

RECORDS OF TAPIROIDEA GRAY 1825 (MAMMALIA, PERISSODACTYLA) FROM KAZAKHSTAN – AN OVERVIEW

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Abstract. Kazakhstan is rich in deposits that have brought to light an extremely rich collection of ancient fossil remains dated from the Paleocene up to the Pleistocene (becoming richer especially starting with the Oligocene).

The peak of the Tapiroidea development occurred during the Eocene.

Systematic studies on Tapiroidea in Kazakhstan were initiated in 1918 by Borissyak.

Until to-day, five of the six Tapiroidea families (Tapiridae GRAY 1821, Lophialetidae MATTHEW & GRANGER 1925, Deperetellidae RADINSKY 1965, Helaletidae OSBORN 1892, and Isectolophidae PETERSON 1919) have been identified in this area.

The “Obaylinskaya” fauna (“Obaylian” fauna) recovered in Obayla river deposits (Zaysan basin, Eastern Kazakhstan) represents the oldest fossil mammalian complex recovered from the territory of the former Soviet Union.

Works carried out between 1993-1995 in the Zaysan basin by a Kazakh-American scientific team increased the previous knowledge on Tapiroidea in this region.

Apart from Kazakhstan, tapiroid remains were found only in a few other localities in the rest of the former Soviet Union (Kyrgyzstan, Ukraine, Northern Caucasus).

Tapiroid remains are also extremely rare in Europe, in general; scarce finds are known from Spain, France, Germany, Austria, Italy, Serbia, Bosnia, Hungary, Slovakia, Romania, Bulgaria.

The Tapiroidea remains are classified here in compliance with the criteria proposed by McKenna & Bell (1997).

Keywords: Tapiroidea, Tapiridae, Lophialetidae, Deperetellidae, Helaletidae, Isectolophidae, Kazakhstan.

INTRODUCTION

Kazakhstan territory is rich in deposits that have brought to light an extremely rich collection of ancient fossil remains dated from the Paleocene up to Pleistocene (becoming richer especially starting with the Oligocene). The peak of the Tapiroidea development occurred during the Eocene, therefore representatives of Tapiroidea were found in almost all Eocene, as well as in some Oligocene Kazakh deposits.

Systematic studies on Tapiroidea in Kazakhstan were initiated by Borissyak (1918:1319-1322).

Until to-day, five of the six Tapiroidea families – Tapiridae GRAY 1821, Lophialetidae MATTHEW & GRANGER 1925, Deperetellidae RADINSKY 1965, Helaletidae OSBORN 1892, and Isectolophidae PETERSON 1919 – have been recorded in Kazakhstan.

As general rule, most of the Tapiroidea remains come from Eastern Kazakhstan (Zaysan basin and Jungarya) and from Central Kazakhstan (Turgay depression) (Bajanov, 1960, 1962; Belyaeva & al., 1962; Biryukov, 1962, 1969; Biryukov & Kostenko, 1965; Gabunya, 1962, inter alios).

Fig. 1 - illustrates the Kazakh sites with tapiroid remains described in this paper.

Acronyms used in the text are as follows:

AN SSSR - USSR Academy of Sciences, Moscow/Leningrad;

ICZN - International Code of Zoological Nomenclature;

IP AN GruzSSR - Institute of Palaeobiology, Georgian Academy of Sciences, Tbilisi;

IZ AN KazSSR - Laboratory of Palaeobiology, Zoological Institute, Kazakh Academy of Sciences, Almaty (former Alma-Ata);

Izd-vo - Izdatel'stvo (Publishing House);

PIN - Palaeontological Institute, Russian Academy of Sciences, Moscow;

ZIN - Zoological Institute, Russian Academy of Sciences, St-Petersburg.

TAPIROID MATERIAL

The tapiroid remains are classified here in compliance with the criteria proposed by McKenna & Bell (1997).

