




PHYLOGENY OF AMENTIFERAE

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• INTRODUCTION

- Eichler first erected the order Amentiferae (1883).
 - He included 9 families in the order which are as follows:
 - **Salicaceae**
 - **Garryaceae**
 - **Myricaceae**
 - **Balanopsidaceae**
 - **Leitneriaceae**
 - **Juglandaceae**
 - **Batidaceae**
 - **Betulaceae**
 - **Fagaceae**
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- Hutchinson transferred all these Amentiferous orders to a phyletic position that treats them as descendents of Hamamelidaceous ancestors
 - Cronquist and Takhtajan kept these families in their subclass Hamamelidae except Salicaceae and Garryaceae which were kept in Dilleniidae and Rosidae respectively.
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- Engler considered it as the most primitive group of Dicotyledons.
 - Benson (1957) divided this group into 10 orders and 12 families
 - **Salicales : Salicaceae**
 - **Garryales: Garryaceae**
 - **Myricales: Myricaceae**
 - **Balanopsidales: Balanopsidaceae**
 - **Leitneriales: Leitneriaceae**
 - **Juglandales: Juglandaceae, Rhoipteleaceae**
 - **Batidales: Batidaceae**
 - **Fagales: Betulaceae, Fagaceae**
 - **Julianales: Julianaceae**
 - **Casuarinales: Casuarinaceae**
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General Characteristics of the group

- Catkin bearers, Catkin is a scaly bracteate, usually flexuous spike or spike like inflorescence of cymules
 - Trees, shrubs
 - Flowers small, unisexual
 - Anemophilous
 - Seeds exalbuminous
 - Distribution: North temperate zone
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1. Salicaceae

- Trees or shrubs, Dioecious
 - Leaves simple, alternate, stipulate, deciduous
 - Flowers unisexual, each flower subtended by a scale (or bract)
 - Perianth absent or vestigial represented by a cupular disk or small nectary
 - Male flowers represented by 2-30 stamens, free or connate
 - Female flowers with 2-4 carpels, unilocular with numerous ovules
 - Parietal or Basal placentation
 - Ovary inferior
 - Seeds exalbuminous covered with silky hairs arising from the funicle
 - Family comprises of 3 genera ,530 species
 - Example: *Populus*, *Salix*, *Chosenia*
 - *Salix alba* L. var. *coerulea*(Sm.) Sm. used in making cricket bats
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2. Juglandaceae

- Deciduous monoecious trees or rarely shrubs
 - Leaves pinnately compound, alternate, stipulate with hairy winterbuds
 - Inflorescence monoecious catkins
 - Male flowers subtended by a primary bract and a secondary bract, perianth lobes 4 but often fewer by abortion with 30-40 stamens
 - Female flowers with a floral envelope of a primary bract and 2 secondary bracts, and with 4 perianth lobes
 - Ovary inferior, bicarpellary, syncarpous, unilocular with a single erect ovule
 - Anemophilous
 - Fruit drupe or nut
 - Seeds exalbuminous
 - Family consist of 7 genera, 50 species
 - Example: *Juglans*, *Carya*, *Platycarya*, *Pterocarya*
 - Economically wood is valuable in cabinet and furniture making
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3. Betulaceae

- Deciduous monoecious trees or rarely shrubs
 - Leaves simple, alternate, stipulate, stipules deciduous
 - Flowers unisexual, monoecious, the staminate in catkins and pistillate in heads
 - Male flowers : tepals 4, minute, stamens 1-4
 - Female flowers: perianth absent , ovary inferior, bicarpellary syncarpous, bilocular at base and unilocular above, each locule with one axillary pendulous ovule
 - Fruit one seeded nut or winged samara
 - Seeds exalbuminous
 - Family consist of 6 genera, 100 species
 - Distributed in north temperate regions and tropical mountains
 - Example: *Betula*, *Alnus*, *Carpinus*
 - Economically the wood is useful as lumber
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4. Fagaceae

- Monoecious trees and shrubs
 - Leaves simple, alternate, stipulate, lobed or entire
 - Flowers unisexual, in dichasia which are often arranged in catkins, the dichasia sometimes reduced to solitary flower
 - Male flowers: Tepals 4-7, stamens 4-40
 - Female flowers: Perianth of 4-6 tepals, ovary inferior, 3-6 carpellary and 3-6 loculed with two ovules in each locule
 - Axile placentation
 - Fruit 1-seeded nut enveloped by cupule or involucre
 - Seeds with large embryo and no endosperm
 - Family consist of 8 genera, 900 species
 - Distributed in temperate and sub tropical regions of the northern hemisphere
 - Example: *Quercus*(Oaks), *Fagus*, *Castanopsis*(Castanea)
 - Economically useful for wood
 - Hutchinson, Engler and Prantl, Cronquist and Takhtajan kept the families Fagaceae and Betulaceae in a single order Fagales.
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5. Myricaceae

- Aromatic trees or shrubs
 - Leaves alternate or subopposite, simple, entire or pinnatifid, resin dotted, exstipulate or stipulate
 - Flowers unisexual or bisexual in short catkin like spikes
 - Male Flowers subtended by a bract and 2 bracteoles, perianth absent, stamens 4-8, filaments distinct or connate
 - Female flowers subtended by a bract and with or without bracteoles, ovary superior, bicarpellary syncarpous, unilocular with a single ovule on basal placentation.
 - Bisexual flowers with a central gynoecium and 3-4 stamens
 - Fruit a small drupe, waxy coated
 - Seed exalbuminous
 - Family consist of 4 genera, 40 species
 - Distributed in northern hemisphere
 - Example: *Myrica*, *Gale*, *Comptonia*
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6. Leitneriaceae

- Dioecious shrubs
 - Leaves alternate, simple, exstipulate
 - Flowers unisexual in catkin like spikes, each flower subtended by a bract
 - Male flower: stamens 3-12
 - Female flowers: subtended by 3 bracts, and a perianth of usually 4 distinct bract like tepals, ovary superior, unilocular with a single ovule on parietal placentation
 - Fruit a leathery compressed obovoid drupe
 - Seed with large embryo and thin fleshy endosperm
 - Family represented by a single genus and single species
 - Example: *Leitneria floridana*
 - Distributed in south eastern United States.
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7. Casuarinaceae

- Evergreen woody trees or shrubs with slender, green, cylindrical and deeply grooved branches
- Leaves in whorls of 4-16 scale like
- Flowers unisexual without perianth
- Male flowers are borne in simple or cupular spikes (catkins) usually terminal on green branches. The internodes are short and at every node is a cup with several stamens hanging out over a edge.
- Each stamen represents a male flower and 4 bracteoles
- Female flowers capitate, each flower is naked in the axil of a bract and 2 bracteoles
- Ovary superior, bicarpellary, syncarpous and unilocular by the suppression of one locule, with two ovules on single parietal placentation.
- After pollination the whole head becomes woody enclosing the ripening seeds. Fruits 1-seeded, winged samara, seeds without endosperm
- Family consist of 2 genera, 65 species
- Distributed in south east Asia to north east Australia
- Example: *Casuarina* and *Gymnostoma*
- *Casuarina equisetifolia* is a good sand binder, grown as wind breaker, poles made of wood is used in building construction and support.

THANK YOU

