

Review of and Contribution to the Stratigraphy of the Cenozoic Sedimentary Rocks in the Republic of Yemen

Hamed A. El-Nakhal

*Department of Environment and Earth Science, Faculty of Science,
The Islamic University of Gaza, c/o Liaison Office of the
Islamic University, P.O. Box 447, Al-Jubaiha, Amman, Jordan*

ABSTRACT. The Cenozoic sedimentary rocks in Yemen consist of marine and nonmarine sediments. They are included within the Mudjzer (= Medj-Zir) Member, Shihr Formation and Hadhramaut and Tihamah Groups. Mudjzer (Paleocene) is the upper member of the Tawilah Formation (Cretaceous-Paleocene), and it consists of alternative sequences of marine and nonmarine sandstones. Hadhramaut Group (Paleocene-Middle Eocene) consists of carbonates and evaporites, and includes the Umm er Radhuma, Jezá, Rus, and Habshiya Formations. The Shihr Formation (Oligocene-Miocene) consists of clastics and carbonates. The Tihamah Group (Miocene-Holocene) includes the Abbas, Bađ, and Kamaran Formations. The Abbas Formation consists of continental clastics of Miocene-Holocene age. The Bađ Formation (Middle-Late Miocene) consists of evaporites and it is divided into the Qurayyah Salt Member and the overlying Harafa Gypsum Member. The Kamaran Formation consists of Quaternary reefal limestone. The Tihamah Group and all of its subdivisions (excluding the Bađ Formation) are introduced here as new units.

The Republic of Yemen occupies the southwestern corner of the Arabian Peninsula bordering the Red Sea and the Gulf of Aden (Fig. 1). It is a new country resulted from the union of the former "Yemen Arab Republic" (North Yemen), and the former "People's Democratic Republic of Yemen" (South Yemen). The present work aims to compile the available stratigraphic information on the Cenozoic sedimentary rocks in Yemen, correlate the equivalent rock units in the two parts of Yemen applying the same terminology whenever this is possible, and to give formal

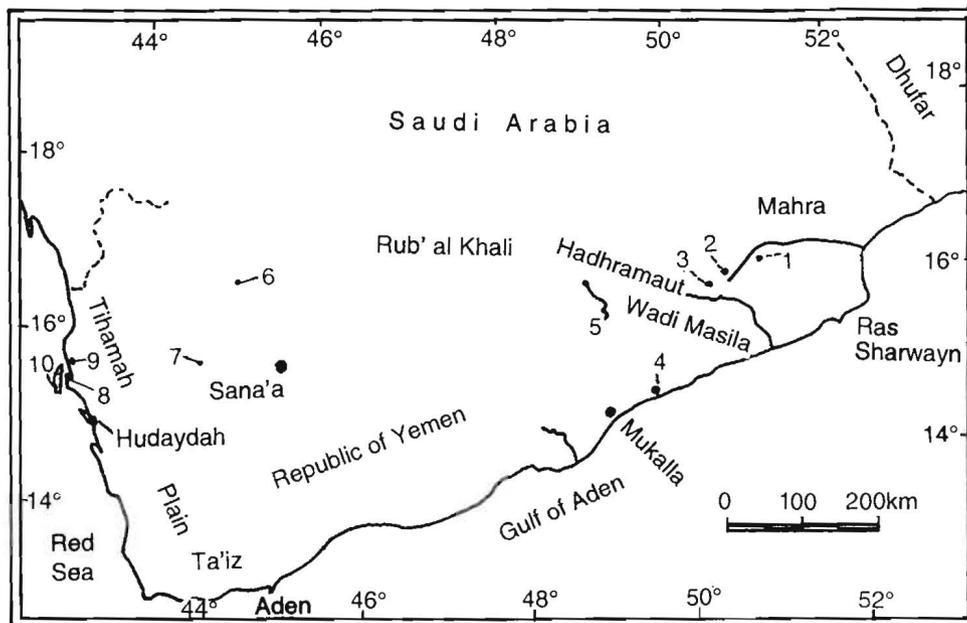


Fig. 1. Index map showing locations of the stratotypes of the Cenozoic sedimentary lithostratigraphic units in the Republic of Yemen (after Beydoun 1964, 1966, Beydoun and Greenwood 1968, Kruck *et al.* 1984, El-Nakhal 1988):

