

Al-Mustaqbal University
College of Pharmacy
5th stage
Clinical Toxicology
Lecture: 8



Herbal Products Toxicity

Weaam J. Abbas

Herbal Products

- ✓ **Herbal products** are medicine derived from **plants**.
- ✓ They are used as **supplements** to improve health and well being, and may be used for other therapeutic purposes.
- ✓ Herbal products are **available** as:
 1. Tablets
 2. Capsules
 3. Powders
 4. Extracts
 5. Teas & So On



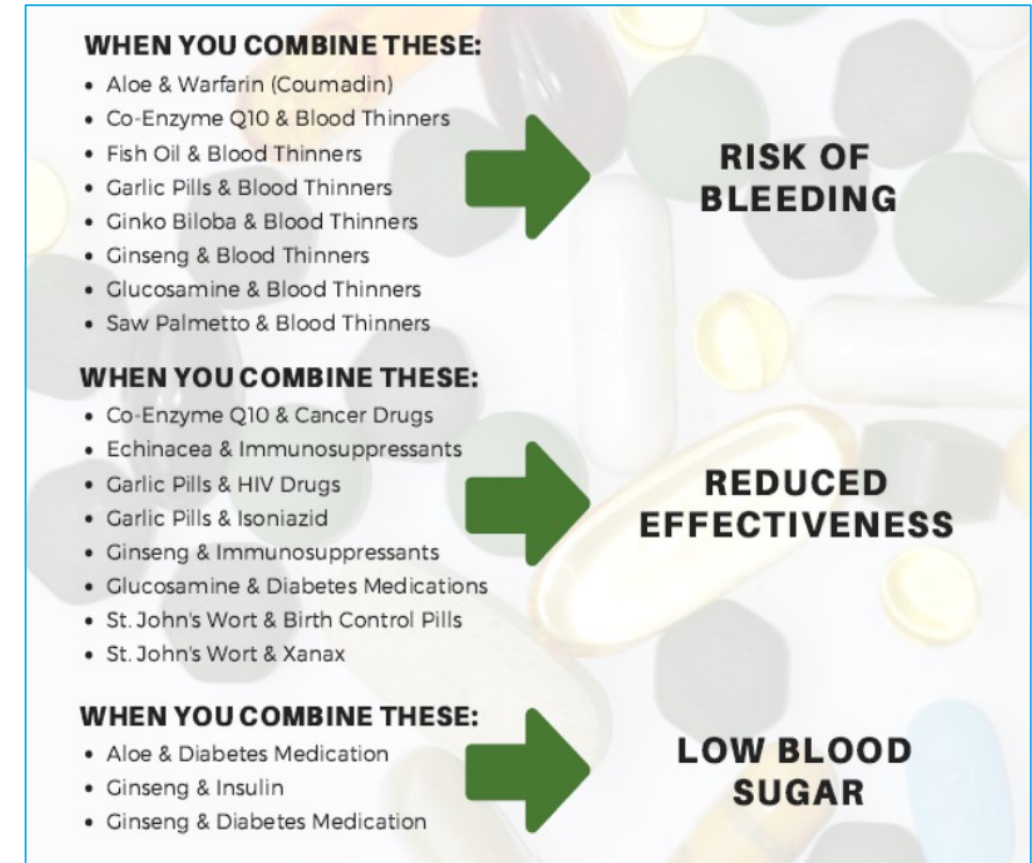
Is It Safe?

- ✓ Herbal medicines are **thought** to be **safe** as it is natural.
- ✓ **But** in fact it can cause **serious adverse effects** and **interaction** with other drugs and supplements.
- ✓ **Less than 10%** of herbal products in the world market are **truly standardized** to known active components.



Herbal Products Hazards

- ✓ For **majority** of these products in use, **very little** is known about their **active and/or toxic** constituents.
- ✓ In many countries including the U.S, herbal medicines are **not subjected** to the same regulatory standards in terms of **efficacy & safety**.
- ✓ In addition, many plants produce **toxic secondary metabolites**.



