

A Middle Miocene rhinoceros find in Transylvania: 19th century forgotten correspondence

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Abstract. The single report in Romania of the Middle Miocene rhinoceros *Brachypotherium brachypus*, a rare species in our country or elsewhere in Europe, is from Petros locality in Hațeg basin. This find is an old one, nearly a century and half ago. A fragmentary letter written by the Hațeg naturalist Ádám Buda to Prof. Antal Koch retrieved in the Paleontological Museum of Babeş-Bolyai University Cluj-Napoca brings some light about this find. The letter was probably written around 1881-1882 and reveals the active exchanges of scientific data between the professor from Cluj and country people interested in natural sciences.

Keywords: *Brachypotherium*, Miocene, 19th century correspondence, Transylvanian naturalists.

INTRODUCTION

The second half of the 19th century, as well as the first couple of decades of the 20th century, were great times for natural sciences studies in Hațeg County (Transylvania). Among the scientists of this region, by far the most famous one is the paleontologist, paleobiologist and geologist Francisc (Ferenc, Franz) Nopcsa (1877-1933), who described in 1897 (although he shared the priority on this fauna with Gy. Halaváts) in detail the latest Cretaceous dinosaurs from the Hațeg sedimentary basin. He pointed out their dwarfism caused by the island environment (Razba, 2000; Jianu and Weishampel, 1998; Benton et al., 2010; Grigorescu, 2010; Weishampel and Jianu, 2011 and references therein). Besides natural sciences, he also took an interest in ethnography, history, geography, religion, language and dialects, travelling a lot in the Austrian-Hungarian Empire, mainly in Bosnia-Herzegovina and Albania. But, on the other hand, he practiced also even more tenebrous activities such as espionage during the First World War (Muntean, 2013). This latter “passion” had unfortunate consequences on his destiny as he ended up tragically by taking his own life in Wien.

Another Hațeg native born geologist was Valeriu Popovici-Hațeg (1868-1929). While Nopcsa spent a longer time in Hațeg region where he returned several times after his travels, the aforementioned geologist went to Romania where he built a career as Director of the Laboratory of Geology (Ministry of Agriculture and Domains Bucharest) and vice-director of the Geological Institute of Romania. He was also interested in Mesozoic topics, mainly in geological case studies in Southern Carpathians (Razba, 2000 and references therein). Over the last decades of his life, his interest in geology was weaker, being replaced by administration tasks and personal projects (Paucă, 2003).

Among biologists, we have to point out the contributions of Alexius Buda (1815-1901) and his son, Ádám Buda (1840-1920), born in Ruși, not far from Hațeg borough. The senior was an ornithologist. He collected a large number of stuffed birds, his collection gathering 214 specimens around the 1848 revolution (Popescu, 1998). Unfortunately, nearly half of this collection was destroyed during the rough historical events. He donated the saved part to the Bethlen College Aiud, where, over the following decades it was almost completely destroyed by the poor preservation environment of this museum (Popescu, 1998).

His son continued the father’s work, but besides ornithology he was also interested in other scientific domains such as entomology, but also geology and paleontology. With these last ones he was supervised by Elek Pávay Vayna, curator of the Museum of Geology Budapest and by Károly Herepey (1817-1906), professor in Aiud, author of a geological monograph on Alba County and the first discoverer of a dinosaur bone in Transylvania (Popescu, 1998; Codrea and Mărginean, 2007). These preoccupations with Earth sciences are of interest to us.

