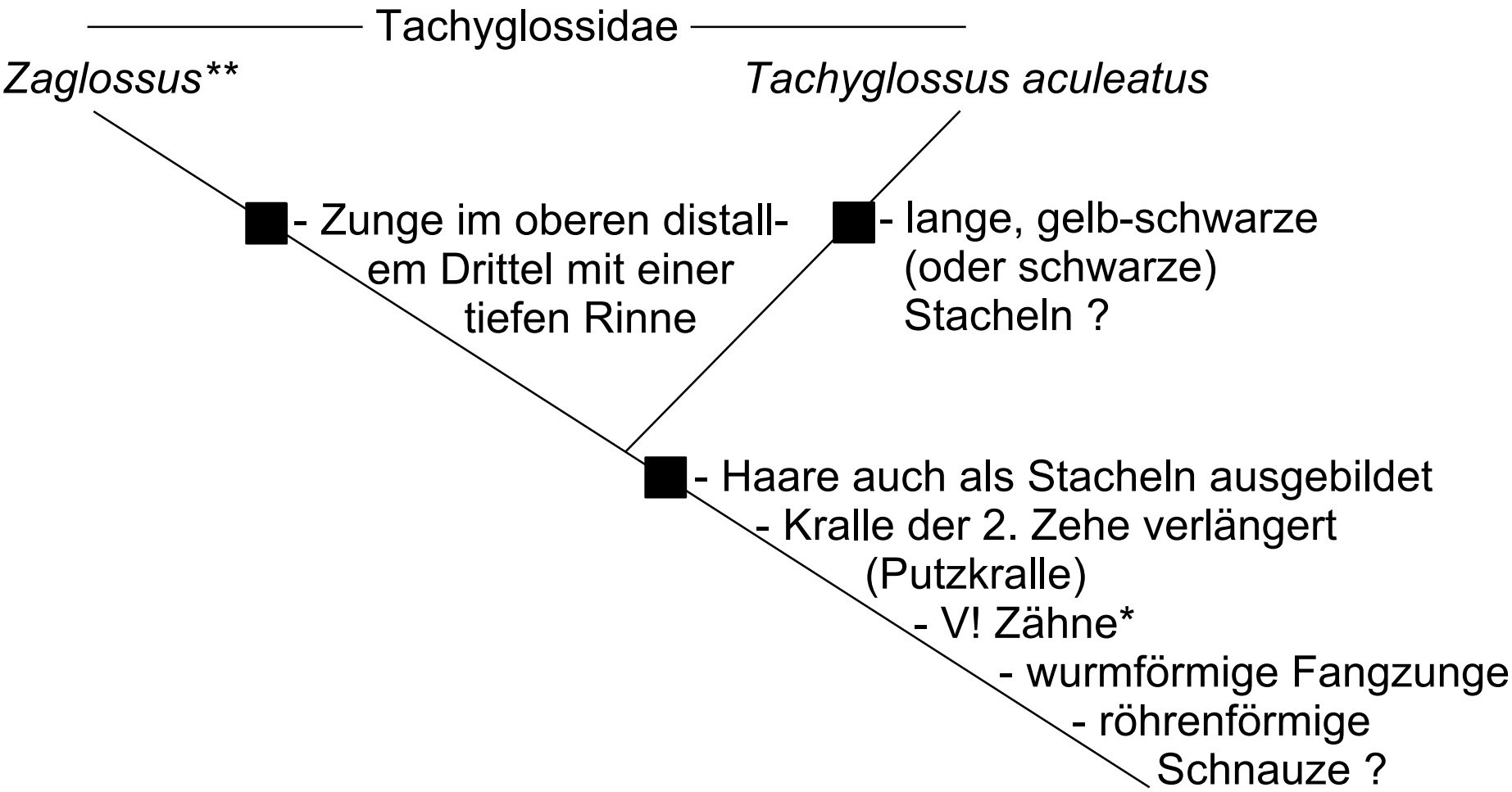
Mammalia


Mammalia
Monotremata
Theria
- Crista marginalis
- R! Alisphenoid
- R! Jugale
- R! Lacimale
- R! Zähne
- Milchdrüsen mit Zitzen
- getrennte Urogenital- u. Analöffnung durch Damm (Perineum)
- Viviparie
- 3 Gehörknöchelchen und sekundäres Kiefergelenk
- Haare
- Milchdrüsen
- Zwerchfell
- Homoiothermie
- Haut mit Talg- und Schweißdrüsen
- R! auf 7 Halswirbel

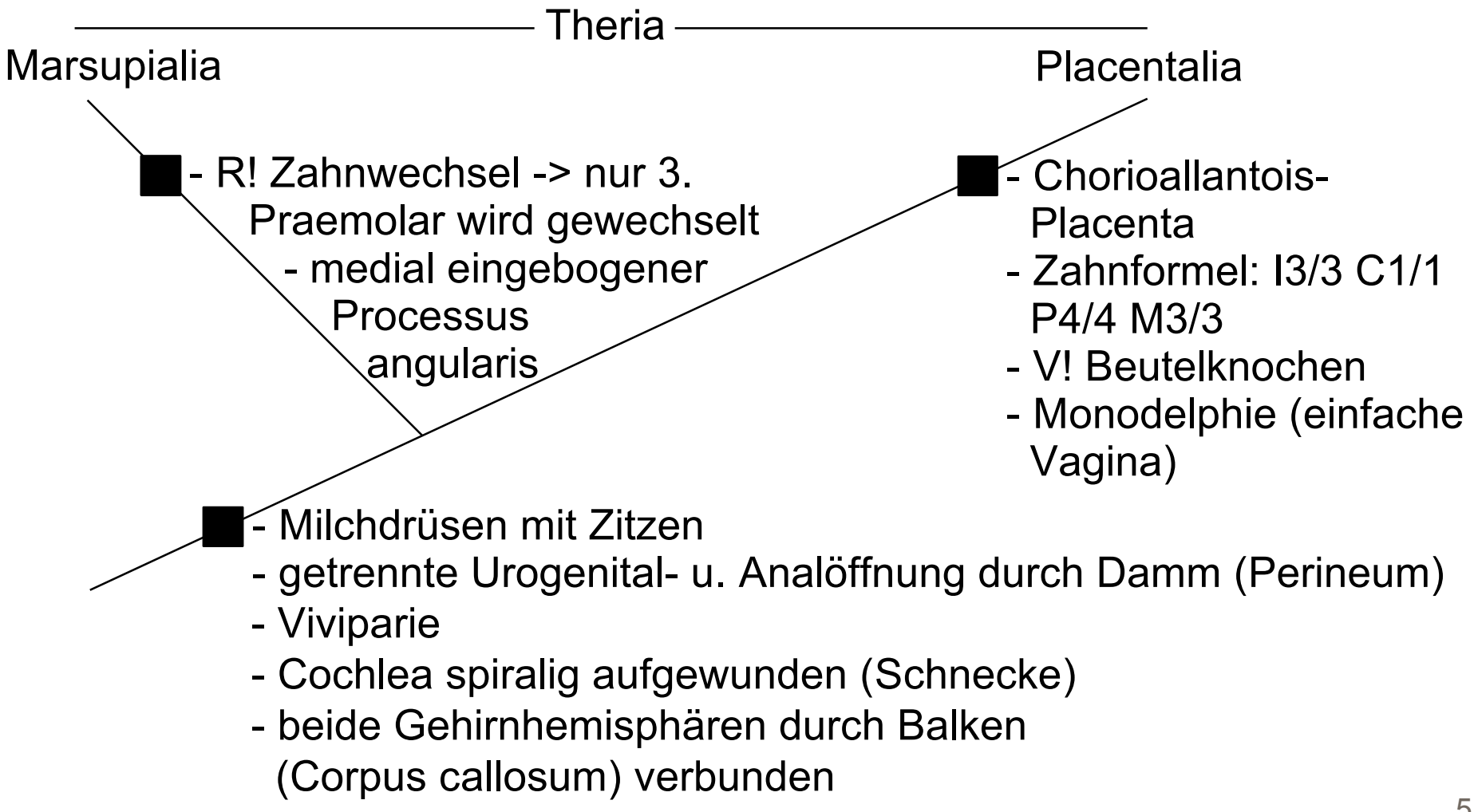
Monotremata



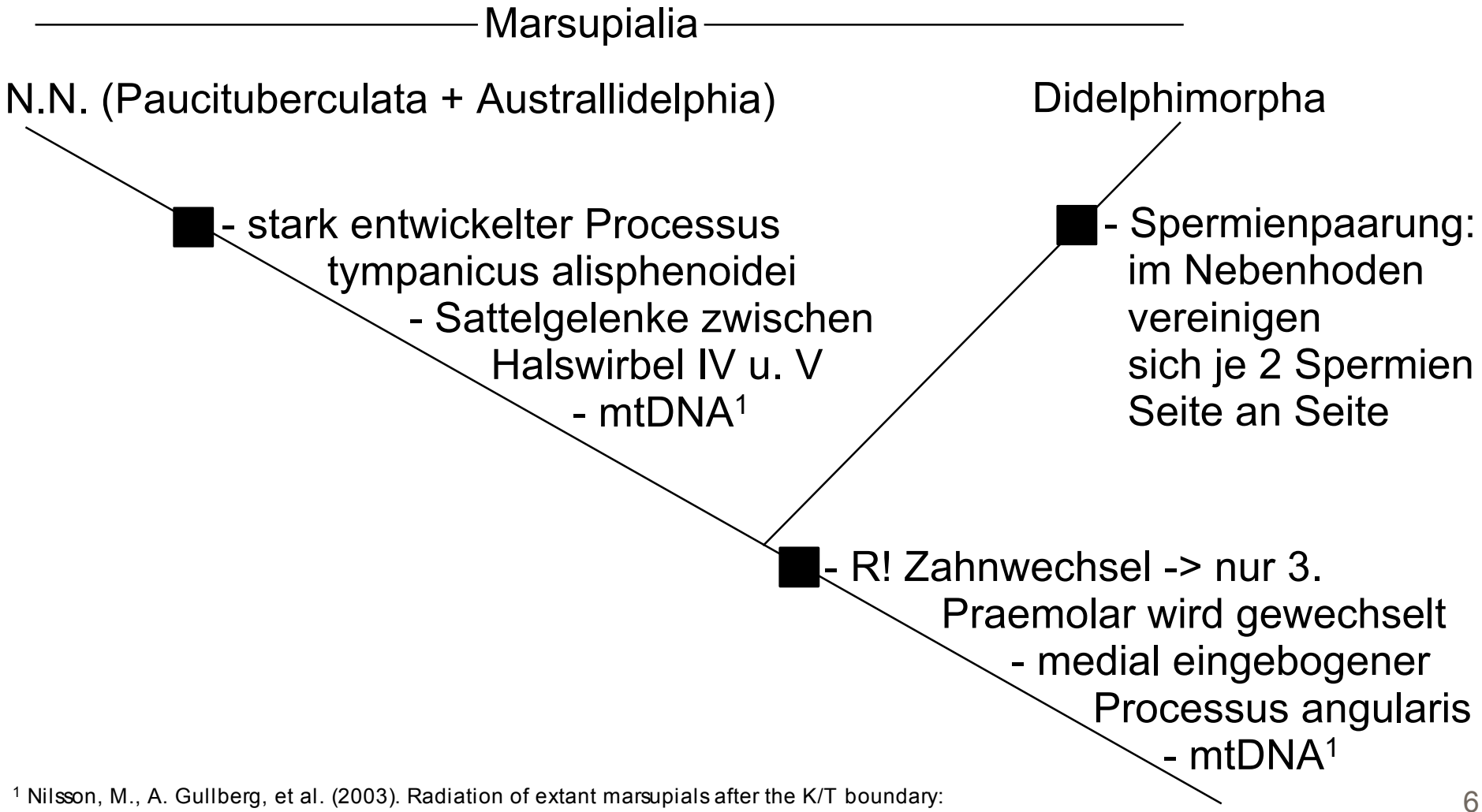
Tachyglossidae



Theria

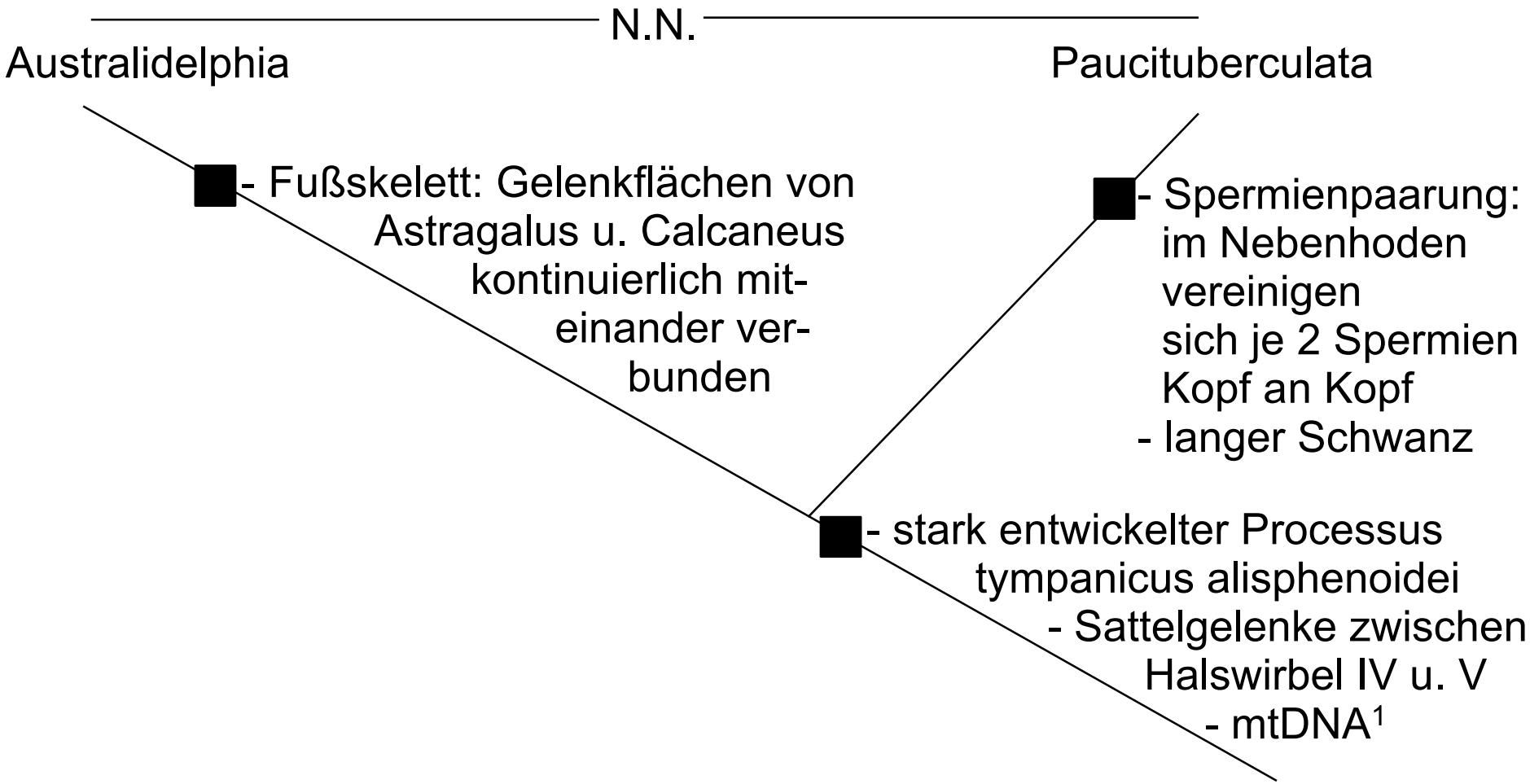

Theria
Marsupialia
Placentalia
- R! Zahnwechsel -> nur 3. Praemolar wird gewechselt
- medial eingebogener Processus angularis
- Chorioallantois-Placenta
- Zahnformel: I3/3 C1/1 P4/4 M3/3
- V! Beutelknochen
- Monodelphie (einfache Vagina)
- Milchdrüsen mit Zitzen
- getrennte Urogenital- u. Analöffnung durch Damm (Perineum)
- Viviparie
- Cochlea spiralig aufgewunden (Schnecke)
- beide Gehirnhemisphären durch Balken (Corpus callosum) verbunden

Marsupialia



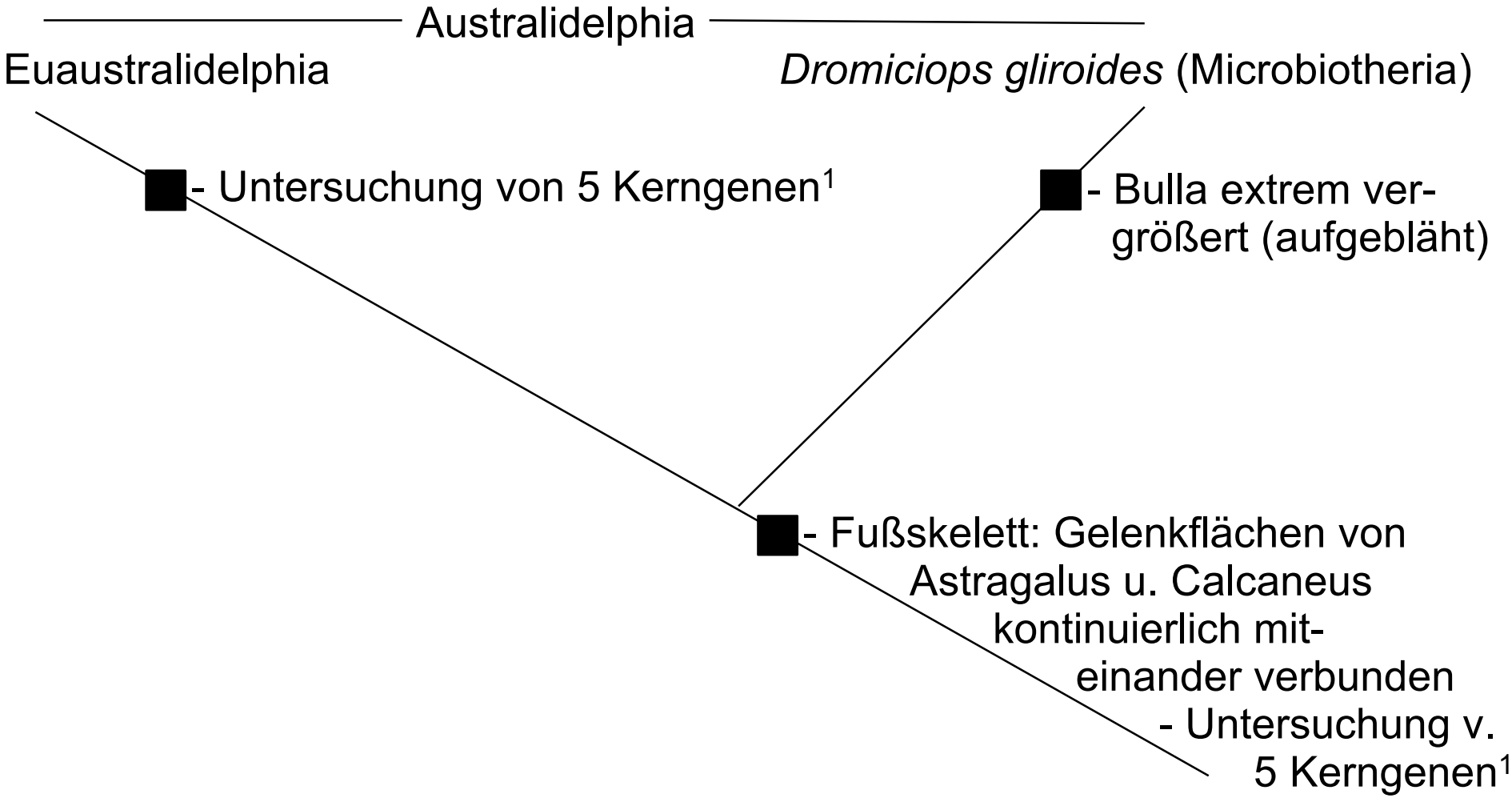
[1] Nilsson, M., A. Gullberg, et al. (2003). Radiation of extant marsupials after the K/T boundary: evidence from complete mitochondrial genomes. J Mol Evol. **57:** 3-12.

N.N. (Paucituberculata + Australidelphia)



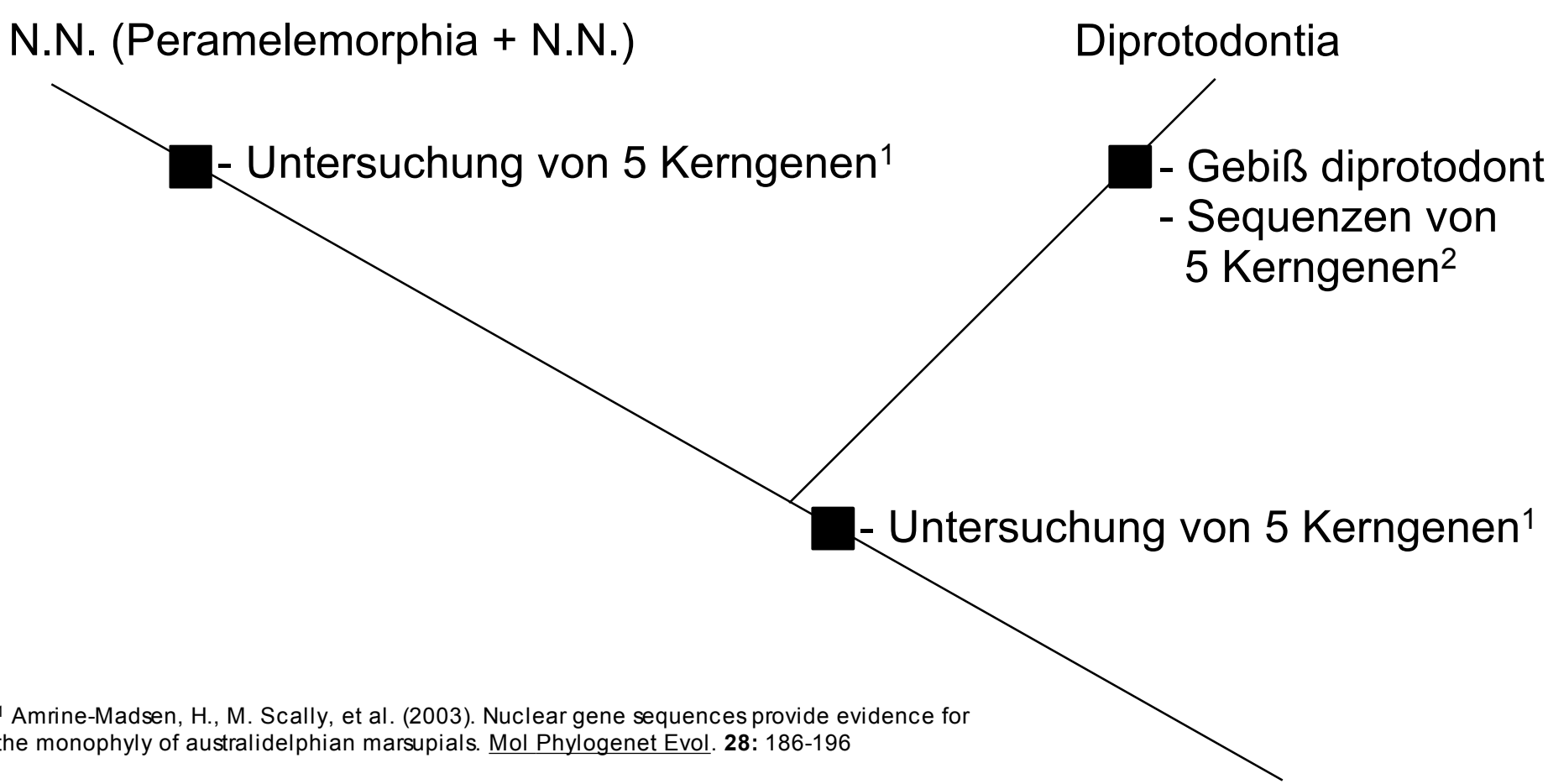
[1] Nilsson, M., A. Gullberg, et al. (2003). Radiation of extant marsupials after the K/T boundary: evidence from complete mitochondrial genomes. J Mol Evol. **57:** 3-12.

