

OLIGOCENE MAMMALS FROM ROMANIA

C. RADULESCU*, P. SAMSON*

Nine species of Oligocene mammals representing three orders and six families are known from Romania. The main area of interest is the Transylvanian basin which yielded the majority of finds of large mammals. Lower Oligocene mammals include „*Ronzotherium*“ *kochi* (lower Stampian, Ronzon level), *Entelodon* aff. *deguilhemii* (lower Stampian, Villebramar level or somewhat older), *Kochictis centennii*, Entelodontidae indet. cf. *Paraentelodon* sp., *Anthracotherium* sp. (large size) (upper Stampian, ? La Ferté-Alais level); a new species of indricothere, *Benaratherium gabuniai* n. sp. (upper Stampian, ? Etampes level) is described and its relationships discussed. Upper Oligocene mammals include *Anthracotherium* sp. (medium size), an indricothere (*Paraceratherium prohorovi*) and a new species of amynodontid. Other mammalian remains are recorded from the Petroșani basin and adjacent area: *Entelodon magnus*, Hațeg basin, lower Oligocene (lower Stampian, Ronzon level) and *Anthracotherium* sp. (large size), Petroșani basin (coal layers), upper Oligocene (Chattian). No micromammals has been reported from Romania.

Key words: macromammals, Oligocene, Transylvania, Romania, systematics, chronology.

1. Introduction.

Remains of Oligocene macromammals are known in Romania from two areas of unequal importance. The most significant fossils were discovered in the northwestern part of the Transylvanian basin. Some other remains were described from the Hațeg and Petroșani basins.

In the present paper the geologic age of the mammalian fossils is reviewed in the light of recent stratigraphic interpretations (foraminifera, ostracoda, nannoplankton, mollusca, fossil flora) (see references in A. Rusu, 1977, 1983). An attempt to correlate the Romanian fossiliferous deposits with the subdivisions of the Continental biostratigraphic scheme (M. Brunet, 1979; Cl. Cavalier, Ch. Pomerol, 1986; D. E. Russell et al., 1982) is also made (table 1).

At present Oligocene micromammals are completely unknown in Romania.

Abbreviations: IGG = Institute of Geology and Geophysics, Bucharest; LPB = Laboratory of Paleontology, University of Bucharest; MBT = Stratigraphical and Paleontological Collection of the Transylvanian Basin Museum, University of Cluj-Napoca.

* Institutul de Speologie „Emil Racoviță“, Str. Frumoasă 11, 78114 București-12, Romania.

2. Paleontology

2.1. Lower Oligocene

2.1.1. Order Condylarthra

? Family Paroxyclaenidae

***Kochictis centennii* Kretzoi, 1943.**

M. Kretzoi (1943) described a new genus and a new species on the basis of the facial part of a crushed cranium with associated mandibles found at Aghireş (coal layer). Remains of a large anthracothere (identified as *A. magnum* Cuvier) were also discovered. The deposit was considered as upper Oligocene (Chattian) in age.

At present, the deposit (Francisc coal layer) which yielded the fossil remains is included in the Dîncu beds of lower Oligocene age (Rupelian s. s., NP 23) (A. Rusu, 1977, 1983).

The same coal layer yielded at the nearby locality of Ticu remains of an entelodontid associated with a large anthracothere (see description below). The above mentioned association suggests a possible correlation with La Ferté-Alais marker level (M. Brunet, 1979; D. E. Russell et al., 1982).

2.1.2. Order Perissodactyla

Family Rhinocerotidae

„*Ronzotherium*“ *kochi* (Kretzoi, 1940)

Praeaceratherium minus Filhol, A. Koch (1911: 379—387, pl. X).
Paracaenopus filholi Osborn, S. Breuning (1924: 17).
Paracaenopus kochi Kretzoi, M. Kretzoi (1940: 92, footnote).
Ronzotherium kochi (Kretzoi), K. Heissig (1969: 36—37).
Epiaceratherium? kochi (Kretzoi), M. Brunet (1979: 104, 158).
Allacerops kochi (Kretzoi), D. E. Russell et al. (1982: 58).
Ronzotherium kochi (Kretzoi), R. Adrover et al. (1983: 426).