- 1) the type section of the Habshiya Formation, lat. $16^{\circ} 06' N$, long. $51^{\circ} 00' E$;
- 2) the reference section of the Rus Formation in the southern provinces, lat. $16^{\circ} 20' N$, long. $50^{\circ} 30' E$;
- 3) the type section of the Jezá Formation, lat. $15^{\circ} 50' N$, long. $50^{\circ} 15' E$;
- 4) the type area of the Shihr Formation, lat. $14^{\circ} 46' N$, long. $49^{\circ} 40' E$;
- 5) the reference section of the Umm er Radhuma Formation in the southern provinces, lat. $15^{\circ} 59' N$, long. $48^{\circ} 44' E$;
- 6) the type section of the Mudjzer (= Medj-Zir) Member, lat. $15^{\circ} 57' 49'' N$, long. $44^{\circ} 47' 47'' 11'' E$;
- 7) the type section of the Tawilah Formation, lat. $15^{\circ} 30' N$, long. $43^{\circ} 42' E$;
- 8) the reference section of the Ba'í Formation in Yemen, and the type sections of the Qurayyah and Harafa Members, lat. $15^{\circ} 19' 05'' N$, long. $42^{\circ} 41' 21'' E$;
- 9) the type section of the Abbas Formation, lat. $15^{\circ} 14' 03'' N$, long. $42^{\circ} 49' 05'' E$;
- 10) the type section of the Kamaran Formation, lat. $15^{\circ} 19' 33'' N$, long. $42^{\circ} 34' 24'' E$.

names for the informal units whenever this is necessary. In this study I shall refer to the former "Yemen Arab Republic" as the northern provinces, and the former "People's Democratic Republic of Yemen" as the southern provinces.

The Cenozoic sedimentary rocks in Yemen consist of marine and nonmarine clastics, carbonates, and evaporites. These are included within the Mudjzer (= Medj-Zir) Sandstone Member (of the Tawilah Formation), Hadhramaut Group, Shihr Formation, and Tihamah Group (Fig. 2). A discussion of the stratigraphy of each of these rock units is given below.

Age	Northern Provinces			Southern Provinces	
Holocene	TIHAMA GROUP	Abbas Formation	Kamaran Formation		TIHAMA GROUP (= post-Miocene deposits)
Pleistocene			Bad Form. Harafa Member Quarayyah Member		
Pliocene					
Miocene					
Oligocene	[Hatched Area]			Shihr Formation	
Eocene				HADHRAMAUT GROUP	
				Rus Formation	
				Jeza' Formation	
Paleocene	Tawilah Formation	Mudjzer Sandstone Member		Umm er Radhuma Formation	
Maastrichtian		Ghiras Sandstone Member	W Mukalla Formation	E Sharwayn Formation	

Fig 2. Subdivisions of the Cenozoic sedimentary rocks in Yemen.

Tawilah Formation:

The type section of this rock unit lies in Jabal Al-Tawilah 50 km northwest of Sana'a (Fig. 1, locality no. 7). It was introduced as Tawilah "Series" by Lamare *et al.* 1930, in which they included the sandstone sequence lying between the Middle-Late Jurassic Amran "Series", and the Tertiary volcanics. Also, Lamare *et al.* 1930, included within their Tawilah "Series" the underlying marls, silstones and shales which form the transitional beds. At that time, the Tawilah "Series" was believed to be nonfossiliferous, and on stratigraphical grounds it was dated as Cretaceous. In 1960, Geukens recorded marine fossils of Eocene or Paleocene age in the upper parts of the Tawilah "Series". Accordingly, he subdivided the Tawilah "Series" into a lower part corresponding to the continental sandstones, and an upper part corresponding to the marine sandstones. Also, that author restricted the term Tawilah "Series" to the lower continental part and he introduced the term "Medj-Zir Series" to accommodate the upper marine sandstones. El-Nakhal 1988, revised the original definition of the Tawilah "Series", restricted it to the sandstone sequence lying between the transitional beds below, and the Tertiary volcanics above. El-Nakhal 1988, gave the Tawilah a formational rank, and divided it into the Ghiras Sandstone Member which includes the continental sandstones (of Cretaceous age), and the "Medj-Zir" Sandstone Member which includes the marine sandstones (of Paleocene age), and this is followed in the present study. The "Medj-Zir" Member will be discussed below, whereas the Ghiras Member being of Cretaceous age will not be treated here.

