

Biological Activities for Sangre de Grado (Croton lechleri)

Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Latex Peru	Toxic Effects General	Fresh Latex	PO Mouse & Topical Mouse	Various	Inactive	In a two-stage mouse skin carcinogenesis system neither Latex nor taspine had carcinogenic or tumor promoter activity after 17 months of treatment.	M26029
Latex Peru	Cell Proliferation Activity	Fresh Latex	Cell Culture	Not stated	Inactive		AS1014
Latex Peru	Cell Proliferation Activity	Fresh Latex	Cell Culture	150 ng/ml	Inactive	vs. human foreskin fibroblasts (Had no effect on cell proliferation.)	M26029
Freeze-dried Latex Ecuador	Antiproliferation Activity	Fresh Latex	Cell Culture	100 mcg/ml	Weak Activity	vs. mitogen stimulated splenocytes and lymphoid leukemia cells	L26126
Latex Peru	Tumor Promoting Activity	Fresh Latex	Cell Culture	Not stated	Inactive		AS1014
Freeze-dried Latex Ecuador	Mutagenic Activity	H2O EXT	Agar Plate	IC50: 50 mcg/plate IC50: 100 mcg/plate IC50: 340 mcg/plate IC50: 430 mcg/plate	Inactive Inactive Active Active	<i>Salmonella typhimurium</i>	L24801
Latex Peru	Mutagenic Activity	H2O EXT	Agar Plate	Various	Weak Activity	<i>Salmonella typhimurium</i>	L27225
Latex Ecuador	Antimutagenic Activity	H2O EXT	Agar Plate	Various	Active	vs. sodium azide- and 2-nitrofluorene- induced mutagenicity	L24801
Dried Trunkbark Ecuador	Cytotoxic Activity	MEOH EXT	Cell Culture	IC50: 50.0 mcg/ml	Weak Activity	vs. CA-9KB	K18768
Heartwood Ecuador	Cytotoxic Activity	MEOH EXT	Cell Culture	IC50: 25.0 mcg/ml	Weak Activity	vs. CA-9KB	K18768
Dried Leaf Ecuador	Cytotoxic Activity	MEOH EXT	Cell Culture	IC50: 90.0 mcg/ml	Weak Activity	vs. CA-9KB	K18768

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Dried Latex Ecuador	Cytotoxic Activity	CHCL3 EXT	Cell Culture	IC50: >900 mcg/ml	Inactive	vs. CA-9KB	K18768
Dried Latex Ecuador	Cytotoxic Activity	MEOH EXT Acetone EXT CHCL3 EXT ETOAC EXT	Cell Culture Cell Culture Cell Culture Cell Culture	IC50: 186.0 mcg/ml IC50: 125.0 mcg/ml IC50: 186.0 mcg/ml IC50: 70.0 mcg/ml	Equiv. Equiv. Equiv. Weak Activity	vs. CA-9KB	K18768
Freeze-dried Latex Ecuador	Cytotoxic Activity	H2O EXT	Cell Culture	IC50: 2.5 mcg/ml	Active	vs. Leuk-K562	L24801
Latex Peru	Cytotoxic Activity	Latex	Cell Culture	Not stated	Active	various tumor cell lines	AS1015
Latex Peru	Cytotoxic Activity	Dimethylcedrusine Ext	Cell Culture	GI50: 0.3 mcg	Active	various tumor cell lines	AS1009
Dried Bark Peru	Crown Gall Tumor Inhibition	ETOAC EXT	Cell Culture	LC50: 1.8 mcg/ml	Active	Assay system is intended to predict for antitumor activity.	T16253
Dried Bark Peru	Crown Gall Tumor Inhibition	H2O EXT	Cell Culture	LC50: 3.0 mcg/ml	Active	Assay system is intended to predict for antitumor activity.	T16253
Dried Bark Peru	Anticrustacean Activity	ETOAC EXT	<i>Artemia salina</i>	LC50: 15.2 mcg/ml	Active	Assay system is intended to predict for antitumor activity.	T16253
Dried Bark Peru	Anticrustacean Activity	H2O EXT	<i>Artemia salina</i>	LC50: 1000 mcg/ml	Active	Assay system is intended to predict for antitumor activity.	T16253
Fresh Latex Brazil	Anticytotoxic Activity	Latex	Cell Culture	Not stated	Active	endothelium-human-umbilical vein (Cells were protected against degradation in a starvation medium.)	K10718
Dried Stembark Ecuador	Cell Differentiation Induction	MEOH EXT	Cell Culture	IC50: 2.3 mcg/ml	Active	LEUK - HL60	L10644
Freeze-dried Latex Ecuador	DNA Synthesis Inhibition	MEOH EXT Acetone EXT CHCL3 EXT ETOAC EXT	Cell Culture Cell Culture Cell Culture Cell Culture	20.0 mcg/ml 20.0 mcg/ml 20.0 mcg/ml 20.0 mcg/ml	Active Inactive Active Active	cells - endothelial	K18768

