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*DICERORHINUS MEGARHINUS* (DE CHRISTOL)  
IN FAUNA ROMANIANĂ DE LA MĂLUȘTENI  
(JUD. GALAȚI)

Rezumat

Fauna de vertebrate fosile de la Mălușteni (jud. Galați) este binecunoscută încă de la începutul secolului, o dată cu prima ei menționare de către Athanasiu (1915). Grație cercetărilor întreprinse până acum, de la Simionescu (1922) până la Rădulescu & Samson (1989) a putut fi întocmită o listă considerabilă de specii. Totuși, până în prezent, nici un material paleontologic nu a fost suficient de edificator pentru a se putea preciza ce specii de rinocer apar în asociația de aici. Lucrarea prezintă un metatarsian II, descoperit în nisipurile cu stratificație încrucișată care apar în obârșia V. Românești, din D. Lacului, adică exact din ocurența clasică din care s-a recoltat fauna de vertebrate. A fost găsit în asociație cu lagomorfe, mici carnivore, castori, cervidee, pești și chelonieni. Acest metapodiu ne-a permis să determinăm existența certă a speciei *Dicerorhinus megarhinus* (de Christol). Aici avem de a face cu o formă destul de evoluată, ce concorda foarte bine cu vârsta ocurenței, care este romanian inferioară (MN 15 a).

STRATIGRAPHICAL SIGNIFICANCE OF CERATOMORPH  
PERISSODACTYLS (MAMMALIA) FROM THE TRANSYLVANIAN  
PALEOGENE

VLAD CODREA\*

**ABSTRACT.** — The already known rhinocerotoids from the Romanian Paleogene deposits prove to have clear affinities with the forms discovered on the Asian territory. Within the Romanian Paleogene the alternances of regressive and transgressive periods caused the episodic occurrence of several emergent areas where the big mammalian faunas settled in successive waves. The stratigraphical position of these discoveries is discussed in the present paper.

**Key-words:** Paleogene, Mammalia, Perissodactyls, Romania.

Considered as a whole, the Romanian territory doesn't contain any occurrence which could furnish any assemblage rich in large Paleogene terrestrial mammals. Micromammals from Romanian deposits of this age are still totally unknown; however we should not suppose that they are absent, the lack of information is due to the inexistence of some special investigations focussed on this topic.

If we do not take into consideration the discovery of a small anthracothere in Maramureș (Patrulius, 1954), some anthracotheriidae skeleton pieces in the Valea Jiului Chattian coalbearing formations (Simionescu, 1935) or the discovery of some embrithopods at Crivadia, Hunedoara (Rădulescu & al., 1976; Rădulescu & Sudre, 1985; Rădulescu & Samson, 1937) we can practically restrain the area of interest for the Paleogene terrestrial mammals to the western and north-western border of the Transylvanian Basin.

However, the chronostratigraphical importance of these faunas, especially for the assignment of the continental formations is difficult to equal. This may have been the reason for using some of these groups in certain stratigraphical nomenclatures. For instance „the molasses with big anthracotheres” from Transylvania and the Petroșani Basin (Răileanu & al., 1930) were mentioned at a certain moment, considering that „the *Anthracotherium* remains represent a good correlation element”. Obviously, we subscribe to this opinion, already verified in several parts of the world, but we want to underline the fact that the significance of the anthracotheres was somehow overestimated for our country if we consider the exactness of determinations which, with one exception (Patrulius, 1954) do not go beyond the level of generic assignments (Rădulescu & Samson, 1989). Therefore, we focussed

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our attention on another group whose representatives can be more easily correlated, that of Ceratomorph Perissodactyls.

