

Ethnobotany. Lecture 13

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February 14th, 2011

Outline

1 Announcements

2 Plants and human sex

- Plants curing hormone imbalance
- Plants curing sexual disorders: aphrodisiacs

Outline

1 Announcements

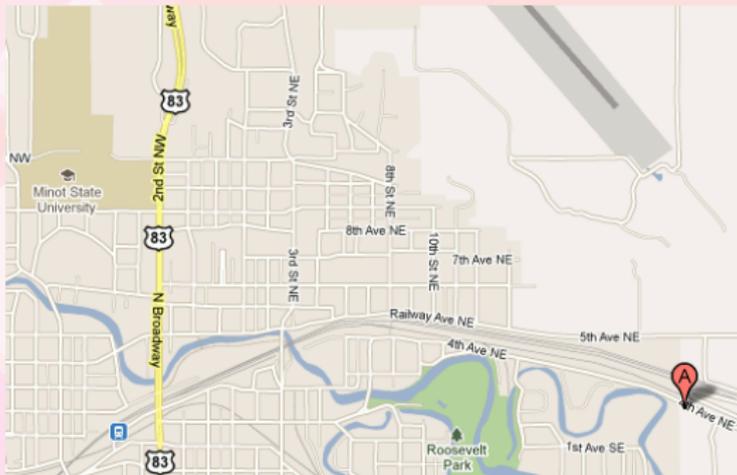
2 Plants and human sex

- Plants curing hormone imbalance
- Plants curing sexual disorders: aphrodisiacs

Previous and next labs

- Previous lab 3: some notes
- Lab 5 will be on February 24th, with two presentations: mango and orange (sweet potato presentation moved to March 31)
- Lab 4 (February 17th) will be an excursion with short (4–5,000 characters) written report about 3–5 best remembered succulent plant species; reports are due to February 24th

