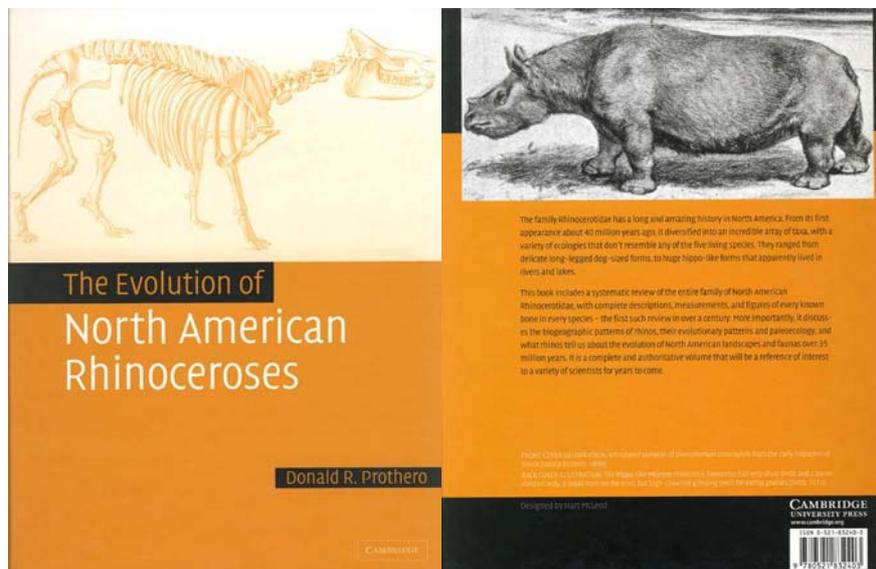


**Prothero, D.P. 2005. The evolution of North American rhinoceroses. - Cambridge, Cambridge University Press**

Book review by J. de Vos



In the early 1970's I worked on my PhD. thesis, called 'The endemic Pleistocene deer of Crete'. For this I collected hundreds of bones from Caves of Crete. From each bone I took at least five measurements. I had to measure the bones with a dial calipers by hand, and wrote down each measurement in an exercise book, which became quite a collection. Thousands of measurements, which I had to work with mathematically with a simple calculator, that could only add up, multiply, divide and subtract. To calculate the average of 60 measurements took a long time. To calculate the X-test or a standard deviation took even more time. My worst nightmare was to loose all these data. This is exactly what happened to Donald R. Prothero when he was doing his study on the North American rhinos, also in the early seventies of the previous century. He lost a lot of his data because People Express Airlines lost his luggage. Donald had to go back to the several museums to re-measure the hundreds of specimens! Only scientists from before personal computers (let alone laptops) can realise how much work is in the book 'The evolution of North American rhinoceroses' of Prothero. It is impressive! The main body of the book (chapters 4 and 5) is a revision of the North American rhinoceroses based on morphological and biometrical descriptions of dental and postcranial elements. The methods (chapter 2) are straightforward: maximal length is maximal length, no discussion about that. I like that way, because in other works often the landmarks for the measurements are too complicated and you have to ask yourself what the author means with his definition of these landmarks. The drawings with the landmarks are clear.

In the 'History of investigation' (p. 18 and 19) all species are mentioned with the author, who created it and the present status. I counted 120 species, which were created in the course of time from 1850 (author: Leidy) until 1999 (author: Albright). All those species were reduced to 37 species within 17 genera (if I counted well), based on good arguments. The revision is mostly based on dental elements (chapter 4) but in chapter 5 the postcranial elements are described, morphologically as well as biometrically, and figured. This is what I like most in this work: now it is possible to do something with new finds. The 37 species still look like quite a lot, but it is not if you realise that they stem from the middle Eocene until the earliest Pliocene. Furthermore, rhinoceroses were the largest land mammals on the continent and competed in the middle and late Eocene only with brontotheres, and after the middle Miocene with the proboscideans. From every species the holotype, hypodigm, known distribution, diagnosis, a description and a discussion is given.

Chapter (6) 'Biogeography and diversity patterns' is based on all those data. It is indicated, assisted with maps, where the different genera and species in different times occurred. The last chapter (chapter 7) is about the 'Paleoecology and evolutionary patterns'. The paragraph about dwarfing attracted my attention. Here I read (p. 205): "As Prothero and Sereno (1982) pointed out, this dwarfing may be comparable to that seen in forest-dwelling or island-dwelling pygmy hippos and elephants, where the reduction in body size is driven by the more limited resource base, and the decreased need to roam large areas of grasslands to find food". It is possible to compare the small rhinos with small forest dwelling hippos, like *Choeropsis liberiensis*, but you can not compare them with island pygmy elephants or hippos, because this is a completely other phenomenon. On Crete, and on other islands in the Mediterranean, Indonesia (Sulawesi, Timor, Sumba, Flores), the Philippines, the Channel

Islands in front of the coast of California, there are so-called unbalanced endemic island faunas. Unbalanced means that there are no large carnivores, and that there are a restricted number of genera (like hippos, cervids, proboscideans and rodents). The hippos, proboscideans and some cervids became small, while the rodents became larger. The pygmy island forms have peculiar adaptations, like shortened legs. Especially the metapodials are shortened and became more robust. This is based on the thousands of measurements I took from the cervids of Crete, but is also valuable for the hippos. The rhinos became only smaller and do not show the peculiar island adaptations.

This book is not a casual reading book, but I can recommend it to all palaeontologists who are interested in mammal vertebrates.

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Dr. John de Vos  
Naturalis National Museum of Natural History  
P.O. Box 9517  
2300 RA Leiden  
The Netherlands  
E-mail: [vos@naturalis.nnm.nl](mailto:vos@naturalis.nnm.nl)