ANGIOSPERMAE

Plants of this taxon are somehow superior to other plants:

a) An ovarium is present to protect the ovule better

b) Pollination and fertilization are guaranteed

Pollination occurs via bugs, birds, the wind, water (plants are entemogamous, ornithogamous, anemogamous and hydrogamous, respectively).

c) There are many types of inflorescences.

d) Trachea are also present in the vessels along with tracheids. Companion cells are also present in the phloem along with sieve elements.

e) While Gymnosperms only consist of trees and shrubs (woody plants), Angiosperms may also be herbaceous.

Angiosperms are divided into two classes according to the number of their cotyledons: Monocotyledones and Dicotyledones.

Class: Monocotyledones

Important characteristics:

The embryo has only one cotyledon.

Mostly herbaceous, annual or perennial plants.

Cork tissue is not present in the stem bark.

Stem is simple, branching may be present in the inflorescence.

Vessels are irregularly arranged.
Cambium is not present, therefore secondary growth is not seen.

They are mostly geophytes that have bulbs, rhizomes or tubers underground.

Leaves are usually simple, sessile, linear, with parallel veins and without stipula, are alternately arranged. Leaves surround the stem with a sheath.

Fibrous roots are present.

The number of calyx, corolla, androecium, gynaeceum members is 3 or in multiples of 3 (trimeric).

Calyx and corolla are not individually present as a perianth, but forms a perigonium, and a member of the perigon is called a tepal.

General flower formula: $\mathbf{P_{3+3}\ A_{3+3}\ \underline{G}_{(3)}}$

Pollination occurs via bugs, therefore plants are entemogamous.

Subdivision: ANGIOSPERMAE
Class: Monocotyledones

Important Monocotyledones plant families in respect to pharmacy are:

POALES

- **Gramineae (Poaceae)**

LILIALES

- **Dioscoreaceae**
- **Liliaceae**
- **Iridaceae**
- **Amaryllidaceae**

MICROSPERMAE (ORCHIDALES)

- **Orchidaceae**

GRAMINAE (POACEAE)

Perennial, herbaceous plants.

Nodes and internodiums are distinctly present.

Plant with a cylindrical and hallow stem, except at the nodes

One leaf is present at a node, they are alternately arranged.

Lamina; linear, with parallel venation, sheath slit (called vagina); formed by the base of the leaf surrounding the stem is present. A ligule is present between the lamina and the vagina (specific to Poaceae).

(*) nodus= node; nodosus = with many nodes
(**) internodium= region between the nodes

Flower: bisexual, sometimes unisexual

Çiçekler erdişi, bazen tek eşeyli

The basic floral unit, spikelet located above two glumes (1)

Spikulalar halinde. Spikulanın tabanında dış brakteye karşılık gelen GLUMA (1)

The spikelets arrange in a manner to form spikes, panicles or raceme

Spikulalar spika, spadiks veya panikulalar meydana getirir.

2 glumelles (inner palea(4) and outer lemma (2))

Spikula ekseni üzerindeki çiçekler GLUMELLA denilen iki brakteolün koltuğundan çıkar. Alt gluma= LEMMA (2), üst gluma= PALEA (4)

Reduced perigonium represented by 2-3 lodicules

Periant 2-3 LODİKULA (5)' dan oluşur

Fruit: Caryopsis

Pollination with wind

Tozlaşma rüzgar ile

Ovary superior; hypogenos, consists of 3 carpels

Ovaryum üst durumlu, 3 karpelden oluşur

2 Stigmas generally feathery

Stigma 2 kollu ve tüy gibi parçalı

Stamens usually 3, sometimes 1-6

Stamenler genellikle 3, bazen 1-6

Has been cultivated for thousands of years.

Annual, herbaceous.

Inflorescence is a condensed spike.

Triticum sativum (Wheat, Buğday)

Fruits: caryopsis, rich in starch and proteins, yields Amylum Tritici (Tritici amylum)

Added to creams, powders etc. as anti-inflammatory agent in pharmaceutical industry. Used in the pharmaceutical technique of drug preparation such as tablets, granules. It is also added to powders when the amount of the active ingredient is required to be reduced since it is a harmless drug.

