

**TENISIA GEN. NOV. : TAXONOMIC  
REVALUATION OF THE ASIAN OLIGOCENE  
RHINOCEROTOID *EGGYSODON TURGACUM*  
(BORISSIAK, 1915) (MAMMALIA,  
PERISSODACTYLA, HYRACODONTIDAE)**

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#### SUMMARY

The Asian hyracodont (Rhinoceroidea) described by Borissiak (1915) as *Epiaceratherium turgaicum* and presently known as *Eggysodon turgaicum*, has been the object of a number of taxonomic and nomenclatorial transformations. The new fossil material of this species, discovered in the Tort-Mola locality (Kazakhstan) is a good evidence to create a new genus for it. This study gives the description of the new oligocene genus, *Tenisia* gen. nov. which differs from *Eggysodon*, mainly because of the non-reduced number of incisors and premolars.

KEY WORDS : OLIGOCENE RHINOCEROIDEA, HYRACODONTID TAXONOMY, *EGGYSODON TURGAICUM* (BORISSIAK 1915), *TENISIA* NOV. GEN.

#### RÉSUMÉ

L'hyracodonte d'Asie (Rhinoceroidea) *Eggysodon turgaicum* décrit jadis par Borissiak (1915), sous le nom d'*Epiaceratherium turgaicum* fut l'objet de nombreuses révisions systématiques. Le nouveau matériel fossile de cette espèce, découvert dans l'Oligocène de Tort-Mola au Kazakhstan, montre qu'il s'agit en réalité d'un nouveau genre : *Tenisia* nov. gen. Ce genre décrit ici se distingue d'*Eggysodon* essentiellement par l'absence de réduction du nombre d'incisives et de prémolaires.

MOTS-CLÉS : RHINOCEROIDES OLIGOCÈNES, TAXONOMIE DES HYRACODONTIDES, *EGGYSODON TURGAICUM* (BORISSIAK, 1915), *TENISIA* NOV. GEN.

#### INTRODUCTION

The large Asian hyracodont, presently known as *Eggysodon turgaicum* (Borissiak, 1915) has been the object of a number of taxonomic and nomenclatorial transformations.

In the first description of this Rhinocerotoid from the Oligocene deposits of the Turgai Region, (Ka-

zakhstan), Borissiak (1915), notes the primitive morphology of premolars and molars and the presence of a large canine. The author points out that the Turgaic form differs from all European forms of Oligocene rhinoceroses known at that times. However, it is closer in its order of molarization to the *Epiaceratherium* ABEL, 1910. This gives Borissiak justification to describe the Turgaic form as a *Epiaceratherium*

turgaicum sp. nov. Later on Borissiak (1918) gave his classical description of the species on the basis of an almost complete skeleton of *E. turgaicum*.

Dal Piaz (1930) has established that *E. turgaicum* is not congeneric with the type species of *Epiaceratherium* - *E. bolcensis*. For the same reason Wood (1932) has included *E. turgaicum* in the new genus, *Allacerops*, created by him. Wood has also included in it the European forms characterised with large canines, namely: the mandible described by Rames (1886), as *Aceratherium gaudryi*; the maxilla described by Roman (1912) as *Eggsodon osborni*; and the mandible, called by Stehlin (1930) *Engyodon* sp. for linguistic reasons. Radinsky (1967) shows the attribution of the genus *Allacerops* to Hyracodonts and notes that the only difference between the European and Asian *Allacerops* is the presence of P<sub>1</sub> in the latter one. He notes also that all the European *Allacerops* have two pairs of lower incisors, while the Turgaic one is with an unknown number. Radinsky points out also the lack of clarity in the problems related to the nomenclature and the taxonomy of *Allacerops*. As a result of a revision of the European material of the genera *Ronzothe-rium* AYMARD, 1854 and *Eggsodon* ROMAN, 1910, Brunet (1979) has proved that the type species of the genus *Allacerops*, *A. osborniana* is congeneric with the type species of *Eggsodon*, *E. osborni*. For this reason, according to the rules of zoological nomenclature the name *Eggsodon* ROMAN, which has priority as Brunet notes, should be recognised as valid, while *Allacerops* WOOD remains a junior synonym. In this way the Turgaic form, established by Borissiak in 1915, should also be regarded as a species into the genus *Eggsodon* ROMAN, 1910. A new find of this form (Tort-Mola Locality, Kazakhstan) and the revision of the old ones convincingly speaks for the generic independence of the Turgaic allaceropine hyracodont.

