
HERBALS AS POTENTIAL COMPLEMENTARY ADJUNCTS WITH MEDICINES

E.1 POTENTIALLY BENEFICIAL COMBINATIONS OF HERBALS WITH DRUGS

With so much attention being paid in the medical literature to potential and actual adverse interactions between herbal and pharmaceutical agents, it is important to recognize those instances in which the combination of an herbal product with a drug can result in therapeutic enhancement.

Beneficial combinations may involve botanicals reducing the drug's adverse effects or increasing its therapeutic effects, but such outcomes are not necessarily completely beneficial. For instance, if herbal reduction of drug toxicity is due to increased metabolism or elimination of the drug, then the consequent reduction in drug efficacy obviously thwarts the effort at improving clinical outcome. Increasing drug effects may involve increasing the drug's bioavailability through increased cellular uptake or retention and/or diminished intracellular breakdown or excretion which may also increase its adverse effects.

Increasing therapeutic effects may also be due to concurrent use of drugs and herbs that simply have additive activities. For example, additive effects will likely occur when the drug and botanical both have cardiotoxic, sedative, hypoglycemic, or anticoagulant activity. (See Appendices B.2.1, B.3, B.4.1 and B.5.1, respectively, for listings of these botanicals.) Combinations of these sorts that only add to the drug effects can conceivably involve an adverse outcome, unless the drug dose is appropriately reduced by the physician.

Exceptions to creating adverse outcomes from additive effects may exist when use oral hypoglycemic drugs alone does not provide adequate control of blood sugar levels. Certain oral hypoglycemic drugs together with herbal products can be more effective than the drug alone in controlling blood sugar in type II diabetes resistant to conventional therapy. (See Appendix B.4.2.) To monitor safety concerns, combining similar therapeutic drugs and herbs should be done under the supervision of a physician.

For the most part, potentially beneficial additive "interactions" from combinations of herbals with drugs having similar pharmacodynamic effects are not included in the appendix E. However, section E.3.2 covers enhancement of anti-inflammatory effects of NSAIDs without increasing adverse effects by combinations with herbal preparations that also have anti-inflammatory properties. Also, section E.6.1 lists botanicals inhibitors of antibiotic resistant bacterial strains. Improved inhibition of antibiotic-resistant bacteria with pharmaceutical and botanical antimicrobial combinations as listed in section E.6.2 can therefore involve potential additive effects, but improved resistant-infection control can also operate by different mechanisms described in other sections of E.6 that deserve more attention in the future.

E.1.1 Probably the most useful and safe interactions involve herbal effects that are different yet

complementary to those of the drug, since these reduce the potential for interference with the known parameters for prescribing the drug. Primarily complementary characteristics are included in the list below, which acts as a Table of Contents for the therapeutic Complementary Adjuncts in the main body of this text, excluding those used only for substance abuse.

For this list the combinations of drugs with extracts, fractions, and/or major active components are listed simply by naming the herb from which they are derived. While only the herb sources and drugs involved in these beneficial interactions are listed here, details of the type of herbal products and their dosages used for *in vivo* combinations are given whenever possible for each of the herbs in their section in the main body of the text. **Beneficial interactions for drugs written in bold type have been documented in humans; italicized drug names indicate those enhancements shown in animals, while plain text is used when improved responses are from *in vitro* studies.**

The potential benefits can most likely be expected to be replicated by using the particular herbal preparation or derivative combined with the same drug(s) as cited in the research. By reporting research data suggestive of useful combinations of medications with botanical preparations, the author does not intend to suggest that these benefits have been adequately established to recommend as standard patient treatment. Personal physicians are necessarily responsible for making the best clinical judgements for individual patients when it comes to the determining the means of employing and optimizing prescription medications.