Wheat embryo
(wheat germ, rüşeym)

Wheat germ is the embryo found in the lower part of the wheat grain.

1 kilogram of wheat germ is obtained from 1 ton of wheat.

Rich in minerals and vitamins, especially E and B group of vitamins.

GLUTEN

Gluten is a group of proteins found in grains like wheat, rye, barley and oats.

People with Celiac diesase can not digest this protein.

When people with Celiac disease eat food containing gluten, their immune system damages their small intestines.

Gluten ***(L.)*** **glue**

Oryza sativa

(Rice, Pirinç)

Origin: Far East

An annual, herbaceous plant

Fruits are rich in starch, but poor in proteins.

Yields Amylum Oryzae (Oryzae amylum) T.K.

Zea mays (corn)

Origin: South America

Annual, herbaceous plant.

Stylus Maydis (Maydis stylus); diuretic
Amylum Maydis (Maydis amylum);
starch consumed as food and used in the making of tablets. And also zein obtained from grains is used in tablet coating and dextrin is used as adhesive.
Oleum Maydis (Maydis oleum);
recommended in the diet due to its unsaturated fatty acid content, regulates blood-cholesterol levels

Agropyron repens

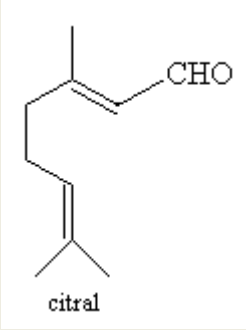
(Couch Grass, Ayrıkotu)

Yields Rhizoma Graminis (Graminis rhizoma)

Usage: Diuretic.

Cymbopogon citratus
(Lemon Grass)

Lemon grass essence is obtained from the leaves.
Smells like lemon since it contains 75% citral

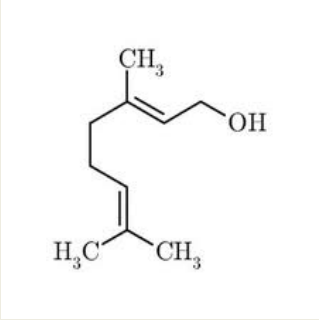


citral

Volatile oils of *C. nardus* (contains citronellal), *C. winterianus*, *C. flexuosus* species are used more since they yield a cheaper volatile oil.

Cymbopogon martini (Palmarosa)
Cymbopogon schoenanthus (Camel grass)

Yields Palma-rosa essence, contains 75-95% geraniol (rose smell) and used instead of rose oil.



Saccharum officinarum
(Sugarcane, Şeker kamışı)

Stems (juice of the stems) yield Saccharum T.F. (Sugar).

Order: **Arecales**

Fam: **Palmae** (Arecaceae)

Usually grows in tropical and subtropical regions.

Cocos nucifera

(Coconut, Hindistan cevizi)

Mesocarp of the fruit =
Coir (fibrous layer)
Used in textile
Endosperma: copra
Used as food

Serenoa repens (=*Sabal serrulata*) (Dwarf palm, Saw Palmetto)

Fructus Serenoae repentis (Sabalis serrulatae fructus) Used in urinary tract disorders, prostatic hypertrophy.

Areca catechu (Areca Palm, Betel Nut Palm)

Yields Semen Arecae (Arecae semen) (betel nut).

Accelerates peristaltic movements of the intestines.
The seed contain alkaloids that are used as helminthic in veterinary medicine

Copernicia cerifera
(Carnauba)

The leaves are covered with a thick layer of wax that yields Cera Carnauba, Cera Palmarum (carnauba wax). Used in the polishing of sugar coated pills.

Phoenix dactylifera (Date tree, Hurma ağacı)

Mesocarp is fleshy and rich in sugar

Order: **Arales**

Fam: **Araceae**

Yields ornamental plants

Arum sp.

(Arum lilies, Yılan yastığı, danaayağı)

Tubers of the plant contains saponins and raphide crystals

POISONOUS!!

Order: Bromeliales
Fam: Bromeliaceae

Origin: Americas

***Ananas comosus* (Ananas)**

From the fruits, an enzyme called bromelin is obtained that digests proteins.

