

**SEDIMENTOLOGY AND RESERVOIR
CHARACTERIZATION OF KINGRIALI FORMATION
IN ZALUCH NALA, WESTERN SALT RANGE, PUNJAB,
PAKISTAN**



By

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ABSTRACT

The Triassic Kingriali Formation has been studied in detail in Zaluch Nala, Western Salt Range, Punjab, Pakistan. The study was conducted on outcrop and well logs data to investigate the detail sedimentology and reservoir characterization of Kingriali Formation. A total of 36 rock samples have been collected from 76m outcrop section to delineate the microfacies and depositional environment of Kingriali Formation. In Kingriali Formation three main microfacies were identified i.e., mudstone, packstone and boundstone microfacies. These microfacies were subdivided into sub-microfacies i.e., fenestral mudstone and bioclastic mudstone sub-microfacies, fenestral ooidal packstone and peloidal packstone sub-microfacies. The Kingriali Formation was deposited on intertidal to subtidal marginal plate reef and inner shelf restricted environment with sub-environments i.e., shoal, bars and beaches. The XRD analysis suggests that Kingriali Formation does not display any significant variations in stoichiometry and crystal ordering. The reservoir characterization was carried out using the parameters i.e., visual porosity, diagenesis, SEM analysis and petrophysical analysis. The visual porosity ranging from 1.8 to 10% was determined with the help of Image J. software. Diagenetic processes identified were dissolution, dolomitization, micritization, compaction, neomorphism and cementation. The dissolution, dolomitization and fracturing enhances while the compaction, micritization, neomorphism and cementation decreases the reservoir potential of Kingriali Formation. The SEM analysis shows various microporosity types i.e., vugs, pores, intracrystalline and intercrystalline porosity and fractures. Petrophysical analysis suggests an average effective porosity of 8% and average sonic porosity of 8% and 12% for Kingriali Formation in Isakhel-01 and Chonai-01 wells respectively, which indicates good reservoir character. However, due to low laterolog deep (LLD) value at different depth and the absence of cross over between neutron and density porosity Kingriali Formation may not be recommended as hydrocarbon reservoir.

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CONTENTS

Page

ABSTRACT	i
ACKNOWLEDGEMENTS	ii
CONTENTS	iii
FIGURES	vi
PLATES	vii
TABLES	x

CHAPTER 1

INTRODUCTION

1.1	Introduction	1
1.2	Literature review	1
1.3	Aims and objectives	3
1.4	Location & accessibility	3
1.5	Methodology	4
1.5.1	Field work	4
1.5.2	Laboratory work	4
1.5.2.1	Thin sections	4
1.5.2.2	X-Ray Diffraction	4
1.5.2.3	SEM analysis	4
1.5.3	Petrophysical analysis	5

CHAPTER 2

GEOLOGICAL SETTINGS

2.1	Tectonic settings	6
2.2	Stratigraphy	7
2.2.1	Stratigraphic section studied	11
2.2.1.1	Triassic succession	11
2.2.1.2	Field observations	13

CHAPTER 3

MICROFACIES AND DEPOSITIONAL ENVIRONMENT

3.1	Introduction	18
3.2	Microfacies of Kingriali Formation	19
3.2.1	Mudstone microfacies	19
3.2.1.1	Fenestral Mudstone Sub-Microfacies (SZK1)	19
3.2.1.2	Bioclastic Mudstone Sub-Microfacies (SZK2)	22
3.2.2	Packstone Microfacies	23
3.2.2.1	Fenestral Ooidal Packstone Microfacies (SZK3)	23
3.2.2.2	Peloidal Packstone Sub-Microfacies (SZK4)	26
3.2.3	Boundstone Microfacies/Reefal Microfacies (SZK5)	29
3.3	Depositional model	30
3.4	XRD analysis	34

