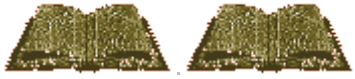
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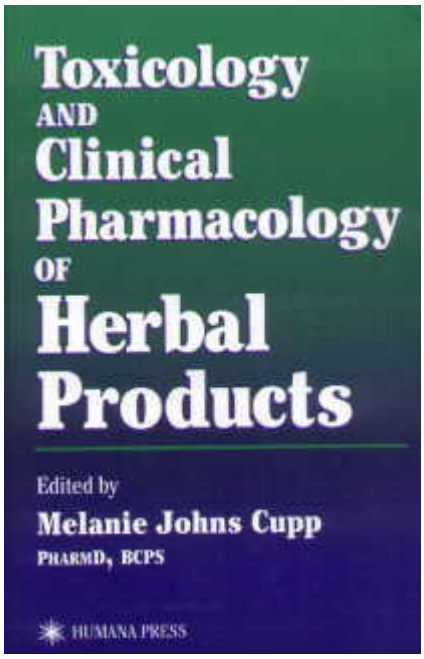
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THEY MAY JUST BE WEEDS, BUT....!

Toxicology and Clinical Pharmacology of Herbal Products, 1st Edition, *Edited by* Melanie Johns Cupp, PharmD, BCPS . Hard Bound, 6" x 9".
(A Book from *Forensic Science and Medicine* Series by Humana Press)
Humana Press Inc., 999 Riverview Drive, Suite 208, Totowa, New Jersey 07512; Publication Date 15 February, 2000. xxvi + 325 pages, ISBN 0-89603-791-6 (alk. Paper). Price $79.50

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If you thought that herbal products were good for you and have no nasty side affects unlike conventional drugs then think again!

The herbal medicine industry (and alternative medicine) is growing at a phenomenal rate if the advertisements in the popular press are anything to go by. Trade group estimates apparently suggest that total sales exceeded $4 billion in 1999. Herbal remedies are easily obtainable not only in health food stores, but in supermarkets, drug stores, discount warehouses and at least in Britain by mail order.

Melanie Cupp's book brings the toxicology and pharmacology of herbal products to the notice of physicians and toxicologists. Most physicians and toxicologists are not aware of the effects and side effects of these products. According to the foreword of this book, in 1998, 1264 papers were published about cocaine (a herbal product) but only 17 about kavakava, an abused herb that is not without toxic side effects. The majority of the papers on kavakava were published in journals not found in ordinary medical libraries.

The stated aim of this book therefore is to present a reliable reference work on herbal toxicology.

View this book on Amazon

Even forensic pathologists, familiar with texts on toxicology covering drugs from Acetaminophen to Zuclopenthixol and poisons from Aconitine to Zebra Fish poisoning, would not have heard of some of these products let alone their toxicology. In this respect the reviewer endorses the view stated by the series editor that "it (the book) is very badly needed".

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Traditional physicians believe in "active ingredients" which need to be isolated and purified whereas herbalists believe the results are better when the whole herb is used. Coca leaf is a good example. South American "Indians" chew coca leaf and drink coca tea (in Peru the latter is offered to tourists as a preventative measure against high-altitude sickness or "soroche"). Blood levels of

cocaine achieved by these means are never high enough to produce toxicity. The same cannot be said about the abuse of purified cocaine!

Herbalists believe in combining herbs to improve efficacy and to reduce adverse effects. Some of these combinations are rational and beneficial. Others are not. Herbalists are not the only one who combine agents. Under current laws in the US & UK anyone is free to market any combination, no matter how misguided the underlying science maybe. Patients are free to try out their own combinations.

Unfortunately, patients forget to tell their physicians in the belief that herbal products are harmless and "natural". What they do not realise is that **herbal products contain active ingredients which have similar actions to conventional drugs**. For example St. John's Wort contains a selective serotonin re-uptake inhibitor. *Ephedra* causes increased catecholamine release. The combination of St. John's Wort and Ephedra is therefore dangerous. Terpenoids in *Ginkgo biloba* interact with platelet activating factor. In anticoagulated patients this has been known to cause fatal brain haemorrhage.

This book is part of the Forensic Science and Medicine series of the Humana Press and is therefore a most welcome book. Melanie J. Cupp and 24 other contributors (including Steven B. Karch, the series editor) have produced an excellent work covering the most widely used herbal products by combing the literature for peer-reviewed publications. Melanie is from the West Virginia University School of Pharmacy, Morgantown, WV, USA as are most of the other contributors.

The first part of the book is a short discussion on the **Legal and Regulatory Aspects of Herbal products**. The second part consists of **monographs** dealing with each herbal product. There is a short third part which summarises **toxicities and drug interactions**.

