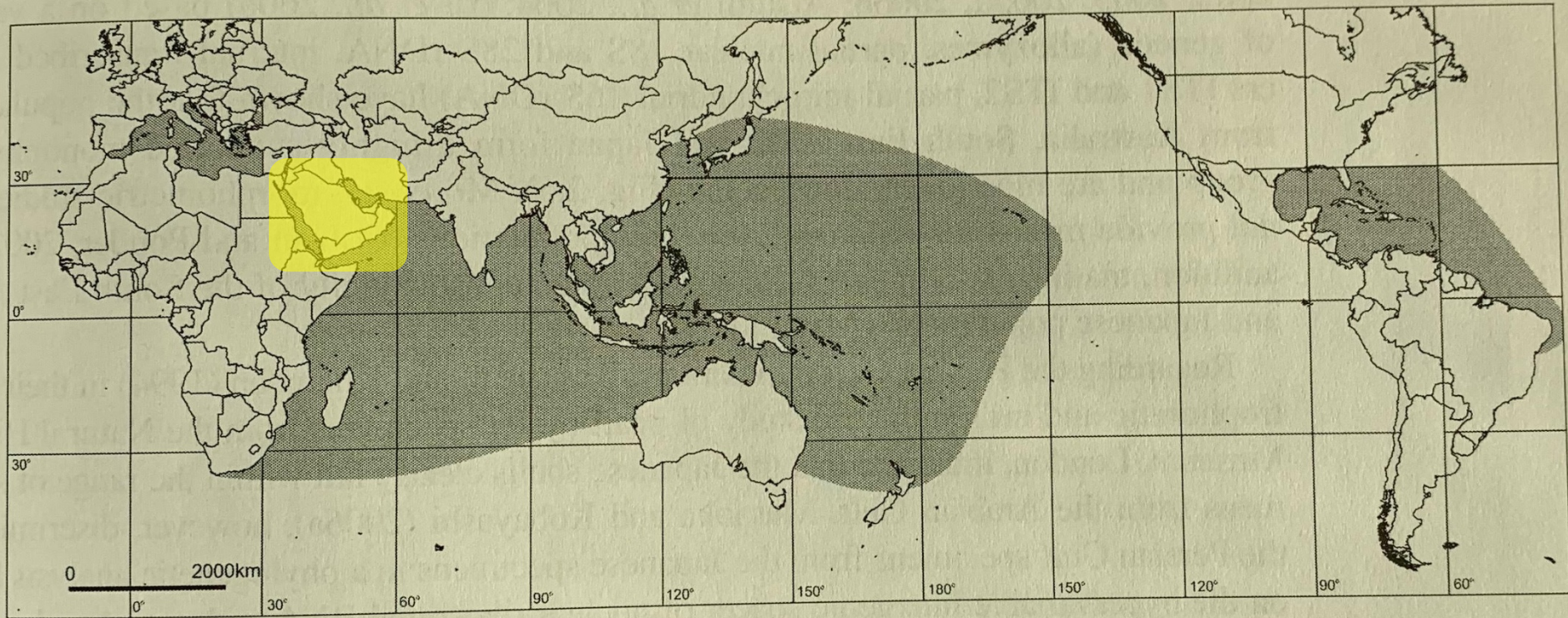
