

Euoplanet TNA Report

PROJECT LEADER

Name: Jozef Kazmierczak (personal TNA No. 037-TNA3)
Address: Institute of Paleobiology, Polish Academy of Sciences, Warsaw, Poland
E-mail: jkaz@twarda.pan.pl

COLLABORATORS

Name:	Affiliation:
Barbara Kremer	Institute of Paleobiology ,Polish Academy of Sciences
	kremer@twarda.pan.pl
Date of TNA visit:	23-28 May 2011
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Host laboratory:	Dr. Ian Franchi
Reimbursed	Yes/ No

Project Title – NanoSIMS investigations of mineral-carbonaceous structures from Archaean stromatolites (2,7 Ga Ventersdorp Supergroup, South Africa)

Scientific Report Summary.

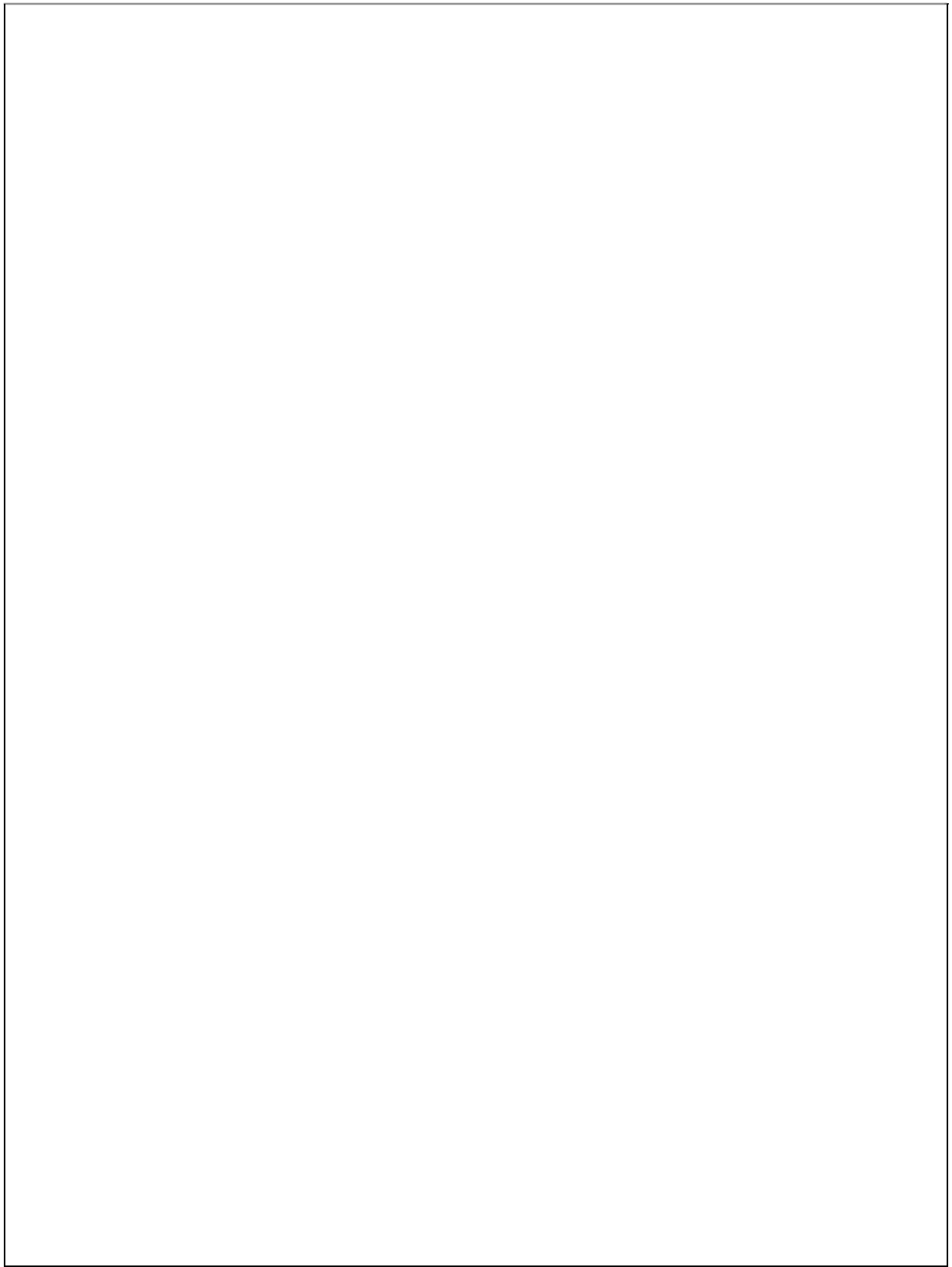
(plain text, no figures, maximum 250 words, to be included in database)

The purpose of the project was an in-depth study of micro-morphology, nanostructure and elemental composition of morphologically preserved Late Archaean biomorphic structures from c. 2.7 Ga-old silicified stromatolites of the Ventersdorp Supergroup (Transvaal , South Africa). We analyzed with the NanoSIMS mineralized filamentous structures of probable biological origin. To proof their biogenicity ten individual mappings have been performed. We mapped the distribution of crucial 'vital' elements like carbon, nitrogen, sulfur, and, additionally, Si, Mg, Al, K and Fe critical to understand the mineralization process of the filaments . The spatial distribution of these elements within the studied structures was proved as highly ordered. The NanoSIMS chemical mapping helped also in recognition of minerals (by recognition of elemental composition) that precipitated within and on the organic filamentous structures. The performed analyses showed that the studied structures are most likely mineralized remnants of filamentous microorganisms comparable to some modern and fossil algae. A separate problem is the biological affinity of the studied filaments. The evaluation of the NanoSIMS data obtained during our visit in the Open University, and other analyses that will be performed in the next few weeks, are expected to clarify whether these structures represent mineralized remnants of prokaryotic or eukaryotic organisms. The usage of NanoSIMS helped to solve the basic scientific tasks of

our project.

Full Scientific Report on the outcome of your TNA visit

Approx. 1 page



Please include:

- Publications arising/planned (include conference abstracts etc)

- Host approval The host is required to approve the report agreeing it is an accurate account of the research performed.