Herbals in the Holistic Treatment of Psoriasis

Dermatologists must be aware of the herbal supplements patients may take and their potential effects.

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As patients' interest in the option to incorporate alternative medicine (AM) into standard medical practice has grown, the medical community has responded in several ways: by beginning to teach related curriculum in medical schools and producing and distributing patient-directed interactive media. A survey of 130 US Medical schools found that around half offered at least one complementary and alternative medicine course or clerkship.[1] As evidence of the worth of these efforts, a recent systematic review of the use of complementary and alternative medicine in the general population found that between 34 and 42 percent of Americans have used at least one AM product over a 12 month period.[2] These numbers are consistent with what Eisenberg et al. found almost two decades ago, proving that the public's pursuit of alternative therapies for medical conditions remains strong.[3] Results from the most recent National Health Interview Survey, released in 2012, estimated out-of-pocket expenditures for AM in the year 2007 at $33.9 billion.[4] Comparatively, $286.1 billion were projected as out-of-pocket expenses for physician services accrued during the same year[5] Reasons stated by patients for using AM include "willingness to do anything, dissatisfaction with 'standard therapies' and failure of conventional therapies."[6]

It is estimated that only approximately 40 percent of the patients who practice AM (herbals) report this to their physicians,[7] often not disclosing information regarding the use of alternative therapies because they do not consider herbals to be pharmacologic (e.g.: a drug with exerts a desired effect on an end organ). Contrary to this, not only are herbals pharmacologic, but they have the potential to significantly interact with prescribed conventional medications.

Psoriasis affects approximately 3.2 percent of the population in the United States (a number estimated as 7.4 million in 2013).[8] As an indicator of the importance of alternative therapies in the lives of patients living with psoriasis (e.g.: herbal treatments, dietary manipulation, vitamin treatments), recent surveys indicated the prevalence of AM use in these patients between 42 and 69 percent.[9] Patients may combine herbal therapies with standard medical therapies for psoriasis, at times employing alternative or herbal modalities without discussing or disclosing their use to their health care provider.

While not all-inclusive, the purpose of this 'at-a-glance' reference table is to raise awareness of the herbal treatments that are used in psoriasis, to aid providers treating patients that are currently using or interested in the addition of herbals to their therapy regimen, as well as shed light on any existing evidence for their use. Provided also are their active ingredients, side effects, and potential interactions with conventional medication. Readers are directed to key resources such as websites by WebMD and Medscape, which both offer information on herbal supplements, their side effects and medication interactions.

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1. Cowen, V. S., & Cyr, V. (2015). Complementary and alternative medicine in US medical schools. Advances in Medical Education and Practice, 6, 113–117. http://doi.org/10.2147/AMEP.S69761
2. Harris P, Cooper K, Relton C, Thomas K. Prevalence of complementary and alternative medicine (CAM) use by the general population: a systematic review and update. Int J Clin Pract. 2012;66:915-916.
3. Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, Van Rompay M, et ci. Trends in alternative medicine use in the United States, 1990-1997. JAMA. 1998 Nov 11;280(18):1569-75.
4. Nahin R, Barnes P, Stussman B, B B. Cost of Complementary and Alternative Medicine (CAM) and frequency of visits to CAM practitioners: United States, 2007. Hyattsville, MD2009.

5. The National Health Expenditure Accounts category of "physician and clinical services" includes "Offices of Physicians (including Doctors of Medicine [M.D.] and Doctors of Osteopathy [D.O.])" (North American Industry Classification System, or NAICS, 6211) and outpa- tient care centers (NAICS 6214), (a portion of NAICS 6215).
6. Ben-Arye E, Ziv M, Frenkel M, Lavi I, Rosenman D. Complementary medicine and psoriasis: linking the patient's outlook with evidence-based medicine. Dermatology. 2003;207(3):302-307.
7. Stein K. Herbal supplements and prescription drugs. A risky combination? J Am Diet Assoc 2000; 100:4 12.; Helwig D. US pharmacy chain tracks customer's use of herbals. CIVIAJ 2000;162:852.
8. Rachakonda T, et al. Psoriasis prevalence among adults in the United States. J Am Acad Dermatol. 2014;70(3):512-516.
9. Talbott W, Duffy N. Complementary and Alternative Medicine for Psoriasis: What the dermatologist needs to know. Am J Clin Dermatol. 2015;16(147-165).

HERBAL SUPPLEMENTS FOR THE TREATMENT OF PSORIASIS

Herbal	Source	Active Ingredient	Formulations	Adverse Effects	Herb-drug interactions	Additional Information	Clinical Trial Findings
Aloe Vera[1-3]	Aloe Vera	Anthraquinone Salicyclic acid	Topical application of gel or liquid, drink, tablet, capsule.	Cathartic, dermatitis, electrolyte abnormalities, hypokalemia, melanosis coli, nephritis, nummular eczema, red urine, seizures	Antiarrthymics, Diuretics, Digoxin, Glyburide, Topical hydrocortisone	Moisturizing and with antibacterial properties.[4] Used for burns and wound healing.[5]	RCT, N=60, showed superiority of 0.5% aloe Vera extract TID for 4 weeks over vehicle.[6] RCT, N=41, showed 90% aloe gel had only a weak effect, and was inferior to vehicle alone.[7] RCT, N=80, comparing aloe vera cream to 0.1% triamcinolone acetonide BID for 8 weeks. Both groups improved in PASI and DLQI scores, statistically greater improvement in Aloe Vera group.[8] **These three trials conducted in patients with mild to moderate PsO.*
Arnica[9,10]	Arnica Montana	Helenalin, dihydrohelenalin esterse (sesquiterpene lactones)	Tinctures, oily extract for diluted wet dressings, gels, creams. Not for oral ingestion.	Contact dermatitis[11]—worse with stronger preparations or long exposure Avoid open wounds or broken skin Toxic if ingested even in small amounts- GI side effects, muscle cramps, paresthesias, angina, arrhythmias. May cause bleeding	Warfarin[12]	Known to have anti-edema, anti-inflammatory and anti-microbial properties. May inhibit NFKB, inflammatory cytokines, and TNF-a[13] Used for acne, bruises, sprains, muscle aches, insect bites, boils, inflamed gums, acne eruptions, hemorrhoids. Found in many seborrheic dermatitis and psoriasis preparations.	No clinical studies yet in psoriasis patients
Balloon Vine[1]	Cardiospermum halicacabum	Flavonoids	Creams and lotions, alternative to cortisone creams	Contraindicated in pregnancy	None known	Anti-inflammatory and anti-pruritic effects. May decrease TNF-a and NO in human mononuclear cells[14]	Prospective study, N=112, chronic skin diseases (psoriasis or eczema) were treated with ointment containing mahonia or cardiospermum, or usual care creams (calcipotriene and corticosteroids) for 2 years. No significant difference noted between groups in improvement, patient satisfaction or adverse drug reaction.[15]
Barberry[2,16] (*related to Oregon grape)	Berberis vulgaris	Berberine	Capsules, teas, or tincture to be taken orally	Coagulant, epistaxis, nausea, vomiting. Contraindicated in pregnancy and lactation	Warfarin	Reduces synthesis of 5-lipoxygenase and thus decreases inflammation and acts as an antioxidant.[17]	RCT, N=60, mild-moderate psoriasis, berberine application group had significantly greater reduction in PASI than placebo at 4 and 6 months.[18]
Bishop's weed[1,19]	Ammi majus	Psoralens	Capsule, tincture or tea.	Phototoxicity, photosensitization. Nausea, vomiting, headache, bleeding, hepatotoxicity, contraindicated in pregnancy	Anti-coagulants, anti-platelet drugs, other photosensitizing drugs (fluoroquinolones, tetracyclines), other hepatotoxic drugs: anticonvulsants, antifungals, statins.	May replace alternative psoralens for psoriatic patients with light therapy May inhibit keratinocyte proliferation in combination with UVA irradiation (when used systemically, as a bath additive or cream form).[20]	RCT, N=54, moderate-severe psorisiasis was treated with either oral 8-MOP PUVA (8-MOP is an extract from Bishop's weed) or narrowband UV-B (TL-01) phototherapy, with no significant difference in number of days to clear or number of days in remission.[20]