Australidelphia



[1] Amrine-Madsen, H., M. Scally, et al. (2003). Nuclear gene sequences provide evidence for the monophyly of australidelphian marsupials. Mol Phylogenet Evol. **28:** 186-196

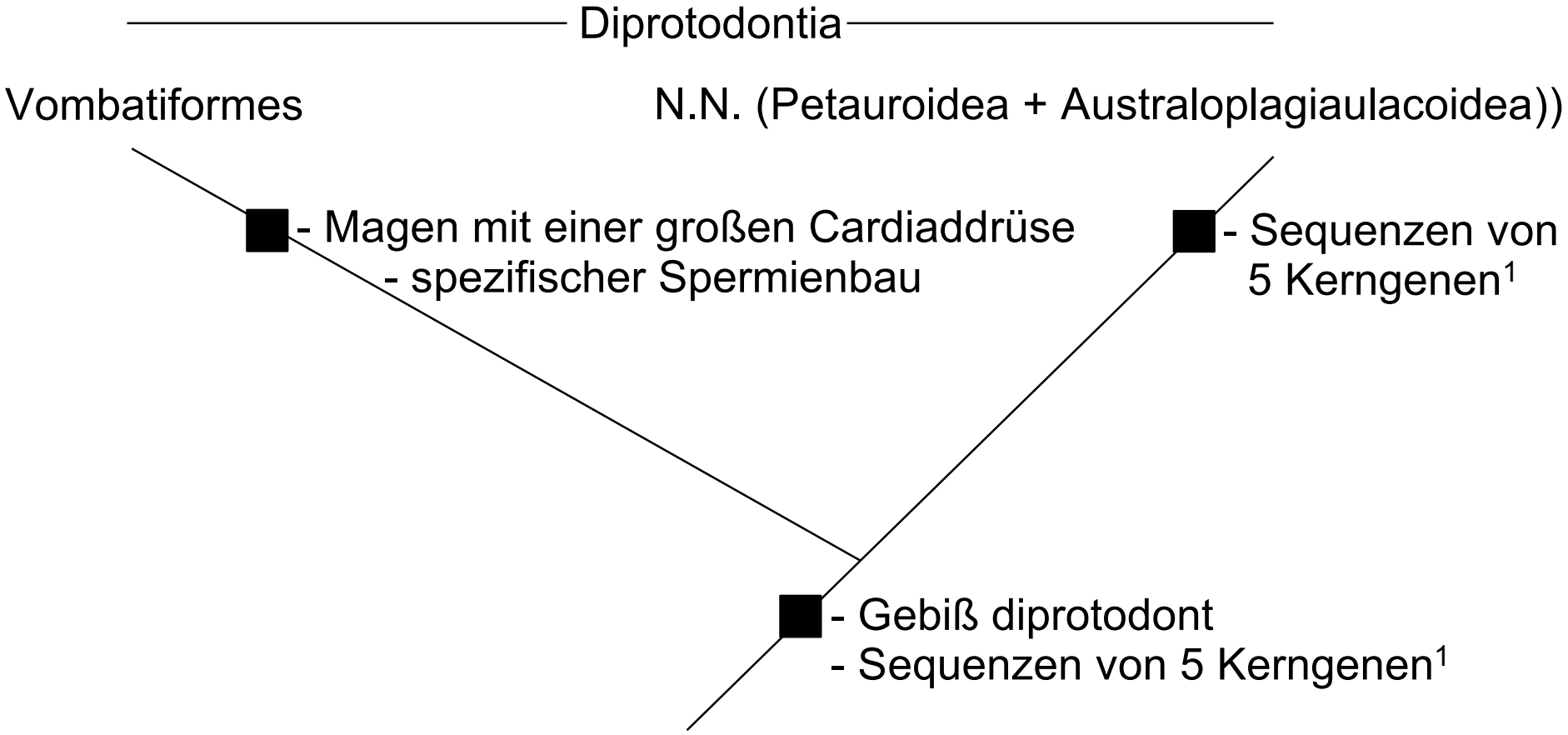
Euaustralidelphia



[1] Amrine-Madsen, H., M. Scally, et al. (2003). Nuclear gene sequences provide evidence for the monophyly of australidelphian marsupials. Mol Phylogenet Evol. **28:** 186-196

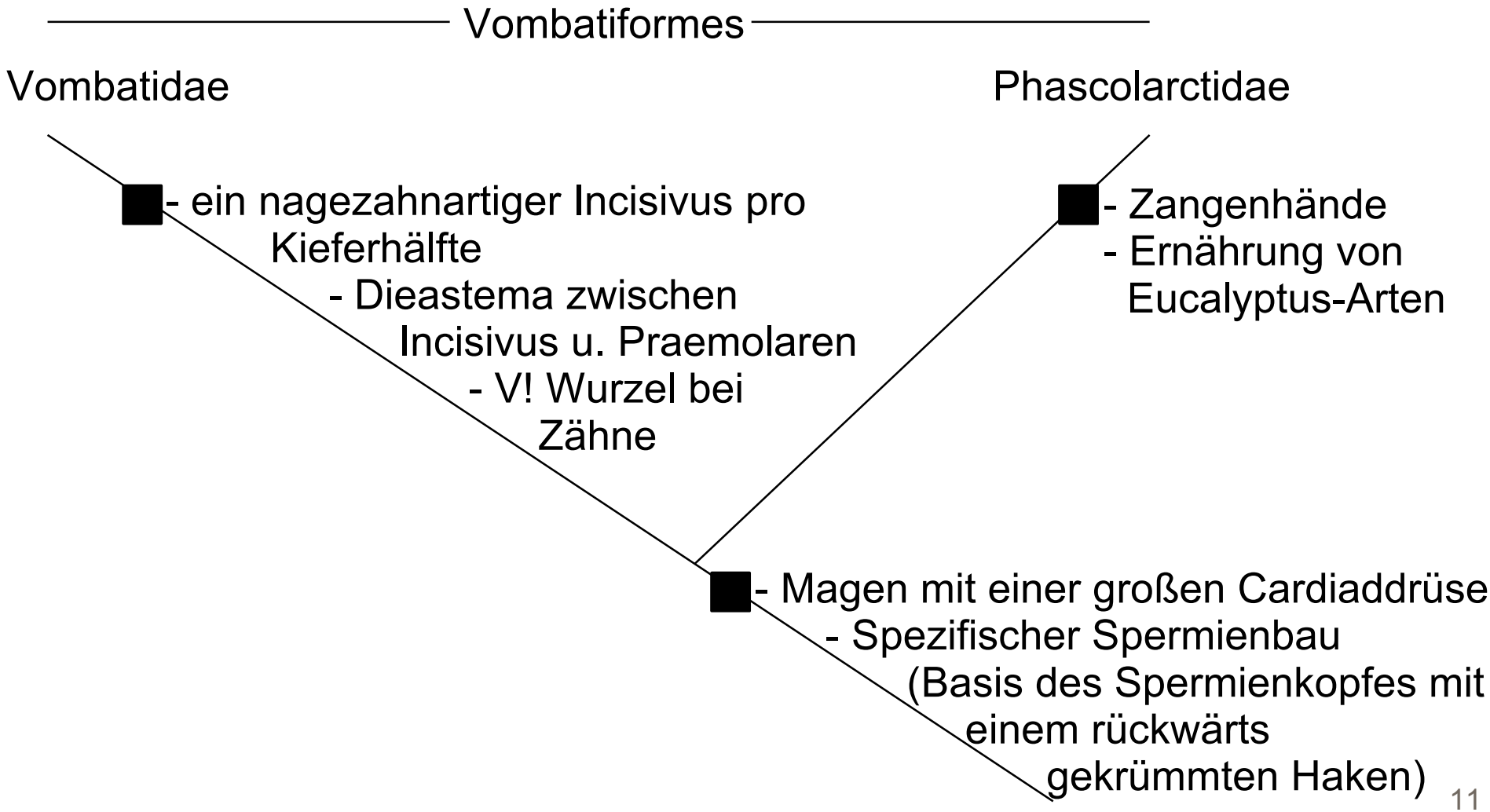
[2] Meredith, R. W., M. Westerman, et al. (2009). A phylogeny of Diprotodontia (Marsupialia) based on sequences for five nuclear genes. Mol Phylogenet Evol. **51:** 554-571.

Diprotodontia

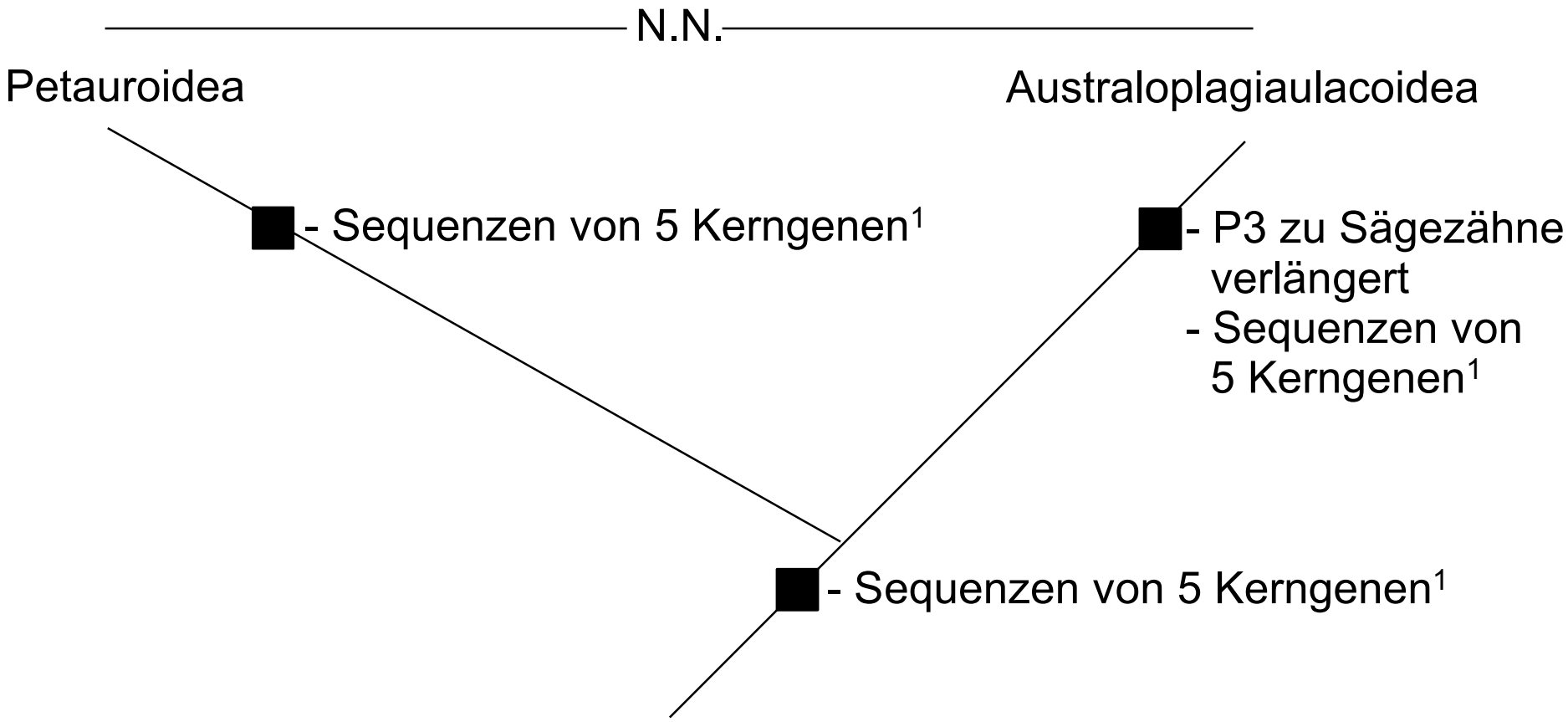


[2] Meredith, R. W., M. Westerman, et al. (2009). A phylogeny of Diprotodontia (Marsupialia) based on sequences for five nuclear genes. Mol Phylogenet Evol. **51:** 554-571.

Vombatiformes

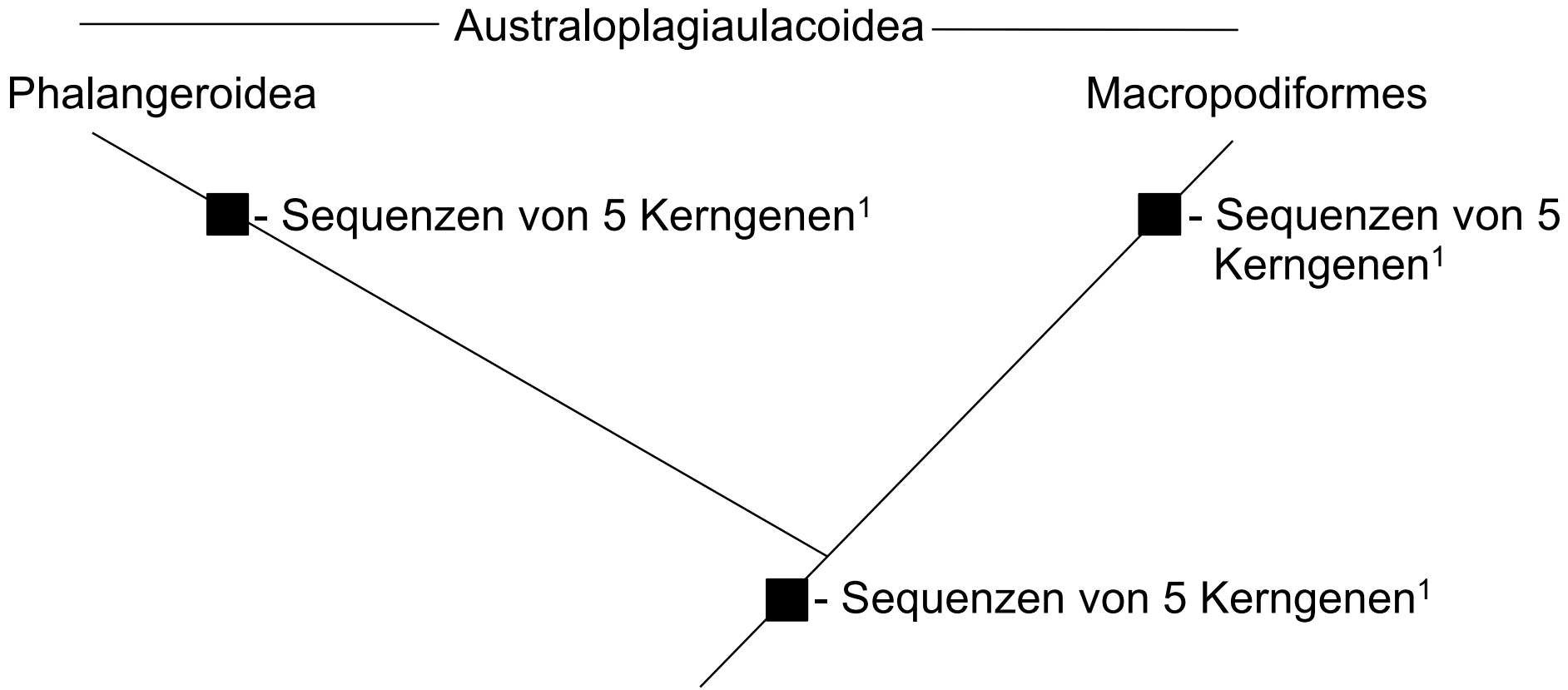


N.N. (Petauroiddea + Australoplagiaulacoidea)



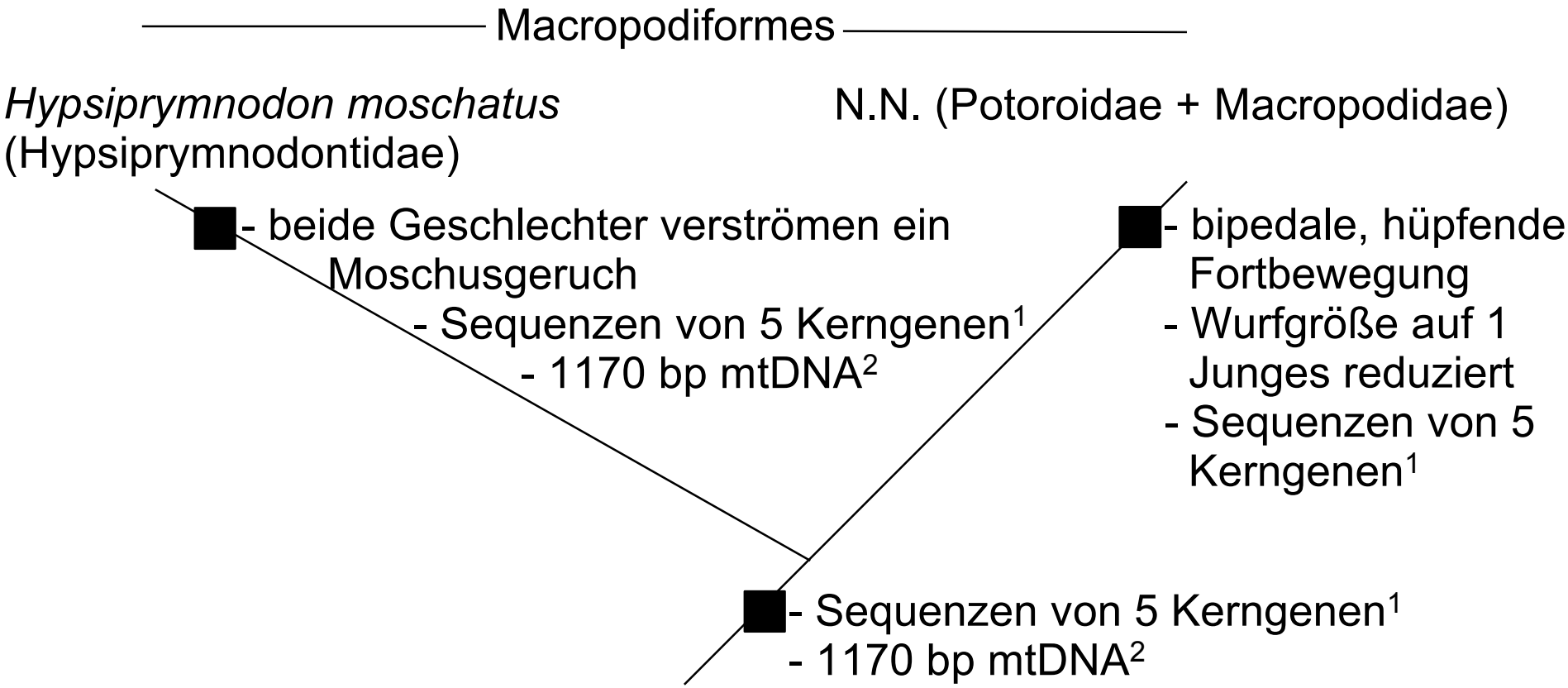
[2] Meredith, R. W., M. Westerman, et al. (2009). A phylogeny of Diprotodontia (Marsupialia) based on sequences for five nuclear genes. Mol Phylogenet Evol. **51:** 554-571.

Australoplagiaulacoidea



[2] Meredith, R. W., M. Westerman, et al. (2009). A phylogeny of Diprotodontia (Marsupialia) based on sequences for five nuclear genes. Mol Phylogenet Evol. **51:** 554-571.

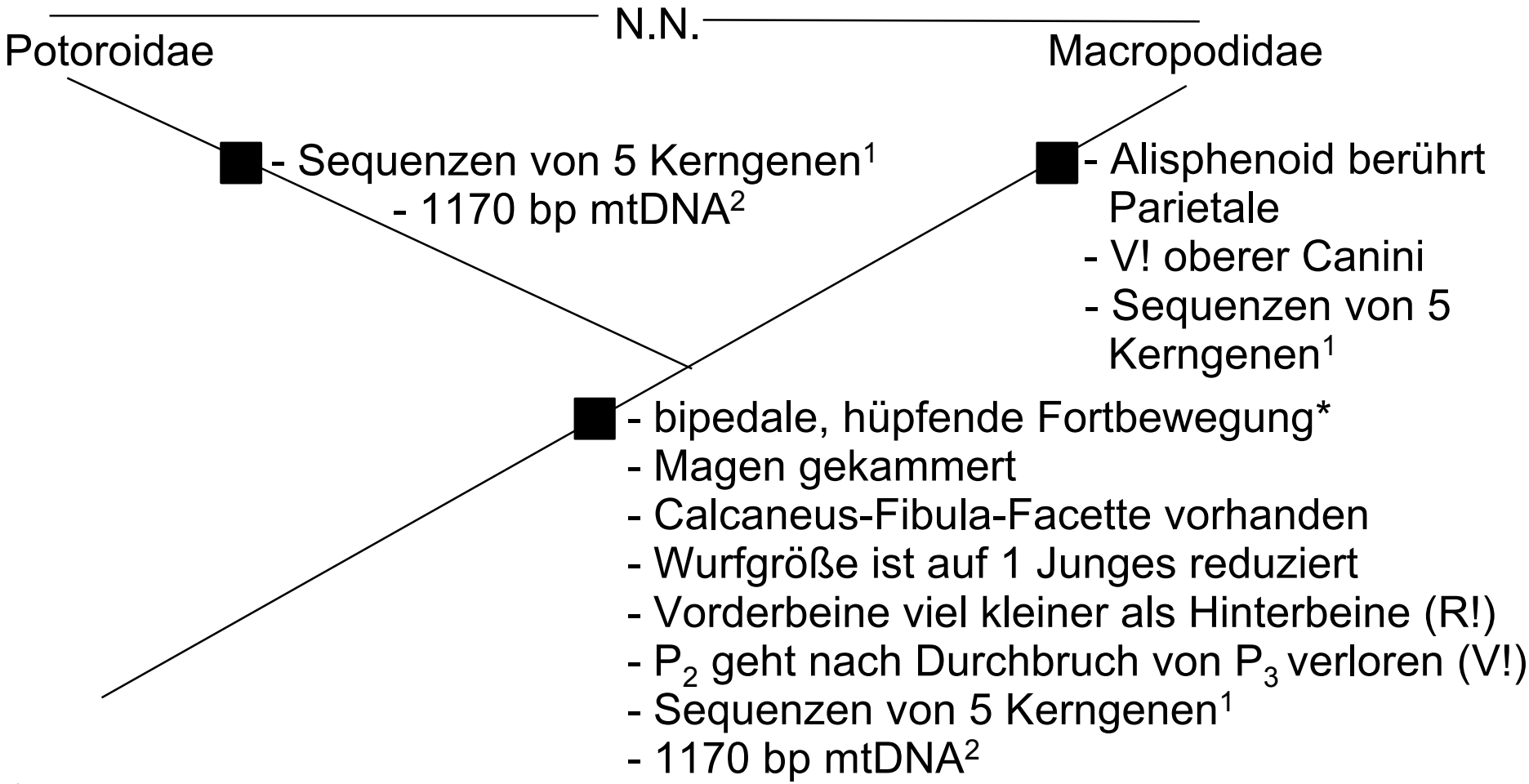
Macropodiformes



[1] Meredith, R. W., M. Westerman, et al. (2009). A phylogeny of Diprotodontia (Marsupialia) based on sequences for five nuclear genes. Mol Phylogenet Evol. **51:** 554-571.

[2] Burk, A., M. Westerman, et al. (1998). The Phylogenetic Position of the Musky Rat-Kangaroo and the Evolution of Bipedal Hopping in Kangaroos (Macropodidae: Diprotodontia). Syst. Biol. 47: 457-474.

