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## **PARACAMELUS MINOR (CAMELIDAE, TYLOPODA) — A NEW CAMELID SPECIES FROM THE MIDDLE PLIOCENE OF UKRAINE**

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***Paracamelus minor* (Camelidae, Tylopoda) — a New Camelid Species from the Middle Pliocene of Ukraine.** Logvynenko V. M. — *Paracamelus minor* sp. n. — a new species from the Odessa Catacombs locality (Ruscinian, MN–15) in the Northern Black Sea area of Ukraine is described. Small size, moderately swelling of the mandibular body, considerable reduction of P<sub>3</sub> and some other peculiarities in the construction of P<sub>4</sub> and M<sub>1</sub> differs this species from all known representatives of the genus *Paracamelus*.

Key words: Camelidae, *Paracamelus minor*, morphology, Pliocene, Ukraine.

***Paracamelus minor* (Camelidae, Tylopoda) — новый вид верблюда из среднего плиоцена Украины.** Логвиненко В. Н. — Описан новый вид *Paracamelus minor* sp. n. из местонахождения Одесские катакомбы (русциний, MN–15) в Северном Причерноморье Украины. Мелкие размеры, умеренное вздутие тела нижней челюсти, значительная редукция P<sub>3</sub> и некоторые другие особенности строения P<sub>4</sub> и M<sub>1</sub> отличают его от всех известных представителей рода *Paracamelus*.

Ключевые слова: Camelidae, *Paracamelus minor*, морфология, плиоцен, Украина.

The first remains of the ancient camelids in the Western Europe are known from the Miocene sediments of Venta del Moro in Spain. On the territory of Ukraine this group appeared in the Early Pliocene (Pont) (Alexeeva, 1977). In the Middle Pliocene (Kimmerian regiestage) *Paracamelus alexejevi* Havesson, 1950 became the dominant species in the Northern Black Sea area. A big quantity of fossil material of this species comes from the Middle Pleistocene red-brown clay, filling the carstic caves in the Pontian limestone of Odessa city (Odessa Catacombs). Among them a mandible of a much smaller camelid was found. The morphological peculiarities of the latter allow us to determine it as a separate taxon of the species rank. This new species is able not only to give us more broad vision on the taxa variation in the genus *Paracamelus*, but also brings some important changes to the view on the developing of this genus in the Pliocene of the Northern Black Sea area.

In the present paper the traditional East-European Regiestage Scheme is used.

**Family Camelidae** Gray, 1821

**Genus *Paracamelus*** Schlosser, 1903

***Paracamelus minor*<sup>\*</sup> Logvynenko sp. n.** (fig. 1, a, b, c)

**Material.** Holotype is known only. Holotype N 0-2073; collection of the National Museum of Natural History of the National Academy of Sciences of Ukraine; a fragment of the right mandible with P<sub>3</sub>, P<sub>4</sub>, M<sub>1</sub> and a half of M<sub>2</sub>; mandibular body is broken in 2 cm in front of the alveolus of P<sub>3</sub>, and in the middle of M<sub>2</sub>; belongs to a young individual.

**Locality.** Ukraine, the Northern Black Sea area, Odessa; the Middle Pleistocene red-brown clay, filling the carstic caves in the Pontian limestone of Odessa city (Odessa Catacombs).

**Age.** Middle Pliocene, Kimmerian regiestage, Moldavian faunal complex (analogue of the late Ruscinian).

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<sup>\*</sup> *minor* (lat.) — small.

