

Palynology of the Jurassic–Cretaceous transition, northern Surat Basin

Jennifer Cooling, UQ School of Earth Sciences and Geological Survey of Queensland, DNRM
PhD student supervised by Professor Joan Esterle and Dr John Mckellar

AGE (Ma)	ERA	PERIOD	EPOCH	STAGE (AGE)	PALYNOSTRATIGRAPHIC ZONES		PREVIOUS STUDIES	THIS STUDY
					SPORE-POLLEN UNITS	NORTHERN SURAT BASIN		
130	CRETACEOUS (in part)	Early	Hauterivian	APK2 (in part)	APK2.1 (in part)	Bunger 1973, Mckellar, in press ¹ , Healy, Muggari & Fairbridge, 1987 ²	W	Bunger 1973
140				Valanginian	APK1.2.2	Foraminisporites wonthaggiensis Interval Zone ² (in part)		
150	JURASSIC (in part)	Late	Bermsian	APK1	Ruffodiaspora australiensis Interval Zone ³	Gubberamunda Sandstone	E	
160			Titonian	APK1.2.2	Ruffodiaspora australiensis Interval Zone ³	Westburne Formation		
			Kimmeridgian	APJ6	Ruffodiaspora australiensis Interval Zone ³	Springbrook Sandstone		
			Oxfordian	APJ5 (in part)	Murospora florida Association Zone ³	Waloon Coal Measures (in part)	INJUNE CREEK GROUP	Mckellar 1998, in press; Waitman in press

Pro: offers up to 4 subdivisions!
Con: not formally published

Pro: formally published
Con: only 1 subdivision



The Existing Biozones
Neither of these zonal schemes have been formally assessed for use in the Surat Basin

Late Jurassic – Early Cretaceous lithostratigraphy and biostratigraphy set against previous and current palynological studies (timescale after Gradstein et al, 2012)

What's being done?

- The palynomorphs in the rocks of the upper Westbourne Formation – lower Mooga Sandstone from 3 stratigraphic boreholes are being documented.
- Bentonite samples from the Orallo Formation are at Boise State University's geochronology laboratory undergoing high-precision U-Pb, CA-IDTIMS dating of zircons.



Why study this section

- It's the last part of the Surat Basin to be palynologically studied and
- Is the most complete record of deposition in Queensland from this time period
- Contains a number of important aquifers
- The goal of this study is to produce a more accurate biozonation that will make distinguishing these formations easier and give us a better understanding of their deposition.

Spore-Pollen Zone	Murospora florida Association Zone/APJ5	Retritriletes watheroensis Association Zone/APJ6	Neorairickia equalis	Foraminisporites deliyl	Ruffodiaspora australiensis/ Ruffodiaspora spp.	Cyclospores hughesi	Diclyotosporites speciosus	Foraminisporites wonthaggiensis Interval Zone/APK2
Index fossil (used to define base of zone)								
Presence	Present	Rare	Present	Common	Present	1 specimen from 18 slides, appears above APK1.2.2 index	Present	Absent (as expected)

Table showing the defining index fossils of the formal and informal biozones covering Australia from the Oxfordian to the Hauterivian and their presence in slides from the upper Gubberamunda and lower Mooga Sandstone.