## TAXONOMY

Order PERISSODACTYLA Owen, 1848  
Suborder CERATOMORPHA Wood, 1937  
Superfamily RHINOCEROTOIDEA Owen, 1845  
Family HYRACODONTIDAE Cope, 1879  
Subfamily ALLACEROPINAE Wood, 1932

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*Epiaceratherium*: Borissiak 1915, p. 781; Borissiak 1918, p. 1-62 (Non Abel, 1910).  
*Allacerops* WOOD, 1932, p. 170 (pars).

*Allacerops*: Beliajeva 1954 a, p. 43; 1954 b, p. 198.

*Eggsodon*: Brunet 1979, p. 162. (pars).

*Eggsodon* Heissig 1989, p. 356 (pars).

*Eggsodon*: Prothero & Schoch 1989, p. 535 (pars).

**Etymology** - From "tenis" = sea in Kazakh, in connection with the locality near the lake Chelkar-Tenis, where the type species described comes from.

**Type species** - *Epiaceratherium turgaicum* (BORISSIAK, 1915) (Bulletin de l'Académie Impériale des Sciences, vol. 1, n° 3, p. 781-787, Moscow, 1915).

**Included species** - One species. *Tenisia turgaica* (BORISSIAK, 1915).

**Stratigraphic and Geographic Distribution** - The beginning of the Late Oligocene (former Middle Oligocene) of Central Asia: Kazakhstan, Chelkar-Tenis (Borissiak 1915; Beliajeva 1954 a), Myneske-suyek (Birjukov 1961), Tort-Mola; Mongolia - Tatal-Gol (Beliajeva 1954 b).

**Note**: Data for *Allacerops turgaica* from the Aral sea, Agispe locality (Kazakhstan) (Beliajeva 1954 a), with Late Upper Oligocene - Early Miocene age, are from material (lacteal molar teeth) with problematic determination, so that we do not consider this locality a valid one for the genus.

**Diagnosis** - Very large Allaceropine hyracodont: M 1-3 = 95-110 mm. Premolars and incisors non-reduced in number: Dental formula - I<sub>3</sub> C<sub>1</sub><sup>1</sup> P<sub>4</sub><sup>4</sup> M<sub>3</sub><sup>3</sup>. Incisors spatulated, semiequal in size with a slight decrease from I<sub>1</sub> to I<sub>3</sub>. C<sub>1</sub><sup>1</sup> large. P<sub>1</sub> single rooted, single cusped. The most molarized upper premolar is generally P<sub>2</sub><sup>2</sup> from submolariform to semimolariform. Postcanine diastema - short. Premolar - Molar index (P 1-4 M/ 1-3) = 86%. Manus tridactyla. Tibio - metatarsal index - 46.4 %.

*TENISIA TURGAICA* (BORISSIAK, 1915).

*Epiaceratherium turgaicum* (BORISSIAK, 1915), p. 781-787.

*Epiaceratherium turgaicum*: Borissiak 1918, p. 1-69.

*Allacerops turgaica*: Wood 1932, p. 170.

*Allacerops turgaica*: Beliajeva 1954 a, p. 43, 1954 b, p. 198.

*Allacerops turgaica*: Birjukov 1961, p. 30.

*Allacerops turgaica*: Radinsky 1967, p. 36.

*Eggsodon turgaicus*: Brunet 1979, p. 163.