Thursday 9 am—excursion to cactus collection

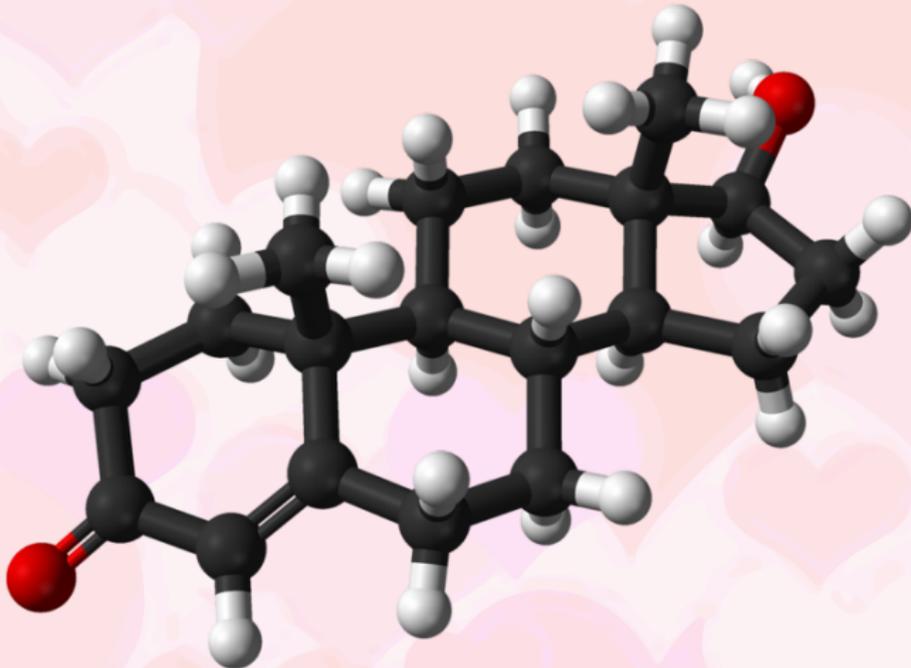


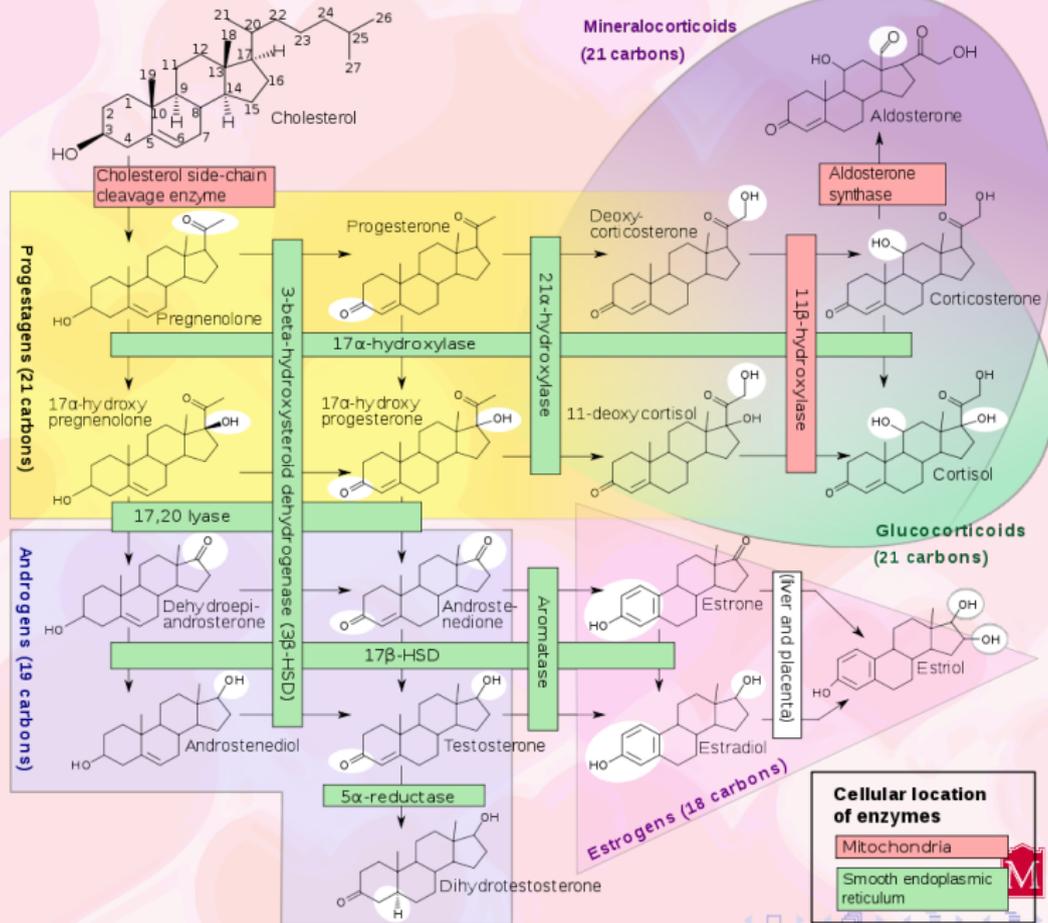
We will meet at 9 am near Lowe's flower shop.
Take notebooks with you.

Testosterone

- In prenatal development, induces gender identity
- Generally, promotes growth of muscle system through facilitation the synthesis of proteins
- Growth of muscle system stimulates growth of bones
- Has androgenic effects: secondary sex characteristics, sperm development
- Regulates fight-or-flight response, aggressive behavior and overall level of muscle energy
- Present in both males and females in 10:1 proportion