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Fresh Latex Brazil	DNA Synthesis Inhibition	Not stated	Cell Culture	Not stated	Active	endothelium-human-umbilical vein (Cells were protected against degradation in a starvation medium.)	K10718
Fresh Latex Peru	Wound Healing Acceleration	Latex	External Mouse	Not stated	Active		M26029
Latex Peru	Wound Healing Acceleration	Latex Polyphenolic fraction	External Rat External Rat	0.01% 7.0%	Active Active		M26029
Fresh Latex Brazil	Wound Healing Acceleration	Not stated	Not stated	Not stated	Active		K10718
Freeze-dried Latex Ecuador	Immunostimulant Activity	Latex	Not stated	5 mcg/ml	Active	Increased phagocytosis in neutrophils.	L26126
Freeze-dried Latex Ecuador	Immunostimulant Activity	Latex	Not stated	10 mcg/ml	Active	Increased phagocytosis in monocytes.	L26126
Fresh Latex Peru	Analgesic Activity	Latex	IP Rat	50.0 mcg/animal	Active		L16482
Latex Peru	Anti-inflammatory Activity	Taspine fraction	Rat	Various	Active	vs. carrageenan-induced pedal edema, vs cotton pellet-induced granuloma and vs. adjuvant polyarthritis model.	N00002
Freeze-dried Latex Ecuador	Anti-inflammatory Activity	Latex	IP Rat	5 mg/kg	Active	vs. carrageenan-induced pedal edema	L26126
Fresh Latex Peru	Anti-inflammatory Activity	Latex	IP Rat	500 mcg/animal	Active		L16482
Freeze-dried Latex Ecuador	Antiulcerous Activity	Latex	Not stated	IC50: 5 mcg/ml	Active	vs. prednisolone-induced ulcers	L26126
Freeze-dried Latex Ecuador	Antioxidant Activity	Latex	Cell Culture	IC50: 7.73 mcg/ml	Active		L26126
Latex Peru	Antioxidant Activity	Latex	In vitro	Not stated	Active	Scavenged free radicals, reduced lipid peroxidation and mediated free radical mediated DNA damage.	AS1012

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Latex Peru	Antioxidant Activity	Latex	Cell Culture	Various	Active	vs. apomorphine-induced oxidative damage in <i>Saccharomyces cerevisiae</i>	L27225
Fresh Latex Peru	Hemostatic Activity	Latex	Rat	1%	Active	vs. mucosa (gastric)	L16482
Fresh Latex Peru	Vasorelaxation Activity	Latex	Rat	Not stated	Active	Artery	L16482
Fresh Latex Peru	Antioxidant Activity	Lyophilized EXT	Not stated	IC50: 1.0 mcg/ml	Active		J19239
Freeze-dried Latex Peru	CNS Depressant Activity	Latex	IG Mouse	ED50: 88.35 mg/kg	Active	vs. exploratory assay	L04841
Freeze-dried Latex Ecuador	Antidiarrheal Activity	Isolated favonoids SB-300 & SP-303	Cell Culture	Not stated	Active	Inhibited CFTR-mediated chloride secretion in human colonic epithelial cells.	L26431
Freeze-dried Latex Ecuador	Antibacterial Activity	Acetone EXT	Agar Plate	MIC: 30.0 mcg/disc	Weak Activity	<i>Bacillus subtilis</i> <i>Escherichia coli</i>	K18768
Freeze-dried Latex Ecuador	Antibacterial Activity	CHCL3 EXT	Agar Plate	MIC: 0.08 mcg/disc MIC: 10.0 mcg/disc	Active Active	<i>Bacillus subtilis</i> <i>Escherichia coli</i>	K18768
Freeze-dried Latex Ecuador	Antibacterial Activity	ETOAC EXT	Agar Plate	MIC: 50.0 mcg/disc	Weak Activity	<i>Bacillus subtilis</i> <i>Escherichia coli</i>	K18768
Freeze-dried Latex Ecuador	Antibacterial Activity	MEOH EXT	Agar Plate	MIC: 10.0 mcg/disc	Active	<i>Bacillus subtilis</i> <i>Escherichia coli</i>	K18768
Dried Bark Peru	Antibacterial Activity	ETOAC EXT	Agar Plate	1.0 mg/disc	Active Inactive	<i>Staphylococcus aureus</i> <i>Escherichia coli</i>	T16253
Dried Bark Peru	Antibacterial Activity	H2O EXT	Agar Plate	1.0 mg/disc	Inactive Inactive	<i>Staphylococcus aureus</i> <i>Escherichia coli</i>	T16253
Latex Colombia	Antibacterial Activity	H2O EXT	Agar Plate	1.0 mg/disc	Active	<i>Staphylococcus aureus</i>	AS1013
Dried Bark Peru	Antifungal Activity	ETOAC EXT	Agar Plate	0.25 mg/ml 0.13 mg/ml 0.13 mg/ml Not stated	Active Active Active Inactive	<i>Trichophytum gallinae</i> <i>Microsporium canis</i> <i>Microsporium gypseum</i> <i>Microsporium fulvum</i>	T16253