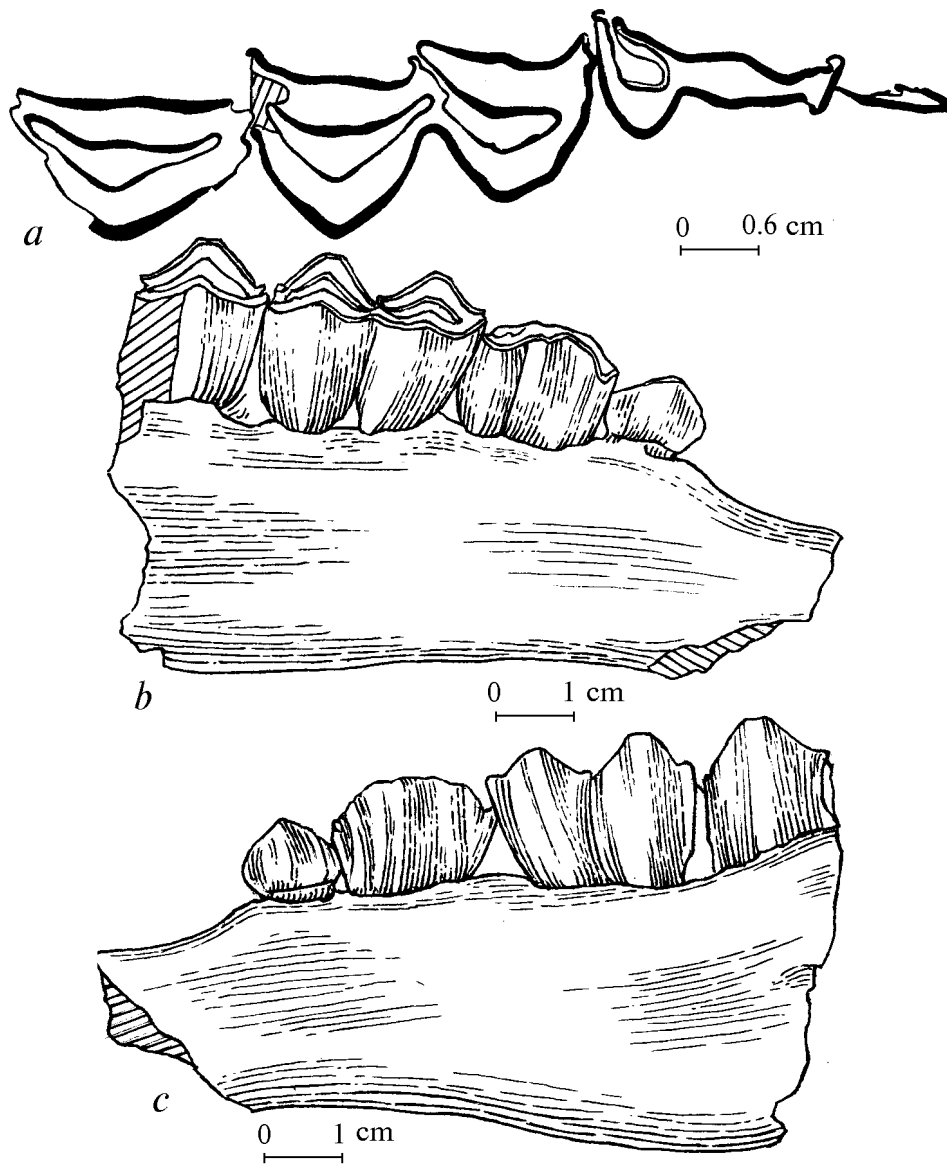


Fig. 1. The mandible of *Paracamelus minor* from Odessa Catacombs (holotype): *a* —  $P_3$ — $M_2$ , occlusal surface; *b* — labial view; *c* — lingual view.

Рис. 1. Нижняя челюсть *Paracamelus minor* из Одесских катакомб (голотип): *a* —  $P_3$ — $M_2$ , жевательная поверхность; *b* — вид с наружной стороны; *c* — вид с внутренней стороны.

**Diagnosis.** *Paracamelus* of a small size, the length of the row  $P_3$ — $P_4$  is 30.5 mm.  $P_3$  slightly reduced.  $P_4$  molarised, with an additional groove in the fore lingual corner. Anterior semilunation on  $M_1$  is closed lower than on the other teeth.  $M_2$  without anterior labial fold. The thickness index of the lower jaw below the middle part of  $M_1$  is 66.8%.

**Description.** The size of the mandible and teeth are small. The length of the row  $P_3$ — $P_4$  is 30.5 mm,  $M_1$ — 30 mm. The rest measurements of the holotype are given in a table. Teeth measurements were taken on the crowns near the alveolus, the measurements of the lower jaw — on the labial side.