Testosteron

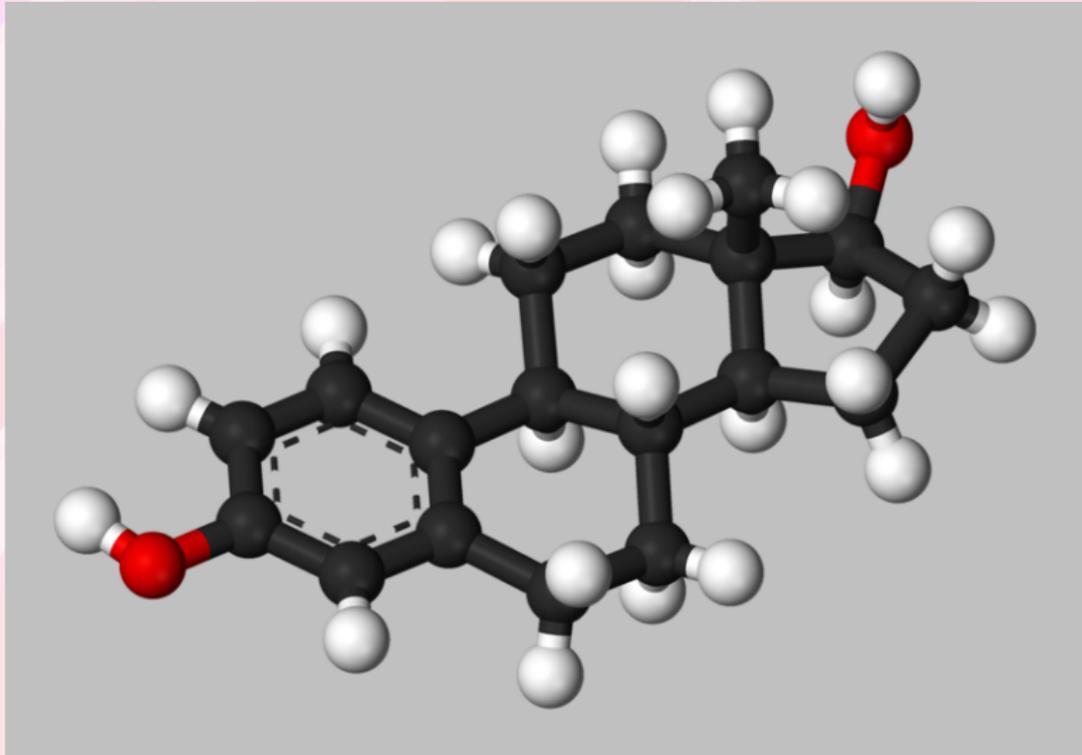




Estrogens

- Group of hormones, most important are estrone (E1) and estradiol (E2)
- Regulate female menstrual cycle
- Activate metabolism, reduce muscle mass, increase the level of fat storage, fasten cholesterol metabolism, promote female secondary sexual characteristics
- Rapid changes of estrogen levels reflects on mental health
- Promote development of some breast cancers
- Present in both males and females