THE LETTER

In the paleontological collections of the Babeş-Bolyai University in Cluj-Napoca (Paleontology-Stratigraphy Museum of the Department of Geology - abbreviated, PSMDG) we found an upper right jaw fragment of a fossil rhinoceros (PSMDG 1492) still nesting in alveoli P4-M1 strongly worn, and the outlines of the broken crowns’ bases of P3, M2 and M3. The fossil is labeled as originating from Petros locality (Baru Mare commune, Hunedoara County) in Hațeg basin (Fig. 1). Based on specific morphology and size, the fossil was assigned to *Brachypotherium brachypus* (LARTET, 1848) (Fig. 2) (Codrea, 1991), a Middle Miocene species reported in

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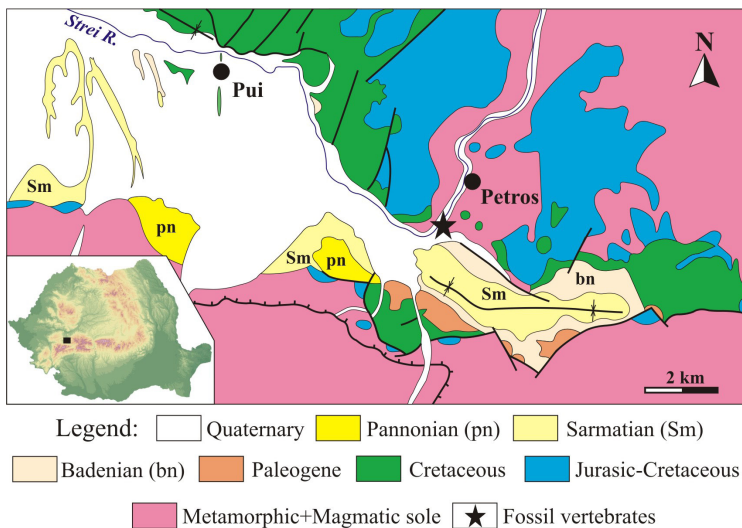


Fig. 1. Presumed location of the find on the geological map.

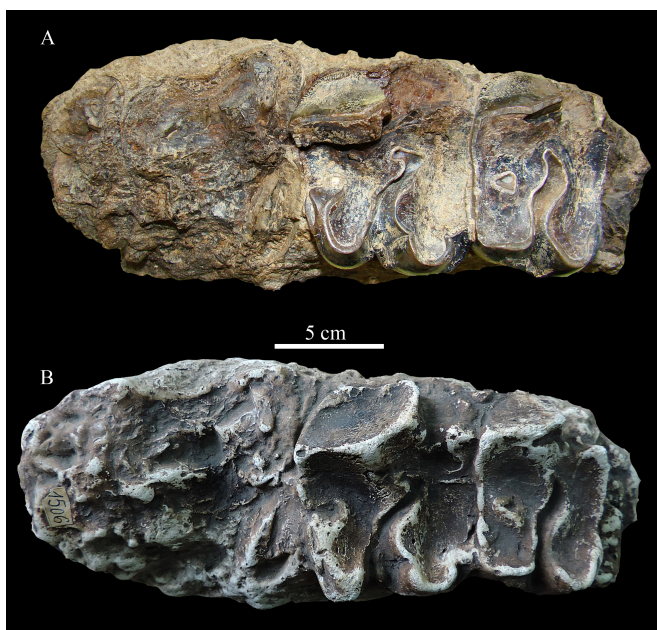


Fig. 2. *Brachytherium brachypus* (LARTET, 1848), Middle Miocene, Petros (Hateg basin); right upper jaw with P4-M1. A – original; B – plaster cast 1:1 probably made in Koch's epoch.

our country only from this locality (Codrea, 2000). Due to its rarity not only in Romania, but also in Europe (Guérin, 1980; Koufos and Kostopoulos, 2013; Zervanová et al., 2013), the Petros find is worth taking a closer look.

Antal (Anton) Koch (1843–1927), former geology professor in Cluj University was the first to mention this fossil as “*Aceratherium cf. Goldfussi*” pointing out several times (1886, 1891, 1900) that it was discovered *ex situ* by Ádám Buda, in the alluvia of Strei River. In the box where the fossil is stored, one of us (VAC) found a fragmentary handwritten letter. Although this is lacking either the addressee's or the addresser's name, based on its content it can easily be ascribable to Ádám Buda. The letter contains four pages, labeled by us with 1–4, from the beginning to the end (Figs. 3, 4).