Forensic Science and Medicine Series of Humana Press

The regulatory aspects of herbal products makes interesting reading. In the United Kingdom any substance not granted a licence as a medical product is treated as a food or food supplement and technically cannot carry a health claim or medical advice although many do. In the USA the Food, Drug and Cosmetic Act (FDA) does not apply to herbal products as they do not fall under the definition of a drug. Herbal products are classified as dietary supplements and come under the Dietary Supplement Health and Education Act of 1994 (DSHEA). The DSHEA is described as a "compromise between patient autonomy and the paternalistic oversight by the FDA". This apparently leads to at least some control over labelling. The label for St. John's Wort may say "Helps enhance well being" but cannot say "Cures Depression".

The Monographs (part two of the book) opens with the *Ephedra* alkaloids (or *Ma Huang* from China). The predominant alkaloid is of course the familiar ephedrine. Traditional physicians would have no difficulty with this and it's well known effect on b- receptors. Needless to say that cardiac arrhythmias are a common side effect with Ephedra preparations.

Each chapter/monograph opens with the history of the product concerned and the chapter on *Kava* informs us that "Captain James Cook was the first to describe the use of Kava during the cultural and religious ceremonies of the South Sea Islanders". Kava dermatopathy is the best known and commonest side effect.

Chapter three covers *Ginkgo biloba* one of the better known herbal products in the UK. The chapter describes the available products and discusses the pharmacological and toxicological effects pertaining to the relevant body systems as well as carcinogenicity, mutagenicity and teratogenicity. In the case of Ginkgo biloba there are no carcinogenic, mutagenic or teratogenic effects. As discussed previously most of the side effects consists of haemorrhages.

Valerian (chapter 4) is followed by the rather better known **St.John's Wort** in chapter 5. The latter is well known in the treatment of insomnia and psychiatric disturbances and is available in the UK as "Natracalm"^{T}. Not surprisingly, it is known to cause interactions with paroxetine. **Chamomile** and *Echinacea* command only a few pages. **Feverfew**, a common decorative garden plant in the UK is discussed in chapter 8. Apparently the common name for feverfew is a corruption of the Latin word *febrifugia*.

Chapter 9 discusses **Garlic**. Warshafsky's Medline based research found that garlic reduced total cholesterol levels by a statistically significant ($p < 0.001$), yet clinically small, (9%)compared to placebo, in patients given the equivalent of half a clove per day. What about the side effects? Advocates of garlic would be pleased to know that apart from allergic reactions these are relatively mild except for fatal botulism. Fatal botulism? Yes, apparently a popular method of preserving chopped garlic in vegetable oils can lead to botulism if the mixture is kept at room temperature. Such products apparently need to be refrigerated or preserved using acidifying agents such as phosphoric or citric acid.

Ginger, another well known culinary product is discussed in chapter 10. Ginger is of course not only used in cooking but in the reviewer's personal experience in the East, is used in various decoctions, combined with coriander seeds, to alleviate fever. No drug interactions with ginger are reported.

Saw Palmetto is found in Texas and in Egypt and historically was used to increase sperm production , sexual vigour and to increase breast size. The latter is not surprising as Saw Palmetto is known to have anti-androgenic properties and is known to inhibit oestrogen receptors in the prostate. Not surprisingly Saw Palmetto can cause decreased libido and impotence. (It is difficult to reconcile this with the ancient Egyptian belief that it increased sperm production!) Liver damage has been reported as a side effect.

...This book is an excellent reference manual and is also a good read. It only covers the more widely used herbal products and not meant to be an encyclopaedic work on all herbal products. It is a collection of monographs. Each of the monographs has a logical and consistent layout as one expects with books from the "Forensic Science and Medicine" series!...

Ginseng, the well known herbal product is covered in chapter 12 and also makes fascinating reading. Ginseng is known to have a modulating effect on the hypothalamic -pituitary-adrenal axis by inducing the secretion of adrenocorticotrophic hormone (ACTH) and increasing plasma cortisol. Interestingly, an in-vitro study has shown that ginseng extracts may be nitric oxide donors and capable of relaxing the smooth muscle of the corpus cavernosum. The authors of this paper suggest that this might explain the claims that ginseng enhances sexual potency. Choi et al 1995, (and quoted in the book) reported increased penile rigidity and girth compared to a placebo in patients with erectile dysfunction. For the curious, the ginseng used in the study was Korean red ginseng. Regrettably as with coca leaves ginseng is now being abused including injection of ginseng extract. The effects are similar to those of high doses of corticosteroids which is self explanatory.