Classis **MAMMALIA** LINNAEUS 1758

Subclassis **THERIA** PARKER & HASWELL 1897

Infraclassis **EUTHERIA** GILL 1872

Grandordo **UNGULATA** LINNAEUS 1766

Mirordo **ALTUNGULATA** PROTHERO & SCHOCH 1989

Ordo **PERISSODACTYLA** OWEN 1848

Subordo **CERATOMORPHA** WOOD 1937

Infraordo **TAPIROMORPHA** HAECKEL 1866

Superfamilia **TAPIROIDEA** GRAY 1825

Familia **TAPIRIDAE** GRAY 1821

Protapirus FILHOL 1877

Protapirus gromovae BIRJUKOV 1972

According to Biryukov (1972:169-170), *Protapirus gromovae* Biryukov 1972 was attested by a large isolated second upper molar with a very low crown (M^2 , fig. 5, measurements in tab. 7) (IZ AN KazSSR 1055-21/48-T, holotype) found in 1948 in a ravine cut in Early Oligocene-Late Miocene deposits situated along the Ashut river (Turgay depression, Kostanai [former Kustanay] region, Central Kazakhstan; Fig. 1–loc 2). The specimen was previously attributed by Gromova (1960) to *Protapirus* sp.

Other Early Oligocene–Late Miocene remains of the same species were found in the Turgay region.

Familia **LOPHIALETIDAE** MATTHEW & GRANGER 1925

Eoletes BIRJUKOV 1974

Eoletes gracilis BIRJUKOV 1974

Plate I, figs. 1a, 1b

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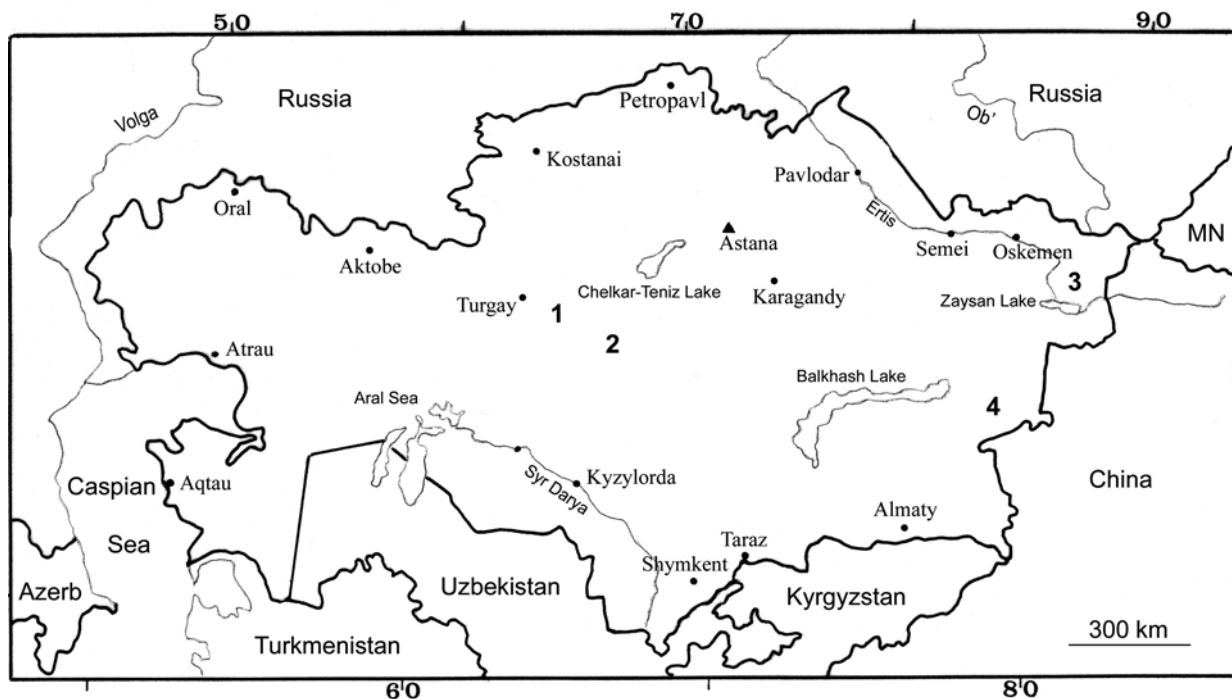