Estradiol



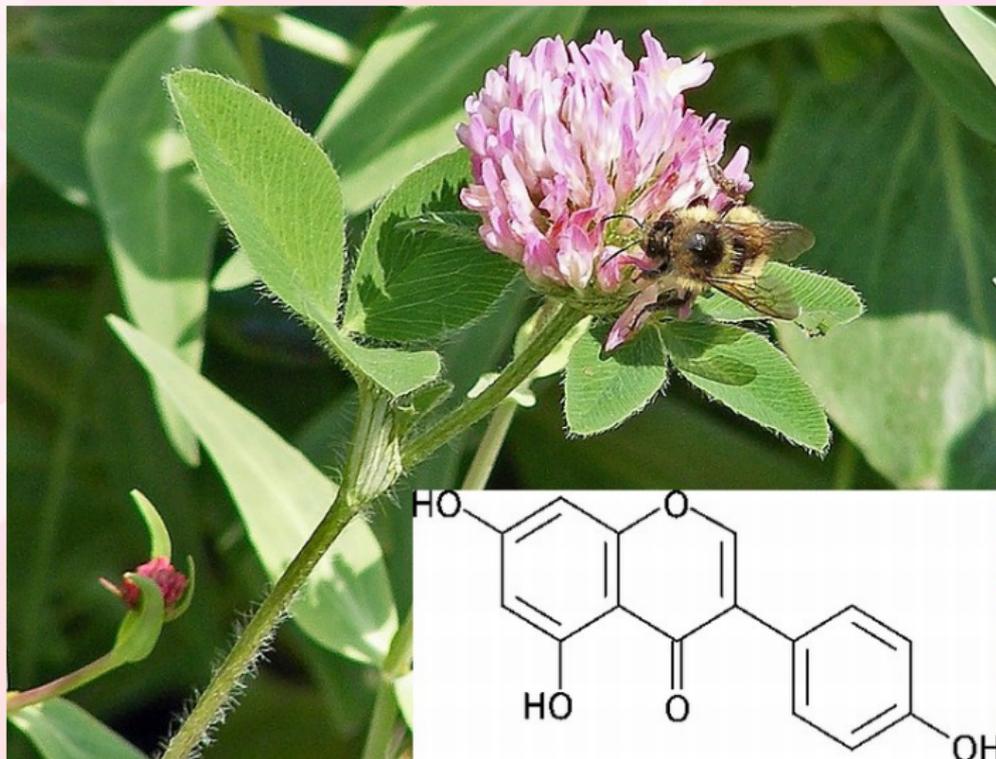
Phytoestrogens

- Plant analogs of steroids, “diet estrogens”
- Have both estrogen and anti-estrogen effects
- Soybeans contain significant amounts of phytoestrogens

Red clover, *Trifolium pratense*

- First spotted because of effect on grazing sheep fertility
- Plant belongs to legume family, Leguminosae
- Red, 2–3 cm diameter flower heads
- European plant, used as a forage and naturalized in North America

Red clover and genistein



Red clover clinical effects

- Genistein and coumestrol are two main components
- Traditionally used for treating skin diseases
- Now often used for a natural hormone therapy, decreases risks of some cancers

Black conosh, *Cicimifuga racemosa*

- Belongs to butterwort family, Ranunculaceae
- The other name is “squawroot” because of traditional use for female therapy
- Traditionally, also used for curing snake bites (“black snakeroot”)

Black cohosh clinical effects

- Glycosides cicimifugosides (e.g., actein) are main active components
- Improve menopausal symptoms, also affects menstrual cycle
- Lowering blood pressure

Black cohosh and actein



Saw palmetto, *Serenoa serrulata*

- Belongs to palm family, Palmae
- Important component of Florida forests
- Fruits are small black berries

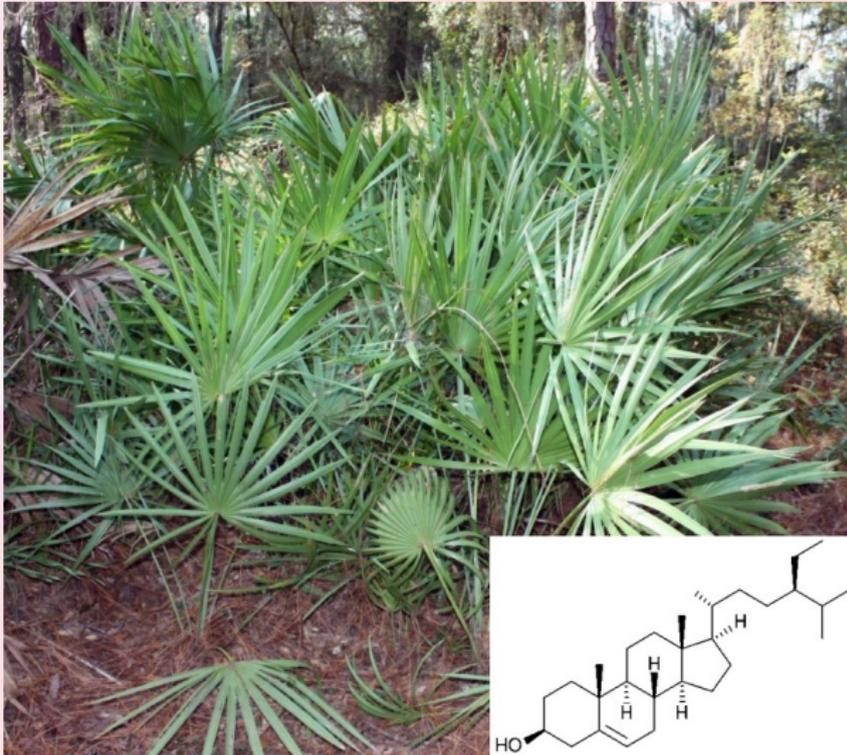
Florida pine flatwood: saw palmetto and slash pine (*Pinus elliotii*)



Clinical effects of saw palmetto

- Contains multiple phytosterols (e.g., β -sitosterol) with estrogen effects
- Used mostly for treating prostate diseases in males

