

Early Pleistocene deer at Dănciulești (Gorj County, Romania)

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Abstract. Early Pleistocene (MN 17; Villanian, Argedavian; Milcovian) deer remains are known in Oltenia region (SW Romania) mainly from the lower faunal horizon Tetoiu 1 (T-1), including the vertebrate localities Valea Roșcăi, La Pietriș and Valea Grăuceanului, all in Vâlcea County. As such fossils are relatively rare in Romania, some cheekteeth and a distal extremity of a metatarsal are reported herein, documenting the presence of deer in the locality Dănciulești (eastern side of Gorj County). Like the previously mentioned ones, this locality also belongs to the Tetoiu Formation, in the Carpathian Foredeep. The sample fossils are scarce, but they reflect the presence of a deer close in size to *Eucladoceros* and another smaller form, possibly close to *Metacervoceros*. The marking is important to underline the potentiality of the area, where Early Pleistocene vertebrates can occur at any time due to erosion or various digging works. Such fossils remain relatively rare in our country so far. Consequently, systematic monitoring of the area in question is strongly recommended.

Keywords: deer, Early Pleistocene, Tetoiu Formation, Carpathian Foredeep, Gorj County, Romania.

The Foredeep of the Southern Carpathians hosts sedimentary successions that extend throughout the Cenozoic (Săndulescu 1980). In the area between the Danube and the Olt River, large areas are covered by Plio-Pleistocene and Holocene deposits that form sedimentary accumulations of piedmont type, disposed as monocline blankets or as alluvial fills of the valleys of the Danube tributary hydrographic network.

From paleontological viewpoint, the whole Dacian sedimentary basin – including the Carpathian Foredeep and part of the Moesian Platform – is famous mainly for Pliocene and Pleistocene vertebrates (e.g., Liteanu 1961, Schoverth et al. 1963a,b, Liteanu & Ghenea 1966, Apostol 1971, 1974, Samson & Rădulescu 1973, Samson 1975, Terzea & Boroneanț 1979, Feru et al. 1979, 1983, Terzea 1981, 1997, 2004, Rădulescu et al. 1989, 2003, Lister & van Essen 2003, Codrea & Diaconu 2003, 2010, 2011, Știucă et al. 2004, Andreescu et al. 2011, 2013 with related references, Codrea et al. 2018, 2021, Gamarra et al. 2023, 2024), but also from economic viewpoint for the coal-bearing strata preserving rich fossil invertebrate and vertebrate assemblages (e.g., Petrescu et al. 1987, 1989, Țicleanu & Andreescu 1988, Rădan & Rădan 1996, 1998, Rădan et al. 1996, Țicleanu & Diaconița 1997, Țicleanu et al. 1988, Codrea & Diaconu 2007, Codrea & Venczel 2018).

Herein, I report the fortuitous find of some cheek-teeth and a distal extremity of a metatarsal documenting the presence of early Pleistocene deer in the locality Dănciulești (Gorj County). This locality is near the triple junction of Gorj, Dolj and Vâlcea counties. This find is important not so much for the quantity or diagnostic quality of the fossils in question, but for the clues provided, which open up the possibility of discovering other Pleistocene vertebrates in this region. It would complete the knowledge in an area that otherwise has already offered interesting and valuable elements related to the fossil mammals. I am referring to other early Pleistocene (MN 17; Villanian, Argedavian; Milcovian) mammals remains already found in the neighborhood in the lower faunal horizon Tetoiu 1 (T-1), including the vertebrate localities

Valea Roșcăi, La Pietriș and Valea Grăuceanului, all in Vâlcea County (Rădulescu et al. 2003 and related references).

Geological setting and age

From a geological viewpoint, Dănciulești is located in the Carpathian Foredeep. As Săndulescu (1980) underlined, the foredeep started its evolution in the Southern Carpathians in the Paleogene, after the last important tectonic phase, i.e. ‘the second Getian phase’ (?early Laramian). The locality is situated in the inner foredeep sector.

The deep underground sedimentary sequences are less important for this approach, but the succession probably includes a series of formations starting with the Paleogene ones and continues with Miocene and Pliocene ones (Mutihac & Ionesi 1974, Mutihac et al. 2004). The pre-Pliocene deposits are probably slightly bent, while the Pliocene and Pleistocene ones are unfolded, forming a slightly monocline blanket that seals the older ones. Its older sedimentary sequences are cropping out as it gets further north. In this region, the Plio-Pleistocene sequences concern alternances between sand and pebbles in dominance, clay and silt strata of fluvial origin, bearing mollusks and mammals’ remains (Andreescu et al. 2013 and related references). The Holocene rocks refer to the river alluvia and the soil blanket, largely covering the interfluvial areas.