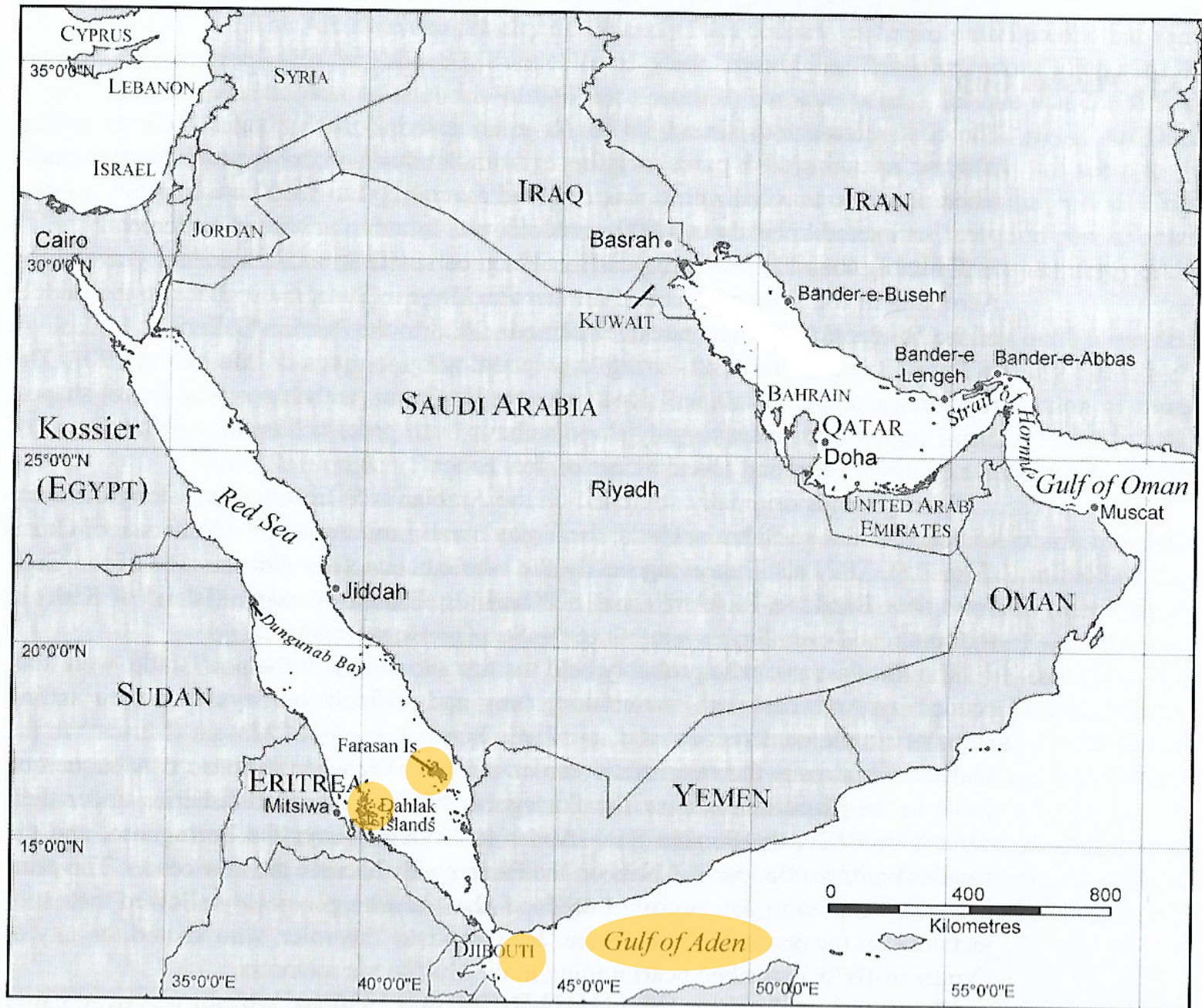


