

Z. BIBLIOGRAPHY

Z2. Geology

**Neotectonic deformation features
in Plio-Pleistocene coastal
aeolianites: Palaeoseismology
and earthquake hazard
implications for the Southern
Cape, South Africa**

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The Bredasdorp Group in the area between Gans Bay and Mossel Bay

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The Bredasdorp Group, in the area between Hermanus and Mossel Bay, consists of a succession of limestone, sandy limestone, sandstone and conglomerate. The limestone beds occur in a narrow belt that extends

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Table 1. Subdivision of the Bredasdorp Group.

Formation	Description	Age
Strandveld	Unconsolidated wind-blown dunes	Holocene
Waenhuiskrans	Semi-consolidated aeolianite	Pleistocene
Rooikrans	Shelly quartzose sand and conglomerate	Pleistocene
Wankoe	Consolidated aeolianite	Mio/Pliocene
De Hoopvlei	Shelly quartzose sand and oyster-bearing conglomerate	Mio/Pliocene

Wankoe Formation. This aeolian facies forms the bulk of the Bredasdorp Group, and in areal extent occupies nearly the entire outcrop area as vegetated, consolidated dunes. These calcarenites consist of cream- to white-coloured, well-rounded quartz grains, scattered pebbles and lenses of coarse material and broken shelly material. Dark specks of glauconite are also present. Typical aeolian cross-bedding characterizes this unit. The maximum calculated thickness of the aeolian facies is 290 metres.

Rooikrans Formation. The Rooikrans Formation is only partly con-

SEDIMENTOLOGY OF THE DE HOOPVLEI FORMATION,
BREDASDORP GROUP, SOUTHERN CAPE PROVINCE

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INTRODUCTION

In the southern Cape Province sediments of the Bredasdorp Group are deposited on wave-planed surfaces cut into Palaeozoic Cape Supergroup and Mesozoic Uitenhage Group rocks. The basal marine De Hoopvlei Formation is characterised by Pliocene fauna and silcrete pebbles derived from the Grahamstown Formation lying on the African erosion surface. The De Hoopvlei is overlain by aeolian calcarenites of the late Pliocene Wankoe Formation. The late Pleistocene marine/ estuarine Klein Brak Formation with typical Swartkops fauna is covered by the semi-consolidated aeolianites of the Waenhuiskrans Formation. The unconsolidated Witzand Formation forms the present beach sand and the extensive coastal dunefields. The Bredasdorp sediments young progressively seawards with the marine units deposited on erosion surfaces of different age and height above sea level.

GEOLOGICAL SETTING

1988

**THE STRATIGRAPHY AND SEDIMENTOLOGY
OF THE
BREDASDORP GROUP,
SOUTHERN CAPE PROVINCE**

**BY
JEAN ARNAUD MALAN**

**Master of Science in Geology
University of Cape Town
September 1990**

1. PROPOSER OF NAME

Wybergh (1919, p. 47) designated the limestones occurring to the west of the Gouritz River the Bredasdorp Limestones. SACS (1980) assigned formation status to the unit, while Malan (1986) raised the rank to that of group when regional mapping indicated that the various mappable units recognised within the Bredasdorp could be regarded as formations.

2. DERIVATION OF NAME

A town in the southern Cape Province (Fig. 1).

3. TYPE AREA

The Bredasdorp district, since the individual formations are well exposed here.

4. STRATIGRAPHIC POSITION AND AGE

Unconformably overlies Mesozoic Uitenhage Group or Palaeozoic Cape Supergroup strata on a seaward-sloping, wave-cut platform and represents the youngest sediments present along the Cape south coast. Miocene–Pliocene marine faunas have been identified from the basal De Hoopvlei Formation by Spies *et al.* (1963). The marine facies is followed by Late Pliocene consolidated aeolian sediments, a Middle Pleistocene marine/estuarine facies and semi- to unconsolidated aeolian sands. The Bredasdorp Group sediments thus range from Miocene to Holocene, progressing from older to younger beds seawards (Table 1, Fig. 2).

5. GEOLOGIC DESCRIPTION

Basic concept and unifying features: Consists essentially of limestone, calcarenite, calcirudite, conglomerate, coquina, sandstone and calcareous sand, and is distinguished from the underlying rocks by its predominantly calcareous nature. These beds dip gently seaward (1° to 2°).

Thickness: Varies considerably, with a maximum of nearly 300 m in the areas south of Riversdale/Albertinia.

Lithology: Generalised lithological descriptions are provided in Figure 2. Comprehensive lithological data are contained in the lithostratigraphic descriptions of the individual formations in the group.

down by regressive seas on wave-cut platforms. The thin basal part of the group is a beach and nearshore deposit which is overlain by calcified coastal dunes of variable thickness. Outcrops near the coast reflect several regression–transgression phases during the Pleistocene and represent a younger accumulation of beach and coastal dune deposits. In places estuarine and lagoonal deposits occur.

6. BOUNDARIES

Lower boundary: Unconformable, sharp. The boundary is defined as the unconformity between the Miocene–Pliocene marine deposits and the older Palaeozoic Cape Supergroup or Mesozoic Uitenhage Group. A basal conglomerate occurs above the contact and the high percentage of calcium carbonate, due to the presence of marine shelly material, is characteristic.

Upper boundary: Bredasdorp Group sediments represent all Cenozoic rocks exposed on the coastal plain excluding Recent calccrete, soils and beach deposits. No upper boundary is defined.

Lateral boundaries: Cut-off points for the Bredasdorp Group have been located at Hermanus in the west and Plettenberg Bay in the east. The cut-offs chosen were influenced by the absence of Cenozoic sediments in the Hermanus–Strand and Plettenberg Bay–Humansdorp areas. Bredasdorp sediments extend to below sea-level and are commonly dredged from the Agulhas Bank down to about 60 m. Maximum depth of sub-sea-level recovery has been 90 m (Siesser, 1971).