N.N. (Potoroidae + Macropodidae)



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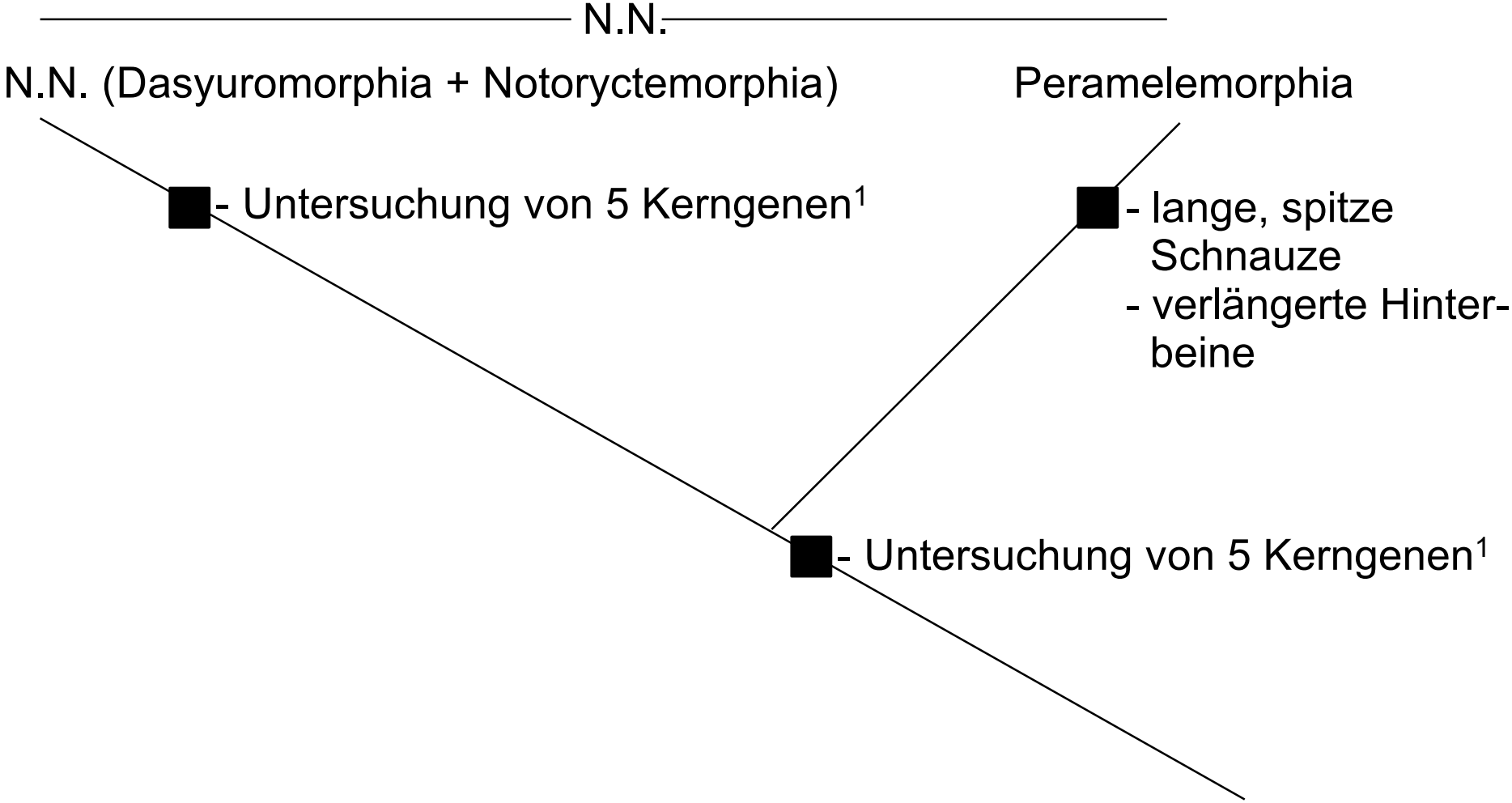
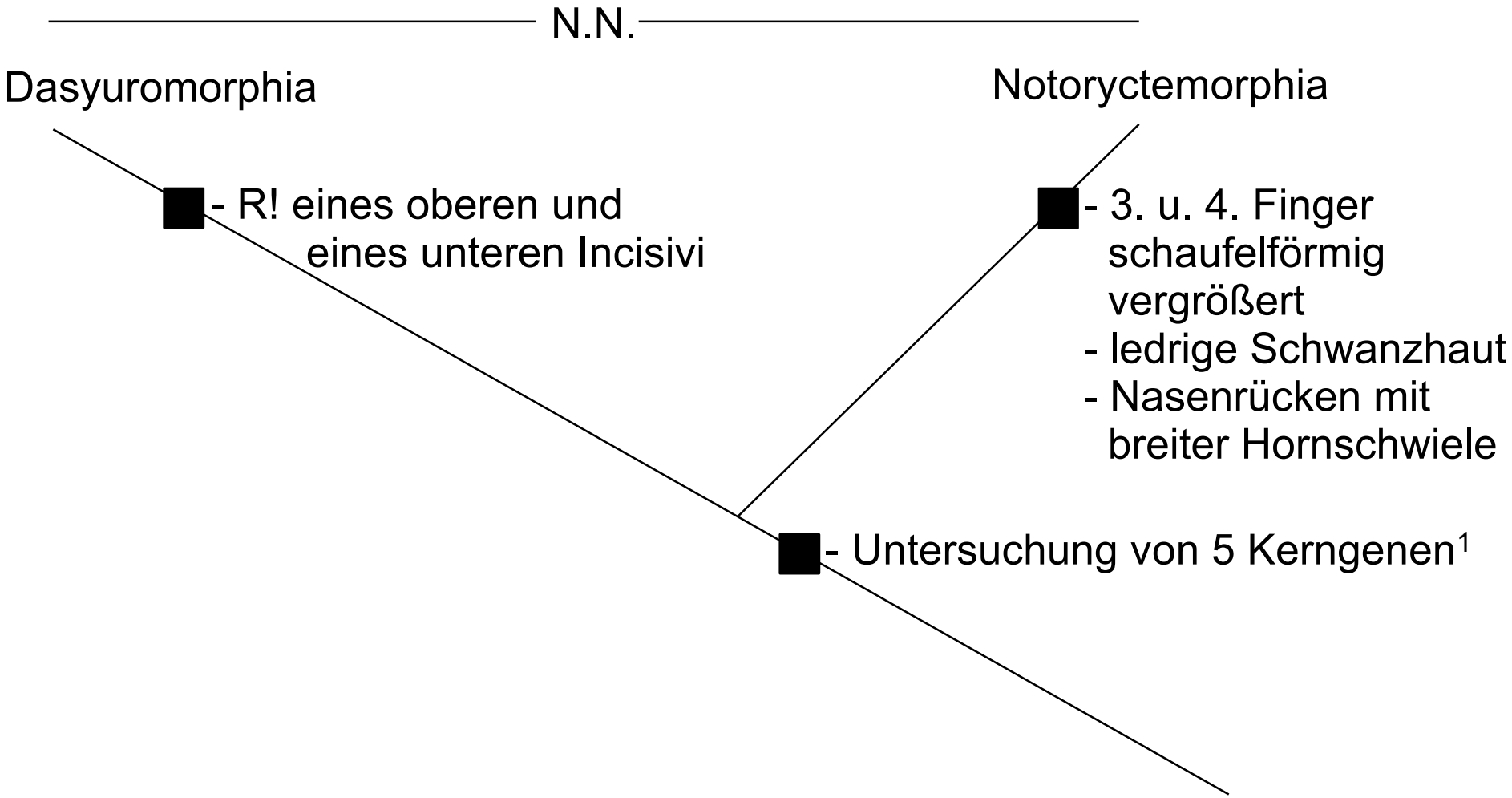
N.N. (Peramelemorphia + N.N.)



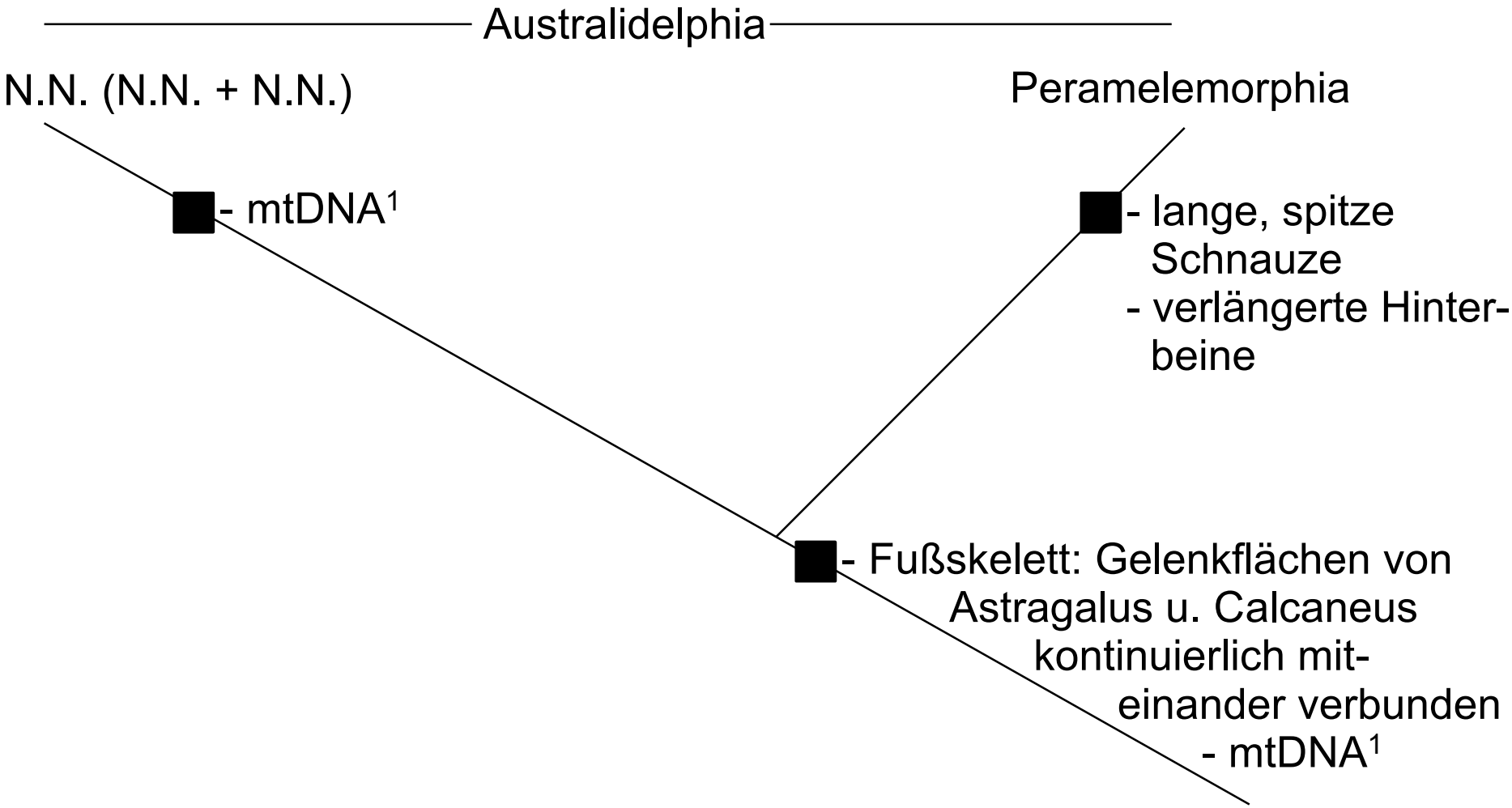
[1] Amrine-Madsen, H., M. Scally, et al. (2003). Nuclear gene sequences provide evidence for the monophyly of australidelphian marsupials. Mol Phylogenet Evol. **28:** 186-196

N.N. (Dasyuromorphia + Notoryctemorphia)



[1] Amrine-Madsen, H., M. Scally, et al. (2003). Nuclear gene sequences provide evidence for the monophyly of australidelphian marsupials. Mol Phylogenet Evol. **28:** 186-196

Australidelphia-Alternative



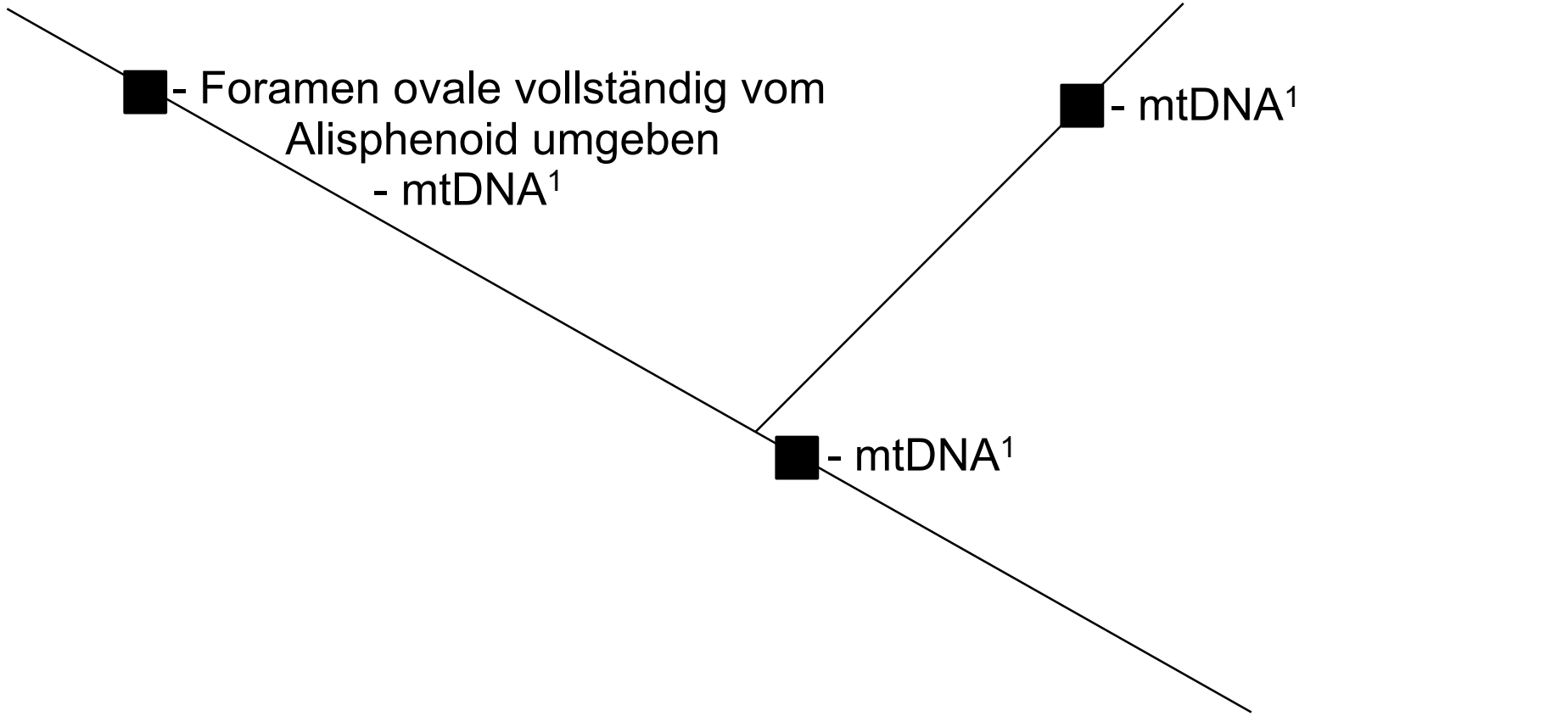
[1] Nilsson, M., A. Gullberg, et al. (2003). Radiation of extant marsupials after the K/T boundary: evidence from complete mitochondrial genomes. J Mol Evol. **57:** 3-12.

N.N. (N.N. + N.N.)

N.N.

N.N. (Microbiotheria + Diprotodontia)

N.N. (Dasyuromorphia + Notoryctemorphia)



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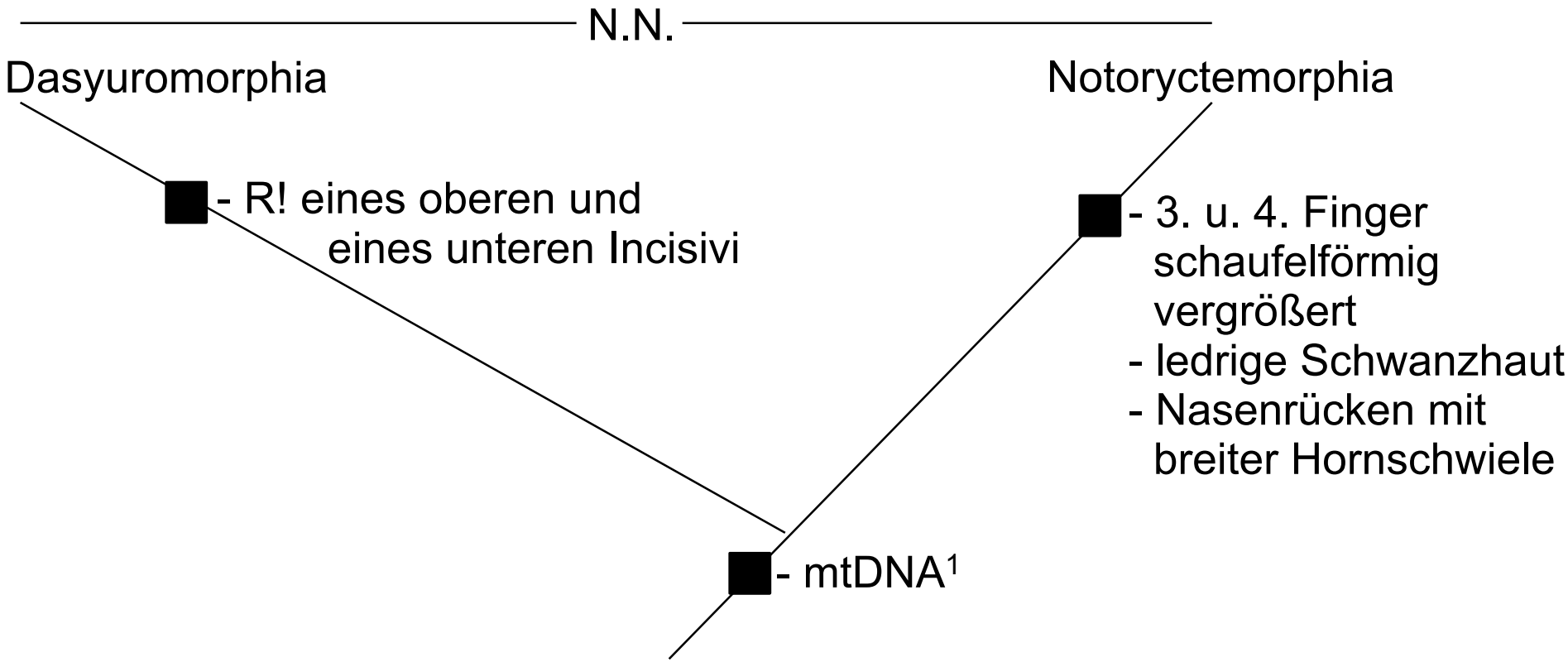
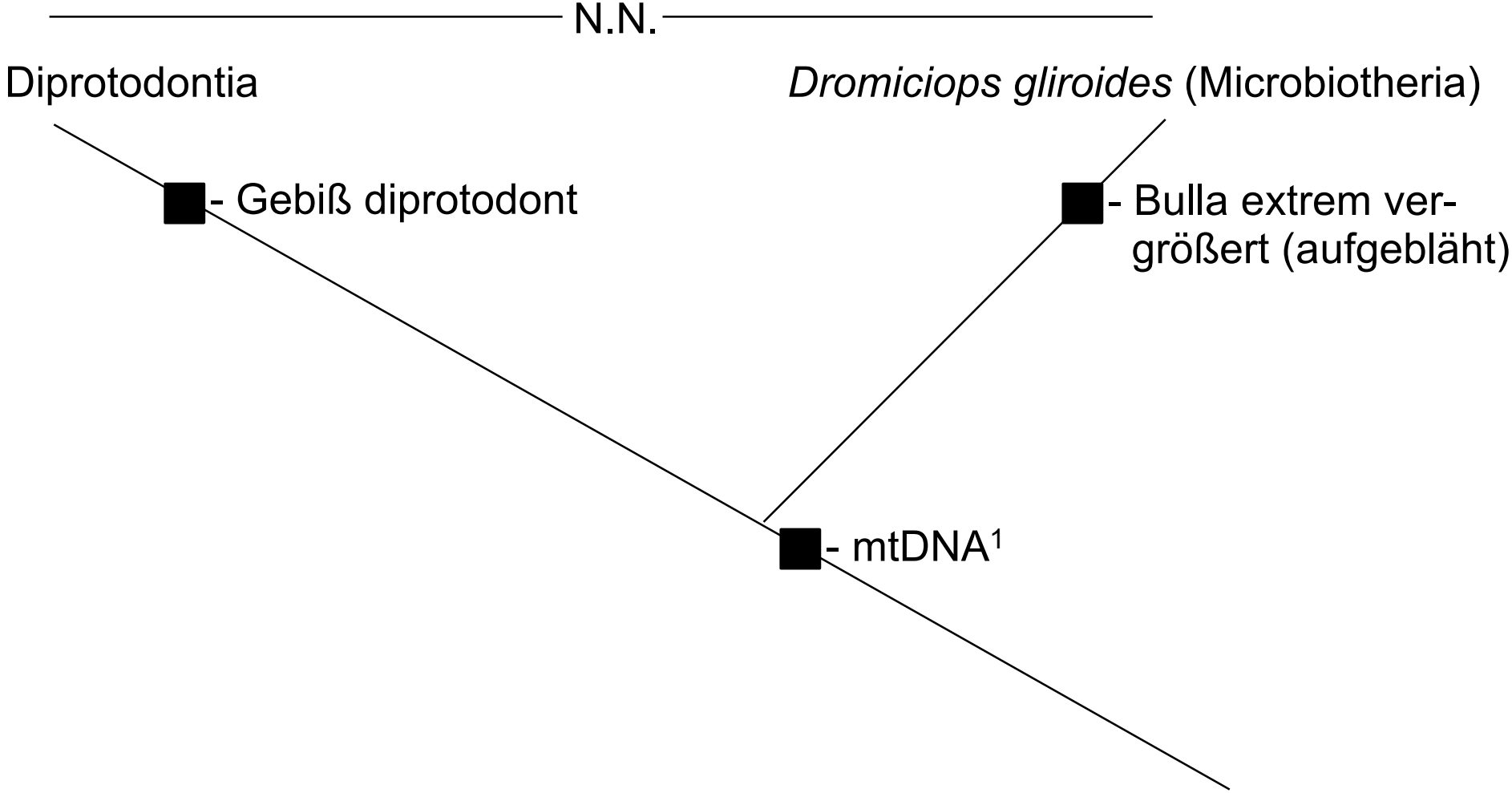
N.N. (Dasyuromorphia + Notoryctemorphia)



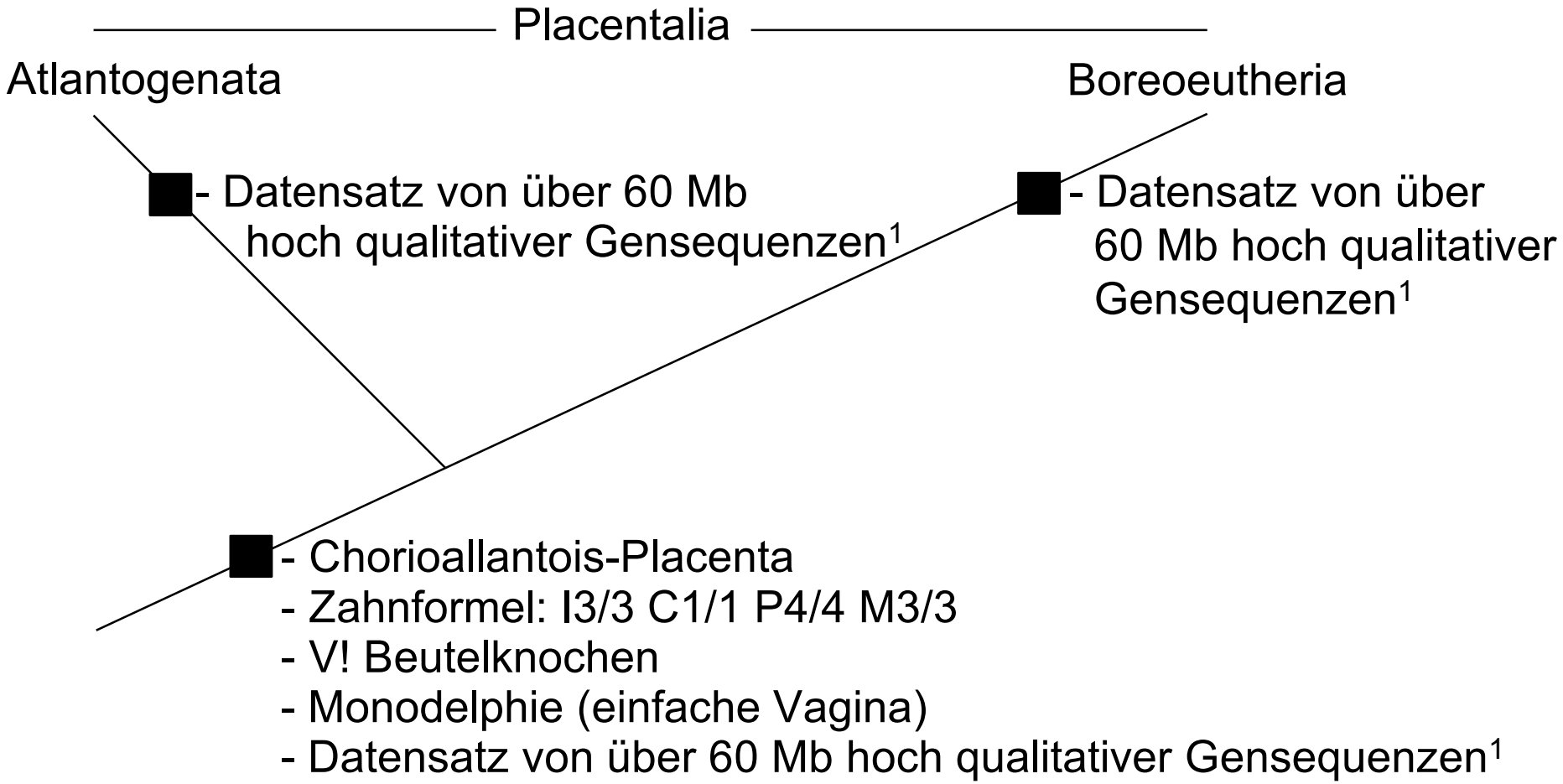
[1] Nilsson, M., A. Gullberg, et al. (2003). Radiation of extant marsupials after the K/T boundary: evidence from complete mitochondrial genomes. J Mol Evol. **57:** 3-12.

