

Palaeobiology

New Spiral-Horned Antelope in Dmanisi Fauna

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ABSTRACT. Discovery of the lower jaw of a fossil man in Dmanisi in 1991 is the most outstanding event in palaeontology since the times of fascinating discoveries of early *pithecanthropus* in Kenia. Rather old age of the Dmanisi man is confirmed by diverse vertebrate fauna and numerous artefacts. Geological age of fossilbearing sediments and of the fauna (1.85 mln yrs) is substantiated by data of bio- and magneto-stratigraphy, also by isotopic dating of the basalts directly underlying the sediments with accumulation of early hominid remains.

Excavations in Dmanisi continue. The list of vertebrate fauna is being filled up by new forms. At present more than thirty representatives of Proboscideans, Predators, Ungulates, Rodents and reptiles have been determined on Dmanisi site. Artiodactyla, among which deer prevails, are represented most richly and diversely. Excavations of the last season revealed remains of antelopes. Among them an incomplete skull of a large antelope is worthy of attention, which undoubtedly belongs to spiral-horned antelopes (tribe *Oiocerini*, Sokolov) according to the character of torsion of its horn cores. Isolated teeth and bones of extremities have been attributed by us to the same group tentatively but, based on the sizes of bones and morphological features of the teeth, an error is almost excluded. © 2012 Bull. Georg. Natl. Acad. Sci.

Key words: *fauna, spiral-horned antelope.*

Homonymously twisted horn appendages, massiveness of horn cores, their form and several characteristic features of structure of the post-corneous sector of the occipital part, as well as, perhaps, peculiarity of structure of molars devoid of any additional elements clearly testify to the belonging of spiral-horned antelope to *Oiocerini*.

It is natural that Dmanisi antelope reveals obvious similarity with representatives of tribe *Oiocerini* Sokolov [1] by structure, form and character of homonymously twisting of horn appendages. But the family Bovidae contains several forms with clearly homo-

nymously twisted horn cores. Among the latter, first of all tribe *Oiocerini* from the Caprine subfamily, as well as *Sinotragus* and *Prosinotragus* from the subfamily Hippotraginae of Mio-Pliocene of China should be mentioned.

Apparently, it is appropriate to note that not all authors include *Oiocerini* in the Caprine subfamily. For example, inclusion of *Oiocerini* in the group of Gazellinae seems indisputable to G. Meladze [2]. Without going into debate on this issue, we show preference to I. Sokolov's systematization of Bovidae, based on the natural characteristics of structure of skull

and horn cores of Bovidae [3].

At present the tribe Oiocerini combines three genera: *Hypsodontus* Sokolov (1949), *Oioceros* Gaillard (1902) and *Paraoioceros* Meladze [2].

It is interesting that I. I. Sokolov [3], having at his disposal only teeth (M^1 - M^3) of Artiodactyla from Chokrak Belomechetskaya (North Caucasus), identified a new genus and species *Hypsodontus mioecenia*, placing it in the group of Bovidae of uncertain taxonomic rank (incertae sedis). A little later, L. K. Gabunia [4], on the grounds of studying additional fossil material, including horn core from Belomechetskaya, and after comparing the corn appendages and teeth of *Hypsodontus* with the material of *Dioceros* from Tung-Gura [5], was convinced of close similarity between Belomechetskaya and Tung-Gura forms. Moreover, taking into account differences of some features of horn core structure, he decided to retain its genus name *Hypsodontus*.

Detailed comparison of Dmanisi antelope with *Hypsodontus* seems unnecessary. Differences between comparable forms are striking. *Hypsodontus* is characterized by comparatively small sizes, its horns are thin, straight, short, set vertically, without keels, weakly homonymously twisted, with rounded cross-section. Teeth of *Hypsodontus* are mesohypsodontic, without additional tubercles and styles. M_3 is of primitive structure, with unforked vallecule.

Some similarities of Dmanisi antelope with *Oioceros* sp. from the Pontic deposits of Bazaleti (East Georgia) are clearly observable, manifested mainly in the structure of half-twisted and half-convoluted horn cores [2]. However, similarity between comparable antelopes is restricted to this. Dmanisi form is larger, its horns are more massive, longer, horn cores are devoid of longitudinal grooves, and horns branch off stronger.

Dmanisi antelope cannot be brought to resemble another East Georgian antelope of Upper Sarmatian age – *Paraoioceros improvisus* [2]. Sarmatian antelope is close to the Dmanisi Upper Pliocene one by large sizes, homonymous twisting of horn cores, but

differs from the latter by the presence of three powerful keels, longitudinal grooves, triangular cross-section of cores and sharp branching off of horn cores.

