Neoproterozoic accretion along the southeastern margin of the Eastern Dharwar Craton, India: Evidence from zircon U-Pb ages and their Hf isotopic composition

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Late Mesoproterozoic high-grade tectonothermal event due to collision of the Eastern Ghats Belt [1] with the Eastern Dharwar-Bastar Cratons, is not recorded by the Paleoproterozoic Krishna Province rocks [2] south of the Godavari graben [3]. The Vinjamuru domain represents Paleoproterozoic metaigneous rocks of a continental arc accreted to the margin of the Eastern Dharwar Craton [4] and coeval with the UHT granulite-facies event in the easternmost Ongole domain [2]. Here, we report zircon isotopic data from one critical amphibolite-facies metaandesite sample (VL47) from the central Vinjamuru domain.

The U-Pb zircon ages in this metavolcanic rock record a protracted polycyclic evolutionary history (Fig.1). Derivation of youngest zircons from crustal melts are seen in their negative $\varepsilon_{Hf\,(t)}$ values at two clusters: 907-1111 Ma ($\varepsilon_{Hf\,(t)}$ = -5 to -7) and 696-810 Ma ($\varepsilon_{Hf\,(t)}$ = -21 to -9).The most likely interpretation of our data is that the Vinjamuru domain rocks also record latest Neoproterozoic accretion (and coeval metamorphism) of the Ongole domain to the Vinjamuru domain, supporting one interpretation of this Eastern Ghats-craton collision at 820 Ma [5].

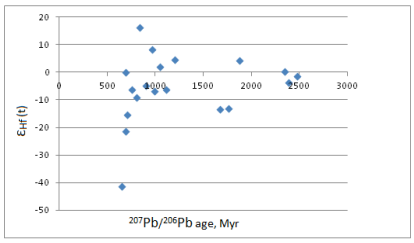

Fig.1. Zircon age vs $\varepsilon_{Hf\,(t)}$ from metaandesite sample VL47

[1] Bose *et al.* , (2011) *GSA Bull* **123**, 2013-2049. [2] Dobmeier and Raith (2003) *Geol Soc Lond Spl Pub* **206**, 145-168. [3] Mezger and Cosca, (1999) *Precamb Res* **94**, 251-271; [4] Ravikant *et al.* ((2012), *Geol J* doi: 10.1002/gj.2441. [5] Okudaira *et al.* *Geol Mag* **138**, 495-498.

Role of *Bacillus mucilaginosus* at silicon biogeochemical cycle in a system "soil – plant"

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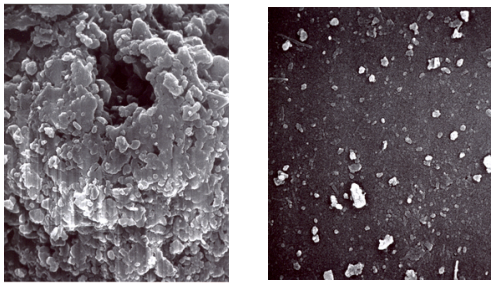
Silicate bacteria *Bacillus mucilaginosus* B-1574 were studied at four steps. First we demonstrated direct evidences that this strain has geochemical activity and is able to leach *Si* and *P* from the object of lithosphere - phosphoric ore of Djeroi mining in Uzbekistan, %: P_2O_5-13,6; CaO-44,75; MgO-1,05; CO_2-20,88; Fe_2O_3-3,03; SiO_2-2,7; C_{org}-0,11 (Fig.1, Table 1).



Bacteria of natural biocenosis from Tomsk grey forest soil

Bacteria Bacillus mucilaginosus strain B-1574

Figure 1: SEM-photos of fragments of a surface of rock particles after 30-days incubation with bacteria, x5000

Days	N bacteria, $x10^8$, cell/ml	SiO_2, mg/l		$(PO_4)^{2-}$, mg/l	
		Treatment	Control	Treatment	Control
5	0,00021	5,62	4,75	0,07	0,05
10	0,05	6,62	5,25	0,19	0,06
30	1,25	20,0	6,38	0,32	0,09

Table 1: Transfer of silicon and phosphorus into a solution

Then we revealed in a liquid culture of this strain significant amounts of organic and ketoacids, polysaccharides, IAA, three individual cytokinins. At the third step we made experiments with mineral "Vermiculite" as a model of secondary alumosilicates. 60 elements were detected in a supernatant by ICP-MS after 50-days incubation with bacteria. Control/Treatment, mg/ml: Mg-84/388; Al- 0.078/2500; Si-26/98; Ca-122/238; Cr-0.054/0.250; Mn- 0.085/3.41; Fe-1.61/36.4; Co-0.015/0.056; Cu- 0.12/0.17; Zn- 0.061/0.390; Mo-0.020/0.031. Then we measured mono-, polysilicic acids and Si-organic compounds in grey forest soil, urbozem and in plants. In both soils we grew *Triticum aestivum* L., *Cucumis sativus* L.: soil polysilicic acids after bacteria activity are the source of plant biolites.

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