N.N. (Diprotodontia + Microbiotheria)



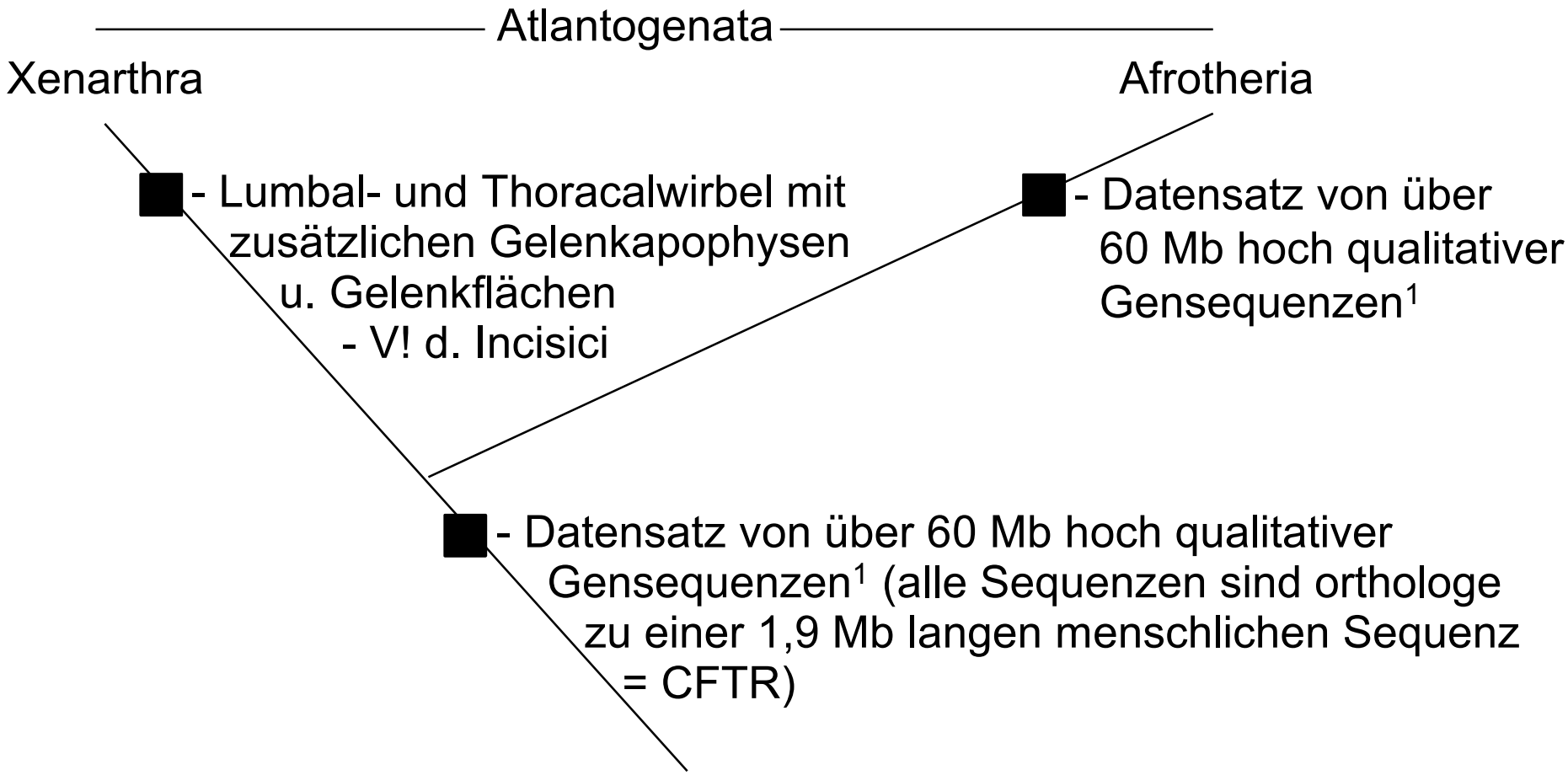
[1] Nilsson, M., A. Gullberg, et al. (2003). Radiation of extant marsupials after the K/T boundary: evidence from complete mitochondrial genomes. J Mol Evol. **57:** 3-12.

Placentalia



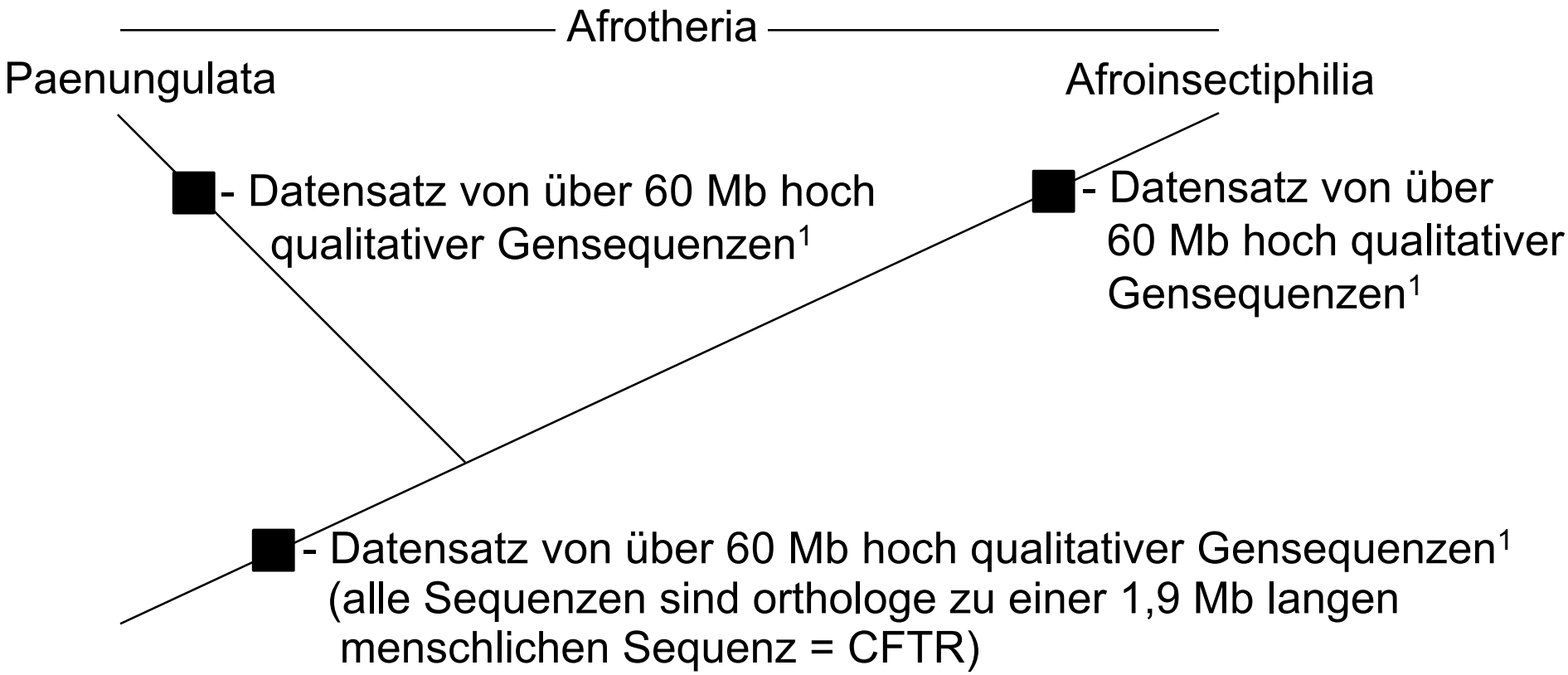
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Atlantogenata



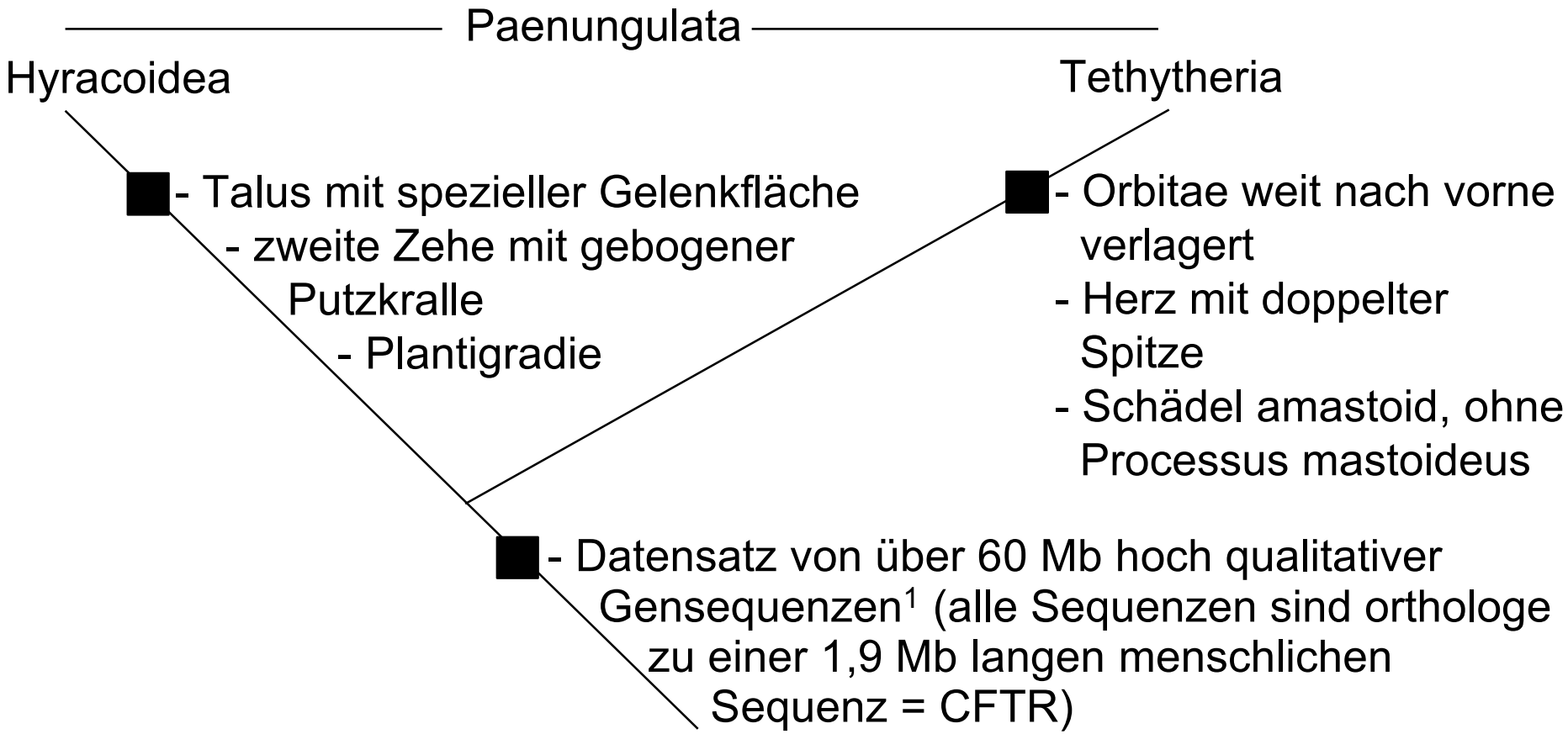
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Afrotheria



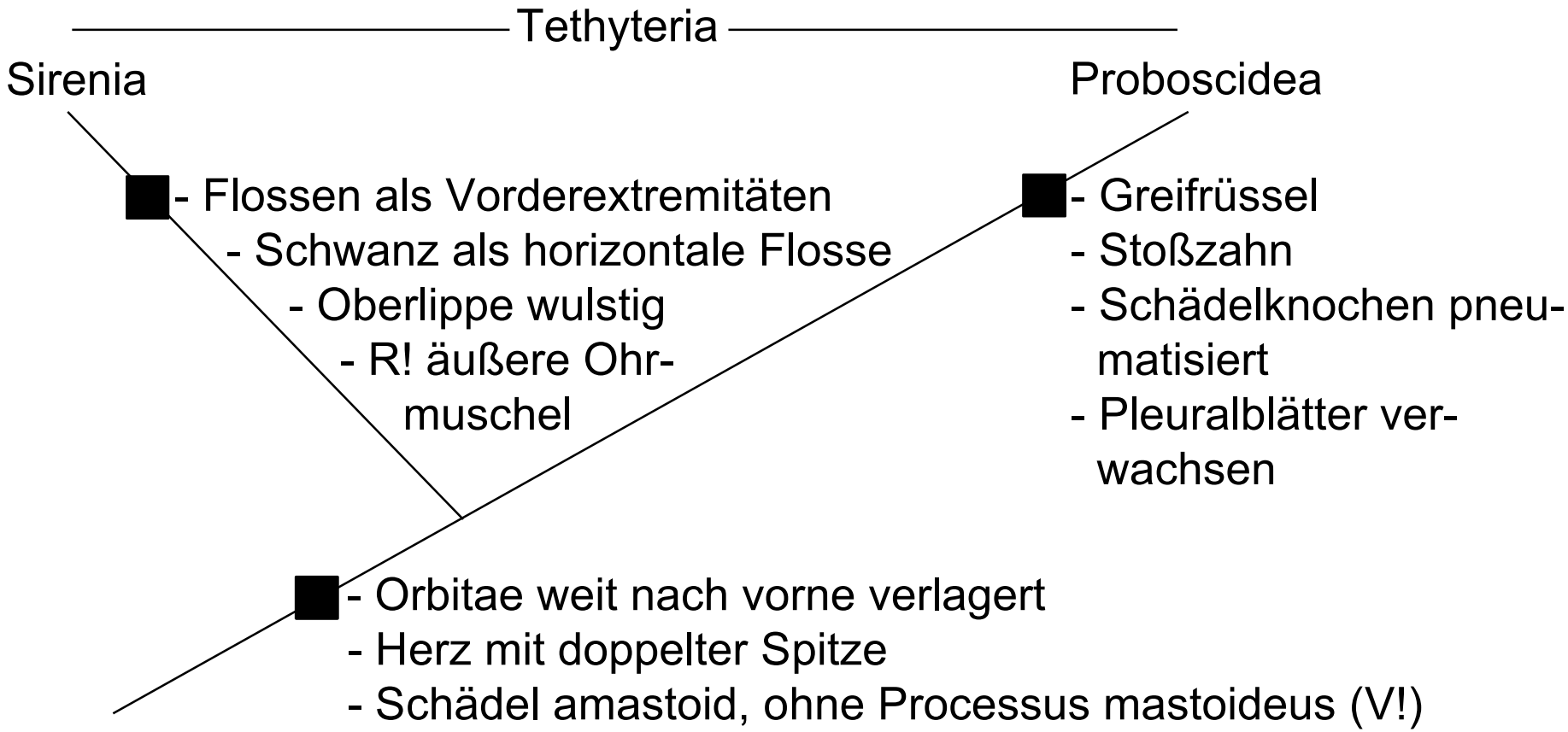
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Paenungulata

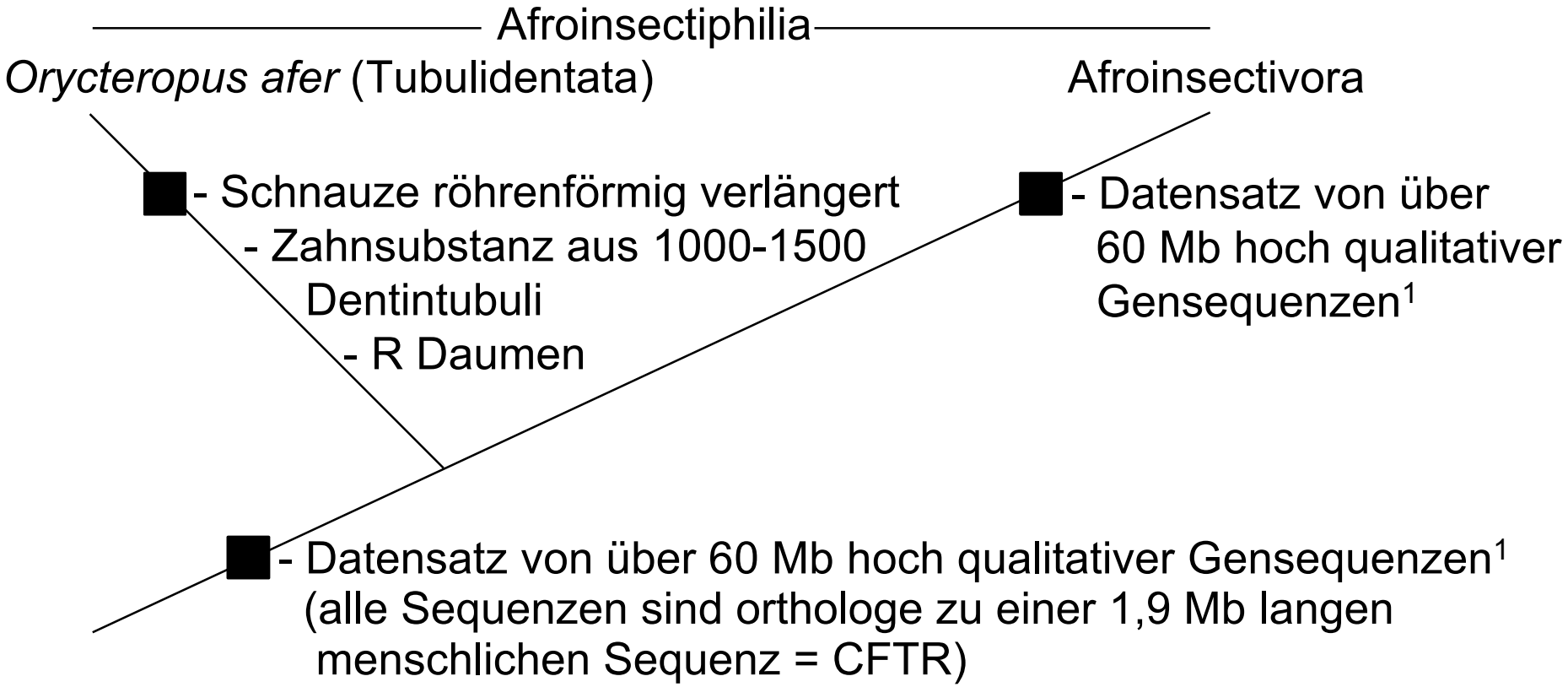


[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Tethyteria

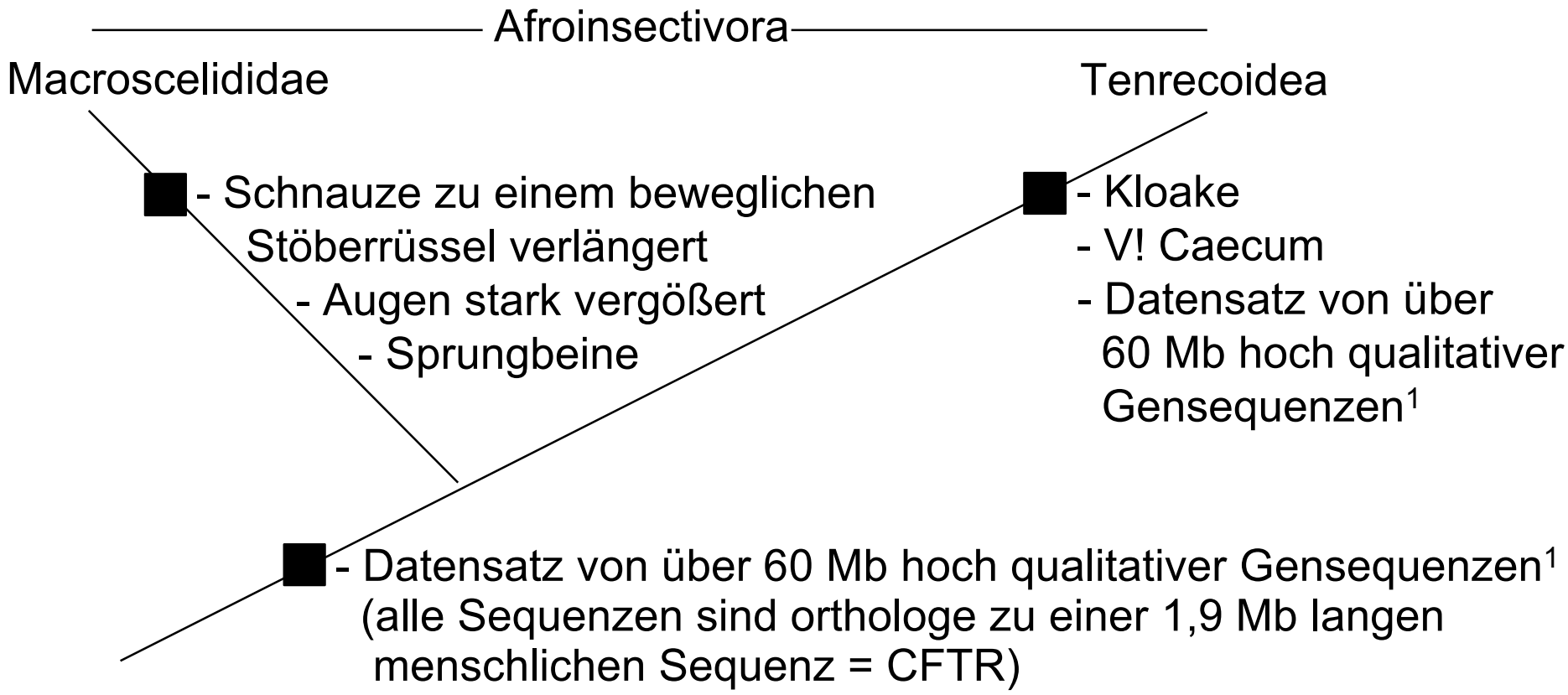

Tethyteria
Sirenia
Proboscidea
- Flossen als Vorderextremitäten
- Schwanz als horizontale Flosse
- Oberlippe wulstig
- R! äußere Ohr-muschel
- Greifrüssel
- Stoßzahn
- Schädelknochen pneu-matisiert
- Pleuralblätter ver-wachsen
- Orbitae weit nach vorne verlagert
- Herz mit doppelter Spitze
- Schädel amastoid, ohne Processus mastoideus (V!)

Afroinsectiphilia



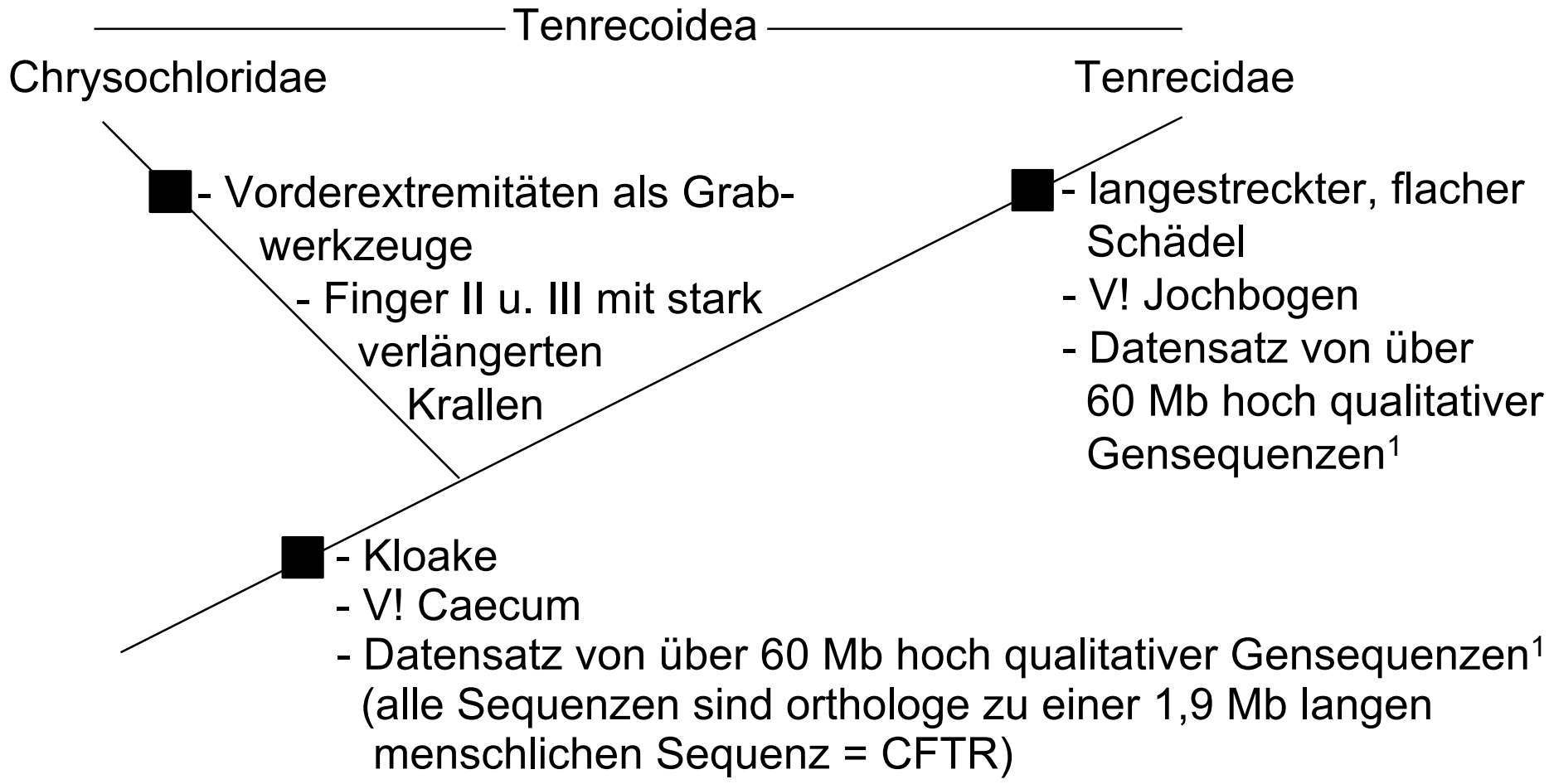
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Afroinsectivora