The letter begins by referring to a sample of Miocene molluscs sent by Buda to Koch. Probably Koch confirmed their receipt at the University of Cluj in a previous letter, as Buda was “*enormously happy to know that the fossils arrived*

without problems, but chiefly for the finding that these ones worth to be studied and among them there are also new species.” He mentioned that he was in possession of a full box of molluscs collected by a trustee man of him at Lăpuş de Sus (Hunedoara County), being sure that among the samples still unseen by Koch there were some new forms, that were missing in the sample already sent to Cluj. Therefore, he proposed to Koch to visit him during the Eastern Time, in order to examine and select the most illustrative ones. It is hard to know if Koch paid him this visit, but obviously a part of the Badenian (Middle Miocene) molluscs from Cluj collection originated from Lăpuş de Sus – a well-known Middle Miocene (Badenian) locality – due to Ádám Buda. However, the sample arrived in Cluj collection is not a large one.

The next paragraph refers to numerous leaf imprints collected in the Oligocene coal-bearing deposits of Jiului Valley sedimentary basin, sent at the Geological Institute of Budapest to Elek Pávay in order to be studied. Pávay promised to return the sample, but even after three years of latency Buda recovered only a small amount after numerous attempts, without any scientific assignation of taxa. A similar story happened to some sea urchins (probably originating also from Lăpuş de Sus) that were lost in Budapest. Buda was extremely sad because he supposed that there were also new species among these. Therefore, after these experiences he said that “*...such a case makes a man become mistrustful*”.

Next, he referred to the fossil of interest for this contribution. Visibly, he considered the rhinoceros' teeth as belonging to an anthracothere: “*Concerning the Antracotherium teeth, these are not originating from Jiului Valley, but from Strei Valley, found upstream of Petros.*” Apart from the wrong systematic, the finding place is doubtful, because the local geology of Petros shows the presence of exclusively old metamorphic and Mesozoic rocks upstream of this locality. Consequently, one may presume that Ádám Buda did not find the fossil himself and probably somebody else gave it to him. It is more likely to presume that the fossil was found downstream of Petros, probably removed from its Miocene rock matrix (coarse sand and microconglomerate). One may suspect that this matrix belongs to Valea Răchişii Formation (Moiescu, 1985; Early Badenian = Astaracian, MN5). As the sample has a rather poor known formation origin, several years ago we tried to identify nannoplankton in the rock matrix. The samples indicated the presence of *Sphaenolithus heteromorphus* Zone, marking Early Badenian (=Moravian, NN); the nannoplankton determination was conducted by the late Prof. N. Mészáros, Babeş-Bolyai University, Cluj-Napoca). One may eventually doubt this evidence, suspecting perhaps that this nannoplankton is reworked in younger sediments. Such a possibility would be supported by the local geology, i.e. the presence nearby Petros of a syncline exposing Badenian deposits on its flanks and filled by Sarmatian s.s. rocks (mainly clastic; Dessila-Codarcea et al., 1968). If the Badenian nannoplankton would be reworked in Sarmatian rocks the age of the rhinoceros could be younger, Astaracian (MN7+8). Unfortunately, such a long time after the find it is very difficult, if not unrealistic, to determine the exact position of the level where the fossil originated from. However, one should consider that the nannoplankton analysis did not