Figure 1 – Index maps of the geographical location of the Kazakh deposits where tapiroids remains were found: 1) Shalkarteniz (Chelkar-Teniz lake); 2) Ashut river and Myneskisuyek (Turgay depression, Kostanai [former Kustanay] region); 3) Obayla river, Kiin-Kerish Mountains, Maykapchagay, Chakpaktas, Mozhevelnik, Chaibulak, Aksyr, Ulken Ulasty, and Kalmakpay (Zaysan basin); 4) Shynzhily river (Alakol district, Taldy-Kurgan region, Northern Jungarya, Southeastern Kazakhstan).

This large-sized tapiroid was testified by several Middle Eocene remains from the “Kolpakhovskaya svita” (“Kolpak” Formation) in the eastern (right) bank of the Shynzhily river (about 8 km north of Kabanbai village, Alakol district, Taldy-Kurgan region, Northern Jungarya, Southeastern Kazakhstan; Fig. 1–loc 4) (Biryukov, 1974a:57-73; Reshetov, 1979:21; Lucas & al., 1997:236-242):

- the holotype, a skull (IZ AN KazSSR 5088/69-Chzh) providing with both complete upper dental ranges (P^1 - M^3) (Biryukov, 1974a, figs 1, 2, 3; Reshetov, 1979, fig. 3; Lucas & al., 1997, fig. 3–A, B, C, D, fig. 4–D, fig. 6–A, B, C) (Plate I, figs. 1a, 1b, this paper);

- a rostrum providing with right I^1 - I^3 , C, P^2 - M^2 and left P^1 - M^3 ranges (IZ AN KazSSR 4773/68) (Biryukov, 1974a, fig. 4; Lucas & al., 1997, fig. 4–A, B, C);

- a highly-damaged maxillary fragment with P^2 - P^3 (IZ AN KazSSR 4822/68);

- a right odontological fragment with dp^4 - m^2 (IZ AN KazSSR 4845/68);

- a left odontological fragment with $i2$, dp^4 , m^1 - m^3 (IZ AN KazSSR 4846/68);

- a fourth upper deciduous premolar (dp^4) (IZ AN KazSSR 34/139);

- a lower jaw with right and left p_1 - m_3 (IZ AN KazSSR 4095/94);

- a lower jaw with right p_4 - m_3 and left p_2 - m_3 (IZ AN KazSSR 5083/69);

- a lower jaw with right and left p_2 - m_3 (IZ AN KazSSR 5084/69) (Biryukov, 1974a, figs 5, 6; Lucas & al., 1997:240, fig. 5–A, B, C);

- a calcaneum (IZ AN KazSSR 3869/1966) (Lucas & al., 1997:240, fig. 5–F, G);

- various postcranial elements (tarsal bones, some of

them not-classified) (Biryukov, 1974a:68-72, figs 7-11, measurements in tabs 3-7; Lucas & al., 1997:238, fig. 5–D, E).

Both upper and lower teeth measurements are given in Biryukov (1974a:61-62, tabs 1, 2) and in Lucas & al. (1997:239, tab. 1). Until to-day, the fourth deciduous premolar represents the sole deciduous tooth known for *E. gracilis* (Lucas & al., 1997:242).

An incomplete dental series consisting of M^1 - M^3 (IZ AN KazSSR 4531/68-Chzh) – assigned to *Teleolophus beliajevi* Birjukov 1974 (recte *Teleolophus beliajevae* Birjukov 1974) by the same author (Biryukov, 1974b, fig 3) – from the “Kolpak” Formation in Shynzhily locality (Alakol district, Taldy-Kurgan region, Northern Jungarya, Southeastern Kazakhstan) actually belongs to *E. gracilis* (Lucas & al., 1997:242). However, it is untraceable in museum collections at present.