The type is represented by a right upper jaw with P^2-M^3 (MBT/1509). The specimen was found in layers belonging to the Mera beds which were considered by A. Koch (1911) to be of middle Oligocene age („Tongrische Stufe“). At present the age of the Mera beds is considered to be lower Oligocene (Henisian, NP 22) (M. Mészáros, C. Ianoliu, 1977; A. Rusu, 1983).

In absence of more complete material, the generic allocation of this species must remain questionable.

It is interesting to note the discovery at Sierra Palomera, Spain, of a mandible described as *Ronzotherium* sp., which may indicate a form similar in size to „*R. kochi*“ (R. Adrover et al., 1983). The fossiliferous level (Palomera B), including *Theridomys aquatilis* (Aymard) is equivalent to Ronzon-Hoogbutsel level (lower Oligocene, Sannoisian) (R. Adrover et al., 1983). The geologic age of the specimen found in the Mera beds and size similarity suggest the presence of the same species (or very related species) in Romania and Spain.

Family Indricotheriidae

Genus *Benaratherium* Gabunia, 1955*Benaratherium gabunia* new species*Indricotherium* sp., L. K. Gabunia, O. Iliescu (1960: 425—427, figs. 2—3).*Beneratherium* sp., L. K. Gabunia (1964: 205).**Type:** left M^2 (IGG/2657 b) (fig. 1.2).**Paratype:** right P^3 (IGG/2657 a) (fig. 1.1).**Locality:** Turea—Cornești (Cluj dept., Romania), white quartzitic sands (L. K. Gabunia, O. Iliescu, 1960, fig. 1).**Geologic age:** lower Oligocene, Cetate beds, upper Stampian (NP 24), correlative in a wide sense with Etampes level and older than the Benara fauna (Georgia, U.S.S.R.) of upper Oligocene age (L. K. Gabunia, 1964).**Derivatio nominis:** dedicated to Prof. L. K. Gabunia, Tbilisi, who first described the indricothere from Transylvania.**Diagnosis:** size about that of *Benaratherium callistrati* Gabunia, but more primitive in dental morphology. P^3 of *Paraceratherium*-type. M^2 allying *Indricotherium* and *Paraceratherium* features; cingulum discontinuous, absent on the lingual side of protoloph and metaloph.**Differential diagnosis:** smaller than representatives of *Indricotherium* and *Paraceratherium*, the new species differs from *B. callistrati* by some characteristics showing a more primitive stage of evolution: cingulum less developed, lacking on the inner wall of protoloph and metaloph; hypocone without anterior groove; crochet absent; very probably more brachyodont.**Description** — P^3 : the ectoloph is missing; the hypocone is well developed, larger than the protocone and somewhat displaced linguallly; a faint lingual groove separates the hypocone from the protocone in the upper part of the crown; the metaconule is already fused with both ectoloph and hypocone in this moderate stage of wear; the position of the metaconule is somewhat oblique, its lingual end joining the anterior part of the hypocone (fig. 1.1). Length aprox. 46 mm. M^2 : the ectoloph is flattened, with mesostyle and metacone folds slightly indicated at the summit of the crown; paracone fold very probably well developed (unfortunately the anteroexternal part of the ectoloph is broken); the protoloph is flattened linguallly (*Paraceratherium*-like); anterior protoconal groove present, more marked toward the base of the crown; posterior groove of the protocone very shallow; antecrochet present, obstructing partially the median valley; inner cingulum lacking on protoloph (*Indricotherium*-like) and metaloph, but present as a ridge blocking the median valley (fig. 1.2).We mention that this molar was determined as M^1 by L. K. Gabunia, O. Iliescu (1960). In our opinion the specimen rather re-