CHAPTER 4

RESERVOIR CHARACTERIZATION

4.1	Introduction	37
4.2	Visual porosity	37
4.3	Diagenesis	41
4.3.1	Dissolution	41
4.3.2	Dolomitization	41
4.3.3	Micritization	44
4.3.4	Compaction	44
4.3.4.1	Mechanical compaction	44
4.3.4.2	Chemical compaction	44
4.3.5	Neomorphism	46
4.3.6	Cementation	46
4.4	SEM analysis	48
4.5	Petrophysical analysis	54
4.5.1	Volume of shale	54
4.5.2	Neutron porosity	55
4.5.3	Density porosity	55
4.5.4	Sonic porosity	55

4.5.5	Average porosity	56
4.5.6	Effective porosity	56
4.5.7	Saturation of water	57
4.5.8	Bulk porosity	57
4.6	Discussion	62
CONCLUSIONS		63
REFERENCES		65

FIGURES

	Page
Figure 1.1. Map of the Salt Ranges and Trans Indus Ranges, Pakistan. The red square show the location of the section and the green square show the location of wells investigated in the present study (Jan and Stephenson, 2011).	3
Figure 2.1. Structural map of the Salt Range and Potwar Plateau showing major structural elements (Modified from Cotton and Koyi, 2000). NDPZ-Northern Potwar Deformed Zone; MBT-Main Boundary Thrust; SRT-Salt Range Thrust; BF-Basement Fault. Red circle show the location of the study area.	7
Figure 2.2. Generalized stratigraphy of Salt Range. (Gee, 1989 and Fatmi 1973).	10
Figure 2.3. Stratigraphy of Zaluch Nala, Western Salt Range (Gee, 1980).	12
Figure 2.4. The lithologic log of Kingriali Formation in Zaluch Nala, Western Salt Range.	14
Figure 3.1. The depositional model of Kingriali Formation, Zaluch Nala, Western Salt Range.	31
Figure 3.2. The microfacies log of Kingriali Formation, Zaluch Nala, Western Salt Range.	33
Figure 3.3. The XRD analysis showing the peaks of various minerals.	35
Figure 3.4. The XRD analysis showing the peaks of various minerals.	35
Figure 4.1. The complete Petrophysical behavior of Kingriali Formation in well Chonai-01.	59
Figure 4.2. The complete petrophysical behavior of Kingriali Formation in well Isakhel-01.	60
Figure 4.3. Cross plot of NPHI and RHOB, showing the lithology of Kingriali Formation in chonai-01 well.	61
Figure 4.4. Cross plot of NPHI and RHOB, showing the lithology of Kingriali Formation in Isakhel-01 well.	61

PLATES

	Page
Plate 2.1. (A). Shows the lower conformable contact of Kingriali Formation with Tredian Formation, (B). Shows the upper unconformable contact of Kingriali Formation with Datta Formation, (C). Shows the outcrop of Kingriali Formation having limestone having greyish color on weathered surface and yellowish color on fresh surface (black color), (D). Black arrow shows the stylolites.	15
Plate 2.2. (A). shows the dolomite with limestone showing secondary origin, (B). Black arrows shows fractures and also dissolution present, (C) black arrow shows gypsum along with dolomite, (D). Shows the sandy limestone.	16
Plate 2.3. (A). Red arrows shows dissolution and black arrows shows dolomite, (B). Fractures present in limestone, (C). Sandy limestone, (D). Vugs present in sandy limestone, (E). Shows stylolites (black arrow), (F). Intermixed limestone and dolomite which shows that dolomite developed due to solution enriched in magnesium i.e. secondary origin of dolomite.	17
Plate 3.1. Photomicrographs of fenestral mudstone sub-microfacies; A. Showing fenestrae within micrite, B. Showing micrite with fine dolomitization and brecciation, C. Showing stylonodular fabric (Scale 300.00 μ m).	20
Plate 3.2. A. Showing fenestrae and dolomitization with porosity, B. Showing two phases of dolomitization with fenestrae, C. Showing fenestrae and micrite (Scale 300.00 μ m).	21
Plate 3.3. Photomicrographs of bioclastic mudstone sub-microfacies; A-D. Showing the bioclasts (yellow arrow) and also ostracods (red arrow) (Scale 300.00 μ m).	22
Plate 3.4. Photomicrographs of fenestral ooidal packstone sub-microfacies; A-C. Showing the ooids (yellow arrow), fenestrae, dolomitization (Scale 300.00 μ m).	24