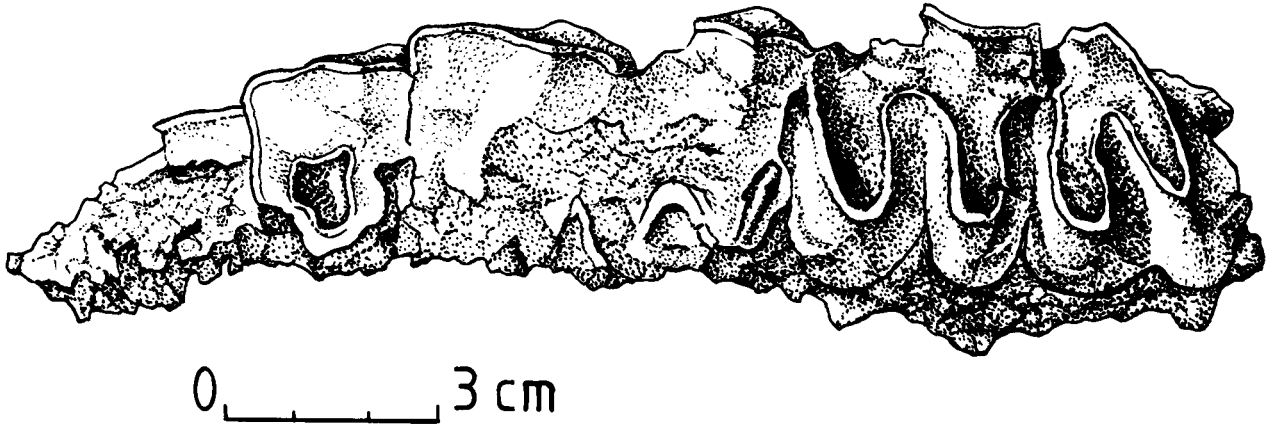


Figure 1 - *Tenisia turgaica* (BORISSIAK, 1915) Fragment of left maxillary with  $P^2 - M^3$  (Coll. : Zool. Inst., Kazakh. Acad. Sci., n° 4-2). Kazakhstan, Turgai Region, Tort-Mola Locality, (Saryinskian svita). *Fragment de maxillaire gauche avec  $P^2 - M^3$* . (Coll. de l'Inst. Zool., Acad. Sci. du Kazakhstan, n° 4-2). Kazakhstan, Région de Turgai, Localité de Tort-Mola, (Série de Saryinskaya).