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Black Nightshade Grieve's Herbal/ Petty Morel[2]	Solanum nigrum	Steroidal components	Topical application of freshly bruised leaves as compress	Death, hallucinogenic, headaches, fever, mydriasis, malaise, respiratory depression	None known	Known to have anti-proliferative effects with pro-apoptotic properties. Also known as an anti-inflammatory by inhibition of leukotrienes.[21]	No clinical studies in psoriasis patients
Burdock[2]	Arctium lappa	Polyacetylene sesquiterpene lactone, tannins	Topical application	Hypoglycemia (in animal models), stimulates uterine smooth muscle, contact dermatitis	Hypoglycemics	Anti-inflammatory effects: Inhibits nitric oxide production, the NFKB pathway, and pro-inflamm cytokines. Anti-oxidant. [22,23]	No clinical trials in psoriasis patients
Calaguala[2]	Polypodium decumanum	Polyunsaturated fatty acids (PUFAs): linoleic acid, Alpha-linoleic acid, Arachadonic acid	Taken by mouth, short-term topical application	Gastroenteritis	None	PUFAs have been shown to inhibit formation of LTB4- an inflammatory mediator seen in high levels in the skin of patients with psoriasis.[24]	No clinical trials in psoriasis patients
Capsaicin, Cayenne[1,2]	Capsicum frutescens	Capsaicin	Topical application in cream, ointment	Burning, colic, diaphoresis, dermatitis in breastfeeding babies from moms on cayenne, gastroenteritis, hypocoagulopathy, lacrimation, nephrotoxicity, plasma cell gingivitis, respiratory symptoms, rhinorrhea. Avoid the face and injured skin. Treatment time should be limited.	ACE-I, Acetaminophen, Aspirin, Anticoagulants, Antihypertensives, MAO-I, Sedatives, Theophylline	Liposomal delivery may be more effective[25] Topical application may down-regulate HIF-1a gene, which contributes to hyperproliferation of keratinocytes in psoriasis.[26]	RCT, N= 197, .025% capsaicin cream applied QID for 6 weeks. Superior to vehicle in scaling, infiltration, erythema and pruritus.[27] RCT, N=44, moderate-severe psoriasis treated with topical capsaicin for 6 weeks. No difference in efficacy between .01% and .025% but both superior to placebo.[28]
Cascara sagrada	Rhamnus purshiada	Anthranoid derivatives	Oral ingestion of tablet	GI side effects, hypokalemia, melanosis coli.[29] Carcinogenic with long-term use.[30]	Digoxin, steroids, other stimulant laxatives, Warfarin, diuretics	Contains chrysarobin, a natural precursor to dithranol- use may potentially increase contact sensitization to dithranol.[31]	No clinical studies in psoriasis patients
Cat's Claw[32]	Uncaria tomentosa	Carboxy alkyl esters	Oral ingestion	Bleeding, low blood pressure, exacerbates autoimmune diseases	Anti-hypertensives, immune suppressants, medications metabolized by cytochrome P4503A4	May enhance DNA repair, reduce DNA damage, and contain anti-inflammatory activity through interaction with NFKB pathway.[33,34]	No clinical trial studies in psoriasis patients
Chaumoogra (related to Hydnocarpus oil from H laurifolia)[2]	Hydnocarpus species	Chaulmoogra, fatty acid ethyl esters	Topical application of powder, emulsion, ointment or oil. Not for oral ingestion.	Central paralysis, constipation, cough, dyspnea, laryngospasms, myalgias, nephrotoxic, visual disorders. Toxic with oral ingestion, may lead to cyanide poisoning and GI side effects	None	Historically known for treatment of leprosy, and other skin conditions.[35]	No recent studies in psoriasis patients
Chamomile [1,2,9]	Matricaria recuctita, Chammila recutita	Chamazulene, quercetin, apigenin. Sesquiterpen alcohol.	Tea made by 2-3tsp dried flowers per cup water, or made into a compress. Brew for wet dressings, irrigation, gels, ointments bath additives	Reaction in people with allergies to ragweed and chrysanthemum, increase PT, aPTT, INR (bleeding risk)	Anticoagulants, Antiplatelets, Sedatives	Has clinically been studied for atopic dermatitis. Demonstrates antimicrobial activity.[36] May decrease inflammation in keratinocytes by inhibition of LTB4 formation.[37]	No recent studies in psoriasis patients

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Chrysanthemum [10,39,40]	Astera-ceae (Compositae) family	Sesquiterpene lactones	Brewed into tea, ingestion of capsule	Allergy, photosensitivity	None known	Used in Southern Italy against Psoriasis and other skin diseases.[41] Anti-inflammatory: Inhibits NFKB, increases anti-inflammatory eicosanoid 15-HETE, while inhibiting 5-LOX and COX-1 pathways.[41] Inhibits IL-1, TNF-alpha and leukocyte accumulation.[42]	No recent studies in psoriasis patients
Dong Quai [1,2,39,43-45]	Radix Angelicae Species	Psoralens (Coumarins) (vasodilators antispasmodics)	Capsule and topical application	Anorexia, bloating, diarrhea, fever, gynecomastia, bleeding, photodermatitis, photosensitivity, potentiate response to radiation therapy, vertigo	Anticoagulants, Oral Contraceptives	Several studies indicate that Dong Quai may be a potential substitute for PUVA therapy. In the presence of UVA irradiation will combine with DNA and inhibit hyperproliferation like psoralen compounds.	RCT, N=92, two-thirds of patients experienced clearing of disease with oral supplements (Radix Angelicae pubiscentis) and long wave UV therapy.[46] Parallel study, N=296, Radix Angelicae dahuricae combined with UVA showed no significant difference in clearance rates from Psoralen with UVA, and had milder side effects compared to psoralen-treatment.[47,48]
Evening Primrose Oil [2,32]	Oenothera biennis	Leandrigenin, cis-gamma-linolenic acid	Capsule, topical, infusion, drink	CI in pregnancy.[49] Gastroenteritis, headache, bleeding	Anticoagulants/ Antiplatelets, Phenothiazines[50]	Anecdotally may be of benefit to patients with arthritis. Polyunsaturated fatty acids may have positive effects in various inflammatory diseases, including psoriasis.[51]	Meta-analysis concluded there is a moderate positive effect of evening primrose on pruritus, scaling and crusting in eczema.[52] RCT, N=37 psoriatic patients given either combination marine oil and evening primrose oil capsule or placebo for 6 months. No significant improvement or decrease in transepidermal water loss was observed.[53] RCT, N=38, patients with psoriatic arthritis were assigned combination murine and evening primrose oil capsules or placebo for 9 months to observe effect on arthritis. No significant difference in clinical improvement was observed.[54]
Feverfew [10]	Tanacetum (Chrysanthemum)	Sesquiterpene lactones (parthenolide), flavonoids	Orally ingestion, topical application	Tachycardia, oral mucositis, dermatitis, "post-feverfew" syndrome upon discontinuation (headaches, insomnia, joint pain, nervousness, poor sleep patterns, stiffness, tension, tiredness) CI in pregnant and lactating women	Anticoagulants/ anti-platelet agents including aspirin and warfarin[12]	Inhibits prostaglandin synthesis, indicating the potential for decrease of inflammation in psoriatic skin.[55]	No clinical studies in psoriasis patients
Flax seed oil, Linseeds [2,39,56]	Linum usitatissimum	Omega-3-unsaturated fatty acids, lignans	Oral ingestion, topical application	Constipation, decreased nutrient absorption, increase in the luteal phase of the menstrual cycle, filling defects on double contrast barium enema, flatulence	Anti-coagulants, Estrogenics: tamoxifen, raloxifene, HRT	Flaxseed and linseed both both contain EPA (eicosapentinoic acid) which competitively inhibits conversion of arachidonic acid to PGE2 and LTB4.	No clinical studies in psoriasis patients