(bromelin: a proteolytic enzyme obtained from pineapples)

Order: **Liliales**

1. Flower hypogynous .....**Liliaceae**

1. Flower epygynous

2. Flowers separate; ..... **Dioscoreaceae**

2. Flower hermaphrodite:

3. Stamen number 6 $\mathbf{A_{3+3}}$ .....**Amaryllidaceae**

3. Stamen number 3 $\mathbf{A_{3+0}}$ .....**Iridaceae**

Family: Liliaceae

$$P_{3+3}\, A_{3+3}\, \underline{G}_{(3)}\, .a$$

Habit: Often perennial herbs propagated by bulbs

Leaves: Alternate, flat, linear, parallel venation, sometimes cordate, succulent/scaly

Stipules, 2 scale-like attachments at the base of the petiole, some of them have phylloclads

Inflorescence: Raceme or umbel
Flower: actinomorphic, hypogynous

Fruit: loculicidal capsule or rarely a berry

Family: Amaryllidaceae

$P_{3+3}\, A_{3+3}\, \overline{\underline{G}}_{(3)}.\ a$

Perennial herbs with bulbs, sometimes rhizomes
Leaves: Linear, parallel venation,sometimes succulent, never cladote

Flowers: supported by a spathe, in umbels often reduced to solitary flower
Perigonium united in tube, sometimes contains an intra-perigonal corona

Fruit: Loculicidal capsule or rarely a berry

Family: Iridaceae

$P_{3+3} A_3 \overline{G}_{(3)}$. a/z

Habit: herbs with rhizomes, tubers or bulbs
Leaves: sessile, basal, with parallel venation, linear or ensiformis

Flower: solitary flower, raceme

Perigonium connate (united) in tube
Spathe +/-
Style with 3 lobes

Fruit: Loculicidal capsule

Monocotyledonae (Liliales)

Liliaceae	$P_{3+3}\, A_{3+3}\, \underline{G}_{(3)}$ **.a**
Iridaceae	$P_{3+3}\, A_{3}\, \overline{G}_{(3)}$**. a/z**
Amaryllidaceae	$P_{3+3}\, A_{3+3}\, \overline{G}_{(3)}$**. a**

Order: Liliales
Family: Liliaceae

Plants of Liliaceae family are important in respect to pharmacy, drugs, their active compounds and usages

1. Species containing alkaloids:
Colchicum autumnale, C. speciosum, Sabadilla officinarum, Veratrum album

2. Species containing anthracene and mucilage:
***Aloe* sp.**

3. Species containing cardioactive heterosides:
***Scilla maritima* (*Urginea maritima*)**
Convallaria majalis

4. Species containing saponosides:
***Smilax* sp., *Polygonatum* sp., *Ruscus* sp.**

5. Others:
***Allium* sp. (heterosiedes, flavonoids, vitamins):**
***Asparagus* sp. (Asparagine), *Asphodelius* sp. (Inuline),**
***Yucca* sp. (Steroidal hormone semi-synthesis)**

6. Ornamental plants:
***Tulipa* sp., *Fritillaria* sp., *Lilium* sp., *Ornithogalum* sp.**

Yucca filamentosa
(Adam’s needle, Avize çiçeği)

Leaves contain steroidal saponosides.

Cultivated as an ornamental plant.

Colchicum autumnale

(Autumn crocus, Çiğdem, Acı çiğdem)

Colchicine is also used in the treatment of Familial Mediterranean Fever.

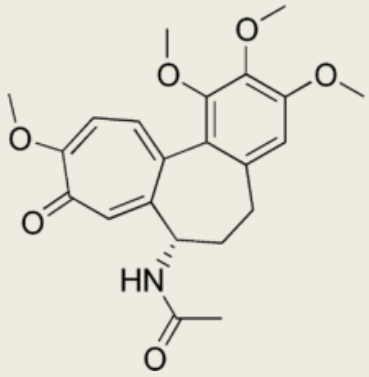
Semen Colchici (Colchici semen)

T.K. contains colchicine and democolsine alkaloids that prevent the formation of cytoplasmic fibers that pull the chromosomes to the poles during cell division (mitosis).

Toxic!

Democolsine alkaloid is used in chronic leukemia.

Cell division stops at the metaphase stage, doubling the chromosome numbers and polyploid plants occur (usage in agriculture). As folk medicine, used as pain reliever for rheumatism and gout.