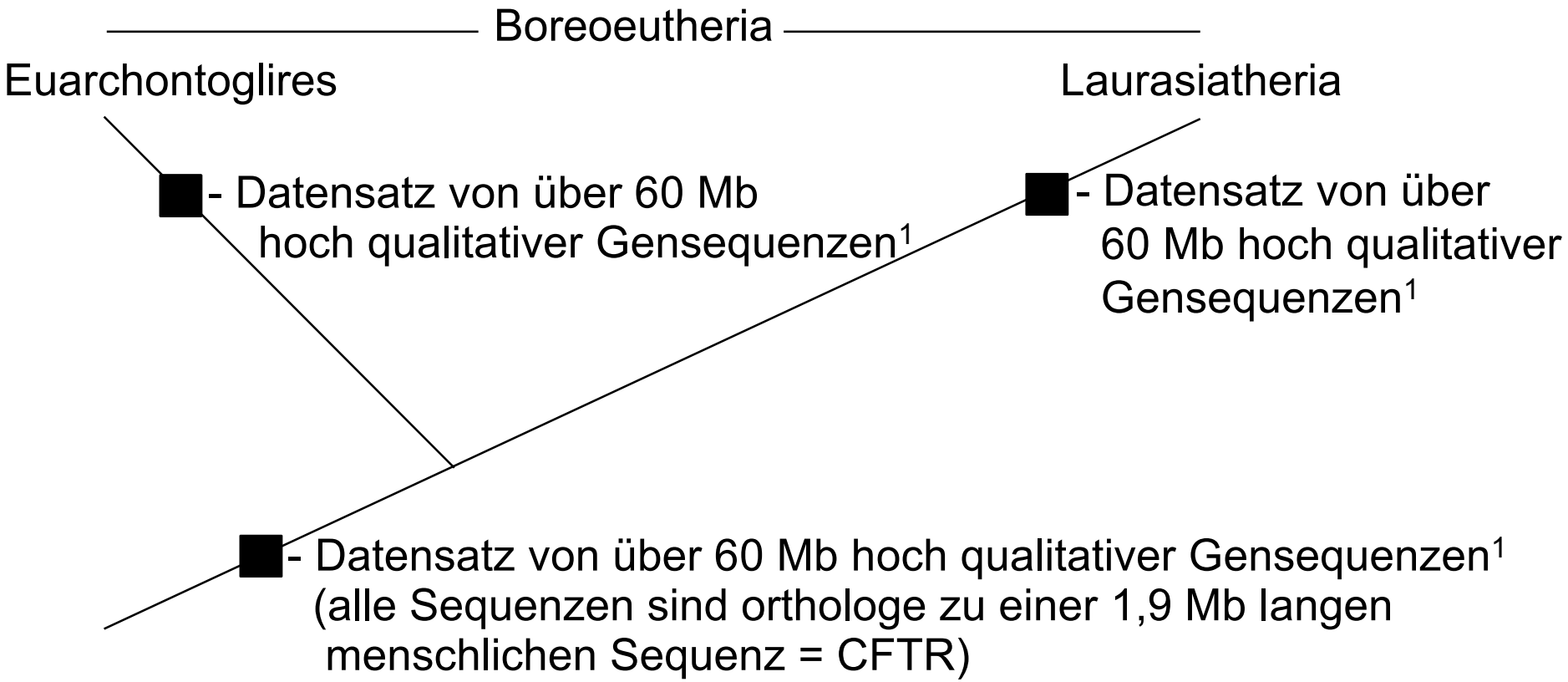
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Tenrecoidea (Afrosoricidae)



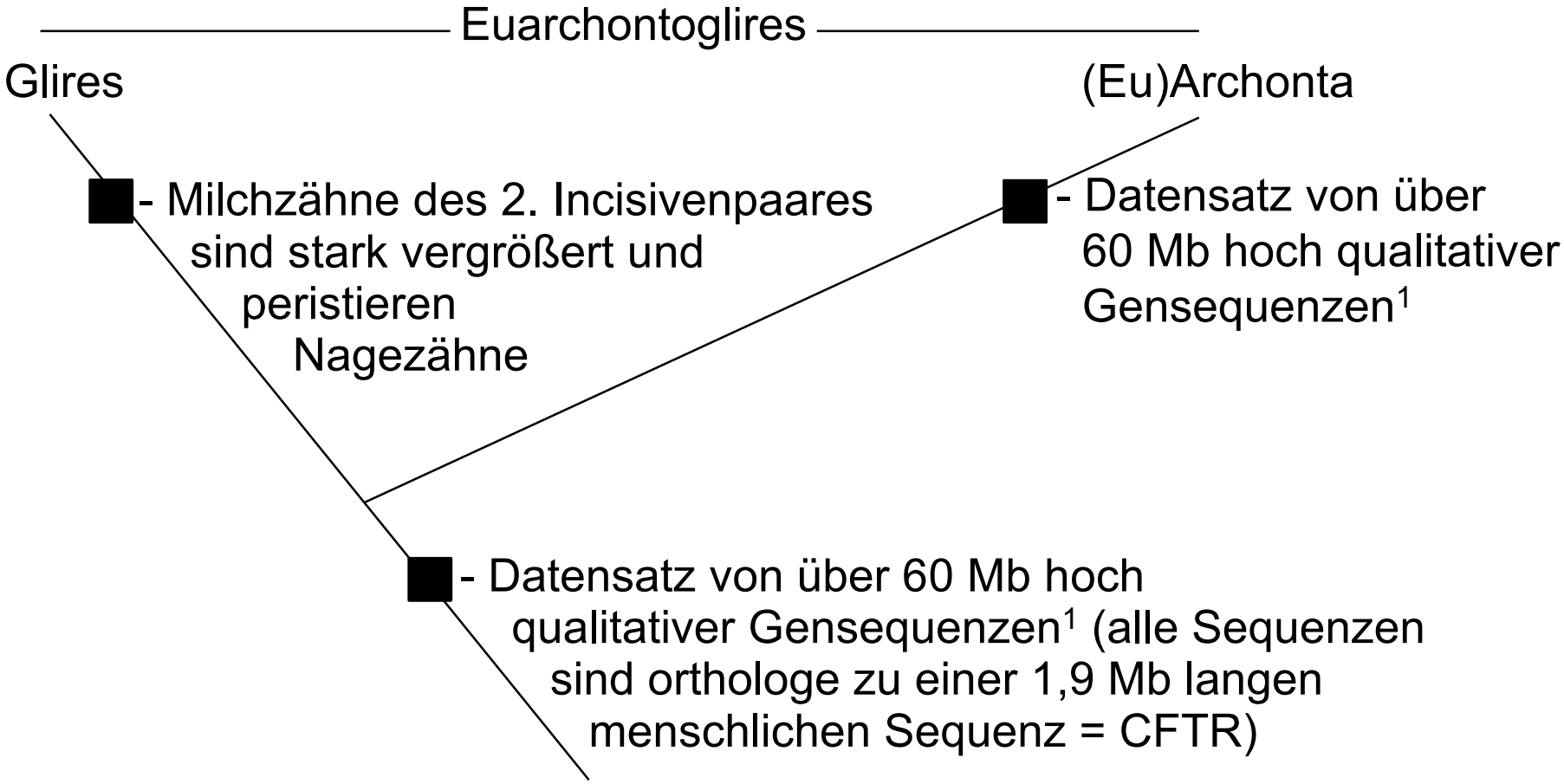
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Boreoeutheria



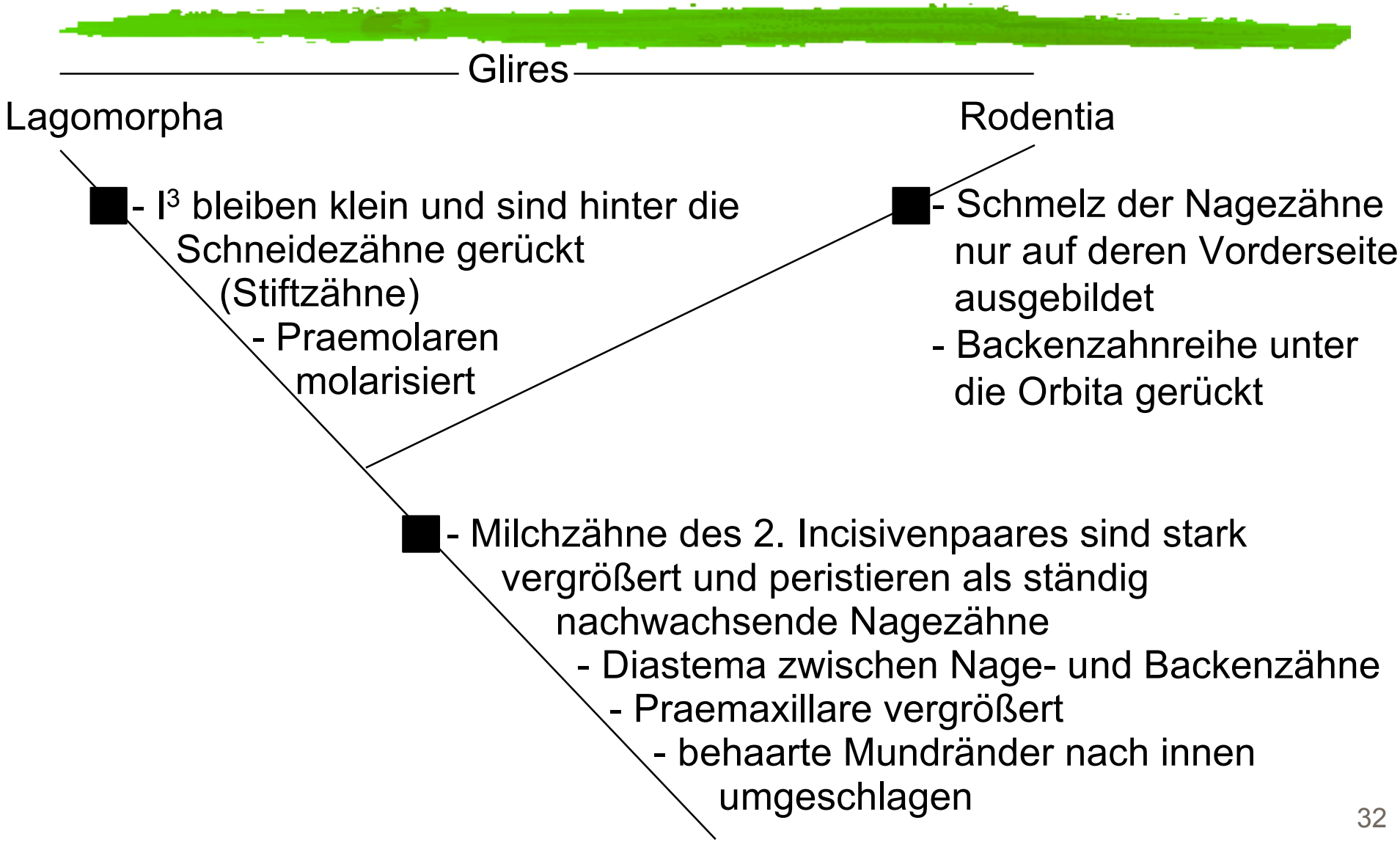
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Euarchontoglires

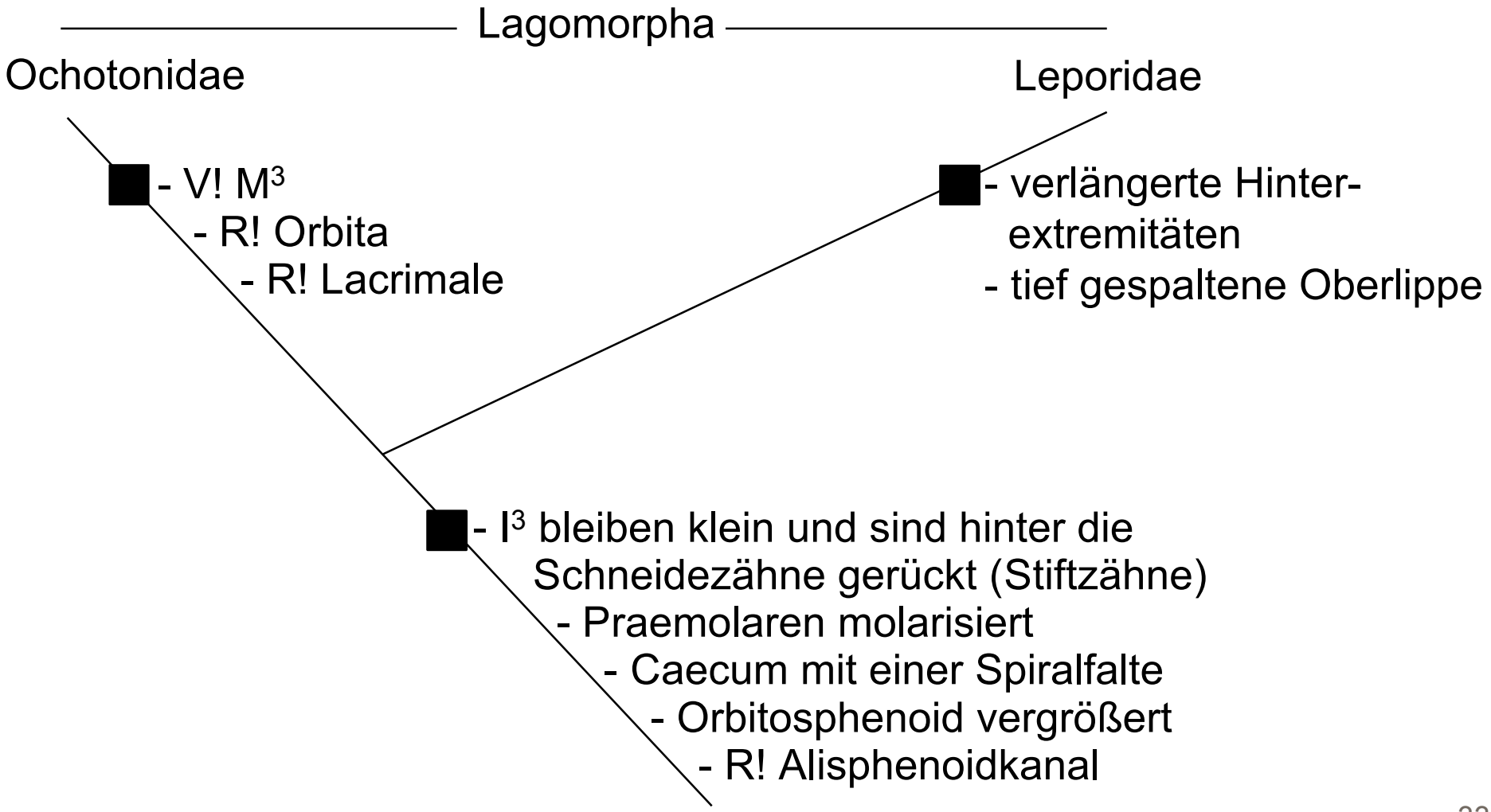


[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

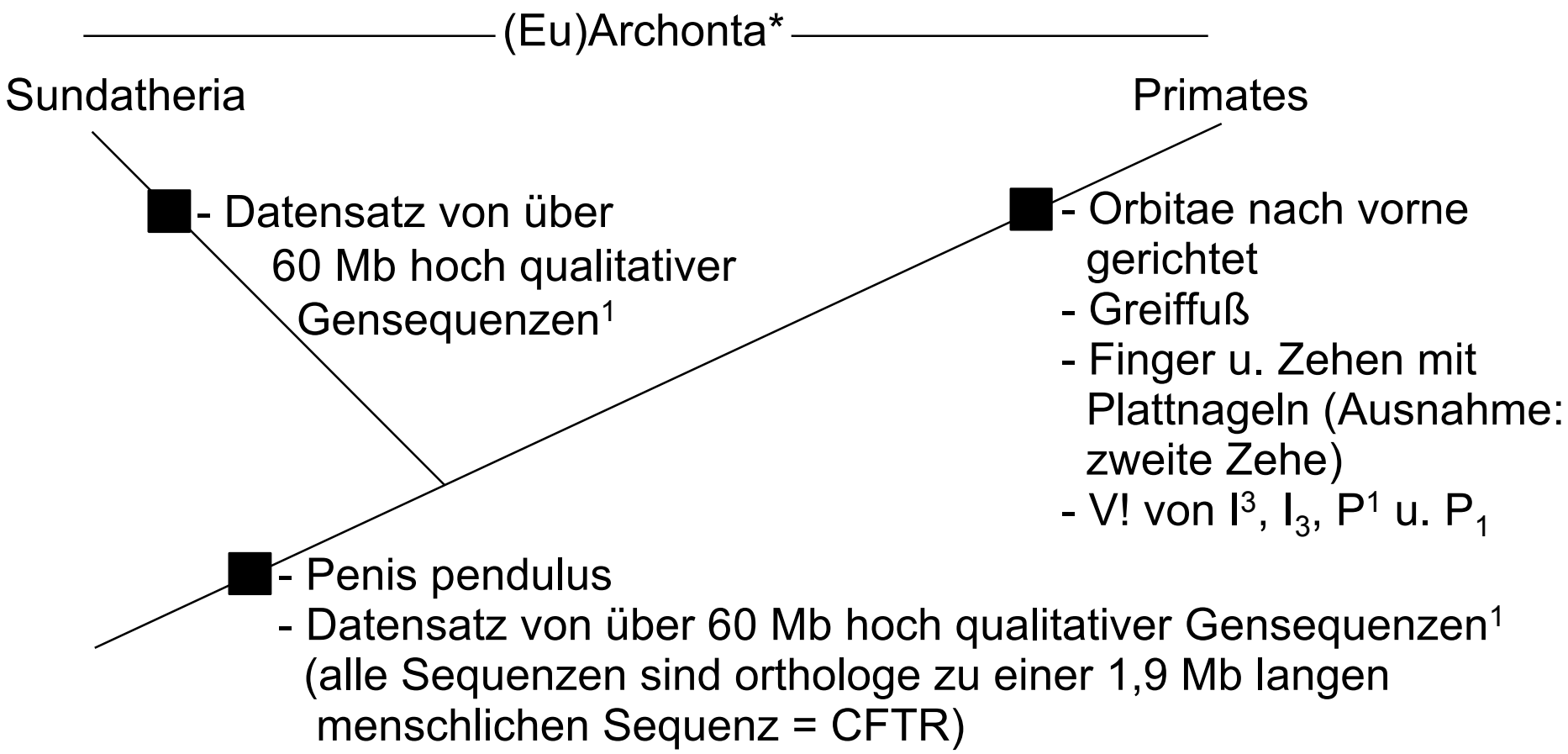
Glires


Glires
Lagomorpha
Rodentia
- I^3 bleiben klein und sind hinter die Schneidezähne gerückt (Stiftzähne)
- Praemolaren molarisiert
- Schmelz der Nagezähne nur auf deren Vorderseite ausgebildet
- Backenzahnreihe unter die Orbita gerückt
- Milchzähne des 2. Incisivenpaares sind stark vergrößert und peristieren als ständig nachwachsende Nagezähne
- Diastema zwischen Nage- und Backenzähne
- Praemaxillare vergrößert
- behaarte Mundränder nach innen umgeschlagen

Lagomorpha

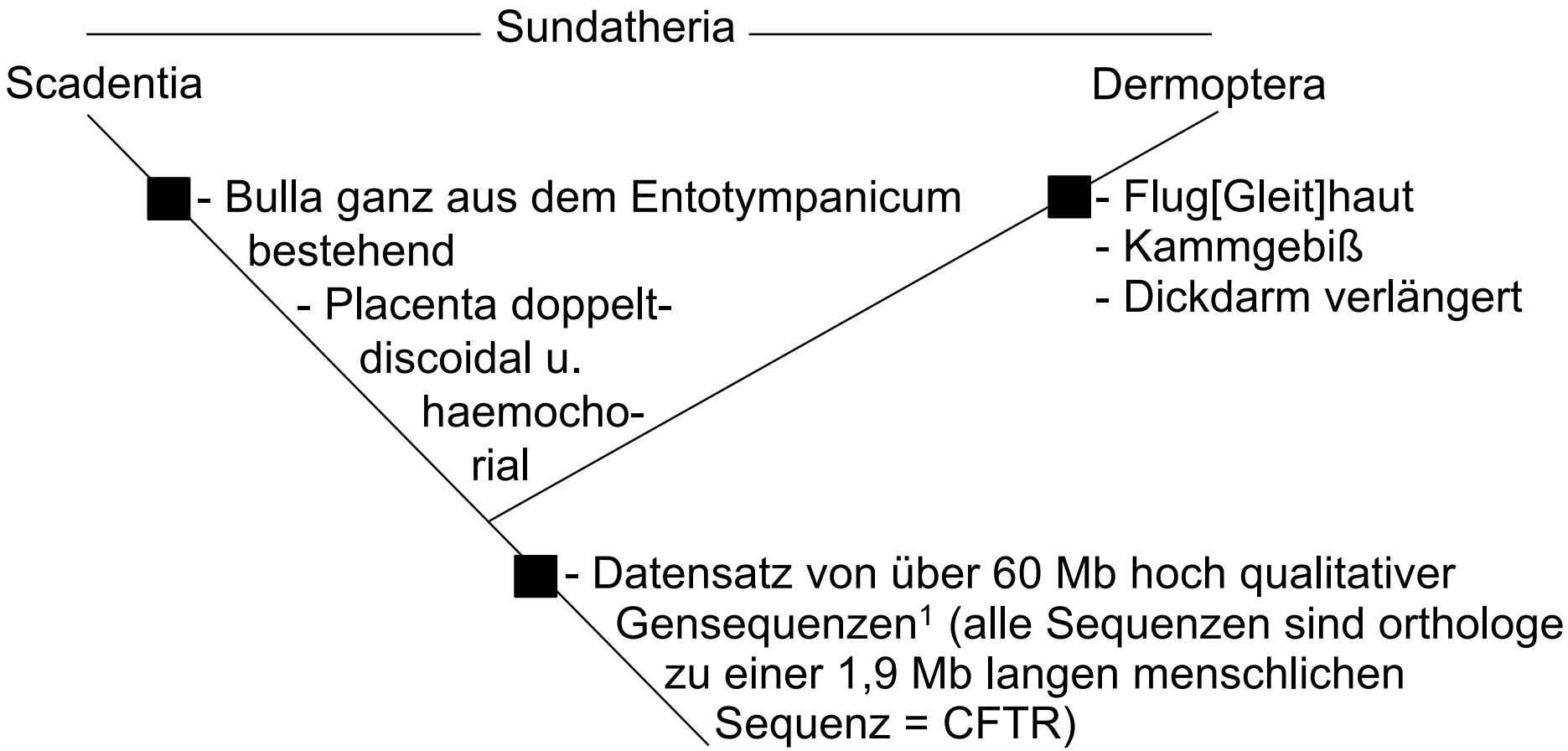

Lagomorpha
Ochotonidae
Leporidae
- V! M3
- R! Orbita
- R! Lacrimale
- verlängerte Hinter-
extremitäten
- tief gespaltene Oberlippe
- I3 bleiben klein und sind hinter die
Schneidezähne gerückt (Stiftzähne)
- Praemolaren molarisiert
- Caecum mit einer Spiralfalte
- Orbitosphenoid vergrößert
- R! Alisphenoidkanal

(Eu)Archonta



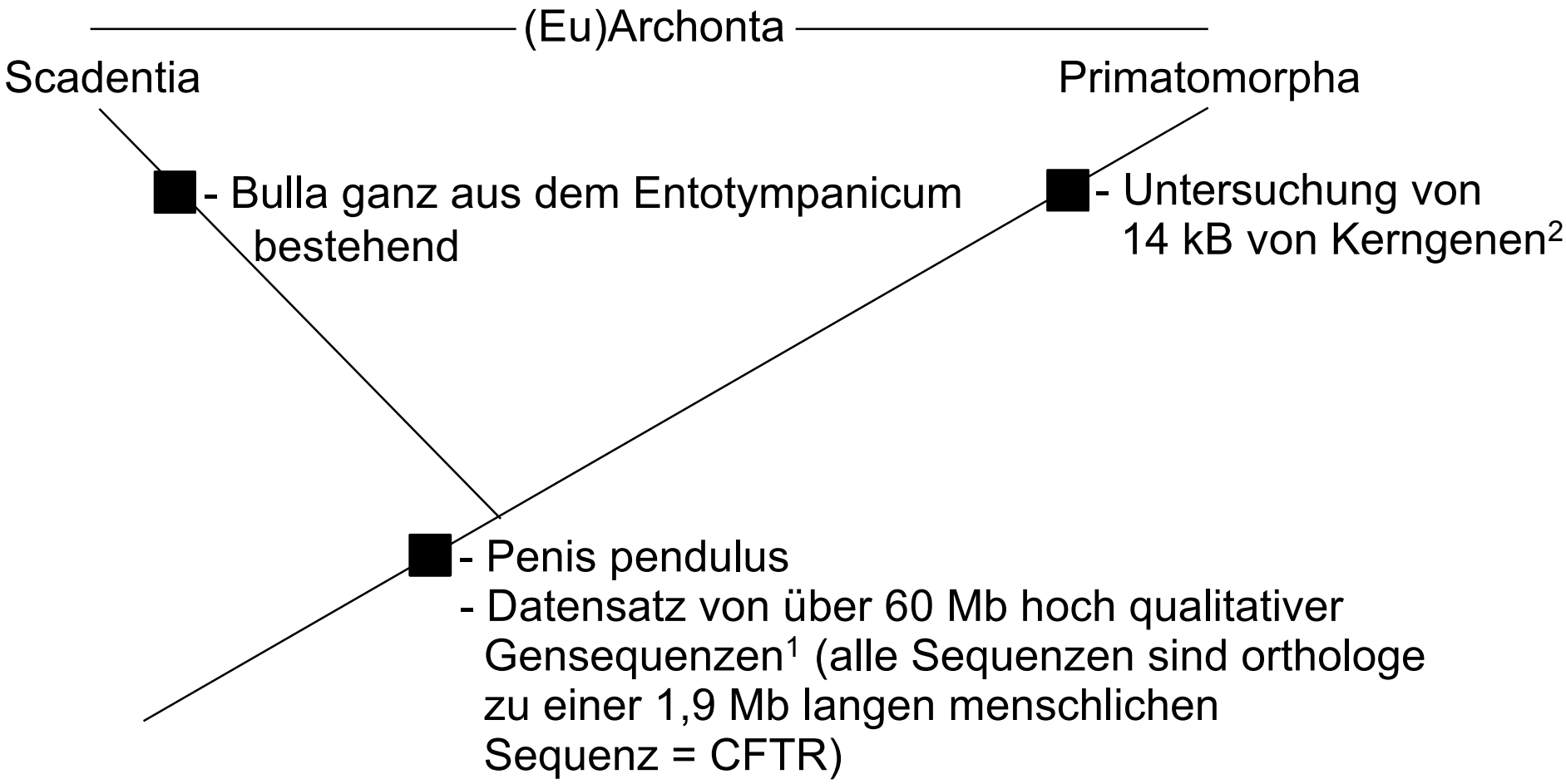
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Sundatheria