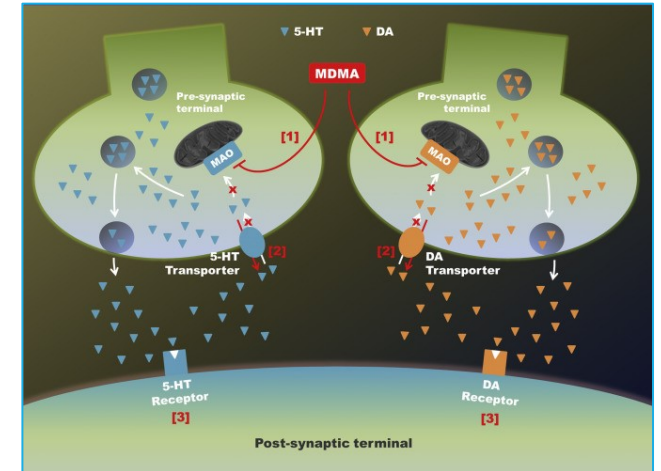
Excessive Use

- ✓ Herbal products are **misused** in excessive doses or in combinations **without** any known **rationale**.
- ✓ **Multi-ingredient** products may contain mixtures of **10 or more** different plants, vitamins, or minerals.
- ✓ The **consumption** of many different herbs increases the risk of **toxicity** from any one of them or from their interactions with each other.

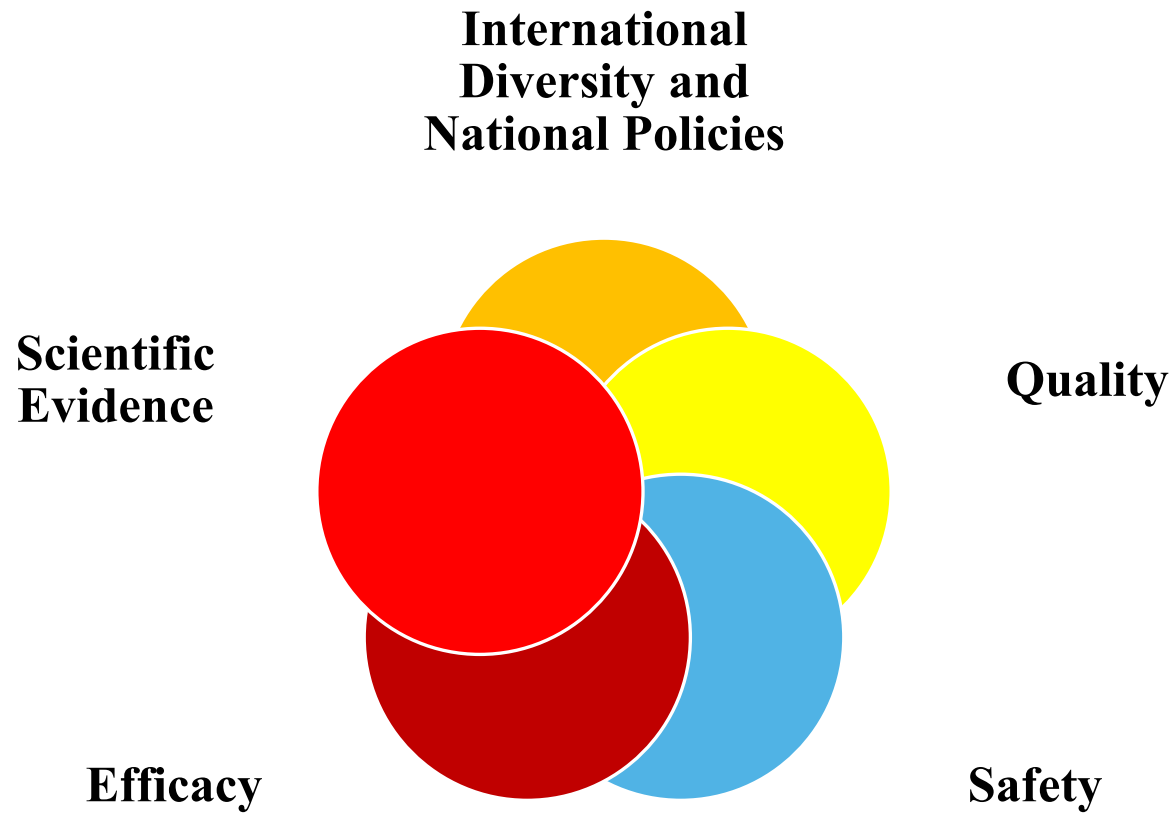


Inappropriate Use

- ✓ Herbal products are marketed as “safe”
- ✓ **ecstasy (MDMA) alternatives** (The popular nickname Molly), delivering a “**natural**” state of euphoria & alertness.
- ✓ **Caffeine, & ephedra** are popular as nonprescription products promoted as **dietary aides** or as mild **stimulants**.
- ✓ **Adolescents & young** adults may be more than willing to experiment with such herbs to **improve** their alertness before a test in school or their athletic performance.



