

**STUDY MATERIALS FOR GYMNOSPERMS**  
**DEPARTMENT OF BOTANY, GOUR MAHAVIDYALAYA**

**Economic importance of gymnosperms**

Gymnosperms are other types of vascular and non-vascular plants of the Kingdom Plantae, which produce seeds directly (without) bearing any flower. Compared to angiosperms, there are far fewer types of gymnosperms. Following are some of the economical importance of gymnosperms:

1. **Ornamental value:** A number of gymnosperms are grown as ornamental plants, e.g., *Cycas*, *Araucaria*, *Thuja* etc.
2. **Food value:** 'Sago' starch obtained from pith and cortex of stem of *Cycas revolute*, *C. rumphi* etc. Young leaves of *Cycas* cooked as vegetables. Seeds of *Pinus gerardiana* (chilgoza) are edible.
3. **Medicinal value:** **Ephedrine** (alkaloid) extracted from *Ephedra* used in treating asthma, cough, cold, bronchitis etc. **Taxol** is an anticancerous medicine extracted from *Taxus* sp.
4. **Industrial value :** **Gum-** *Cycas* gum used as adhesive, antidote for snake bites and using malignant ulcers. **Canada balsam** – It is turpentine obtained from *Abies balsamea* and used as a mounting medium in biological preparations.  
The leaves of cycads are used for preparing baskets, mats, hats, brooms etc. **Tannins** extracted from bark of *Araucaria*, *Pinus*, *Sequoia* etc. used in leather industry.  
**Papers** like newsprints, writing and printing papers are being prepared from the wood pulp of *Pinus*, *Picea*, *Abies*, *Gnetum* etc. **Plywood** prepared from *Podocarpus*.
5. **Source of oils:** Oils extracted from seeds of *Cycas revoluta*, *Macrozamia reidleyi*, *Pinus cembra* and *Cephalotaxus drupacea* are used as edible oils. Oils obtained from *Cedrus deodara*, *Cyptomeria japonica* and *Cupressus sermpervirens* are used in preparations of perfumes.
6. **Timber:** *Pinus roxburghii* ('chir'), is one of the most widely used commercial timber of India. It yields a resinous, non-durable and light wood which finds its use mainly in packing cases, construction work, low priced furniture, poles, railway sleepers, truck and bus chassis. *P. wallichiana* ("Kail" or blue pine) is comparatively hard and durable, and put to uses similar to that of a chir.
7. **Others:** **Copal** and **Sandarac** are hard resins which contain very little essential oil. Copal is obtained, from living trees as well as fossil state. The most important is Kauri gum or Kauri copal from *Agathis australis*. It is used for the preparation of lacquers, varnishes and enamels.

**Amber** is also a fossil resin secreted by the extinct pine, *Pinus succinifera*. Fossil amber sometimes shows the presence of remains of plants and animals.



trapped in the resin. It has been reported that the human blood, when kept in an amber container, does not coagulate.