Spiral-horned antelopes – *Sinotragus* and *Prosinotragus* – from the Mio-Pliocene of China [6], though they reveal some similarities with Dmanisi antelope by the presence of homonymously twisted horn cores, still considerably differ from the Georgian antelope by three-keeled horn cores, and accordingly, by triangular cross-section of cores (*Sinotragus*), horns bent backwards arcwise and slightly convoluted cores (*Prosinotragus*).

Family Bovidae Gray, 1821

Subfamily Caprinae Gill, 1872

Tribe Oiocerini Sokolov, 1953

Genus *Pontoceros* Ver., Alex., David et Baig., 1971

***Pontoceros surprine* sp. nov. Vekua, 2012-03-12 (Fig. 1-4).**

The name of the species is derived from English *surprine* – unexpected.

Material. Incomplete skull (D5552) with horn cores. Facial and incisal parts on the skull are broken. Post-corneous part of skull is relatively well-preserved. The skull is rather large. Fragment of right horn (D5702).

Diagnosis. Antelope of large sizes (width of skull in the region of bulla tympani – 142 mm), horn cores are massive, set steeply, are weakly bent backwards, homonymously twisted into one full turn. Horn core has one sharply projected keel, originating from rear external surface of horn core. Cross-section of the core is almost round.

Geological age. Upper Pliocene, the end of Middle Villafranche.

Description and comparison. The skull is of large size (maximal width of post-corneous part of the skull in the region of bulla tympani is 142 mm), with relatively high brain section (height of occiput is 76.3 mm). Horn cores are massive without inner cavity even at the base of cores. Horns are slightly convoluted and twisted homonymously into open spiral at one full turn and have only one sharply projected



Fig. 1. Dmanisi. *Pontoceros surprine* sp. nov. Skull. Dorsal view.

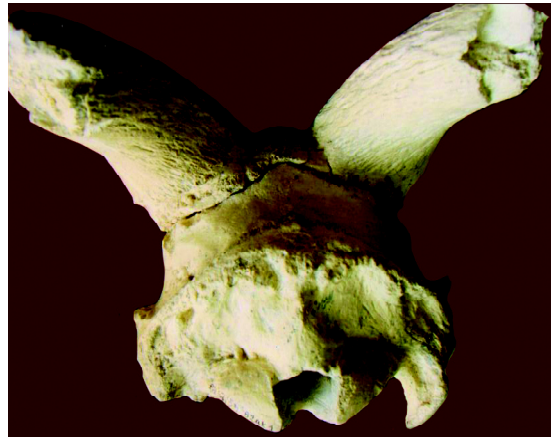


Fig. 3. Dmanisi. *Pontoceros surprine* sp. nov. Skull. Occipital view.



Fig. 2. Dmanisi. *Pontoceros surprine* sp. nov. Skull. Lateral view.

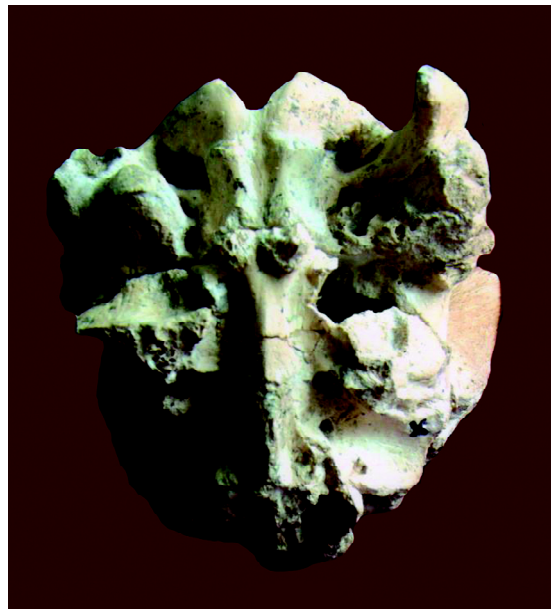


Fig. 4. Dmanisi. *Pontoceros surprine* sp. nov. Skull. Ventral view.

rear external keel. Cross-section of horns is nearly round, horns are bent backwards, weakly branching off. Fracture of skull axis is about 50 degrees. There are no longitudinal grooves on the surface of horn cores. The length of the post-corneous part of the skull is medium. Basioccipitale is rather wide, of elongated-rectangular form, with a slight front contraction. Longitudinal rollers are developed on the lateral sides of bone, and observable groove is stretched between them. Frontal and rear pairs of tuber are raised.