Mudjzer (= Medj-Zir) Sandstone Member: It was introduced by Geukens 1960, as "Medj-Zir Series" to accommodate the alternating marine and nonmarine sandstones which bear marine fossils of Paleocene or Eocene age, and form the upper part of the Tawilah "Series". However, as this rock unit could not be mapped separately from the underlying continental sandstones (= the Ghiras Member), El-Nakhal 1988, considered it as the upper member of the Tawilah Formation.

According to Geukens 1960, 1966, the type section of the "Medj-Zir Series" lies in Al-Ghiras area at the cliffs that lie to the north of Majzir Village (lat. 15° 34' N, long. 44° 36' E). However, field work has shown that both the location and the spelling of the "Medj-Zir" or the "Majzir" Village as provided by Geukens were not accurate which made it difficult for subsequent workers to recognize the type locality and section of this rock unit during the last three decades. Recently, I have succeeded in delineating the location of the "Medj-Zir" Village whose correct name is Mudjzer (pronounced as the word number) which lies in the southern part of Al-Hazm area (Fig. 1, locality no. 6), and not in Al-Ghiras area as was mentioned by Geukens. Therefore, I suggest that the "Medj-Zir Series" of Geukens 1960, 1966, and

“Medj-Zir” Sandstone Member of El-Nakhal 1988, be replaced by the term Mudjzer Sandstone Member, and this is followed in the present study.

At its type locality the present member includes alternative sequences of marine and nonmarine sandstones and consists of about 120 m of white, usually fine- to medium-grained, compact occasionally gravelly sandstones, with clay, siltstone and shale interbeds. The lower parts bear marine fossils; the uppermost part contains ferruginous, spherulitic concretions and nodules which appear to be a paleosol that covered the area before the extrusion of the Tertiary volcanics. The Mudjzer Member extends conformably above the Ghiras Member and below the Yemen Volcanics. The recorded macro- and microfossils date the present member as Paleocene (Geukens 1960, 1966, El-Nakhal 1988).

The occurrence of the Mudjzer Member is restricted to the northern provinces mainly in the central and northern parts around Sana'a basin (Fig. 1). This indicates that the marine transgression which took place during the Paleocene, and led to the deposition of the sandstones of the Mudjzer Member was of limited geographical distribution.

Hadhramaut Group:

This group was introduced by Wetzel and Morton in 1948, in an unpublished report (cited in Beydoun and Greenwood 1968). It includes the sedimentary rocks which were laid down after the end of the Maastrichtian, and range in age between the Paleocene and Middle Eocene. It is recognized in the eastern parts of the southern provinces of Yemen, and in Dhofar (in Oman). In its full development, the group reaches a thickness of 818 m. It shows some variation in facies, but the overall lithology is the same throughout. The present rock unit consists of marine limestone and dolomite, and evaporites in its upper part. Beydoun 1966, and Beydoun and Greenwood 1968, divided the Hadhramaut Group into four formations which are from base to top, the Umm er Radhuma, Jezá, Rus, and Habshiya Formations.

Umm er Radhuma Formation:

The Umm er Radhuma Formation was named by Henry and Brown in 1935, in an unpublished report (cited in Powers *et al.* 1966, Powers 1968), for the Umm Radhumah wells in Saudi Arabia (lat. 28° 41' N, long. 44° 41' E). The stratotype consists of poorly fossiliferous limestone and dolomite. It is widely exposed in central Saudi Arabia, and widespread in the subsurface, being recognized in well sections throughout the Rub' al Khali, eastern Arabia, and Arabian Gulf areas. On the basis of its fossil content, it was dated as Paleocene-Early Eocene.