E.1.1 HERBS AND THOSE DRUGS WHICH MAY POTENTIALLY BE COMPLEMENTED

- Aloe gel (*Aloe vera*) – **polyethylene oxide**,⁶¹⁹ *hydrocortisone acetate*²¹²
 American ginseng root (*Panax quinquefolius*) – cytoxan, doxorubicin (adriamycin),
 methotrexate, tamoxifen, taxol (paclitaxel)⁹⁸¹
 Anemarrhena (*Anemarrhena asphodeloides*) – cerulenin, clotrimazole, ketoconazole,
 miconazole¹¹²⁰
 Arjun bark (*Terminalia arjuna*) – **amiodarone, captopril, digoxin, enalapril, furosemide,**
isosorbide dinatrate, nifedipine, spironolactone²⁶⁶¹
 Ashwagandha root (*Withania somnifera*) – *azathioprine*,¹²⁷⁸ *clonazepam*,¹²⁹⁰
cyclophosphamide,^{1278,1279,1583,2217} *diazepam*,¹²⁹⁰ *DPT vaccine*,²⁰⁰⁶ *haloperidol*,²²⁹⁵
paclitaxel,²²¹⁸ *prednisolone*,¹²⁷⁸ *reserpine*¹⁸⁵⁵
 Asian ginseng root (*Panax ginseng*) – **amoxicillin, clavulanic acid**;¹⁰⁸⁸ (red ginseng) –
didanosine, zidovudine,^{1335,1336} **5-fluorouracil, cisplatin**,¹³⁸² **influenza vaccine**,⁴⁰⁸
doxorubicin (adriamycin),²²⁵⁷ *paclitaxel*,¹⁷²¹ *cefotaxime*, *kanamycin*²⁶⁸⁸
 Asparagus root (*Asparagus racemosus*) – *DPT vaccine*²⁰⁰⁷
 Astragalus root (*Astragalus membranaceus*) – **cisplatin**,¹⁸⁵¹ **recombinant interferon- α 1**,²³⁵⁹
acyclovir,⁴⁰⁹ *stilbenemidine*,⁶⁰⁰ *interferon- α 2b*, *interleukin-2*⁴⁰⁹
 Bacopa herb (*Bacopa monniera*) – *morphine*,^{1661,1662} *phenytoin*¹⁶⁶³
 Barberry root bark (*Berberis vulgaris*) – **ACE inhibitors**,^{1457,2639} **digoxin, nitrates**,^{1457,2639}
spironolactone,^{1457,2639} **sulphacetamide**,⁵⁷⁷ *acetaminophen*,¹²¹⁵ *buspirone*,²⁶⁶⁸
cyclophosphamide,^{398,2570} *ritanserin*,²⁶⁶⁸ *chloromycetin*, *penicillin*⁵⁷⁸
 Bilberry fruit (*Vaccinium myrtillus*) – *indomethacin*, *phenylbutazone*, *reserpine*⁶²⁴

