

Recent Foraminiferida from the Sea Shores of Yemen Arab Republic, Part I: The Genus QUINQUELOCULINA

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More than 100 foraminiferid species have been recorded from four sandy samples collected from different localities along the nearshore zone of the southeastern Red Sea, Yemen Arab Republic. Twenty six species of these belong to the genus *QUINQUELOCULINA* d'Orbigny which are discussed here and illustrated.

The present work is a reconnaissance study aimed at recording the existing foraminiferida in the nearshore zone of the southeastern Red Sea, Yemen Arab Republic. Limited by the nature of samples, no attempt has been made to explain the environmental factors affecting their distribution. Literature survey shows that no similar studies have been previously carried out on this part of the Red Sea.

All the recorded species will be discussed in three successive parts: Part 1, the present part, is devoted to the genus *QUINQUELOCULINA* d'Orbigny, Part 2 will be concerned with the genus *Triloculina* d'Orbigny and Part 3 will treat the remaining genera.

Methods of Study

Four sandy samples were collected during the period February-April 1978, from the sea shore at Salif, Hudaydah, Zabeed and Mukha (Fig. 1). These samples were collected from nearshore areas at about 1.5 m water depth. One hundred grams of each of the original sandy samples were treated for studying their foraminiferid content and they were hand picked under the binocular microscope. Several species

were identified by using the catalogue of foraminifera (Ellis and Messina 1940). All the recorded species were drawn by the author from camera lucida. The frequency of these forms in the different localities, is shown in Table 1. The illustrated specimens are deposited in the Department of Geology, Sana'a University.

Systematic Descriptions

The systematic position of the genus *Quinqueloculina* d'Orbigny is according to the classification Loeblich and Tappan (1964).

Order FORAMINIFERIDA Eichwald 1830
Suborder MILIOLINA Delage and Hérourard 1896
Superfamily MILIOLACEA Ehrenberg 1839
Family MILIOLIDAE Ehrenberg 1839
Subfamily QUINQUELOCULININAE Cushman 1917
Genus QUINQUELOCULINA d'Orbigny 1826

Quinqueloculina agglutinata Cushman
pl. 4, Fig. 10 - 12

Quinqueloculina agglutinata Cushman 1917, p. 43, Pl. 9, Fig. 2.

Quinqueloculina agglutinata Cushman, Haman 1966, p. 68, Pl. 7, Fig. 2 - 4.

Quinqueloculina agglutinata Cushman, Murray 1969, p. 416 (no Fig.)

Quinqueloculina agglutinata Cushman, Sen Gupta 1971, p. 85 (no Fig.)

Remarks

Q. agglutinata is characterised by the presence of a large amount of the agglutinated material in the wall of its test. So, this species, as well as the similar forms such as *Q. sabulosa* Cushman which is recorded in the present study, represents a transitional stage between the genus QUINQUELOCULINA d'Orbigny and the genus *Dentostomina* Carman.

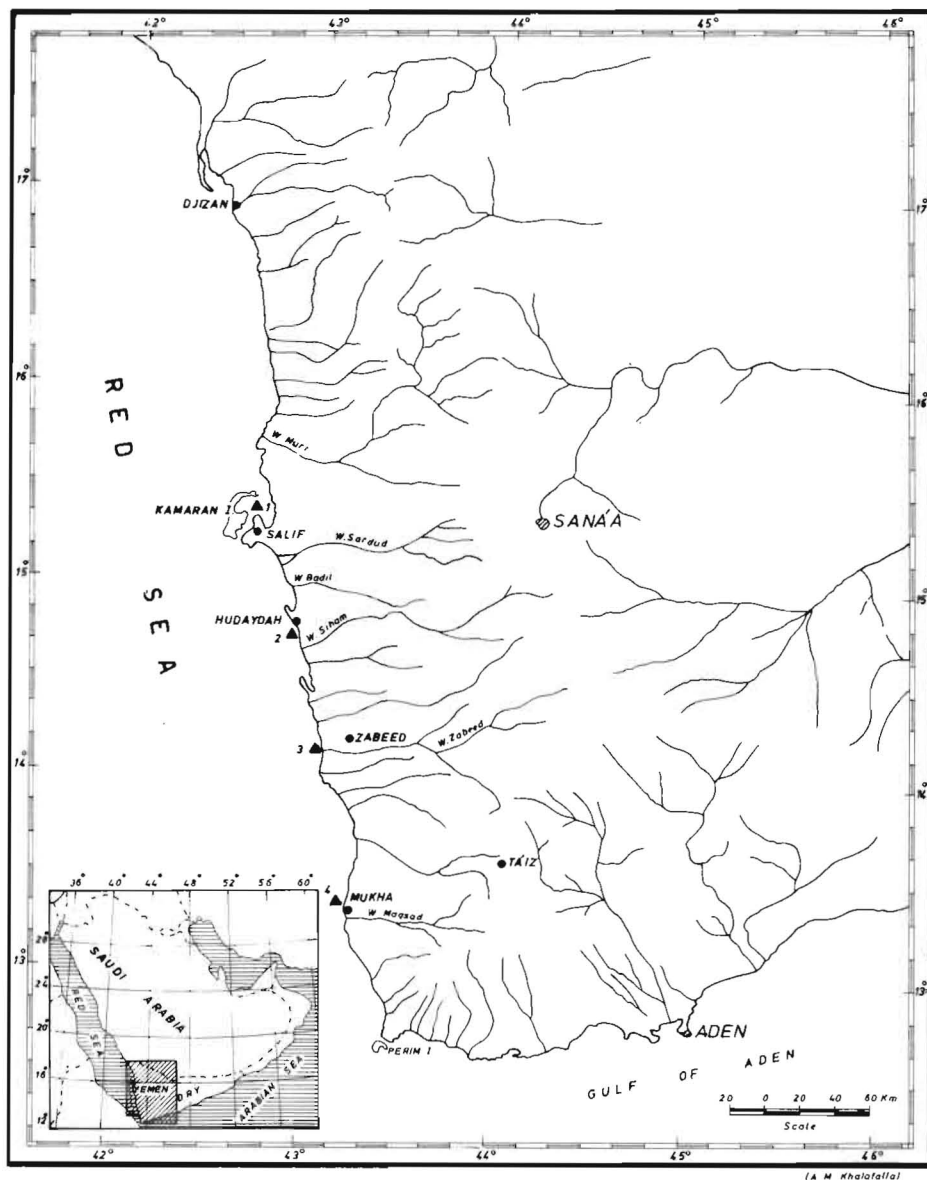
The present species was originally described from off Alaska (Cushman 1917). It was later recorded from Denmark (Haman 1966), the Atlantic continental shelf of the U.S.A. (Murray 1969) and Newfoundland (Sen Gupta 1971). In Yemen, *Q. agglutinata* occurs in all of the studied samples.