A reference section for the Umm er Radhuma Formation in the southern provinces of Yemen was designated in the cliff face east of Say'un, Wadi Hadhramaut (Fig. 1, locality no. 5). This section was described by Wetzel and Morton in 1948, in an unpublished report, under the obsolete name "Saiun Limestone" (Beydoun 1964, Beydoun and Greenwood 1968). It attains a thickness of 215 m and consists of basal dolomite and shale, overlain by fine-grained, nodular, marly, massive, locally dolomitic, occasionally with calcite veins and chert vugs, limestone. The formation occurs in the eastern parts of the southern provinces. It is apparently conformably underlain by the Mukalla Formation, and conformably overlain by the Jezá Formation. The Umm er Radhuma Formation in Yemen has yielded a rich assemblage of fossils which dates it as Paleocene (Beydoun 1966, Beydoun and Greenwood 1968).

Jezá Formation:

This formation is easily distinguished in western Al-Mahra and Hadhramaut where it forms mesalike landscape on the underlying Umm er Radhuma Formation. It is not recognized in the easternmost parts of Al-Mahra. The Jezá Formation was introduced by Wetzel and Morton in 1948, in an unpublished report. Later in 1964, it was emended by Beydoun. The stratotype lies in south Al-Mahra, in Wadi Hibun (Fig. 1, locality no. 3). It consists of 133 m of alternations of fossiliferous papery yellow and pink shale, some marl and thin bands of limestone, chalky to crystalline limestone, locally silicified and with bands of chert and some gypsum bands near the top. It conformably extends between the underlying Umm er Radhuma Formation, and the overlying Rus Formation. On the basis of its fossil content the present formation was assigned to the Early Eocene. However, in Ras Sharwayn and some localities in Hadhramaut, the basal part extends down to the Paleocene (Beydoun 1966, Beydoun and Greenwood 1968).

In the coastal Mahra, at Ras Darja, the Jezá Formation is divisible into two parts: a lower consisting of 87 m of limestone, marl, and marly limestone; and an upper consisting of 65 m of thin bedded dolomitic to chalky limestone.

Rus Formation:

The stratotype of this formation lies in the Dammam Dome in Saudi Arabia (lat. 26° 19' 04" N, long. 50° 07' 51" E). It was introduced by Bramkamp in an unpublished report in 1946 (cited in Powers *et al.* 1966, Powers 1968). Its exposures in Saudi Arabia are limited to a narrow band near Wadi as Sahba, and in the core of the Dammam Dome, but it is widespread in the subsurface. At its type area it consists of 57 m of unfossiliferous limestones and marls, with occasional geodal

quartz and irregular masses of crystalline gypsum. On stratigraphical grounds this formation in Saudi Arabia was assigned to the Early Eocene.

In Yemen, the exposures of the Rus Formation are recognized in the eastern parts of the southern provinces. A reference section for this formation was designated in Wadi Hibun, south Mahra (Fig. 1, locality no. 2). This section was described by Wetzel and Morton in 1948, in an unpublished report, under the obsolete term "Hiboun Gypsum Member". It consists of 138 m of bedded to massive gypsum with occasional bands of chert and dolomitic limestone at the base and top. It extends conformably over the Jezá Formation, and below the Habshiya Formation. In north Al-Mahra, the Rus Formation bears the dwarf echinoid *Sismondia polymorpha* Duncan and Sladen, of probable Early Eocene age. This is in addition to sparse nondiagnostic fossils present in the limestone interbeds. On the basis of its stratigraphical position this formation in Yemen was assigned to the Early Eocene (Beydoun 1964, Beydoun and Greenwood 1968).

Habshiya Formation:

The Habshiya Formation was introduced by Beydoun 1964, to replace the obsolete term "Upper Jezá Marl Formation" described by Wetzel and Morton in 1948, in an unpublished report. It is well exposed in the eastern parts of the southern provinces and in Dhufar (Oman), but absent in the western parts. The stratotype lies along the southern side of Wadi Ghadun in Mahra (Fig. 1, locality 1). It consists of 224 m of fossiliferous grey-green, yellow and pink papery shale, and yellow, chalky and gypsiferous marl alternating with limestone and chalky and dolomitic limestones; the shale and marl are dominant in the lower half. This formation is conformably underlain by the Rus Formation, and it is generally not overlain by other units, but occasionally unconformably overlain by the Shihr Formation or younger sediments. The Habshiya Formation has yielded a rich assemblage of fossils which dates it as Lutetian (Middle Eocene), (Beydoun 1966, Beydoun and Greenwood 1968).

