

Jiwaji University school of studies in earth science

For M.sc geology IInd semester

Paper GT203 – UNIT 4 – topic 4.2(Vindhyan Supergroup)

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Introduction

- Vindhyan supergroup is named after the Vindhyan mountain in central India .
- Covers an exposed area of 60,000 sq.km and a concealed area of 1,62,0000 sq.km under the Indo Gangetic Alluvium and deccan trap
- The strata are exposed in Son valley, Bundelkhand and Rajasthan.
- The Son- Narmada fault bound the basin in the south and the great boundary fault in the northwest
- Geographically, it starts from sasaram in the east and to Dholpur in the north.
- It belongs to mesoproterozoic.

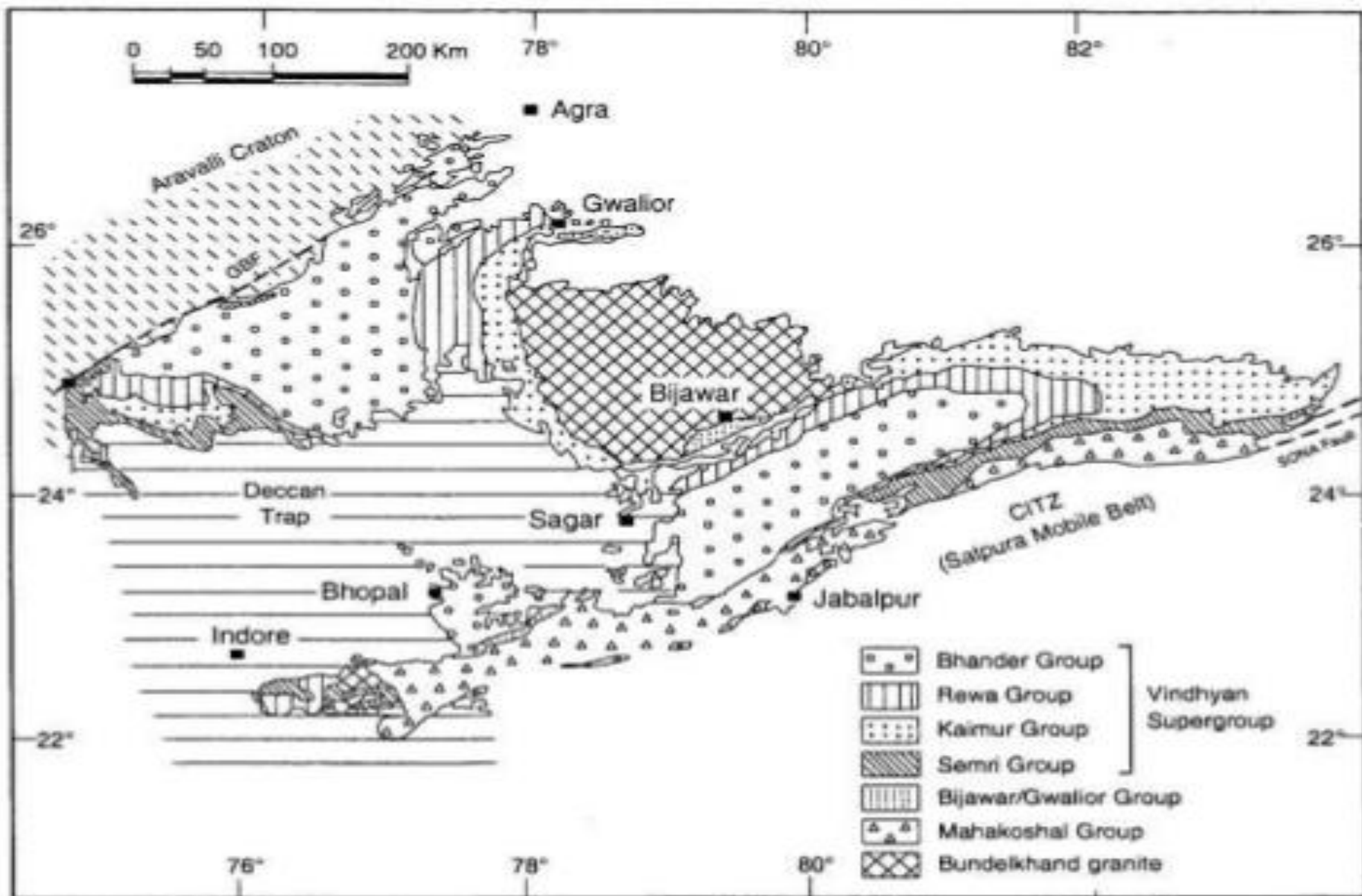


Table 5.1. Lithostratigraphy of Vindhyan Supergroup

| Group | Formation | Alternative Names |
|---|------------------------|--|
| Bhander Group (1300-1500 m) | Maihar Sandstone | (Upper Bhander Sst.: Divided into Bhavpura Sh., Balwan Lst. Shikaoda Sst.) |
| | Sirbu Shale | |
| | Bundi Hill Sandstone | (Lower Bhander Sst.) |
| | Lakheri Limestone | (Bhander Lst., Nagod Lst.) |
| | Ganurgarh Shale | (Simrawal Sh.) |
| ----- Disconformity/ Gradational Contact ----- | | |
| Rewa Group (100-300 m) | Govindgarh Sandstone | (Upper Rewa Sst., Gahadra Sst.) |
| | Drummondganj Sandstone | |
| | Jhiri Shale | (Variegated Sh.) |
| | Asan Sandstone | (Lower Rewa Sst., Itwa Sst., Kanar Sst.) |
| | Panna Shale | |
| ----- Normal Contact / Facies Change ----- | | |
| Kaimur Group (400 m) | Dhandraul Quartzite | (Upper Kaimur Sst., Scarp Sst.) |
| | Mangesar Formation | |
| | Bijaigarh Shale | |
| | Markundi Sandstone | (Ghaghar Sst.) |
| | Ghurma Shale | (Susnai Breccia) |
| Sasaram Sandstone | (Lower Kaimur Sst.) | |
| ----- Unconformity / Normal Contact ----- | | |
| Semri Group (3000-4000 m) | Suket Shale | (Baghwar Sh.) |
| | Rohtas Limestone | (Nimbahera Lst.: Divided into Bari Sh., Jiran Sst. and Khori Malan Cong.) |
| | Chorhat Sandstone | (Glauconite Bed, Rampur Sst., Basuhari Sst., Tirohan Breccia) |
| | Bargawan Limestone | (Salkhan Lst., Fawn Lst., Chorhat Lst., Tirohan Lst.) |
| | Kheinjua Shale | (Olive Sh., Koldaha Sh., Binota Sh.) |
| | Chopan Porcellanite | (Deonar Porc.) |
| | Kajrahat Limestone | (Kuteshwar Lst., Bhagwanpura Lst., Tirohan Lst., Lohar Dol.) |
| | Arangi Shale | |
| | Deoland Sandstone | (Khardeola Sst., Pandwafall Sst.) |
| ----- Angular Unconformity / Non-conformity ----- | | |

Geological details

- Vindhyan supergroup is subdivided into two groups- Upper vindhyan and lower vindhyan, composed of sandstone , shale and carbonate , few conglomerate and volcanoclastic bed .
- Lower vindhyan is 1300- 1100 M.y, marine in origin consisting of calcaerous and argillaceous sediments.