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Garlic[10]	Allium sativum	Sulfur-containing compounds, flavonoids, selenium	Raw garlic juice, heated garlic juice, dehydrated garlic powder, aged garlic extract. Topical application	Irritant contact dermatitis, allergic contact dermatitis, zosteriform dermatitis, contact urticarial, induction of pemphigus	Chlorpropamide, Ritonavir, Saquinavir, Warfarin[12]	Sulfur-containing compounds interrupt NFKB pathway, prevents and repairs oxidative damage.[57,58] NF-KB is a well known inflammatory pathway involved in psoriasis.	No clinical studies in psoriasis patients
Ginkgo Biloba[9,10,59]	Gingko biloba	Terpene trilactones, flavonoids	Oral ingestion	Spontaneous bleeding, reports of subarachnoid and intracerebral hemorrhage. Not indicated for children or pregnant or breastfeeding women	Aspirin, Warfarin, Ibuprofen, Ticlopidine, Azprazolam, Digoxin, Diltiazem, Haloperidol, Trazodone, Nicardipine, Nifedipine, Omeprazole, Thiazide diuretics, Tolbutamide, Valproate[12]	The extract may increase anti-inflammatory IL-10 and decrease levels of IL-1, NF-KB and IL-6.[60,61] Has been shown to suppress phospholipase-2, inhibit COX and NO synthase in an animal model of chronic skin inflammation.[62]	No recent clinical trials in psoriasis patients, has been investigated in murine models to replicate mechanisms of psoriasis.
Ginseng[10]	Panax ginseng, Panax quinquefolius	Ginsenoside	Oral ingestion	Nervousness, insomnia, headache, dizziness, GI upset	Bumetanide, Ethacrynic acid, Furosemide, Isocarboxazid, Nifedipine, Estrogens, corticosteroids, Phenelzine, Torasemide, Tranylcypromine, Warfarin, Antidiabetic, agents[12]	Inhibits expression of NO synthase and COX-2 in murine models, both seen with elevated levels in psoriatic patients, and may improve chronic inflammatory skin disorders.[63] Regulates levels of COX, IFN-g and IL-4; all associated with inflammation seen in psoriasis patients, study on induced chronic inflammation of mouse ears.[64]	No recent clinical trials in psoriasis patients, has been investigated in murine models to replicate mechanisms of psoriasis.
Goa Powder [1,2,65]	Andira araroba (chrysarobin)	Anthrone derivatives (cignolin)	Paste formed by mixing powder with vinegar or lemon juice, or mixed with glycerin or starch paste and applied topically., or combined with acetic acid and lard to form an ointment.	Conjunctivitis, contact allergy, gastroenteritis, nephritis	None known	Anthralin, derivative of andira araroba combats hyperproliferation of keratinocytes by acting on several inflammatory markers.[66] Inhibits release of pro-inflammatory cytokines and proliferation of keratinocytes.	Anthrone derivatives of Goa powder are widely used in plaque psoriasis. RCT, N=106, chronic plaque psoriasis, patients received calcipotriol ointment BID or dithranol cream once daily. After 12 weeks there was no significant difference between the groups in PASI reduction.[67]
Goldenseal[2,39]	Hydrastis Canadensis	Berberine alkaloid	Capsules, teas or tinctures	Anxiety, bradycardia, changes in PT/PTT/INR, constipation, convulsions, depression, emesis, gastric ulcers, hallucinations, hypotension, increased bilirubin levels, interferes with THC detection in urinalysis, nausea, respiratory depression, seizures	Antihypertensives, Anticoagulants, Antiplatelets, Barbiturates, Inhibits Cytochrome P- 450 3A4, Vitamin B Complex	May decrease inflammation contributing to psoriasis by Inhibition of TNF-a by AP-1 blockade.[68]	No studies available
Hogweed[2,43]	Heracleum sphondylium	Furanocoumarins (Psoralens)	Oral ingestion	Carcinogenic properties, diarrhea, dizziness, nausea, phototoxic, tachycardia	Digoxin , MAO-I	May have similar effect of psoralens in PUVA therapy	No studies available

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Indian Penny Wort/Gotu Kola[2,69]	Hydrocotyle/ Centella asiatica	Madecassic acid, Asicaticoside, Triterpenoid glycoside, Fusidic acid (pentacyclic triterpenes)	Oral tablets or drops, topical ointments or powder, SC or IM injections.	Contact dermatitis, headache, hyperglycemia, hyperlipidemia, photosensitization, pruritus, reduced fertility, sedation	Anti-hyperlipidemics, Hypoglycemics, Insulin	Improves wound healing and prevents hypertrophic scar formation by the maturation of new collagen tissue.[70] May inhibit proliferation of keratinocytes.[71]	No clinical study in psoriasis patients
Licorice Root [1,2,44,72,73]	Glycyrrhiza glabra	Glycurrhizin	Topical application, brewed teas, oral ingestion	Bradyarrhythmias, decreased libido in men, edema, hyperminerolcorticoidsm, hypernatremia, hypertension, hypokalemia, lethargy, myalgias, pseudo-hyperaldosteronism, suppression of scalp sebum secretion	Antiarrthymics, Anticoagulants, Antiplatelets, Aspirin, Cardiac glycosides, Corticosteroids, Diuretics, Insulin, Hormonal therapy, Stimulant laxatives, MAO-I	Immunosuppressive and immune-enhancing activity. Topical application exhibits anti-proliferative and anti-inflammatory activities.[74] Decreases skin inflammation in Imiquimod-induced psoriasis in mice by inhibiting ICAM-1 expression via MAPK and NF-KB signaling pathways in keratinocytes.[75]	No clinical trials in psoriasis patients, has been studied in induced-psoriatic murine models and atopic dermatitis.
Marigold[1,9,10]	Calendula	Esters of faradiol	Topical preparation for wounds, ulcers, burns, boils, rashes, chapped hands, herpes zoster, varicose veins. Gargles for throat and mouth inflammation.	Allergic contact dermatitis	None known	Mild anti-inflammatory and antimicrobial properties.[77] Has been shown effective against bacteria including S. aureus, which may aggravate psoriasis. Has demonstrated efficacy in preventing radiodermatitis compared to standard trolamine.[78]	No clinical trials in psoriasis patients
Milk thistle/ Holy thistle/ Lady's thistle/ Mary thistle[2,19,32]	Silybum marianum	Flavonoids	Topical, capsule, infusion drink	Altered LFTLs, diaphoresis, diarrhea, gastroenteritis, uterine stimulation	Butyrophenones, Inhbits Cytochrome P-450 3A4, Phenothiazines, Phentolamine, Yohimbe, Amiodarone, Indinavir[12]	Contains anti-oxidant and anti-inflammatory properties.[79] May protect the liver from toxins.[80] Inhibitor of LTB4 synthesis by leukocytes, may aid the liver in removal of endotoxins which may contribute to psoriasis.[81]	No clinical trials in psoriasis patients
Neem tree[1]	Azadirachta indica	Nimbidin	Oral ingestion, topical application, safer for short term use	Oral intake likely unsafe in pregnancy and lactation. Worse side effects seen in children taking Neem by mouth, hypoglycemia, may worsen auto-immune conditions	Azathioprine, Imuran, Glimepriride, Glucotrol, Micronase, Orinase, Prednisolone, Tolinase, Zenapax[12]	One study indicates neem tree may be a useful adjuvant systemic therapy to topical treatment. Active ingredient more potent inhibitor of prostaglandin synthesis than acetylsalicylic acid	RCT, N=50, psoriasis patients receiving topical preparations of 5% tar and 3% salicylic acid, one group was given capsule with Neem tree extract and the other placebo. After 12 weeks the Neem tree group had significantly better PASI scores compared to placebo group.[82]
Oleandrin[2]	Nerium oleander	Unknown, possibly extract similar to methanol	Oral, intradermal injections, topical application in creams	Heart block,[83] vomiting, abdominal pain, cyanosis, hypotension, hypothermia, vertigo, respiratory paralysis[84]	Calcium Salts, Digoxin, Laxatives, Quinidine	Contains anti-mitotic activity, antioxidant, analgesic, anti-inflammatory and anti-angiogenesis activity.[85] Has shown various anti-inflammatory activity in murine splenic lymphocytes.[86]	No clinical studies in psoriasis patients