1. Geographical distribution

- Pearl oysters occur around the world in tropical and subtropical regions.
 - Indian Ocean
 - Arabia Gulf
 - Red Sea
 - East Africa & Madagascar
 - Strait of Mannar
 - India, Pakistan & Bangladesh
 - Indian/Pacific Ocean
 - Pacific Ocean
 - Central America



Ref. *The Pearl Oyster* (P. Southgate & John Lucas (2008))



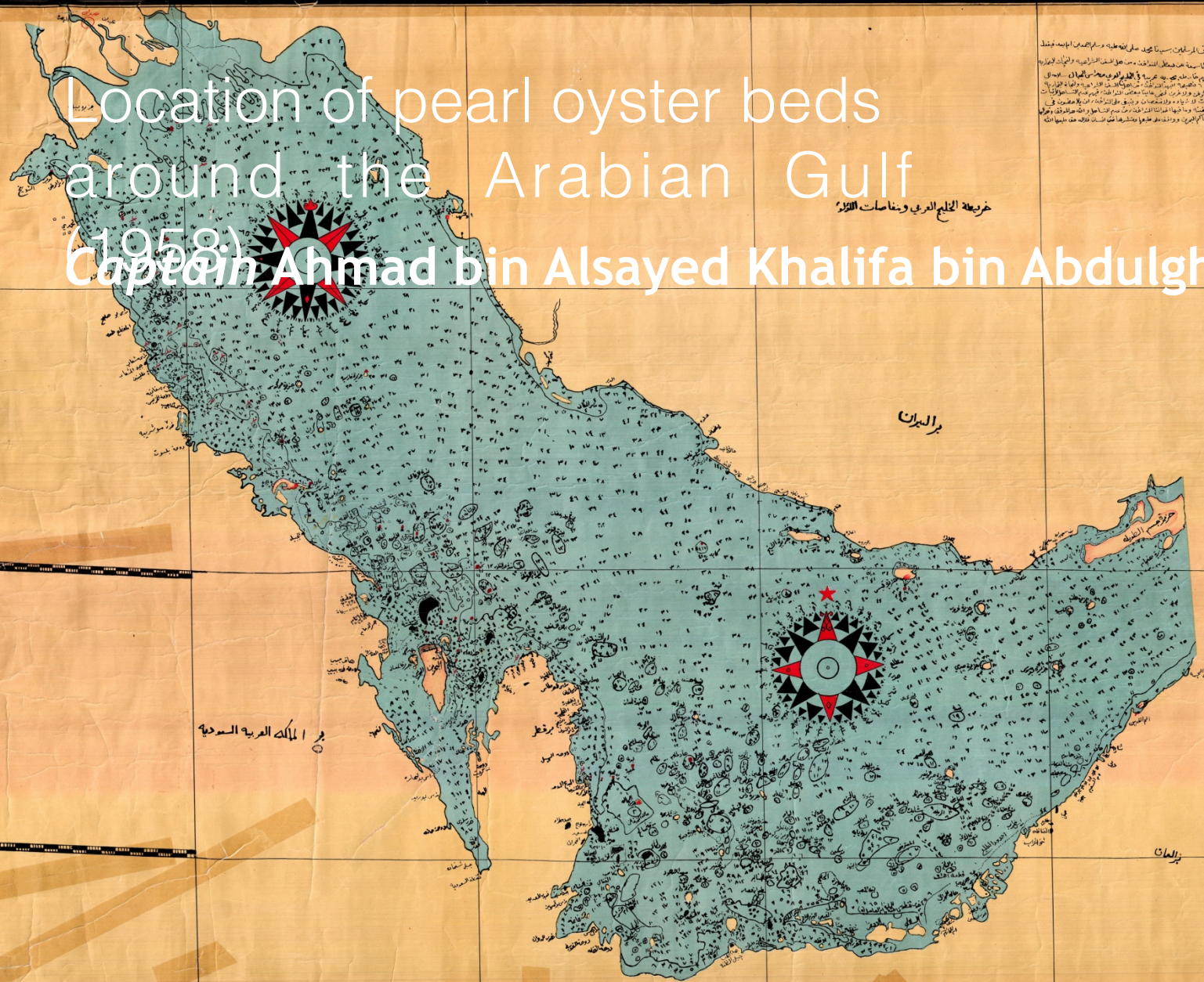
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خريطة الخليج العربي ومناصات التلال

Location of pearl oyster beds around the Arabian Gulf

(1958) Captain Ahmad bin Alsayed Khalifa bin Abdulghafoor



المملكة العربية السعودية

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2. Habitat and Ecology

- Pearl oysters occur in shallow waters to a depth of approximately 20., enriched with freshwater or terrestrial enriched water.
- They attach by byssus to a variety of substrata on rocky, gravel , and more rarely, sandy bottoms.
- Among recorded substrata are seagrasses and clumps of dead shells.
- They typically recline on the right valve with the plane of commissure at approximately 45° to the attachment surface.



3. Taxonomy

- All oyster species that produce pearls of commercial value are classified within the genera *Pinctada* & *Pteria*.

Pinctada fucata / *martensii* / *radiata* / *imbricata*
Species complex

Pinctada margaritifera

Pinctada mazatlanica

Pinctada anomioides

Pinctada maxima

Pinctada nigra

Pinctada rutila

Pteria penguin



Gulf pearl oyster
Pinctada radiata



Black-lip pearl oyster
Pinctada margaritifera

➤ Taxonomy of pearl oyster species

Pinctada fucata - martensii - radiata - imbricata

remains unsettled because of substantial morphological variation within and among populations, local geographical isolation of some populations, transport of human, hybridization, and erratic taxonomic practice.