Shihr Formation:

The Shihr Formation includes a sequence of sedimentary rocks of varied lithology occurring in scattered generally scree-covered outcrops that form part of a depositional sequence laid down in coastal embayments after the emergence of the eastern parts of the southern provinces of Yemen in the terminal Eocene. This formation was briefly described as Shihr Beds from the area near Shihr, coastal Hadhramaut (Fig. 1, locality no 4), by Wetzel and Morton in 1948, in an unpublished report. It was later emended by Beydoun 1964, who treated it as a

group. However, as the work done on the deposits included within this unit was insufficient for subdividing them into formations, the Shihr is given here a formational rank. The Shihr Formation is well exposed in Hadhramaut and Mahra. Due to the diversity of its lithology, it was not given a type section. Its thickness is variable being not less than 60 m to over 450 m. It consists of conglomerate, sandstone, marl, gypsum, reefal limestone, chalky limestone. The contact with the underlying sedimentary rocks is unconformable. Usually the formation is not overlain by other rock units, but occasionally it is unconformably overlain by Pleistocene organic reefs. The Shihr Formation has yielded numerous fossils which date it as Oligocene-Miocene, though its age may be locally as high as Pliocene (Beydoun 1966, Beydoun and Greenwood 1968).

Tihamah Group:

This group is introduced as a new rock unit to accommodate the syn-and post-rift sedimentary successions in the Republic of Yemen which constitute the coastal plains bordering the Red Sea (Tihamah Plain) and the Gulf of Aden. The Tihamah Plain (Fig. 1) is designated as the type area. On the basis of its stratigraphical position, and the few fossils recorded in some of its components, the Tihamah Group is dated as Miocene-Holocene. According to this definition, the Mudjzer (= Mudj-Zir) Member which includes pre-rift sandstones of Paleocene age, is excluded from the present group.

Rocks correlatable with the Tihamah Group in the southern provinces were included within the informal term "post -Miocene deposits" of Beydoun 1964.

The Tihamah sequence can be divided into three main types of sediments which are: 1) continental clastics, 2) evaporites and 3) organic reefs. Each of these types is given a formational rank, and they are formally named as Abbas, Bad and Kamaran Formations, respectively. The Bad Formation is furthermore, subdivided into the Qurayyah Salt Member, and the overlying Harafa Gypsum Member.

Abbas Formation:

This new formation is introduced to include the syn-and post-rift continental clastics which constitute the coastal plains of the Red Sea and the Gulf of Aden. The Type area lies in the Tihamah Plain. The surface and subsurface sequences lying around the Ibn Abbas Village (Fig.1, locality no. 9) constitute the type section of this new unit. It consists of valley-fill alluvial deposits including poorly sorted clastics such as gravel, sand, silt, and clay. The size of the fragments shows a tendency to decrease seawards. Occasionally in the regions adjacent to the sea shores, the uppermost parts of this formation consists of fine clastics saturated with brine and

salt encrusted in mud flats (sabkhas) periodically flooded. The formation of these sabkhas refers to the infiltration of seawater as a result of tidal storms.

The thickness of the Abbas Formation is variable. In Tihamah Plain it increases gradually westwards. Geophysical information indicates that the formation reaches its maximum thickness near the coasts of the Red Sea where it was estimated as 5000 m (Tesco 1971). A similar thickness was also mentioned for equivalent sediments in Jizan area, Saudi Arabia (Jado and Zötl 1984).

On the basis of its stratigraphical position, the Abbas Formation is assigned to the Miocene-Holocene. Its lower contact is not exposed. Geophysical information however, indicates that the formation is underlain either by dense marine sediments or weathered basement rocks (Tesco 1971). In both cases, the contact is considered as being unconformable. Usually the present rock unit is not overlain by other units. Occasionally it is unconformably overlain by Holocene sand dunes.

Bad' Formation:

The evaporitic sequence which is intermittently exposed along the coastal region of the northern parts of the Tihamah Plain in Yemen, is correlated with and named after the Bad' Formation of Saudi Arabia. This sequence however, was previously correlated with the Baid Formation of Saudi Arabia (Grolier and Overstreet 1978, Kruck *et al*, 1984), but as the two units are lithologically different, that correlation is not followed in the present study. In 1982, Abou-Khadrah introduced the term Salif Evaporites for the present sequence. However, as the Bad' Formation was introduced in 1981, it has the date priority, and therefore, Abou-Khadrah's term becomes a junior synonym.