From the “Shakpaktas” Formation deposits (Eocene) in Mozhevelnik locality (Zaysan basin, Eastern Kazakhstan; Fig. 1– loc 3) come *Eoletes* sp. skeletal remains (Emry & al., 2001). Furthermore, Emry & al. (2001) assumed that remains from the same site ascribed to *Subhyracodon tshakpaktasensis* (Gabunya, 1999) must actually be assigned to *Eoletes* sp.

Moreover, remains of *Lophialetes* Matthew & Granger 1925 and *Schlosseria* Matthew & Granger 1926 were also recovered at Chakpaktas (Zaysan basin, Eastern Kazakhstan; Fig. 1– loc 3) (unpublished material).

***Breviodon* RADINSKY 1965**

***Breviodon* sp.**

From Eocene beds (“Obayla” Formation) of the Zaysan basin (Eastern Kazakhstan; Fig. 1– loc 3) comes

a small (length = 8.5 mm, width = 5.3 mm) isolated second lower molar (M_2) (PIN 2432-99) assigned to *Breviodon* sp. (Reshetov, 1979:27). Accordingly, tapiroids of the genus *Breviodon* were characterized by very small sizes.

Familia **DEPERETELLIDAE** RADINSKY 1965

Teleolophus MATTHEW & GRANGER 1925

Teleolophus beliajevi BIRJUKOV 1974 (recte *Teleolophus beliajevae* BIRJUKOV 1974)

The species was defined based on a maxillary fragment with a complete dental range (P^1 - M^3) (IZ AN KazSSR 4847/68-Chzh, holotype) of Middle Eocene age coming from the "Kolpak" Formation cropping out along the eastern (right) bank of the Shynzhlyly river (Alakol district, Taldy-Kurgan region, Northern Jungarya, Southeastern Kazakhstan; Fig. 1– loc 4) (Biryukov, 1974b:78, fig 1; Reshetov, 1979:37, figs. 6–2; Lucas & al., 1997:242-243, fig. 7–A, measurements on p. 242) (Plate I, fig. 2, this paper).

An incomplete dental series consisting of M^1 - M^3 (IZ AN KazSSR 4834/68-Chzh) assigned to *T. beliajevae* by Biryukov (1974b, fig 2) from the "Kolpak" Formation in Shynzhlyly locality (Alakol district, Taldy-Kurgan region, Northern Jungarya, Southeastern Kazakhstan) appears to be untraceable in museum collections at present. In any case, further studies performed on this material pointed out the great similarity of *T. beliajevi* with *Teleolophus medius* Matthew & Granger 1925. Therefore *T. beliajevi* was defined as synonym (junior subjective synonym of *T. medius*) (Lucas & al., 1997:243).

Furthermore, the above mentioned authors rightly emphasized that the name of this species – named in honour of the Russian palaeontologist Elena I. Belyaeva – should contain the Latin feminine suffix "ae", not the masculine "i", in accordance with the Art. 31 of the ICZN (1985) (Lucas & al., 1997:242).

Teleolophus zaisanicus GABUNYA 1984

Only one isolated third lower molar (M_3) (IP AN GruzSSR L-33, holotype) from the Middle Eocene of Obayla (Zaysan basin, Eastern Kazakhstan; Fig. 1– loc 3) is attributed to this species (Gabunya, 1984:130-132).

Familia **HELALETIDAE** OSBORN 1892

Helaletes MARSH 1872

Helaletes mongoliensis (OSBORN 1923)

Eocene remains of this species come from the "Obayla" Formation along the Obayla river (Zaysan basin, Eastern Kazakhstan; Fig. 1– loc 3) (Reshetov, 1979:15-16) (unknown collections).

H. mongoliensis was a tapiroid of relatively large size. Remains of this species were also identified in the Eocene deposits of Mongolia, Northern China, and Northern America.