Quinqueloculina bellatula Bandy
pl. 5, Fig. 1 - 3

Quinqueloculina akneriana d'Orbigny var. *bellatula* Bandy 1950, p. 273. pl. 41, Fig. 1.

Quinqueloculina bellatula Bandy, Arnal 1958, p. 39, pl. 10, Fig. 13 - 15.

Quinqueloculina akneriana d'Orbigny var. *bellatula* Bandy, Bandy 1961, p. 16, pl. 1, Fig. 1.



Text-Fig. 1. Sample collecting localities, Yemen Arab Republic.

Table 1. The frequency of the recorded species in the studied localities.

		Sample No	1	2	3	4
Species	Locality	Salif	Hudaydah	Zabeed	Mukha	
<i>Q. agglutinata</i>		F	F	A	A	
<i>bellatula</i>		F	F	F	A	
<i>disparilis</i>		—	F	R	F	
<i>distorqueata</i>		A	A	A	A	
<i>flavescens</i>		F	F	F	A	
<i>granuloscostata</i>		C	C	A	C	
<i>jugosa</i>		—	R	—	R	
<i>laevigata</i>		F	F	R	A	
<i>lamarckiana</i>		A	A	A	A	
<i>lata</i>		—	R	R	R	
<i>mosharrafai</i>		A	R	F	F	
<i>multimarginata</i>		—	R	R	—	
<i>neostraitula</i>		R	R	R	—	
<i>parkeri</i>		F	F	F	F	
<i>plicosa</i>		R	R	F	—	
<i>poeyana</i>		R	R	—	R	
<i>polygona</i>		F	F	A	F	
<i>sabulosa</i>		—	R	—	—	
<i>seminulum</i>		F	F	A	A	
<i>subcuneata</i>		—	R	—	F	
<i>subdecorata</i>		—	R	—	—	
<i>triangularis</i>		F	F	F	A	
<i>trigonula</i>		A	A	A	A	
<i>tropicalis</i>		R	R	R	—	
<i>undulosecostata</i>		—	R	R	A	
<i>venusta</i>		R	—	R	R	

R = Rare: 1 - 4 specimens. F = Frequent: 5 - 15 specimens.

A = Abundant: over 15 specimens.

Quinqueloculina akneriana d'Orbigny var. *bellatula* Bandy, Lankford and Phleger 1973, p. 125, pl. 2, Fig. 7.

Remarks

Bandy (1950) described this species from the Pleistocene of Oregon. It was later recorded from California (Arnal 1958; Bandy 1961) and western North America (Lankford and Phleger 1973). In Yemen, it occurs in the four studied localities.

Quinqueloculina disparilis d'Orbigny

Pl. 2, Fig. 4 - 6

Quinqueloculina disparilis d'Orbigny, 1893, p. 70.

Remarks

Q. disparilis was recorded from the Gulf of Marseilles, France (d'Orbigny 1893). In the present study, it is recorded in samples no. 2, 3 and 4.

Quinqueloculina distorteata Cushman

Pl. 3, Fig. 4 - 6

Quinqueloculina distorteata Cushman 1954 (in Cushman, Todd and Post) p. 333, pl. 83, Fig. 27.

Remarks

The present species was described from Marshall Islands (Cushman 1954). In the studied samples, *Q. distorteata* occurs as an abundant form.

Quinqueloculina flavescens d'Orbigny

Pl. 5, Fig. 10 - 12

Quinqueloculina flavescens d'Orbigny 1905, p. 68, Pl. 4, Fig. 4.

Remarks

Q. flavescens was originally described from Madagascar (d'Orbigny 1905). In Yemen, it is recorded in all of the studied localities.

Quinqueloculina granulocostata Germeraad

Pl. 1, Fig. 13 - 15

Quinqueloculina granulocostata Germeraad 1946, p. 63, pl. 6, Fig. 15-20.

Remarks

The present species was described from Indonesia (Germeraad 1946). In Yemen, *Q. granulocostata* is recorded in the four studied samples.

Quinqueloculina jugosa Cushman

Pl. 2, Fig. 1 - 3

Quinqueloculina seminulum (Linné) var. *jugosa* Cushman 1944, p. 13, pl. 2, Fig. 15.*Quinqueloculina seminulum* (Linné) var. *jugosa* Cushman, Miller 1953, p. 52, pl. 8, Fig. 5.*Remarks*

Cushman (1944) described the present species from the Recent deposits of the New England Coast. It was later recorded from northern Carolina (Miller 1953). In the present study, *Q. jugosa* occurs as a rare form in samples no. 2 and 4.

Quinqueloculina laevigata d'Orbigny

Pl. 5, Fig. 4 - 6

Quinqueloculina laevigata d'Orbigny 1939, p. 143, Pl. 3, Fig. 31 - 33.*Quinqueloculina laevigata* d'Orbigny, Boltovskoy and Lena 1970, p. 153, pl. 19, Fig. 19 - 21.*Quinqueloculina laevigata* d'Orbigny, Lankford and Phleger 1973, p. 126, pl. 2, Fig. 5 - 6.*Quinqueloculina laevigata* d'Orbigny, Cherif and Flick 1974, p. 240, pl. 2, Fig. 1 - 5.*Quinqueloculina laevigata* d'Orbigny, Scott *et al.* 1976, p. 89 (no Fig.)*Remarks*

Q. laevigata was described from the Holocene of the Canary Islands and the Tertiary of Paris (d'Orbigny 1839). It was later recorded from the Recent deposits of: Argentine (Boltovskoy and Lena 1970), western North America (Lankford and Phleger 1973), Greece (Cherif and Flick 1974) and southern California (Scott *et al.* 1976). In Yemen, *Q. laevigata* occurs in the four studies samples.

