UPPER CRETACEOUS BUGEEN TSAV, DJADOKHTA FORMATIONS OF MONGOLIA

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Introduction

Upper Cretaceous Bugeen tsav and Djadokhta formations of Mongolia including remarks on previous understandings are discussed and their diagnosis refined. Stratigraphical collumnar sections of type and references localizes and lists of fossils are given. It is shown that two upper cretaceous formations represent different lithological and faunistic units.The only dinosaur and other reptiles genera known to be common to upper cretaceous deposits of Asia and North America are Tyrannosauridae (Tyrannosaurus and Tarbosaurus). Ornithomimidae (Ornithomimus, Gallimimus), Camarosauridae(Sauropods) and Turtles (Trionichidae) several dinosaur and other reptiles families are endemic to Asia and North America.

The stratigraphy of upper Cretaceous rocks of the south Eastern parts of Mongolia was first discussed in Geological and Palaeontological literature in a note by Charles P.Berkey (Granger & Gregory,1923) more detailed results of stratigraphic studies accomplished by members of the Polish-Mongolian Paleontological Expeditions (Lefeld, R.Gradzinsky, Jerzikevicz 1971-1977). The most important excavations were made South Mongolia and important papers on the stratigraphy of the upper cretaceous beds resulted ((I.A.Efremov.1954.1955, Rozhdestvensky 1975, 1965, 1971, 1974;) Maleev 1952, 1955, 1956).

Members of the Polish–Mongolian Paleontological Expedition between 1963-1965 and 1970-1971 also explored parts of southern Mongolia. Geological results of expedition were discussed mainly by Gradzinsky et, al 1969, 1970, Gradzinsky Jerzykiewicz 1972, 1974, kielan Jaworowska1974a.1975a.1975c.Lefeld 1965, 1971 and Maryanska & Osmolska 1974, 1975.

The Soviet–Mongolian Paleontological expedition has began to work in Mongolia from south to North, and east to west completely explored by intervals on stratigraphy for cambrian-to Neogenian periods as whole Kramarenko, 1974,Beliaeva1974,Rozhdestven sky1979, Barsbold (1972,1983), Perle (1979,

1981,1982,1993,2005).general essys of the stra tigraphy of Mongolian upper cretaceous deposits were have been provided by Marinov 1957, Vasiliev 1959, Martinson 1975, Barsbold(1981,1983).Still now some problems we have discussed about stratigraphical units and formation of the upper cretaceous deposits and refined the diagnoses of two important rock units Bugeen tsav formation and of

Djadochta formation presented lists of life assemblages (faunal characteristics) Bugeen tsav formation lithology. Dominant lithology is poorly cemented, fine grained arkosic sandstone of reddish -- orange to brick orange fossil – bearing layer 15-20 cm. thin clay strata in the uppermost section of profile we have usually search.

Historical background

The Bugeen tsav formation was established in the early 1960 by paleontologists from Russian Academy of sciences at the locality of Bugeen tsav by P.K. Tchudinov and. B.A. Trofimov and by Mongolian Geographer O.Namnandorzh in1964.who made the first paleontological excavation for the skeletons of the gigantic carnivorous dinosaur Tarbosaurus bataar in last years the soviet–mongolian paleontologists have been recovered as topotype of Tarbosaurus bataar in 1987,1989.

Fossils

The complete lists of fossils described from the formation discussed (Djadokhta and Bugeen tsav) as well as from the upper Cretaceous beds of the almost the some region from the bed of Bayan dzak (Djadokhta), Gurileen tsav, Bugeen tsav are given in tables 1 – 3.

Invertebrates from the Bugeen tsav and Djadokhta formations of upper Cretaceous localities

Table I

Ostracodes	
Gobiocypris tugri[illegible]sis khand	Djadokhta
Iliocypris poste[illegible]s khand	Djadokhta
limnocythere [illegible]la [illegible]urensis khand	Bugeen tsav
Mongolianell[illegible] c[illegible]spidigera Stankevitch	Bugeen tsav
Cypridea bif[illegible]rmata biformata Szczehura, Blaszyk	Bugeen tsav
Gastropod[illegible]	
Mesolanit[illegible]s efremovi martinson	Bugeen tsav
Mesolanit[illegible]es bayanchongoriensis Barsbold	Bugeen tsav
Buginell[illegible] buginica Barsbold –	Bugeen tsav
Bugine[illegible]la autochtonica Barsbold –	Bugeen tsav
Pseud[illegible]bhyria kozlovi Barsbold	Bugeen tsav

The probably biostratigraphic equivalensy of these beds, withing those of the D[illegible]adokhta, Bugeen tsav formations are discussed below.