The Bad' Formation was introduced by Bokhary 1981, to accommodate the evaporites which form the upper part of the Raghama Group (Miocene) in Saudi Arabia. Its type area lies in the Midyan region and it was named after the Bad' Village which lies about 20 km east of the Gulf of Aqabah. In its type area the Bad' Formation consists of evaporites with marl and shale at its lower part.

The sequence of evaporites which is exposed and quarried in the Salif Village (Fig. 1, locality no. 8), is designated as the reference section of the Bad' Formation in the Republic of Yemen. The Salif Village lies about 62 km north of Hudaydah City.

The exposed part of the reference section (base not exposed) consists of about 120 m of coarse-grained, recrystallized rock salt (halite), with thin interbeds of pyritic black shale, followed upwards by about 10-20 m of whitish, light brown

gypsum beds and gypsiferous clastics. The formation is disconformably overlain by marine sediments bearing microfauna of Pliocene age (Grolier and Overstreet 1978). On the basis of the recorded microflora, the evaporites of the Bad Formation were assigned to the Middle-Late Miocene (Grolier and Overstreet 1978). In Yemen, the present formation is intermittently exposed along the coastal region particularly in the northern parts of the Tihamah Plain, and on the basis of its lithologic characteristics it is subdivided into the Qurayyah Salt Member, and the overlying Harafa Gypsum Member.

Qurayyah Salt Member: This new member is introduced to include the lower part of the Bad Formation in Yemen. It consists of 120 m of coarse-grained, recrystallized rock salt (halite), with thin interbeds of pyritic black shale. Its base is not exposed, and it is conformably overlain by the Harafa Gypsum Member. The type section includes the lower part of the rock salt and gypsum quarry which lies in the Salif Village (Fig. 1 locality no. 8). It is named after the Qurayyah Village which lies about one km east of the Salif Village. Its microfossils, age, and distribution are similar to those of the Bad Formation in Yemen.

Harafa Gypsum Member: The Harafa Member is suggested as a new unit to accommodate the upper part of the Bad Formation in Yemen. Its type section lies in the upper part of the Salif rock salt and gypsum quarry (Fig. 1, locality no. 8). It is named after Ras Harafa which lies about 6 km northeast the Salif Village. The member consists of about 10-20 m of whitish and light brownish gypsum and gypsiferous clastics. It is conformably underlain by the Qurayyah Salt member. Its upper contact, microfossils, age and distribution are as those of the Bad Formation in Yemen.

Kamaran Formation:

This new formation includes the organic reefs which constitute the Kamaran Island and the other similar islands in Yemen. Its stratotype consists of the surface and subsurface sequences of the organic reefs which form Kamaran Island (Fig. 1, locality no. 10). It consists of yellow, green, marly limestone, and reefal limestone. The formation is rich with both fossil and Holocene exoskeletons of benthic marine organisms which date it as Pleistocene- Holocene (Macfadyen 1930, Cox 1931, Brighton 1931).

The Kamaran Formation is not overlain by other rock units. Its base is not exposed but its thickness may reach 300 m (Ours 1976, Ishutin 1982). A similar thickness was recorded for equivalent organic reefs that form the Farasan Islands in Saudi Arabia (Jado and Zötl 1984).

Remarks: The emergence of the organic reefs of the Kamaran Island may be due to eustatic variations in the sea level. Alternatively, this may be partly or additionally, due to tectonic uplifting and salt ascent. The shape and position of Kamaran Island parallel to the Red Sea Graben substantiates a tectonic development.