Quinqueloculina lamarckiana d'Orbigny

Pl. 4, Fig. 13 - 15

Quinqueloculina lamarckiana d'Orbigny 1839, p. 189, Pl. 11, Fig. 14, 15.*Quinqueloculina lamarckiana* d'Orbigny, Bandy 1953, p. 177, Pl. 21, Fig. 3.*Quinqueloculina lamarckiana* d'Orbigny, Miller 1953, p. 51, Pl. 7, Fig. 8.*Quinqueloculina lamarckiana* d'Orbigny, Bhatia 1956, p. 17, Pl. 2, Fig. 10.*Quinqueloculina lamarckiana* d'Orbigny, Bandy 1961, p. 16, Pl. 1, Fig. 10.*Quinqueloculina lamarckiana* d'Orbigny, Murray 1969, p. 401, (no Fig.)*Quinqueloculina lamarckiana* d'Orbigny, Lankford and Phleger 1973, p. 126, Pl. 1, Fig. 23.*Quinqueloculina lamarckiana* d'Orbigny, Brooks 1973, p. 391 (no Fig.).

Quinqueloculina lamarckiana d'Orbigny, Scott *et al.* 1976, p. 63 (no Fig.).

Quinqueloculina lamarckiana d'Orbigny, Lohmann 1978, p. 25 (no Fig.).

Remarks

This cosmopolitan species was described from the recent deposits Cuba and Jamaica (d'Orbigny 1839). It was later recorded from the Holocene of several parts of the world such as: California (Bandy 1953, 1961; Scott *et al.* 1976), Carolina (Miller 1953), West India (Bhatia 1956), the Atlantic continental shelf of U.S.A. (Murray 1969), western North America (Lankford and Phleger 1973) and Puerto Rico (Books, 1973). In the present study, *Q. lamarckiana* occurs as an abundant form in the four localities.

Quinqueloculina lata Terquem

Pl. 3, Fig. 7 - 9

Quinqueloculina lata Terquem 1876, p. 82, Pl. 11, Fig. 8.

Quinqueloculina lata Terquem Murray 1969, p. 416 (no Fig.).

Quinqueloculina lata Terquem, Murray 1970, p. 485 (no Fig.).

Quinqueloculina lata Terquem, Rouvillois 1970, p. 196 (no Fig.).

Quinqueloculina lata Terquem, Rao and Rao 1974, p. 407 (no Fig.).

Quinqueloculina lata Terquem, Levy *et al.* 1975, p. 172, Pl. 1, Fig 3 - 5, 8 - 9.

Quinqueloculina lata Terquem, Haward and Haynes, 1976, p. 34 (no Fig.)

Remarks

Q. lata occurs as a rare form in the studied localities no. 2, 3 and 4. It was previously recorded from the Holocene deposits of France (Terquem 1876; Rouvillois 1970; Levy *et al.* 1975), the Atlantic continental shelf of U.S.A (Murray 1969), the English Channel (Murray 1970), East India (Rao and Rao 1974) and Plymouth and Cardigan Bay, U.K. (Haward and Haynes 1976).

Quinqueloculina mosharrafai Said

Pl. 1, Fig. 16-18

Quinqueloculina mosharrafai Said 1949, p. 10, Pl. 1, Fig. 23.

Quinqueloculina cf. *mosharrafai* Said, Bhatia 1956, p. 17, Pl. 2, Fig. 11.

Remarks

This form was described from northern Red Sea (Said 1949). It was later recorded from western India (Bhatia 1956). In the present study, it is recorded in the four localities.

Quinqueloculina multimarginata Said

Pl. 3, Fig. 10-12

Quinqueloculina multimarginata Said 1949, p. 10, Pl. 1, Fig. 34.

Remarks

Rare specimens of this form have been recorded in samples no. 2 and 3. It was originally described from the Recent deposits of northern Red Sea (Said 1949).

Quinqueloculina neostraitula
Thalmann Pl. 1, Fig. 1-3

Quinqueloculina straitula Cushman 1932 (non Deshayes, 1931), p. 27, Pl. 7, Fig. 3, 4.
Quinqueloculina straitula Cushman, Said 1950, p. 5, Pl. 1, Fig. 9.
Quinqueloculina neostraitula Thalmann 1950, p. 45.

Remarks

The present species was described from the recent deposits of Fiji Islands, Pacific Ocean (Cushman 1932) as *Q. straitula*. Thalmann (1950) discovered that this name had been preoccupied by *Q. straitula* Deshayes, 1831. So, Thalmann (*op. cit.*) introduced *Q. neostraitula* as a new name. This form was also recorded from northern Red Sea (Said 1950). In Yemen, *Q. neostraitula* occurs as a rare form in localities no. 1, 2 and 3.

Quinqueloculina parkeri (Brady)
Pl. 1, Fig. 10-12

Miliolina parkeri Brady, 1881, p. 46.
Quinqueloculina parkeri (Brady), Said 1950, p. 5, Pl. 1, Fig. 8.
Quinqueloculina parkeri (Brady), Hughes 1977, p. 53, Pl. 2, Fig. 44, 45.

Remarks

Q. parkeri has been recorded as a frequent form in all of the studied samples. It was previously described from Hawaii Islands (Brady 1881), northern Red Sea (Said 1950) and Solomon Islands (Hughes 1977).

Quinqueloculina plicosa Costa
Pl. 1, Fig. 7-9

Quinqueloculina plicosa Costa 1856, p. 322, Pl. 25, Fig. 2, 5, 7.

Remarks

This form was described from Italy (Costa 1856). In the present study, *Q. plicosa* occurs in samples no. 1, 2 and 3.

Quinqueloculina poeyana d'Orbigny
Pl. 2, Fig. 7-9

Quinqueloculina poeyana d'Orbigny, 1839, p. 191, Pl. 11, Fig. 25-27

Quinqueloculina poeyana d'Orbigny, Miller 1953, p. 52, Pl. 8, Fig. 2.

Quinqueloculina poeyana d'Orbigny, Bandy 1961, p. 16, Pl. 2, Fig. 4.

Quinqueloculina poeyana d'Orbigny, Murray 1969, p. 416 (no Fig.).

Remarks

In Yemen, *Q. poeyana* occurs as a rare form in samples no. 1, 2 and 4. It was previously recorded from the Recent deposits of Cuba (d'Orbigny 1839), north Carolina (Miller 1953), California (Bandy 1961) and the Atlantic continental shelf of U.S.A. (Murray 1969).

Quinqueloculina polygona d'Orbigny

Pl. 4, Fig. 4-6

Quinqueloculina polygona d'Orbigny 1839, p. 198, Pl. 8, Fig. 21-23.