- Black cohosh root * (*Cimicifuga racemosa*) – analgesics,¹⁴²² clomiphene,²⁷⁰⁴ triptans,¹⁴²² tamoxifen,¹⁶⁵⁵ docetaxel, doxorubicin (adriamycin)¹⁷³⁶
- Black cumin seed (*Nigella sativa*) – salbutamol, corticosteroids,²⁴⁸⁹ cisplatin²⁶¹⁵
- Black currant seed oil (*Ribes nigrum*) – corticosteroids, NSAIDs,¹³⁹⁹ tamoxifen⁵⁸⁹
- Black pepper fruit (*Piper nigrum*) – curcumin¹⁵³²
- Borage seed (*Borago officinalis*) – corticosteroids, NSAIDs,^{1401,1402} tamoxifen⁵⁸⁹
- Bromelain / pineapple stem (*Ananas comosus*) – aspirin,^{1405,1406} chloramphenicol,²⁰⁸ codeine,¹⁴⁰⁵ cortisone,¹⁴⁰⁶ erythromycin,²⁰⁸ 5-fluorouracil,²⁰⁹ novobiacin, penicillin,²⁰⁸ propoxyphene,^{1405,1406} vincristine,²⁰⁹ cefazolin¹¹¹⁰
- Burdock root (*Arctium lappa*) – acetaminophen¹⁴⁰⁴
- Cannabis leaves/tops * (*Cannabis sativa*) – cisplatin, cyclophosphamide, dacarbazine, doxorubicin (adriamycin), methotrexate, procarbazine, streptozocin¹⁰⁷⁸
- Cassia bark (*Cinnamomum cassia*) – phenylbutazone,⁸⁴³ amphotericin B¹⁸⁵⁶
- Cat's claw bark (*Uncaria tomentosa*) – hydroxychloroquine,¹³²¹ pneumococcal vaccine,¹²⁴⁰ prednisolone, sulfasalazine,¹³²¹ indomethacin^{597,1389,1784}
- Cayenne fruit * (*Capsicum frutescens*) – analgesics,¹⁵⁴⁰ aspirin,²¹¹ corticosteroids, NSAIDs¹⁵⁴⁰
- Chamomile flowers (*Matricaria recutita*) – L-asparaginase, cisplatin, cyclophosphamide, cytosine arabinoside, daunorubicin, doxorubicin (adriamycin), 5-fluorouracil,²⁵⁴¹ methotrexate,^{1803,2541} vincristine,²⁵⁴¹ indomethacin²⁶⁴
- Chicory root (*Cichorium intybus*) – cyclophosphamide, cytarabine, doxorubicin (adriamycin), 5-fluorouracil, methotrexate, vincristine sulfate¹¹¹⁵
- Chinese skullcap root (*Scutellaria baicalensis*) – irinotecan,¹⁸²⁹ acetaminophen,¹⁸⁹¹ cyclophosphamide, 5-fluorouracil²²⁰⁷
- Chokeberry fruit (*Aronia melanocarpa*) – ACE inhibitors, aspirin, atorvastatin, simvastatin,²⁶⁷⁵ indomethacin¹⁹⁸³
- Cinchona bark * (*Cinchona* spp.) – carmustine (BCNU)¹⁵⁴⁷
- Cocoa seeds (*Theobroma cacao*) – ACE inhibitors, antiplatelet drugs, beta blockers, oral hypoglycemics, insulin, statins²⁶⁰⁰
- Coptis root (*Coptis* spp.) – ACE inhibitors,^{1457,2639} digoxin, nitrates,^{1457,2639} spironolactone,^{1457,2639} sulphacetamide,⁵⁷⁷ acetaminophen,¹²¹⁵ buspirone,²⁶⁶⁸ cyclophosphamide,²⁵⁷⁰ ritanserine,²⁶⁶⁸ chloromycetin, penicillin⁵⁷⁸
- Cordyceps mycelium (*Cordyceps sinensis*) – amikacin, astemizole,⁵⁹⁸ cyclosporine,^{598,1804} gentamicin, ketotifen, kanamycin, ouabain⁵⁹⁸
- Cranberry leaves (*Vaccinium macrocarpon*) – bortezomib, thalidomide²⁴²⁸
- Cumin seeds (*Cuminum cyminum*) – rifampicin²²⁹⁶
- Dan shen roots (*Salvia miltiorrhiza*) – doxorubicin (adriamycin)²²⁵⁶
- Devil's claw roots/tubers (*Harpagophytum procumbens*) – acetaminophen,¹⁴¹¹ analgesics,²²⁵⁹ acetaminophen, aspirin, celecoxib,¹³⁶⁸ diclofenac,^{1368,1411} ibuprofen, indomethacin, ketoprofen, metamizol, naproxen, piroxicam, propyphenazon, rofecoxib,¹³⁶⁸ tramadol¹⁴¹²
- Dog rose hips (*Rosa canina*) – acetaminophen,^{2565,2566} NSAIDs,^{2564,2565,2566} tramadol²⁵⁶⁵ petals – ampicillin, benzylpenicillin oxacillin, tetracycline²³⁵¹
- Dong quai root (*Angelica sinensis*) – analgesics, triptans,¹⁴²² cyclophosphamide,²⁶⁷⁷ doxorubicin (adriamycin),²⁶⁷² indomethacin¹¹⁰¹