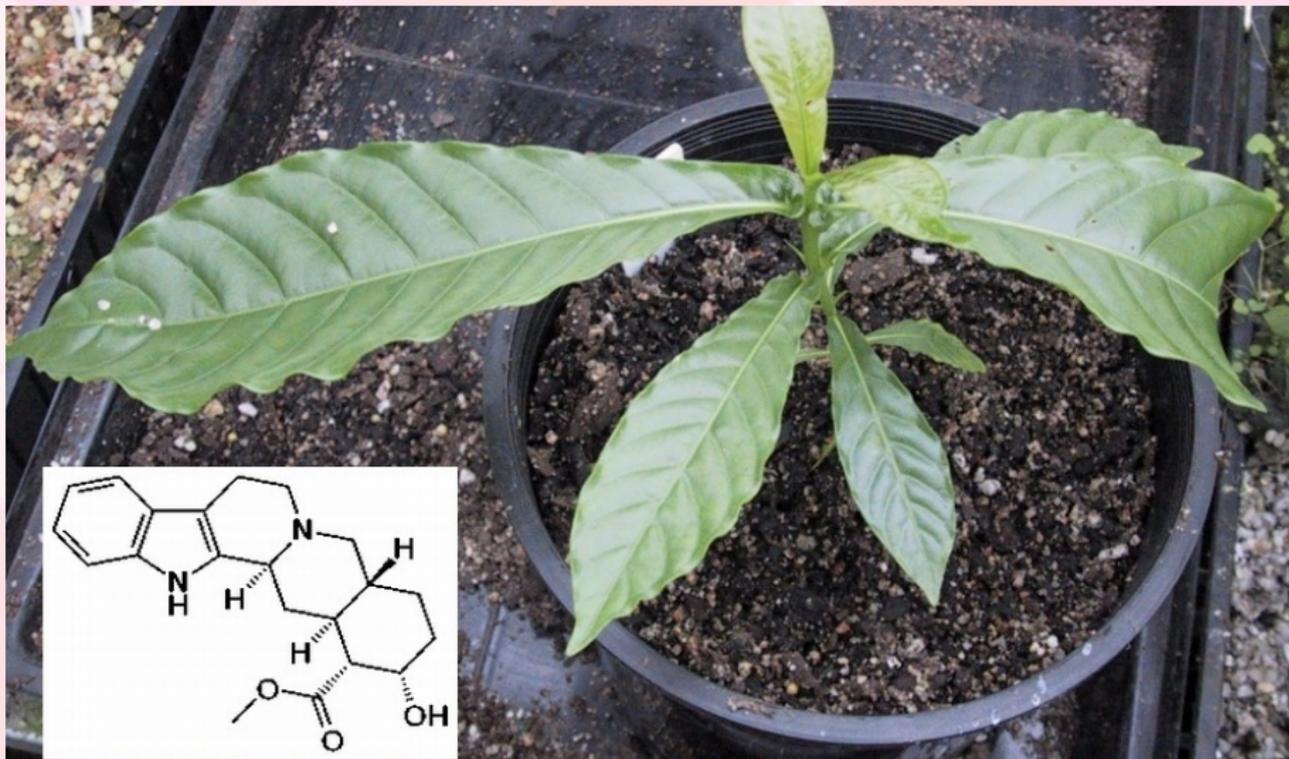
Saw palmetto and β -sitosterol



African Yohimbe, *Pausinystalia yohimbe*

- Belongs to Rubiaceae family (which is rich of medicinal plants)
- Tall West African tree
- Bark is most rich of pharmaceutical components