- Upper vindhyan is 1000-600 M.y, fluvial origin and exclusively arenaceous.
- Upper vindhyan enclose two diamond bearing horizon, from which panna and Golconda diamonds have been mined.
- The upper and lower vindhyan supergroup are separated by unconformity, prominent in the North but almost disappears in the southern areas.

Lithology

Lower Vindhyan

SEMRI SERIES

- 3000 to 4000m thickness
- Derived its name from Semri river well developed in the eastern Son valley.
- It rests with non- conformity on bundelkhand .
- Irregular thickness indicate irregular basin floor
- It is made up of five alternating formations of shale and carbonates with areas of sandstones and volcanic clastic units.
- basal succession consist of conglomerate , cross bed ferruginous sandstone and shale.

Upper Vindhyan

KAIMUR SERIES

- Separated by an unconformity from lower vindhyan
- 400 m thickness
- named after kaimur scrap.
- It is essentially made up of sandstone- shale.
- Ripple marks and sun cracks are found on the shales
- In Bundelkhand it shows a basal conglomerate containing jasper
- Using Rb-Sr isochron the age 1100-1150 Ma.

REWA GROUP

- Named after the Rewa state, thickness-100-300m.
- Sediments thickness to the north indicating deepening of the basin.
- Separated from kaimur by a zone of diamond bearing conglomerate .
- Consist of a series of shales and sandstone formations that, in areas contain kimberlite derived diamondiferous conglomerate.
- The presence of mud crack suggest periodical exposures and the presence of rain prints in the shale indicates the sub aerial conditons.
- The basal panna shale without any basal conglomerate indicates continuity of depositon from kaimur group.

Bhander group

- Named after bhander upland, extensively developed along the axis of the basin and in the Bhopal inlier within the Deccan trap.
- Thickness 1300-1500m
- Separated from the Rewa group by a horizon diamond bearing conglomerate.
- Bhander sandstone are fine grained and soft.
- the Ganurgarh shale with stromatolitic limestone indicates shoreline lagoon-tidal flat complex.
- The top unit of maihar sandstone unit is a blanket deposit with ripple marks, cross bedding and load cast indicating tidal flat to near shore littoral environment.

Economic Importance

- Diamond, pyrite, coal, limestone.
- Diamond have been reported in the conglomerate in the panna
- The limestone of Vindhyan are among the most important sources of raw material for the lime and cement industry in India.
- Vindhyan sandstone near U.P on disintegrating by weathering yield good sands which are being used for the manufacture of glass.
- Pyrite is reported from the Bijaigarh shales of lower Kaimur. The material is of good quality , containing around 45% sulphur, without any arsenic.