miatt hi-tolereris isme, nuver gji'te
 német le foglalták s el ömverem
 sámdékornak. — Valjon nem volna
 o' hajlandó a Múzeum art meg
 nem? éin art 1000 futu meg tud
 na'm szerem mindon hurra'ale'at
 könyvekkel egyitt — megle'en csak a
 sok könyvek pár pár füv'etüt éineg
 a gji'taméy a'lt 5074 faj'el tudomá
 nyisan nemerue — mehek kisétt' igon
 sok új' állata fel-fel'erett' faj'is mar
 kömülhelöl a gji'taméy mag' 15-20 ora
 vnuv'ul a'lt igon sepe' preparalusa o's
 nemerue — igon sok vore a'ltal le'ser
 rett példányokkal. — Ha' lenne a
 Múzeumnak egy új' gji'taméy't keréi
 kömül ki' sálandani.
 Ha éren u'rdona el határo'no' mag'it a
 Múzeum egy kéne' m'it'ön anyem tudatni
 hogy a meg'el'ol'he a Gipszet' mag' tel'essom, met
 tal'ém pár hét' múlva mar' ké'se' lenne.
 Éon konstans'mal a tudomá'ny is sokat
 vesitett, mert mint' tudományosan ki
 képerett' auro'is'ér egy sok munká' ki' s'öl
 g'or'sana is meg' tette' u'lt' ar' ol' ké'm
 letet'et s a német' un'om't'ar'ok' év'it
 is mar' igon ké'v'elt' egy'én u'lt' — Is a
 ké'v'el'het'len k'et'el' nem kímél'imey
 ar' igon ember'ket' sem. —
 Igon éim'én' fog'ok ha a munká'
 körbe' keser' tud'os'it'ol'sa'imat anyem
 szerenc'sé'ltat'ni' fug' — valamin't
 el' fog'ad'm art'is' hogy a lel'ke'g'ón'k'ém
 mey hatá'mer'uttak' prot'án' egy'ent'is' is
 el' k'ü'ld'essenek — s ha ar'ok' tel'esen
 nem'erue k'ü'ld'et'ül' el', igon mag' kö'le'

Igen tisztelt úr! —

Beszer sora'it netem, s igon éim'el'ik' hogy
 a kömül'et'ek mindon haj' né'lt'ül' é'nt'art'os
 mey, — Is mey' é'nt'ak'él' annak, hogy éin
 Some'nek tartot'ik a tan'ul'm'ö'ny'és'ra,
 s új' faj'ok is tal'ált'at'nak k'isé't'it'ek.

As emb'it'ett' egy'ö'ny'ö'g'ök'ör' kan'ora's' é's'ig
 ny'g'on nem mag'am tal'ált'tam, Is bi'nt'os
 mag'ok' lenne' hogy u'lt' tal'ált'at'ott', egy
 mey k'isé't'it' emb'eren' áll'at', ki' ké'v'és'm
 ne' isme gji't'ott' egy' é'v'et', s ar'ok'at
 el' k'ü'ld'ite' nek'em, Is mint'én' mag'a
 nem gji't'ó', s ké'v'és'm csak is a fel'
 lap'ny'g'is'ak'na' tar'j'el'ott' — art' nem is k'ü'
 hette' egy'él' ké'f'it'.

Mag' mag'am lap'ny'g'ul' egy' egy'én' la
 Is'inal' to'le' me'f'ek'et' ki' u'ol'og'at'ni'
 mey' nem u'lt' é'v'ém — é'm k'is'em' h'g'
 é'ek' k'isé't'it' is — valamin't 1/3 né'v'én' is
 k'ün' f'

Fig. 3. Facsimile of pages 1 and 4 of the letter.

mar'ol'ott' gji'tamé'yan'ke is lenne'k
 ol'ganak, mehek ar' el'k'ü'ld'ít'et'ek k'isé't'it'
 ké'p'is'el'el'é' mindon'ek, é'ent' igon u'lt'
 sor'inek' tart'om'ám, ha le'ke't'ö'j'és' len'
 ne'! hogy a Múze'it' é'm'eg'el'ek'én' se'ven
 é's'it'at'ne' anyem keser' sém'ig'et',
 mey' ki' u'ol'og'at'ni'ok' ar'ok'hol' is a
 s'ü't'és'ö'z'et'et. —