Quinqueloculina polygona d'Orbigny, Brooks 1973, p. 406, Pl. 6, Fig. 19, 20.

Remarks

The present species was described from the recent deposits of Cuba and Jamaica (d'Orbigny 1839). It was later recorded from the Holocene of Puerto Rico (Brooks 1973). In the present study, *Q. polygona* occurs in the four localities.

Quinqueloculina sabulosa Cushman

Pl. 4, Fig. 7-9

Quinqueloculina sabulosa Cushman 1947, p. 87, Pl. 18, Fig. 22.

Quinqueloculina sabulosa Cushman, Lankford and Phleger 1973, p. 126, Pl. 2, Fig. 4.

Remarks

Q. sabulosa was described from the recent deposits of the coast of Carolina (Cushman 1947). It was later recorded from the western shore of North America (Lankford and Phleger 1973). In the studied area, this species occurs as a rare form in locality no. 2.

As it has been mentioned in the remarks of *Q. agglutinata*, the test of *Q. sabulosa* contains a noticeable amount of the agglutinated grains. So, it can be considered as a transitional stage between the two genera *Quinqueloculina* d'Orbigny, and *Dentostomina* Carman.

Quinqueloculina seminulum (Linné)

Pl. 5, Fig. 13-15

Serpula seminulum Linné, 1758, p. 786.

Quinqueloculina sp. cf. *Q. seminulum* Linné, Miller 1953, p. 52, Pl. 8, Fig. 1.

Quinqueloculina seminulum Linnaeus, Bhatia 1956, p. 17, Pl. 2, Fig. 9.

- Quinqueloculina seminulum* Linné, Haman 1966, p. 68, Pl. 7, Fig. 5-7.
Quinqueloculina seminulum Linné, Murray 1969, p. 416 (no Fig.).
Quinqueloculina seminulum Linné, Rouvillois 1970, p. 196 (no Fig.).
Quinqueloculina seminulum Linné, Murray 1970, p. 485, Pl. 1, Fig. 9,10.
Quinqueloculina cf. *Q. seminulum* Linné, Bhalla 1970, p. 156, Pl. 20, Fig. 1.
Quinqueloculina seminulum Linné, Sen Gupta 1971, p. 85, Pl. 1, Fig. 25-27.
Quinqueloculina seminulum Linné, Brooks 1973, p. 391 (no Fig.).
Quinqueloculina seminulum Linné, Rao and Rao 1974, p. 414, Pl. 1, Fig. 11.
Quinqueloculina seminulum Linné, Haward and Haynes 1976, p. 34, Pl. 1, Fig. 6.
Quinqueloculina seminulum Linné, Scott *et al.* 1976, p. 89, (no Fig.).
Quinqueloculina seminulum Linné, Hughes 1977, p. 48 (no Fig.).
Quinqueloculina seminula Linné, Haake 1977, 64 (no Fig.).

Remarks

This cosmopolitan species was originally described from the recent deposits of the Adriatic Sea (Linné 1758). It was later recorded from the Holocene of numerous localities such as: Carolina (Miller 1953), India (Bhatia 1956; Bhalla 1970; Rao and Rao 1974), Denmark (Haman 1966), the Atlantic continental shelf of U.S.A. (Murray 1969), the Atlantic continental shelf of France (Rouvillois, 1970), the English Channel (Murray 1970), Newfoundland (Sen Gupta 1971), Puerto Rico (Brooks 1973), Plymouth and Cardigan Bay, U.K. (Haward and Haynes, 1976), California (Scott *et al.* 1976), Solomon Islands, Pacific Ocean (Hughes 1977) and again from the Adriatic Sea (Haake 1977). In Yemen, *Q. seminulum* has been recorded in all of the studied samples.

Quinqueloculina subcuneata Cushman Pl. 2, Fig. 13-15

- Quinqueloculina crassa* d'Orbigny var. *Subcuneata* Cushman 1921, p. 423, Pl. 89, Fig. 4.
Quinqueloculina crassa d'Orbigny var. *subcuneata* Cushman, Bhatia 1956, p. 17, Pl. 2, Fig. 2.
Quinqueloculina subcuneata Cushman, Rao and Rao 1974, p. 414, Pl. 1, Fig. 12.
Quinqueloculina crassa var. *subcuneata* Cushman, Hughes 1977, p. 53, Pl. 2, Fig. 33-35.

Remarks

Cushman (1921) described this species from the Philippine Islands. It was later recorded from India (Bhatia 1956; Rao and Rao 1977) and Solomon Islands (Hughes 1977). In the studied area, *Q. subcuneata* occurs in the samples no. 2 and 4.

Quinqueloculina subdecorata Pl. 2, Fig. 10-12

- Quinqueloculina subdecorata* Cushman 1918, p. 71, Pl. 29, Fig. 3.

Quinqueloculina subdecorata Cushman, Arnal 1958, p. 40, Pl. 11, Fig. 3-5.

Remarks

Originally this species was described from the Miocene of Virginia (Cushman 1918). It was later recorded from the recent deposits California (Arnal 1958). In Yemen, rare specimens of *Q. subdecorata* have been recorded in sample no. 2.

Quinqueloculina triangularis d'Orbigny
Pl. 4, Fig. 1-3

Quinqueloculina triangularis d'Orbigny 1846, 288, Pl. 18, Fig. 7-9.

Quinqueloculina triangularis d'Orbigny, Cherif and Flick 1974, p. 238, Pl. 1, Fig. 1-3.

Remarks

Q. triangularis was described from the Tertiary and the Recent of Austria and Germany (d'Orbigny 1846). It was later recorded from the Recent deposits of Greece (Cherif and Flick 1974). In Yemen, the present species has been recorded in all of the studied samples.

Quinqueloculina trigonula Terquem
Pl. 3, Fig. 1-3

Quinqueloculina trigonula Terquem 1876, p. 84, Pl. 12, Fig. 4.

Quinqueloculina trigonula Terquem, Levy *et al.* 1975, p. 172, Pl. 1, Fig. 10-15.

Remarks

This species was described from the northern shores of France (Terquem, 1876; Levy *et al.* 1975). In the studied area, *Q. trigonula* occurs as an abundant form in the four localities.

Quinqueloculina tropicalis Cushman
Pl. 5, Fig. 7-9

Quinqueloculina tropicalis Cushman 1924, p. 63, Pl. 23, Fig. 9, 10.