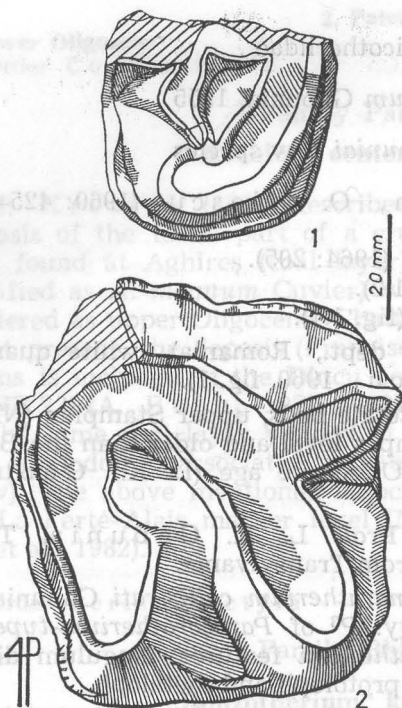


Fig. 1. *Benaratherium gabunia* n. sp., Turea-Cornești (white quartzitic sands), Cetate beds, upper Stampian: 1. right P³, paratype (IGG/2657 a); 2. left M², type (IGG/2657 b). Occlusal view.

presents M², judging from its posterior narrowness, the great obliquity of the ectoloph with respect to the anteroposterior axis of the crown, anterior direction of the medisinus.

L. K. Gabunia, O. Iliescu (1960) indicated 70 mm for the length of the molar. This measurement was taken at the base of the crown and corresponds, according to K. Heissig (1969, fig. 1), to the length at the external wall of the molar. Taken at the upper level of the cingulum (following M. Brunet, 1979), the length is slightly larger (approx. 73 mm); anterior width > 85 mm; posterior width = 78 mm; maximum height of the ectoloph (at metacone) = 39 mm.

Discussion — Although first described as *Indricotherium* (L. K. Gabunia, O. Iliescu, 1960), the dental remains from Transylvania were later considered as pertaining to *Benaratherium* (L. K. Gabunia, 1964).

Size similarity suggests that the two specimens from Turea-Cornești may belong in the genus *Benaratherium*. Unfortunately the upper premolars of *B. callistrati* (type species) are unknown. Compared with the homologous molar (heavily worn) from Benara (L. K. Gabunia, 1964, fig. 44), the M² from Turea-Cornești is smaller and possesses a less developed cingulum; hypoconal groove and crista (very slightly indicated) mentioned by L. K. Gabunia (1964) for the M² from Benara are absent on the specimen from Transylvania. In addition, *B. ga-*

buniai n. sp. seems to be more brachyodont (judging from all dental remains from Benara). *B. gabuniai* n. sp. might represent the ancestral stock which gave rise to *B. callistrati*.

2.1.3. Order Artiodactyla

Family Entelodontidae

Entelodon magnus Aymard, 1846

Elodon transsilvanicus Kretzoi, M. Kretzoi (1941: 347—348, fig. 2).

Entelodon magnus Aymard, M. Brunet (1979: 25).

M. Kretzoi (1941) named a new genus and a new species on the basis of a left lower molar (M_1 or M_2) found in a conglomerate level at Merișor-Crivadia, a locality situated in the eastern part of the Hațeg basin near the border with the Petroșani basin.

In his review of Entelodontoidea, M. Brunet (1979) considered the specimen from Merișor-Crivadia as belonging to *E. magnus*. The presence of this species seems to indicate for that part of the conglomerate which yielded the fossil a lower Oligocene age equivalent to the lower Stampian (Ronzon level) (D. E. Russell et al., 1982).

Entelodon aff. *deguilhemi* Répelin, 1919

(= *E. zachariensis* Répelin, 1919)

Elotherium (Entelodon) magnum Pomel, A. Koch (1894: 368).

Elotherium hungaricum Kretzoi, M. Kretzoi (1941: 345—347, fig. 1).

Entelodon aff. *deguilhemi* Répelin, M. Brunet (1979: 59).