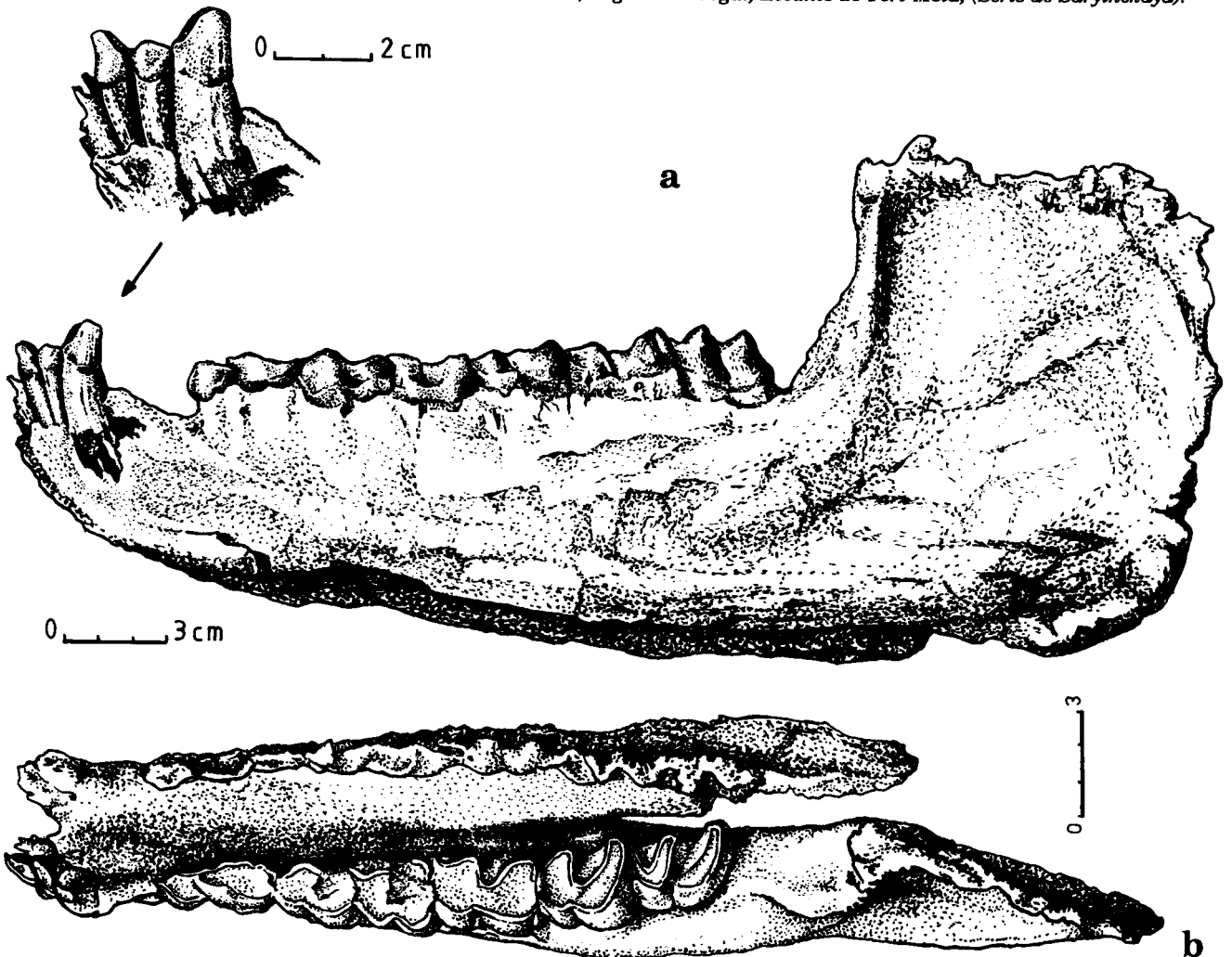


Figure 2 - *Tenisia turgaica* (BORISSIAK, 1915) Incomplete mandible with  $I_1 - M_3$  (Coll. : Zool. Inst., Kazakh. Acad. Sci., n° 4-3). Kazakhstan, Turgai Region, Tort-Mola Locality (Saryinskiansvita). **a** : lateral view (with additional figure of the incisors and left canine). **b** : occlusal view. *Mandibule incomplète avec  $I_1 - M_3$*  (Coll. de l'Inst. Zool., Acad. Sci. du Kazakhstan, n° 4-3). Kazakhstan, Région de Turgai, Localité de Tort-Mola, (Série de Saryinskaya). **a** : vue latéral (avec une figure a part des incisives et de la canine gauche). **b** : vue occlusiale.

