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2008 : August - Fast Breaking Papers : M. Santosh

## FAST BREAKING PAPERS - 2008

**August 2008**


**M. Santosh talks with *ScienceWatch.com* and answers a few questions about this month's Fast Breaking Paper in the field of Geosciences. The author has also sent along images of their work.**



**Article Title: Discovery of sapphirine-bearing Mg-Al granulites in the North China Craton: Implications for paleoproterozoic ultrahigh temperature metamorphism**

Authors: Santosh, M;Tsunogae, T;Li, JH;Liu, SJ

Journal: GONDWANA RES

Volume: 11

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Year: APR 2007

\* Kochi Univ, Fac Sci, Dept Nat Environm Sci, Akebono Cho 2-5-1, Kochi 7808520, Japan.

(addresses have been truncated)

### SW: Why do you think your paper is highly cited?

Possibly because it presents a new discovery in a thrust area field study of global interest. This is the first time that rocks metamorphosed at extreme temperatures of around 1,000 degrees Celsius in the Earth's crust, and, characterized by certain diagnostic mineral assemblages, are being reported from the North China Craton. The paper has wider implications within the plate tectonic framework in understanding the evolution of the Earth.

### SW: Would you summarize the significance of your paper in layman's terms?

The North China Craton, from where the new discovery is reported in this paper, is a part of the fundamental Precambrian nucleus of Asia and is also a fragment of a supercontinent (large continental mass) termed "Columbia" that existed around two billion years ago on the surface of the globe. The time of the formation of Columbia marks several important changes in the Earth's history and include the surface environment, as well the evolution of primitive life.

This paper presents the discovery of a special type of high-grade metamorphic rocks from the northern margin of the North China Craton, within the Inner Mongolia region, carrying mineral assemblages diagnostic of formation under extreme thermal conditions associated with the collisional amalgamation of the North China Craton within the Columbia supercontinent. The results have important implications for the tectonics of the North China Craton, the history of the evolution of continents within the Precambrian

Figure 1: [+ details](#)



Figure 2:

nucleus of Asia, as well as in understanding the history of the two-billion-year-old supercontinent Columbia.

**SW: How did you become involved in this research, and were there any problems along the way?**

I was invited to participate in a symposium held in Beijing a few years ago, when I had an opportunity to collaborate with my counterparts in China and, during the course of routine studies related to my fields of specialty, I came across these spectacular rocks which had not been reported before from this region of the world.

I had previous experience studying similar rocks from much younger terranes belonging to the 550-million-year-old "Gondwana" supercontinent and recognized the importance of the discovery from the North China Craton in tracing the much older geological history of the Earth. We obtained quite interesting analytical results and decided to publish these findings in *Gondwana Research*, which is the flagship journal for research related to the evolution of continents and supercontinents.

**SW: Where do you see your research leading in the future?**

We consider this discovery to be just the tip of the iceberg. There is much more to be discovered, and if similar findings can be revealed all along the northern margin of the North China Craton, as well as in other crustal fragments attached to the supercontinent Columbia, it would lead to interesting models on the assembly of supercontinents in the past, and would also revolutionize the existing concepts and models on the tectonic history of the North China Craton.

Eventually, these would contribute to the growing interest on the dynamics of the solid Earth with regard to plate, plume, and anti-plate tectonics in increasing our understanding of global material circulation on a whole-Earth scale in relation to processes from the mantle to the surface of the Earth, including the environment.

**SW: Do you foresee any social or political implications for your research?**

This finding has already triggered considerable enthusiasm and interest throughout the global community, and has also paved the way for the initiation of several new research projects in China in related fields. We hope that this would generate better facilities, enhanced research levels, and the increased participation of student communities and researchers, increasing research and job opportunities, wider international collaborations, all ultimately contributing to the enhancement of knowledge for the benefit of human society.

**M. Santosh, Ph.D., D.Sc.**

**Professor**

**Department of Natural Environmental Science**

**Faculty of Science**

**Kochi University**

**Kochi, Japan**

Keywords: north china craton, diagnostic mineral assemblages, plate tectonic framework, precambrian nucleus of asia, two-billion-year-old supercontinent columbia, high-grade metamorphic rocks, inner mongolia region, mineral assemblages



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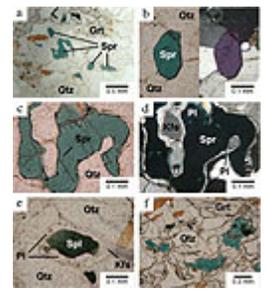


Figure 3:

