A PRELIMINAR REPORT ON THE QUATERNARY SEQUENCE IN THE COASTAL AREA OF BENADIR (CENTRAL SOMALIA)

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FOREWORD

Repeated ingressive and regressive phases occured in the Somali coastal area during Quaternary, due to tectonic displacements and or eustatic oscillations of the sea level (Jobstraibizer & Cumar Shire Yuusuf, 1977; Sommavilla, 1977; Perissotto, 1978). These phases resulted in the deposition of heteropic facies which, however, are not found everywhere, depending from different tectonic history of various coastal sectors. Moreover, widespread recent deposits, primarily eolian, hinder from an exhaustive observation of the Quaternary sequence in many places. In the studied area, which extends in between the villages of Gesira and Danane, from Raas Boqol iyo Toban iyo Afar to Raas Baqal, the entire Quaternar sequence is fairly well exposed and stratigraphic relationships between different formations (Fig. 1) seem to be rather evident.

STRATIGRAPHY

The stratigraphic sequence is made of sandy and/or calcarenitic units and lies unconformably on the Raas Aw Maki Calcarenite which is the oldest formation cropping in the considered area.

The Raas Aw Maki Calcarenite exhibits some differences in lithology from place to place. In the type area it consists mainly of bioclastic calcarenite of carbonatic platform environment; reefal bodies as well as beautiful examples of coralgal facies are intercalated locally. Layers of beach sand and of calcareous cross laminated eolian

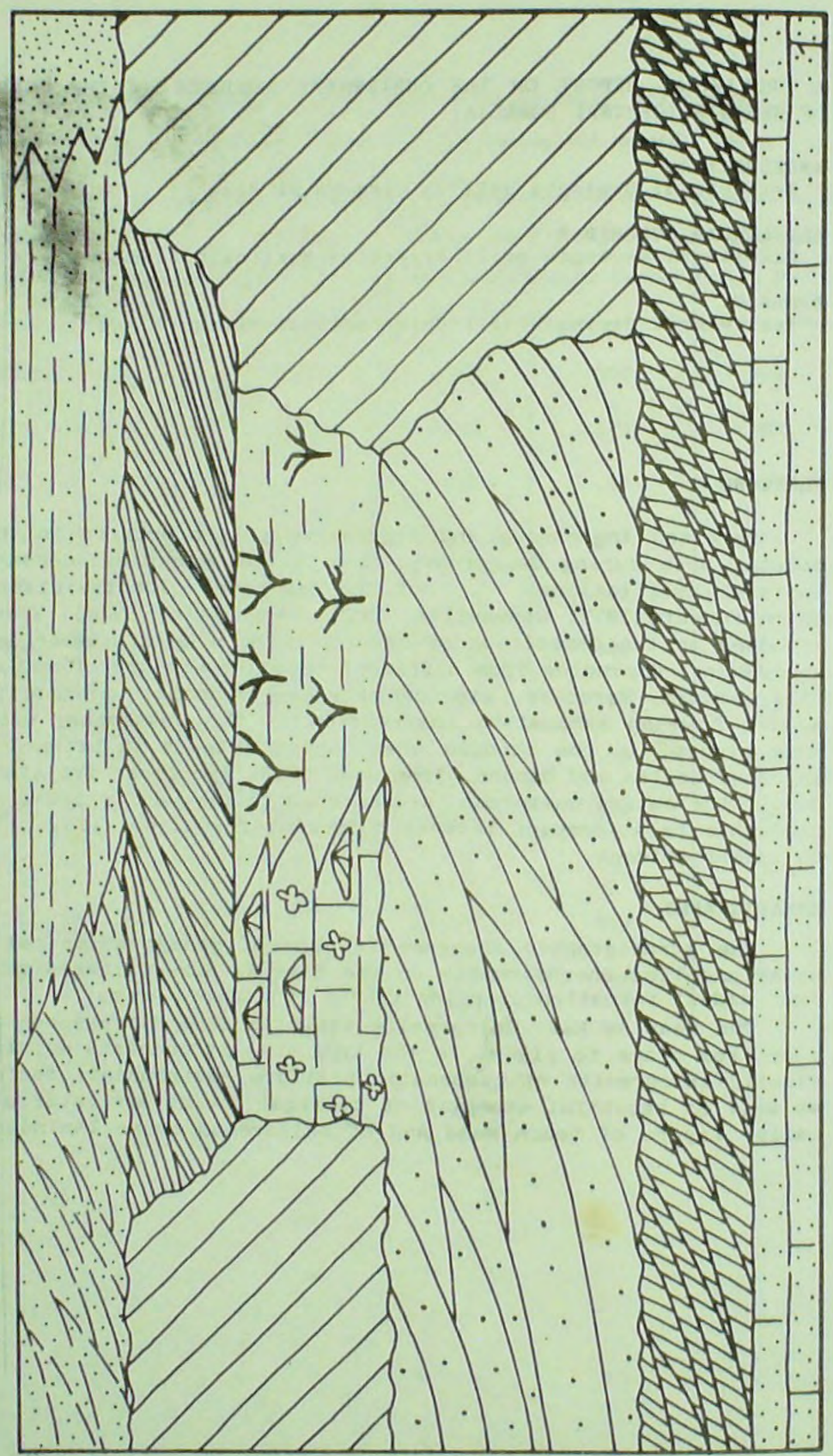

Fig. 1 - Stratigraphic sketch of the Coastal Quaternary Sequence in Benadir.
1) Ras Aw Maki Calcarenite; 2) Brava sand; 3) Gesira calcarenite a; 4) Gesira calcarenite b; 5) Ceel Baqal sand; 6) Present sediments.

sand are observed in the topmost part, proving a regressive sedimentary evolution. The Raas Aw Maki Calcarenite is truncated upward by a very gently, landward-sloping, almost flat abrasion surface. This unit, where widely cropping, exhibits karst phenomena, primarily broad but shallow sinkholes and extensive karren.

The Brava Sand occupies the largest cropping area and builds up the coastal range of low hills in the Benadir Region. This formation exhibits a quite uniform lithology and consists of quartzose-feldspathic eolian reddish sand; cross lamination is generally evident. The Brava Sand is always observed to lie unconformably on the Raas Aw Maki Calcarenite; it is topped by an erosion surface, more or less weathered, on which very abundant, empty shells of Achatina lactea Reeve are found. The species just mentioned is still living in wet areas of East Africa (Piccoli & Hilal Abdalla Faraj, 1979); its massive presence suggests a period of warn-rainy climate, responsible for dunes anchoring and extensive pedogenesis. This period possibly corresponds to the Holocene panafrican humid phase, which has an average age of 6000 years B.P. (Belluomini et al., 1980).

The Brava Sand is overlain by the Gesira Calcarenite within which two heteropic facies are easily distinguishable.

One (b) contains more or less rich molluscan assemblages which suggest beach rock or sandy beach conditions. In the first case Gastropods inhabiting hard substrata appear to be the most typical forms; among them Patella, Fissurella and Nerita are prevailing, being represented by hundreds of specimens. The fossil locality 1 yelded the following species:

Fissurella (Fissurella) sp.
Patella (Patellidea) granularis Linnaeus
Turbo (Lunella) coronatus Gmelin
Nerita (Theliostyla) sp.
Nerita (Theliostyla) plexa Chemnitz
Mauritia mauritiana (Linnaeus)
Erosaria turdus (Lamarck)
Cypraecassis (Cypraecassis) rufa (Linnaeus)
Bursa bubo (Linnaeus)
Mancinella rudolphi (Lamarck)
Fasciolaria (Pleuroploca) trapezium (Linnaeus)
Saccostrea cucullata (Born)
Stylopora sp.
Goniastraea favus Forsk

In the second case, high diversity transported fossil assemblages are found which consist of species brought into from different fossil communities; in any case, all of them are linked to the reeflagoon complex. The fossil locality 3 yelded the following taxa (1):

Patella (Patellidea) granularis Linnaeus
Cellana testudinaria (Linnaeus)
Turbo (Turbo) marmoratus Linnaeus
Turbo (Marmarostoma) setosus Gmelin
Nerita (Theliostyla) plexa Chemnitz
Nerita (Ritena) plicata Linnaeus
Nerita (Ritena) undata Linnaeus
Strombus (Canarium) cf. mutabilis Swainson
Strombus (Conomurex) decorus Röding
Strombus (Gibberulus) gibberulus gibbosus Röding
Lambis (Harpago) chiragra arthritica (Röding)
Cypraea tigris Linnaeus
Mauritia mauritiana (Linnaeus)
Monetaria annulus (Linnaeus)
Erosaria erosa (Linnaeus)
Cypraecassis (Cypraecassis) rufa (Linnaeus)
Chicoreus (Chicoreus)ramosus (Linnaeus)
Mancinella alouina (Röding)
Mancinella bufo (Lamarck)
Mancinella rudolphi (Lamarck)
Bullia (Bullia) grayi Reeve
Fasciolaria (Pleuroploca) filamentosa inermis Jonas
Fasciolaria (Pleuroploca) trapezium (Linnaeus)
Gonus litteratus Linnaeus
Conus miles Linnaeus
Conus striatus Linnaeus
Conus textilis Linnaeus
Hastula strigilata (Linnaeus)
Anadara (Anadara) antiquata (Linnaeus)
Crassostrea virleti (Deshayes)
Hyotissa hyotis (Linnaeus)

(1) In this site the original sediment has been blown away by wind action and fossils are found lying on the eroded surface of Brava Sand.

Saccostrea cucullata (Born)
Tridacna (Chametrachea) maxima (Röding)
Favia pallida (Dana)
Goniastraea favus Forsk

The second facies (a) is characterized by an intricate network of Callianassid-type burrows; it replaces the facies (b) toward the present-day coastline. The sediment exhibits a marked unimodal, left skewed, particle-size distribution.