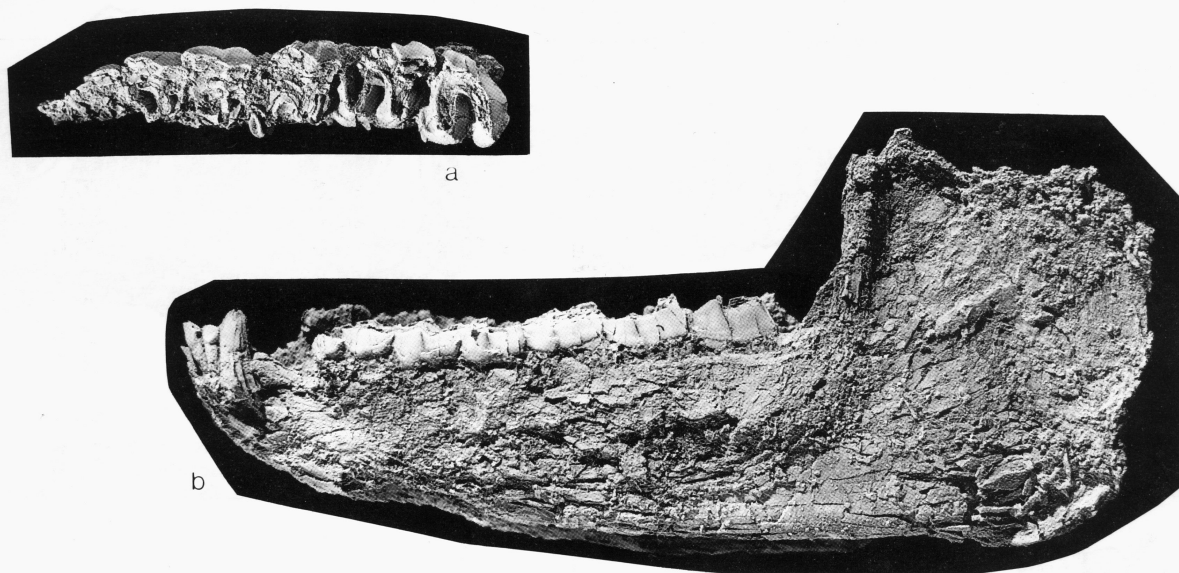


Fig. 3 - *Tenisia turgaica* (BORISSIAK, 1915). a : Fragment of left maxillary with  $P^2$  -  $M^3$  (Coll.: Zool. Inst., Kazakh. Acad. Sci., n° 4-2). Kazakhstan, Turgai Region, Tort-Mola Locality, (Saryinskian svita). Occlusal view (x 0,35). b : Incomplete mandible with  $I_3$  -  $M_3$ . (Coll. : Zool. Inst., Kazakh. Acad. Sci., n° 4-3). Kazakhstan, Turgai Region, Tort-Mola Locality, (Saryinskian svita). Lateral view of the left semimandible (x 0,35). a : fragment de maxillaire gauche avec  $P^2$  -  $M^3$  (Coll. de l'Inst. Zool., Acad. Sci. du Kazakhstan, n° 4-2). Kazakhstan, Région de Turgai, Localité de Tort-Mola, (Série de Saryinskaya). Vue occlusale (x 0,35). b : mandibule incomplète avec  $I_3$  -  $M_3$ . (Coll. de l'Inst. Zool., Acad. Sci. du Kazakhstan, n° 4-3). Kazakhstan, Région de Turgai, Localité de Tort-Mola, (Série de Saryinskaya). Vue latérale de l'hémimandibule gauche (x 0,35).

*Eggsyodon turgaicum* HEISSIG, 1989, p. 356.

**Holotype** - Fragment of the maxilla with  $P^1$  -  $M^3$  and the alveole for  $C^1$  of the lower part of the Upper Oligocene deposits (former Middle Oligocene) of Kazakhstan (lake Chelkar-Tenis, Turgai region), coll. of the Paleontol. Inst. Moscow, No 1401-138 (A. Borissiak 1915, Fig. 1).

**Diagnosis** - Same as for the genus.

**Stratigraphic and geographic distribution** - Same as for the genus.

**Notes on the description** - The detailed description of the species done by Borissiak (1918) has not lost its significance to date. We only offer a description of the new material from Tort-Mola (Kazakhstan), contributing to the diagnosis of the species and giving a reason for the separation of *Tenisia* from *Eggsyodon* as a new genus.

**New material** - Maxilla, represented by a fragment of destruktred left teeth row with  $P^2$  -  $M^3$  and an incomplete poorly preserved mandible with a symphysis and horizontal branches. (Coll. Inst. of Zool. Acad. Sci. Kazakhstan, n° 4 - 2, 3). (Fig. 3, Table 1).

**Locality. Stratigraphic data** - The material described was discovered in 1984 by J. Akynov in the Tort - Mola locality, placed along the right bank of Dulugaly - Dgilanchik River, (Djezkan-gan Region, Kazakhstan), 6 km. to the West from the large Myneske - suyek locality, discovered by V. V. Lavrov and V. S. Kornilova in 1947. The Tort - Mola deposits consist of brown-red clays with green clay embeddings and gravelite interbeds. In the upper part of the exposure the mixed clays are displaced by sandstone interbeds. The total thickness of deposits is 20 m. The lenses with flora and bone remains are confined to the lower part of the exposure. The described material was found out in the brown-red clays layer - 7 m. over the exposure foot. All these series of mixed clays with gravelite interbeds and sandstone is characteristic also for the basic locality Myneske - suyek, and was referred by V.V. Lavrov (1959) to the "indricotherian" svita, overlying the marine clays of the Cheganian svita. Presently, the horizons of the mixed clays and sandstones in the region of Myneske - suyek and Tort - Mola are referred to the Saryinskian Svita of the Eastern Turgai. The faunistic complex of the "Indricotherian" Svita includes : Tsaganomyidae - *Cyclomytus turgaicus* (VINOGRADOV & GAMBARYAN, 1952) (Shevyreva, 1976) ; Cylindrodontidae - *Ardynomys kazachstanicus* (VINOGRADOV &