Remarks

Cushman (1924) described *Q. tropicalis* from the recent deposits of Pago Pago Harbor. In Yemen, this species occurs as a rare form in localities 1, 2 and 3.

Quinqueloculina undulosecostata Terquem
Pl. 1, Fig. 4-6

Quinqueloculina undulose-costata Terquem 1882, p. 185, Pl. 20, Fig. 18, 19.

Quinqueloculina undulose-costata Terquem, Bhatia 1956, p. 17, Pl. 2, Fig. 8.

Remarks

Q. undulosecostata was described from the Eocene of Paris (Terquem 1882). It was later recorded from the recent deposits of the western shores of India (Bhatia 1956). In the studied area, the present species occurs in samples No. 2, 3 and 4.

Quinqueloculina venusta Karrer

Pl. 3, Fig. 13-15

Quinqueloculina venusta Karrer 1868, p. 147, Pl. 2, Fig. 6.

Quinqueloculina venusta Karrer, Bhatia 1956, p. 17, Pl. 2, Fig. 6.

Quinqueloculina venusta Karrer, Lohmann 1978, p. 25, Pl. 4, Fig. 8, 9.

Remarks

The present species was described from the Miocene of Romania (Karrer 1868). It was later recorded from the recent deposits of western shores of India (Bhatia 1956) and from western south Atlantic Ocean (Lohmann 1978). In Yemen, *Q. Venusta* occurs as a rare form in samples No. 1, 3 and 4.

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Plate 1

- Fig. 1 - 3. *Q. neostraitula* Thalmann, from Hudaydah sea shore,
1, 3. Side views.
2. Apertural view.
- Fig. 4 - 6. *Q. undulosecostata* Terquem, from Mukha sea shore,
4, 6. Side views.
5. Apertural view.
- Fig. 7 - 9. *Q. plicosa* Costa, from Hudaydah sea shore,
7, 9. Side views.
8. Apertural view.
- Fig. 10-12. *Q. parkeri* (Brady), from Hudaydah sea shore,
10, 12. Side views.
11. Apertural view.
- Fig. 13-15. *A. granulocostata* Germeraad, from Zabeed sea shore,
13,15. Side views.
14. Apertural view.
- Fig. 16-18. *Q. mosharrafai* Said, from Zabeed sea shore,
16,18. Side views.
17. Apertural view.

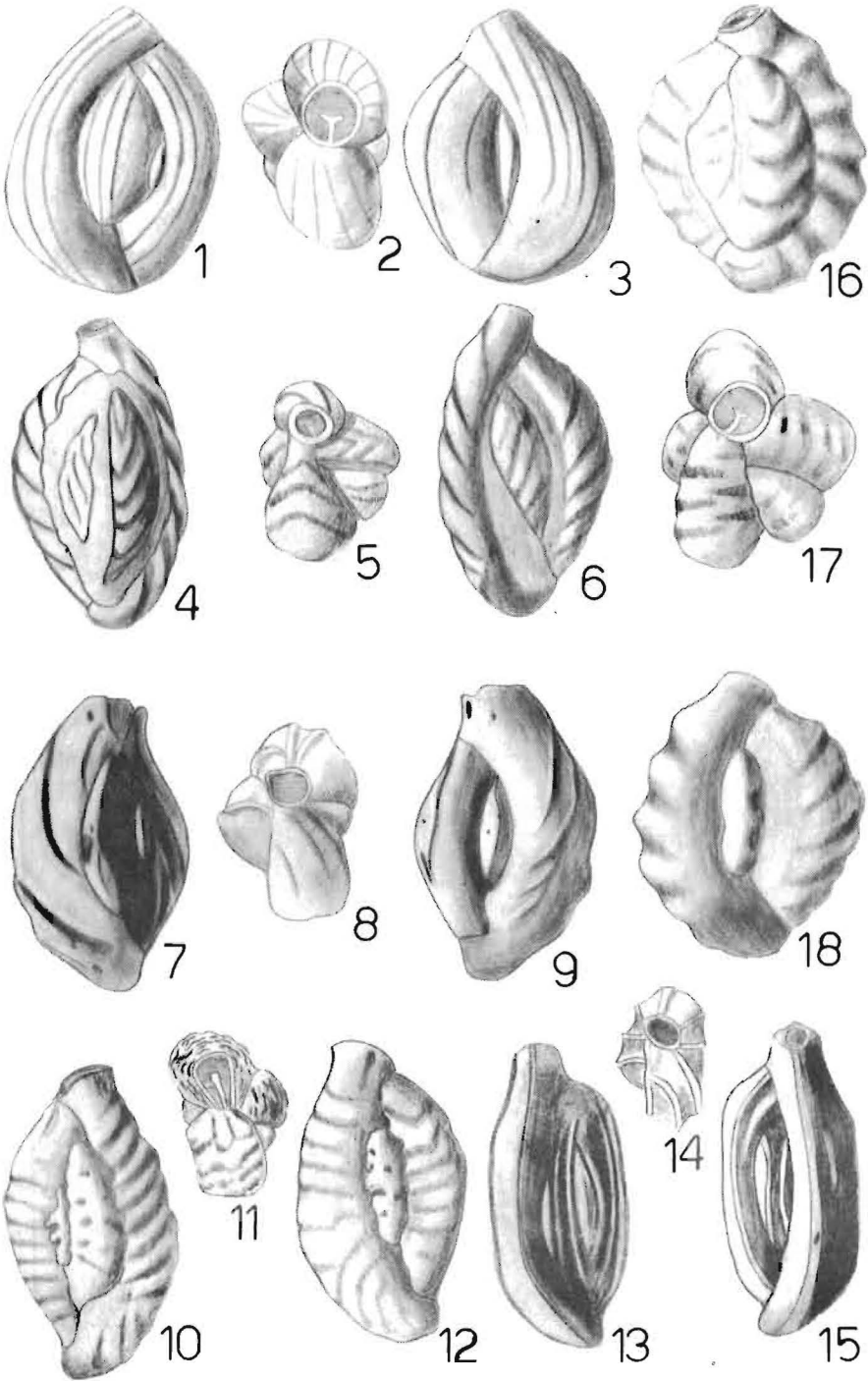


Plate 2

- Fig. 1 - 3. *Q. jugosa* Cushman, from Hudaydah sea shore,
1, 3. Side views.
2. Apertural view.
- Fig. 4 - 6. *Q. disparilis* d'Orbigny, from Hudaydah sea shore,
4, 6. Side views.
5. Apertural view.
- Fig. 7 - 9. *Q. poeyana* d'Orbigny, from Salif sea shore,
7, 9. Side view.
8. Apertural view.
- Fig. 10-12. *Q. subdecorata* Cushman, from Hudaydah sea shore,
10,12. Side views.
11. Apertural view.
- Fig. 13-15. *Q. subcuneata* Cushman, from Hudaydah sea shore,
13,15. Side views.
14. Apertural view.