- Echinacea purpurea plant (*Echinacea purpurea*) – econazole nitrate,³⁹¹ desamethazone, prednisone,²¹⁹⁹ phenytoin²²⁰²
- Eleuthero root (*Eleutherococcus senticosus*) – kanamycin, monomycin¹¹²
- English lavender (*Lavandula officinalis*) – imipramine¹³⁸⁷
- Evening primrose seed (*Oenothera biennis*) – colchicine,¹¹⁴⁸ NSAIDs,¹⁴⁰⁰ tamoxifen,⁵⁸⁹ cyclosporine^{413,414}
- Fenugreek seed (*Trigonella foenum-graecum*) – paclitaxel, doxorubicin (adriamycin)²⁴²⁹
- Flax seed (*Linum usitatissimum*) – tamoxifen^{2240, 2241, 2242,2243,2245}
- Frankincense gum resin (*Boswellia serrata*) – NSAIDs,¹⁵³⁴ ibuprofen,²⁴⁸³ indomethacin²⁶⁶²
- French maritime pine bark (*Pinus pinaster*) – analgesics,²³²⁴ antihistamines,²⁷⁰⁶ CCNU, cisplatin,²⁵²³ cyclophosphamide, doxorubicin (adriamycin),²⁵²² 5-fluorouracil, gemcitabine,²⁵²³ NSAIDs,^{2324,2526} nifedipine,¹⁶²³ ramipril,²⁶⁸³ vinblastine²⁵²³
- Garlic bulbs [# = aged garlic extract] * (*Allium sativum*) – aspirin,^{1772,1857} betamethasone,²²⁶⁰ statins,^{1772,1857} acetaminophen,^{540,1816} doxorubicin (adriamycin),¹²⁷³ #5-fluorouracil,¹²⁶² gentamicin,^{1911,1912,1913} #gentamicin,^{1914,1915} isoprenaline (isoproterenol)⁷⁶² #methotrexate,^{1262,1865} ketoconazole,²³⁶⁴ vancomycin¹⁵⁶⁰
- Ginger rhizome (*Zingiber officinale*) – acetaminophen,¹⁴⁰⁹ alcuronium,⁵⁰⁸ analgesics,²⁴⁸⁴ atracurium,⁵⁰⁹ cisplatin,²⁵³⁴ cyclophosphamide,^{1598,2513} doxorubicin (adriamycin), epirubicin, etoposide,²⁵¹³ fentanyl,⁵⁰⁹ gemcitabine, granisetron,²⁵⁸⁵ navalbine,²⁵¹³ NSAIDs,^{1408,2484} ondansetron,²⁵⁸⁵ paclitaxel,²⁵¹³ propofol,⁵⁰⁹ thiopental, vecuronium,⁵⁰⁸ aspirin, hydrochloric acid, indomethacin⁵⁰⁶
- Ginkgo leaves (*Ginkgo biloba*) – antidepressants (bupropion, fluoxetine, nefazodone, paroxetine, phenelzine, protriptyline, sertraline, venlafaxine),⁵²⁶ cyclosporine,⁵²⁷ 5-fluorouracil,¹⁶⁶⁹ haloperidol,^{1281,2113} papaverine,¹⁹⁷ trimipramine,¹³¹⁷ meclofenoxate⁵³⁰
- Goldenseal roots/rhizome * (*Hydrastis canadensis*) – ACE inhibitors,^{1457,2639} digoxin, nitrates,^{1457,2639} spironolactone,^{1457,2639} sulphacetamide,⁵⁷⁷ acetaminophen,¹²¹⁵ buspirone,²⁶⁶⁸ cyclophosphamide,²⁵⁷⁰ ritanserine,²⁶⁶⁸ chloromycetin, penicillin⁵⁷⁸
- Grape seed extract (*Vitis* spp.) – cisplatin¹⁸⁷⁷
- Hawthorn leaves/flowers (*Crataegus* spp.) – ACE inhibitors,^{2238,2239} beta-blockers, calcium channel blockers,²²³⁹ digoxin,^{395,2238} diuretics,^{1095,1303,2238,2239} hydrochlorothiazide, triamterene,¹³⁰³ isoprenaline (isoproterenol),⁷⁶² digitoxin, g-strophanthin¹⁵⁷
- Hops strobiles (*Humulus lupulus*) – ciprofloxacin, polymyxin B, tobramycin²²⁷⁴
- Khella fruit * (*Ammi visnaga*) – digitoxin¹⁴¹
- Kutki root (*Picrorhiza kurroa*) – hydrochloric acid,¹²¹³ indomethacin,²²⁷⁶ isoprenaline (isoproterenol)¹²¹⁴
- Licorice root/rhizome * (*Glycyrrhiza glabra*, *G. uralensis*) – aspirin,²²⁰ interferon- β ,¹⁹⁸⁹ hydrocortisone,²¹³ acetaminophen,¹⁰⁹⁹ cimetidine,²²¹ ibuprofen,¹⁰⁰⁶ acyclovir, adenine arabinoside,¹⁸²⁶ azathioprine,¹⁹⁵³ bromovinyldeoxyuridine, phosphonoformate¹⁸²⁶
- Long pepper fruit (*Piper longum*) – curcumin¹⁵³²
- Maca root (*Lepidium meyenii*) – SSRIs (citalopram, duloxetine, escitalopram, fluoxetine, fluvoxamine, sertraline, paroxetine, venlafaxine)²⁴⁸⁶