Colodon MARSH 1890

Colodon orientalis BORISSIAK 1918

This species is represented by:

– a maxillary fragment provided with a complete dental range (P^1 - M^3) (PIN 1442-49, holotype) found in Middle Oligocene deposits from Shalkarteniz (Chelkar-Teniz lake, Central Kazakhstan; Fig. 1– loc 1) (Borissyak, 1918:27; fig. 1) (Plate I, fig. 3, this paper) (vide autem in Gromova, 1960:93 and in Radinsky, 1965:233);

– three calcanea (IZ AN KazSSR 858-3/48-T, 351-

31/47-T, and 252-31/48-T) collected from Middle Oligocene beds in Myneskisuyek (Turgay depression, Kostanai [former Kustanay] region, Central Kazakhstan; Fig. 1– loc 2) (Gromova, 1960:79-107);

– a calcaneum (IZ AN KazSSR 3K-57 335/761) and two astragali (IZ AN KazSSR 3K-57 211/412 and 3K-57 200/309) coming from the Late Eocene–Early Oligocene of the Kiin-Kerish Mountains (Northern Prizaysan', Zaysan basin; Fig. 1– loc 3) (Biryukov, 1972:167; not figured; measurements: astragali, in tab. 1, p. 161 – calcaneum, in tab. 5);

– two astragali (IZ AN KazSSR O 194-153/54-T and O 442-44/54-T) and an os naviculare (IZ AN KazSSR O 320-45/54-T) recovered from Middle Oligocene beds in Myneskisuyek (Turgay depression, Kostanai [former Kustanay] region, Central Kazakhstan; Fig. 1– loc 2) (Biryukov, 1972:168; not figured; measurements: astragali, in tab. 1, p. 161 – os naviculare, in tab. 6).

– three astragali (IZ AN KazSSR 350-30/47-T, 275-167/54-T, and 329-150/54-T) from Myneskisuyek (Central Kazakhstan; Fig. 1– loc 2) (Gromova, 1960:79-107).

Remains of *C. orientalis* were also found in the Middle Oligocene beds of the Kiin-Kerish Mountains (Northern Prizaysan', Zaysan basin; Fig. 1– loc 3) (Belyaeva & al., 1962:311-312; Reshetov, 1979:18-19) as well as in both Asian and North American Early–Middle Oligocene deposits.

In Eocene deposits of the "Obayla" Formation cropping out along the Obayla river near Maykapchagay (south-eastern part of the Zaysan basin, Eastern Kazakhstan; Fig. 1– loc 3) a singular tapiroid (third or fourth) upper premolar (PIN 2432-98) of relatively great dimensions was found. It was confidently ascribed to the Helaletidae family (Reshetov, 1979:17-18).

Familia **ISECTOLOPHIDAE** PETERSON 1919

According to Gabunya (1961), two Isectolophidae (gen. indet.) fragmentary upper molars (M^1 and M^2) were recovered from Obayla (Zaysan basin, Eastern Kazakhstan; Fig. 1– loc 3).

Few other odontological remains belonging to this family were discovered in Mongolia, China, and Northern America (vide autem in Reshetov, 1979:12-14).

Finds of other representatives of both Lophialetidae and Deperetellidae families were attested from Eocene deposits at Shynzhlyly (Alakol district, Taldy-Kurgan region, Northern Jungarya, Southeastern Kazakhstan; Fig. 1– loc 4) (Kojamkulova & Orlovskaya, 1971). Other representatives of the Lophialetidae, Deperetellidae, Helaletidae, and Isectolophidae families coming from Eocene deposits of the villages of Chaibulak, Aksyjr, Ulken Ulasty, and Kalmakpay (all localities located in the Zaysan basin; Fig. 1– loc 3) are also known (Gabunya, 1984:130-132).

Finally, works carried out between 1993-1995 in Zaysan basin by a Kazakh-American scientific team increased the previous knowledge on Tapiroidea in this region.

