

# Earth's first landmass emerged in Singhbhum

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**In news-** A new study has suggested that the earliest continental landmass emerged from Jharkhand's Singhbhum region.

## **Key highlights of the study-**

- Researchers have **found sandstones in Singhbhum with geological signatures of ancient river channels**, tidal plains and beaches over 3.2 billion years old, **representing the earliest crust exposed to air.**
- Patches of the earliest continental land, however, exist in Australia and South Africa, too.
- They have **found the age by analysing the uranium and lead contents of tiny minerals** and **studied the granites that form the continental crust of Singhbhum region.**
- According to them, these **granites are 3.5 to 3.1 billion years old and formed through extensive volcanism that happened about 35-45 km deep inside the Earth** and continued on-and-off for hundreds of millions of years until all the magma solidified to form a thick continental crust in the area.
- The **researchers believe the earliest emergence of continents would have contributed to a proliferation of photosynthetic organisms**, which would have increased oxygen levels in the atmosphere.
- This study was conducted by researchers from India, Australia and the US.
- The researchers also aim to understand the evolution of **India's three other ancient continental fragments - Dharwar, Bastar and Bundelkhand regions.**

## **Theories of landmass evolution-**

- **Continental Drift theory-** It is the hypothesis that the Earth's continents have moved over geologic time relative to each other, thus appearing to have "drifted" across the ocean bed. It is associated with **Alfred Wegener**.
- **Convectional Current theory-** According to this theory, the intense heat generated by radioactive substances in the mantle seeks a path to escape, giving rise to the formation of convection currents in the mantle. It was proposed by **Arthur Holmes** in the 1930s.
- **Seafloor spreading theory-** This theory, introduced by **Harry Hess & Robert Dietz**, was proven as patterns of magnetic field polarity preserved in seafloor basalt and by age dating of the rocks. **Polar wandering theory-** This theory is similar to Continental Drift theory. It is the relative movement of the earth's crust and upper mantle with respect to the rotational poles of the earth.