Post-corneous part of the skull is rather broad

(142 mm), relatively high (76.3 mm.). Parietal surface of skull is evenly convex, supraoccipitale occupies a noticeably broad area of dorsal surface of the post-corneous part of the skull and is directed forward with a narrow vertex of triangle.

Parietal crista is sharply projected and restricts occipital surface. Suturalambdoidalis is nearly straight with a weak curve and passes directly behind the horn cores. Fracture of skull axis is medium (in the limits of 50 degrees). Dorsal surface of brain case is located at an angle of 55 degrees towards the occipital surface.

Fragment of upper part of horn core (D5702) is massive, right-sided, judging by direction of keel, with homonymous twisting. There is the second keel-like longitudinal thickening, which can be tentatively taken for a keel, but this is not certain.

Upper jaw teeth are mesohypsodontic. Molars are devoid of supplementary styles. Styles and crests are weakly projected on the external side of teeth. Correlation of lower premolars with whole length of teeth row is medium – 42.7.

Lower molars are absolutely devoid of supplementary element. There is even no trace of external front fold on the back molars. Correlation of lower molar row with whole length of teeth row is 39.9.

According to Sokolov [1], an overwhelming majority of fossils and modern forms included in the tribe of spiral-horned antelopes have clearly heteronymously twisted and convoluted horn appendages. Moreover, they are provided with some well-observable keels and cross-section is generally triangular. That is why systematization of Oiocerini is based solely on the form of horn cores, character of twisting and convolution, presence of inner cavity, keels and so on.

An interesting antelope with clearly homonymously twisted horn cores from Upper Pliocene deposits in the area of Nogaïsk is described and singled out as a new genus and species *Pontoceros ambiguus* by a group of authors (Vereshchagin, Alekseeva, David, Baigushcheva, [7]). It is natural, that we bring precisely Dmanisi antelope close to this antelope, although there is no complete similarity between these antelopes under comparison. In spite of the closeness of the Nogaïsk and Dmanisi antelopes by homonymous torsion of horn cores, Dmanisi form cannot be identified with *P. ambiguus*. That is why we identify a new species of genus *Pontoceros*.

Dmanisi species differs from *P. ambiguus* by more massive, short horn cores, somewhat larger sizes, presence of one raised keel, rounded cross-section, lack of grooves on cores and cavities in the bases of

horn appendages. According to authors' description, horn cores of *P. ambiguus* are three-keeled, slender, cross-section is triangular. There are longitudinal fissures on the horn surfaces and cavities at the base of horn appendages.

Detailed comparison of Dmanisi antelope with *P. ambiguus* convinces me that the described antelope from Dmanisi obviously belongs to a new, hitherto unknown species of tribe Oiocerini.

It should be noted that we categorically reject inclusion of Lower Pleistocene antelope *Sinoreas* from Akhalkalaki (Southern Georgia) in the group of genus *Pontoceros*. According to all characteristic features of the structure of horn cores (character of torsion, number of keels, cross-section etc.), *Sinoreas* from Akhalkalaki sharply differs both from *Pontoceros ambiguus* and from the new form of *Pontoceros* from Dmanisi.

We do not identify Akhalkalaki antelope with *Sinoreas*. Therefore its definition is given questionable and its attribution to the genus *Pontoceros* is obvious misunderstanding.

In the Lower Pleistocene deposits of Apollonia (Greece) fragments of horn cores of antelope with obvious homonymous twisting of horn appendages were found. The famous paleontologist Dmitri Kostopoulos [8], describing these remains, compares them with Nogaïsk antelope and comes to the logical conclusion on the affinity of the antelopes under comparison. At the same time he identifies a new subspecies *Pontoceros ambiguus mediterraneus* Kost., 1997 on the grounds of some morphological features.

Naturally, we undertook a detailed comparison of Dmanisi antelope with its Greek counterpart. According to the descriptions of the author, the Greek antelope is a rather large form with homonymously twisted massive long horn cores. There are three keels pronounced in different degrees with obvious longitudinal grooves on the horns. The antelope from Apollonia manifests considerable similarity with the Nogaïsk antelope by all the listed morphological fea-