7. HISTORICAL BACKGROUND

Wybergh (1919) used the term Bredasdorp Limestones (beds, formation) for the limestones in the Bredasdorp district. In mapping the area around Mossel Bay, Houghton *et al.* (1937) referred to the coastal limestones as the Alexandria Series, implying correlation with the Alexandria Formation of the eastern Cape Province. Spies *et al.* (1963, p. 15), described the coastal sediments as the Bredasdorp Beds.

Siesser (1971) used the informal term Coastal Limestone, first mentioned by Wybergh (1919), for all the Tertiary and Pleistocene carbonate rocks exposed along the coast from Saldanha Bay to East London. The name Bredasdorp

*Secrets of
De Hoop
and Environs*

Field notes on the
GEOMORPHOLOGY, HYDROLOGY
and ARCHAEOLOGY
Between CAPE AGULHAS and CAPE INFANTA



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LITHOSTRATIGRAPHY OF THE WAENHUISKRANS FORMATION (BREDASDORP GROUP)

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**NOTES ON AN ENON BASIN NORTHEAST OF BREDASDORP,
SOUTHERN CAPE PROVINCE**

by

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Abstract

Geological mapping has revealed a previously unknown occurrence of Uitenhage Group sediments northeast of Bredasdorp. Reddish-brown monomictic clast-supported conglomerates represent the basal Enon Formation and crop out over an area of about 60 km². These outcrops probably represent erosional remnants of the landward extension of the offshore Bredasdorp Basin present on the Agulhas Bank.

1. INTRODUCTION

Fifteen kilometres northeast of Bredasdorp reddish-brown rudaceous sediments crop out intermittently over an area of about 60 km² (Fig. 1.1). The stratigraphical relationship of these grits and conglomerates, exposed in the lower reaches of the Salt River and in the catchment area of the Waterskilpads River (Fig. 1.2), has as yet not been satisfactorily clarified. Wybergh (1919) interpreted coarse grits and conglomerates exposed along the lower reaches of the Salt River as part of the basal unit of the Bredasdorp Formation. During a geohydrological research project, clay and claygrounds in excess of 80 m were identified beneath the arenaceous Bredasdorp limestones in the same area (Whittingham 1969). An internal report to the Department of Transport also described extensive pebble and boulder gravels of Pleistocene to Recent age in this area (Kantey et al. 1973). However, geological mapping during 1984 in the districts of Bredasdorp and Riversdale and research on the Bredasdorp Formation have now clarified the stratigraphical relationship of these rudaceous beds.

The reddish-brown conglomerates are unconformably overlain by Late Tertiary Bredasdorp calcarenites on the farm Wind Hoek 78 and rests in turn discordantly on Palaeozoic Bokkeveld pelites along the Waterskilpads River on Zout Pans Vlakte 82 and Roode Valley 87. The basal conglomerate of the Bredasdorp Group* is predominantly highly calcareous due to the

* Not yet approved by SACS

presence of marine shells and never exceeds 12 m in thickness. This is in complete contrast to the thickness in excess of 80 m as measured for the older conglomerates (Whittingham 1969). The Bredasdorp calcarenites furthermore have a yellowish-grey colour compared to the reddish-brown colour for the underlying noncalcareous conglomerate. Clasts in the latter are clearly of Bokkeveld and Table Mountain derivation.

2. STRATIGRAPHY AND SEDIMENTOLOGY

Reddish-brown rudaceous sediments crop out on the farms Roode Valley 87, Water Schilpad River 84, Patryze Kraal 79, Zout Pans Vlakte 82, Te Vreda 83 in the Waterskilpads River catchment and along the Salt River on Wind Hoek 78 (Fig. 1.2). Interbedded with these conglomerate horizons are layers of siltstone and sandstone, averaging 0,6 m and seldom exceeding 1,0 m in thickness, as well as thin claystone layers, less than 20 cm thick (Figs 2.1 and 2.2). Cross-bedding occurs in places and both upward-fining and upward-coarsening grain-size trends are present. A slight unconformity with the overlying Bredasdorp beds can be observed at various localities on Wind Hoek 78 and along the upper reaches of the De Hoopvlei. The southernmost known occurrence is present on Moerasfontein 169 where it has been exposed in a shallow ditch and where its presence has also been revealed by boreholes drilled through the Late Tertiary calcarenites.

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Compiled by

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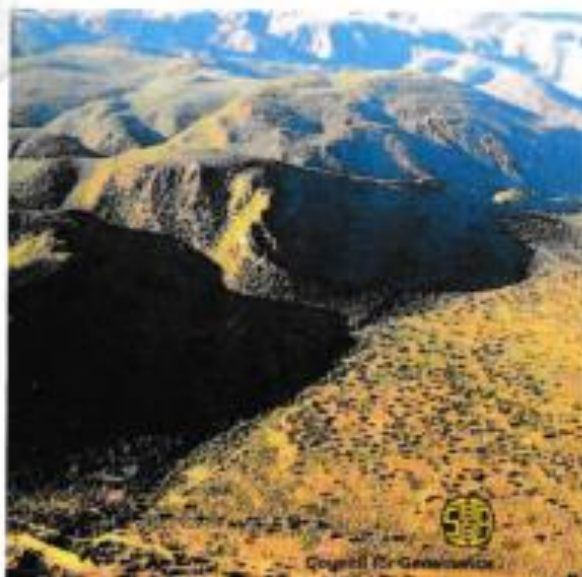
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Lithostratigraphy of the Enon Formation (Uitenhage Group), South Africa

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**AGE, GENESIS AND SIGNIFICANCE OF SOUTH AFRICAN
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