*Prohyracodon orientale* Koch is the earliest representant known in Romania. The specimens were collected by Koch during the seventh decade of the XIX-th century and offered to the Transylvanian Museum, but initially the author assigned these remains to a wrong genus. When the error was corrected and Koch published the rhinocerotoid new species (1897), the Rădaia occurrence had already become known thanks to a previous discovery not in the least less famous: that of a brontothere, *Brachydiastematherium transilvanicum* (Böckh & Matyasovsky, 1877). The age of the deposits containing the skeleton remains, was extremely controverted: Pávay — who equivalates them to the Roth breccias — as well as Böckh & Matyasovsky assigned these red variegated clays to the Lower Eocene. Koch (1894) assigned them to the Lutetian and Depéret (fide Osborn, 1929) to the Ypresian. Wood (1929) accepts Mateescu's opinion that „the variegated beds of Andrășháza (Mera) belong to the Middle Eocene — Auversian”. Stehlin (1903) mentions a more recent age, Lower Oligocene, while Osborn (1929) supports the idea of an Upper Eocene age, thus proving to have a remarkable intuition, which later, we'll find at Radinsky (1967). At present, it is not a problem to assign an age to the Valea Nadășului Formation, the subjacent as well as supra-jacent deposits can be dated microfloristically (Mészáros, 1991). The red clays being deposited in an interval of time situated between the biozones NP 18 (beginning under the Lăghia Limestone, to the top of Mortănușa Beds) and NP 19 (from the basis of the Cluj Limestone), i.e. the basal Priabouian.

Though this age was mentioned in a great number of papers, both in our country and abroad (e.g. Bombiță & al., 1975; Rădulescu & Samson, 1937; N. Mészáros, 1991; a.s.o.) it is surprising for us to notice that in several recent documents, some authors (e.g. Lucas & Schoch, 1939) still refer to a Middle Eocene age at Rădaia. Dashzeveg (1991) mentioned a Lower Oligocene age for these deposits.

To correlate the Rădaia deposits with those of Western Europe is still a difficult problem as we do not hold any linking paleomammalogic element between the territory of our country and the afore-mentioned geographic environment. However, Rădaia is supposed to be situated either on the Fons 4 level or in La Debruge.

A possible isocronism may be presumed between Rădaia and Motnik (= Mötnig), a Slovenian occurrence. Heissig (1939) considered that *Meningotherium*, a genus from this occurrence is nothing more but a junior synonym of *Prohyracodon*. However, we must mention that the slovenian species is bigger than the transylvanian one, and we are thinking for a younger age at Motnik.

A closer isocronism is possible with the bulgarian occurrence Bobov Dol, where some dental remains of *Prohyracodon aff. meridionale*

(Nikolov, 1985; Nikolov & Heissig, 1985) have been recently discovered.

The correlations may be extended with great success to large areas on the Asian territory. It is the case of the Chinese Lumeyi Formation (Chow & Xu, 1931) or to the basal part of the Heti (Rancun member, Shauxi, Honan).

As for the specific determination, we consider that the chinese species *P. meridionale* and *P. progressa* are synonym with *P. orientale*: the dental features invoked by Chow & Xu as valid for a distinction between these species, are insufficient arguments for a specific distinctness and fall into the realm of the individual variations. The age of the chinese deposits is an Upper Eocene one, as in Transylvania.

The indricotheres are also included among the ceratomorph perissodactyls. The earliest representative comes from the Fildu de Jos merian deposits, Sălaj county (Codrea & Șuraru, unpublished material). These remains reveal a much smaller size as compared to the genus *Paraceratherium* (= *Indricotherium*, *Baluchitherium*) proper. Therefore it is not excluded that the specimen from the Mera Beds belongs to the genus *Urtinotherium* and thus it is included in the first immigration wave of the Asian indricotheres towards Europe. We are convinced that, considering this point of view, the Fildu de Jos occurrence is older than that from Dragovistiza in Bulgaria (Nikolov, 1985; Nikolov & Heissig, 1985) where the species *Paraceratherium* (= *Indricotherium*) *transouralicum* was discovered.

Another discovery comes from the quartzitic whitish sands in the Turea-Cornești (Cluj county: Gabunia & Iliescu, 1960) deposits, assigned to the Upper Stampian (NP 24 biozone), approximately correlated with the Etampes level, older than that of Benara, Georgia. Till the Romanian species *Benaratherium gabuniai* was defined (Rădulescu & Samson, 1939), genus *Benaratherium* was monospecific, the generic distinction being considered uncertain by Radinsky (1967).

