

Study about Fossil & Fossilization process – importance and types of Fossils plants

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Abstract : The study of fossils of plant life of the geologic past is called paleobotany. Paleobotany tells us the story of preserved vestiges of the plant life of the past. In simplified language paleobotany may be defined as a branch of botany which deals with the study of such plants which are living in past but extinct now.

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FOSSILS

The study of dead remains of the organism or their imprints preserved in the geological rocks is called fossil. Fossils are used to study organisms present in the past. Fossils is derived from a Latin word *fovere* meaning “to dig”. In fact fossils are impressions or cast of the organelles (organism) living sometime back but now extinct, on. They are present in rocks. Now they are required to be dug out. Normally



the plant dies and its degeneration starts immediately. This degeneration continues till the entire body is broken into chemical compounds. Thus no evidence of its former existence remains. But sometimes under certain circumstances the degeneration of the plant body stops. Thus



parts of the body remain in visible form. These remains are known as fossils. These fossils are lifeless.

Plant fossils are normally present in rocks composed of sediments deposited in waters. These stratified rocks are super imposed upon one another in series. These rocks are built of sediments.

These accumulate in bottoms of seas, lakes, swamps, flooded valleys, subsiding beaches etc.

The rock formation is correlated with the geological approach in the subject paleobotany. In fact fossil are the makers of geologic time. The study of a botany as well as geology is essential for the study of fossil plants. The classification of fossil plants is very difficult as there are many chances for error.



Fossilization

In the basic process of fossilization, the physical part of any plant or animal must be buried within a well-protective matrix in the crust of the earth. This matrix in the earth's crust is usually sedimentary. The sedimentary environment of this kind can be of several types such as lake, stream, inland sea or estuarine, etc.

In several cases it has also been observed that diatom frustules also get incorporated in deposits of deep sea basins. In rare cases, the sedimentary environment is in the form of volcanic deposits or other subaqueous conditions. The portions of the organisms (plant or animal) preserved in sediment become stony or lithified during course of time.

Chemical weathering and flooding also help in the formation of these particles. These rock particles or sediments accumulate and water is squeezed out of them. During course of time, this makes them much more compact or rocky structure. Such a rocky structure is called sedimentary rock.

The process of formation of fossil in the rocks is called fossilization. It has following stages:



1. First of all the wind or stem borne plant come into quiet water and become saturated. Now it begins to sink.
2. The entire plant or some part of it lies in parallel to horizontal position. In presence of mud or sand plant it will sterile with sand.
3. Abundant sediment will cause rapid accumulation and the plants will be separated from one another. Thus rocks are formed in between which plant parts (mainly stem, leaves) remain present.
4. The weight of the accumulating sediments will flatten it. The sediments increase in thickness, compact. As a result, less resistant and more compressible plant part's flattened to a new portion of its original thickness.
5. The plant parts become cylindrical. They are made up of hard tissues the weight overlying of sediments will produce a lens shaped object. Thus the rocks have the compression of impression of plant. Thus rock having compression when split open on one surface usually bears the impressed outer part.

Importance of Fossils

The study of fossil plants has great importance. :

1. They throw light on Phylogeny and evolution of plants. The extinct plants tell us some stages through which existing group have passed during course of their development.
2. Fossil plants give a historical approach to plant kingdom.
3. Fossils are helpful in classification of plants.
4. Fossil plant can be used in the field of descriptive and comparative anatomy.

Types of Fossils plants

Some of the important type of plant fossils is as follows

1. Petrifications or Mineralized plants: In this type of plants fossil the original cell of the plant tissue is retained by means of some minerals like, silica etc. These mineral has infiltrated the tissues. In this type of fossil sometimes the material of original plant may be preserved e.g. coal balls, Silicified wood etc.

2. Cast on incrustations: In this type of plant fossil, the form of plant is preserved as a cast. The cast results from the filling of a cavity formed by decay of tissues of plant part. Here the internal structures are destroyed and carbonaceous substances of the plant are totally gone e.g. stem leaf scars, larger seeds etc.

3. Compressions: In this type of plant fossil, the external form of plant modifies and leaves impressions on the sediment which overlies it.

4. Compaction or Mummified plants: In this type of plant fossil, the plants or their parts get compressed by vertical pressure against one another. Mostly plant rudiments found in peat and coal as compressions. Coal or coal balls are the important sources of plant fossils. Coals are irregular or sub-spherical mass of calcium or magnesium carbonates (or some other mineral matter).



5. Impressions: In this type of plant fossil, the roots, stems, leaves, fruits and seeds are preserved as impressions

in such a fashion that they seem to be the actual dried specimens laid on the stone.

6. Amber: Coniferous plants exude a resinous substance. It drops on the floor of forests. It accumulates and hardens over ages. Insects, fragments of plants and other animals get preserved in it and become fossilized. It is called amber.

Conclusion :

Very few fossils preserve soft parts; some insects are preserved in amber and animals may be preserved in ice. Some fossils are created when minerals replace the organic material. A fossil may be in the form of a mold, which is the depression left in the shape of the material or a cast, which is rocky material that filled the mold.

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