The deer fossils were found in the early Pleistocene sandy rocks cropping out on the hilly area located on the geographical right bank of the Plosca Valley (Fig. 1).

Materials and methods

The fossil deer teeth and fragmentary bones were unearthed during agricultural work. It is very possible that during these works, the deer leg bone was broken due to an unprofessional extraction from the rock. The rock matrix cleaned the fossils simply by washing them in water. As fossilization gave the fossils enough hardness, impregnating them with professional polymers was no longer necessary.

The measurements of the teeth and bone were done using a usual caliper, with a precision of 0.05 mm. The measurements followed Heintz (1970) and Croitor (2018). The photographs were captured using a professional tripod, a camera SONY® DSC—RX 100M5 WW 605351, and a ZEISS lens 1,8-2,8/8,8-25,7. The fossils are curated in the

paleontological collection of the ‘Alexandru Ștefulescu’ Museum in Târgu Jiu, Gorj County (abbreviated A.Șt.M.).

Abbreviations: P – upper premolar; m – lower molar; dext. – right; sin. – left; DT – transverse diameter; DAP – antero-posterior diameter.

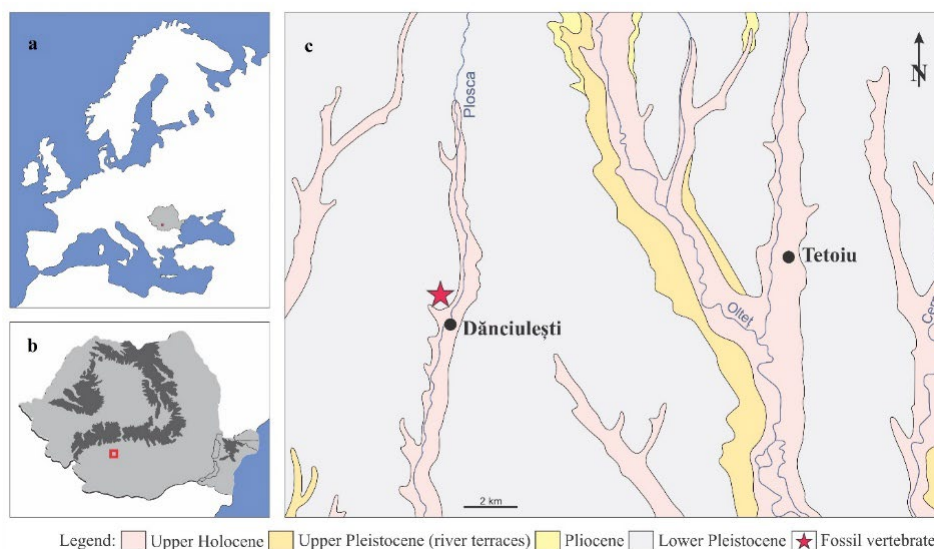


Figure 1. Location of Dănciulești locality : a – Europe ; b – Romania ; c – on the geological map of the area (after the geological map 1: 200000 of the Geological Institute of Romania, folio 33 Tg. Jiu L-34-XXX, modified).

Systematic paleontology

Class Mammalia Linnaeus, 1758
 Infraclass Placentalia Owen, 1837
 Order Artiodactyla Owen, 1848
 Infraorder Pecora Linnaeus, 1758
 Suprafamily Cervoidea Simpson, 1931
 Family Cervidae Goldfuss, 1820
 Cervidae indet. (Fig. 2 a-f)

Material: right premolar tooth row P2 – P4 (A.Șt.M. 35278; Fig. 2 a-b), isolate left m2 (A.Șt.M. 35279; Fig. 2 c-d) and a metatarsal III distal fragment (A.Șt.M. 35280; Fig. 2 e-f).

Description. The upper premolar series (P2-P4) of the right jaw is characterized in this case by teeth with relatively advanced wear, decreasing from the first anterior to the last premolar. The outer (labial) and inner (palatal) walls are vertical oblique, exposing a converging tendency in occlusal direction specific of cervids, which distinguishes them from bovid cheek teeth (Heintz 1970).