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Olive Oil[10]	Olea	Oleic acid, phenolic compounds, squalene (Hydroxytyrosol)	Massaged directly into affected areas of skin (including scalp)	May decrease blood sugar, may decrease blood pressure	Hypoglycemic agents, anti-hypertensives	Component hydroxytyrosol may have anti-angiogenic effects in endothelial cell cultures which may indicate presumptive inhibition of hyperproliferation of psoriasis.[87] Hydroxytyrosol exerts anti-inflammatory effects through NF-KB activity.[88]	Not studied alone in recent clinical trials in psoriasis patients. Patient-blinded, partially-controlled study, N=18 with psoriasis, 21 with dermatitis, application of olive oil in combination with honey and beeswax improved 50% of patients with atopic dermatitis or psoriasis and reduced the necessary application of corticosteroid for those also using steroid cream.[89]
Oregon Grape[1,2,16,90]	Berberis/ aquifolium	Mahonia extract	Taken orally in capsules, teas or tinctures, topical ointments or creams made from extract	Burning, coagulant, neurotoxic, pruritus	Warfarin	Clinical trials performed where mahonia extract is used as the active ingredient in topical treatment. Inhibits the lipoxygenase and lipid hydroperoxide, reducing growth of human keratinocytes.[91,92]	Double-blinded RCT, N=200, patients with mild-moderate psoriasis received a 10% cream. Significant improvement noted by PASI compared to placebo, well-tolerated.[93] Double-blinded, half-body RCT, N=82, varied severity, compared ointment with 10% mahonia with vehicle as control. >50% patients/physicians rated mahonia as ineffective, though it was superior to ointment base. 3-4x more likely to lead to improvement in mod-severe conditions than mild conditions.[94] RCT, half-body active control, N=60, Compared to dithranol in, mahonia reduced epidermal T-cell infiltration but less than dithranol. Resulted in marked regression of proliferation and adhesion markers, though less potent than dithranol.[95]
Oregano Oil[19,32,96]	Origanum vulgare	Polyphenols from extracted lipids	Orally or topically. Undiluted oil is very potent and should be diluted before use.	Allergic contact dermatitis, hypoglycemia, increased bleeding risk, possibly unsafe in pregnancy and breast-feeding	Lithium, Anticoagulants, anti-platelets	Anecdotally has been used by many patients with psoriasis[97] Demonstrates anti-oxidant activity[98]	No clinical trials
Pansy Flower[9,10,99]	Viola tricolor	Salicylic acids, saponins, mucilage	Brews, broths, oily extracts for wet dressings: 1-2tsp flower to 1 cup water to use for dressings	No adverse effects known for topical or oral use	None known	Saponins and mucilage may have softening and soothing effects Has been used for seborrheic dermatitis	No clinical trials in psoriasis patients, has been studied for atopic dermatitis.
Paper Mulberry[10]	Brousonetia papyrifera	Phenols	Juice may be extracted and ingested or made into poultice to topical application, the fruit may be eaten or the root made into a brew.	Hypoglycemia	Hypoglycemic agents	More often used for skin bleaching. Anti-oxidant, free-radical scavenger [100]	2-Group study, N=56, compared combination herbal bath versus 0.1% anthralin ointment for 8 weeks in psoriasis patients. Anthralin was superior in efficacy and decreased relapse measured by PASI reduction.[101]
Psyllium[2]	Plantago ovata	unknown	Tablet or powder for oral ingestion	Abdominal pain, back pain, constipation, cough, diarrhea, dysphagia, emesis, flatulence, GI bleeding, headache, nausea, rhinorrhea, sinus irritation	Carbamazepine, Digoxin, Diuretics, Hypoglycemics, Insulin, Lithium, Mesalamine, Nitrofurantoin, Tetracycline, Warfarin	May be useful in psoriatic patients who also suffer from metabolic syndrome.[102,103]	No clinical trials in psoriasis patients

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Quing Dai[1,2,16,44]	Indigo naturalis	Indirubin	Topically, PO	Gastroenteritis, hematuria, increase LFTs, leukopenia , pruritus	None	Several clinical studies that indicate indigo naturalis-containing ointment may lead to improvement in plaque-type psoriasis May modify differentiation and proliferation of keratinocytes by inhibiting neutrophil migration into epithelium.[104]	RCT, N=42 moderate-severe psoriasis treated for 12 weeks with indigo-containing ointment had 81% improvement vs 26% placebo (P<0.001).[105] 14 patients with chronic plaque psoriasis treated with indigo naturalis ointment or vehicle ointment on contralateral lesions for 8 weeks. Reduction of clinical scores achieved by indigo naturalis ointment.[106] 31 patients applied indigo naturalis to psoriatic nails for 24 weeks and results were 49.8% improvement for one hand and 59.3% improvement for single nail versus 22.3% and 16.3% seen in controls.[107]
Red Clover[2,108]	Trifolium pretense	Isoflavones, estrogenic extracts, Salicylates	Wet dressings with the extract for skin lesions. Taken orally for menopausal symptoms	Bleeding, low platelets, breast tenderness, swelling, increased thyroid function, migraine/ headache, dizziness, vertigo, tremor, hypertension, acne, rash, pruritus, psoriasis, constipation, diarrhea, nausea, mouth ulcer, sore throat, myalgia, osteoarthritis, bronchitis, reflux, thrush. CI in pregnancy	Anticoagulants, (Warfarin, Antiplatelets (aspirin), Estrogenics: tamoxifen, raloxifene, HRT, OCPs[109]	Anti-inflammatory and anti-oxidant properties. Has been used for psoriasis, eczema and wound healing.[110,111]	No clinical trials in psoriasis patients
Rockrose[1]	Cistus incanus	Flavonoids, polyphenols	Application of brewed tea from leaves topically or ingested tea orally	No acute toxic effects known	None known	Can be applied topically to soothe and heal wounds.	No clinical studies of using rockrose for psoriasis, but it has been studied for atopic dermatitis.
Rosemary[10]	Rosmarinus officinalis	Caffeic acid, rosmarinic acid (Polyphenols) salicylate	Topical application of extract oil, oral ingestion of undiluted oil is likely unsafe	Allergy, contact dermatitis, epilepsy, seizures, bleeding[109] Hyperglycemia	Anti-platelet and anti-coagulant medications, ACE-inhibitors, diuretics, Lithium, Doxirubicin, hypoglycemics	Mentioned as one of the herbals that has an anti-inflammatory effect by suppressing NFKB pathway,[58] with potential benefit for inflammatory conditions such as Psoriasis May decrease formation of LTB4	No trials available in psoriasis patients
Sarsaparilla [2]	Smilax species	Beta-sitosterol, saponin glycosides	Ingestion of powder from root in tablet	Gastroenteritis, nephritis	Bismuth subsalicylate, Digoxin, Lithium	Has been used as part of combination Chinese medicine for psoriasis that has demonstrated anti-proliferative and anti-inflammatory effects in murine induced inflammatory dermatoses. [74] Contains steroid-like compounds.[113]	No clinical trials evaluating efficacy of sarsaparilla alone in psoriasis patients