$P_3$  is comparatively small. It has a slightly marked back basin, that resembles more the enamel fold passing by obliquely the inner side of a tooth from the middle up to the back part of the crown foundation.

Table 1. Measurements of the mandibles and teeth of the camelids *Paracamelus* and *Camelus*Табл. 1. Промеры нижних челюстей и зубов верблюдов родов *Paracamelus* и *Camelus*

Measurement	<i>P. minor</i>		<i>P. alexejevi</i>				<i>P. alutensis</i>		<i>P. gigas</i>		<i>P. trofimovi</i>	<i>Camelus sp.</i>
	Odessa Catacombs		n	Lim	M	±m	Kairy	Morskaya	Vinodelnoe	Xenan (China)	Kuruksai	
	Holotype 0-2073						OF-900	OF-902	Havesson, 1954	Zdansky, 1927	Sharapov, 1986	6172
Length of P <sub>3</sub> P <sub>4</sub>	30.5	5	38–50	43.49	2.22	—	—	46.0	45.0	33.0	—	
Length of P <sub>3</sub> M <sub>1</sub>	59.2	5	67–84	75.06	3.15	—	—	—	—	—	—	
Length of P <sub>3</sub>	10.0	8	15–19	17.23	0.75	—	—	18.0	19.0	9.0	—	
Length of P <sub>4</sub>	20.4	5	20–27	22.74	1.36	—	—	27.0	26.0	24.4	24.2	
Length of M <sub>1</sub>	24.8	11	33–43	38.03	0.51	24.0	27.0	34.0	35.0	30.0	30.4	
Width of P <sub>3</sub>	5.1	5	8–10	9.17	0.33	—	—	—	—	—	—	
Width of P <sub>4</sub>	11.0	8	13–15	13.01	0.31	—	—	—	—	15.5	14.5	
Width of M <sub>1</sub>	15.0	11	21–24	22.46	0.38	—	18.0	—	—	22.0	21.0	
Height of mandible below the middle of:												
P <sub>3</sub>	30.5	5	49–60	54.20	2.03	—	—	—	—	—	—	
P <sub>4</sub>	30.0	5	48–64	53.30	2.65	—	—	—	—	68.0	44.6	
M <sub>1</sub>	31.6	5	52–69	60.29	3.36	33.5	30.0	67.0	—	77.0	47.3	
M <sub>2</sub>	35.4	5	58–74	65.74	3.50	35.7	37.0	—	—	—	46.4	
Thickness of mandible below the middle of:												
P <sub>3</sub>	12.4	6	20–24	21.8	0.63	—	—	—	—	—	—	
P <sub>4</sub>	14.9	6	24–27	25.1	0.55	—	—	—	—	—	25.1	
M <sub>1</sub>	21.0	6	30–32	31.3	0.55	26.7	26.0	—	—	—	28.0	
M <sub>2</sub>	27.1	6	35–38	36.0	0.51	32.5	32.2	—	—	—	34.0	
Index (%):												
3/1	32.8	5	37–44	39.74	1.10	—	—	39.1	42.2	27.3	—	
4/1	66.8	5	52–60	55.34	1.60	—	—	58.7	57.8	73.9	—	
5/1	81.3	5	70–90	77.04	3.43	—	—	74.0	77.8	90.9	—	
3/9	32.8	4	27–33	30.6	—	—	—	29.0	—	—	—	
4/10	68.0	4	31–49	41.93	—	—	—	—	—	38.4	54.5	
5/11	77.5	4	50–61	56.20	—	71.6	90.0	50.7	—	39.0	63.8	
13/9	40.6	4	38–41	40.21	—	—	—	—	—	—	—	
14/10	49.7	4	42–46	44.25	—	—	—	—	—	—	56.8	
15/11	66.5	4	44–56	52.03	—	80.0	86.7	—	—	—	59.6	
16/12	76.8	4	52–63	57.74	—	91.0	87.0	—	—	—	74.0	

P<sub>4</sub> has a groove in the fore lingual corner, which is typical for the genus *Paracamelus*. Protoconid is thickened, hypoconid is arch-shaped. The groove between them is deep, ends at the beginning of the back basin level. The basin between the paraconid and metaconid is deeper than that one between the metaconid and entoconid. The basin between entoconid and entostylid of an oval shape, opened in its upper part, ends on the level of the middle height of the tooth. Index of the length of P<sub>4</sub> to the height of the lower jaw (4/10) is about 68%.