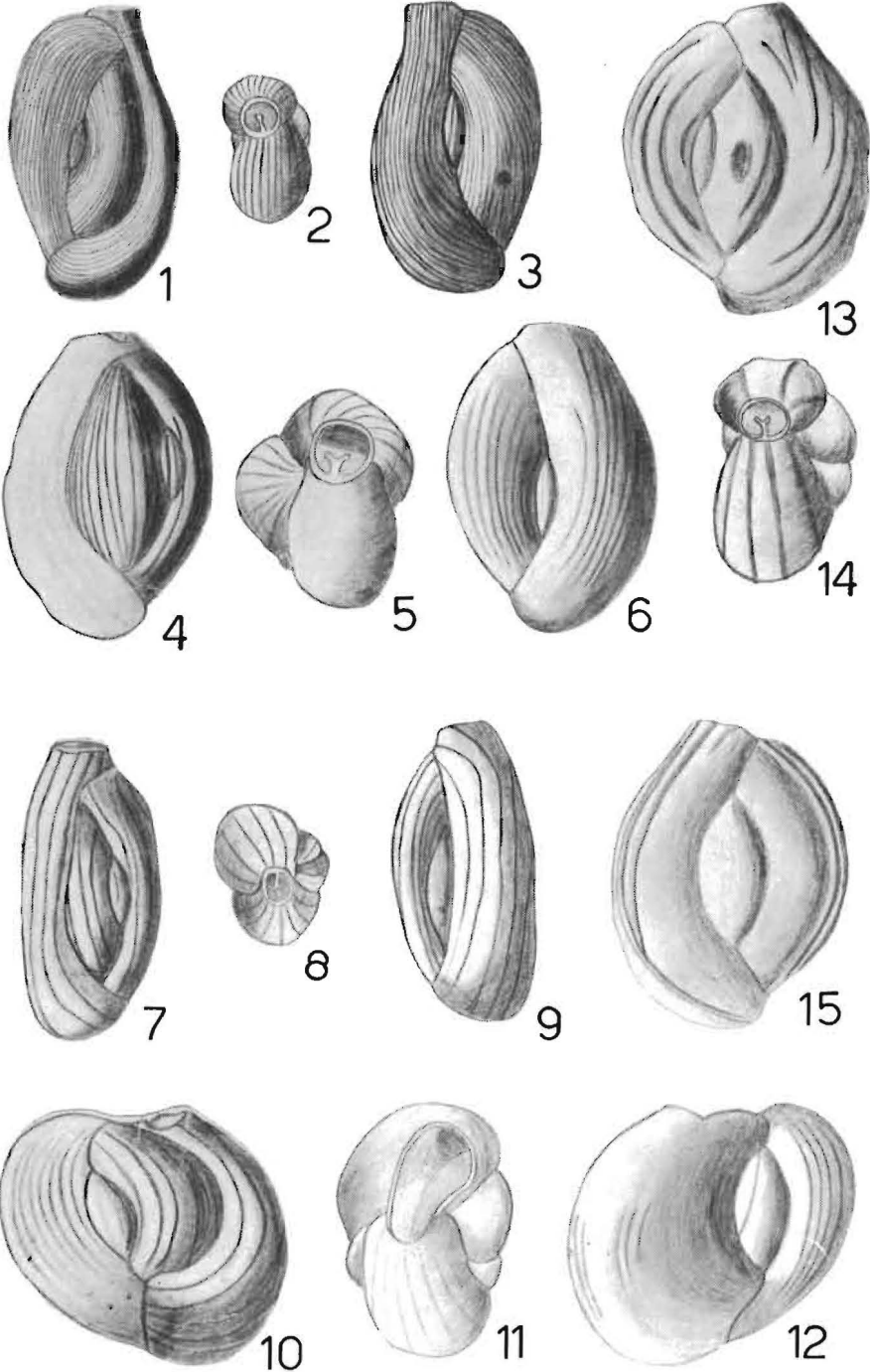


Plate 3

- Fig. 1 - 3. *Q. trigonula* Terquem, from Hudaydah sea shore.
1, 3. Side views.
2. Apertural view.
- Fig. 4 - 6. *Q. distorta* Cushman, from Mukha sea shore,
4, 6. Side views.
5. Apertural view.
- Fig. 7 - 9. *Q. lata* Terquem, from Hudaydah sea shore,
7, 9. Side views.
8. Apertural view.
- Fig. 10-12. *Q. multimarginata* Said, from Hudaydah sea shore,
10,12. Side Views.
11. Apertural view.
- Fig. 13-15. *Q. venusta* Karrer, from Zabeed sea shore,
13,15. Side views.
14. Apertural view.

