BSc. Botany (Hons) – 2ND Year

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Fossilisation

Fossilisation is the process of transfer of material from biosphere (organic material) to lithosphere (fossil), in which the organic material is being replaced by inorganic mineral matter. The chances of an organism becoming a fossil are very less. It has been observed that for every organism that dies its chances of fossilisation are less than one in a million. The organisms are composed of the following parts:

- soft fleshy parts–made up of unstable organic compounds of carbon, oxygen and hydrogen.
- hard parts, for example shells, skeletons, bones and teeth–made up of stable hard compounds such as calcium carbonate and calcium phosphate, and
- both soft and hard parts.

Conditions for Fossilisation

Like today's organisms which are living in different environments such as in seas, rivers, lakes or on plains or mountains, it is assumed that pre-historic organisms might have lived in similar kinds of environments. It may be noted that all environments are not equally suitable for preservation or fossilisation. Hence, the nature or composition of the organisms and type of environment where they are living play an important role in fossilisation. The favourable conditions for fossilisation are mentioned below:

- The organisms should have hard parts: The hard parts of organisms such as shells, bones, teeth and wood take more time to break down and can be preserved as fossils. On the other hand, the soft-bodied organisms, forexample, insects, worms and jellyfish decay very quickly after death and are rarely preserved.
- Rapid burial of organisms after death under a thick cover of sediments: If the organisms are quickly buried under the sediment, it cuts the supply of oxygen and prevents destruction of the organisms by scavengers and decay.
- Environment: The environment plays an important role in the organism's ability to fossilise. It has been observed that marine organisms are more likely to be fossilised than those living

on land because marine organisms have greater chance of being covered rapidly by sediments, which increases the chance of fossilisation. Land-based organisms have less chance of being covered by sediments and more risk from scavengers and hence, they have less chances to fossilise.

Processes of Fossilisation

Fossilisation may occur in many ways. Sometimes, the entire organism including its soft parts is preserved. In rare cases, only hard parts of the organism are fossilised. In few cases, only imprints and traces of organisms are preserved. Hence, different organism types show different processes of fossilisation. Fossils occur in many different forms such as unaltered soft parts, unaltered hard parts and altered hard parts. Depending upon the nature of fossils, the processes of fossilisation may be classified into the following types: i) Unaltered soft parts or exceptional preservation ii) Unaltered hard parts preservation iii) Altered hard parts preservation, which is further divided into (a) Permineralisation or petrifaction (b) Replacement (c) Carbonisation (d) Molds and casts (e) Tracks and trails