Colchicum speciosum
(False Autumn Crocus, Vargit Çiçeği)

Flowering of the plant is the determinant of time for leaving the upland, that's why it is called "vargit çiçeği" in Turkish.

Seeds have colchicine derivatives (also alkaloids), plants is exported.

Schoenocaulon officinale
(=*Sabadilla officinarum*)
(Sabadilla, bitotu)

Used for hair loss and lethal for parasites (that's why it is called "bitotu (louse plant) " in Turkish)

The extract isolated from Sabadillae Semen (Sabadillae semen) contains *veratrinum alkaloid mixture and is* used externally as pain reliever for rheumatism.

Veratrum album (False Helleborine, White Hellebore, Beyaz Çöpleme)

Contains protoveratrine A and **B**
Lowers Blood Pressure and used for rheumatism
However POISONOUS!!

Aloe sp.
(Aloe, Sarısabır)

Succulent plant with short stem and succulent, triangular, dentate leaves 15-50 cm long; forms a basal rosette.

The leaf extract is called Aloe T.K., T. F. (Aloe, Sarısabır).

Also obtained from
Aloe vera,
Aloe africana,
Aloe ferox
Aloe spicata

Contains 3-15% Anthracene derivatives. Effective on the large bowel: purgative*

(*purgative: tending to clease or purge, especially causing the evacuation of bowels)

***A. vera* leaves yield a mucilage known as Aloe vera gel (does not contain anthracene derivatives but have polysaccharides, musilage, vitamins, amino acid, sterols, saponosides)**

Used in cosmetics, in wound healing (sun burn, eczema), hair preparations, hand and body lotions.

Allium sp.

Inflorescence: Umbella (covered – protected when young- with a spatha)

Allium sativum

(Garlic, Sarımsak)

Bulbus is formed of many bulblets

Lowers blood pressure.
Contains vitamins A and C and also substances with antibiotic effect.
Oral bactericide.

Contains allyl disulfide, alliin.

Allium cepa

(Onion, Soğan)

A culture plant.
Contains vitamins A, C and B_2 and flavonosides.

Appetizer, has antibiotic activity.

Urginea maritima (= Scilla maritima)

(White Squill, Sea Onion, Adasoğanı)

Yields Bulbus Scillae (Scillae bulbus) T.K..

Contains cardioactive heterosides, is also diuretic.

Contain raphides that irritate the skin and therefore it is used for rheumatism to relieve pain (externally).

Smilax sp. (Saparna)

Fruit type: Berry

Radix Sarsaparillae (Sarsaparillae radix)

Extract prepared from the flowers with petroleum benzene is used in the perfumery and cosmetics industry.

Contains saponosides and is used in skin diseases like leprosy* and is also diuretic.

(*leprosy: A slowly progressive, chronic infectious disease caused by the bacterium *Mycobacterium leprae,* that damages nerves, skin, and mucous membranes, and can lead to loss of sensation, paralysis, gangrene, and deformity if untreated)

Smilax officinalis
(Sarsaparilla, Saparna)

Smilax medica

Polygonatum multiflorum

(Solomon's seal, Mührüsüleyman)

Yields

Rhizoma Polygonati (Polygonati rhizoma)

containing saponosides.

Used externally to relieve rheumatism pain.

Ruscus aculeatus

(Butcher's Broom, Christmas Berry, Tavşanmemesi)

Roots and rhizomes yield Radix Rusci aculeati (Rusci rhizoma) that contains ruscogenin. Diuretic and anti-inflammatory*.
(* anti-inflammatory: preventing or reducing inflamation)

Also used in Chronic Venous Insufficiency, varicose veins (protects and strengthens veins) and adjunctive in hemorrhoids.

(*Varicose vein: a condition in which the superficial veins, esp. of the legs, become tortuous, knotted, and swollen: caused by a defect in the venous valves or in the venous pump that normally moves the blood out of the legs when standing for long periods**)**

Asparagus officinalis

(Asparagus, Kuşkonmaz)

Roots and rhizomes yield Radix Asparagi that contains asparagine. Diuretic.

Young shoots are consumed as food.