- Maitake mushroom (*Grifola frondosa*) – mitomycin C,¹⁰⁵⁰ carmustine (BCNU)¹⁵¹¹
- Mangosteen stem bark (*Garcinia mangostana*) – gentamicin, vancomycin¹⁷⁷¹
- Marshmallow root (*Althaea officinalis*) – ACE inhibitors²²⁷³
- Mate leaf (*Ilex paraguayensis*) – simvastatin, atorvastatin, lovastatin²⁶⁰⁵
- Milk thistle seeds (*Silybum marianum*) – butyrophenones,⁸⁴ desferrioxamine,²⁷⁰² dexamethasone,²⁶⁵⁰ dilantin,¹¹⁹ glibenclamide,²⁰⁴¹ 6-mercaptopurine,^{1795,2650} metformin,²⁰⁴¹ methotrexate,^{1795,2650} phenothiazines,⁸⁴ prednisone,²⁶⁵⁰ tacrine,¹²⁶⁰ thioguanine, vincristine,²⁶⁵⁰ acetaminophen,^{117,2681} cisplatin,^{186,187,1620} cyclosporine,⁴⁹⁶ doxorubicin (adriamycin),¹⁸³⁵ halothane,^{118,1042} methoxsalen,¹³³⁴ amiodarone,¹⁸¹⁷ carboplatin,¹⁷⁹⁶ daunomycin,¹⁵⁶² vincristine¹⁶²¹
- Neem leaf and/or bark (*Azadirachta indica*) – cyclophosphamide,¹⁹⁵⁸ indomethacin^{2518,2519}
- Noni fruit (*Morinda citrifolia*) – cisplatin, doxorubicin (adriamycin), 5-fluorouracil, vincristine¹⁷⁵⁸
- Oregon grape root bark (*Mahonia* spp.) – ACE inhibitors,^{1457,2639} digoxin, nitrates,^{1457,2639} spironolactone,^{1457,2639} sulphacetamide,⁵⁷⁷ acetaminophen,¹²¹⁵ buspirone,²⁶⁶⁸ cyclophosphamide,^{398,2570} ritanserine,²⁶⁶⁸ chloromycetin, penicillin⁵⁷⁸
- Passion flower leaves (*Passiflora incarnata*) – clonidine,¹¹⁹² diazepam,¹⁷⁵³ ethanol,¹⁷⁵¹ morphine,¹⁵⁴¹ nicotine,¹⁷⁵² THC¹⁷⁵⁴
- Peppermint leaves (*Mentha x piperita*) – doxorubicin (adriamycin)¹²⁸²
- Plantain leaves (*Plantago major*) – 5-fluorouracil¹⁵²⁵
- Pomegranate fruit (*Punica granatum*) – chloramphenicol, gentamicin, ampicillin, tetracycline, oxacillin²³⁵⁵
- Psyllium seed husks (*Plantago ovata*, *P. psyllium*) – glibenclamide (glyburide),¹⁴⁴⁸ orlistat,¹¹⁹³ simvastatin¹⁷³⁵
- Rhatany root (*Krameria triandra*) – carboplatin, cyclophosphamide, epirubicin, paclitaxel (taxol)²³¹⁴
- Rhodiola root (*Rhodiola rosea*) – cyclophosphamide,¹⁵⁴⁹ doxorubicin (adriamycin)¹⁵⁶³
- Rosemary leaves (*Rosmarinus officinalis*) – bortezomib,²⁴²⁸ erythromycin, tetracycline,²³⁷⁶ thalidomide²⁴²⁸
- Royal sun agaricus (*Agaricus blazei*) – carboplatin, etoposide,¹⁸⁵⁰ gliclazide, metformin,²²¹⁵ paclitaxel (taxol)¹⁸⁵⁰
- Sage leaves * (*Salvia officinalis*) – doxorubicin (adriamycin)¹²⁸²
- Schisandra fruit (*Schisandra chinensis*) – acetaminophen⁶⁹⁶
- Sea buckthorn fruit (*Hippophae rhamnoides*) – indomethacin¹⁹⁵⁹
- Sesame seed oil (*Sesamum indicum*) – atenolol, glibenclamide²⁰⁵⁰
- Shrub aloe leaves (*Aloe arborescens*) – cisplatin, etoposide, 5-fluorouracil, gemcitabine, oxaliplatin, vinorelbine²⁶¹¹
- Soy beans (*Glycine max*) – analgesics, triptans,¹⁴²² cisplatin,¹⁹⁶² docetaxel,¹⁹⁶¹ methotrexate,¹⁵⁴⁵ doxorubicin (adriamycin),¹⁹⁶¹ fluorouracil,²¹²⁹ tamoxifen²¹²⁸
- St. John's wort tops (*Hypericum perforatum*) – temozolomide²⁶⁵⁷
- Stinging nettle leaves (*Urtica* spp.) – diclofenac³⁸⁶
- Tea green leaves (*Camellia sinensis*) – aspirin,⁴⁹² doxorubicin (adriamycin),^{489,490,491,1245} idarubicin,¹⁶⁰⁵ indomethacin,⁴⁹² levofloxacin,²³⁶⁰ pirarubicin,¹⁶⁰⁶ reserpine,⁴⁹² tamoxifen,²⁰³⁹ benzylpenicillin,^{1439,1531} methicillin,¹⁴³⁹ oxacillin, ampicillin, cefmetazole, imipenem,¹⁵³¹ sulindac²¹³³