M. Kretzoi (1941) described a new species on the basis of a fragment of upper jaw with M_1^{-2} found at Huedin. According to A. Koch (1894) the specimen was found in the Ticu beds (upper Oligocene in his opinion), in clay and sandstone layers beneath the coal deposits which yielded the remains of *Kochictis centennii* (see above).

After M. Brunet (1979), *E. hungaricum* cannot be separated on morphological grounds from both *Entelodon magnus* and *E. deguilhemi*. The Romanian specimen was assigned by M. Brunet (l. c.) to *E. aff. deguilhemi* (= *E. zachariensis*) which includes forms intermediate in size between *E. magnus* and *E. deguilhemi*.

It will be remembered that most of the Oligocene deposits outcropping around Huedin may belong to the lower Ticu (Moigrad) beds (oral comm. Drs. V. Moisesescu and A. Rusu). At present the Moigrad beds are considered to be lower Oligocene in age (Rupelian s. s., NP 23) (A. Rusu, 1983). *E. aff. deguilhemi* from Huedin, representing a transitional form between *E. magnus* and *E. deguilhemi*, may be situated in the lower Stampian (M. Brunet, 1979), being roughly equivalent to Villebramar level or, perhaps, somewhat older.

Entelodontidae indet. cf. *Paraentelodon* sp.

Anthracotherium aff. *illyricum* Teller (pars), V. Barbu (1964: 12—14, plate II, figs. 4—5).

Entelodontidae (? *Paraentelodon*), L. K. Gabunia (in Schaedis, 8. XI. 1973).

A right upper canine (LPB/1277) was discovered at Ticu (Francisc coal layer, Dîncu beds, upper Stampian, NP 23).

Description — The specimen is distinguished by the large size of the root relative to the crown. The base of the root is broken. The cone-shaped crown is characterized by the reduction of the anterior and posterior crests; the anterior crest is practically absent, whereas the posterior one is weakly developed, slightly more marked at the base of the crown (fig. 2.1). An elongated wear facet is present on the antero-internal side of the crown, showing the contact with the lower canine; this wear facet also runs for a short distance on the root. Another wear

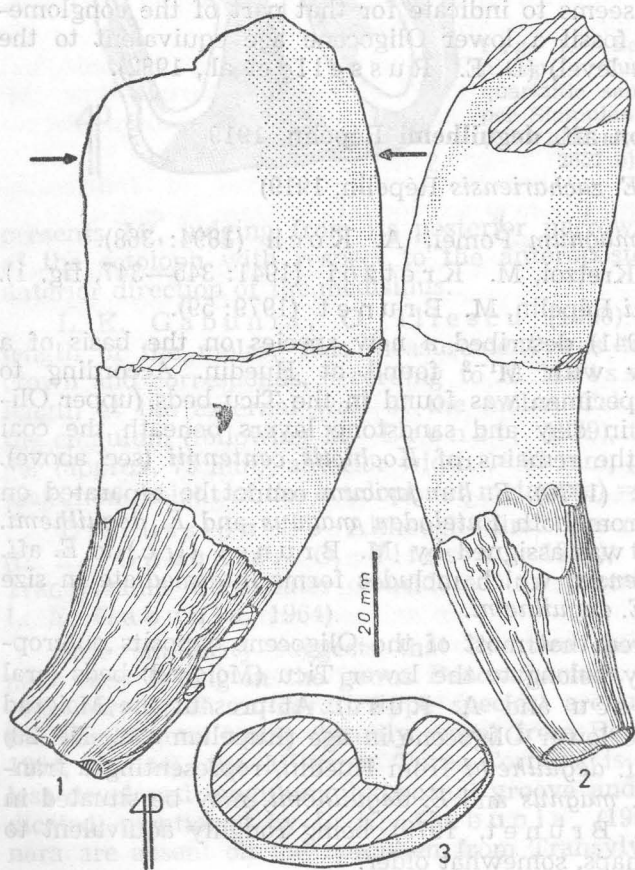


Fig. 2. Entelodontidae indet. cf. *Paraentelodon* sp., Ticu (Francisc coal layer), Dîncu beds, upper Stampian. Right upper canine (LPB/1277): 1. external and 2. postero-internal views; 3. aspect of the broken end of the root at the level indicated by arrows.

facet, much more reduced, indicating a contact with the first lower premolar, is present on the posterior side of the tooth at the limit between the crown and root (fig. 2.2). The enamel presents longitudinal wrinkles which are apparent on the crown wherever wear facets have not removed them.