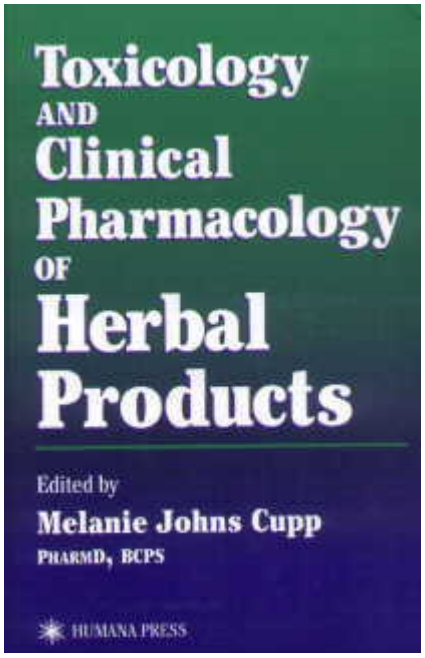
Being somewhat partial to cranberry juice it is with some trepidation that the reviewer read the monograph on **Cranberry** (chapter 13) but is pleased to report that side effects are mild and are associated with ingestion of absurdly large amounts of cranberry (>3 - 4L / day)! Its purported antimicrobial effect on the genito urinary tract is apparently achieved by acidifying the urine.

The next chapters cover **Borage, Calamus, Chaparral, Coltsfoot, Comfrey, Scullcap, Licorice, Pokeweed, Sassafras** and **Hawthorn**. *Borago officinalis* (common borage or common bugloss) is a well known European and North American plant. Known since the first century AD, currently borage oil is promoted as a source of essential fatty acids. **Calamus** has been in use since bibilical times and is well known in Indian Ayurvedic Medicine as "Racha". **Chapparral** (*Larrea tridentata*) is promoted as an anticancer agent and has a wide variety of side effects including carcinogenicity. **Licorice** (*glycyrrhiza glabara*) has been used for flavouring sweets in the West and is known to have a mineralocorticoid-like effect.

The reviewer's knowledge of **Hawthorn** in particular was minimal and merely that of its use as a hedging plant in English gardens! Apparently there is more to hawthorn than that and hawthorn preparations "are popular in Europe and gaining popularity in the United States". It is promoted for various cardiac conditions. The cardiovascular effects of hawthorn make interesting reading and are not unlike those of digitalis. Surprisingly there are no well documented reports of toxicity or drug interactions although the authors, quite logically, say that inter actions are theoretically possible with cardioactive medication.

QUICK NOTES

Some major highlights of *Toxicology and Clinical Pharmacology of Herbal Products* at a glance:



& Authoritative review of the pharmactology and therapeutics of leading herbal products
& Detailed case report descriptions and descriptions of pathologic findings
& List of herbal toxicities by affected organ and of herbs involved in drug interactions
& Extensive references to primary literature and clinical studies
& Unique reference source for herbal pharmacokinetic information

Aloe, another well known product at least in the world of cosmetics is discussed in chapter 24. Aloe in common with other anthranoid laxatives can lead to melanosis coli, a harmless pathological curiosity leading to a dusky discoloration of the mucosa of the large bowel.

The next two chapters cover **Senna** and **Cascara**. Both are well known laxatives. The use of senna leaf based decoctions is well known in the Indian sub-continent and the Middle East.

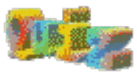
The last two chapters (27 & 28) cover **Dong Quai** (Angelica) and **Cat's Claw** two relatively uncommon products. The latter is a mainly Asian and South American plant. In recent times Cat's Claw has been promoted as useful in the treatment of AIDS but in-vitro studies show that high concentrations required to inhibit viruses would adversely affect the host cell morphology.

What does one make of this book?

This book is an excellent reference manual and is also a good read. It only covers the more widely used herbal products and not meant to be an encyclopaedic work on all herbal products. It is not a work on poisonous plants. As mentioned previously it is a collection of monographs. Each of the monographs has a logical and consistent layout as one expects with books from the Forensic Science and Medicine series! In addition to a standard index the contents page itself acts as an index to a large extent. Each chapter is complete with exhaustive references. Illustrations are limited to two colour plates printed on coated paper showing the appearance of the different capsules and tablets of herbal preparations. This is unlikely to be comprehensive given the wide varieties and formulations available worldwide. Rather disappointingly there are no illustrations of the plants themselves. Black and white line illustrations of the various plants and their flowers would have been a welcome addition for those readers curious to know the botanical features of the rather exotic plants mentioned.

As one would expect from the Humana Press the printing and the binding are of good quality and at $ 79.50 should be affordable.

Top of the review!



Not sure whether the book would be useful to you or not? Why not take this quiz to test your current knowledge on the Toxicology and Clinical Pharmacology of Herbal Products? It might help you make up your mind. Click on the quiz icon on the left to go to the quiz.



-Gyan Fernando
Gyan C. A. Fernando is a UK based Forensic Pathologist and lives in rural Devon where there are wide open spaces and wild plants in spite of rapid development.

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