4. Fouling organisms

Some of the flora & fauna found in the pearl beds have been identified as important enemies of pearl oyster either direct aggressive action or indirectly in the struggle for



➤ The organisms which cause destruction of pearl oyster are:

- **Octopi** – predation by killing and praying on flesh.
- **Fishes** – **Rays** and **skates** – by crunching the shells and eating the meat.
- **Boring polychaetes** – by drilling the shell valve after settling on the shell valves (*Polydora* sp.).
- **Boring sponge** – by riddling the shell valves with minute holes for gaining substratum for living.
- **Boring polychaetes** – by drilling the shell valve after settling on the shell valves (*Polydora* sp.).

- **Crabs and Lobsters** – by destroying byssal threads and killing the oysters.
- **Sea Star** – by tearing the shell valves apart and feeding on oyster meat.

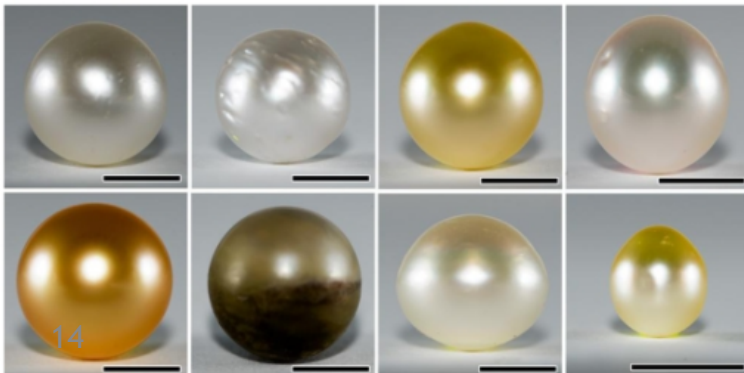




P. maxima



South sea pearls



5. Background history

- Bahrain was the centre of the historically famous pearl fisheries of the Arabian Gulf before the discovery of oil in early 1930s.
- The pearl fishery had decline in the wake of the oil boom, as pearl divers took up land based, less hazardous occupations .
- The last official pearl fishing season was in the second half of 1950s.

- The ex-Bahrain Centre for Studies and Research (BCSR) had taken the initiative to investigate whether the pearl fishery could be revived as an additional source of income.
- A preliminary survey of the pearl oyster beds located north and northeast of Bahrain was conducted by BCSR in August 1985.
- The purpose of that expedition was to determine the status of the pearl oyster in these beds after 30 years during which the oyster beds were not exploited.

- Based on the result of the preliminary survey, a steering committee was formed in February 1986 to plan a detailed survey and decide policy matters.
- A survey vessel was purchased and equipped with necessary navigational and aqualung equipment.



Research-cum-survey Vessel "Danat Al Bahrain"

6. Objectives

- to determine the **size** and **density** of the **oyster populations** on the off-shore pearl oyster beds which were known previously in pearl fishery.
- to explore the **frequency** of **occurrence** and **quality** of natural pearls.
- to understand the **environmental conditions** on the pearl oyster beds.
- to investigate producing pearls from the natural beds through culture.

7. Major works

- As no major scientific work had been carried out earlier on the pearl oysters of this region, it was necessary to take up the a number of studies in order to have a comprehensive picture of the status of pearl oyster beds, and serve the principle objectives, as follows:
 - a. A survey of some of the important pearl oyster beds.
 - b. Studies on the yield and size composition of pearls obtained from different beds.

- c. Spawning behavior of the pearl oysters based on the examination of gonadal smears and plankton samples.
- d. Salinity, temperature and pH and their fluctuations during the different seasons and their influence on the breeding of pearl oysters.
- e. A general study on the size composition distribution of oysters.
- f. Experimental studies on the spat collection technology.

