

## Geology of the Trans-Altai Gobi, SW Mongolia

(1 fig.)

P. HANŽL<sup>1</sup> – J. OTAVA<sup>1</sup> – M. REJCHRT<sup>2</sup> – D. NARANBAATAR<sup>3</sup> – J. COGGEREL<sup>3</sup> –  
B. BAYANJARGAL<sup>3</sup> – O. LEXA<sup>4</sup> – M. ČERNÝ<sup>5</sup>

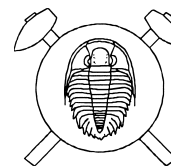
<sup>1</sup> Czech Geological Survey, Leitnerova 22, 658 69 Brno, Czech Republic, hanzl@cgu.cz

<sup>2</sup> Czech Geological Survey, Klárov 3, 118 21 Praha, Czech Republic, rejchrt@cgu.cz

<sup>3</sup> Bureau of Geological Investigation, PO Box 37/318, Ulaanbaatar, Mongolia, gobicz@maginet.mn

<sup>4</sup> Institute of Petrology and Structural Geology, Faculty of Science, Charles University, 128 43 Prague, Czech Republic, lexa@natur.cuni.cz

<sup>5</sup> Geomin, Znojemská 78, 586 56 Jihlava, Czech Republic, geomin@geomin.cz



Geological survey of the western part of the Gobi Desert was carried out in years 1999–2002 within the framework of the International Development and Assistance Programme of the Czech Republic. The area of interest has been limited by latitude 44°N, longitude 99°E and by the national boundary between Mongolia and China. The geologically very little known area is formed of Palaeozoic volcanisedimentary and magmatic complexes locally covered by Mesozoic and Cenozoic sediments in the zone of junction and termination of the Tien-Shan and Altai orogenic belts.

Three main Palaeozoic geological megaunits (terranes) have been distinguished here from N to S: Edrengyin Nuruu (EN), Trans-Altai zone (TA) and Gobi Tien-Shan (GTS) in accordance with Ruzhencev and Pospelov (1992). According to the lithostratigraphic sequences (Fig. 1), these units represent complex Silurian (?)–Devonian and Carboniferous basin/volcanic arc systems between the Tarim block/North China craton in the South and the Siberian craton in the North and are separated by important suture zones.

The suture between the GTS and TA is masked and reactivated by the E-W trending Gobi Tien Shan fault system described by Cunningham et al. (1996) as a Cenozoic left-lateral strike-slip fault. The suture between TA and EN is marked by a NW-SE trending structure with the ophiolitic mélangé. Closing of this suture is followed by intrusion of the Trans-Altai intrusive complex of Lower (?)–Middle Carboniferous age which is common for all the terranes. The suture was reactivated in the latest stages of the Variscan tectonic activity and it could be interpreted as a dextral shear zone according to Landsat imagery. This Trans-Altai shear zone resembles a shear zone described by Allen et al. (1992) from the Northern Tien Shan in the NW China.

Variscan orogeny in the Trans-Altai Gobi was accompanied by immense magmatic activity. The huge syn- to late-orogenic Gobi Tien Shan batholith of Upper Devonian–Lower Carboniferous age is confined only to GTS. It is a composite, cordilleran I-type like batholith. The Lower Carboniferous Bayanayrag Massif exposed only in EN largely corresponds to an M-type granite. The Trans-Altai intrusive complex comprises simple granite–gran-

odiorite plutons of I-type affinity. Post orogenic, Upper Carboniferous–Permian intrusive rocks of alkaline affinity are scattered in small bodies through the whole area. Subvolcanic granite – rhyolite bodies form the Cagaan Bogd intrusive complex and balloon like plutons of the Ikh Bayanulin complex are exposed along the suture separating EN and TA zones.

The Palaeozoic rocks of the Trans-Altai Gobi are covered by Mesozoic and Cenozoic sediments. While the Upper Triassic–Lower Jurassic are folded and Jurassic–

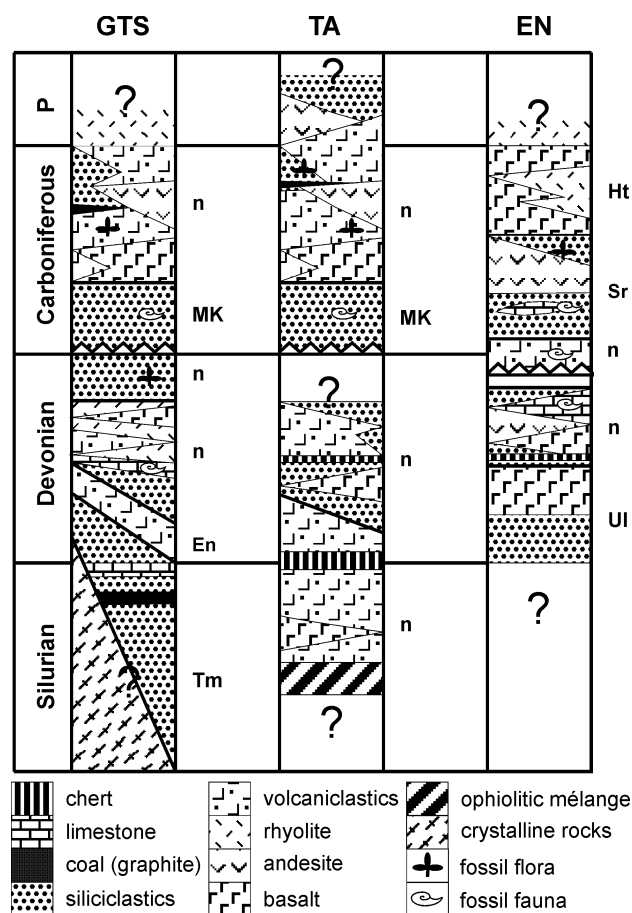


Fig. 1

Lower Cretaceous sediments are slightly declined only, those of Upper Cretaceous and Cenozoic age are subhorizontally bedded. Recent geological structure of the Trans-Altai Gobi is strongly affected by Cenozoic faults related to the lateral displacements of the crust caused by subduction of the Indian Subcontinent beneath Eurasia (Tapponier – Molnar, 1979).

*Acknowledgments.* This study is a part of the project “Geological and geochemical mapping of Trans-Altai Gobi” prepared by Geomin Co., Jihlava in cooperation with Mineral Resources Authority of Mongolia within the framework of the International Development and Assistance Project of the Czech Republic. We are grateful to our colleagues from the Geomin Jihlava, Czech Geological Survey, Charles University Prague, Mongolian Geological Survey, Mongolian Academy of Science and Mongolian Technical University who helped us with the field work as well as with the processing of data. This work

would not be possible without assistance of many individuals who provided support for the field work. Here we especially thank to J. G. Holák.

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