P2 has a pronounced asymmetrical outer wall with a fairly wide folded parastyle. It is joined with the paracone at the base of the crown. Due to advanced tooth wear, the bi-lobation on the inner wall is relatively inconspicuous.

At P3 the asymmetry of the outer wall is more attenuated than the previous premolar. The parastyle is much more tightly angulated and converges with the paracone towards the base of the crown, where the two ridges meet. The metastyle is poorly raised on the outer wall. On the inner wall, bi-lobation is the most evident in the series of these premolars.

The rear premolar of the series P4 exposes a far more symmetric outer wall, with metastyle and parastyle almost equally relegated. However, the metastyle is sharper. In this wear stage, the inner wall's bi-lobation is faintly expressed.

The lower m2 exposes even a more pronounced obliquity of the inner and outer walls in the upper direction. The parastylid is faint, weakly expressed. The metaconid column is raised and thick (about 3 mm), with continuity to the base of the crown. The column of the entoconid is thinner than that of the metaconid (ca. 2.1 mm), also having continuity to the base of the crown. The ectostylid is conical in shape and small (ca. 4.4 mm). There is no cingulum.

The single postcranial bone refers to a distal metatarsal fragment, with a very concave caudal face and an anteromedial channel, which is now very faint due to its pre-burial history.

Measurements (mm)

	right P2	right P3	right P4	left m2
Length	18.0	18.5	15.5	26.7
Width	17.0	21.4	21.0	17.0
Length P2-P4			55.8	
Metatarsal III				
DT			30.0	
DAP			18.7	

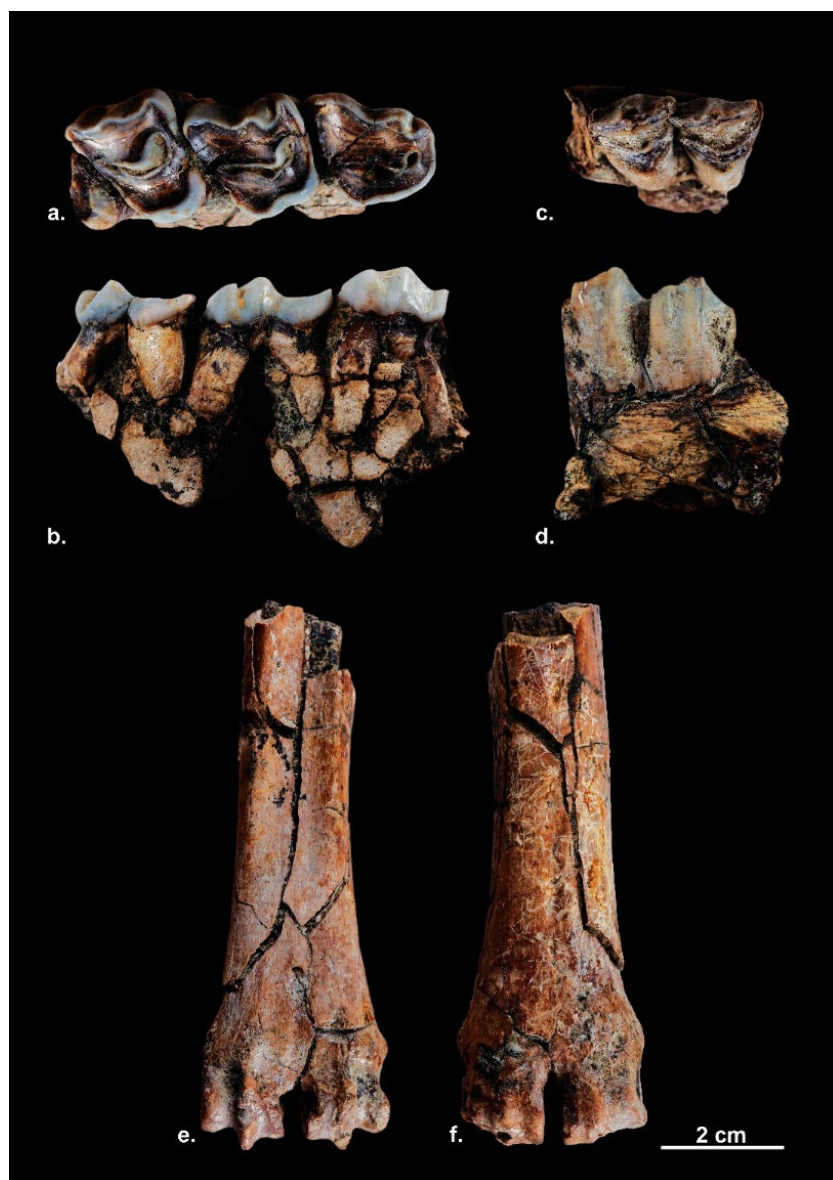


Figure 2. Fossil deer from Dănciulești:

a-b – right P2 – P4 (A.Șt.M.p.c. 35278);

c-d– left m2 (A.Șt.M.p.c. 35279);

e-f - metatarsal III distal fragment (A.Șt.M.p.c. 35280);

scale bar: 20 mm.

Comparisons and discussion

The number and quality of fossils collected from this locality are extremely scarce, offering only limited possibilities for systematic assignments. For instance, one can only report the presence of Pleistocene cervids in this locality. The absence of antlers is a serious oddity in their systematic assignment. This problem was debated a long time ago by Heintz (1970), but the overwhelming majority of paleontologists still use antler morphology as a criterion for systematic classification, to which are added elements concerning cranial morphology (Croitor 2018). However, as it resulted from the description of the materials, at Dănciulești, only an isolated upper tooththrow fragment and a lower cheek tooth, as well as a single post-cranial fragment, were available for study. Even in such context, the presence of two forms of cervids differing in size is rather clear: a larger form documented by the cheek teeth and a second one, smaller, proven by the metatarsal fragment.

The most significant data is the upper premolars' sizes, the premolar series' length, and the tooth morphologies. According to the available data, the large size form could be close to a representative of the genus *Eucladoceros*, the sizes of

the cheek teeth being close to the ones from St. Vallier and Senèze (France; Heintz 1970, Valli 2004, Pastre et al. 2015, Costeur et al. 2018). Both these localities are included in the Land Mammal Zone MN 17, the first one in the biozone MNQ17, the second in MNQ18, i.e. Early Pleistocene, Gelasian (van der Made & Dimitrievic 2015, Gibbard & Head 2020, Curran et al. 2021). The metapodial fragment documenting the small form is herein also assigned to Cervidae indet., a representative possibly close to *Metacervoceros rhenanus philisi/rhenanus* group.

Obviously, a clear geological age for this locality cannot be done on such poor material. However, the local geology could be of interest in this case. The locality where the fossil deer remains were unearthed is very close to the famous early Pleistocene vertebrate localities Tetoiu and La Pietriș (ca. 14 kms westward in straight line; Rădulescu et al. 2003 and references therein). As the Pleistocene sedimentary successions in the area are in a slight monocline structure, Tetoiu is somewhat older compared to La Pietriș, and even older than Fântâna lui Mitilan nearby Irimești (Curran et al. 2021). Dănciulești could coeval with Tetoiu or La Pietriș, but

such parallelism at this stage of knowledge remains highly speculative, just a presumption.

Another locality where *Eucladoceros* was reported is Podari (Late Pliocene, Early Villafranchian, MN 16a; Andreescu et al. 2013), in the Oltenia region (SW Romania), on the Jiu River, near Craiova city. A complete femur related to this genus was unearthed there (Gamarrá et al. 2023, 2024). Until this discovery, the Podari locality yielded only micro-vertebrates. The specimen from this locality is the oldest representative of this genus in Romania.

A similar situation concerns the reconstruction of the paleoenvironments where the deer of the specified locality lived. For such interpretations, it is necessary to identify a taphocoenosis with many taxa, possibly including other vertebrate groups, such as fish, herpetofauna and birds, and mammals. Such an objective remains to be defined by future research.

Concluding remarks

Located at the triple junction between Gorj, Dolj, and Vâlcea counties, the Dănciulești locality area is proving promising for collecting early Pleistocene vertebrates. Moreover, it is not far from the localities of Irimești and Tetoii, both iconic for the fauna already studied and curated in reference collections in our country. Consequently, it should be considered for systematic field surveys in the coming years.

So far, based on fragmentary fossils collected fortuitously from this locality, the presence of two-sized cervids can be supported in a larger and smaller form. This situation is similar to that of the Grăunceanu Valley, where *Eucladoceros* sp. and a smaller deer associated with the *Cervus rhenanus/philisi* group are present (Rădulescu et al. 2003).