Fam: Dioscoraceae

Perianth petaloid

Ovary inferior; epigynous

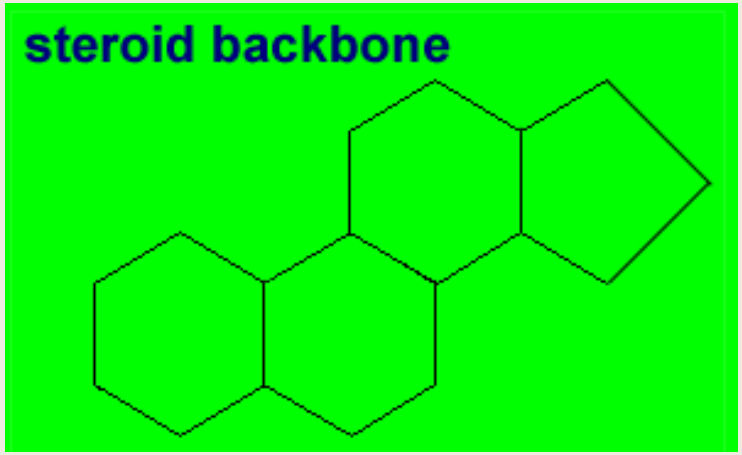
unisexual

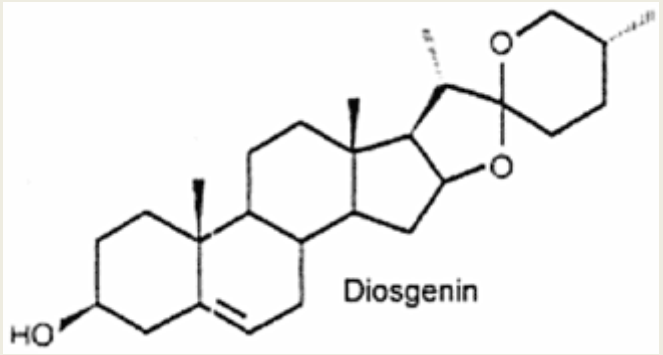
Dioscorea is a genus of over 600 species of flowering plants in the family Dioscoraceae, native throughout the tropical and warm temperate regions of the world. The vast majority of the species are tropical, with only a few species extending into temperate climates. It is named after the ancient Greek physician and botanist Dioscorides.

Dioscorea mexicana
(Mexican yam)

Dioscorea sylvatica
(Elephant's foot)

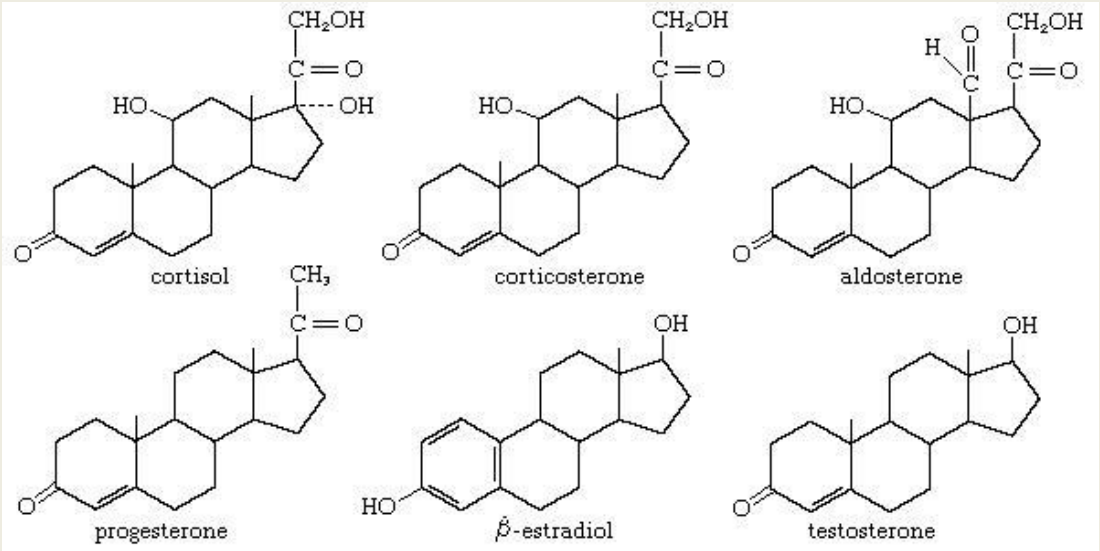
Dioscorea spp. **yields diosgenin (a steroidal saponoside). This saponoside is the precursor in the synthesis of corticosteroids.**





Steroid hormone, any of a group of hormones that belong to the class of chemical compounds known as steroids; they are secreted by three “steroid glands”—the **adrenal cortex, testes,** and **ovaries**—and during pregnancy by the **placenta**.