- Thunder god vine peeled root *(*Tripterygium wilfordii*) – NSAIDs, prednisone^{1417,1418,2606}
- Thyme leaves (*Thymus vulgaris*) – amphotericin B²³⁶⁵
- Turkey tail mycelia extract (*Trametes versicolor*) – cyclophosphamide,^{222,226}
 4'epidoxorubicin, vincristine,²²² 5-fluorouracil,^{224,225,226} ftorafur,²²³ futraful,²⁵³⁸
 6-mercaptopurine,²²⁷ mitomycin C,^{223,224,225,226} prednisolone,²²⁶ tegafur/uracil^{2536,2537}
- Turmeric root (*Curcuma longa*, *C. aromatica*) – 5-aminosalicylic acid, azathioprine,
 budesonide, 6-methylprednisone, prednisone, sulfasalazine,²¹⁹⁵ cyclosporine,¹¹¹⁹
 doxorubicin (adriamycin)²⁰¹⁹ indomethacin,³⁵⁰ melanoma vaccine,¹⁶³⁵ reserpine,³⁵⁰
 cefixime, cephotaxime,²⁶⁷³ cisplatin,²¹³⁴ tetracycline, vancomycin,²⁶⁷³ vinorelbine²¹³⁵
- Valerian root *(*Valeriana officinalis*) – morphine²⁶⁷⁸
- Watercress herb (*Nasturtium officinale*) – acetaminophen²⁰⁰⁹
- Wheat fermented germ (*Triticum vulgare*) – chemotherapy,^{2036,2247} dacarbazine,²²⁴⁶
 cyclosporine, methotrexate, methylprednisolone, prednisolone²⁰³²
- Wild yam root (*Dioscorea villosa*) – paclitaxel, doxorubicin (adriamycin)²⁴²⁹
- Willow bark (*Salix* spp.) – acetaminophen, NSAIDs,¹³⁹⁰ tramadol⁷⁶⁹
- Wormwood herb *(*Artemisia absinthium*)–5-aminosalicylates (mesalamine), azathioprine,
 methotrexate, prednisone²²⁰¹

E.2 HERBAL AIDS FOR MODIFYING SUBSTANCE ABUSE

Herbal products, like nutrients or other supplemental approaches, cannot be expected to act as cures for addictions. However, in some cases they may help to diminish abusive consumption by reducing cravings or alleviating some withdrawal symptoms. In these instances they might temporarily act as partial replacements and in the process safely aid in the cessation of a destructive habit. Some may facilitate withdrawal through binding receptor sites or altering enzymatic conversions. In cases of failure to cease or reduce consumption of toxic inebriants, herbal supplements may provide a means of reducing organ damage by the addictive toxin. Inadequacy of current methods to effectively address a variety of drug addictions that constitute a continuing plague in our chemically-dependent society requires innovative approaches for more meaningful changes. Wholistic detoxification that utilizes biological, physical, mental, emotional, and/or spiritual approaches should be considered in therapeutic trials to assist the transformation of the addicted individual. Use of botanicals constitutes only one component for incorporation into a multi-faceted approach to provide drug-dependent individuals with as complete support as possible.²⁷⁰⁷ Therefore, in this context herbal agents should be used with appropriate professional supervision in conjunction with counseling.

Some dangers are inherent in overcoming substance abuse, especially when an intervention agent is used that has its own toxicity, and in these situations its use should only be considered in a controlled and medically-supervised environment. A controlled setting is essential to prevent access to self-administered psychotropic agents, since concurrent use of an addictive drug with a potent botanicals or other medications can be especially detrimental. For example, though the alkaloid ibogaine from iboga may be used to treat morphine or other opiate addictions, ibogaine has similar toxicity to morphine, and if taken together their toxicity is increased 5-fold⁵⁴⁴ and may be deadly.¹¹²¹