Diverse invertebrates (dinosaurs and Mammals excluded)from the Bugeen tsav,Djadokhta and Gurileen Tsav birds

Table II

Gobipteryx minuta Elzanowski	Khulsan
Crocodiles	
Shamosuchus djadokhtaensis mook Bayan Dzak	Djadokhta
Gobiosuchus Kielane Bayan dzak	Djadokhta
Paralligator ancostraeis Konzucova	Bugeen tsav
Turtles	
Zangerlia testudinimorpha Mlinarsky	Bugeen Tsav
Mongoloemys elegans khozatzky and Mlinarsky	Bugeen tsav
Trionyx sp Mlinarsky at Narmandakh	Bugeen tsav
Neurankyleus sp.Mlinarsky and Narmandakh	Bugeen tsav
Neurankyleus sp. Narmandakh	Bugeen Tsav

It should be note that the vertebrates are reoresented by different species assemblages in three formations expect deltatheridium represented (Buseen tsav, Gurileen tsav and Djadokhta) no other species yet described has been found in common between any two formations.

Mammals and dinosaurs from the Bugeen tsav, Gurileen tsav and Djadokhta formations described by Barsbold 1974, 1976 Borsuk – Bielynicka , 1977, Gilmore, 1933 Kielan Jaworowska (1969, 1974, 1975, 1975 a, b, c) Mammals

Table III

Gobibaatar parvus Kaelan Jaworowska	Djadokhta
Bulganbaatar kuczynskii Kielen Jaworowska	Djadokhta
Deltatheridium pretrituberculare tardum kielan Jaworowska	Buqeen tsav
Dinosaurs	
Velociraptor mongoliensis Osborn	Djadokhta
Saurornithoides barsbold Osborn	Bugeen tsav, Djadokhta
Oviraptor philoceratops Osborn	Bugeen tsav Djadokta
Sauropoda Opisthocoelicaudia Borsuk, Bialnicka tsav	Bugeen tsav, Gurileen
Protoceratops andrewsi Granges & Gregory	Djadokhta
Pinacosaurus grangery , Gilmore	Djadokhta, Bugeen tsav
Tarbosaurus bataar Mallev tsav	Bugeen tsav,Gurileen
Saurolophus anguistirostris Rozhtestvensky tsav	Bugeen tsav, Gurileen
Dyoplosaurus giganteus Maleev tsav	Bugeen tsav, Gurileen

On the basis of the fossil content it seems completely justified to regard the beds of Bugeen tsav and Gurileen tsav as biostratigraphic equivalent of the Nemegt formation. The data on the vertebrate assemblages of the beds at Bugeen tsav are from preliminary information provided by Tchudinov 1966.

Relationship of Djadokhta formation and Bugeen tsav formation

No physical contact between the Djadokhta and Bugeen tsav formation has yet been discovered, comparative studies of dinosaurs suggest that the Bugeen tsav formation is probably older Lance formation of North America1 Rozhdestvensky 1971, 1974, Barsbold 1983 and as an approximation may embrace not only lower maestrichtian but also the upper parts of campanian stage.The Bugeen tsav formation is probably an equivalent of the early maestrichtian stage, then Djadokhta formation may be older then that Bugeen stav formation, where fossil – bearing

cretaceous rock are interbeded with coniacian – santanian strata, Thus it is possible, but far from proven that the Djadokhta formation embraces the lower part of the campanian stage. In summer 2005 year the British exploration society expedition and biologist from National University of Mongolia we have organized cooperative field work and in short time provided recognizance route at fossil – bearing layers deposits because of Bugeen tsav locality and we have been excavated some fragments of skeletons of the sauropod dinosaur (almost complete 8 ribs of 2m. in length, most probably these ribs of sauropod related to the opisthocoelicaudia sp. and Gigantic flesh – eating dinosaur – Tarbosaurus Hind limb fossill bones including the Tibia, fibulia and metatharsalia and pes. Also the British exploration society expedition at Bugeen tsav locality we have discovered several limnic faun such as Gastropods and bivalvia - like a Buginella bugin ca some other limnic faun – Ostracodes – as the Cypridae the all field collections of the British exploration society expedition now housed at the Biological Department of National University of Mongolia and we just have beginning the preparations.

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МОНГОЛЫН МЕЗОПРОТЕРОЗОЙ, НЕОПРОТЕРОЗОЙН ХУРДСААС ЦУГЛУУЛСАН МИКРОФИТОЛИТ, СТРОМАТОЛИТЫН ТУХАЙ ТОЙМ

Н.ГАНБАТ

НоваГоулд ХХК

Товч агуулга

Манай орны нутагт прокембрийн настай тунамал хурдас ихээхэн тархалттай.Уг хурдсуудын байршилт,бүтцийг судлах,тэдгээрийн стратиграфын ангиллыг зохиох ажил манай оронд Монгол-Зөвлөлтийн хамтарсан геологийн экспедицийн хуучин нэрээр үйл ажиллагаа идэвхтэй явагдаж байсан.

1970-1980 оны үед эрчимжиж,одоогоор бараг зогсолтын байдалд ороод байна.Энэ хугацаанд судалгааны нэгэн гол аргачлал нь биостратиграфын арга байлаа.Энэ аргаар прокембрийн нас нь найдвартай тогтоогдоогүй хурдас чулуулгаас эртний замаг,бичил ургамлын чулуужсан үлдэгдэл (микрофитолит,строматолит болон микрофоссилууд)-ийг системтэй судалж Монголын кембрийн өмнөх хурдасын насыг тодорхойлох,улмаар бүс нутгийн стратиграфын ангилал зохиох талаар нилээд ажил хийж зохих үр дүнд хүрсэн