SHELL BEDS

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Synonyms

Coquinas
Lumachelles
Shell gravels

Definition

Dense deposits of biologic hard parts more than 2 mm in size in estuarine and other environments are generally defined as shell concentrations (Kidwell, 1991). They are also known as coquinas, lumachelles, or shell gravels, as well as the more familiar term "shell beds."

Text

Although the term "shell beds" refers to a particular geometric arrangement of biogenic remains, the great variety of shell beds reflects the diverse descriptive approaches used to classify them. The scheme proposed by Kidwell et al. (1986) is based on different field observations of the shell deposits, such as their biofabric, geometry, taxonomic composition, and internal structure, which can be measured in the field by non-specialists. This procedure allows investigators to obtain a range of ecological, hydrodynamic, and topographic data on the mode of the shell bed formation (Fursich, 1995).

There are different classification schemes for shell beds. In the basic approach proposed by Kidwell et al. (1986), shell beds may be plotted in six areas of a schematic ternary diagram: biological, sedimentological, and diagenetic processes are the end-members, whereas three mixed areas reflect combinations of these factors (Fig. 1). Comparative analysis may yield data on environmental indicators to characterize, according to prevailing shell bed types, the ideal transect from marginal-marine to fully-marine depositional settings, even if the same type of shell bed may appear in different environments. In general terms, marginal-marine environments (e.g., estuaries) exhibit a diverse assortment of biogenic and sedimentologic concentrations. In the intertidal and supratidal settings, for example, biogenic concentrations include channel-margin oyster bars, mussel clumps, levels of deep-burrowing infaunal bivalves in life position, ray pits, bird nests, and hermit crab-generated beds, whereas sedimentologic concentrations may be produced by lateral migration of channels and by storm surges (shell pavements and spits). The more refined genetic scheme proposed by Kidwell (1991) on the basis of their depositional histories and stratigraphies organizes shell beds into four broad categories: event, composite, hyatal, and lag concentrations. In this manner, the interpretation yields a stratigraphic signature of the shell-rich sedimentary body to identify the final concentration process and a 'taphonomic characterization' of the fossil remains to reconstruct their history before and during the concentration event(s). These four types of shell beds are not discrete categories because they intergrade, and each one may be present in the supra-, inter- and subtidal environments characterizing the estuarine systems.

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Cross-references

Biogenic sedimentary structures
Biogenous sediment
Sedimentary structures
Stratigraphy of estuaries