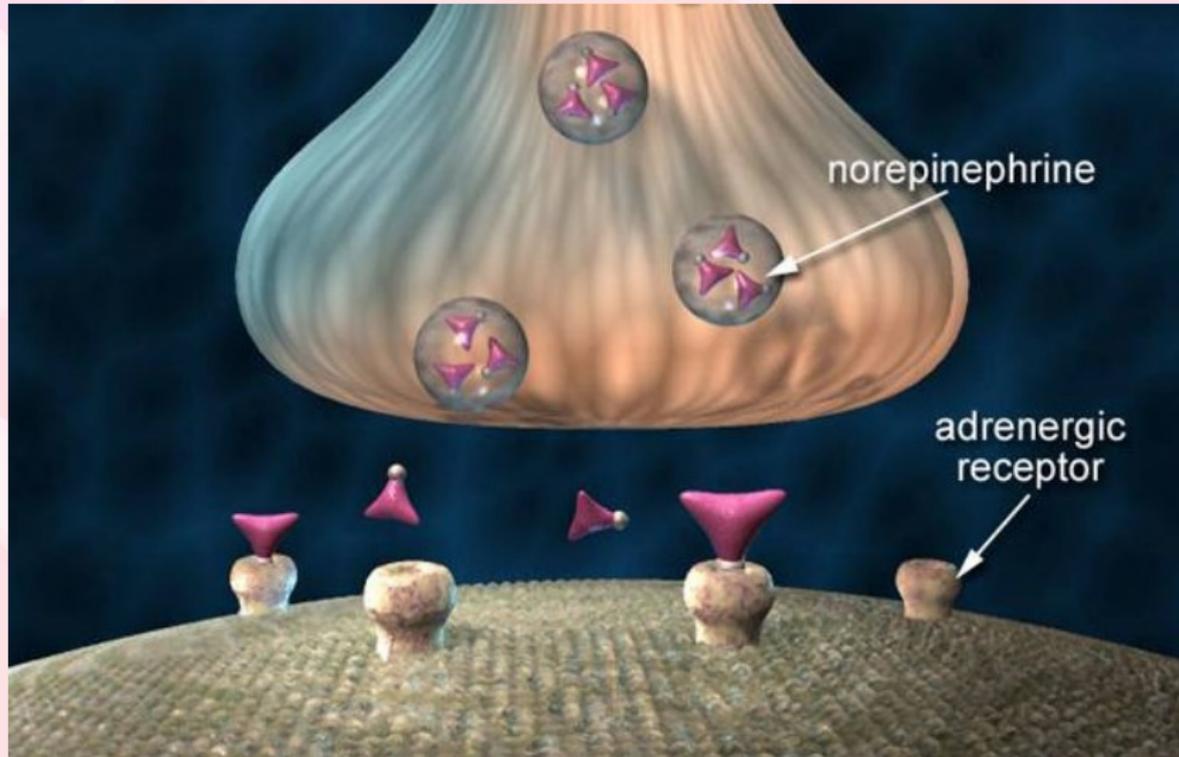
Yohimbe and yohimbine



Yohimbe pharmacological effects

- Contains multiple alkaloids, including yohimbine
- Alkaloid is α -adrenergic blocker, widely used as sexual stimulant

Adrenergic receptor



Mediterranean garden rocket, *Eruca sativa*

- Herbaceous plant from cabbage family, Cruciferae
- Used as leaf vegetable and as a sexual stimulant from Roman times
- Source of digestive alcohol, *rucolino*

Garden rocket and “Rucolino”



Indian gokharu, *Tribulus terrestris*

- Eurasian herbaceous creeping plant from Zygophyllaceae family, naturalized in U.S.
- Fruits have extremely large spines dangerous even to bicycles
- Important traditional part of Indian Ayurveda and Unani medicinal traditions
- Main component is steroidal protodioscin, increases the level of testosterone

Gokharu



West Asian tonghat, *Auricoma longifolia*

- Small Indonesian tree from Simaroubaceae family
- Main active components are extremely bitter (50 times more than quinine) quassinoids (e.g., eurycomalactone) from tree toots
- It is shown that root extract increase sperm count, testosterone level, and even anti-cancer
- Now widely used as anabolic for bodybuilders

Tonghat and eurymalactone



Central American damiana, *Turnera diffusa*

- Shrub from Turneraceae family, native to southern U.S. and Mexico
- Native Americans prepared “damiana tea” as sexual stimulator
- It is shown that constituents may take part in estrogen metabolism

Damiana



Southern American walking palm, *Socratea exorrhiza*

- Small palm from Amazonian forests
- Widely known as “walking plant” because it constantly develops new stilt roots whereas older are decaying
- Inner parts of stilt roots are used as aphrodisiac

Walking palm



Summary

- There are two main ways for plants to influence human reproductive system: produce hormone analogs, or act directly to nervous centers

For Further Reading



A. Shipunov.

Ethnobotany [Electronic resource]. 2011—onwards.

Mode of access:

http://ashipunov.info/shipunov/school/biol_310