The inner side of the root is flattened and present in its basal half an elongated depression which might indicate a coalescence zone (double-rooted ancestral condition). The outer side of the root is convexe (fig. 2.2—3).

Measurements:

anteroposterior diameter of the crown (at base)	36.0 mm
transverse diameter of the crown (at base)	31.5
anteroposterior maximum diameter of the root	57.0
transverse diameter of the root	36.5

Discussion — Judging from measurements, the canine from Ticu is of smaller size as compared with *Paraentelodon intermedius* Gabunia from Benara (L. K. Gabunia, 1964) and intermediate in size between *Entelodon magnus* and *E. deguilhemi* (M. Brunet, 1979) (inferred partially from the lower canines).

Unlike *Entelodon*, *Paraentelodon* is distinguished by the reduction of the crests on the crown. Except its smaller size, the specimen from Ticu seems, on morphological grounds, to be more related to *Paraentelodon* than to *Entelodon*.

It is interesting to note that *Paraentelodon* sp. of lower Oligocene age was reported from Dobrinište, Bulgaria (I. Nikolov, K. Heissig, 1985). Compared with *P. intermedius* the specimen from Bulgaria (M_3) is smaller.

Although very imperfectly known, an entelodontid, attributable to *Paraentelodon*, seems to have been spread during the lower Oligocene in the Transylvanian basin (upper Stampian) and Balkan regions.

Family Anthracotheriidae

Anthracotherium sp. (large size)

Anthracotherium aff. *illyricum* Teller (pars), V. Barbu (1964: 11—12, 14, plate I, figs. 1—3).

Remains of anthracotheres were found at Ticu (Francisc coal layer, Dîncu beds, upper Stampian, NP 23). V. Barbu (1964) described two upper molars (M^2 , M^3) and a lower molar (M_1). At present only the M^3 (LPB/1293) is kept in the collections of the University of Bucharest.

V. Barbu (1964) regarded the two upper molars as belonging to a single individual. If so, a striking feature of the Ticu anthracothere would be the large size of M^3 relative to M^2 .

M^3 (fig. 3) is elongated, trapezium-shaped; it is distinguished by the well developed vestibular styles (parastyle in particular which is detached with respect to paracone).

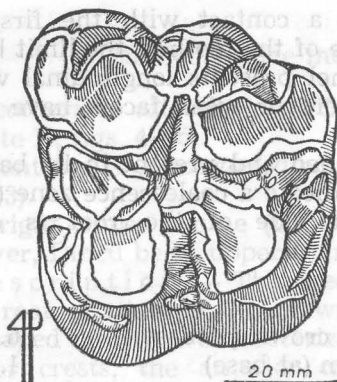


Fig. 3. *Anthracotherium* sp. (large size), Ticu (Francisc coal layer), Dincu beds, upper Stampian: left M^3 (LPB/1293). Occlusal view.

Measurements:

	M^3	M^2	M_1
	(after V. Barbu, 1964)		
length	56.0	43	40 mm
anterior width	62.5	50	30
posterior width	58.5	—	—

Relationships of European anthracotheres are still poorly understood and a review is badly needed. Until all large anthracotheres are reviewed, specific assignment of isolated teeth should remain questionable.

2.2. Upper Oligocene

2.2.1. Order Artiodactyla

Family Anthracotheriidae

Anthracotherium sp. (medium size)

Anthracotherium magnum Cuvier, L. Mártonfi (1890: 361—365).

An M^3 , found at Cristolțel (coal layer, Valea Almașului beds, Chattian, NP 25), has following measurements (from L. Mártonfi, 1890):

length	47 mm
anterior width	51
posterior width	40

Anthracotherium sp. (large size)

Anthracotherium aff. *illyricum* Teller, I. Simionescu (1935: 1—9, figs. 1—6, in text, 1—2, plate).