[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

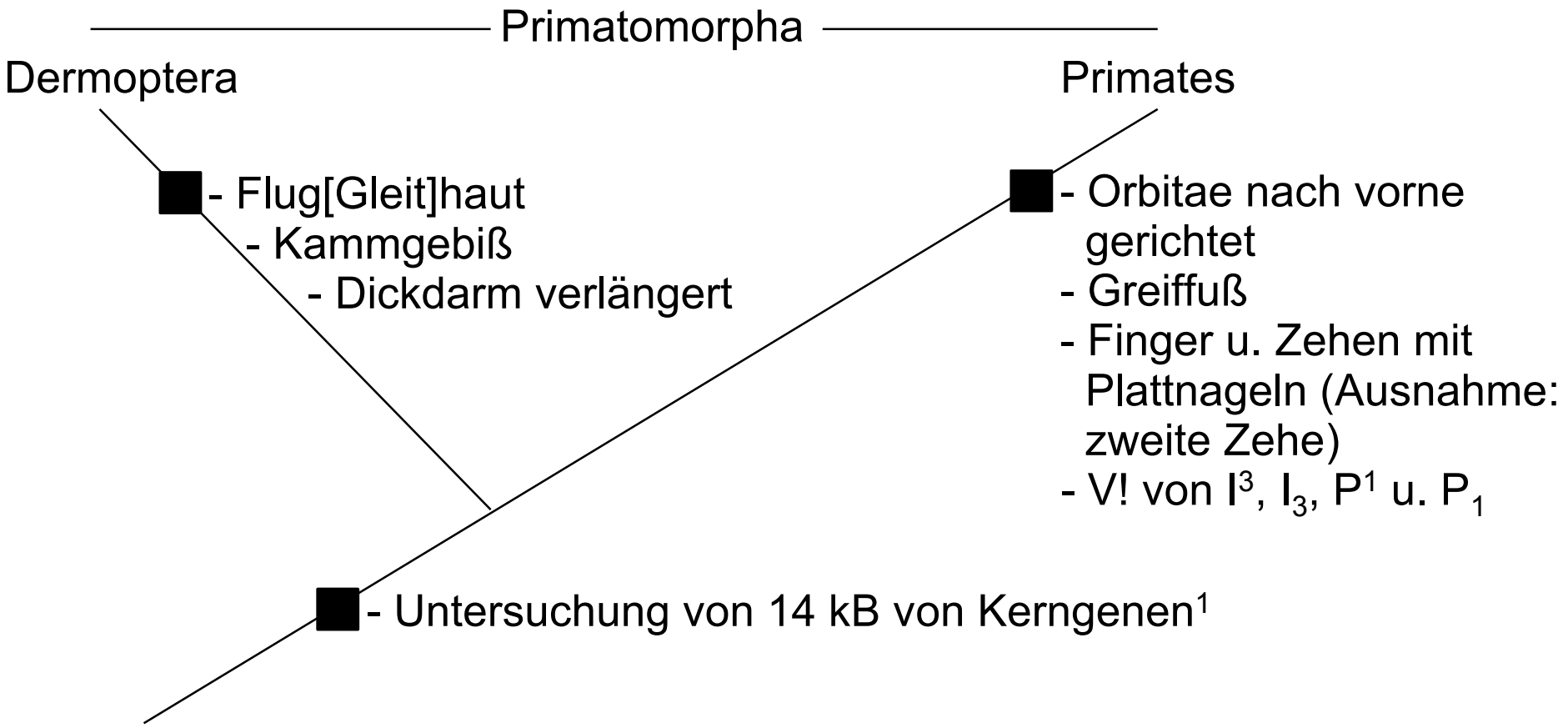
(Eu)Archonta-Alternative



[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

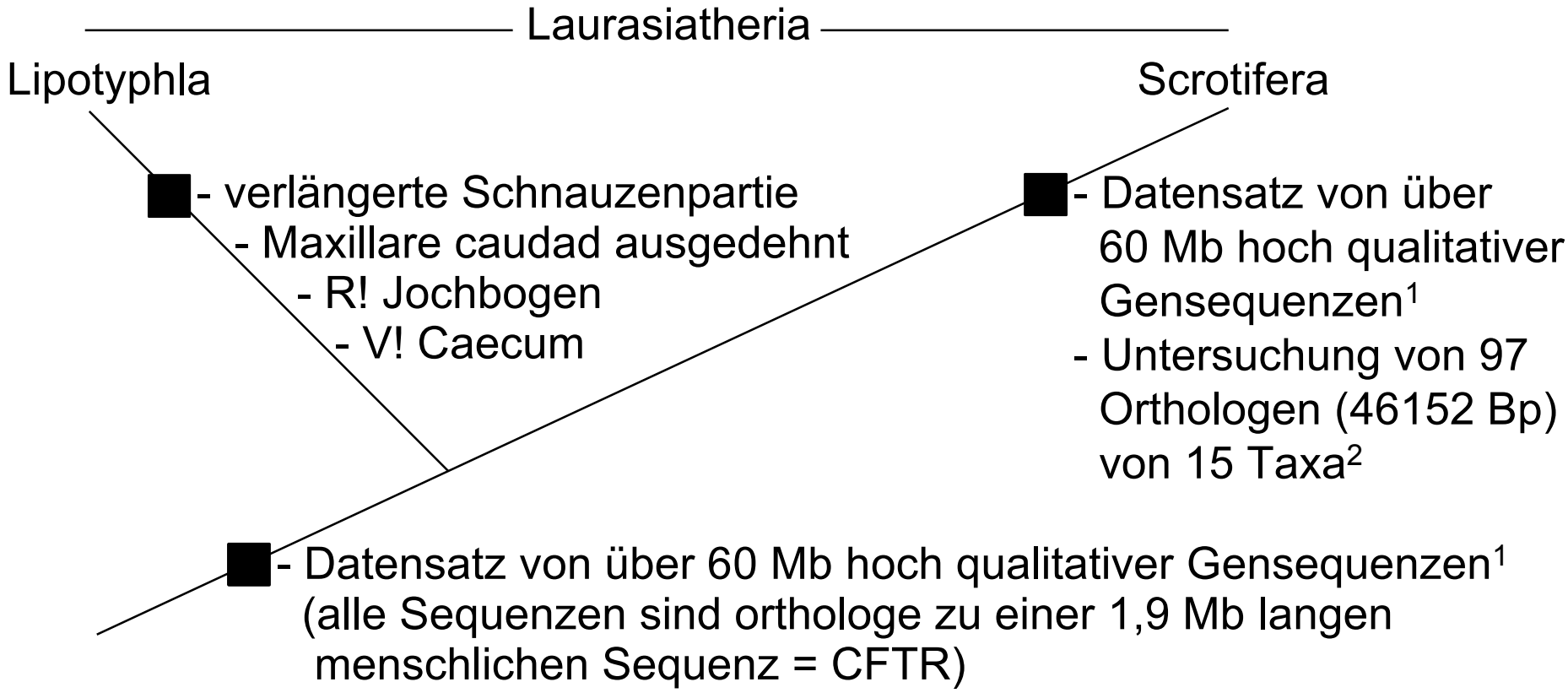
[2] Janecka, J., W. Miller, et al. (2007). Molecular and Genomic Data Identify the Closest Living Relative of Primates. Science. 318: 792-794.

Primatomorpha



[1] Janecka, J., W. Miller, et al. (2007). Molecular and Genomic Data Identify the Closest Living Relative of Primates. Science. 318: 792-794.

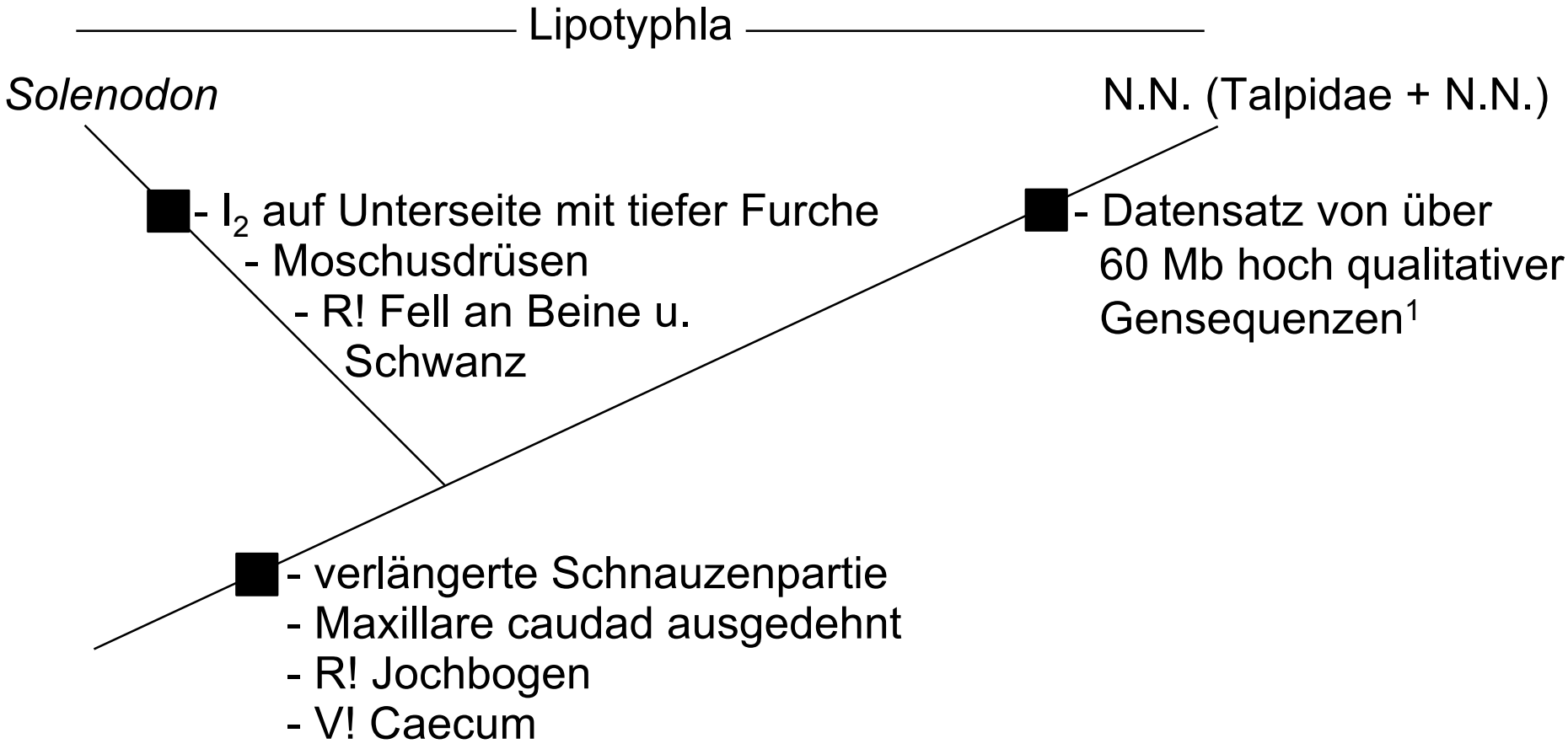
Laurasiatheria



[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

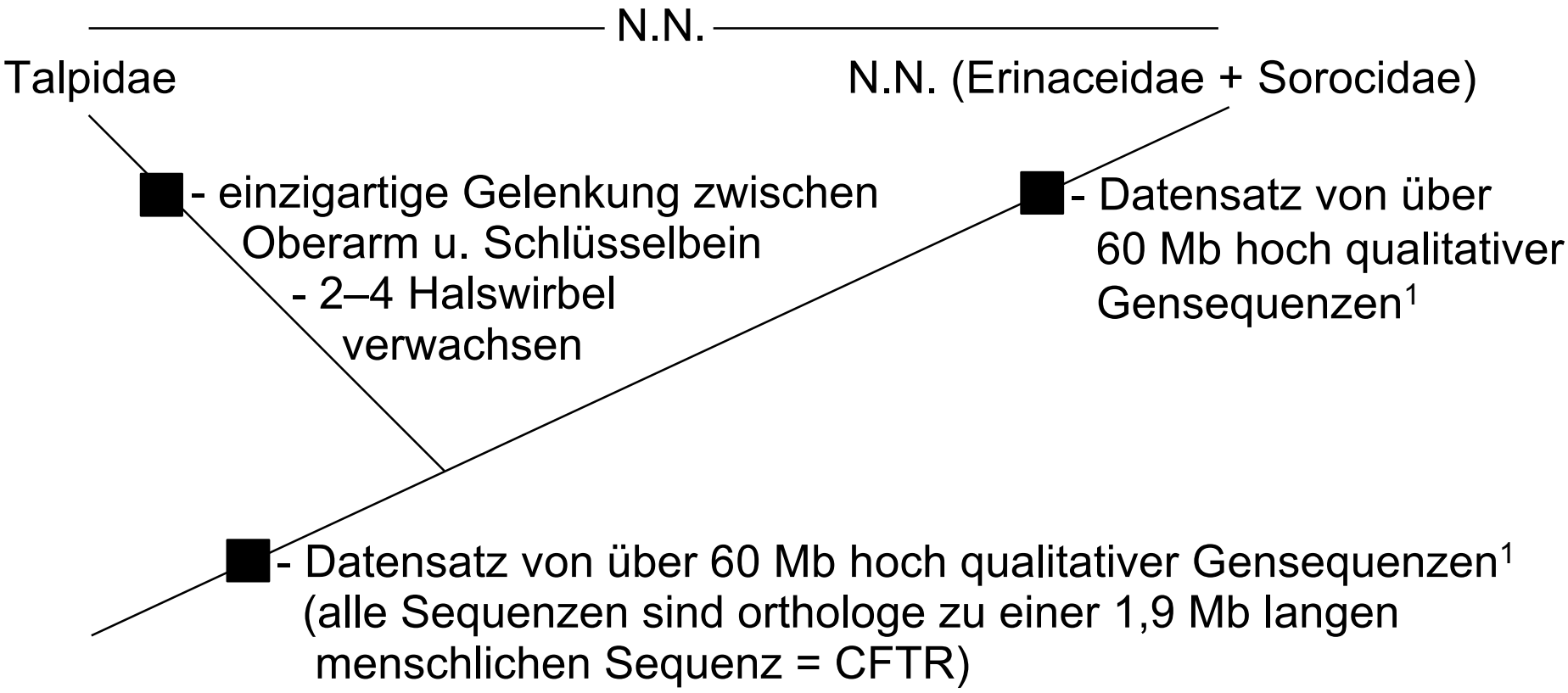
[2] Zhou, X., S. Xu, et al. (2011). Phylogenomic analysis resolves the interordinal relationships and rapid diversification of the laurasiatherian mammals. Systematic Biol. **61:** 150-164.

Lipotyphla



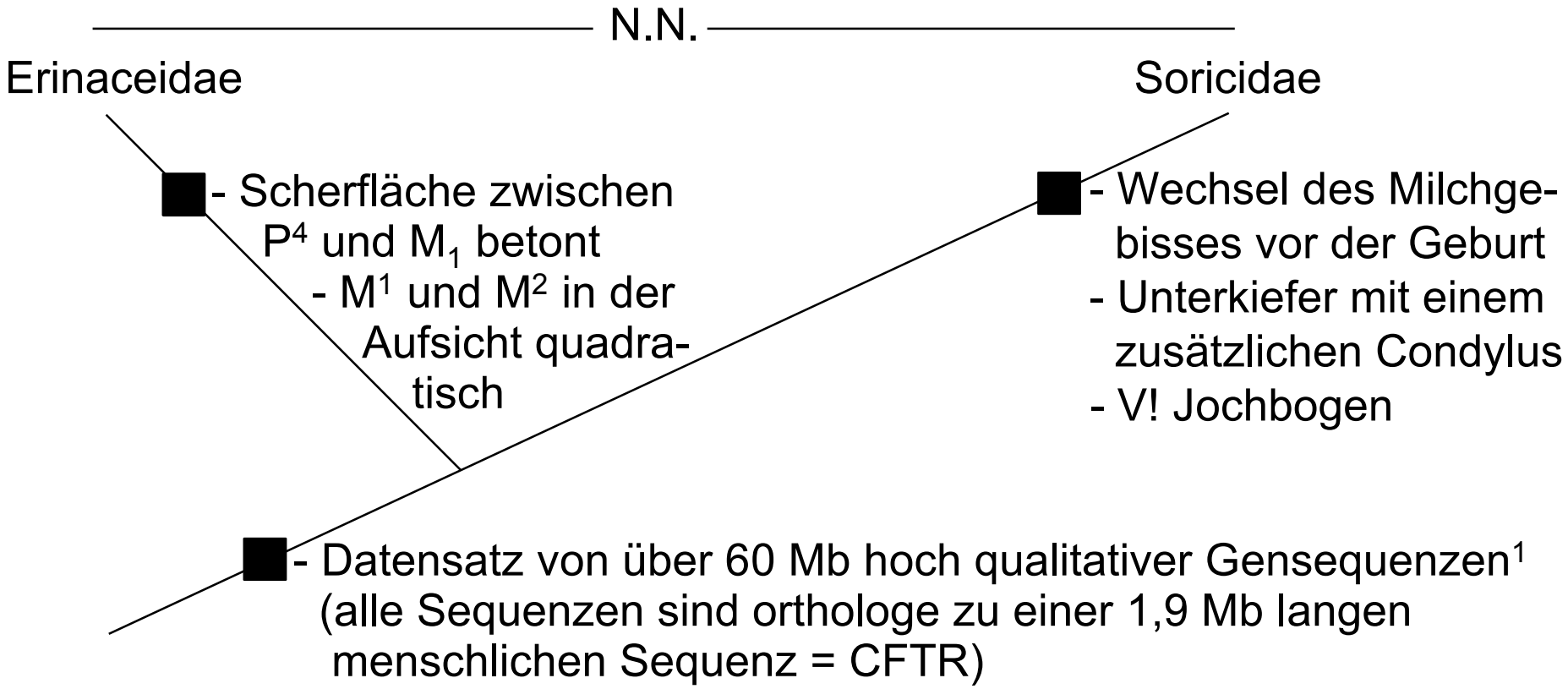
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

N.N. (Talpidae + N.N.)



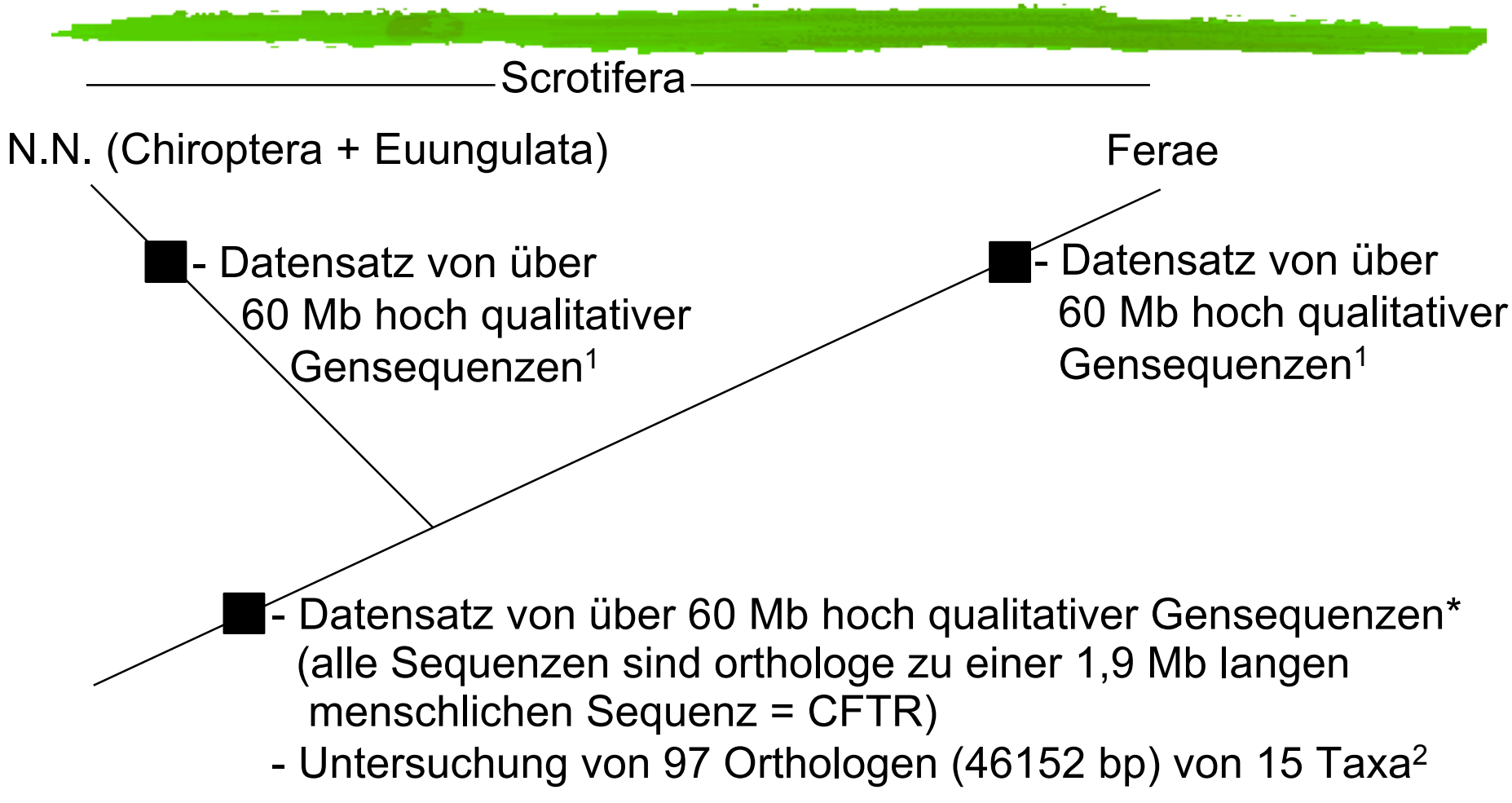
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

N.N. (Erinaceidae + Soricidae)