Summary and Conclusions

The revision of the stratigraphy of the Cenozoic sedimentary rocks in the Republic of Yemen has led to the following conclusions:

- The Cenozoic Erathem consists of wide variety of sedimentary rocks including carbonates, evaporites and marine and nonmarine clastics.
- A limited marine transgression took place during the Paleocene in the northern provinces when the Mudjzer (Mudj-Zir) Sandstone Member was laid down in Sana'a area.
- In the southern provinces, the Cenozoic marine sediments (Hadhramaut Group of Paleocene-Middle Eocene age, and the Shihr Formation of Oligocene-Miocene age), are confined to the eastern parts.
- In conjunction with the fracturing and rifting of the Gulf of Aden-Red Sea Grabens, a rapid subsidence of this zone took place in a series of secondary grabens which were filled with the thick evaporites of the Bad' Formation (Middle-Late Miocene), and the enormous volumes of clastics of the Abbas Formation (Miocene-Holocene), carried by the rivers which adjusted the new topography. This was associated with considerable igneous activity in the western parts of Yemen.
- During the Quaternary, the organic reefs of the Kamaran Formation developed, and rivers continued to fill the eastern parts of the Tihamah Plain.

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مراجعة وإضافة لطبقية صخور حقب الحياة الحديثة الرسوبية في الجمهورية اليمنية

حامد أحمد النخال

قسم البيئة وعلوم الأرض - كلية العلوم - الجامعة الإسلامية - غزة
بواسطة مكتب ارتباط الجامعة الإسلامية - ص. ب. (٤٤٧) - الجبيلة - عمان - الأردن

يضم حقب الحياة الحديثة مجموعة متباينة من الصخور الرسوبية التي يمتد عمرها من الباليوسين حتى الحديث . وقد وُضِعَتْ هذه الصخور في عدد من الوحدات الصخرية وهي عضو مجزر الرملي ، وتكوين الشحر ، ومجموعتي حضرموت وتهامة .

إن عضو مجزر الرملي هو العضو العلوي من تكوين الطويلة (طباشيري - باليوسين) ، ويضم تتابعات متبادلة من الصخور الرملية القارية والبحرية التي تحمل أحافير بحرية مثل الفورامينيفرا والقواقع التي على أساس وجودها نُسِبَ عمره إلى الباليوسين ، ويقتصر وجوده على حوض صنعاء والمناطق المجاورة .

وتتكون مجموعة حضرموت من كربونات ومتبخرات وطين صفائحي ، وينحصر وجودها على المحافظات الجنوبية من اليمن ، وتدل الأحافير التي تحملها هذه المجموعة الصخرية بأن عمرها الجيولوجي يمتد من الباليوسين إلى أواسط الأيوسين . وتضم مجموعة حضرموت أربعة تكوينات وهي أم الرضومة ، وجزع ، ورض ، وحبشية . يتبع تكوين أم الرضومة عهد الباليوسين ، ويتكون من دولومايت وصخور جيرية وطين صفائحي . أما

تكوين جزع فيتكون من طين صفائحي ومارل وصخور جيرية . كما يتكون تكوين رص من الجبس ، وقد نُسبَ عمر تكويني جزع ورص إلى أوائل الأيوسين . ويتكون تكوين حيشية من طين صفائحي ومارل وصخور جيرية وقد نُسبَ عمره إلى أواسط الأيوسين .

أما تكوين الشحر فيتكون من فتاتيات ومتبخرات يمتد عمرها من الأوليجوسين حتى نهاية الميوسين ، وتوزيع صخور تكوين الشحر يشبه مجموعة حضر موت حيث يقتصر وجوده على المحافظات الجنوبية .

وتضم مجموعة تهامة (ميوسين - حديث) تكوينات عباس ، والبَدْع ، وكمران . يتكون تكوين عباس (ميوسين - حديث) من الفتاتيات القارية التي تملأ منخفض منطقة البحر الأحمر وخليج عدن . كما يتكون تكوين البَدْع (أواسط وأواخر الميوسين) من رواسب من الملح الصخري يعلوها طبقات من الجبس . وقد وُضِعَتُ الرواسب الملحية في عضو القرية كما وُضِعَتُ طبقات الجبس في عضو حرقاً . وتنتشر مكاشف تكوين البَدْع بشكل متقطع في الأجزاء الشمالية من سواحل البحر الأحمر في اليمن . أما تكوين كمران فيضم الشعاب العضوية التي تكون جزيرة كمران والجزر المشابهة والتي تتبع في عمرها العصر الرباعي .

إن مجموعة تهامة وجميع أقسامها (باستثناء تكوين البَدْع) هي وحدات صخرية جديدة تقترح لأول مرة في البحث الحالي .