

<https://creationismeweersproken.blogspot.com/2023/01/de-rode-panda-en-cserhati-2-overzicht.html>

THE RED PANDA AND CSERHATI (2): LITERATURE SURVEY

In blog post 1 of this series it emerged that there are three scientific possibilities for the classification within the superfamily Musteloidea. The mustelids Mustelidae and the raccoon-like Procyonidae are always sister groups. The differences between the possibilities are in the placement of the red panda family Ailuridae and the skunk family Mephitidae

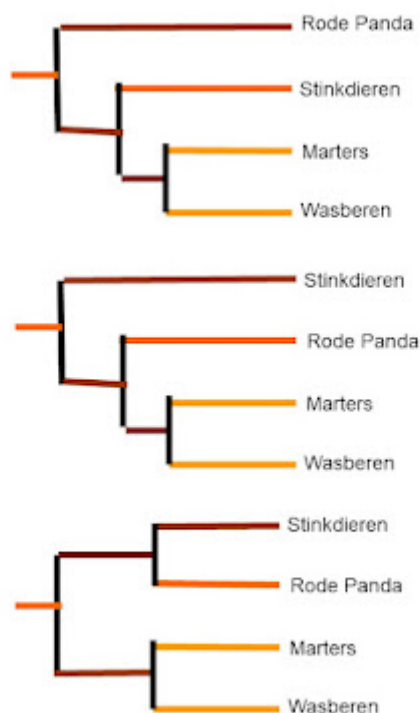


Figure 1 Three possibilities for the phylogenetic tree of the Musteloidea.(stinkdieren = skunks; rode panda = red panda; marters = marten family; wasberen = raccoon family)

Here I present a survey of the literature, how often each of these possibilities has been found - without claiming to be complete.

The first possibility is that the first split in the Musteloidea is found between red panda and skunks + raccoons + mustelids.

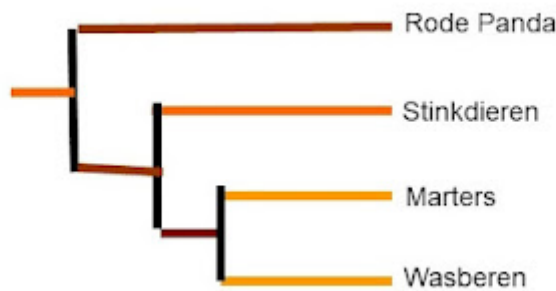


Figure 2 First split in the Musteloidea between red panda and skunks + raccoons + martens. (stinkdieren = skunks; rode panda = red panda; marters = marten family; wasberen = raccoon family)

Flynn, J.J., Nedbal, M.A., Dragoo, J.W., & Honeycutt, R.L. (2000) Whence the red panda? *Mol Phylogenetic Evol.* 17:190–199.

Flynn, J.J.; Finarelli, J.A.; Zehr, S.; Hsu, J. & Nedbal, M.A. (2005). Molecular phylogeny of the Carnivora (Mammalia): Assessing the impact of increased sampling on resolving enigmatic relationships. *Systematic Biology.* 54: 317–337.

Fulton, T.L, Strobeck, C. (2007) Novel phylogeny of the raccoon family (Procyonidae: Carnivora) based on nuclear and mitochondrial DNA evidence. *Molecular Phylogenetics and Evolution* 43:1171–7.

The second possibility is that the first split in the Musteloidea is between skunks and red panda + raccoons + mustelids.



Figure 3 First split in the Musteloidea between skunks and red panda + raccoons + martens (stinkdieren = skunks; rode panda = red panda; marters = marten family; wasberen = raccoon family)

Fulton, T.L, Strobeck, C. (2007) Novel phylogeny of the raccoon family (Procyonidae: Carnivora) based on nuclear and mitochondrial DNA evidence. *Molecular Phylogenetics and Evolution* 43:1171–7.

Sato, J.J, Wolsan, M., Minami, S., Hosoda, T., Sinaga, M.H., Hiyama, K., Yamaguchi, Y. & Suzuki, H. (2009) Deciphering and dating the red panda's ancestry and early adaptive radiation of Musteloidea. *Molecular Phylogenetics and Evolution* 53 (2009) 907–922

Eizirik, E., W.J. Murphy, K.P. Koepfli, W.E. Johnson, J.W. Dragoo, R.K.Wayne, en S.J. O'Brien (2010). Pattern and timing of the diversification of the mammalian order Carnivora inferred from multiple nuclear gene sequences. *Molecular Phylogenetics and Evolution* 56: 49-63.