[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

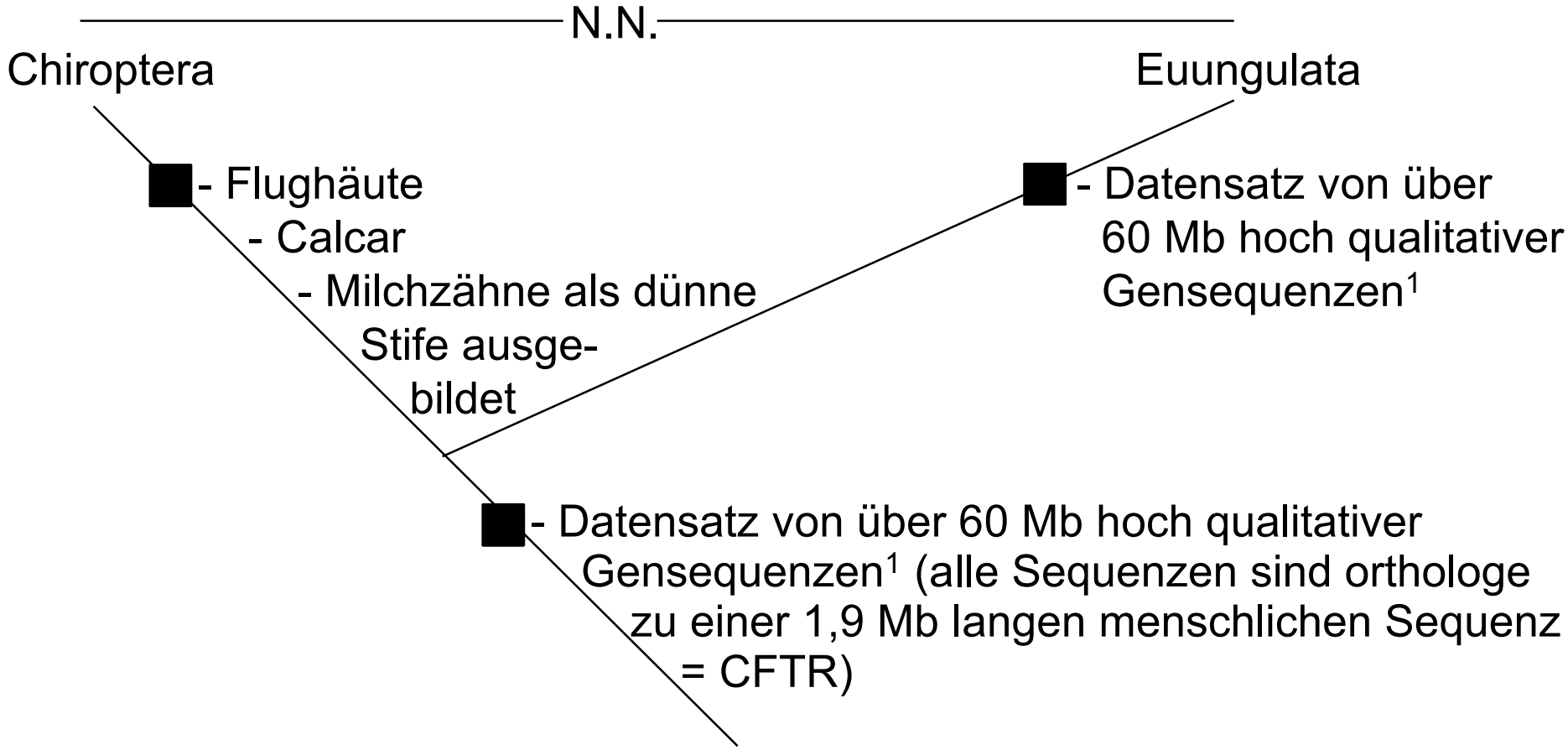
Scrotifera



[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

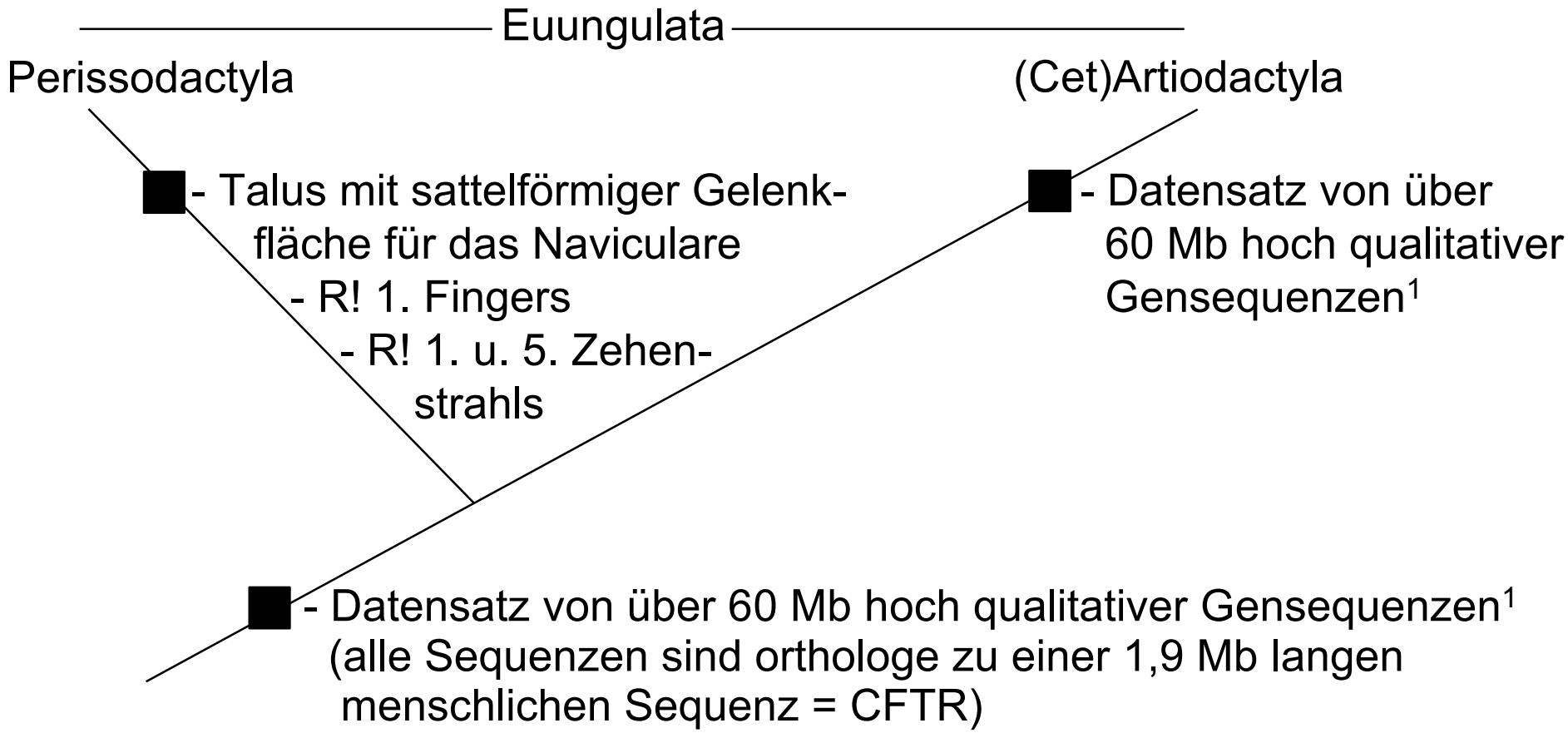
[2] Zhou, X., S. Xu, et al. (2011). Phylogenomic analysis resolves the interordinal relationships and rapid diversification of the laurasiatherian mammals. Systematic Biol. **61:** 150-164.

N.N. (Chiroptera + Euungulata)



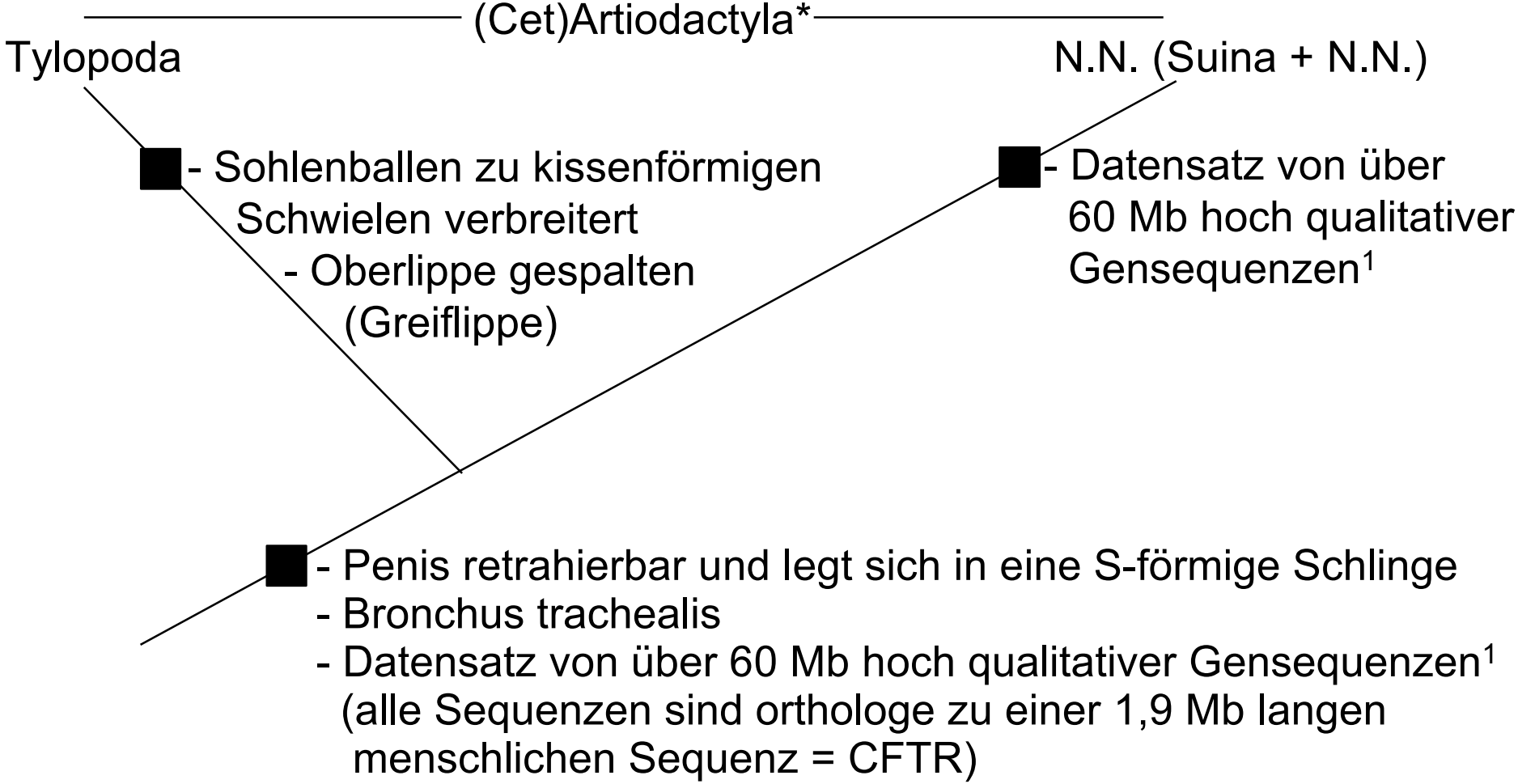
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Euungulata



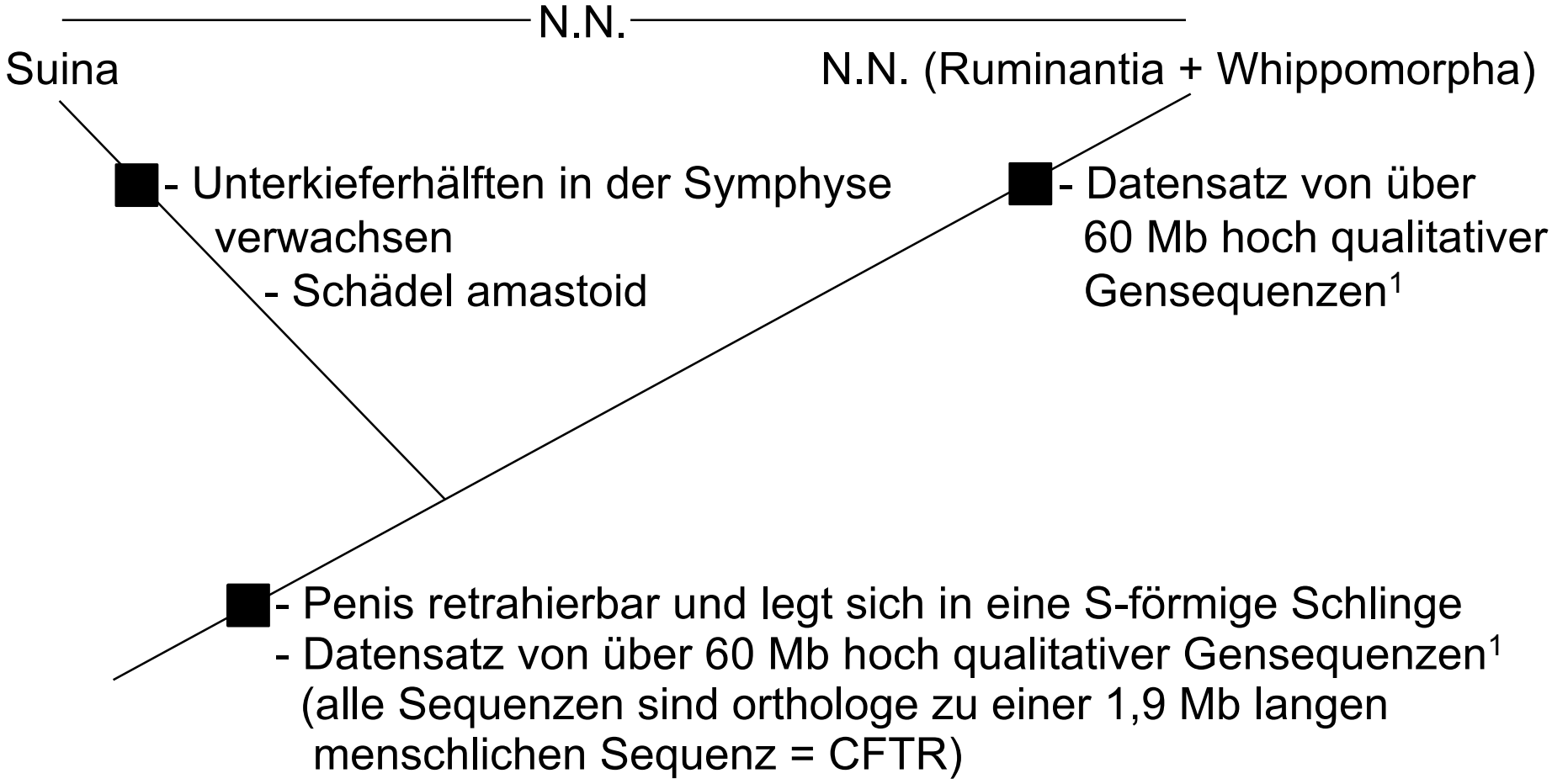
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

(Cet)Artiodactyla



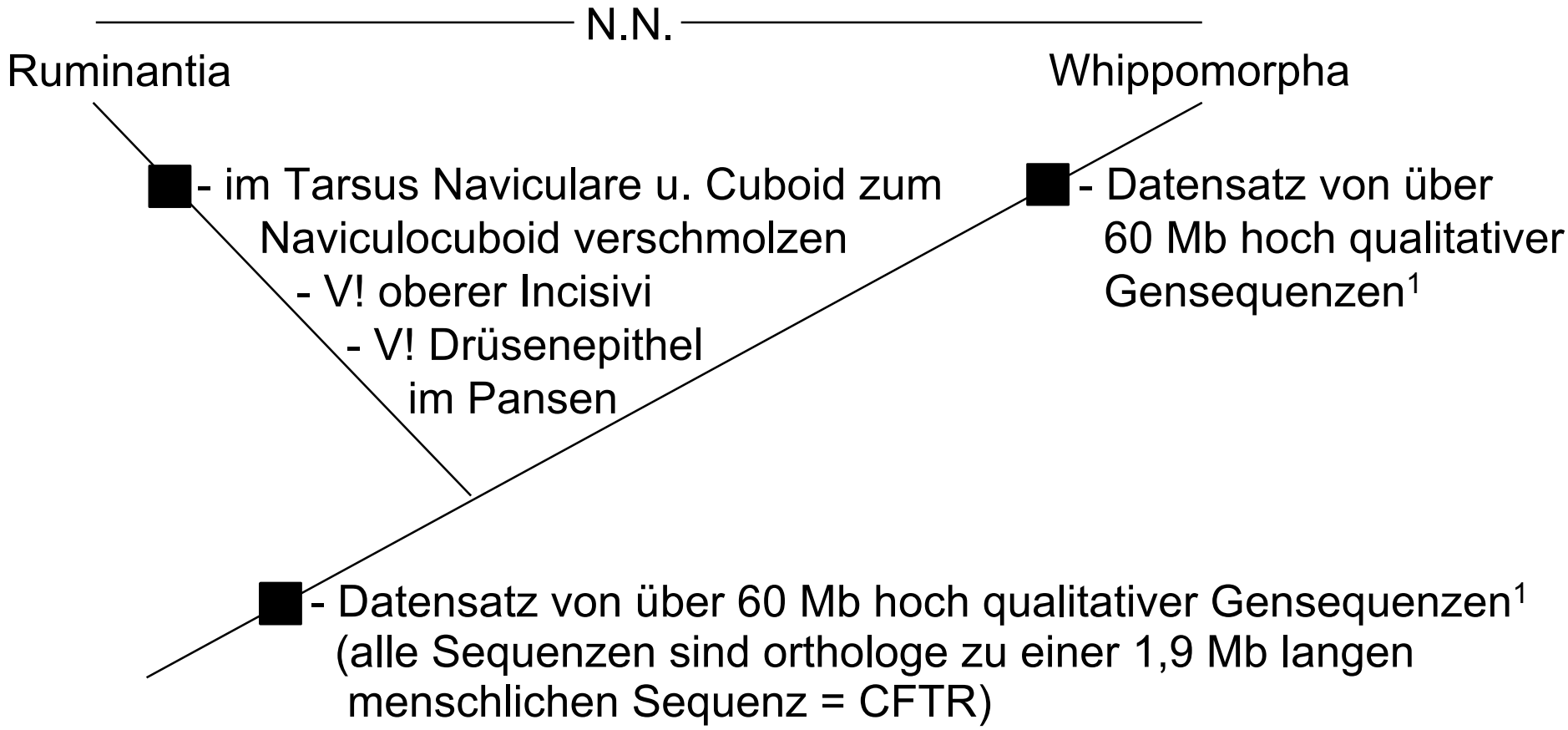
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

N.N. (Suina + N.N.)



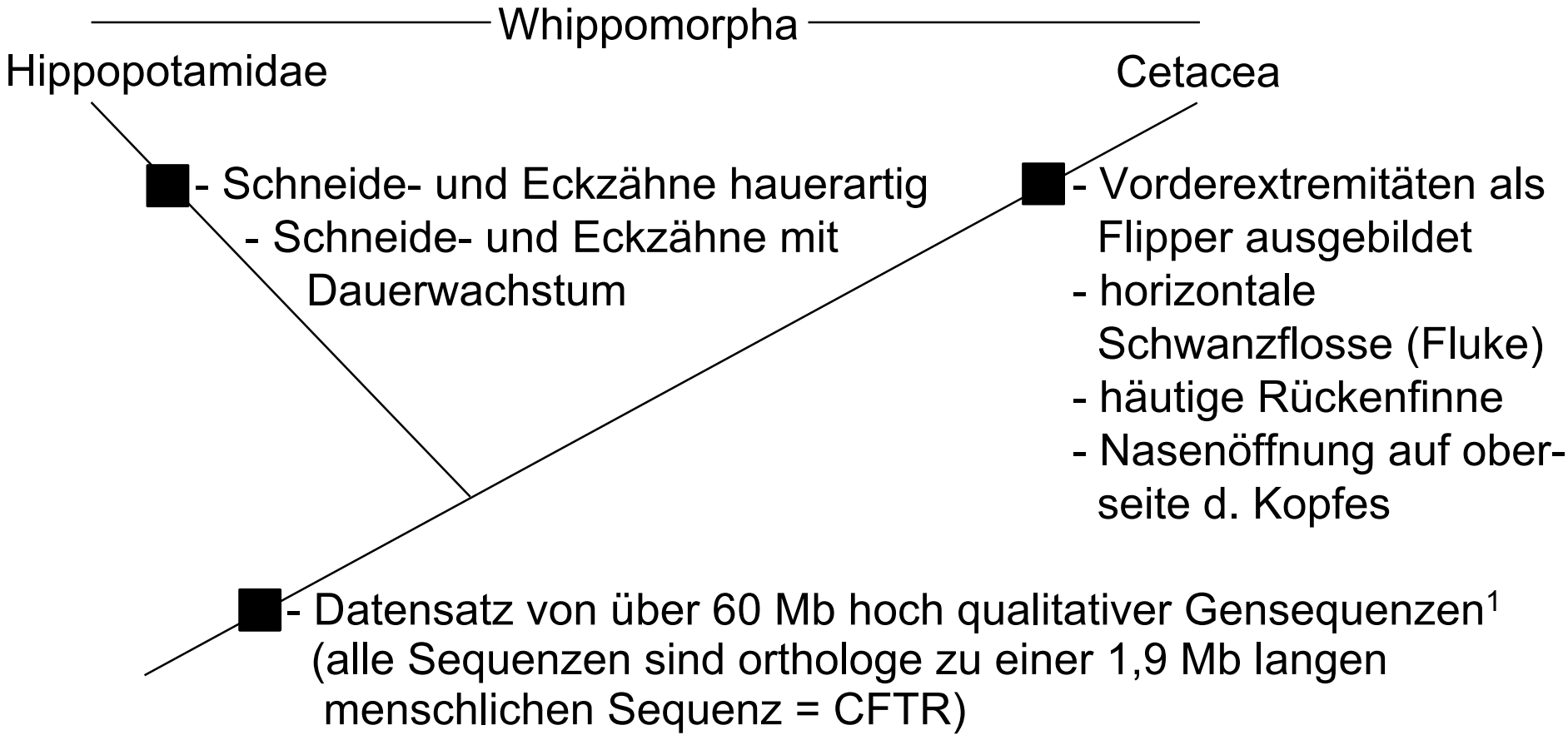
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

N.N. (Ruminantia + Whippomorpha)



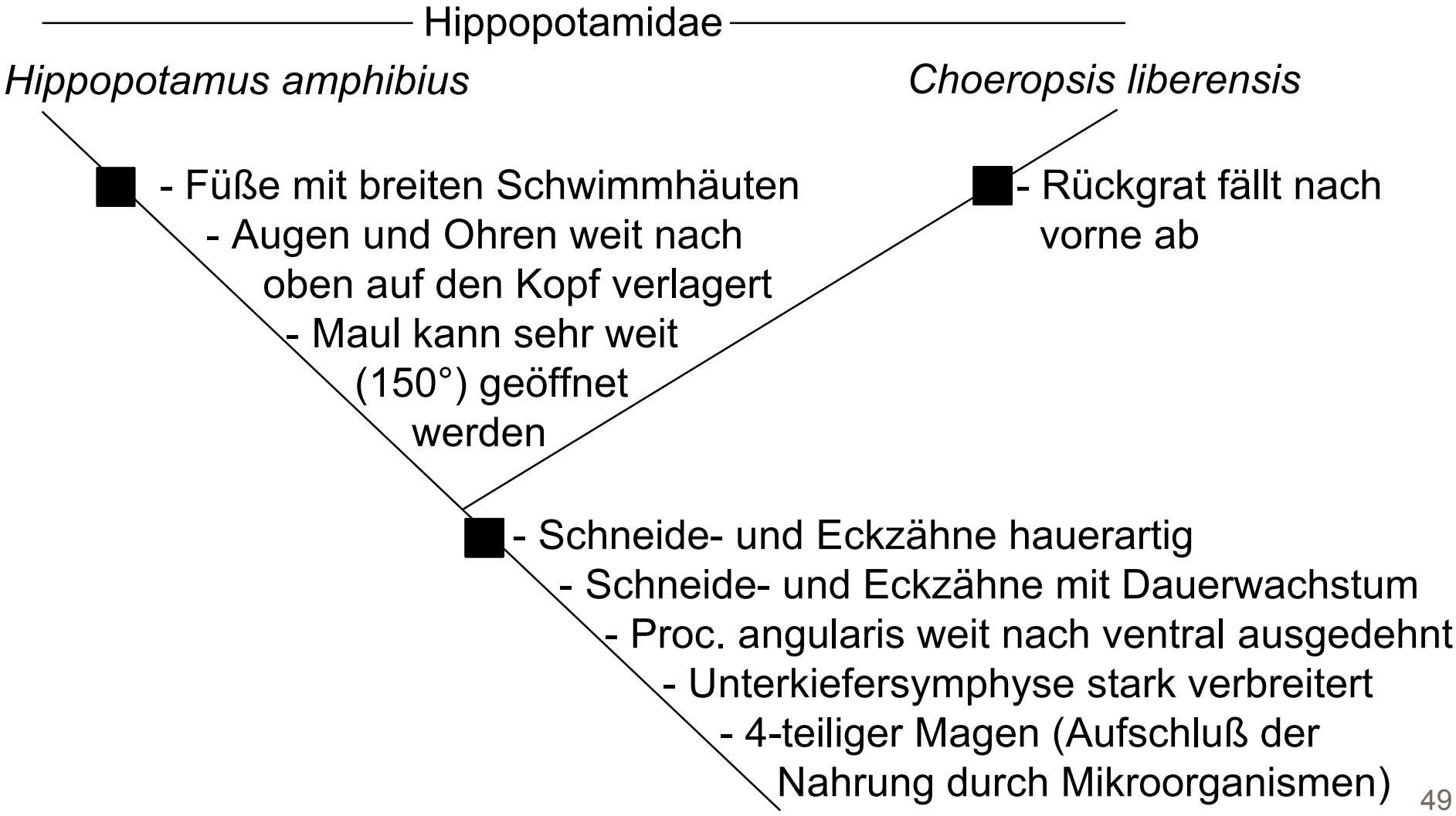
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Whippomorpha