RHINOCEROTOID FOSSIL MATERIAL PREVIOUSLY ASSIGNED TO TAPIROIDS

The following three species, formerly assigned to the tapiroid superfamily, should be currently referred to the superfamily Rhinoceroidea GRAY, 1925.

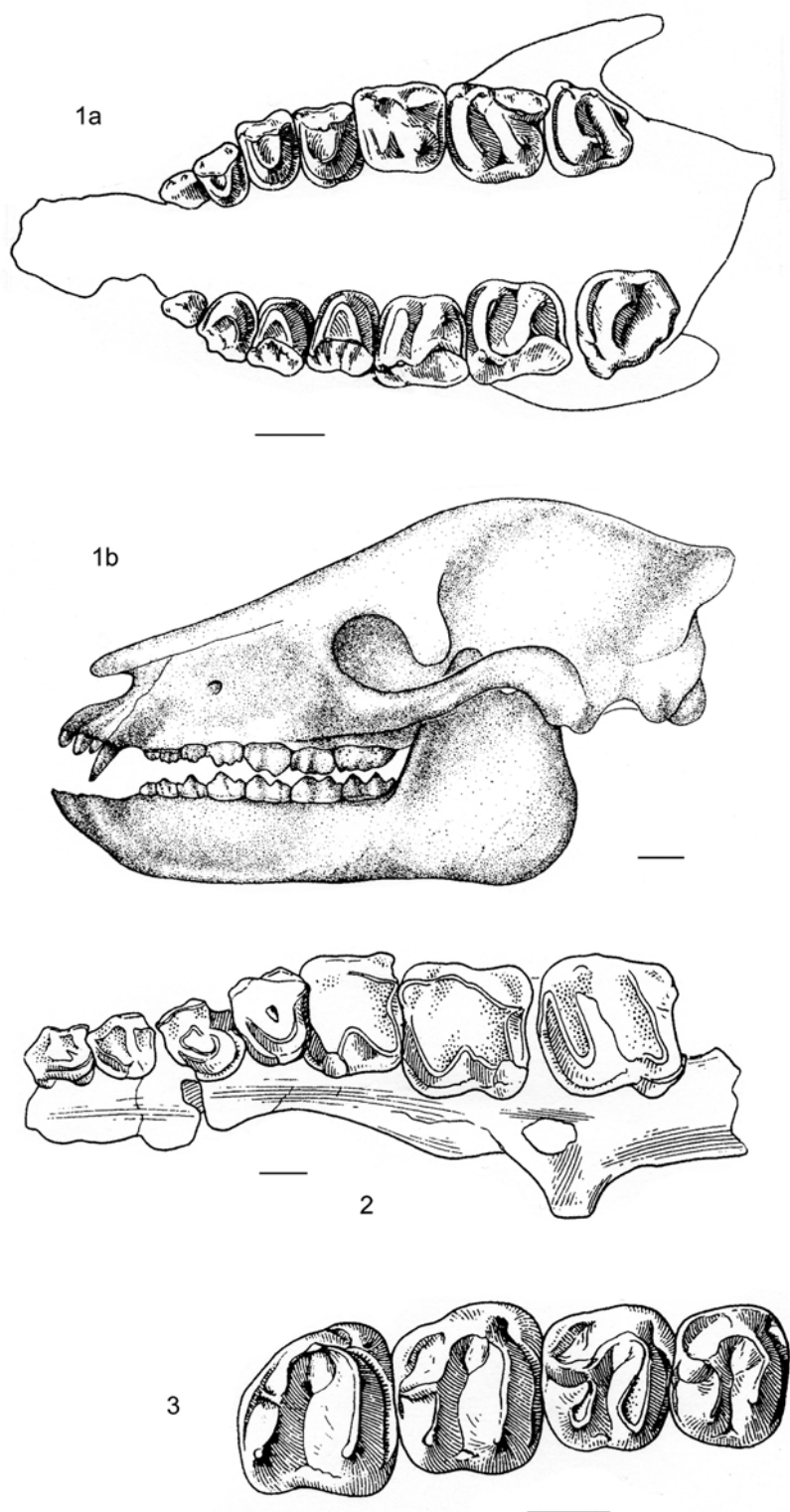


Plate I – *Eoletes gracilis* BIRJUKOV 1974; Middle Eocene, “Kolpak” Formation; right bank of the Shynzhlyly river (Alakol district, Taldy-Kurgan region, Northern Jungarya, Southeastern Kazakhstan); skull (IZ AN KazSSR 5088/69-Chzh, holotype), (1a) basal view (dental ranges, P¹-M³) and (1 b) restoration of the same skull with mandible (lateral view) (Laboratory of Palaeobiology, Zoological Institute of the Kazakh Academy of Sciences, Almaty [former Alma-Ata]) – *Teleolophus beliajevae* BIRJUKOV 1974; Middle Eocene, “Kolpak” Formation; right bank of the Shynzhlyly river (Alakol district, Taldy-Kurgan region, Northern Jungarya, Southeastern Kazakhstan); maxillary fragment with P¹-M³ (IZ AN KazSSR 4847/68-Chzh, holotype), (2) occlusal view (Laboratory of Palaeobiology, Zoological Institute of the Kazakh Academy of Sciences, Almaty [former Alma-Ata]) – *Colodon orientalis* BORISSIAK 1918; Middle Oligocene; Shalkarteniz (Chelkar-Teniz lake, Central Kazakhstan); P⁴-M³ (PIN 1442-99, holotype), (3) occlusal view (Palaeontological Institute, Russian Academy of Sciences, Moscow).
Scale bar = 1 cm (1a, 2, and 3, after Reshetov, 1979; 1b, after Lucas & al., 1997).

Ergilia GROMOVA 1952 (= **Ardynia** MATTHEW & GRANGER 1923)

Ergilia kazachstanica GROMOVA 1960