On M<sub>1</sub> the parastylid and entostylid are more developed than the mesostylid. A middle rib is clearly distinguished on the medial side. Anterior semilunation in the back part is not closed, in spite of the considerable tooth obliteration (fig. 1, c). The index of the tooth length to the height of the mandibular body below M<sub>1</sub> is 77.5%. M<sub>2</sub> is similar to M<sub>1</sub>, but is a little larger.

Inferior side of the lower jaw is prominent, especially under the molars, whereas a medial side is almost direct and the anterior part below the premolars is arched laterally. One can see a gradual increasing of the mandibular body thickness indexes from P<sub>3</sub> to M<sub>1</sub> (40.6% below the middle of P<sub>3</sub> and 76.8% below the middle of M<sub>2</sub>).

Comparison. According to the measurements of the lower jaw and teeth, *P. minor* is smaller than *P. gigas* Schlosser, 1903, *P. praebactrianus* (Orlov, 1927), *P. alexejevi* Havesson, 1950, *P. aguirrei* Morales, 1984, *P. trofimovi* Sharapov, 1986, and all representatives of the genus *Camelus*. It is nearly of the same size as *P. alutensis* Stefanescu, 1895. The length of the raw P<sub>3</sub>–P<sub>4</sub> is as follows: *P. minor* — 30.5 mm, *P. gigas* 45–46 mm (Zdansky, 1926), *P. alexejevi* — 38–50 mm, *P. alutensis* 33–35 mm (Havesson, 1954), and *P. trofimovi* —

33 mm (Sharapov, 1986). The anterior semilunation on  $M_1$  of *P. minor* is closed later (in the middle of tooth level) than in all camelids listed above.

As to the construction of the lower jaw and teeth, *P. minor* is similar to *P. alexejevi* from the same locality and to *P. alutensis* as well.  $P_3$  of *P. alexejevi* is less reduced than that of *P. minor* (the indexes of the length of this tooth to the length of the raw  $P_3$ – $P_4$  are 39.7% and 32.8% respectively). The construction of  $P_4$  (closing of the back basin, the development of conids, stylids and basins) in both species is similar, but *P. alutensis* has a groove between protoconid and hypoconid which comes into the crown of a tooth deeper and separates the posterior part more clearly. The construction of molars in both species is similar as well, but their middle ribs in *P. minor* are more marked. The thickness of the jaw from  $P_3$  to  $M_2$  (index 13/9–16/12) increasing quickly than in *P. alexejevi*.

*P. alutensis* differs from *P. minor* by larger absolute and relative thickness of the lower jaw (see table), as well as by its shape and construction of  $M_1$  (Havesson, 1954, Alexeeva, 1977).

*P. aguirrei* from the Later Pliocene of Spain is considerably larger. The length of its  $P_3$  is 20 mm. A posterior basin of  $P_3$  in this species is larger and is removed to the center of the tooth crown (Pickford, Morales, Soria, 1995).

Notes. Morphological peculiarities of *P. minor* differ it from all earlier known species of the genus *Paracamelus* and shows that this camelid is related to *P. alexejevi* and *P. alutensis*. Since *P. minor* existed at the same time as *P. alexejevi* and it has many similar features with the latter, it makes possible to suppose that both species are very related and could have a common ancestor which is still unknown. Moreover, the morphology of the mandible (especially its considerable thickness) and lower teeth give a possibility to suppose that described species could be a direct ancestor of *P. alutensis*. Therefore, the view of V. A. Topachevsky (1956) on the origin of *P. alutensis* from *P. alexejevi* can be changed — there are much more reasons to regard *P. minor* as the ancestor of *P. alutensis*.

Distribution. The Middle Pliocene of Ukraine: Odessa Catacombs.

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