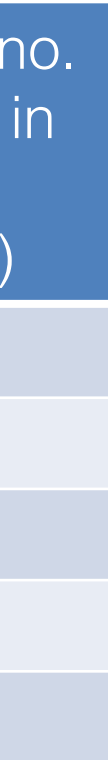
- g. Early rate of growth of spat and the yearlings.
- h. Attempts at pearl culture.
- i. Training on pearl culture technology.

7.1 Surveying pearl oyster beds

1. Shiqiteh
2. Bu Haqul
3. Almayanah
4. Bu Amamah
5. Bu Lthamah
6. Blkharub
7. Bu Suwar
8. Bljaal
9. Arjlah
10. Shutayah
11. Alwadi
12. Bin Zayaan

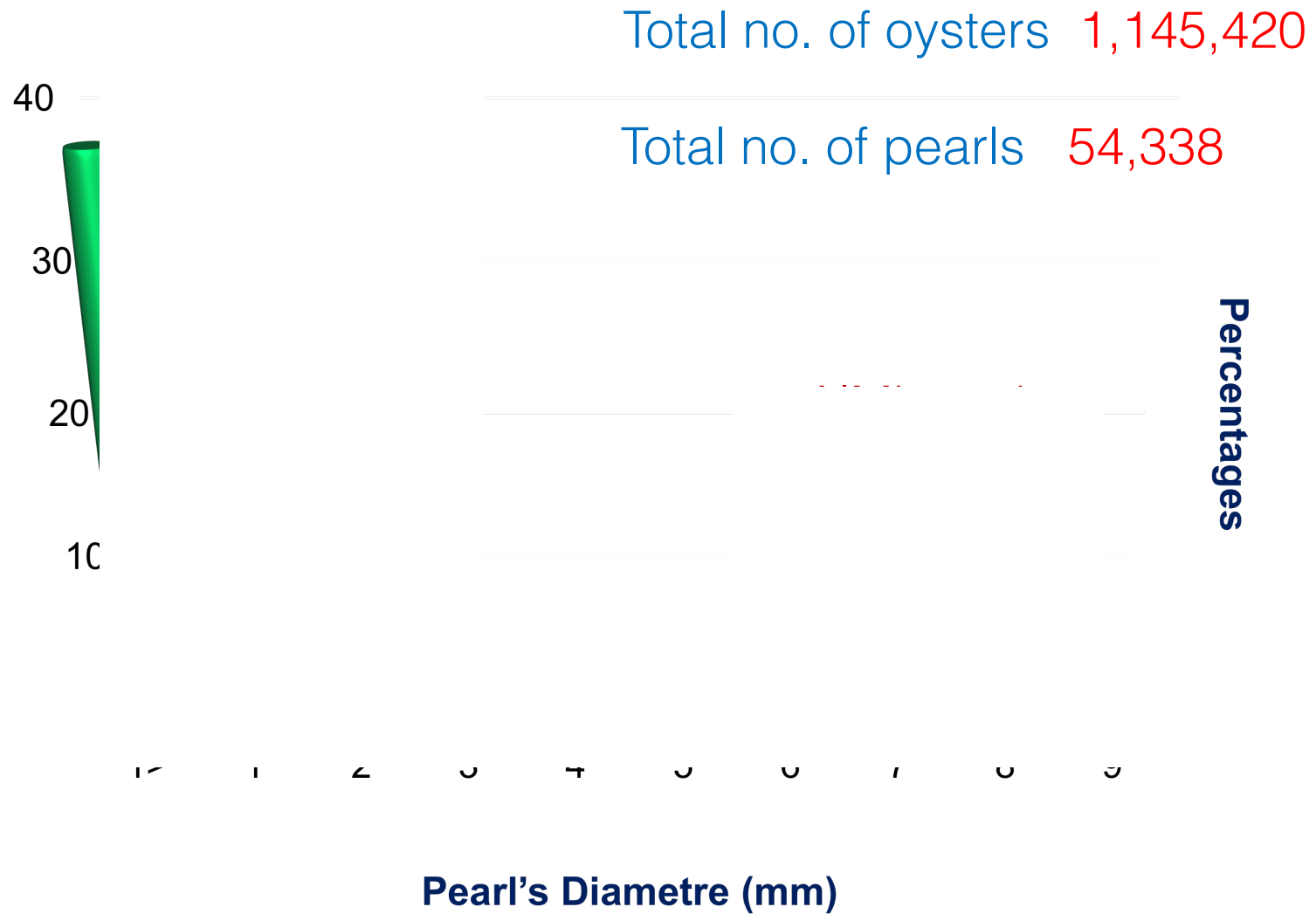


Approximate total area and estimated number of oysters available in some oyster beds.