Plate 3.5.	Photomicrographs of fenestral ooidal packstone sub-microfacies; A-C. Showing the ooids (yellow arrow), fenestrae, dolomitization (Scale 300.00µm).	25
Plate 3.6.	Photomicrographs of peloidal packstone sub-microfacies. Yellow arrow show the peloids (Scale 300.00µm).	27
Plate 3.7.	Photomicrographs of peloidal packstone sub-microfacies. Yellow arrow show the peloids (Scale 300.00µm).	28
Plate 3.8.	Photomicrographs of reefal facies having colonial coral reefs (red arrow) and micrite are also present (Scale 300.00µm).	29
Plate 4.1.	Photomicrographs of fenestral mudstone submicrofacies; A, C, E, G showing the visual porosity without Image J software while B, D, F, H showing the visual porosity determined with the help of image J software (Scale 300.00µm).	38
Plate 4.2.	Photomicrographs of bioclastic mudstone and peloidal packstone submicrofacies; A & B. showing the visual porosity with and without Image J software respectively, C, E, G showing the visual porosity of peloidal packstone submicrofacies without Image J software while D, F, H showing the visual porosity of peloidal packstone submicrofacies with Image J software (Scale 300.00µm).	39
Plate 4.3.	Photomicrographs of fenestral ooidal packstone submicrofacies and reefal facies; A, C, E showing the visual porosity without image J software while B, D, F showing the visual porosity with image J software of fenestral ooidal packstone submicrofacies. G. showing the visual porosity without image J software while H. showing visual porosity with image J software of reefal facies (Scale 300.00µm).	40
Plate 4.4.	Photomicrographs of dissolution (A-D) yellow arrow and dolomitization (E-H) pink arrow (Scale 300.00µm).	43
Plate 4.5.	Photomicrographs of micritization (A-B) yellow arrow, compaction: fractures (C-E) pink arrow and stylolites (F-H) green arrow (Scale 300.00µm).	45

Plate 4.6.	Photomicrographs of neomorphism (A-B) pink arrow and cementation (C-D) green arrow (Scale 300.00 μ m).	47
Plate 4.7.	Images of SEM having vugs (V), pores (P), dolomite (Dol) and quartz (Q) (Scale range from 5 μ m to 10 μ m).	48
Plate 4.8.	Images of SEM having vugs (V), pores (P), dolomite (Dol) and quartz (Q) (Scale range from 5 μ m to 50 μ m).	49
Plate 4.9.	Images of SEM having vugs (V), pores (P), dolomite (Dol) and quartz (Q) (Scale range from 1 μ m to 50 μ m).	50
Plate 4.10.	Images of SEM having vugs (V), pores (P), fractures (F), dolomite (Dol) and quartz (Q) (Scale range from 5 μ m to 50 μ m).	51
Plate 4.11.	Images of SEM having vugs (V), pores (P), fractures (F), dolomite (Dol) and quartz (Q) (Scale range from 5 μ m to 10 μ m).	52
Plate 4.12.	Images of SEM having vugs (V), pores (P) and quartz (Q) (Scale range from 5 μ m to 50 μ m).	53

TABLES

	Page
Table 3.1. The percentage of allochems, micrite and cement with facies of the Kingriali Formation.	32
Table 4.1. Selected wells for petrophysical interpretation.	54
Table 4.2. Sonic log values in different types of rocks (Schlumberger, 1972).	56
Table 4.3. Bulk volume water at irreducible water saturation as function of type of porosity (Asquith 1985).	57
Table 4.4. Bulk Volume Water as a function of grain size and lithology (Asquith 1985).	58
Table 4.5. The average values of petrophysical parameters.	58