

Biostratigraphy

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Biostratigraphy: is the science of dating rocks by using the fossils contained within them or the element of stratigraphy that deals with the distribution of fossils in the stratigraphic record and the organization of strata into units on the basis of their contained fossils. Usually the aim is correlation, that is, demonstrating that a particular horizon in one geological section represents the same period of time as another .

Biostratigraphic units are defined by the presence of fossils and its remains alike plant or animal that common in sedimentary rocks, no stipulate that the fossils to be clear view so using for diagnosis the biozones this one the many of zones originate by the microfossils.

The fossils that using in determination the Biozones it that return to organisms were live together in one place then collect after the death in the same place , is mean the fossils not move from original site.

Biocoenosis is term that indicate group of organism which live together as collection has joint relation. The area Where group of the joint organism and acclimatized live in this environment called **Biotope**.

Thanatocoenosis is term that indicate group of organism which collected after the death.

Reworked fossils: Fossils from rocks of one age that have been eroded, transported, and redeposited in sediments of a younger age. Because of the difference in their significance with respect to age and environment, they should be treated apart from those believed to be indigenous.

Introduced or infiltrated fossils(Leaked): Fossils introduced into older or younger rocks by fluids, through animal burrows or root cavities, or by sedimentary dikes or diapirs. They should be distinguished from indigenous fossils in biostratigraphic zonation.

The Stratigraphic Importance of Fossils

Fossils were once living organisms and as such are sensitive indicators of past environments, sedimentation patterns, and their distributions.

In addition, because of the irreversibility of evolution, fossils are particularly useful in working out the relative times of origin of sedimentary strata.

- 1- Consider rocky depicted distinguished for the rocky beds.
- 2- Consider exact indication for the past environment .
- 3- Important in the chronocorrelation of beds .

Index Fossil

Biostratigraphic units are divided into **zones** which are the stratigraphic ranges of **index organisms (fossil)**. Some fossils are more useful than others for relative age determinations. Fossils that are most useful are called **Index Fossil(Zone Fossil)**.

The factors maximize a fossil's usefulness(make a good index fossil):

- 1-Distinctive appearance/easy to Recognize .
- 2-Short duration between first appearance and extinction(range).
- 3-Widespread geographic distribution (makes correlation possible across wide area/multiple continents).

Characteristics of Index Fossils :

- Easy to recognize
- Short(Limited) stratigraphic range.
- Large geographic range.
- Found in many environments.

Relation between Biostratigraphic units and Lithostratigraphic units

Biostratigraphic and Lithostratigraphic units are fundamentally different kinds of stratigraphic units based on different distinguishing criteria.

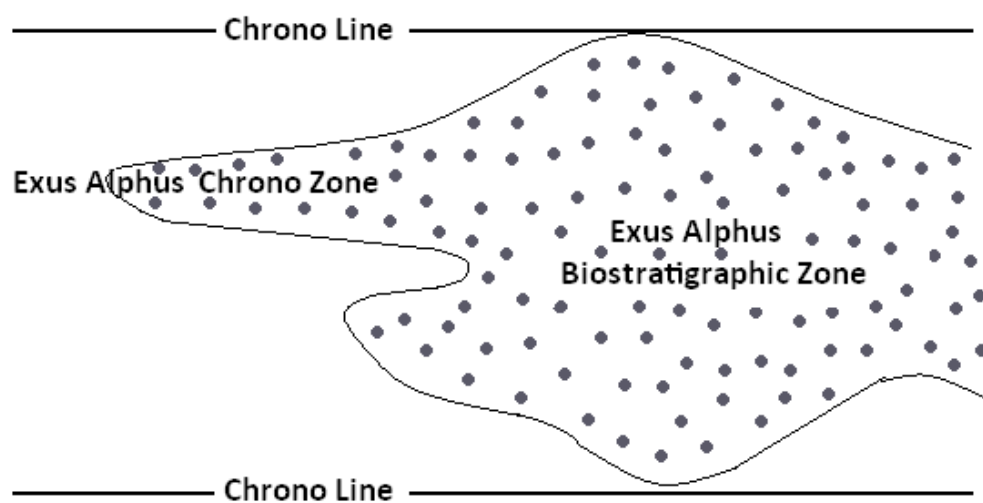
Both lithostratigraphic and biostratigraphic units reflect the environment of deposition, but biostratigraphic units are more influenced by, and indicative of, geologic age. They are also less repetitive in character because they are based on irreversible evolutionary change. Their boundaries may coincide locally, but commonly they lie at different stratigraphic horizons or cross each other. When the fossils become with great number and clear view where can observation it in the field, the fossils become a part of rocky depicted then their boundaries coincide. The other condition of conformity when occur change in the depositional environment which reflects in quality of the rocks precipitation, so the organism which live in that environment .

Relation between Biostratigraphic units and Chronostratigraphic units

Chronostratigraphic units are defined as encompassing all rocks formed within certain time spans of Earth history regardless of their compositions or properties. Biostratigraphic units may approximate chronostratigraphic units even over wide areas if the biostratigraphic units boundaries limited in specific fossil range or group of fossils that the fossil or this group important as index fossil for specific age at that coincide the two units , but the boundaries of biostratigraphic units may diverge from those of a chronostratigraphic unit many reasons. Principal among these are changes in depositional facies, variations in conditions for fossilization and preservation of fossils, vagaries of fossil discovery, and biogeographic differences.

Biostratigraphic units cannot be recognized in rocks where there are no fossils. So biostratigraphic units not **Isochronous** in all area inversion chrono zone boundaries – according to definition-must be **Isochronous** in all area.

Example



Biostratigraphic profile explain the relationship between biostratigraphic unit of the species Exus Alphas (Exus Alphas Biostratigraphic Zone) and chronostratigraphic units for the same species(Exus Alphas Chrono Zone).