They are transported through the bloodstream to the cells of various target organs where they carry out the regulation of a wide range of physiological functions.



Corticosteroids, often known as steroids, are anti-inflammatory medicines prescribed for a wide range of conditions.

They're a man-made version of hormones normally produced by the adrenal glands (two small glands that sit on top of the kidneys).

Corticosteroids are available in different forms, including:
tablets (oral steroids)
injections – which can be into blood vessels, joints or muscles
inhalers – such as mouth or nasal sprays
lotions, gels or creams (topical steroids)

What are corticosteroids used for?
Corticosteroids are mainly used to reduce inflammation and suppress the immune system.
They are used to treat conditions such as:
asthma
allergic rhinitis and hay fever
urticarial (hives)
atopic eczema
chronic obstructive pulmonary disease (COPD)
painful and inflamed joints, muscles and tendons
lupus
inflammatory bowel disease (IBD) – including Crohn's disease and ulcerative colitis
giant cell arteritis and polymyalgia rheumatica
multiple sclerosis (MS)
Corticosteroids can also be used to replace certain hormones that are not being produced by the body naturally – for example, in people withAddison's disease.

POSSIBLE SIDE EFFECTS

Corticosteroids will only be prescribed if the potential benefits of treatment outweigh the risks. They will also be prescribed at the lowest effective dose for the shortest possible time.

There aren't usually any severe side effects if you take steroid injections, a steroid inhaler, or a short course of steroid tablets. However, prolonged treatment at high doses – particularly with steroid tablets – can cause problems in some people.

Potential side effects of long-term treatment include:

increased appetite – potentially leading to weight gain

acne

thinned skin that bruises easily

increased risk of infections

mood changes, mood swings and depression

diabetes

high blood pressure

osteoporosis (weak and brittle bones)

withdrawal symptoms caused by suppression of the adrenal glands

Fam: Amaryllidaceae

Galanthus sp.

(Snowdrop; Kardelen)

Galanthus elwesii

(Giant snowdrop)

Galanthus ikariae

Contains galantamine (alkaloid)
It is used in Alzheimer's disease*.

(* Alzheimer's disease: A disease marked by the loss of cognitive ability, generally over a period of 10 to 15 years, and associated with the development of abnormal tissues and protein deposits in the cerebral cortex)

In the 1950s it all seems to have begun when a Bulgarian pharmacologist noticed people rubbing their foreheads with snowdrops (probably the leaves or the bulbs, not the flowers, because it's the leaves and bulbs that contain galantamine) to ease pain.

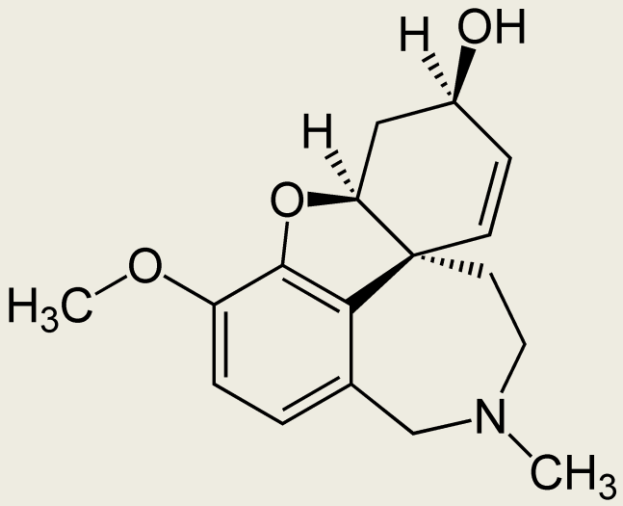
This had probably been a common practice for a long time, but his observation brought it to scientists' attention.