A k'ü'ld'ít'et'et' k'is'én' tel'ep'én' tal'olt' le'
 u'lt' lap'ny'g'at'ok' is mag' s'á'm'lon' mag'
 nak — é'et'et' Is' Is' mag' É'ek' k'ar'ot'ém
 é't'et'el'én' fel' ké'rt'e' u'lt' a' k'ale'p'it'
 f'ü'ld'it'ani' é'nt'ér'et' tan'ul'm'ö'ny'és'is' u'
 g'ett' — ig'ém'el'én' hogy ar'ok'at' mey' k'at'ó'
 m'ua' k'ü'ld'it'ik' u'is'a. — Is faj'ol'm'
 3 é'm' u't'á'ny'á'n'is'm' u't'á'n' al'ig' tud'
 tum' a fel'k'ü'ld'ít'et'ek'nek' egy' né'v'it'
 u'is'a' ké'p'is' — s ar'ok'at' is mag' a' mag'
 k'ü'ld'ít'et'ém' mey' hatá'm'ér'at'lan'ul. —

Ekk'or' ne'v'et'ek' ar'a' t'ü's't'ém'és'im'
 nek' is egy' né'v'e' — me'f'ek'el' pá'raj'
 tud'os'it'ol'sa' sém'it' t'ü't'é' új' faj' tal'á'
 tat'ott' — Is u'la' is ne'v'et'ek'. — Ar'
 is'ig' é's'et' tan'ul'm'ö'ny'és'is' mey' ar' emb'ert'
 k'ü'ld'ít'et'et'el'ém' t'ér'it'. —

A mi ar' Antracotherium faj'okat' é'ke'
 ti' ar'ok' nem a k'ü'ld'ít'et' — k'one'm'
 a k'ü'ld'ít'et'et' u'lt' k'ü'ld'ít'et'et' k'ü'ld'
 k'ü'ld'ít'et'ek' ki'. —

Ami ar'ok'at' a Múze'um'is' é'ne' t'ü't'ó'
 né'v'it' ar'it' anyem'is'it' é'let', mey' mey'
 fog'ok' g'ü'ld'ít'et'ni' — ar'el' k'is'it'is'it'
 tom, hogy é'p'ur'it'et'ni' nem' fug'ok,
 mert' k'ale'lem' u't'á'n' mag' egy' é'nt'ér'et'et'
 fug'ok' k'ü'ld'ít'et'et'et'et'et'. —

Egy' Bont'ó' ne'v'it' é's'm'ert'ém' k'is'ek'
 t'ü't'ó' g'ü'ld'ít'et'et'et'et'et'et'et'et'et'et'
 s'int' ar'ok' k'is'it'et'et'et'et'et'et'et'et'
 at'g'it' is (mag' is k'is'it'et'et'et'et'et'et'
 k'is'ek' k'is'it'et'et'et'et'et'et'et'et'et'et'
 é'nt'ér'et'et'et'et'et'et'et'et'et'et'et'
 mey'at', s fel' is k'is'em' mag' ha a
 u'ol'og'at'et'et'et'et'et'et'et'et'et'et'et'
 yem. —

Nem' m'ul'at'et'et'et'et'et'et'et'et'et'
 faj'ol'm'at' k'is'em' k'is'em', hogy é'ren' u'
 k'is'em' é'nt'ér'et'et'et'et'et'et'et'et'et'
 k'is'em' k'is'em' k'is'em' k'is'em' k'is'em'
 k'is'em' k'is'em' k'is'em' k'is'em' k'is'em'

Fig. 4. Facsimile of pages 2 and 3 of the letter.

reveal younger species as Early Badenian. On the other hand, the work carried out by Moisescu (1985) indicates the wide presence of the Lower Badenian rocks of the Valea Răchiții Formation in this area.

Probably Koch warmly wished to include this fossil in the University of Cluj collection, but at the moment Buda wrote his letter, he was visibly still undecided: “Concerning the donation to the Museum I will think about it – I assure you that the fossil will not be lost, because after my death it will be in possession of an institute”. Currently the fossil is in Paleontological Museum collection of Babeş-Bolyai University, but besides it there is also a plaster cast (PSMDG 1506) probably made in Koch’s time, a natural size replica (Fig. 2B). Obviously, the professor played it safe, enabling further studies based at least on this cast. The cast is also valuable because it reveals minor damage occurred to the original fossil (see difference on the M1 ectoloph in Fig. 2A, now less complete as once in Fig. 2B) across nearly one century and a half.

Furthermore, he expressed his deep sorrow due to the death of his “single naturalist friend from this region, Kenderesy Dénes”. Kenderesy (1846-1881) was an entomologist, focusing mainly on studies of coleopteran groups. Due to some “minor debts” Kenderesy’s collection of insects was seized and proposed for auction. He wondered if Cluj Museum could buy this collection (“the collection consists of 5974 species, ordered in a scientific manner” meaning “ca. 15-20 thousands specimens prepared and ordered extremely well – a lot of specimens obtained through exchanges”), proposing a mediation for himself. The low costs (around a thousand forints) would also include a rich collection of entomology books. It was obviously a set-back, because a part of Kenderesy’s collection is now in Budapest, the other one in the Antipa Museum (2016) in Bucharest, bought a couple of years after Kenderesy’s death in 1883. However, this paragraph offers a guiding mark about the epoch when this letter was written - probably around 1881-1882 - at any hand close enough to the entomologist’s death. As far as we know, the first clear report on the Petros rhinoceros find was released in 1886, when Koch wrote about it for the first time.

The letter ends on an optimistic note, but the final part is incomplete and presumes that another additional page contained the whole ending and signature: “I’ll be extremely pleased if you’ll inform me about the progress of your precious work and I’ll accept that the assigned specimens be sent one by one by post (...), with gratitude...”.

CONCLUSION

This forgotten letter emphasizes the high interest for natural sciences of some natives from Hațeg area, like Ádám Buda. They tried to keep close contacts with the main Transylvanian scientists from Cluj and Sibiu – both academic centers at the time, in order to solve problems of their professional interest. Obviously, the correspondence between Koch and Buda jr. was richer, but the other letters are now lost, probably due to turbulent times during the World Wars in Transylvania. Only a restricted part of Koch’s manuscripts and correspondence could be retrieved in the collections of the University of Cluj (Codrea et al., 2011). This text brings a

spotlight on the fossil rhinoceros find, but it also brings to our attention the Hațeg native scientists like Kenderesy, sometimes completely omitted in repertories related to Hunedoara County (e.g., Razba, 2000).

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REFERENCES

- Benton, M.J., Csiki, Z., Grigorescu, D., Redelsdorf, R., Sander, M.P., Stein, K. & Weishampel, D.B. 2010, Dinosaurs and the island rule: The dwarfed dinosaurs from Hațeg Island. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 293: 438-454. <http://dx.doi.org/10.1016/j.palaeo.2010.01.026>
- Codrea, V., 1991, Some details concerning the discovery of *Brachypotherium brachypus* (Lartet) at Petros, Hunedoara district. *Studia Universitatis Babeş-Bolyai, Geologie-Geografie*, 36 (2): 25-31.
- Codrea, V., 2000, Tertiary rhinoceros and tapirs in Romania. *Presă Universitară Clujeană, Cluj-Napoca*, 174 p. (in Romanian).
- Codrea, V., Mărginean, R. 2007, A catalogue of fossil vertebrates from Aiud Natural Sciences Museum. *Oltenia, Studii și comunicări, Științele Naturii*, XXIII: 177-186.
- Codrea, A.V., Morărescu, G.-R. & Săsăran, L. 2011, Aspects of Antal Koch’s activity depicted by his correspondence. *Philobiblon*, XVI (1): 133-142.
- Dessila-Codarcea, M., Savu, H., Pavelescu, M., Stancu, I. & Lupu, D. 1967, *Geological map of Romania, scale 1:200.000, Orăștie Sheet*. Institutul de Geologie și Geofizică, București.
- Grigorescu, D. 2010, The Latest Cretaceous fauna with dinosaurs and mammals from the Hațeg Basin - A historical overview. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 293: 271-282. <http://dx.doi.org/10.1016/j.palaeo.2010.01.030>
- Guérin, C. 1980, Les rhinocéros (Mammalia, Perissodactyla) du Miocène terminal au Pléistocène supérieur en Europe Occidentale. Comparaison avec les espèces actuelles. *Documents du Laboratoire Géologique de Lyon*, 79 (1-3): 1-1182.
- Halaváts, Gy. 1897, Data on the knowledge of geological correlation of the Hațeg basin. *Magyar Királyi Földtani Intézet, Évi Jelentések 1896-ról*, 90-95, Budapest (in Hungarian).
- Jianu M.C., Weishampel, D.B. 1998, Nopcsa family and its historical importance in “Hațeg Country”. In: *Țara Hațegului 750 (1247-1997)* (Consiliul local Hațeg Ed.), Hațeg, p. 202-227 (in Romanian).