Late Eocene–Middle Oligocene osteological remains ascribed to this species were recovered from five Kazakh localities: Kiin-Kerish Mountains (Northern Prizaysan', Zaysan basin) (Biryukov, 1972:160-162), Shintuzsay (about 40 km southeast of Turgay, Turgay depression, Kostanai [former Kustanay] region, Central Kazakhstan) (Gromova, 1960:79-107), Myneskisuyek (Turgay depression, Kostanai [former Kustanay] region, Central Kazakhstan) (Biryukov, 1972:162-166; Gromova, 1960:79-107), Shalkarteniz (Chelkar-Teniz lake, Central Kazakhstan) (Biryukov, 1972:163), and Aqtau' [former Aktau] (Aqtau' Mountains, Southwestern Jungarya, Southwestern Kazakhstan) (Bajanov & Kostenko, 1961).

However, *Ardynia* (*Ergilia*) *kazachstanica* considered as a species belonging to the Helaletidae family by Gromova (1952) was later referred to the rhinocerotoid family Hyracodontidae COPE 1879 by Radinsky (1965, 1967) on the basis of its skeletal remains from Mongolia.

According to McKenna & Bell (1997), the following two other species also fall into the rhinocerotoid family Hyracodontidae COPE 1879 (subfam. Hyracodontinae COPE 1879). According to Radinsky (1965) and Prothero & Schoch (1989), the first one is identical with *Helaletes nanus* MARSH 1871 known from the Middle Eocene of North America.

Veragromovia GABUNIA 1961

Veragromovia desmatotheroides GABUNIA 1961

This Eocene species from the "Obayla" Formation along the Obayla river (Zaysan basin, Eastern Kazakhstan; Fig. 1– loc 3) was described based on an isolated third upper molar (M^3) (IP AN GruzSSR 3-V, holotype) by Gabunya (1961:711, 1962:22) (vide autem in Reshetov, 1979:16).

Rhodopagus RADINSKY 1965

Rhodopagus minutissimus RESHETOV 1979 (holotype: maxillary fragment PIN 3486-1 from Andarak II, Kyrgyzstan).