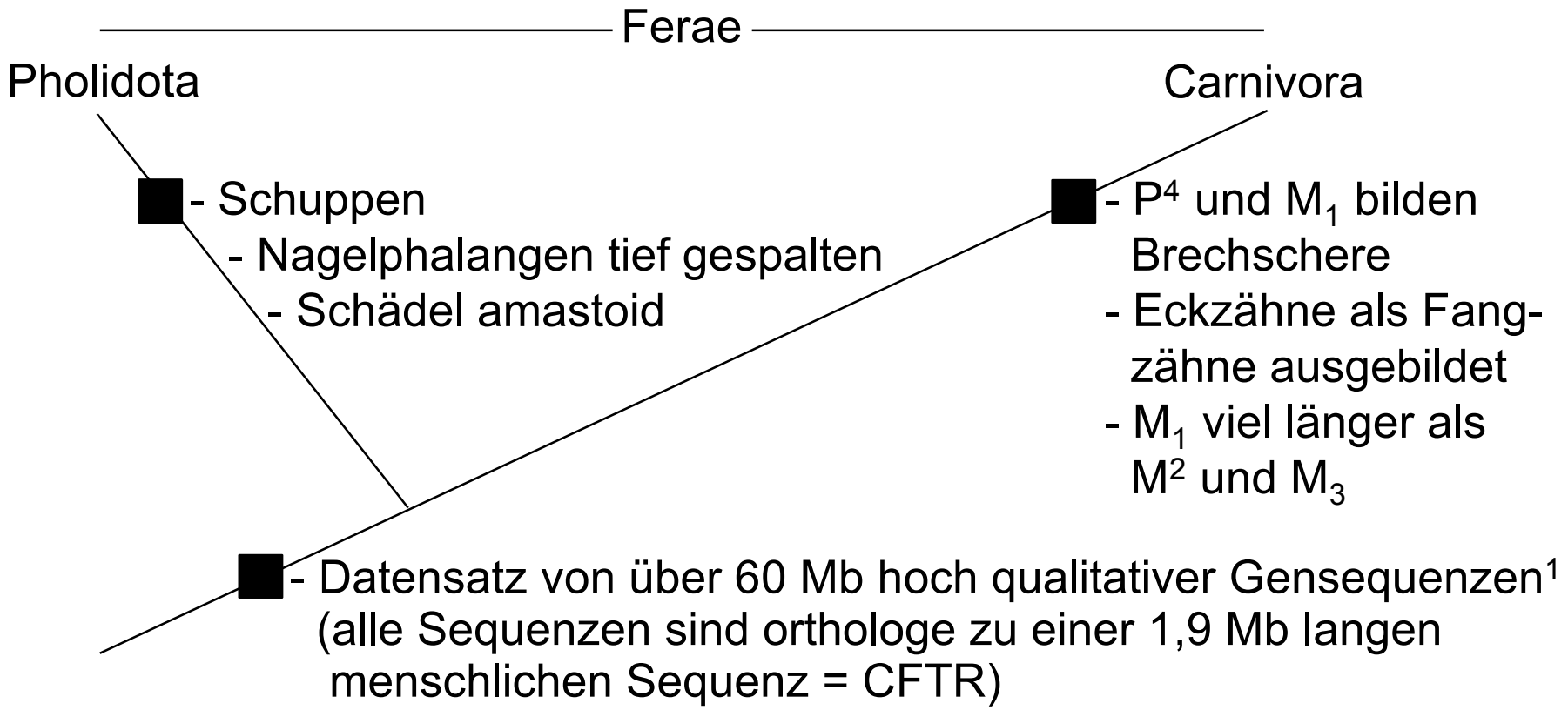


[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Hippopotamidae

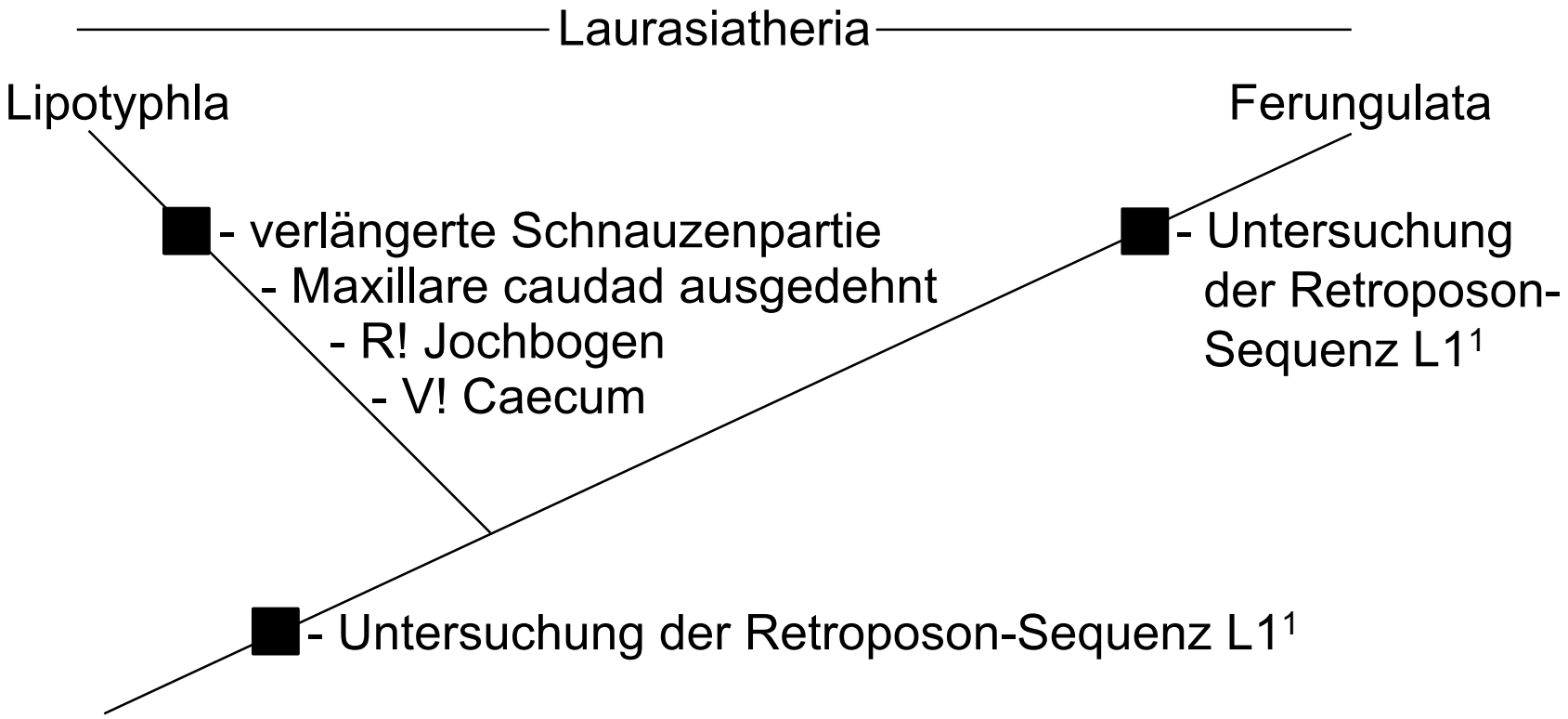


Ferae



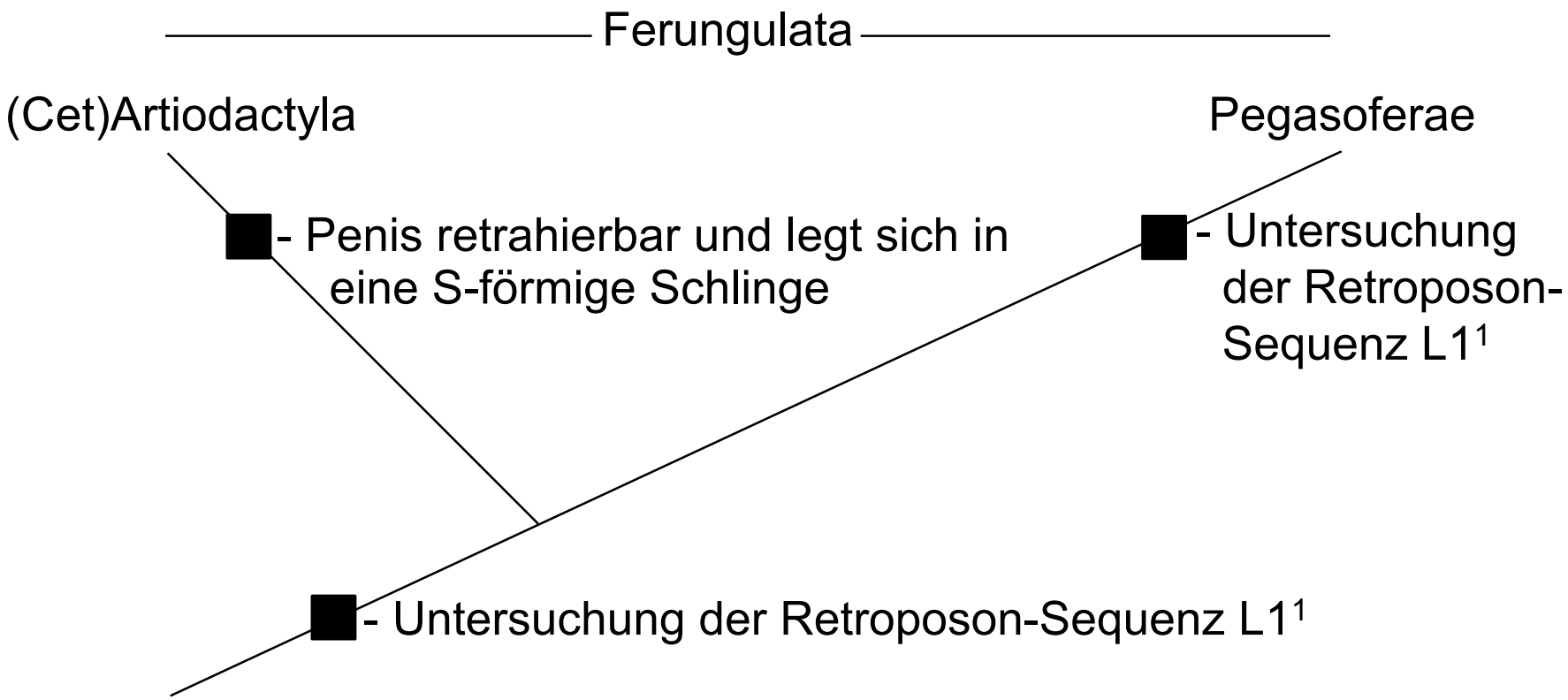
[1] Prasad, A. B., M. W. Allard, et al. (2008). Confirming the phylogeny of mammals by use of large comparative sequence data sets. Molecular Biology and Evolution. **25:** 1795-1808.

Laurasiatheria-Alternative



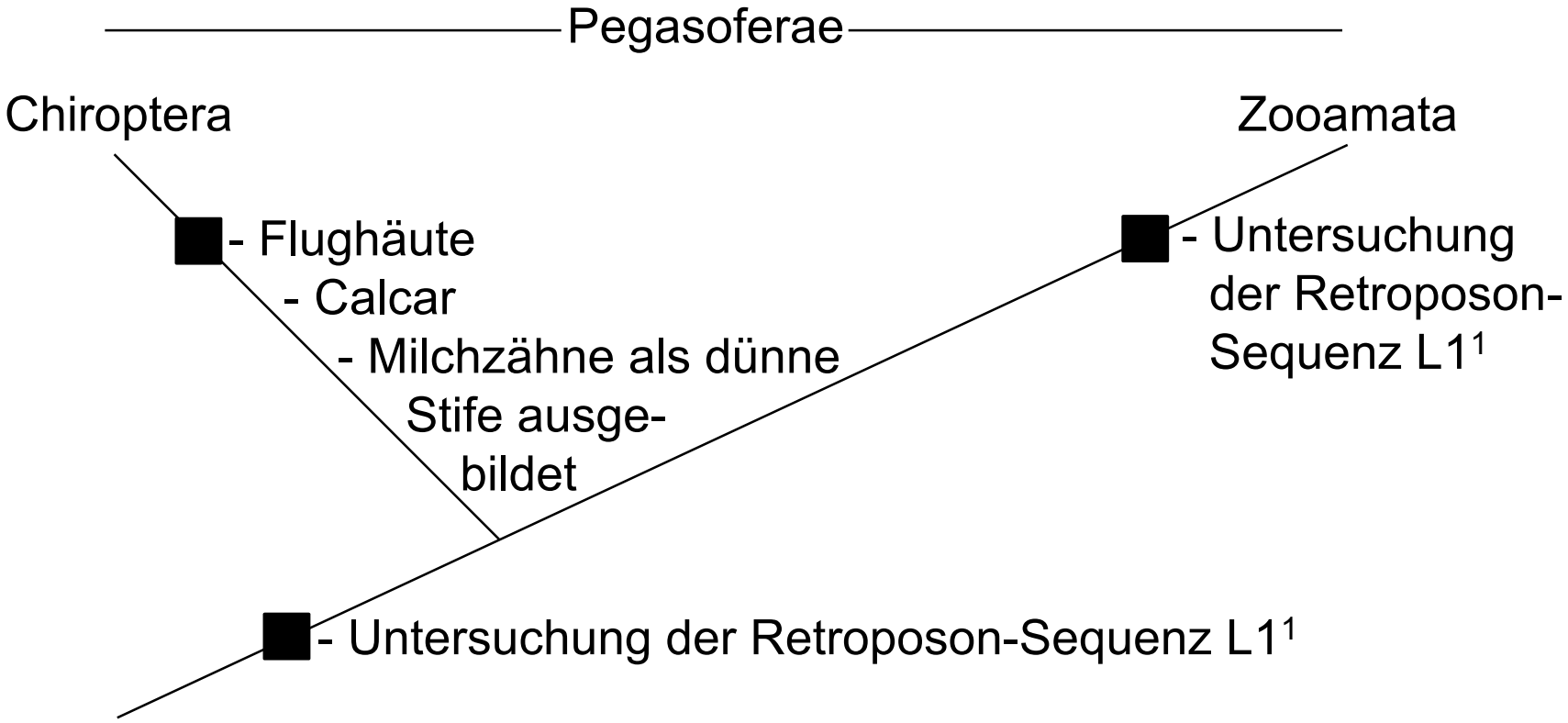
[1] Nishihara, H., M. Hasegawa, et al. (2006). Pegasoferae, an unexpected mammalian clade revealed by tracking ancient retroposon insertions. Proc Natl Acad Sci USA. **103:** 9929-9934.

Ferungulata



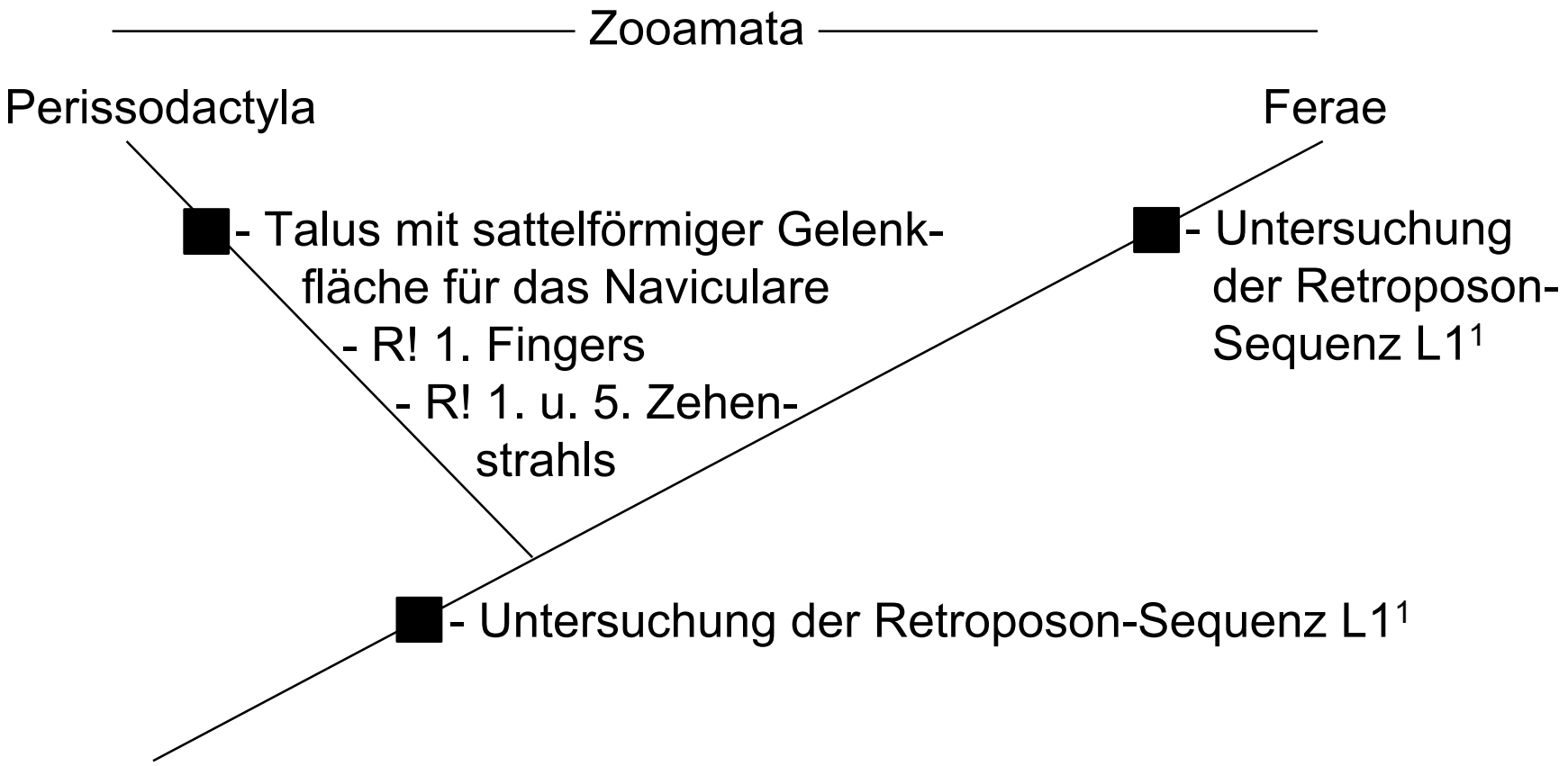
[1] Nishihara, H., M. Hasegawa, et al. (2006). Pegasoferae, an unexpected mammalian clade revealed by tracking ancient retroposon insertions. Proc Natl Acad Sci USA. **103:** 9929-9934.

Pegasoferae



[1] Nishihara, H., M. Hasegawa, et al. (2006). Pegasoferae, an unexpected mammalian clade revealed by tracking ancient retroposon insertions. Proc Natl Acad Sci USA. **103:** 9929-9934.

Zooamata



[1] Nishihara, H., M. Hasegawa, et al. (2006). Pegasoferae, an unexpected mammalian clade revealed by tracking ancient retroposon insertions. Proc Natl Acad Sci USA. **103:** 9929-9934.

Mammalia - geschriebenes System

- Mammalia
  - Monotremata
    - *Ornithorhynchus anatinus*
    - Tachyglossidae
      - *Tachyglossus aculeatus*
      - *Zaglossus*
  - Theria
    - Marsupialia
      - Didelphimorpha
      - N.N. (Paucituberculata + Australidelphia)
        - Paucituberculata
        - Australidelphia
          - *Dromiciops gliroides* (Microbiotheria)
          - Euaustralidelphia
            - Diprodontia
              - Vombatiformes
                - Vombatidae
                - Phascolarctidae
              - N.N. (Petauroidea + Australoplagiaulacoidea)
                - Petauroidea
                - Australoplagiaulacoidea
                  - Phalangeroidea
                  - Macropodiformes
                    - *Hypsiprymnodon moschatus* (Hypsiprymnodontidae)
                    - N.N. (Potoroidae + Macropodidae)
                      - Potoroidae
                      - Macropodidae
            - N.N. (Peramelemorphia + N.N.)
              - Peramelemorphia
              - N.N. (Notorytemorphia + Dasyuromorphia)
                - Notoryctemorphia
                - Dasyuromorphia
    - Placentalia
      - Atlantogenata
        - Xenarthra
        - Afrotheria
          - Paenungulata
            - Hyracoidea
            - Tethytheria
              - Sirenia
              - Proboscidea

- Afroinsectiphilia
  - *Orycteropus afer* (Tubulidentata)
  - Afroinsectivora
    - Macroscelididae
    - Tenrecoidea
      - Chrysochloridae
      - Tenrecidae
- Boreoeutheria
  - Euarchontoglires
    - Glires
      - Lagomorpha
        - Ochotonidae
        - Leporidae
      - Rodentia
    - (Eu)Archonta
      - Sundatheria
        - Scadentia
        - Dermoptera
      - Primates
  - Laurasiatheria
    - Lipotyphla
      - *Solenodon*
      - N.N. (Talpidae + N.N.)
        - Talpidae
        - N.N. (Erinaceidae + Soricidae)
          - Erinaceidae
          - Soricidae
    - Scrotifera
      - Ferae
        - Pholidota
        - Carnivora
      - N.N. (Chiroptera + Euungulata)
        - Chiroptera
        - Euungulata
          - Perissodactyla
          - (Cet)Artiodactyla
            - Tylopoda
            - N.N. (Suina + N.N.)
              - Suina
              - N.N. (Ruminantia + Whippomorpa)
                - Ruminantia
                - Whippomorpha
                  - Hippopotamidae
                  - Cetacea

Anmerkungen

Anmerkungen zur Seite 3:

* Der hauptsächlich bei den Männchen ausgebildete, hornüberzogene und umklappbare Sporn, auf dessen Spitze eine im Schenkelbereich liegende Giftdrüse ausmündet, wird z.T. als Apomorphie der Monotremata genannt. Dieses Merkmal könnte aber eine Plesiomorphie sein denn *Gobicondon* †, ein mutmaßlicher Stammgruppenvertreter der Mammalia und *Zahngheotherium* †, ein mutmaßlicher Stammgruppenvertreter der Theria, scheinen ebenfalls einen spornartigen Fersenanhang besessen zu haben (Mickoleit 2005 zit. n. Hu, Wang, Lou & Li 1997).
** Ob die schnabelförmige Schnauze ein abgeleitetes Merkmal für *Ornithorhynchus anatinus* ist, lässt sich schwer sagen, da ungewiss ist, wie die Schnauzenform der Stammart der Monotremata war. Somit ist auch die röhrenförmige Schnauzenform der Tachyglossidae als Apomorphie dieser Gruppe fraglich (siehe Seite 4).

Anmerkungen zur Seite 4:

* *Ornithorhynchus anatinus* weist juvenil noch 2-3 Paar höckerigen Zähnen im Ober- und Unterkiefer auf (Mickoleit 2005).

** Innerhalb von Zaglossus werden zur Zeit drei Arten anerkannt. *Zaglossus bruinji* (Westlicher Langschnabeligel) ist durch die Reduktion auf 3 Krallen an den Vorder-und Hinterpfoten gekennzeichnet. *Zaglossus batoni* (Östlicher Langschnabeligel) weist in der Regel 5 Krallen an den Vorder-und Hinterpfoten auf aber es können auch nur 4 an den Hinterpfoten vorkommen. Bei *Zaglossus bartoni* ist weiterhin die Orbitotemporal-Grube reduziert, die bei *Zaglossus bruinji* sehr groß ausgebildet ist. Die dritte erst 1998 beschriebene Art ist *Zaglossus attenboroughi* (Attenborough-Langschnabeligel), die nur anhand eines einzigen Museumsexemplar beschrieben wurde. Diese Art ist die kleinste *Zaglossus*-Art, weist wohl 5 Krallen an allen Pfoten auf und lebt ausschließlich in den Cyclops-Bergen auf Neuguinea (T.F Flannery, C.P Groves 1998).
Wie die Verwandtschaft der 3 Arten untereinander ist, konnte ich leider nicht ermitteln.

Anmerkungen zur Seite 15:

* Die morphologischen apomorphen Merkmale für Potorooidae + Macropodidae sind der Arbeit von Burk et. al. (1998) entnommen.

Anmerkungen zur Seite 34:

* Bei der Namensgebung der Placentalia-Taxa habe ich mich an der Arbeit von Asher & Helgen (2010) orientiert. Diese Arbeit gibt Vorschläge für eine einheitliche Benennung höherrangiger Taxa (Taxa mit einem höheren kategorialen Rang als den der Familie). Dabei versuchen sie die Prioritätsregel für Artnamen auch auf diese höherrangigen Taxa anzuwenden, was vereinfacht bedeutet den erst verwendeten Namen für ein Taxon zu benutzen, um somit Stabilität in die Namensgebung zu bringen. Für das auf der Seite 34 dargestellte Taxon schlagen Asher und Helgen den Begriff Archonta vor.

Ich habe die Vorsilbe „Eu“ in klammern davor gesetzt, weil dieses Taxon eher unter dem Begriff Euarchonta bekannt ist.

Anmerkungen zur Seite 45:

* Ähnlich wie für das Taxon Archonta auf der Seite 34, habe ich hier in Klammern eine Vorsilbe gesetzt, da dieses Taxon in der Regel als Cetartiodactyla bekannt ist.

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