



Daitari Greenstone Belt

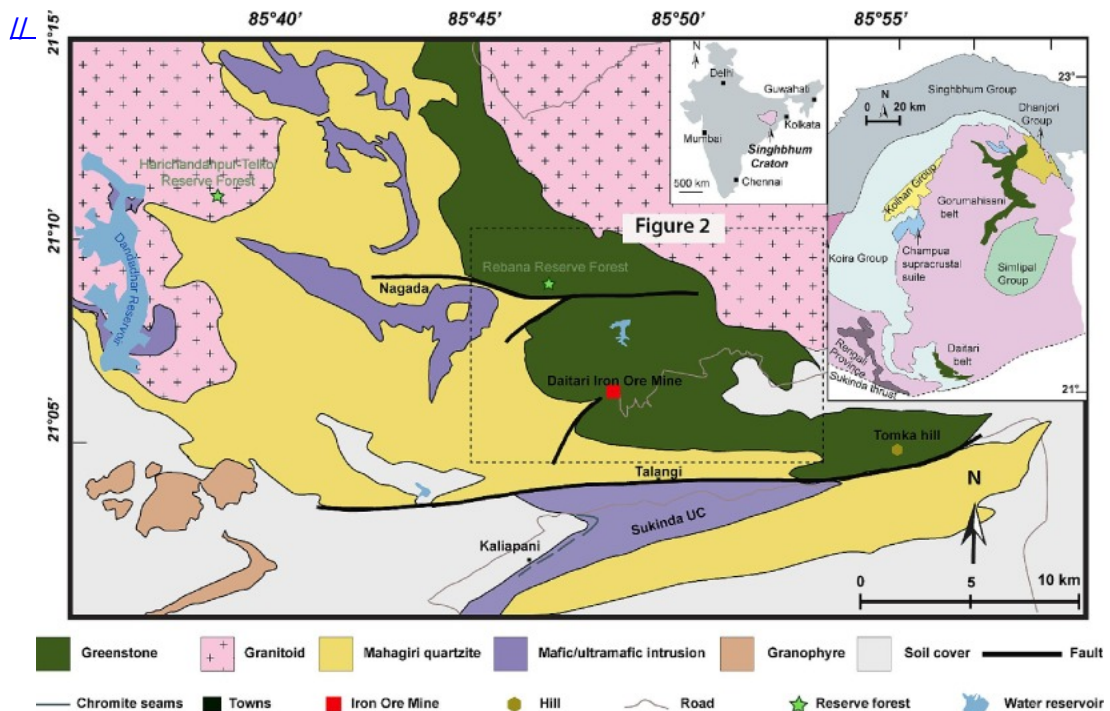
Why In News?

A recent research has unveiled remarkably well-preserved volcanic and sedimentary rocks in [Singhbhum craton](#), eastern India, dating back 3.5 billion years.

- Singhbhum craton is **stretched across Jharkhand and Odisha between Chhota Nagpur plateau and the Eastern Ghats**.
- These findings shed light on India's geologic history and its **similarities to regions in South Africa and Australia**.

What are the Findings?

- **Study Area:**
 - The study focused on volcanic and sedimentary rocks that **formed approximately 3.5 billion years ago** in the **Daitari greenstone belt** in the Singhbhum Craton in east India.
 - These rocks are exceptionally well-preserved and offer a glimpse into Earth's past.
- **Geologic Makeup of Greenstones:**
 - The researchers discovered that the Daitari greenstone belt shares **similar geological characteristics** with the greenstones found in **South Africa's Barberton and Nondweni areas**, as well as those in **Australia's Pilbara Craton**.
 - This similarity suggests a common geologic history for these regions.



- **Sub-Marine Volcanic Activity:**

- The study revealed that **sub-marine volcanic eruptions** were prevalent between **3.5 and 3.3 billion years ago**.
- These eruptions left behind **pillow lava formations** within the greenstone rocks of the Singhbhum, Kaapvaal, and Pilbara cratons.
- **Pillow lava** is formed when **hot molten basaltic magma slowly erupted underwater and solidified rapidly** to form roughly spherical or rounded pillow shapes.
- **Sub-Marine Sedimentary Rocks:**
 - Following silicic volcanism, sub-marine turbidity current deposits formed as the volcanic vents drowned.
 - These sedimentary rocks provide valuable insights into sub-marine environments and were dated to approximately 3.5 billion years ago using precise **detrital U-Pb zircon data**.
 - Detrital zircon U-Pb geochronology is a **tool for sedimentological studies** such as provenance, correlation of successions, and definition of maximum depositional ages as well as **for studies concerning paleogeographic reconstructions and evolution of the continental crust**.

What is the Significance of Findings?

- **Understanding Ancient Environments:**
 - The study of ancient greenstones, including both volcanic and sedimentary rocks, allows scientists to **gain insights into habitable environments on Earth during its early stages**. These rocks **serve as time capsules**, providing clues about the planet's evolution.
- **Geological Processes:**
 - These findings **contribute to our understanding of diverse volcanic processes** and the **geologic history of ancient continents**.
- **Geological Connections:**
 - The similarities between the geology of India, South Africa, and Australia **suggest that these regions may have experienced similar geological processes** 3.5 billion years ago.
- **Paleogeographic Positioning:**
 - Further studies may shed light on the paleo-geographic positioning of these ancient continents during that time and contribute to theories related to **plate tectonics**.

[Source: TH](#)

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