		Tort-Mola		Chelkar-Tenis			Myneske - suyek
			n	min	x	max	
P <sub>1</sub>	length	14.6	-	-	-	-	-
	width	-	-	-	-	-	-
	2:1	-	-	-	-	-	-
P <sub>2</sub>	length	22.0	3	20.0	21.8	23.5	20.0
	width	14.5	3	12.5	13.5	14.0	11.0
	2:1	65.9	3	56.8	62.3	70.0	55.0
P <sub>3</sub>	length	24.8	4	21.5	22.9	25.0	23.0
	width	20.8	4	16.5	17.0	17.5	16.0
	2:1	83.9	4	70.0	75.0	80.0	70.0
P <sub>4</sub>	length	24.0	5	23.0	24.3	26.5	25.5
	width	21.7	5	17.0	19.1	20.0	19.5
	2:1	90.7	5	70.8	79.2	87.0	76.5
M <sub>1</sub>	length	29.9	6	22.0	29.1	32.5	-
	width	26.4	6	22.0	23.6	25.0	-
	2:1	88.3	6	73.3	82.0	100.0	-
M <sub>2</sub>	length	33.2	4	34.0	34.5	35.0	-
	width	26.3	3	24.5	25.2	25.0	-
	2:1	79.2	3	72.0	77.2	83.3	-
M <sub>3</sub>	length	33.0	5	35.0	36.5	37.5	-
	width	23.8	5	22.0	23.8	24.5	-
	2:1	72.1	5	62.8	68.3	78.0	-
Length P <sub>1-4</sub>		82.3					
Length M <sub>1-3</sub>		96.7					

Table 1 - *Tenisia turgaica* (BORISSIAK, 1915). Sizes and proportions of mandibular teeth from Tort-Mola, coll. Zool. Inst., Kazak. Akad. Sci. n° 4-3, compared with those from Chelkar-Tenis (after Borissiak, 1918) and Myneske - suyek (after Birjukov, 1961). *Tailles et proportions des dents mandibulaires de Tenisia turgaica* (BORISSIAK, 1915) de Tort-Mola, coll. de l'Inst. Zool. Inst., Kazak Akad. Sci. n° 4-3, comparées avec celles provenant de Chelkar-Tenis (d'après Borissiak 1918) et de Myneske - suyek (d'après Birjukov 1961).

GAMBARYAN, 1952); Castoridae - *Agnatocastor aubekerovi* LYCHEV, 1978; Hyaenodontae - *Hyaenodon dubius* FILHOL, 1873; Chalicotheridae - *Schizotherium turgaicum* (BORISSIAK, 1920); Helaeidae - *Colodon orientalis* (BORISSIAK, 1918); Indricotheridae - *Indricotherium transuralicum* (PAVLOV, 1922); Hyracodontidae - *Ardynia kazakhstanensis* (BELIAJEVA, 1952); Amynodontidae - *Cadurcodon kazakademius* (BIRJUKOV, 1961); Entelodontidae - *Entelodon major* (BIRJUKOV, 1961). This complex points to the age of the horizons of Myneske - suyek region corresponding to the "Indricotherian Age" of terrestrial mammals from Central Asia, that is to the Middle Oligocene, according to the former authors (Janshin 1953; Lavrov 1959; Nikiforova 1960), i. e. at the limit of the Early and the Late Oligocene, but most probably at the beginning of the Late Oligo-

cene (bearing in mind the current division of the Oligocene in two parts).

#### Description of the Tort - Mola material.

Maxilla: P<sup>2-4</sup> are represented only by fragmentary tooth crowns. M<sup>1-3</sup> - crowns are preserved, but somewhat deformed. P<sup>3</sup> is submolariform. Molars are with a lingual cingulum. Posterior cingulum of M<sup>3</sup> is present. The M<sup>3</sup> metastyle is absent. The mandible is with preserved left teeth row. The diastema is relatively short and cannot be measured due to some deformation of the mandibular symphysis. Dental formula: I<sub>3</sub>; C<sub>1</sub>; P<sub>4</sub>; M<sub>3</sub>. Anterior teeth are represented by the root of I<sub>1</sub>, part of the crown of I<sub>2</sub> and I<sub>3</sub>, which is completely preserved as well as the canine. Judging by the preserved incisors, their crowns are of spatulate form. Incisors tops are worn out, but the pattern

of the fragmentary crown of  $I_2$  allows the assumption that the median part of the unworn incisor tops in the discussed form is somewhat above their marginal parts of the upper edge. Judging by the size of roots, the incisors are approximately the same form and sizes, but a slight decrease from  $I_1$  to  $I_3$  occurs. Maximum width of crown of  $I_3$  is 11.2 mm, antero-posterior diameter - 7.7 mm.

**Canine** : relatively massive, conical, with big root. The crown is somewhat elongated antero-posteriorly, with a diameter of 12 mm.

$P_1$  - single rooted, with an elongated antero-posteriorly crown. The crown has one median elevated conus. The Cingulum is slightly marked in the posterior part of the external wall.

**Note** : this tooth we consider as  $P_1$  not  $dP_1$  (in any case it is a tooth of the definitive dentition) as in all known adult jaws of the species deep alveoles for it are present in the dentition.

$P_2$  - considerably larger than  $P_1$ , with two roots. The trigonid is shorter than the talonid. The lateral cingulum in the hypolophid is marked.

$P_3$  - Tooth much larger than  $P_2$ . Noticeable division into trigonid and talonid. Lateral cingulum is clearly marked.

$P_4$  - Considerably molarized in comparison with the previous teeth. The lateral cingulum is relatively well marked. Distinct division into trigonid and wide talonid.

Molars are larger than premolars and moreover,  $M_2$  is the largest. The median groove on the external wall of molars is well marked. Talonids are large. The lateral cingulums are slightly marked. Meta- and entoconid parts of teeth are high.

**Discussion** - In its morphology the described material from Tort - Mola fully corresponds to the Turgiac species, described by Borissiak (1915, 1918) from Chelkar - Tennis and obviously belongs to it. So far, the number of incisors of the taxon described by Borissiak (1918) (on incomplete symphysis) expressed the supposition of the existence of only one pair of lower incisors. For this reason Beliajeva (1954 b) has placed one pair of lower incisors in the diagnosis of the Turgaic "allacerops". The new find from Tort - Mola shows however, that these incisors are in fact three pairs.

Borsuk-Bialynicka (1968) describes a new species *Allacerops minor* from Ulan - Ganda (Late Oligocene of Mongolia), raising into the status of spe-

cies the subspecies *A. turgaica minor*, described by Beliajeva from Tatal - Gol (Mongolia).

Recently, Dashzeveg (1991) maintains those generic and specific names for the material described from Ulan - Ganda, and moreover is placing Allaceropinae, for no clear reasons, in the Rhinocerotidae as it was the case with the earliest authors. The attribution of "*A. minor*" from Ulan - Ganda to *Tenisia* is doubtful due to the fragmentary nature of the material. Dashzeveg (1991) describes other remains from the Lower Oligocene of Mongolia (Khoer-Dzan Locality) under the name *Allacerops* sp. However, the scant remains do not allow the positive claim on its specific and generic attribution. All reliable remains of the Asiatic "*Allacerops*" in their morphology and dimensional variations are within the limits of individual variability (also see Tabl. 1). This is why a justification appears now to accept the existence of only one species - *Tenisia turgaica* (BORISSIAK, 1915) in the genus. The existing fossil material is insufficient for judgement of the taxonomic value of those described by Beliajeva (1954 b) subspecies.