Table. Measurements of the skull of *Pontoceros*

Skull	<i>Pontoceros surprine</i> Dmanisi	<i>Pontoceros ambiguus</i> Nogaïsk. Vereshchagin et al.1971	<i>Parastrepsiceros sokolovi</i> Kvabebi Georgia.	<i>Pontoceros ambiguus mediterraneus</i> , Apollonia, Greece. Kostopoulos, 1979
Width of the back horn of the skull	57.4	-	95-110	-
Width of brain box	117	-	-	-
Width of skull mastoid	126	-	-	-
Height of the occipital	76.3	-	72.82	-
Maximum width of the skull	Ca. 142.5	-	113-130	-
Distance from horn to occipital	100.6	-	93-110	-
Length of the horn	Ca.150	260	332	205
Distance between the external edges of the horns	139	-	127-138	-
Distance between the inside edges of the horns	35.7	50-55	22-26	-
Diameter of antero-posterior base of the horn core	50.0	46	44-56	40.5
Width of the horn core	55.2	48	53-63	43.2
Number of the horn keel	1	3	2	3
Form of the transversal cut (crosscut) of the horn	Round	Triangle	Triangle	Triangle

tures but by the same features it obviously differs from the Dmanisi one. First of all, Dmanisi antelope has somewhat shorter and more massive horn appendages in contrast to the Greek and Nogaïsk antelopes, has only one sharply projected keel (accordingly, they have different cross-sections), horns are devoid of longitudinal fissures and are slightly bent backward.

We are aware that inclusion of Dmanisi antelope in the group of the genus *Pontoceros* is conditioned by the scarcity of fossil material both from Dmanisi and from Apollonia and Nogaïsk. We are sure that with accumulation of fossil material on antelopes from Dmanisi, we will be obliged to find out some new genus name. At the level of present day information, we have decided only to single out a new species of Dmanisi antelope in the group of *Pontoceros* - *P. surprine*.

General remarks. There are only some isolated finds of remains of spiral-horned Bovidae on the ter-

ritory of Georgia. All of them are timed to various stratigraphic horizons. Of the Pleistocene of Akhalkalaki *Sinorea* sp.? is described [9]. In Pontic deposits of Bazaleti *Oioceros* sp. is determined [10], from Akchagil deposits of Kvabebi spiral-horned *Parastrepsiceros sokolovi* is described [11], and in Sarmatian deposits of Yaghludja remains of *Paraioiceros improvisus* are found [2]. Finally, an interesting form is discovered in Dmanisi.

Systematization of spiral-horned antelopes, especially from tribe *Oiocerini*, is complex and intricate, which is caused by the incompleteness of fossil material. Some researchers attribute *Oiocerini* to *Caprinae* subfamily [1], while others to *Hippotraginae* [6], and Meladze [2] includes them into group of *Gazellinae*.

In Meladze's opinion (1985), *Oiocerini* became detached from the common stem, perhaps from the genus *Hypsodontus*, in the Middle Miocene epoch, spreading widely in Eurasia.

პალეობიოლოგია

ხვეულრქიანი ანტილოპა დმანისის ფაუნაში

ა. ვეკუა

აკადემიის წევრი, საქართველოს ეროვნული მუზეუმი, პალეობიოლოგიის ინსტიტუტი

დმანისის უძველესი პომინიდეების ნაშთების აღმოჩენა (1991 წ.) ბოლო დროის უმნიშვნელოვანესი მოვლენაა პალეოანთროპოლოგიაში. ქართველი მეცნიერების უახლესი გამოკვლევები დმანისის პომინიდეების შესახებ მსოფლიო სამეცნიერო წრის ყურადღების ცენტრში მოექცა. დღეს უკვე დავას არ იწვევს დმანისის აღმოჩენების გეოლოგიური სიძველე 1,85 მლნ წელი, რაც დადასტურებულია პალეობიოლოგიური, მაგნიტოსტრატиграფიული და იზოტოპური კვლევის მეთოდებით. დმანისის პალეოანთროპოლოგიურმა აღმოჩენებმა ძირითადად შეცვალეს ადრე არსებული წარმოდგენები უძველესი ადამიანის წარმოშობის, მიგრაციის გზებისა და ტემპების შესახებ. დღეს უკვე დადგენილია, რომ აფრიკიდან წამოსული პომინიდი (*Homo ergaster*) შშრომელი ადამიანი პლიოცენის ბოლოს შემოვიდა სამხრეთ კავკასიაში და ბინადრობდა სამხრეთ საქართველოს ტერიტორიაზე.

წინამდებარე სტატია ეხება დმანისის ფაუნის ახალ ელემენტს — ხვეულრქიან ანტილოპას, რომელსაც რქის პომონიძური ხვევა ახასიათებს. გამოთქმულია მოსაზრება ხვეულრქიანი ანტილოპის სისტემატიკური ადგილისა და ცხოვრების ნირის შესახებ

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