HERBAL SUPPLEMENTS FOR THE TREATMENT OF PSORIASIS							
Slippery Elm[2,9,56]	Ulmus rubra	Mucilage	Topically when mixed with water. Can be used as an herbal bandage once it dries. Capsule, tablet, IV, Infusion drink, Herbal tea	Dermatitis. Oral form may induce miscarriage[114]	May slow absorption of oral medications	None	No clinical trials to evaluate efficacy in psoriasis, but 5 psoriatic patients in a case series saw improvement with oral supplements[115]
St. Johns Wort[1,2,116]	Hypericum perforatum	Bioflavonoids: hyperin, hyperforin, hyperoside, quercetin, kaempferol, rutin, hyperoside	Tablet or capsule	Abdominal discomfort, acute neuropathy, constipation, confusion, elevated LFTs, fatigue, headache, increased PT, mania, nausea, photosensitivity, sleep disturbances, sedation, serotonin syndrome, sexual dysfunction, vertigo, withdrawal syndrome, xerostomia	Alcohol, Alprazolam, Anesthetics, Clopidogrel, Phenprocoumon, Cyclosporine, Induces Cytochrome P450 3A4, Dextromethorphan Digoxin, Diltiazem, HIV protease inhibitors, HIV non-nucleoside reverse transcriptase inhibitors, Irinotecan, Oral contraceptives, Nifedipine, SSRIs, Sumatriptan, Sympathomimetics, Tacrolimus, Theophylline, Tricyclic antidepressants, Tamoxifen, Warfarin	Antibacterial, anti-inflammatory and differentiation-promoting properties.	No clinical trials on efficacy in psoriasis, has been studied in patients with atopic dermatitis.
Sunflower[2]	Helianthus annuus	Steroids, linoleic acid	Topical application of oil	Diuretic, Expectorant	Anticoagulants	Has been shown to increase epidermal lipid synthesis and skin hydration, particularly in atopic dermatitis.[118]	Open-label study, N=22, studied as part of a combination herbal topical therapy (Psirelax), showed a 59% reduction in PASI applying treatment BID for 4 wks.[119]
Tea Tree Oil[2,120]	Melaleuca alternifolia	terpinen-4-ol, alpha-terpineol, and alpha-pinene	Topical treatment with essential oil extracted from leaves, capsule	Disorientation, coma, neutrophil leukocytosis, systemic contact dermatitis[121]	No drug interactions reported	Tea tree oil is able to reduce histamine-induced skin inflammation.[122] Components may decrease inflammation by inhibiting TNF-a formation, and IL-1, IL-8, PGE2.[123] Contains known anti-microbial and anti-fungal properties[124]	No clinical studies observing psoriasis treatment with tea tree oil.
Thunder God Vine[2,39]	Tripterygium wilfordii Hook	Triptolide (diterpenoid triepoxide)	Oral ingestion	Abdominal pain, amenorrhea, anorexia, cardiovascular collapse, death, diarrhea, emesis, hypocalcemia, infertility in men, nausea, renal failure, skin rashes, skin pigmentation, stomatitis, softening of fingernails	Immunesuppresants (chemotherapy agents, steroids)	Immunosuppressive and anti-inflammatory properties with minimal side effects.[125] [126,127]	No clinical trials in psoriasis patients

HERBAL SUPPLEMENTS FOR THE TREATMENT OF PSORIASIS							
Turmeric/ curcumin [10,32,56]	Curcuma longa	Sesquiterpenes, zingiberene, curcuminoids	Capsule, tablet, topical, infusion drink, dietary modification	Contraindicated in patients with bile duct obstruction, gallstones, and GI disorders. Allergic contact dermatitis[128]	Anticoagulants/ Antiplatelets, Camptothecin, Cyclophosphamide, Doxorubicin, ndomethacin, Mechlorethamine, Reserpine	Several clinical studies have showed effectiveness of curcumin supplementation with traditional therapy improves psoriasis. May alter metabolism of arachidonic acid and prostaglandin synthesis.[129]	Clinical controlled trial, N=10, showed improvement in severity of chronic moderate-to-severe psoriasis with alcohol-based gel 0.1% curcumin, and indicated mechanism of turmeric through suppression of phosphorylase kinase.[130] RCT, N= 63 patients with chronic plaque psoriasis over 12 weeks of either topical steroid ointment with 2mg Meriva (lecithin-based delivery form of curcumin) per day, or steroid ointment plus placebo. Showed significant improvement in PASI of Meriva group (48% improvement) compared to placebo (12%), indicating curcumin as an effective adjuvant to psoriasis treatment.[131]
White tiger, Japanese Pogoda tree, huai hua mii[2]	Saphora Japonica	Matrine and oxymatrine alkaloids, thought to induce apoptosis of keratinocytes	Capsule or tablet	Abortifacient, cytosine can be toxic in high quantities (similar to nicotine), facial edema	None	Has been used as part of Traditional Chinese Medicine therapy as combination of herbals.	RCT, N=61, Was used as part of a combination of Traditional Chinese Medicine herbals to treat moderate-to-severe plaque psoriasis versus methotrexate versus placebo, and outcomes assessed by PASI at 6 months were statistically better with methotrexate. [132]
White Willow bark[1]	Salix alba	Salicylic acid	Ingested orally, topically applied to psoriatic plaques	Can cause Reyes syndrome in children if taken <16yo with current viral illness. GI irritation when taken orally.	Anticoagulants, NSAIDS, Phenytoin[12]	Has been long-used to exfoliate hyperkeratotic plaques[133] Salicylic acid is the strongest therapeutically employed keratolytic substance.[134] May improve arthritis[135]	No recent clinical studies in psoriasis patients.
Wintergreen/ Boxberry[2,56]	Gaultheria procumbens	Methyl salicylate	Capsule, topical, drink	Acid-base disturbances, emesis, increase PT/INR, pulmonary edema, spontaneous pneumothorax, tachypnea, tinnitus[136]	Warfarin, Aspirin	Anti-inflammatory action and effective analgesia when used topically.	No clinical studies with psoriasis patients.
Witch Hazel [9,10]	Hamamelis virginiana	tannins	Brew, distillates, tinctures for wet dressings, ointments, suppositories, gels	GI upset and hepatotoxicity if ingested. For topical application only.	None	FDA-approved as an astringent for acne.	No clinical trials in psoriasis patients
Xi Shu/ Cancer Tree/Happy Tree/Tree of Joy [2,16,39]	Camptotheca accuminata decne	Camptothecin (alkaloids)	Taken in tablet, or topical application as tincture, ointment or gel.	Bone Marrow suppression, contact dermatitis, cystitis, diarrhea, liver function abnormalities, myelosuppression, post-inflammatory pigment alteration	In vitro inhibitor of the CYP 450 3A4 and 2C8 isoenzymes	Several clinical studies indicate camptotheca applied topically may improve psoriatic plaques.	Open trial, N=92, Topical Application of .03% concentration showed more anti-psoriatic activity than 1% hydrocortisone.[48] 60 day open label parallel group study, N=184, showed thin gel preparation of camptotheca is more effective in reducing lesion area than placebo, camptotheca ointment or camptotheca tincture.[138]

Key: RCT=randomized controlled trial. N=number or patients. CI=contraindicated. BID=twice a day. TID=three times a day. QID=four times a day.

1. Reuter J, Wölfle U, Weckesser S, Schempp C. Which Plant for which skin disease? Part 1: Atopic dermatitis, psoriasis, acne, condyloma and herpes simplex. Journal of the German Society of Dermatology. 2010;8(10):788–796.
2. Steele T, Rogers CJ, Jacob SE. Herbal Remedies for Psoriasis: What are our patients taking? Dermatology Nursing. 2007;19(5):448–463.
3. Klein A, Penneys N. Aloe Vera. J Acad Am Derm. 1988;19(4):82.
4. Tian B, et al. Relationship between antibacterial activity of aloe and its anthraquinone compounds. Zhongguo Zhong Yao Za Zhi;28(11):1034–1037.
5. Robson M, Heggers J, Hagstrom W. Aloe Vera revisited. Journal of Burn care and Rehabilitation. 1982;3:157–162.
6. Syed T, Ahmad S, Ahmad S, Afzal M. Management of psoriasis with aloe vera extract in a hydrophilic cream: A placebo-controlled, double-blind study. Tropical Medicine and International Health. 1996;1(4):505–509.
7. Paulsen E, Korsholm L, Brandrup F. A double-blind placebo-controlled study of a commercial aloe-vera gel in the treatment of slight-to-moderate psoriasis vulgaris. J Eur Acad Dermatol Venereol. 2005;19:326–331.
8. Choonhakarn C, Busaracome P, Sripanidkulchai B, Sarakarn P. A prospective, randomized, clinical trial comparing topical Aloe Vera with 0.1% triamcinolone acetone in mild to moderate plaque psoriasis. J Eur Acad Dermatol Venereol. 2010;24:168–172.
9. Bedi M, Shenefelt P. Herbal Therapy in Dermatology. Arch Dermatol 2002;18:232–242.
10. Weingartner J, Miller A. Boards' Fodder: Herbal Supplements in Dermatology. Directions in Residency. 2015(Spring):1–2.
11. Hörmann H, Korting H. Allergic acute contact dermatitis due to Arnica tincture self-medication. Phytomedicine. 1995;4:315–317.
12. Cock I. The safe use of herbal medicines: counter-indications, cross-reactivity and toxicity. Pharmacognosy Communications. 2015;5(1):2–38.
13. Lyss G, et al. Henalin, an anti-inflammatory sesquiterpene lactone from arnica, selectively inhibits transcription factor NF-KB. Biol Chem. 378(951–961).
14. Venkatesh BK, Krishnakumari S. Cardiospermum halicacaburn suppresses the production of TNF-alpha and nitric oxide by human peripheral blood mono-

nuclear cells. African Journal of Biomedical Research. 2006;9(2).
15. Jong M, Ermuth U, Augustin M. Plant-based ointments versus usual care in the management of chronic skin diseases: A comparative analysis on outcome and safety. Complementary Therapies in Medicine. 2013;21(5):453-459.
16. Deng S, May B, Zhang A, Lu C, Xue C. Plant extracts for the topical management of psoriasis: a systematic review and meta-analysis. British Journal of Dermatology. 2013;169:769-782.
17. Javadzadeh SM, Fallah SR. Therapeutic application of different parts Berberis vulgaris. International Journal of Agriculture and Crop Sciences. 2012;4(7):404-408.
18. Ghorbani Birgani A, et al. The effect of berberine on patients with psoriasis. Arak Medical University Journal. 2013;15(8):61-67.
19. Kuchekar A, et al. Psoriasis: a comprehensive review. . International Journal of Pharmacy and Life Sciences. 2011;2(6):857-877.
20. Markhams T, Rogers S, Collins P. Narrowband UV-B (TL-01) phototherapy vs oral 8-methoxypsoralen psoralen-UV-A for the treatment of chronic plaque psoriasis. Arch Dermatol. 2003;139:325-328.
21. Jain R, et al. Solanum nigrum: Current perspectives on Therapeutic Properties. Alternative Medicine Review. 2011;16(1):78-85.
22. Lin C, et al. Anti-inflammatory and radical scavenge effects of Arctium lappa. The American Journal of Chinese Medicine. 1996;24(2):127-137.
23. Chan Y, Cheng L, Wu J, et al. A review of the pharmacological effects of Arctium lappa (Burdock). Inflammopharmacology. 2011;19(245-254).
24. Vasange-Tuominen M, Perera-Ivarsson P, Shen J, Bohlin L, Rolfsen W. The fern Polypodiuth decurn-anum, used in the treatment of psoriasis, and its fatty acid constituents as inhibitors of leukotriene B4 formation. Prostaglandins, Leukotrienes, and Essential Fatty Acids. 1994;50(5):279-284.
25. Agrawal U, et al. Capsaicin delivery into the skin with lipidic nanoparticles for the treatment of psoriasis. Artificial cells, nanomedicine, and biotechnology. 2015;43(1):33-39.
26. Yu C-s. Study on Hlf-1α gene translation in psoriatic epidermis with the topical treatment of capsaicin ointment. ISRN pharmaceutics. 2011;2011.
27. Ellis C, Berberian B, Sulica V, et al. A double-blind evaluation of topical capsaicin in pruritic psoriasis. J Am Acad Derm. 1993;29(3):438-442.
28. Bernstein J, et al. Effects of topically applied capsaicin on moderate and severe psoriasis vulgaris. J Am Acad Dermatol. 1986;15(3):504-507.
29. Bertram P. Melanosis coli: a consequence of "alternative therapy" for psoriasis. Am J Gastroenterol. 1993;88(6):971.
30. Van Gorkom B, et al. Review article: anthranoid laxatives and their potential carcinogenic effects. Aliment Pharmacol Ther. 1999;13(443-452).
31. Malhotra V, et al. Frequency of Patch-test positivity in patients with Psoriasis: A prospective controlled study. Acta Derm Venereol. 2002;82:432-435.
32. Anderson N, Mortensen W. Expert tips for using herbal and dietary supplements. National Psoriasis Foundation; 2015.
33. Mammone T, Akesson C, Gan D, Giampapa V, Pero R. A water soluble extract from uncaria tomentosa (Cat's Claw) is a potent enhancer of DNA repair in primary organ cultures of human skin. Phytotherapy Research. 2006;20(178-183).
34. Sandoval-Chacón M, Thompson J, et al. Anti-Inflammatory actions of cat's claw: the role of NF-KB. Aliment Pharmacol. 1998;12:1279-1289.
35. Rana V. Chemical constituents, biosynthesis and therapeutic applications of chaulmoogra oil. Phytoconstituents & Physiological Processes. 2012;34:269-278.
36. Aggag M, Yousef R. Study of antimicrobial activity of chamomile oil. Planta Medica. 1972;22(2):140-144.
37. Safayhi H, et al. Chamazulene: An antioxidant-type inhibitor of leuktriene B4 formation. Planta Medica. 1994;60(5):410-413.
38. Patzelt-Wenczler R, Ponce-Poschl E. Proof of efficacy of Kamillosan cream in atopic eczema. Eur J Med Res. 2000;5:171-175.
39. Rahman M, et al. Classical to Current Approach for Treatment of Psoriasis: A Review. Endocrine, Metabolic & Immune Disorders- Drug Targets. 2012;12:287-302.
40. Gao M, Li H, Zhang L, Xiao S. Studies on chemical constituents from flowers of Chrysanthemum indium,. Zhong Yao Cai. 2008;31:682-684.
41. Bader A, Martini F, Schinella G, Rios J, Prieto J. Modulation of Cox-1, 5-, 12-, and 15-Lox by popular herbal remedies used in southern Italy against psoriasis and other skin diseases. Phytother Res. 2015;29(1):108-113.
42. Lee D, Choi G, Yoon T, Cheon M, Choo B, Kim H. Anti-inflammatory activity of Chrysanthemum indium extract in acute and chronic cutaneous inflammation. Journal of Ethnopharmacology. 2009;123(1):149-154.
43. Singh KK, Tripathy S. Natural Treatment Alternative for Psoriasis: A Review on Herbal Resources. Journal of Applied Pharmeceutical Science. 2014;4(11):114-121.
44. Bartosinska J, et al. Traditional Chinese medicine herbs- are they safe for psoriatic patients? Folia Histochemica et Cytobiologica. 2011;28(2):201-205.
45. Shen's Herbal Products. Angelica sinensis: Radix angelica sinensis, dang gui, tang kwei, dang quai, dong quai, dong qui, dong guay. 2000; http://www.drshen.com/dongquay danggui.htm. Accessed August 6, 2007.
46. Li F, et al. Cases suffering from psoriasis treated with traditional Chinese medicine and long wave ultraviolet. Chin J Phys Ther. 1983;6:144-145.
47. Zhang G, Wang H, Zhou Y. Treatment of psoriasis by photochemotherapy: a comparison between the photosensitizing capsule of Angelica dahurica and 8-MOP. Natl Med J China. 1983;63:16-19.
48. Koo J, Arain S. Traditional Chinese medicine for the treatment of dermatologic disorders. Arch Dermatol. 1998;134:1388-1393.
49. Dove D, Johnson P. Oral evening primrose oil: Its effect on length of pregnancy and selected intrapartum outcomes in low-risk nulliparous women. Journal of Nurse Midwifrey. 1999;44(3):320-324.
50. Holman C, Bell A. A trial of evening primrose oil in the treatment of chronic schizophrenia. Journal of Orthormolecular Psychiatry. 1983;12:302-304.
51. Gil A. Polyunsaturated fatty acids and inflammatory diseases. Biomed Pharmacotherapy. 2002;56:388-396.
52. Morse N, Clough P. A meta-analysis of randomized, placebo-controlled clinical trials of Efamol evening primrose oil in atopic eczema. Where do we go from here in light of more recent discoveries? Curr Pharm Biotechnol. 2006;7:503-524.
53. Oliwiecki S, Burton J. Evening primrose oil and marine oil in the treatment of psoriasis. Clinical and Experimental Dermatology. 1994;19(2):127-129.
54. Veale D, et al. A double-blind placebo-controlled trial of efamol marine on skin and joint symptoms of psoriatic arthritis. B J Rheumatology. 1994;33(10):954-958.
55. Pareek A, Suthar M, Rathore G, Bansai V. Feverfew (Tanacetum parthenium): A systematic Review. Pharmacognosy Review. 2011;5(9):103-110.
56. Sahu R, et al. Herbal Remedies: a new era for Psoriasis Diseases. International Journal of Pharmaceutical Sciences and Research. 2011;2(3):525-533.
57. Ide N, Lau B. Garlic compounds minimize intracellular oxidative stress and inhibit nuclear factor-KB activation. J Nutr. 2001;131:1020S-1026S.
58. Aggarwal B, Shishodia S. Suppression of the nuclear factor-kappaB activation pathway by spice-derived phytochemicals: reasoning for seasoning. Ann NY Acad Sci. 2004;1030:434-441.
59. Pazyar N, Yaghoobi R. Ginkgo biloba extract: a novel addition to anti-psoriasis ammunition? J Altern Complement Med. 2012;18(4):316-317.
60. Li G, Lei XX, Yi Y, et al. Studies on the effect of Ginkgo biloba extracts on NF-kappaB pathway [Chinese]. Zhong Yao Cai. 2008;31:1357-1360.
61. Jiao Y, Rui Y, et al. Effects of Ginkgo biloba extract on expressions of IL-1B, TNF-a, and IL-10 in U937 foam cells. Yao Xue Xue Bao. 2007;42:930-934.
62. Lim H, et al. Effects of anti-inflammatory biflavonoid, Ginkgetin, on chronic skin inflammation. Biol Pharm Bull. 2006;29(5):1046-1049.
63. Bae E, Han M, Shin Y, Kim D. Inhibitory effects of Korean Red Ginseng and its genuine constituents Ginsenosides Rg3, Rf and Rh2 in mouse passive cutaneous anaphylaxis reaction and contact dermatitis models. Biol Pharm Bull. 2006;29(9):1862-1867.
64. Shin Y, et al. Effect of ginsenoside Rb1 and compound K in chronic oxazolone-induced mouse dermatitis. Int Immunopharmacol. 2005;5:1183-1191.
65. Shaikh G, Ali S, Talmale S, Surwase U, al e. Alternative medicine for Psoriasis- Natural Herbal ayurvedic treatment- a Review. International Journal of Ayuvedic and Herbal Medicine. 2012;2(3):455-463.
66. Sehgal V, Verma P, Khurana A. Anthralin/dithranol in dermatology. International Journal of Dermatology. 2014;53:e449-460.
67. van de Kerkhof P, van der Valk P, Swinkels O, Kucharekova M, al e. A comparison of twice-daily calcipotriol ointment with once-daily short-contact cream therapy: a randomized controlled trial of supervised treatment of psoriasis vulgaris in a daycare setting. Br J Dermatol. 2006;155(4):800-807.
68. Lee D, et al. Effects of 12-alkyl-substituted berberine alkaloids on the expression of COX-2, TNF-a, iNOS, and IL-12 production in LPS-stimulated macrophages. Life Sci. 2003;73:1401-1412.
69. HerbMed: Centella asiatica. http://www.herbmed/org/herbs/Herb95.htm. Accessed August 6, 2007.
70. Bylka W, Znajdek-Awizen P, Stuzinska-Sroka E, et al. Centella asiatic in cosmetology. Postepy Dermatol Alergol. 2013;30(1):46-49.
71. Sampson J, et al. In vitro keratinocyte antiproliferant effect of Centella asiatica extract and triterpenoid saponins. Phytomedicine. 2001;8(3):230-235.
72. Evans E. The rational use of gly- cyrrhetinic acid dermatology. . The British Journal of Clinical Practice. 1958;12(4):269-274.
73. Tse T. The use of common Chinese herbs in the treatment of psoriasis. Clin Exp Dermatol. 2003;28:469-475.
74. Man M, et al. Chinese herbal medicine (Tuhuai extract) exhibits topical anti-proliferative and anti-inflammatory activity in murine disease models. Exp Dermatol. 2008;17(8):681-687.
75. Xiong H, Xu Y, Tan G, Y H, et al. Glycyrrhizin ameliorates Imiquimod-induced psoriasis-like skin lesions in BALB/c mice and inhibits TNF-a-induced ICAM-1 expression via NFKB/MAPK in HaCaTcells. Cell Physiol Biochem. 2015;35:1335-1346.
76. Saeedi M, Morteza-Semnani K, Ghoreishi M. The treatment of atopic dermatitis with licorice gel. J Dermatolog Treat. 1996;14:153-157.
77. Roopashree T, Raman D, Shobha Rani R, Narendra C. Antibacterial activity of antipsoriatic herbs: Cassia tora, Momordica chrantia, and calendula officinalis. International Journal of Applied Research in Natural Products. 2008;1(3):20-28.
78. Kodiyan J, et al. A review of the use of topical Calendula in the prevention and treatment of radiotherapy-induced skin reactions. Antioxidants. 2015;4(2):293-303.
79. Amenta R, et al. Traditional medicine as a source of new therapeutic agents against psoriasis. Fitoterapia. 2000;71(1):S13-20.
80. Pares A, Planas R, Torres M, et al. Effects of silymarin in alcoholic patients with cirrhosis of the liver; Results of a controlled, double-blind, randomized and multi-center trial. Journal of Hepatology. 1998;28(4):615-621.
81. Thorne Research I. Monograph: Silybum marianum (milk thistle). Alternative Medicine Review. 1999;4(2):272-274.
82. Pandey S, Iha A, Kaur V. Aqueous extract of neem leaves in treatment of psoriasis vulgaris. Indian J Dermatol Venerol Leprol. 1994;60(63-67).
83. Wojtyna W, Enseleit F. A rare cause of complete heart block after transdermal botanical treatment for psoriasis. Pacing Clin Electrophysiol. 2004;27(12):1686-1688.
84. Langford S, Boor P. Oleander toxicity: an examination of human and animal toxic exposures. Toxicology. 1996;109(1):1-13.
85. Dey P, Chaudhuri T. Pharmacological aspects of Nerium indicum Mill: A comprehensive review. Pharmacognosy Review. 2014;8(16):156-162.
86. Dey P, Chaudhuri T. Immunomodulatory activity of Nerium indium through inhibition of nitric oxide and cyclooxygenase activity and modulation of TH1/TH2 cytokine balance in murine splenic lymphocytes. Cytotechnology. 2015:1-13.
87. Fortes C, JA G-V, Quesada A, Medina M. Evaluation of the anti-angiogenic potential of hydrosytyrosol and tyrosol, two bio-active phenolic compounds of extra virgin olive oil, in endothelial cultures. Food Chemistry. 2012;134(1):134-140.
88. Killeen M, Linder M, Pontoniere P, Crea R. NF-KB signaling and chronic inflammatory diseases: exploring the potential of natural products to drive new therapeutic opportunities. Drug Discovery Today. 2014;19(4):373-378.
89. Al-Waili N. Topical application of natural honey, beeswax, and olive oil mixture for atopic dermatitis or psoriasis: partially-controlled, single-blinded study. Complement Ther Med. 2003;11(4):226-234.
90. Gieler U, Von der Weth A, Heger M. Mahonia aquifolium- a new type of topical treatment for psoriasis. J Derm Treat. 1995;6:31-34.
91. Müller K, Ziereis K. The anti-psoriatic Mahonia aquifolium and its active constituents.I. Pro- and anti-oxidant properties and inhibition of 5-lipoxygenase. Planta Medica. 1994;60(5):421-424.
92. Misik V, Bezakova L, Kostalova D. Lipoxygenase inhibition and antioxidant properties of protoberberine and aporphine alkaloids isolated from Mahonia aquifolium. Planta Medica. 1995;61(4):372-373.
93. Bernstein S, Donsky H, Gulliver W, Hamilton D, Nobel S, Norman R. Treatment of mild to moderate psoriasis with Reiéva, a Mahonia aquifolium extract- a double-blind, placebo-controlled study. Am J Ther. 2006;13:121-126.
94. Wiesenauer M, Ludtke R. Mahonia aquifolium in patients with psoriasis vulgaris- an intraindividual study. Phytomedicine. 1996;3:231-235.
95. Augustin M, et al. Effects of Mahonia aquifolium ointment on the expression of adhesion, proliferation, and activation in the skin of patients with psoriasis. Forsch Komplementarmed. 1999;6:19-21.
96. Oregano Oil: Active Ingredients/Side Effects/Interactions. http://www.webmd.com/vitamins-supplements/ingredientmono-644-oregano.aspx?activeingredientid=644&activeingredientname=oregano. Accessed July 22, 2015.
97. Kuchekar A, et al. Psoriasis: a comprehensive review. International Journal of Pharmacy and Life Sciences. 2011;2(6):857-877.