The discovery from Turea-Cornești cannot be correlated with other discoveries of the same age. The age of the Petrosvet Svita from Benara was considered to be Upper Oligocene by Gabunia (1964). It is difficult to estimate the exact position of Benara on the geochronologic scale of Western European indices. Most of the mammal species that compose this faunistic list are new ones. Only the creodont *Hyacnodon dubius* and the anthracothere *Bothriodon cf. velaunus* could be possible elements of connection. The first one occurs between the levels Aubrelong 1—Itardios, the second being restricted to the MP 21 Soumaille biozone level. In this context we naturally wonder if the age of the Benara fauna should not be lowered on the stratigraphic scale. The morphologic elements mentioned by the Romanian authors for the species from the Turea-Cornești deposits indicate that this is a brachyodont form, with more archaic characteristics, thus being older than the Georgian one. Therefore, an age disparity between the Turea-Cornești and the Benara

deposits should be accepted: still more difficult is to appreciate the duration of this discrepancy.

The youngest indricothere from Romania, that of Sutoru, Sălaj county (Codrea, 1989) is assigned to the species *Paraccraterium prohorovi*. The age for the lower part of Zimbor Beds (sensu Koch), where the remains were discovered, is an Upper Oligocene one. The species is well-documented from the Asian Upper Oligocene (Russel & Zhai, 1987). Between the Black Sea and the Caspian Sea it also occurs in some younger deposits, Lower Miocene—Agenian ones (Gabiunia, 1981).

We consider that the Sutoru deposits could be related to the Pech du Fraysse (MP 28) west-European level.

It is also known a rhinocerotid from the meridian deposits on the Valea Popești, near Cluj-Napoca (Koch, 1911). Its generic assignment remains debatable, two opinions being recently expressed: one maintains that it belongs to *Epiacceratherium* (Brunet, 1979), the other assigns it to *Ronzotherium* (Heissig, 1969). We agree with the opinion expressed by Rădulescu & Samson (1989) leaving the generic terminology opened: „*Ronzotherium*” *kochi*. As a consequence of the already mentioned uncertainties, the stratigraphical significance of the Cluj rhinoceros is not an exceptional one. In case it is a *Ronzotherium* close in physiognomy to that of Sierra Palomera, Spain (Adrover & al., 1983) we can relate the Cluj occurrence to the Ronzon-Hoogbutsel level or even to a much earlier sequence if we consider the migration for the representatives of this genus from Asia to Europe and thus it is supposed that they reached our meridian at an earlier age than the Spanish one. Brunet's hypothesis is also an appealing one, but in this case we are supposed to have a belated representative of the genus *Epiacceratherium*.

Finally, we have to remember a recent discovery, which concerns the existence of an amynodont at the level of Culeșu Beds, i.e. the upper part of Zimbor Beds sensu Koch (Codrea & Șuraru, 1989). The new species we refer to, „*Cadurcodon*” *zimborensis* has a restrained stratigraphical significance, as it was never located before in a different position. Its generic assignment, which is still debatable, could be solved by a richer and better preserved material. The age of these deposits are Later Chattian, at the limit of NP 25 and NN 1 biozones (Mészáros & al., 1979).

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### SEMNIFICAȚIILE STRATIGRAFICE ALE PERISSODACTYLELOR CERATOMORFE (MAMMALIA) DIN PALEOGENUL TRANSILVANIEI

(Rezumat)

Pentru Paleogenul din România, Perissodactylele Ceratomorfe constituie elemente adecvate pentru datări stratigrafice și pentru corelări areale. În lucrare sunt succint prezentate descoperirile de acest gen, fiind subliniate următoarele aspecte:

i. *Prohyracodon orientale*, specie descrisă de Koch (1897) de la Rădaia, este cel mai vechi rhinocerotoid cunoscut până în prezent în țara noastră. Vârsta depozitelor de la Rădaia în care au fost descoperite resturi ale acestui mamifer este *priaboniană inferioară*, putând fi foarte probabil plasată undeva la nivelul biozonelor Fous 4 sau La Débruge. Un eventual izocronism poate fi presupus cu ocurențele de la Motnik (Slovenia), Bobov Dol (Bulgaria) sau cu formațiunile Luneyi sau Heti (China). În lucrarea de față susținem sinonimia dintre speciile descrise din Eocenul superior chinez, *P. meridionale* și *P. progressa* cu *P. orientale*. Denumirea speciei transilvane are evident, prioritate.