Yu, L., Luan, P.T., Jin, W, Ryder, O.A., Chemnick, L.G., Davis, H.A.& Zhang, Y.P. (2011) Phylogenetic Utility of Nuclear Introns in Interfamilial Relationships of Caniformia (Order Carnivora) *Systematic Biology* 60:175–187;

Law, C.J.; Slater, G.J. & Mehta, R.S. (2018). Lineage Diversity and Size Disparity in Musteloidea: Testing Patterns of Adaptive Radiation Using Molecular and Fossil-Based Methods. *Systematic Biology*. 67: 127–144.

The third possibility is that the first split in the Musteloidea is between skunks + red panda and raccoons + mustelids. This possibility is often mentioned as a less substantiated possibility in articles that present evidence for one of the first two possibilities.

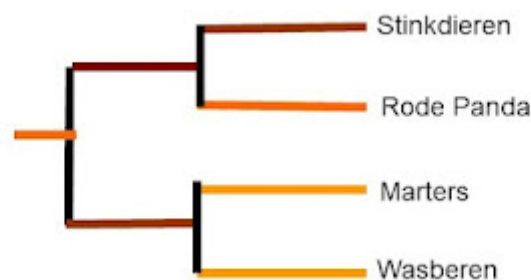


Figure 4 First split in the Musteloidea between skunks * red panda and raccoons + martens . (stinkdieren = skunks; rode panda = red panda; martens = marten family; wasberen = raccoon family)

Flynn, J.J., Nedbal, M.A., Dragoo, .J.W, & Honeycutt, R.L. (2000) Whence the red panda? *Mol Phylogenet Evol.* 17:190–199.

Delisle, I. & Strobeck, C. (2005) A phylogeny of the Caniformia (order Carnivora) based on 12 complete protein-coding mitochondrial genes. *Molecular Phylogenetics and Evolution* 37: 192–201

Sato, J.J., Wolsan, M., Suzuki, H., Hosoda, T., Yamaguchi, Y., Hiyama, K., Kobayashi, M., Minami, S. (2006) Evidence from nuclear DNA sequences sheds light on the phylogenetic relationships of Pinnipedia: single origin with affinity to Musteloidea. *Zoological Science* 23:125–46.

Fulton, T.L, Strobeck, C. (2007) Novel phylogeny of the raccoon family (Procyonidae: Carnivora) based on nuclear and mitochondrial DNA evidence. *Molecular Phylogenetics and Evolution* 43:1171–1177.

Law, C.J.; Slater, G.J. & Mehta, R.S. (2018). Lineage Diversity and Size Disparity in Musteloidea: Testing Patterns of Adaptive Radiation Using Molecular and Fossil-Based Methods. *Systematic Biology* 67: 127–144..

Jin, Z., Xu, H., Li, D. Xie, M., Zhang, M., Ni, Q., & Yao, Y. (2019) Complete mitochondrial genome of red panda (*Ailurus fulgens*) and its phylogenetic analysis. *Mitochondrial DNA part B* 4: 2339-2340

Hassanin, A.; Veron, G.; Ropiquet, A.; van Vuuren, B. J.; Lécuyer, A.; Goodman, S. M.; Haider, J.; Nguyen, T. T. (2021). Evolutionary history of Carnivora (Mammalia, Laurasiatheria) inferred from mitochondrial genomes. *PLOS ONE*. 16 (2): e0240770.

Hassanin A, Veron G, rA, Jansen van Vuuren B, Lécuyer A, Goodman SM, et al. (2021) Correction: Evolutionary history of Carnivora (Mammalia, Laurasiatheria) inferred from mitochondrial genomes. *PLoS ONE* 16(3): e0249387.

This third possibility for the classification of the superfamily Musteloidea, the red panda as family Ailuridae as a sister group of the family Mephitidae, now has most support. The study by Hassanin et al (2021) is the most comprehensive study of the phylogeny of the order Carnivora to date. Moreover, this possibility for classification was also found earlier, as a less substantiated possibility in studies that ended up with one of the other two possibilities.