The material (LPB/275), consisting of two specimens, a fragment of right mandibula with P_4 (broken), M_{1-3} (damaged) and a fragment of symphysis with left I_2 , C and right I_{1-2} , was described by I. Simionescu (1935). The specimens were found at Petroșani (coal layers, Dilja-Uricani formation, Chattian) (V. Moisesescu, 1981).

CHRONO- STRATIGRAPHY	LITHO- STRATIGRAPHIC UNITS (A. Rusu, 1982)	NANNO - PLANKTON	LOCALITIES	MACROMAMMALS	MACROMAMMAL MARKER LEVELS	CHRONO- STRATIGRAPHY
MIO- CENE		NN 1				MIO- CENE
CHATTIAN	SÎNMIHAI BEDS	NP 25				CHATTIAN
	ZIMBOR BEDS		Crisolpel (2)	<i>Anthracotherium</i> sp. (medium size)	?	
	VAR SANDSTONE	NP 24				
	CETATE BEDS		Turea-Cornesti	<i>Benaratherium gabunia</i> n. sp.	? Erampes	
	DÎNCU BEDS	NP 23	Ticu, Agihireş (Francisc coal layer)	<i>Kochictis centennii</i> <i>Paracentalodon</i> sp. <i>Anthracotherium</i> sp. (large size)	? La Ferré-Alais	
	MOIGRAD BEDS				Montalban	
			Huedin	<i>Entelodon</i> aff. <i>deguilhemi</i>	Villebramar St. Zacharie	
	NERA BEDS	NP 22				
	HOIA LIMESTONE		Cluj (1)	<i>Ranzotherium kochi</i>	Ronzen	
	BREBI MARLS					
NP 21						
EO- CENE						EO- CENE

Table 1. Stratigraphic distribution and correlation of the Oligocene mammal localities of Romania. 1. Merişor-Crivadia (Haţeg basin): *Entelodon magnus*; 2. Petroşani (Petroşani basin): *Anthracotherium* sp. (large size).

Measurements:

	M ₁	M ₂	M ₃
length	39.5	49.5	81.0 mm
anterior width	27.0	33.0	39.0
posterior width	29.0	35.0	40.0
width talonid	—	—	26.0
inside depth of mandible at	67.5	73.0	71.5

According to L. K. Gabunia (1964) the anthracothere from Petroșani and *A. kwablianicum* Gabunia from Benara are very similar, the main difference being that the former is somewhat larger (the length of the largest M₃ from Benara is 66.5 mm).

Belonging also to the upper Oligocene, two recent finds of mammals indicate the presence in the Zimbor beds (Chattian, NP 25) of an indricothere, *Paraceratherium prohorovi* (Borissiak) and a new species of „*Cadurcodon*“ (Amynodontidae) (see V. Codrea; V. Codrea, N. Șuraru, this volume).

Acknowledgments — We wish to express our gratitude to Dr. Th. Neagu and Dr. Marioara Orbocea, University of Bucharest, Dr. M. Bleahu and E. Știucă, Institute of Geology and Geophysics, Bucharest, Dr. I. Petrescu, Dr. N. Șuraru and V. Codrea, University of Cluj-Napoca, for permission to study specimens in their respective institutions. Appreciation is extended to Prof. Dr. N. Mészáros, University of Cluj-Napoca, Dr. V. Moiescu and Dr. A. Rusu, Institute of Geology and Geophysics, Bucharest, Dr. O. Iliescu, Enterprise for Geological and Geophysical Prospecting, Bucharest, for discussion on chronology of the fossiliferous deposits.