It is to noted that, at the top of this unit, high density and low diversity assemblages dominated by Potamides palustris (Linnaeus) are found all over the area. This fact provides evidence of an environmental evolution from marine to swamp conditions; remnants are possibly represented nowadays by the small swamp North East of the Gesira village. The conformable contract with the overlying Ceel Baqal Sand is exposed in the Raas Aw Maki-Raas Baqal area.

The latter formations is made of calcareous, white eolian sand, characterized by a right skewed grain-size distribution; cross lamination is always observed. This unit, East and West of the type area, rests on both the Brava Sand the Raas Aw Maki Calcarenite directly.

Recent sediments mainly consist of silicate eolian sands which build up series of moving dunes over more or less wide areas. Moreover residual red clays are locally found, formed by the weathering of the feldspar-rich Brava Sand. Finally, beach sands, mostly carbonate and bioclastic are observed in bays or coves along the otherwise cliff coast.

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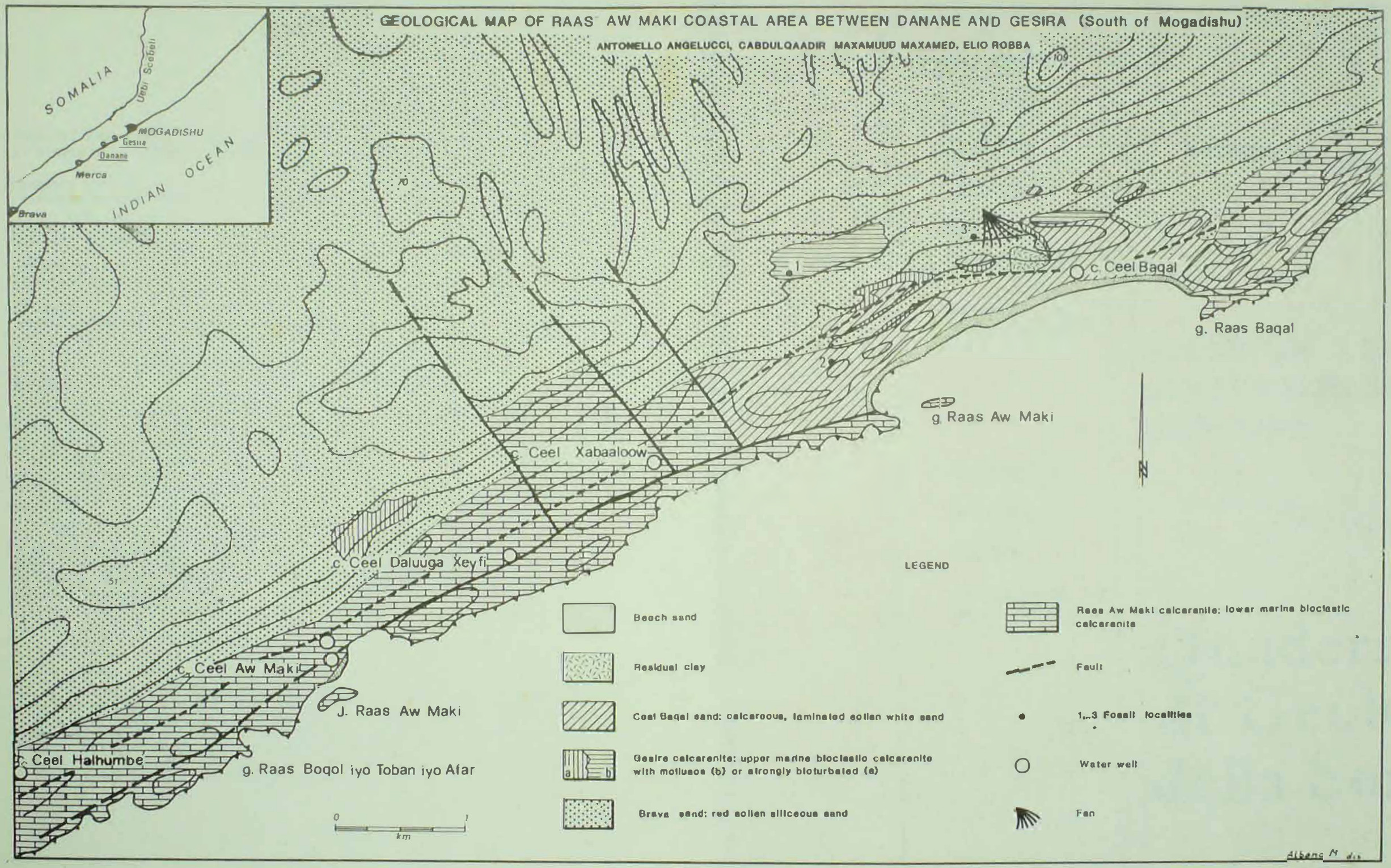
GEOLOGICAL MAP OF RAAS AW MAKI COASTAL AREA BETWEEN DANANE AND GESIRA (South of Mogadishu)

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