Herbal Products Challenges



Contamination

- ✓ Some herbal products contain **high concentrations of heavy metals**, such as lead, mercury, and arsenic.
- ✓ Use of **herbal medications** should **awaken** suspicion of **lead contamination**.
- ✓ Chinese **herbal medications** have been an incredible source of **contamination**.
- ✓ One study showing that, out of **247** traditional Chinese medicines investigated, a proportion were **contaminated** with arsenic (5-15%), lead (5%), and mercury (approximately 65%).



Adulteration

- ✓ **Adulteration** is the intentional introduction of extraneous ingredients into a product.
- ✓ The objects of such adulteration include **drugs** for clinical effectiveness, **industrial dyes** to modify appearance and **substitution** to enhance quantities.
- ✓ Some herbal preparations have been found to be adulterated with drug ingredients, For example, **Caffeine,** **Acetaminophen,** **Hydrochlorothiazide,** **Ephedrine,** & **Chlorpheniramine.**



HERBAL TOXICITY

✓ These **unidentified** ingredients may be unintentionally included in the product for example:

1. Misidentification of a toxic plant as a desired non-toxic plant
2. Or contamination with pesticide residues or heavy metals
3. Or introduced for increased effect (e.g addition of a pharmaceutical agent to the herbal preparation).



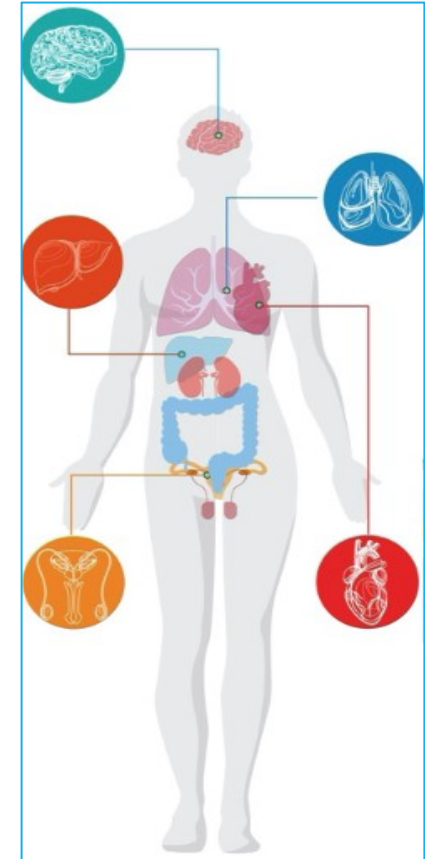
Herbal Toxicity

- ✓ **Dietary supplements**, including **herbal products**, are regulated as a food product, thus does **not require** to be effective or safe prior to **marketing**.
- ✓ The US **Food and Drug Administration (FDA)** has **little control** over the marketing of **herbal products**, but may **prohibit** sales of herbal products containing **pharmaceutical agents**.
- ✓ The FDA also may **prohibit** sale of an herbal product **proven** to have **serious** or **unreasonable risk** under conditions of use on the label or as commonly consumed.

HERBAL TOXICITY PATHOPHYSIOLOGY

✓ Herbal products are generally **heterogeneous**, may produce **multiple** effects, and may affect multiple organ systems, including:

- ❖ Nervous system
- ❖ Cardiovascular system
- ❖ Gastrointestinal tract
- ❖ Hepatic and renal systems
- ❖ Hematologic system



HEMATOLOGICAL TOXICITY

- ✓ **Ginkgo biloba** has been reported to increase bleeding times and may have contributed to **intracranial hemorrhages**.
- ✓ **Yohimbine** use has been associated with **agranulocytosis**.
- ✓ Other herbal medication, has been associated with **thrombocytopenia**.



HEMATOLOGICAL TOXICITY

WHEN YOU COMBINE THESE:

**Garlic pills + blood thinner
Ginko biloba + blood thinner
Ginseng + blood thinner**



**RISK OF
BLEEDING**