98. Lagouri V,et al. Composition and antioxidant activity of essential oils from oregano plants grown wild in Greece. Zeitschrift für Lebensmittel-Untersuchung und Forschung. 1993;197(1):20-23.
99. Shenefelt PD. Herbal Medicine: Biomolecular and Clinical Aspects. 2 ed. Boca Raton, FL: CRC Press; 2011.
100. Sun J, Liu S, Zhang C, et al. Chemical composition and antioxidant activities of Broussonetia papyrifera fruits. PLoS One. 2012;7(2):e32021.
101. Deng S, Brian H.Zhang, Anthony L.Chuanjian, LuXue, Charlie C. Topical Herbal Formulae in the Management of Psoriasis: Systemic Review with Meta-Analysis of Clinical Studies and Investigation of the Pharmacological Actions of the Main Herbs. Phytotherapy Research. 2014;28:480-497.
102. Anderson J, et al. Effects of psyllium on glucose and serum lipid responses in men with type 2 diabetes and hypercholesterolemia. Am J Clin Nutr. 1999;70(4):466-473.
103. Rodrigues-Moran M, et al Lipid- and glucose-lowering efficacy of plantago psyllium in type II diabetes. Journal of Diabetes and its complications. 1998;12(5):273-278.
104. Lin Y, Leu Y, Huang T, et a. Anti-inflammatory effects of the extract of indigo naturalis in human neutrophils. J Ethnopharmacol. 2009;125:51-58.
105. Lin Y, Chang C, Chang Y, Wong W, Chang S, Pang J. Clinical assessments of patients with recalcitrant psoriasis in a randomized, observer-blind, vehicle-controlled trial using indigo naturalis. Arch Dermatol. 2008;144:1457-1464.
106. Lin Y-K, et al. The efficacy and safety of topically applied indigo naturalis ointment in patients with plaque-type psoriasis. Dermatology. 2007;214(2):155-161.
107. Lin Y, See L, Huang Y, Chang Y, et al. Efficacy and safety of Indigo naturalis extract oil (Lindioil) in treating nail psoriasis: A randomized, observer-blind, vehicle-controlled trial. Phytomedicine. 2014;21(7):1015-1020.
108. Booth N, et al. Clinical studies of red clover (Trifolium pretense), dietary supplements in menopause. Menopause. 2006;13(2):251-264.
109. Posadzki P, Watson LK, Ernst E. Adverse effects of herbal medicines: an overview of systematic reviews. Clinical Medicine. 2013;13(1):7-12.
110. Sabudak T, Fuler N. Trifolium L.- A review on its phytochemical and pharmacological profile. Phytotherapy Research. 2009;23:439-446.
111. Kolodziejczyk-Czepas J. Trifolium species-derived substances and extracts- Biological activity and prospects for medicinal applications. Journal of Ethnopharmacology. 2012;143:14-23.
112. Wiese G. Neurodermitisbehandlung mit Cystus-Teekraut. Naturheilpraxis mit Naturmedizin. 1996;49:1069-1071.
113. Patel SS, Savjani JK. Systemic review of plant steroids as potential anti-inflammatory agents: Current status and future perspectives. The Journal of Phytopharmacology. 2015;4(2):121-125.
114. Vender R. Adverse reactions to herbal therapy in dermatology. Skin Therapy Lett. 2003;8(3):5-8.
115. Brown A, et al. Medical nutrition therapy as a potential complementary treatment for psoriasis--five case reports. Altern Med Rev. 2004;9(3):297-307.
116. McIntyre M. A review of the benefits, adverse effects, drug interactions and safety of St. John's wort (Hypericum perforatum): The implications with regard to regulation of herbal medicines. J Alt Complement Med. 2000;6(2):115-124.
117. Schempp C, Hezel S, Simon J. [Topical Treatment of atopic dermatitis with Hypericum cream. A randomized, placebo-controlled, double-blind half-side comparison study.]. Hautarzt. 2003;54:248-253.
118. Eichenfield L, McCollum A, Msika P. the benefits of sunflower oleo distillate (SOD) in pediatric dermatology. Pediatr Dermatol. 2009;26:669-675.
119. Shiri J, Cicurel AA, Cohen AD. An open-label study of herbal topical medication (Psirelax) for patients with chronic plaque psoriasis. Science World Journal. 2011;6(4):13-16.
120. Osborne F, Chandler F. Australian tea tree oil. Herbal Medicine. 1998:42-46.
121. Rubel D, Freeman S, Southwell I. Tea tree oil allergy: What is the offending agent? Report of three cases of tea tree oil allergy and review of the literature. The Australian Journal of Dermatology. 1998;39(4):244-247.
122. Koh K, Pearce A, Marshman G, Finlay-Jones J, Hart P. Tea tree oil reduces histamine-induced skin inflammation. British Journal of Dermatology. 2002;147(6):1212-1217.
123. Pazyar N, Yaghoobi R. Tea Tree Oil as a Novel Antipsoriasis Weapon. Skin Pharmacol Physiol. 2012;25:162-163.
124. May J, Chan C, King A, Williams L, French G. Time-kill studies of tea tree oils on clinical isolates. Journal of Antimicrobial Chemotherapy. 2000;45(5):639-643.
125. Zhou Z, Yang Y, Ding J, Li Y, Miao Z. Triptolide: structural modifications, structure-activity relationships, bioactivities, clinical development and mechanisms. Nat Prod Rep. 2012;29:457-475.
126. Oiu D. Immunosuppressive and anti-inflammatory mechanisms of triptolide, the principle active diterpenoid from the Chinese medicinal herb Tripterygium wilfordii Hook f. Drugs in R&D. 2003;4(1):1-18.
127. Ming J. Pharmacological and clinical study on polyglycoside of tripterygium wilfordii hook f. Chinese Medical Journal. 1996;57(6A):35.
128. Hata M, Sasaki E, Ota M, et al. Allergic contact dermatitis from cur cumin (turmeric). Contact Dermatitis. 1997;36(2):107-108.
129. Joe B, Lokesh B. Effect of cur cumin and capsaicin on arachidonic acid metabolism and lysosomal enzyme secretion by rat peritoneal macrophages. Lipids. 1997;32(11):1173-1180.
130. Heng M, Song M, Harker J, Heng M. Drug-induced suppression of phosphorylase kinase activity correlates with the resolution of psoriasis as assessed by clinical, histological and immunohistochemical parameters. Br J Dermatol. 2000;143(5):937-949.
131. Antiga E, Boncilini V, Volpi W, Del Biano E, Caproni M. Oral Curcumin (Meriva) is effective as an adjuvant treatment and is able to reduce IL-11 serum levels in patients with psoriasis vulgaris. Biomed Research International. 2015:1-7.
132. Ho S, Yeung C, Chan H. Methotrexate versus traditional Chinese medicine in psoriasis: a randomized, placebo-controlled trial to determine efficacy, safety and quality of life. Clinical and experimental dermatology. 2010;35(7):717-722.
133. Augustin M, Hoch Y. Physiotherapie bei Hautkrankheiten. Munchen: Elsevier GmbH; 2004.
134. Waller J, Dreher F, Behnam S, et al. Keratolytic properties of benzoyl peroxide and retinoid acid resemble salicylic acid in man. Skin Pharmacol Physiol. 2006;19:283-289.
135. Yunos N, Mat Ali R, Kean O, Abas R. Cytotoxicity Evaluations on Vitex negundo anti-inflammatory extracts. Malaysian Journal of Science. 2005;24:213-217.
136. Bell A, Duggin G. Acute methyl salicylate toxicity complicating herbal skin treatment for psoriasis. Emergency Medicine. 2002;14:188-190.
137. Korting H, Schafer-Korting M, Klovekorn W, Klovekorn G, Martin C, Laux P. Comparative efficacy of hamamelis distillate and hydrocortisone cream in atopic eczema. Eur J Clin Pharmacol. 1995;48:461-465.
138. Wang A, Liu Z, Liu S, et a. Treatment of psoriasis vulgaris with lacquer made of camptotheca acuminata nuts. J Clin Dermatol. 1998;27:243-244.