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Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Dried Bark Peru	Antifungal Activity	H2O EXT	Agar Plate	Not stated	Inactive Inactive Inactive Inactive	<i>Trichophytum gallinae</i> <i>Microsporium canis</i> <i>Microsporium gypseum</i> <i>Microsporium fulvum</i>	T16253
Dried Bark Peru	Antiyeast Activity	ETOAC EXT	Agar Plate	1.0 mg/disc	Inactive Inactive	<i>Candida albicans</i> <i>Saccharomyces cerevisiae</i>	T16253
Dried Bark Peru	Antiyeast Activity	H2O EXT	Agar Plate	1.0 mg/disc	Inactive Inactive	<i>Candida albicans</i> <i>Saccharomyces cerevisiae</i>	T16253
Latex Colombia	Antiviral Activity	H2O EXT	Cell Culture	Not stated	Active Active	Virus - <i>Cytomegalovirus</i> Virus - <i>Sindbis</i>	AS1013
Fresh Latex South America	Antiviral Activity	Latex	Cell Culture	Not stated	Active Active	Virus - Respiratory Syncytial Virus - <i>Influenza A</i>	H14332
Dried Bark Peru	Antiviral Activity	ETOAC EXT	Cell Culture	LC50: 0.28 mcg/ml LC50: <1.0 mcg/ml	Active Active	Virus - <i>Cytomegalovirus</i> Virus - <i>Sindbis</i> (Virus exposed to extract before infecting host cells.)	T16253
Dried Bark Peru	Antiviral Activity	H2O EXT	Cell Culture	IC50: 487.0 mcg/ml LC50: >100 mcg/ml	Active Inactive	Virus - <i>Cytomegalovirus</i> Virus - <i>Sindbis</i> (Infected host cells exposed to extract.)	T16253
Dried Bark Peru	Antiviral Activity	ETOAC EXT	Cell Culture	LC50: >100 mcg/ml	Inactive Inactive	Virus - <i>Cytomegalovirus</i> Virus - <i>Sindbis</i> (Virus exposed to extract before infecting host cells.)	T16253
Dried Bark Peru	Antiviral Activity	ETOAC EXT	Cell Culture	LC50: >100 mcg/ml	Inactive Inactive	Virus - <i>Cytomegalovirus</i> Virus - <i>Sindbis</i> (Infected host cells exposed to extract.)	T16253

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Biological Activities for Compounds in Sangre de Grado (Croton lechleri)