#### **TENISIA GEN. NOV. : DIFFERENCES AND RELATIONSHIP WITH RELATED GENERA**

As we separate *Tenisia* gen. nov. from *Eggysodon* ROMAN the comparison of the two genera is particularly important. It would also be to the point to analyse the position of *Tenisia* gen. nov. within the system of Non-amynodont Rhinocerotoids.

The presence of large canines and non-differentiated in form, spatulate incisors definitely places *Tenisia* gen. nov. in the Hyracodontidae. At present that family includes three subfamilies (Prothero & Schoch 1989). The large canines differentiate the described form from the majority of Hyracodonts, united (Prothero & Schoch 1989) in the subfamily Hyracodontinae COPE.

Incisors (spatulated, without gaps between them) differentiate categorically *Tenisia* gen. nov. from *Forstercooperia* WOOD (Indricotheriinae) and yet *Forstercooperia* obviously has a tetradactyl manus (Heissig 1989a). The latest one could only formally be compared to the genus described by us to the extent it is similar in size and has as large canines. In fact Indricotheres, placed traditionally after Radinsky (1967) in a subfamily of Hyracodontidae should according to some recent views be raised again to the rank of family (Heissig 1989a ; Spassov 1989). It appears that their

ancestor *Forstercooperia* should not be included in it (Spassov 1989).

The large size of the canines, considerably exceeding those of the spatulate incisors, places *Tenisia* gen. nov. (as well as *Eggysodon*) in the subfamily Allaceropinae Wood, which unites (Heissig 1989b) Hyracodontids with such features.

Allaceropinae have a reduced number of incisors (Heissig 1989 b). *Tenisia* gen. nov. is the only Allaceropinae hyracodont with a non-reduced number of incisors in the mandible. In *Ilianodon* CHOW & XU the exact number of incisors is unknown but probably reduced. *Tenisia* differs from the Eocene *Ilianodon* by considerably broader molars. *Ilianodon* has controversial premolar diagnosis: without P<sub>1</sub> after the original description, or with two-rooted P<sub>1</sub> after Heissig (1989 b). In both cases it differs from *Tenisia*. In the non-reduced incisors and in its single rooted P<sub>1</sub>, as well as in its large size *Tenisia* differs from the Eocene Allaceropine hyracodont *Prohyracodon* KOCH.

*Tenisia* gen. nov. differs from the European Oligocene *Eggysodon* ROMAN in the non-reduced number of incisors and premolars (2 lower incisors, and absence of P<sub>1</sub>) in *Eggysodon*.

**Discussion and conclusions** - The similarity in the morphology, in the temporal range and in dimensions have been the reason so far, for the Turgaic Allaceropine Hyracodont, described by Borissiak (1915) to be included in one and the same genus with European *Eggysodon*. This point of view was particularly due to the fact that so far the number of incisors in the mandible of the Asiatic form was not known. The difference known so far between European *Eggysodon* and the Turgaic form amounted only to the presence or absence of P<sub>1</sub>. However this feature by itself does not have a great taxonomic value. It is known that in many mammals the tendency towards reduction of P<sub>1</sub> (i.e. the absence of this tooth) may be manifested in the framework of intraspecific variability. The number and form of the incisors is however a much more stable one. The morphology of the rostral teeth reflects to a greater extent the morpho-functional aspect of feeding, in particular in Ceratomorphs. For this reason the number of incisors is in the case a feature with serious taxonomic significance. If to the differences in the numbers of incisors between European *Eggysodon* and the Turgaic *Eggysodon*, we add the difference in the numbers of premolars in the definitive dentition (in all known mandibulae of the Turgaic species they are four,

while in the known adult European specimens the first Pm is absent), we find sufficient morphological considerations to separate the Turgaic form from *Eggysodon* and to create a new genus *Tenisia* gen. nov. for the Asian form.

In spite of its late Oligocene age *Tenisia turgaica* has the most plesiomorphic rostral dentition between Allaceropinae and with its non-reduced incisors this taxon differs from all remaining representatives of the subfamily.

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