- Koch, A. 1886, Third complement to the fossil record of the Transylvanian fossil mammals and ancient men. *Orvos-Természettudományi Értesítő*, XI, II, I: 21-24, Kolozsvár (in Hungarian).
- Koch, A. 1891, A review of the Transylvanian fossil mammals. A Magyar orvosok és természetvizsgálók 1890 Augusztus 16-20-ig, Nagyváradon tartott XXV vándorgyűlésének történeti vázlatja és munkálatai: 456-466, Budapest (in Hungarian).
- Koch, A. 1900, A systematic review of the fossil vertebrate remains from the lands of the Hungarian crown. *Magyar orvosok és természetvizsgálók vándorgyűlései*, 30: 526-560, Budapest (in Hungarian).
- Koufos, G. D., Kostopoulos, D. S. 2013, First report of *Brachypotherium* Roger, 1904 (Rhinocerotidae, Mammalia) in the Middle Miocene of Greece. *Geodiversitas*, 35 (3): 629-641. <http://dx.doi.org/10.5252/g2013n3a6>
- Moisescu, V., 1985, Geological observations in Baru-Rusești region (Hațeg Depression). *Dări de seamă ale Institutului de Geologie și Geofizică*, LXIX (4): 137-154 (in Romania).
- Muntean, D. 2013, *The adventures and travels of Baron Nopcsa*. SENS, Deva, 382 p. (in Romanian).
- National Museum of Natural History Grigore Antipa, <http://www.antipa.ro/ro/categories/54/pages/61> (Accessed February 22, 2016)
- Paucă M. 2008, *I have lived my life. Memoires of the geologist Mircea Paucă*. București, 288 p. (in Romanian).
- Popescu C., 1998, Ornithological collection of Ádám Buda (Hațeg inhabitant) at the Museum of Natural History in Sibiu. In: *Țara Hațegului 750 (1247-1997)* (Consiliul local Hațeg Ed.), Hațeg p. 190-201 (in Romanian).
- Razba, M. 2000, *Hunedoara District personalities: men of culture, art, science, technology and sport (sec. XV-XX)*. *Dictionary*. Biblioteca Județeană "Ovid Densusianu" Hunedoara-Deva, Deva, 565 p. (in Romanian).
- Zervanová, J., Sabol, M., Hudáčková-Hlavatá, N. & Holec, P. 2013, *Brachypotherium* cf. *brachypus* and *Lartetotherium* sp. (Rhinocerotidae, Perissodactyla, Mammalia) from the Middle Miocene Dúbravka-Pole site (western Slovakia). *Acta Geologica Slovaca*, 5 (1): 55-68.
- Weishampel, D.B., Jianu M-C. 2011, *Transylvanian Dinosaurs*. The John Hopkins University Press, Baltimore, 328 p.