Based on these arguments alone, proposing any correlation between these localities would be imprudent. A much richer sample is needed to clearly establish the geological age of the hosting strata and correlate them with those in the western sector of the Dacian sedimentary basin.

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References

Andreescu, I., Codrea, V., Enache, C., Lubenescu, V., Munteanu, T., Petculescu, A.L., Știucă, E., Terzea, E. (2011): Reassessment of the Pliocene/Pleistocene (Neogene/Quaternary) boundary in the Dacian Basin (Eastern Paratethys), Romania. *Oltenia, Studii și comunicări, Științele Naturii* 27 (1): 197-220.

Andreescu, I., Codrea, V., Lubenescu, V., Munteanu, T., Petculescu, A.L., Știucă, E., Terzea, E. (2013): New developments in the Upper Pliocene-Pleistocene Stratigraphic Units of the Dacian Basin (Eastern Paratethys), Romania. *Quaternary International* 284: 15-19.

Apostol, L. (1971): Données sur le squelette de *Mammuthus trogontherii* (Pohlig) découvert dans la Plaine Roumaine. *Travaux Muséum Histoire Naturelle "Gr. Antipa"* 11: 459-472.

Apostol, L. (1974): *Mammuthus trogontherii* (Pohlig) dans la région Fetești (Stelnică, Vlașca), département Ialomița. *Travaux Muséum Histoire Naturelle*

"Gr. Antipa" 14: 481-488.

Codrea, V., Diaconu, F. (2003): Plio-Pleistocene large herbivores from Husnicioara (Mehedinți Department). *Studii și cercetări, Geologie-Geografie* 8: 73-86.

Codrea, V., Diaconu, F. (2007): *Mammuth borsoni* (Hays 1834) from the Early Pliocene of Husnicioara (Mehedinți district, Romania). *Studia Universitatis Babeș-Bolyai, Geologia* 52 (2): 73-77.

Codrea, A.V., Diaconu, F. (2010): Borson's mastodon (*Mammuth borsoni*) find in Hurduești, Mehedinți District. *Drobeta, Seria Științele Naturii* 20: 7-12.

Codrea, V., Diaconu, F. (2011): *Anancus arvernensis* (Mammalia: Proboscidea) at Fântâna Domnească (Mehedinți District). *Drobeta, Seria Științele Naturii* 21: 7-12.

Codrea, V., Venczel, M. (2018): A Pliocene mastodon at Berbești (Vâlcea District). *Argessis Studii și comunicări, Seria Științele Naturii* 26: 27-38.

Codrea, A.V., Trif, N., Venczel, M., Grecu, C.E. (2018): Mastodon teeth in Câmpulung Muscel Museum collections. *Argessis, Studii și comunicări, Seria Științele Naturii* 26: 13-25.

Codrea, A.V., Venczel, M., Solomon, A.A., Sabău, I., Bordeianu, M., Fărcaș, C. (2021): How many Pliocene mastodon species lived in Romania? *Marisia, Natural Sciences* 1: 65-84.

Costeur, L., Valli, A., Beaudouin, C., Bastien Mennecart, B. (2018): On some ruminant petrosal bones and their bony labyrinth from Senèze (Villafranchian, France). *Revue de Paléobiologie* 37 (2): 443-456.

Croitor, R. (2018): Plio-Pleistocene deer of Western Palaearctic: Taxonomy, Systematics, Phylogeny. *Institute of Zoology of the Academy of Sciences of Moldova*.

Curran, S., Terhune, C., Croitor, R., Dragușin, V., Fox, L.D., Garrett, N., Ironside, B.L., Petculescu, A.L., Pobiner, B., Robinson, C., Robu, M., Tanțău, I., Ungar, P. (2021): Multiproxy paleoenvironmental reconstruction of Early Pleistocene sites from the Olteț River Valley of Romania. *Palaeoecography, Palaeclimatology, Palaeclimatology* 574: 110445.

Feru, M., Rădulescu, C., Samson, P. (1979): Biostratigraphie (micromammifères) des dépôts plio-pléistocènes du domaine gétique de la Dépression Valaque. *Travaux Institut Spéologie "E. Racovitza"* 18: 141-169.

Feru, M., Rădulescu, C., Samson, P. (1983): Succession des mammifères plio-pléistocènes dans le Bassin Dacique (Roumanie). *Anuarul Institutului de Geologie și Geofizică* 59: 161-167.