ii. Un fragment distal de tibie descoperit în depozitele meriene de la Fildu de Jos (Sălaj), ce aparține unui indricoteriîn, poate fi atribuit, dacă este să judecăm după dimensiuni, genului *Urtinotherium*. Este dovada celui mai vechi val de imigrări al indricoteriînlor dinspre Asia spre țara noastră.

iii. *Benaratherium gabuniai*, un indricoteriîn de talie mică, descoperit în nisipurile Stampiense superioare de la Turea-Cornești (Cluj), apare ca un ancestor al speciei cunoscute de la Benara (Georgia). Vârsta depozitelor de la Benara este pusă de noi în discuție. Credem că depozitele georgiene ar putea fi în realitate cu ceva mai vechi decât s-a apreciat inițial.

iv. Stratele de Zimbor, sensu Koch, au furnizat din jumătatea lor inferioară resturi ale unui indricoteriîn, *Paraceratherium prohorovi*, iar din partea superioară, un amynodontid: „*Cadurcodon*” *zimborensis*. Sunt subliniate semnificațiile stratigrafice ale indricoteriînului. Amynodontidul rămâne deocamdată un element ce nu poate fi racordat nici unei alte descoperiri.

v. Din Stratele de Mera de pe Valea Popeștilor, lângă Cluj-Napoca se cunoaște un rhinocerotid, „*Ronzotherium*” *kochi*, a cărui apartenență generică nu a putut fi încă suficient clarificată. În situația în care ar fi vorba despre un *Ronzotherium*, este posibil ca aceste depozite să poată fi corelate cu nivelul Ronzon-Hoogbutsel, fără a exclude însă și posibilitatea unei apariții ceva mai timpurii la meridianul țării noastre.

### MICROFACIES AND MICROFOSSILS IN THE CALCAREOUS OLISTOLITHS FROM CETEA (APUSENI MOUNTAINS). PRELIMINARY NOTE

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**ABSTRACT.** — The study of thin sections through samples collected from one of the calcareous olistoliths occurring in the neighbourhood of Cetea (Pietrele Cetii), emphasized the existence of several microfacies characterizing deposits of carbonate platform, typical for the external infralittoral domain and to the platform border. The micropaleontological assemblage consist of species characteristic for the Upper Tithonian-Berriasian interval.

**Key words:** *Calcareous microfacies, Tithonian-Berriasian, Southern Apuseni Mountains, Romania.*

**I. Introduction.** Pietrele Cetii are recorded as calcareous „klippen” in the geological literature since the previous century. They occur as isolated calcareous bodies in a larger terrigenous sedimentary mass from which they emerge as a consequence of differential weathering.

Herbich (1877) was among the first authors who studied this area. The same author described in 1886 a rich gastropod and lamellibranch assemblage, including new species, deposited in the Paleontology Museum from Cluj-Napoca. Herbich (1877, 1886) assigns the limestones from Pietrele Cetii to the Upper Tithonian (Stramberg), and the surrounding sandstones to the Lower Neocomian.

The stratigraphic position of the olistoliths from Cetea was subsequently discussed by Bordea et al. (1968). These authors identify four formations in the Galda-Râmeți area: (1) the mixed volcano-sedimentary formation, assigned to the Upper Jurassic–Neocomian; (2) the grey wildflysch formation, assigned to the Barremian–Aptian; (3) the violaceous wildflysch formation, assigned to the Upper Aptian–Middle Albian, and (4) the Râmeți beds, assigned to the Cenomanian–Barremian.

Antonescu (1974) reconsiders the age of the wildflysch deposits in the area on account of palynomorph study. The author estimates that the gray wildflysch and the violaceous wildflysch described by Bordea (1968) represents a single formation, assigned to the Upper Cenomanian–Turonian–Senonian. The lithostratigraphic columns correlating various sequences clearly show that the olistoliths-bearing wildflysch from Galda de Sus–Valea Cetii area is of Turonian age (Middle

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