In medical practice throughout Eastern Europe, the compound came to be used for the alleviation of neuromuscular ailments, such as neuritis and neuralgia. Evidence also shows that galantamine was used for treating neurological conditions such as post-polio paralysis and myasthenia gravis*.

Indications that the compound enhances neurotransmission in the brain led to its being used to treat poliomyelitis, and this has been its primary use in Eastern Europe for the last half-century.

* **Myasthenia gravis** is characterized by weakness and rapid fatigue of any of the muscles under your voluntary control.

They showed that galantamine acts as an ***acetylcholinesterase inhibitor.***



galantamine

That led to the publication, in 1951, of a paper by two Russians, who gave the first pharmacological description of galantamine.

Galantamine keeps acetylcholinesterase from breaking down acetylcholine, temporarily leading to increased memory function, dream recall and lucidity.

Acetylcholineesterase inhibitor

a molecule that helps maintain normal levels of the neurotransmitter acetylcholine in the brain, by inhibiting the action of the enzyme that attacks it.

Acetylcholinesterase inhibitors have become the dominant form of therapy for Alzheimer's disease, which is characterized by deficits in cholinergic (acetylcholine-based) function.

We now know that galantamine—unlike other anti-Alzheimer's agents—has an additional mode of cholinergic action that gives it a distinct edge in efficacy, especially in the long term.

Commercialization Of Galantamine

Galantamine was first used (as Nivalin) for the treatment of Alzheimer's in 1996, and in that year, the first patent on a synthetic process for the compound was issued to an Austrian company, Sanochemia Pharmazeutika.

Subsequent commercialization of galantamine was undertaken by a **Belgian company**, **Janssen Pharmaceutica** (a subsidiary of Johnson & Johnson), and a **British company, Shire Pharmaceuticals Group**.

In 2000 the compound emerged under the new trade name **Reminyl®**, and in 2001 the FDA approved its use for the treatment of mild to moderate cases of Alzheimer's disease in the United States.

The following year, 1952, saw publication of a paper describing the first isolation and identification of galantamine, an alkaloid, as a unique chemical compound. (Determining the molecular structure of a natural substance is essential for enabling chemists to devise strategies for synthesizing it from scratch.)

Much research on galantamine by Russian and Bulgarian scientists followed during the 1950s and beyond. In 1958 it was commercialized in Bulgaria under the trade name Nivalin®.

GENERIC NAME: GALANTAMINE - ORAL (ga-LAN-ta-meen)

BRAND NAME(S): Razadyne, Reminyl

USES: Galantamine is used to treat mild to moderate confusion (dementia) related to Alzheimer's disease.

It does not cure Alzheimer's disease, but it may improve memory, awareness, and the ability to perform daily functions.

This medication works by restoring the balance of certain natural substances (neurotransmitters) in the brain.

The natural source of galantamine are certain species of daffodil and because these species are scarce and because the isolation of galanthamine from daffodil is expensive (a 1996 figure specifies 50,000 US dollar per kilogram, the yield from daffodil is 0.1-0.2% dry weight) alternative synthetic sources are under development by means of total synthesis.

Leucojum aestivum
(Spring Snowflake, Gölsoğanı)

Contains galantamine.

Exported

Agave spp

Contains **hecogenin**

Fam: Iridaceae
(Iris family, Süsengiller)

***Iris* sp. (Iris, Süsen)**

Iris florentina

Iris pallida

Iris germanica

These species yield **Rhizoma Iridis (Iridis rhizoma)** T.K. (Orris root, Menekşe kökü).

Contains **volatile oil** and **mucilage**.

Used in perfumery.

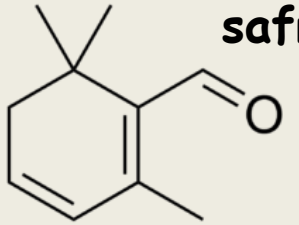
Crocus sativus (Saffron crocus, Safran)

Yields Crocus T.K. (safran).