Gamarrá, J., Salesa, M.J., Siliceo, G., Popescu, A., Codrea, A.V. (2023): First report of *Eucladoceros* (Cervidae, Mammalia) from the Late Pliocene site of Podari (MN 16a, SW Romania). In: Alba, D.M., Marigó, J., Nacarino-Meneses, C., Villa, A. (eds.), *Book of Abstracts of the 20th Annual Conference of the European Association of Vertebrate Paleontologists*, 26th June – 1st July 2023. *Palaeoecologia, Special Volume*: 1-23.

Gamarrá, J., Salesa, M.J., Siliceo, G., Popescu, A., Codrea, A.V. (2024): First report of *Eucladoceros* (Cervidae, Mammalia) from the Late Pliocene site of Podari (MN 16a, SW Romania): description and ecomorphological implications of the femoral anatomy. *North-Western Journal of Zoology* 20 (2): e241902.

Gibbard, P.L., Head, M.J. (2020): The Quaternary Period. In: Gradstein, F.M., Ogg, J.G., Schmitz, D.M., Ogg, G.M. (eds.), *Geologic Time Scale*, Vol. 2, 1218 – 1255, Elsevier.

Heintz, E. (1970): Les Cervidés villafranchiens de France et d'Espagne. *Mémoires du Muséum national d'Histoire Naturelle, Série C, Sciences de la Terre*, XXII, Vol. I: 303 p + XL pl., Vol. II: 206 p.

Lister, A.M., van Essen, H. (2003): *Mammuthus rumanus* (Ștefănescu), the earliest mammoth in Europe. pp. 47-52. In: Petculescu, A., Știucă, E. (eds.), *Advances in Vertebrate Paleontology* Hen to Panta, A Tribute to C. Rădulescu and P.M. Samson, Romanian Academy, "Emil Racovitza" Institute of Speleology.

Liteanu, E. (1961): Despre limita Terțiar-Cuaternar în Depresiunea Valahă. pp. 65-108. In: *Comitetul Geologic, Institutul Geologic, Studii Tehnice Economice Seria E/5, Hidrogeologie*, București.

Liteanu, E., Ghenea, C. (1966): Cuaternarul din România. pp. 1-119. In: *Studii Tehnice Economice, Seria H/1, Comitetul Geologic, Institutul Geologic*, București.

Van der Made, J., Dimitriević, V. (2015): *Eucladoceros montenegrensis* n. sp. and other Cervidae from the Lower Pleistocene of Trlica (Montenegro). *Quaternary International* 389: 90-118.

Mutihaç, V., Ionescu, L. (1974): *Geologia României*. Ed. Tehnică.

Mutihaç, V., Stratulat, I.M., Fechet, M.R. (2004): *Geologia României*. Ed. Didactică și Pedagogică R.A.

Pastre, J.-F., Debard, E., Nomade, S., Guillou, H., Faure, M., Guérin, C., Delson, E. (2015): Nouvelles données géologiques et téphrochronologiques sur le gisement paléontologique du maar de Senèze (Pliocène inférieur, Massif central, France). *Quaternaire* 26: 225-244.

Petrescu, I., Codrea, V., Pătruțoiu, I., Meilescu, C. (1987): Contributions à la connaissance de la géologie, de la paléontologie, de la palynologie et de la genèse des formations de charbon du Pliocène supérieur (Roumanien) de la zone Roșia – Peșteana – Turceni (département de Gorj). *Studia Universitatis Babeș-Bolyai, Geologie-Geografie* 32(2): 11-27.

Petrescu, I., Cernita, P., Meilescu, C., Codrea, V., Pascovici, N., Vădan, M., Hosu, A.L., Manda, S., Bengulescu, L. (1989): Preliminary approaches to the