REFERENCES

- Adrover, R., Feist, M., Ginsburg, L., Guérin, Cl. Hugueney, M., Moissenet, E., 1983: *Les formations continentales paléogènes de la Sierra Palomera (Province de Teruel, Espagne) et leur place dans la biostratigraphie tertiaire des Chaînes Ibériques orientales*. Bull. Soc. géol. France, (7), 25, 3, 421—431, Paris.
- Barbu, V., 1964: *Resturi de Anthracotherium din cărbunii de la Ticu (Regiunea Cluj)*. Bul. Inst. Petrol, Gaze, Geol., 11, 9—19, București.
- Breuning, S., 1924: *Beiträge zur Stammesgeschichte der Rhinocerotidae*. Verh. Zool. Bot. Ges. Wien, 73, (1923), 5—46, Wien.
- Brunet, M., 1979: *Les grands mammifères chefs de file de l'immigration oligocène et le problème de la limite Eocène-Oligocène en Europe*, 281 p., Edit. Fondation Singer-Polignac, Paris.
- Cavelier, Cl., Pomerol, Ch., 1986: *Stratigraphy of the Paleogene*. Bull. Soc. géol. France, (8), 2, 2, 255—265, Paris.
- Gabunia, L. K., 1964: *La faune de mammifères de l'Oligocène du Benara*, 262 p., Metsniereba Press, Tbilisi (in Russian with French abs.).
- Gabunia, L. K., Iliescu, O., 1960: *On the first discovery of giant rhinoceros remains from the fam. Indricotheriidae in Romania*. Doklady Akad. Nauk SSSR, 130, 2, 425—427, Moscow (in Russian).

- Heissig, K., 1969: *Die Rhinocerotidae (Mammalia) aus der oberoligozänen Spaltenfüllung von Gaimersheim bei Ingolstadt in Bayern und ihre phylogenetische Stellung*. Abh. bayer. Akad. Wiss. math. naturw. Kl., N. F., 138, 1—133, München.
- Koch, A., 1894: *Die Tertiärbildungen des Beckens der siebenbürgischen Landestheile. I. Theil. Paläogene Abtheilung*. Mitt. Jb. kgl. ung. geol. Anst., 10, 6, 177—397, Budapest.
- Koch, A., 1911: *Rhinoceriden-Reste aus den Mitteloligocenen Schichten der Gegend von Kolozsvár*. Ann. Mus. Nat. Hung., 9, 379—387, Budapest.
- Kretzoi, M., 1940: *Alttertiäre Perissodactylen aus Ungarn*. Ann. Mus. Nat. Hung. (Min., Geol., Paleont.), 33, 87—98, Budapest.
- Kretzoi, M., 1941: *Siebenbürgische Elotheriiden*. Földt. Közl., 71, 7—12, 345—348, Budapest.
- Kretzoi, M., 1943: *Kochictis centennii n. g. n. sp., ein alttertümlicher Creodonte aus dem Oberoligozän Siebenbürgens*. Földt. Közl., 73, 1—3, 190—195, Budapest.
- Mártonfi, L., 1890: *Anthracotherium magnum Cuv. von Kl. Krisztolec*. Sber. med.-naturw. Sect. Siebenbürg. Museumver., II. Naturw. Abt., 15, 3, 361—365, Cluj.
- Mészáros, M., Ianoliu, C., 1977: *Az Erdélyi-medence paleogén üledékeinek nannoplanktonja*. Földt. Közl. 107, 1, 90—96, Budapest (English abs.).
- Moisescu, V., 1981: *Considerații asupra unităților litostratigrafice ale terțiului din bazinul Petroșani (Chattian-Badenian) (II)*. St. Cerc. Geol., Geofiz., Geogr., Geologie, 26, 1, 109—118, București.
- Nikolov, I., Heissig, K., 1985: *Fossile Säugetiere aus dem Obereozän und Unteroligozän Bulgariens und ihre Bedeutung für die Palaeogeographie*. Mitt. Bayer. Staatssl. Paläont. hist. Geol., 25, 61—79, München.
- Russell, D. E., Hartenberger, J.-L., Pomerol, Ch., Søn, S., Schmidt-Kittler, N., Vianey-Liaud, M., 1982: *Mammals and stratigraphy: the Paleogene of Europe, Palaeovertebrata*, Mém. extra, 1—77, Montpellier.
- Rusu, A., 1977: *Stratigrafia depozitelor oligocene din nord-vestul Transilvaniei (regiunea Treznea—Hida—Poiana Blenchii)*. An. Inst. geol. geofiz., 51, 69—223, București.
- Rusu, A., 1983: *Remarks on Oligocene chrono- and biostratigraphy in Transylvania (Romania)*. An. Inst. geol. geofiz., 59, București.
- Simionescu, I., 1935: *Asupra unui Anthracotherium de la Petroșani*. Acad. Rom. Mem. Sect. St., (3), 10, 6, 145—157, București.

