

## Biological Activities for Extracts of Sarsaparilla (*Smilax officinalis*)

Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Not Stated	Hemolytic Activity	Not Stated	In vitro	Not Stated	Inactive	No effect on RBC surface tension, nor any hemolysis seen.	BN1014
Root Not Stated	Dermatogenic Effect	MEOH Ext	Oral Human Adult	30 g	Active	Favorable effect in lepers.	BN1013
Root Not Stated	Dermatogenic Effect	Infusion	Not Stated	Not Stated	Active	Favorable effect in psoriasis and eczema.	BN1011
Root Japan	Dermatogenic Effect	H2O Ext into Fine Granules	Oral Human Adult	5.4 g	Active	Erythroderma psoriaticum - diffuse red and silver-white scales over the entire body. Scales disappeared and redness subsided after 2 weeks. Gradual remission of lesions at 1 month.	BN1035
Root Japan	Dermatogenic Effect	H2O Ext into Fine Granules	Oral Human Adult	5.4 g	Active	Normalized abnormal keratinization in 1 month in patient with palmoplantar keratosis.	BN1035
Not Stated	Dermatogenic Effect	Not Stated	Human Adult	Not Stated	Active	Used as an adjuvant for the treatment of leprosy.	BN1044
Root Japan	Antipsoriatic Activity	H2O Ext into Fine Granules	Oral Human Adult	3.6 g	Active	Remission of silver-white scales on elbow and knee and decreased pruritis after 1 month of treatment.	BN1035
Root Japan	Antipsoriatic Activity	H2O Ext into Fine Granules	Oral Human Child	3.6 g	Active	9 year old child with pustular psoriasis, severe desquamation and pruritis on the palms and soles had gradual remission over 2 months, which remained after treatment was discontinued.	BN1035
Root Japan	Antieczema Activity	ETOH Ext in hydrophilic cream	Topical Human Child	2 ml extract to 140 g cream	Active	Cleared atopic dermatitis lesions.	BN1035
Root Japan	Antieczema Activity	Decoction	Oral Human Adult	60 ml	Active	Atopic dermatitis improved.	BN1035
Root Japan	Antieczema Activity	H2O Ext into Fine Granules	Oral Human Child	3.6 g	Active	Non-responsive steroidal dry skin and eczema over the face disappeared after 1.5 months of treatment with no side effects.	BN1035

Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Root Not Stated	Renal Effect	Not Stated	Oral Human Adult	2.4 g	Active  Inactive Inactive	Fall in serum non-protein N seen in 8-14 days in both normal and nephrotic patients, probably due to kidney stimulation and increased urinary excretion. With the fall in non-protein N, symptoms of early uremia (headache, anorexia) are relieved. No diuresis. No inhibition of protein metabolism.	BN1012
Not Stated	Uric Acid Excretion	Not Stated	Human Adult	Not Stated	Active	In chronic nephritis a sarsaparilla preparation increased urinary excretion of uric acid, with a fall of blood uric acid concentration of 30%.	BN1010
Not Stated Germany	Diuretic Activity	Not Stated	Human Adult	Not Stated	Active		BN1043
Rhizome China	Anti-inflammatory Activity	H2O Ext	Rat	400 & 800 mg/kg	Active Active Active	Inhibited the swelling of the footpad in adjuvant arthritis. Reduced LPS-induced production of IL-1, TNF and NO by peritoneal macrophages. Increased T-lymphocyte proliferation and IL-2 production by splenocytes.	BN1016
Rhizome China	Anti-inflammatory Activity	H2O Ext	Rat	Not Stated	Active	Inhibited primary inflammation of adjuvant arthritis.	BN1016
Root Saudi Arabia	Anti-inflammatory Activity	ETOH (95%) Ext	Oral Rat	500 mg/kg	Active Active	vs. carrageenan-induced acute inflammation. vs. cotton pellet-induced exudation.	BN1021
Rhizome China	Immunomodulatory Activity	H2O Ext	Rat	400 & 800 mg/kg	Active Active	Reduced picryl chloride-induced and chyclophosphamide-induced delayed-type hypersensitivity. Normalized CD4/CD8 ratios.	BN1016
Root Japan	Analgesic Activity	Decoction	Oral Human Adult	Not Stated	Active		BN1035
Root + Rhizome USA	Antirheumatic Activity	H2O Ext	Oral Human Adult	100 mg/kg	Active	In rheumatoid arthritis (RA) patients on no medication a combination of plants, including smilax, decreased the proinflammatory mediators, ESR levels and provided relief of RA pain and swellings.	BN1032

Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Root Japan	Antiasthmatic Activity	Decoction	Oral Human Child	100 ml	Active	Reduced frequency of coughing and emesis in a 7 yr old boy with asthmatic bronchitis. During 1 year after discontinuation the cough has not reoccurred.	BN1035
Root Japan	Antiasthmatic Activity	Decoction	Oral Human Adult	60 ml	Active	Bronchial asthma ceased after 2 weeks. Patient was able to stop antiasthmatic and antiallergic medications.	BN1035
Root Japan	Antiasthmatic Activity	Infusion	Oral Human Adult	480 ml	Active	No asthmatic attack during treatment or after discontinuation of the 4 week treatment.	BN1035
Root Japan	Antiasthmatic Activity	Decoction	Oral Human Adult	60 ml	Active	In 10 patients bronchial asthma markedly improved with no side-effects. A reduction in serum IgE levels was seen during treatment and persisted after treatment was discontinued.	BN1035
Root Japan	Antiallergic Activity	Decoction	Oral Human Adult	60 ml	Active		BN1035
Root China	Antioxidant Activity	MEOH Ext Ethyl acetate Ext BuOH Ext H2O Ext MEOH Ext	Not Stated Not Stated Not Stated Not Stated Cell Culture	IC50=7.4 mcg/ml Not Stated Not Stated Not Stated 4-100 mcg/ml	Active Active Active Active Active	DPPH free radical scavenging activity seen. Increased production of superoxide dismutase, catalase and glutathione peroxidase seen.	BN1017
Rhizome Japan	Hypoglycemic Activity	MEOH Ext	IP Mice	100 mg/kg	Active Active  Inactive  Active Active	Hypoglycemic effect in normal mice. Hypoglycemic effect in KK-Ay mice (NIDDM model). vs. streptozotocin-induced diabetic mice (IDDM model). vs. epinephrine-induced hyperglycemia. Increased insulin sensitivity.	BN1019
Not Stated China	Antimutagenic Activity	Decoction	In vitro	Not Stated	Active	Inhibited the mutagenicity of benzo(a)pyrene.	BN1022
Root Japan	Carcinomatous Pain Relief	Decoction	Oral Human Adult	60 ml	Active	Pain associated with cancer of the stomach disappeared in 2 days. No relapse of pain after 6 months.	BN1035

Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Not Stated	Hepatoprotective Activity	Not Stated	Rat	Not Stated	Active		BN1042
Not Stated Germany	Digestive Activity	Not Stated	Human Adult	Not Stated	Active	Improved appetite and digestion.	BN1043
Rhizome China	Antisymphilitic Activity	Not Stated	Not Stated	Not Stated	Active	Negative blood test result seen in 90% of acute cases and 50% of chronic cases.	ZZ1060
Root Not Stated	Antibacterial Activity	ETOH (95%) Ext ETOH (95%) Ext H2O Ext	Agar Plate	Not Stated	Inactive	<i>Escherichia coli</i> <i>Staphylococcus aureus</i> <i>Escherichia coli</i>	A15179
Root Not Stated	Antimycobacterial Activity	ETOH (95%) Ext H2O Ext	Agar Plate	Not Stated	Inactive Inactive	<i>Mycobacterium tuberculosis</i> <i>Mycobacterium tuberculosis</i>	A15179 A15179
Root Not Stated	Antimycobacterial Activity	Fluid Extract	Agar Plate	MIC=25.0 Mg/ml	Weak Activity	<i>Mycobacterium tuberculosis</i>	A03634
Not Stated Guatemala	Antifungal Activity	H2O Ext	In vitro	Not Stated	Active	Fungicidal and fungistatic activity seen.	BN1020
Not Stated Guatemala	Antifungal Activity	H2O Ext	In vitro	Not Stated	Active	<i>E. floccosum</i> <i>T. rubrum</i> <i>T. mentagrophytes</i> <i>M. canis</i> <i>M. gypseum</i>	BN1020

## Biological Activities for Compounds of Sarsaparilla (*Smilax officinalis*)

Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Steroidal saponins	Hemolytic Activity	In vitro	Not Stated	Active		BN1018
Sarsaponin	Antipsoriatic Activity	Human Adult	Not Stated	Active	In 92 patients, endotoxin-binding sarsaponin improved psoriasis in 62% and completely cleared psoriatic lesions in 18%. More effective in chronic, large plaque psoriasis.	BN1031
Flavonoids + Chromones	Immunosuppressive Activity	Mice	Not Stated	Active	Inhibited activated immune cells; mainly T cells.	BN1033

Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Diosgenin	Inflammatory Activity	Cell Culture	Not Stated	Active	Increased prostaglandin E2 synthesis.	BN1040
Diosgenin	Anti-inflammatory Activity	Injection Rat	>80 mg/kg	Active	Attenuated subacute intestinal inflammation and normalized bile secretion in indomethacin-induced intestinal inflammation model.	BN1041
Smitilbin + engeletin + astilbin + eurryphin + resveratrol	Hepatoprotective Activity	Cell Culture	Not Stated	Active Inactive	Pre-treatment with compounds blocked non-parenchymal cell ALT release following immunological liver injury to hepatocytes. CCl4-induced ALT release from hepatocytes.	BN1025
Flavonoids + Chromones	Hepatoprotective Activity	Mice	Not Stated	Active Inactive	Maintained viability of hepatocytes and non-parenchymal (NPC) liver cells during induced immunological liver injury (DTH reaction) and inhibited ALT & AST release. Induced apoptosis against non-adherent NPC cells (T lymphocyte populations are the main components). Apoptosis of hepatocytes and NPC-adherent cells.	BN1033
Astilbin	Hepatoprotective Activity	Oral Mice	50 or 100 mg/kg	Active Inactive	No elevation in ALT and AST seen compared to control group. Did not prevent hepatocyte damage. vs. CCl4 administration.	BN1033
Resveratrol	Antioxidant Activity	Not Stated	Not Stated	Active		BN1025
Sarsasapogenin	Antioxidant Activity	Cell Culture	Not Stated	Active	Suppressed arachidonic acid-, fMLP- and PMA-induced superoxide generation.	BN1036
Diosgenin	Antioxidant Activity	Cell Culture	Not Stated	Active	Increased oxidative stress is seen in brain and CSF of HIV-infected patients with an accumulation of toxic substances in the CSF which can induce dementia. Diosgenin blocks CSF-induced toxicity.	BN1039
Sarsasapogenin	Cholinergic Activity	Not Stated	Not Stated	Active	Upregulates M.sub.1 cholinergic receptors and down-regulates beta-adrenergic receptors which may be pathologically raised in Alzheimer's disease & senile dementia of the Alzheimer's type.	BN1034

Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Smilagenin	Muscarinic Receptor Upregulation	Not Stated	Not Stated	Active	Increased the number of M2 receptors in the brain.	BN1034
Smilagenin	Muscarinic Receptor Upregulation	Cell Culture	10(-5) M 1-10 .mu.M	Active Active	Increased the number of muscarinic receptors expressed on the surface of chinese hamster ovary cells. Effect not antagonized by tamoxifen. Increased muscarinic receptor density.	BN1034
Smilagenin	Muscarinic Receptor Upregulation	Cell Culture	Not Stated	Active	Beta-amyloid reduced the number of muscarinic receptors on PC12 cells; smilagenin ameliorated this effect.	BN1034
Smilagenin	Muscarinic Receptor Upregulation	Cell Culture	10(-6)M	Active	Increased the number of muscarinic receptors expressed on neonatal cardiac muscle after 10 days in vitro.	BN1034
Sarsasapogenin	Muscarinic Receptor Upregulation	Cell Culture	10(-5)M	Active	Increased the number of muscarinic receptors expressed on neonatal cardiac muscle after 10 days in vitro.	BN1034
Smilagenin	Muscarinic Receptor Upregulation	Oral Aged Rats	18 mg/kg	Active	Reversed the decline in muscarinic receptor number in the brain, restoring levels to those observed in young control animals.	BN1034
Smilagenin	Steroid Receptor Activity	Not Stated	Not Stated	Inactive	No effect on estrogen, progesterone, glucocorticoid and testosterone receptors.	BN1034
Smilagenin	Cognitive Enhancement	Oral Rat	18 mg/kg	Active	Reversed the decline in cognitive function in aged rats; enhanced learning and memory performance in the Y-maze tests, with results comparable to those of young animals.	BN1034
Diosgenin	Hypocholesterolemic Activity	Oral Dog	Not Stated	Active	Hypocholesterolemic effect in diabetic dogs.	BN1037
Smilagenin	Hypocholesterolemic Activity	Oral Dog	Not Stated	Active	Hypocholesterolemic effect in diabetic dogs.	BN1037
Diosgenin	Antiproliferative Activity	Cell Culture	Not Stated	Active	Osteosarcoma cells. Caused cell cycle arrest associated with apoptosis and enhanced activation of p53.	BN1038
Diosgenin	Antiproliferative Activity	Cell Culture	Not Stated	Active	Able to induce differentiation of human erythroleukemia cells.	BN1040

Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Diosgenin	Antiproliferative Activity	Cell Culture	Not Stated	Active	Human osteosarcoma 1547 cell line.	BN1040

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