- palynology of the Lower Pliocene (Dacian) deposits in the Husnicioara area (Mehedinți County, SW Romania). *Studia Universitatis Babeș-Bolyai, Geologie-Geografie* 34 (2): 67-74.
- Rădan, S.C., Rădan, M. (1996): Magnetostratigraphy as a technique of nomination and correlation of coal beds; two examples from western Dacic Basin (Romania). *Geologica Carpathica* 47 (3): 174-176.
- Rădan, S.C., Rădan, M. (1998): Study of the Geomagnetic Field Structure in Tertiary in the Context of Magnetostratigraphic Scale Elaboration. pp. 215-231. In: I - The Pliocene, 70. Anuarul Institutului Geologic al României.
- Rădan, S.C., Rădan, M., Rădan, S., Andreescu, I., Vanghelie, I. (1996): Magnetostratigraphic and mineralogical study of Dacian-Romanian formations from Mehedinți area: towards the synonymous nomination of lignite beds related to the Motru zone. In: Anuarul Institutului Geologic al României 69, I, 324-331.
- Rădulescu, C., Samson, P.-M., Știucă, E. (1989): Pliocene (Lower Romanian) micromammals in the Dacic Basin. *Miscellanea Speologica Romanica* 1: 313-326.
- Rădulescu, C., Samson, P.-M., Petculescu, A., Știucă, E. (2003): Pliocene large mammals of Romania. *Coloquios de Paleontologia, Volumen Extraordinario* 1: 549-558.
- Samson, P.-M. (1975): Les Equides fossiles de Roumanie. *Geologica Romana* 14: 165-362.
- Samson, P.-M., Rădulescu, C. (1973): Les faunes de Mammifères et la limite Pliocène/Pléistocène en Roumanie. *Travaux Institut Spéologie "E. Racovitza"* 12: 191-228.
- Schoverth, E., Feru, M., Șerbănescu, V., Tudor, R. (1963a): Observații asupra Villafranchianului din bazinul mijlociu al Jiului. *Comitetul geologic, Institutul geologic, Studii tehnice și economice, Seria E, Hidrogeologie* 6: 71-84.
- Schoverth, E., Feru, M., Șerbănescu, V., Sbenghe, R., Croitoru, M., Croitoru, E. (1963b): Cercetări geologice în zona centrală din vestul Câmpiei Getice. *Comitetul geologic, Institutul geologic, Studii tehnice și economice, Seria E, Hidrogeologie* 6: 85-103.
- Săndulescu, M. (1980): *Geotectonica României*. Editura Tehnică, București.
- Știucă, E., Petculescu, A., Arghir, R. (2004): Mamiferele mari din Romanianul Bazinului Dacic: implicațiile lor biocronologice. pp. 73-79. In: Olteanu, R. (ed.), *Romanianul și problemele lui: faună, stratigrafie, sedimentogeneză*. Institutul de Speologie "E. Racovitza", Cluj Napoca.
- Terzea, E. (1981): Remarques sur la biostratigraphie du Pliocène du sud de la Plaine Roumaine (zone de Turnu Măgurele). *Travaux Institut Spéologie "E. Racovitza"* 20: 113-126.
- Terzea, E. (1997): Biochronologie du Pliocène du bord méridional du Bassin Dacique. pp. 649-660. In: Aguilar, J.P., Legendre, S., Michaux, J. (eds.), 1997. *Actes. Congres Biochronologie*, 97, 21. Mémoire Travaux E.P.H.E., Institut Montpellier.
- Terzea, E. (2004): Asociații de mamifere din Romanianul de pe țărmul sudic al Bazinului Dacic (România). pp. 57-71. In: Olteanu, R. (ed.), *Romanianul și problemele lui: faună, stratigrafie, sedimentogeneză*. Institutul de Speologie "E. Racovitza", București.
- Terzea, E., Boroneanț, V. (1979): Découverte d'une faune de Mammifères pliocènes à Ciuperceni (dép.de Teleorman). *Remarques sur deux espèces inconnues en Roumanie*, Travaux Institut Spéologie "E. Racovitza" 18: 171-184.
- Țicleanu, N., Andreescu, I. (1988): Considerations on the development of Pliocene coaly complexes in the Jiu-Motru sector (Oltenia). *Dări de Seamă Institutul Geologic Geofizic* 72-73 (2): 226-244.
- Țicleanu, N., Diaconița, D. (1997): The main coal facies and lithotypes of the Pliocene coal basin of Oltenia, Romania. pp. 131-139. In: *European Coal Geology and Technology*, 125. Geological Society Special Publication.
- Țicleanu, N., Andreescu, I., Bițoianu, C., Pauliuc, S., Nicolae, Gh., Păslaru, T., Grigorescu, G., Țicleanu, M. (1988): Remarks on the relationship between the spatial distribution of the coal complexes in the Olt-Jiu sector and the structural-genetic factors. *Dări de Seamă Institutul Geologic Geofizic* 72-73 (2): 215-225.
- Valli, A.M.F. (2004): Cervidae from the late Pliocene deposits (Mid-Villafranchian) of Saint-Vallier (Drome, France). *Geobios* 37: 191-232.