# Scientific Research Outcome Report

*Ichnofabric Mapping of the Mundhan and Guneri Sections with Special Reference to (Umian Mundhanian Kutch Stages), Western Kachchh, Gujarat*

1. **Faculty Name:** Dr. Bhawanisingh G. Desai

2. **Branch / Department:** School of Petroleum Technology, PDPU

3. **Researcher's Name along with designation:**
   Dr. Bhawanisingh G. Desai, Assistant Professor, SPT, PDPU

4. **Research Title:** Ichnofabric Mapping of the Mundhan and Guneri Sections with Special Reference to (Umian Mundhanian Kutch Stages), Western Kachchh, Gujarat

5. **Major Goal of this Scientific Research Project:** The major objective of this research was to carry out Ichnological characterization of samples collected from the study area

6. **Major Activities**

**a)** Ichnological characterization of Umian - Mundhanian Stage.
**b)** To delineate palaeoceanographic conditions based on Ichnofabric analysis
**c)** To reconstruct palaeo-basinal history of Mundhan - Guneri Sector for Umian – Mundhanian Stage

7. **Specific Objectives & Research Hypothesis**

- Sea level changes and bottom water oxygenation were observed and documented based on formation fluctuation
- Paleocological and evolutionary changes in ichnotaxa occurring in Katesar Member was studied bed-by-bed and systematically documented

**8. List of equipment, technical facilities/resources used from PDPU for the above mentioned research activity**

- PDPU library has been utilized for preparing the initial knowledge base

**9. Significant Results/key outcomes/achievements/Benefits along with necessary pictures / diagrams / images**

- A total of 53 recurring ichnospecies are documented from the Study area, of which many are being reported for the first time from Indian subcontinent.
- From the Jhuran formation fluctuations of sea level changes and bottom water oxygenation are documented.
- Paleocological and evolutionary changes in ichnotaxa occurring in Katesar Member is studied bed-by-bed and systematically documented.
- In Guneri Member delta tributary main trunk channel is delineated along with associated tidal flats and characterized ichnologically
- For the first time, globally, a complete community of 13 *Conichnus* trace fossils is documented in detail and studied for their behavioral aspects
- For first time from Indian subcontinent, a distinct horizon of ichnogenus*Balanoglossites* is documented indicating *Glossifunguites* Ichnofacies surface.
- Early Aptialtransgressive event based on *Teredolite* wood boring and Belemnites is documented in lower two fossiliferous beds of Ukra hill member
- 10 basinal scale ichnological horizons are delineated, which help in inter-basinal correlation across the Kachchh basin.
- 14 Ichnofabric models are proposed for understanding paleo-basinal history.

**10. Impact of the research outcomes or findings that address the intellectual merit and broader impacts of the research work**

Ichnology is the branch of geology and biology that deals with traces of organismal behavior, such as burrows and footprints. Community dynamics and burrowing behaviour are revealed by inter-burrow relationships, burrow initiation levels and sedimentology. This study also helps in understanding paleo-

basinal history of the said areas. Results presented herein may aid in the understanding of palaeo-community dynamics in other sequences.

**11. How the results have been shared/ disseminated:**

***Publications in Peer Reviewed journals***

- **Desai, B.G**., 2013. Ichnological Analysis of Transgressive Marine Tounge in Prograding Deltaic System: Evidence from Ukra Hill Member, Western Kachchh, India. Journal Geological Society of India, 82(2): 143-152.
- **Desai, B.G.** and Saklani, R., 2012. Significance of Ichnogenus Balanoglossites Mägdefrau, 1932 from Lower Cretaceous Guneri Member [Bhuj Formation] of Guneri Dome, Kachchh, India. Swiss Journal of Paleontology, 131(2): 255-263
- **Desai, B.G**., 2012. Trace fossils from Kaladongar Formation exposed in KuarBeyt, Patcham Island, Kachchh basin, India. Journal of Paleontological society of India, 57(1): 53-59.

***Conference Proceedings***

- **Desai, B. G**. (2012) Ichnostratigraphy and ichnological events of Mesozoic sediments of Western Kachchh, India., National Level field workshop and Brainstorming sessions on Geology of Kachchh basin, Western India from 26th-29 January 2012, Bhuj Kachchh
- **Desai, B. G** and Vartak, A (2012) Cretaceous Belemnites biostratigraphy of Kachchh and South India: Implications for Migration routes, Paleogeography and Sea level changes., National Level field workshop and Brainstorming sessions on Geology of Kachchh basin, Western India from 26th-29 January 2012, Bhuj Kachchh

**12. Give also name of other PDPU individuals involved in the research**.

**13. Which organizations have been involved as partners?**

**14. Have other collaborators been involved?**

- Rajendra Saklani, CSIR Senior Research Fellow

**15. Mention if any infrastructure got added out of research outcome to PDPU institutional resources.**

Digital Camera; Global Positioning System; Fossil Cleaning Equipment