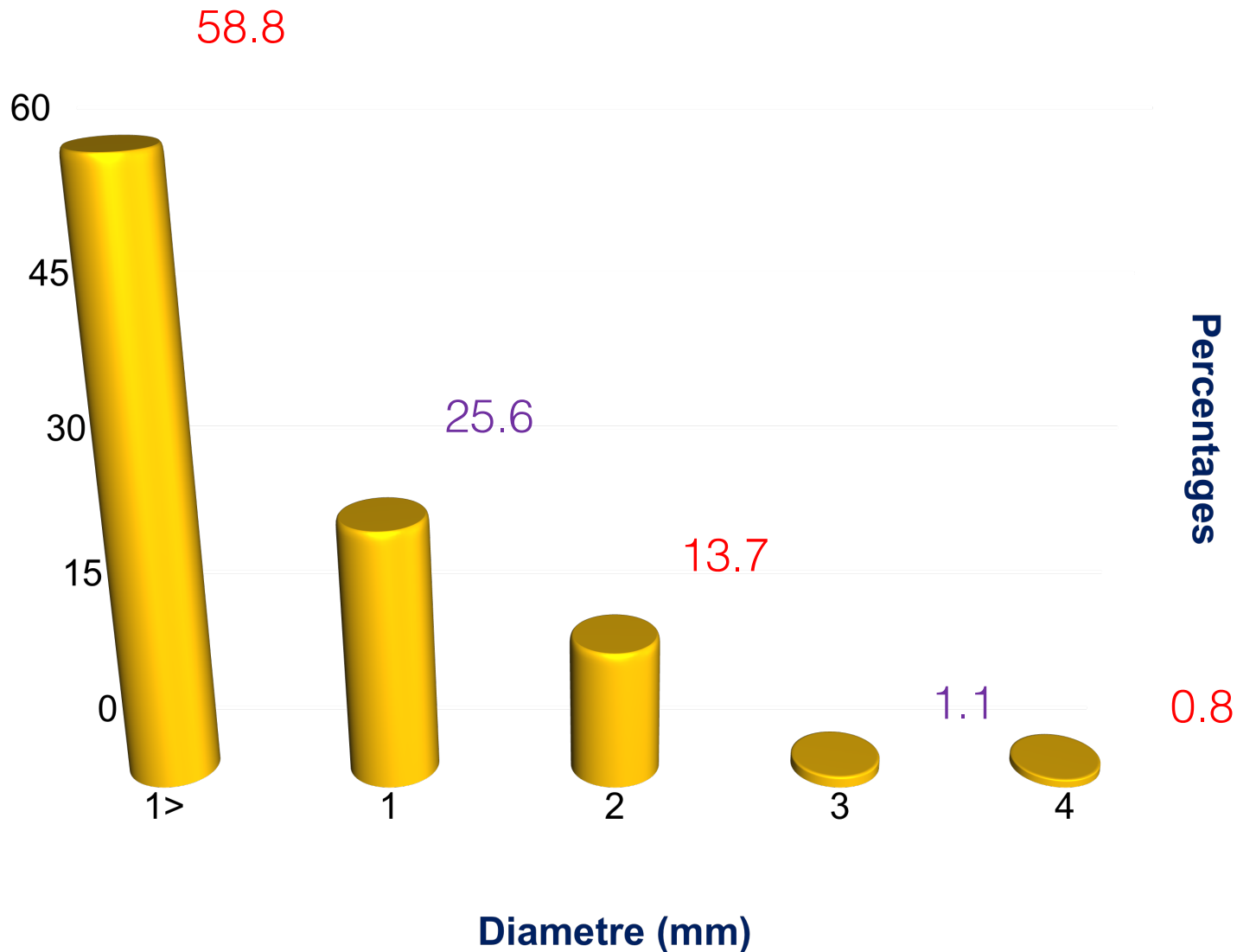


7.2 Pearl content and its size ranges





Distribution pattern of different size groups of pearls obtained from the Pearl Oyster Beds in Bahrain Waters.