MAMIFERELE OLIGOCENE DIN ROMÂNIA

(Rezumat)

Resturi de mamifere oligocene sînt cunoscute, în România, în special din nord-vestul bazinului Transilvaniei dar și din bazinele Hațeg și Petroșani. Componenta specifică și corelația la scară continentală (D. E. Russell et al., 1982) a depozitelor fosilifere (tabel 1) se pot stabili după cum urmează (în lipsa altei indicații, fosilele se raportează la bazinul Transilvaniei):

Oligocen inferior

Ord. Condylarthra

- Fam. ? Paroxylaenidae: *Kochictis centenni* Kretzoi (M. Kretzoi, 1943), Aghireș (stratul de cărbune Francisc), strate de Dincu, NP 23 (A. Rusu, 1977, 1983), Stampian superior (? nivel-reper La Ferté-Alais).

- Ord. Perissodactyla
- Fam. Rhinocerotidae: „*Ronzotherium*“ *kochi* (Kretzoi) (A. Koch, 1911; M. Kretzoi, 1940), Cluj, strate de Mera, NP 22, Stampian inferior (nivel-reper Ronzon).
 - Fam. Indricotheriidae: *Benaratherium gabuniai* n. sp., Turea-Cornești (nisipuri cuarțite albe), strate de Cetate, NP 24, Stampian superior (? nivel-reper Etampes).
- Ord. Artiodactyla
- Fam. Entelodontidae: *Entelodon magnus* Aymard (= *Elodon transsilvanicus* Kretzoi) (M. Brunet, 1979; M. Kretzoi, 1941), bazinul Hațeg, Merisor—Crivadia (conglomerat), Stampian inferior (nivel-reper Ronzon). *Entelodon* aff. *deguilhemii* Répelin (= *Elotherium hungaricum* Kretzoi), Huedin, strate de Moigrad, NP 23, Stampian inferior (nivel-reper Villebramar sau ceva mai vechi). Entelodontidae indet. cf. *Paraentelodon* sp. (*Anthracotherium* aff. *illyricum* Teller in V. Barbu, 1964), Ticu (stratul de cărbune Francisc).
 - Fam. Anthracotheriidae: *Anthracotherium* sp. (talie mare) (A. aff. *illyricum* in V. Barbu, 1964), Ticu (stratul de cărbune Francisc), asociat cu *Paraentelodon* sp. (pentru cronologie a se vedea mai sus).

Oligocen superior

- Fam. Anthracotheriidae: *Anthracotherium* sp. (A. *magnum* Cuvier in L. Mártonfi, 1890), Cristolțel (strat de cărbune), strate de Valea Almașului, Chattian, NP 25. *Anthracotherium* sp. (talie mare) (A. aff. *illyricum* in I. Simionescu, 1935), Petroșani (strate de cărbune), formațiunea de Dilja-Uricani, Chattian (V. Moiescu, 1981).

Două descoperiri recente din bazinul Transilvaniei indică prezența în stratele de Zimbor (Chattian, NP 25) a unui indricotheriid (*Paraceratherium prohorovi* Borissiak) și a unei specii noi de „*Cadurcodon*“ (Fam. Amynodontidae) (a se vedea V. Codrea; V. Codrea, N. Șuraru, în acest volum).

În faza actuală a cunoștințelor, micromamiferele sînt complet necunoscute în Oligocenul din România.