Rhodopagus sp. aff. *R. minutissimus* RESHETOV 1979

Middle Eocene remains referred to this species were discovered in Chakpaktas (Zaysan basin) (Gabunya, 1983:456-457).

Rhodopagus sp.

A very small, isolated (second or third) upper premolar (PIN 2432-12) assigned to *Rhodopagus* sp. was recovered from "Obayla" Formation deposits (Eocene) along the Obayla river near Maykapchagay (south-eastern part of the Zaysan basin) (Reshetov, 1979:30-31). *Rhodopagus* sp. remains also come from Chakpaktas (Zaysan basin) (unpublished material).

CONCLUSIONS

Obviously, this paper does not pretend to be exhaustive. The aim of the present work is only that of giving a new concise view regarding the tapiroid occurrences in Kazakhstan.

As far as the rest of the former Soviet Union is concerned, tapiroids are barely represented.

Most of their remains come from Kyrgyzstan where they were found in Middle Eocene "alay" levels at Andarak (Andarak I) and in Middle Eocene deposits along the

Toruaygyr river:

– at Andarak I, *Deperetella ferganica* BELIAJEVA, 1962 (fam. Deperetellidae) is testified by a singular second upper premolar (P^2) (PIN 1996-1, holotype) (Belyaeva, 1962:144–fig. 1; Reshetov, 1979:38–39–fig. 6–3);

– on the right bank of the Toruaygyr river (0.5 km from its confluence with the Kuul'dek river, southern slope of the Kungey-Zailiy rise, southern border of the Toruaygyr plain) remains of *Deperetella kungeica* TARASOV, 1968 and *Teleolophus* sp. (fam. Deperetellidae), *Lophialetes expeditus* MATTHEW & GRANGER, 1925 and *Schlosseria* sp. (fam. Lophialetidae) (Tarasov, 1968; Nesmeyanov & al., 1977) were discovered.

Remains of *L. expeditus* (fam. Lophialetidae) (Eocene) were also found in five other Kyrgyzian localities: Irdyn-Manga, Ulan-Shire, Khaychin-Ula II, Khaychin-Ula III, and Kholboldji-Nur I (Reshetov, 1979:20-21).

Fossil remains belonging to the Tapiridae family are recorded from three localities only:

– Korotkevich (1967:1074-76) reported on a *Tapirus* sp. cf. *T. arvernensis* DEVÉZE ET BOUILLET, 1827 (recte CROIZET & JOBERT, 1828) third upper deciduous premolar (dp^3) (figured in Korotkevich, 1967:1075) found in 1964 in Middle Pliocene sand-gravel deposits of the Kuchurgan river valley near the village of Novopetrovka (Odessa district, Ukraine);

– poorly-characterized *Tapirus arvernensis* CROIZET & JOBERT, 1828 remains come from Miocene beds near Khutor Khmel'na (Circassia, Ukraine) (Dubrovo & Kapelist, 1979);

– a *Tapirus* sp. cf. *T. arvernensis* mandibular fragment (provided with four teeth) and two other skeletal remains come from the Pliocene levels of the "Kosyakinsky kar'er" ("Kosyakin quarry") (Stavropol' district, Northern Caucasus) without any specimen description (Belyaeva, 1948:83; Vereshchagin, 1954, 1959:52–tab. 3–fig. 25/3) (collections: PIN or ZIN).

More details about ex-USSR (Kazakhstan included) and Mongolian tapiroids are available in Reshetov (1979:12-42) and Dmitrieva & Nesmeyanov (1982).

Finally, tapiroid remains are also extremely rare in Europe, in general. At present, only scarce finds (*T. arvernensis*, *T. priscus* KAUP 1832, *T. balkanicus* SPASSOV & GINSBURG 1999, *Tapiriscus pannonicus* KRETZOÏ 1951) are known from Spain, France, Germany, Austria, Italy, Serbia, Bosnia, Hungary, Slovakia, Romania, and Bulgaria.

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