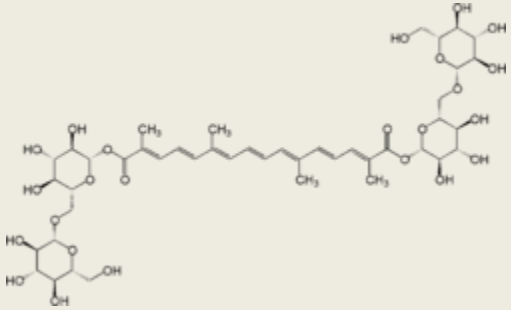
The drug consists of 3 lobed stigmas of the flower collected during flowering period.

Safranal gives the characteristic odor of the drug.
The red-orange color of the drug comes from the compound called **crosin.**

safranal



crosin



Has emmenagoue effect, if consumed in high amounts, may lead to abortus.

Used in food industry, especially in the preparation of desserts.

Order: Microspermae (Gynandrae, Orchidales)

Lacks chlorophyll, epiphyte plants
Aerial roots absorb the ambient humidity.

Perigonium is petaloid, one large tepal developed into a labellum, usually with spurs.

Subfamily Monandrae with 1 stamen
Subfamily Diandrae with 2 stamens

Pollination is via bugs (entemogamous plants).

Fam: **Orchidaceae**

These species has a main and a daughter tuber. The main tuber gives this year's plant and the daughter tuber gives the next year's plant.

Orchis anatolica
(Anatolian orchid, Anadolu orkidesi, Salep)

***Ophrys apifera* (Bee orchid)**

***Serapias* sp.**

***Anacamptis* sp.**

***Ophrys*, *Serapias*, *Aceras*, *Anacamptis*, *Dactylorhiza* species are called salep in Turkish.**

Daughter tubers of these perennial, herbaceous plants are removed while the plant still is in flowering time, dried and the drug called **Tubera Salep** (**Salep Tubera)** (T.K.) (Salep yumrusu) is obtained.

Contains 40-50% mucilage and starch, used as emollient.

Salep species can only propagate via their tubers, therefore collecting them completely threatens their survival.

Vanilla planifolia
(Vanilla, Vanilya)

The only climbing species of the family.

Grows in the tropics and is being cultivated in many countries including Mexico.

The fruit is a cylindrical, fleshy capsule. It is collected while still green.

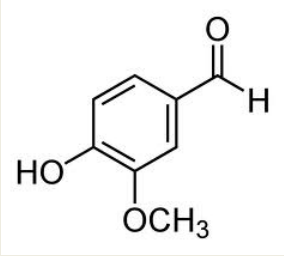
Then it is left to fermentation (kept one day in a dry and the other day in a moist environment), so vanillin forms.

After this fermentation, the drug called **Fructus Vanillae (Vanillae fructus) T.K. (Vanilya meyvası)** is obtained.

Blackish, shiny drug has characteristic vanilla odor.

Used in perfumery and also is an appetizer (due to its odor).

Vanillin is obtained from these fruits.



Fam: Zingiberaceae (Ginger family)

Perennial plants with fleshy and creeping rhizome or tuber, growing in the tropics.

Elettaria cardamomum

(Cardamom, kakule)

A big herbaceous plant with rhizomes growing in Asia and India.

Unripe fruits are collected to yield Fructus Cardamomi (Cardamomi fructus)T.K. (kakule meyvesi).

Volatile oil containing seeds are used as stomachic (digestive) and for culinary purposes.

Zingiber officinale

(Ginger, Zencefil)

Gives the drug named Rhizoma Zingiberis (Zingiberis rhizoma) (Ginger).

Powdered drug has been recommended for carsickness recently.

Zingiberis rhizoma is used as digestive

Curcuma longa

(Turmeric, Zerdeçal)

Cultivated in India and tropical Asia.

Rhizoma Curcumae (Curcumae longae rhizoma)

The drug contains
curcumin

It gives the color and odor of the spice called Curry (Köri)

Usage in foods is widespread in India and Southeast Asia.

Curcuma zedoaria (Zedoary, Cedvar)

Rhizoma Zedoariae (Zedoariae rhizoma)

The drug Rhizoma Zedoariae (Cedvar) is used as spice

Alpinia officinarum (Lesser galangan, Havlıcan)

Rhizoma Galangae (Galangae rhizoma)

Rhizoma Galangae (Galangae rhizoma) (Havlıcan) is used as spice.