Distribution pattern of different size groups of pearls collected from the Pearl Oyster Beds in Kuwait Waters.

7.3 Heavy metal analysis of pearl oyster *Pinctada radiata*

Heavy metals were well within the normal range expected in unpolluted waters.	Concentration Dry wt basis (mg/kg)
	0.01 >
	Not detected
	5
	2.40
	3
	22
	241
	1140
se	8
ocarbons	10 >
n	60.8

7.4 Experimental studies on spat collection technology

- Spat collection is a technology by which the very young oysters are collected from nature by providing suitable spat setting material at the appropriate time at suitable places.
- In all the countries where Pelecypod molluscs, e.g. oysters, pearl oysters, or mussels are cultured, spat collection is carried out on a fairly large scale.
- This technology affords a simpler and easier method of capturing the young ones and growing them to adult oysters.
- It helps to raise a good stock of oysters.

7.4.1 Types of spat collectors



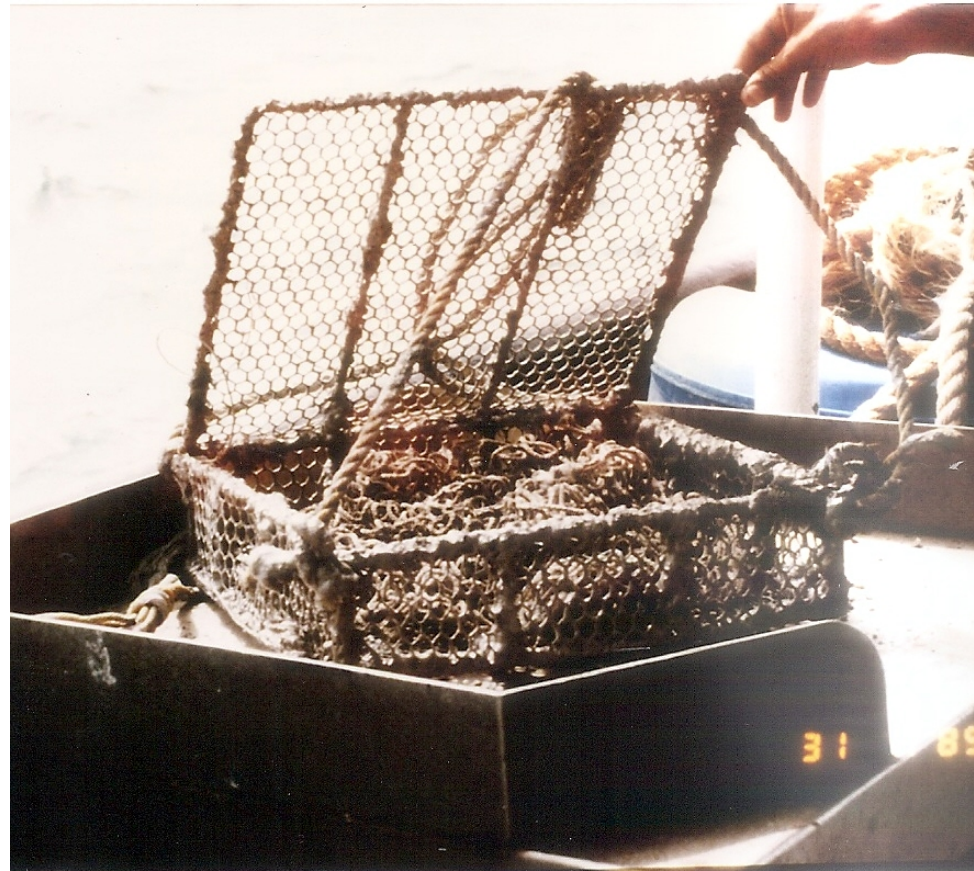
Oyster shell ren



Date palm leaves & twigs



Plastic fruit basket



Cement coated oyster cage



Wooden frame coated with bitumen

7.4.2 Locations of spat collectors



- Experiment has revealed the most suitable spat collector, location, and time of laying collectors in the sea



Oyster shell ren



Thank you for
Your attention

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