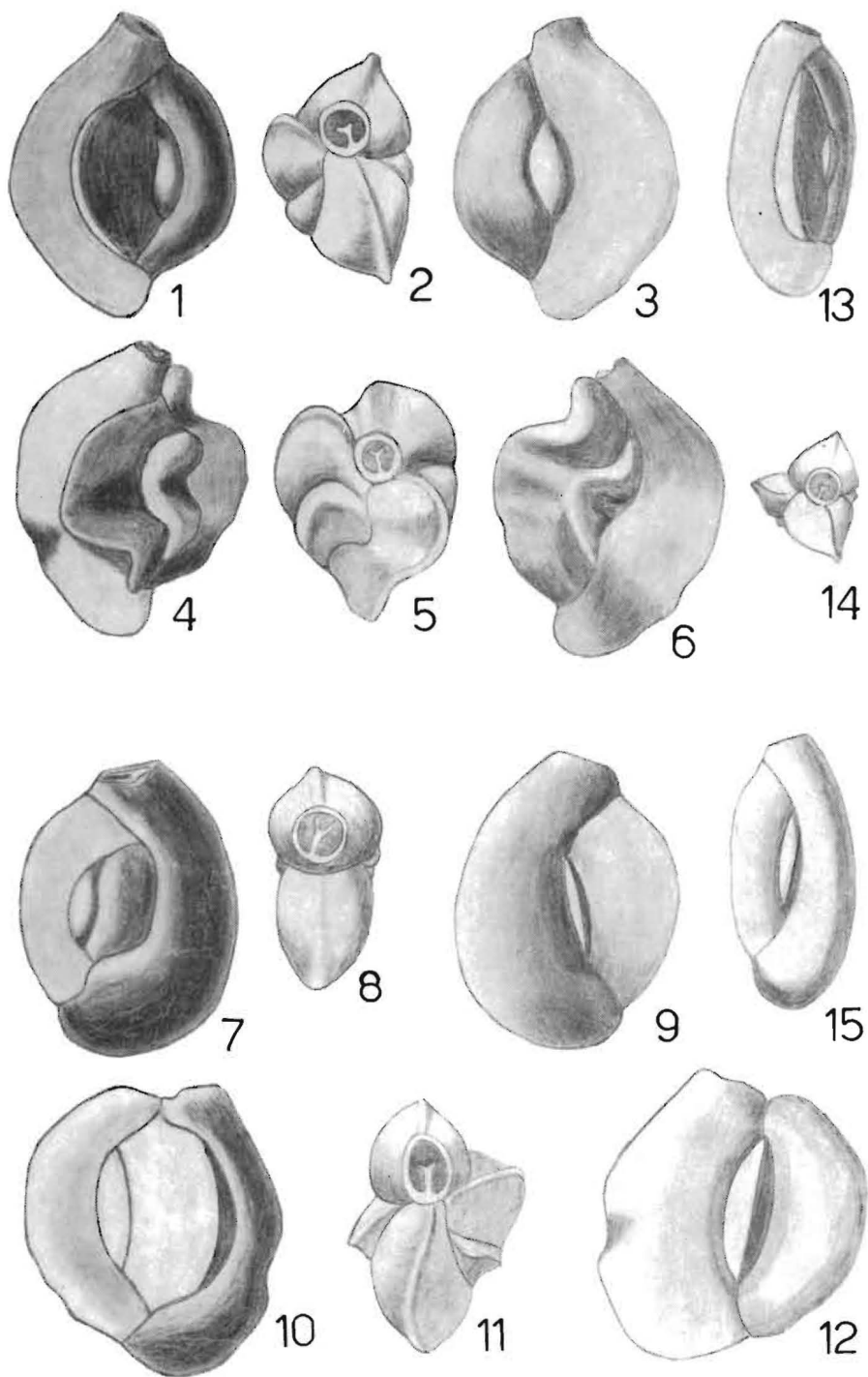


Plate 4

- Fig. 1 - 3. *Q. triangularis* d'Orbigny, from Hudaydah sea shore,
1, 3. Side views.
2. Apertural view.
- Fig. 4 - 6. *Q. polygona* d'Orbigny, from Hudaydah sea shore,
4, 6. Side views.
5. Apertural view
- Fig. 7 - 9. *Q. sabulosa* Cushman, from Hudaydah sea shore,
7, 9. Side views.
8. Apertural view.
- Fig. 10-12. *Q. Agglutinata* Cushman, from Hudaydah sea shore,
10,12. Side views.
11. Apertural view.
- Fig. 13-15. *Q. lamarckiana* d'Orbigny, from Zabeed sea shore,
13,15. Side views.
14. Apertural view.

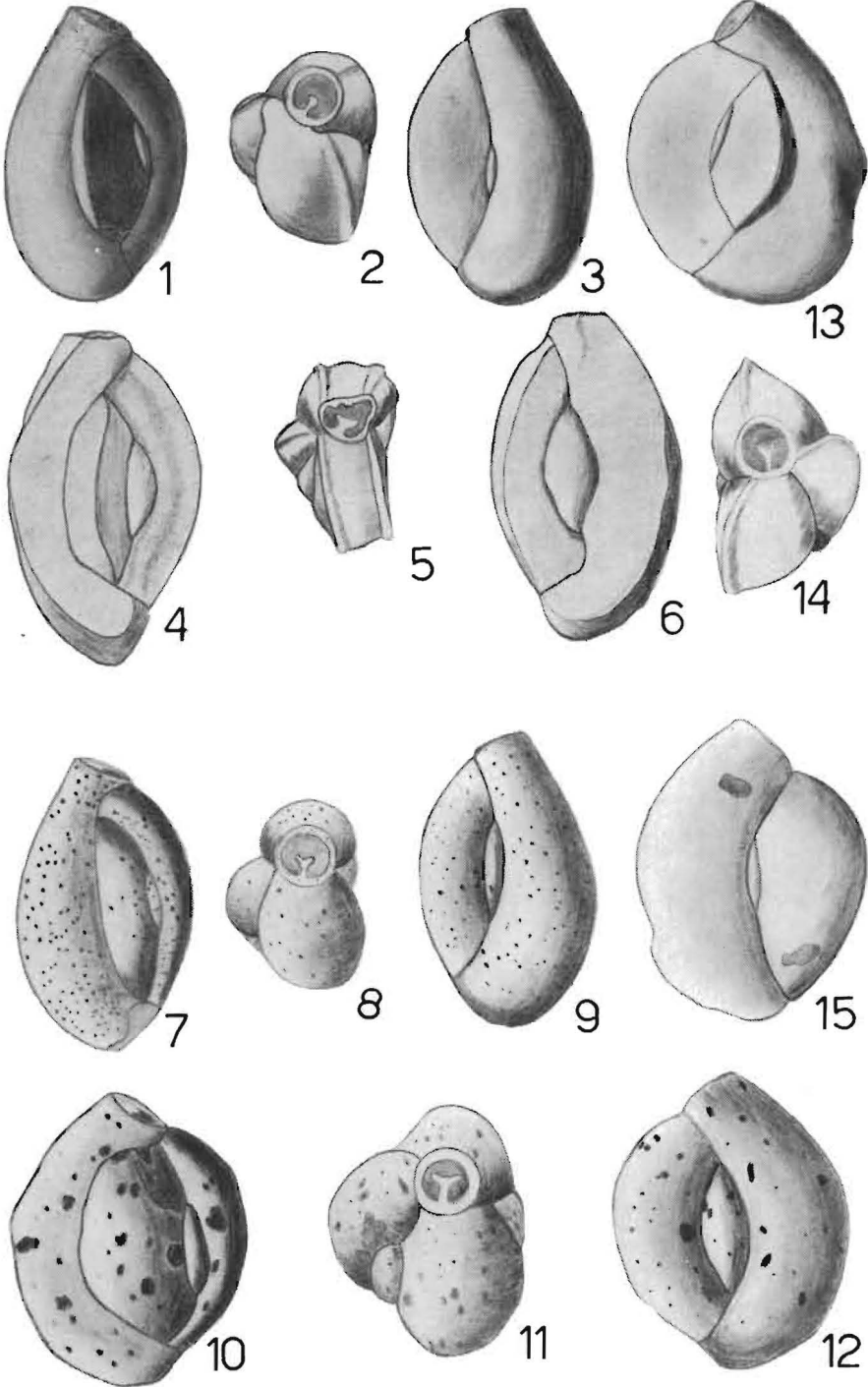
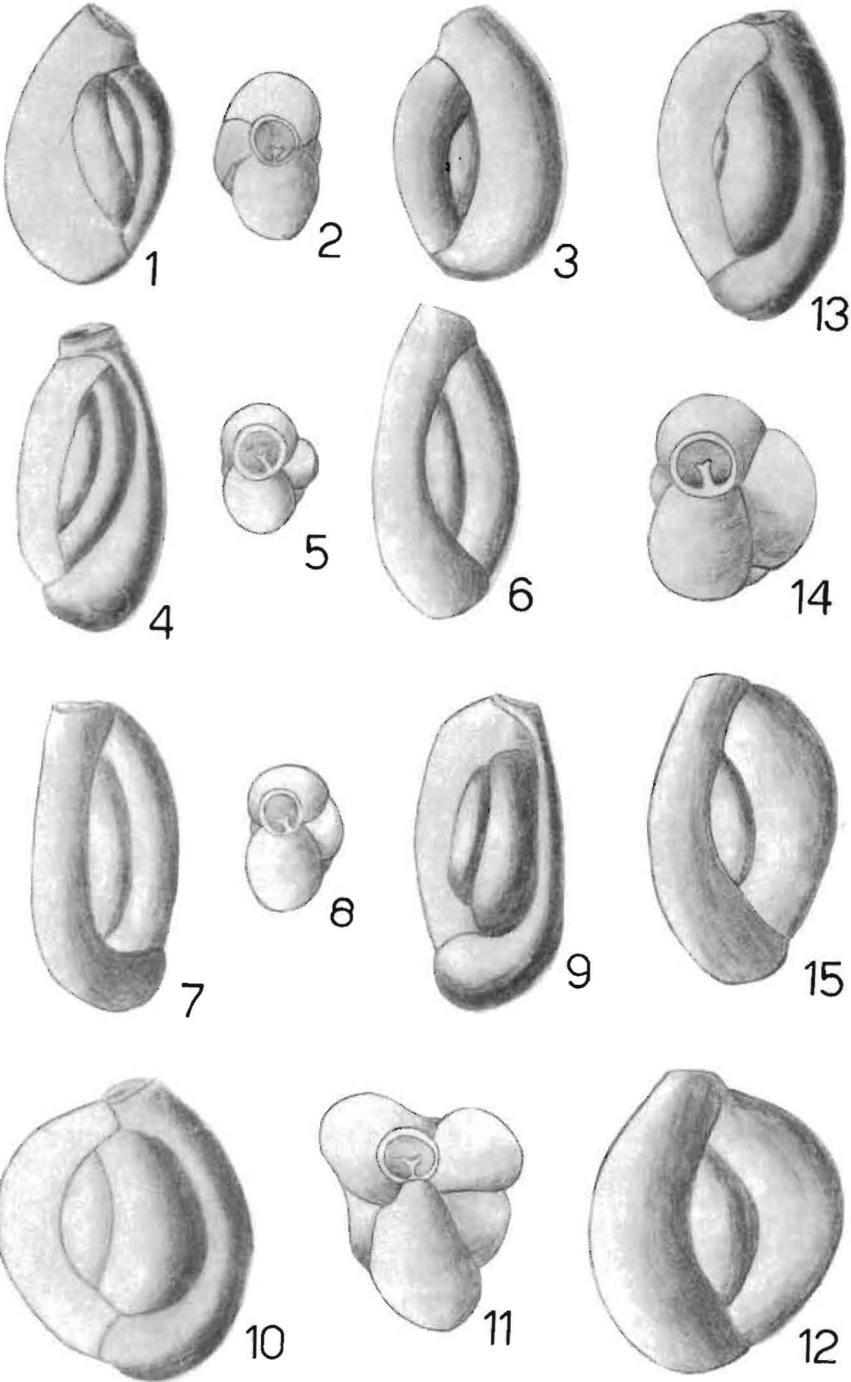


Plate 5

- Fig. 1 - 3. *Q. bellatula* Bandy, from Hudaydah sea shore.
1, 3. Side views.
2. Apertural view.
- Fig. 4 - 6. *Q. laevigata* d'Orbigny, from Hudaydah sea shore.
4, 6. Side views.
5. Apertural view.
- Fig. 7 - 9. *Q. tropicalis* Cushman, from Hudaydah sea shore,
7, 9. Side views.
8. Apertural view.
- Fig. 10-12. *Q. flavescens* d'Orbigny, from Zabeed sea shore,
10,12. Side views.
11. Apertural view.
- Fig. 13-15. *Q. seminulum* (Linne), from Hudaydah sea shore,
13,15. Side views.
14. Apertural view.



دراسة عن الفورامينيفريدا الحديثة من شواطئ الجمهورية
العربية اليمنية
الجزء الأول : QUINQUELOCULINA

حامد أحمد النخال

قسم الجيولوجيا ، جامعة صنعاء ، الجمهورية العربية اليمنية •

لقد تم التعرف في الدراسة الحالية على أكثر من ١٠٠ نوع من الفورامينيفريدا
جمعت من أربع مناطق مختلفة من الشواطئ الجنوبية الشرقية للبحر الأحمر في
الجمهورية العربية اليمنية •

سنة وعشرون نوعا منها تتبع جنس QUINQUELOCULINA وهذه الأنواع

التابعة لجنس QUINQUELOCULINA ستدرس وتناقش في الجزء الحالي •