Compound	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Taspine	Toxicity Assessment	PO Rat	LD50: 518 mg/kg	Active		N00002
Taspine	Carcinogenic Activity	External Mouse	0.2 mg/animal	Inactive	Dosing twice weekly for 17 months.	M26029
Taspine	Teratogenic Activity	Cell Culture	Not stated	Inactive	vs. rat embryo cultures	AS1006
Taspine	Embryotoxic Activity	Cell Culture	80 mcg/ml	Inactive	vs rat embryo cultures	AS1006
Taspine	Wound Healing Activity	Rat External	250 mcg/animal	Active	Had significantly greater mononuclear cellular infiltration over controls.	AS1007
Taspine	Wound Healing Activity	Rat External	250 mcg/animal	Active	Wound tensile strength increased at 5 & 7 days post surgery	AS1007
Taspine	Wound Healing Activity	Mouse External	ED50: 0.375 mg/kg	Active		M26029
Taspine	Wound Healing Activity	Human External	Not stated	Active		K15048
Taspine	Wound Healing Activity	In vivo In vitro	150-300 mcg/animal 0.50-0.4 mcg/ml	Active Active	Enhanced wound healing by increasing the autocrine of TGF-beta1 and EGF by fibroblasts.	AS1016
Taspine	Wound Healing Activity	Rat External	2 mg/ml	Active	Promoted skin wound healing, accelerated the growth of newly born capillaries and raised the production of protein and collagen in wound tissue.	AS1017
Taspine	Cytotoxic Activity	Cell Culture	IC50=0.39 mcg/ml IC50=0.17 mcg/ml	Active Active	KB cancer cells V-79 cancer cells	AS1008
Taspine	Cytotoxic Activity	Cell Culture	IC50=0.39 mcg/ml IC50=0.17 mcg/ml	Active Active	CA-9KB cancer cells. Hamster-Chinese V79	L04063 M30433
Taspine	Immune Enhancement Activity	Cell Culture	Not stated	Active	Enhanced phagocytosis in monocytes.	L26126
Taspine	Cell Growth Enhancement	Cell Culture	100 mcg/ml	Inactive	fibroblasts - foetal lung	AS1007

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Compound	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Taspine	Cell Migration Effect	Cell Culture	0.2 ng/ml	Active	fibroblasts - human	M26029
Taspine	Anticomplement Activity	Cell Culture	IC50: 38 mcg/ml	Active	vs. CP complement system	L26126
Taspine	Anti-inflammatory Activity	GI Rat GI Rat	100 mg/kg 20 mg/kg 20 mg/kg	Active Active Active	vs. carrageenan-induced pedal edema vs. adjuvant-induced arthritis vs. cotton pellet granuloma	A14041
Taspine	Anti-inflammatory Activity	IG Rat	58 mg/kg 20 mg/kg 20 mg/kg	Active Active Active	vs. carrageenin-induced pedal edema vs. cotton pellet-induced granuloma vs. adjuvant polyarthritis	N00002
Taspine	Antiviral Activity	Cell Culture	Not stated	Active Active Active	Avian myeloblastosis Rauscher murine leukemia Simian sarcoma	K10864
Taspine	Antiviral Activity	Cell Culture	Not stated	Active	Inhibited glucose-6-phosphate dehydrogenase in animal tumor viruses.	L00933
SP-303	Toxic Effect	IG Mouse	90 mg/kg	Inactive		H14332
SP-303	Toxic Effect	IG Monkey	> 200 mg/kg	Active	CNS side effects, thrombocytopenia & histopathological side effects.	H14332
SP-303	Toxic Effect	IG Dog	100 mg/kg	Inactive		H14332
SP-303	Toxic Effect	IP Rat	30 mg/kg	Active	All animals died.	K19993
SP-303	Toxicity Assessment	IP Mouse IV Mouse IV Rat IP Rat IG Rat IV Dog	LD50: >50 mg/kg LD50: >100 mg/kg LD50: >50 mg/kg LD50: >100 mg/kg LD50: >300 mg/kg LD50: >18.9 mg/kg	Inactive		H14332
SP-303	Toxic Effect	IP Mouse	30 mg/kg	Inactive		H14332
SP-303	Antidiarrheal Activity	Human Oral	50 mg daily Not stated 2 gm daily 2 gm daily	Active Active Active Active		J16486 J17024 L05604 L06176

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Compound	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
SP-303	Antidiarrheal Activity	IG Mouse	100 mg/kg	Active		L06695
SP-303	Antiviral Activity	Cell Culture	ED50: 13.6 mcg/ml ED50: 6.7 mcg/ml ED50: 7.0 mcg/ml ED50: 13.7 mcg/ml ED50: 3.0 mcg/ml ED50: 50.0 mcg/ml	Active Active Active Active Active Active	Respiratory syncytial A Respiratory syncytial B Influenza A Influenza B Parainfluenza Type 1 Parainfluenza Type 3	H14332
SP-303	Antiviral Activity	Cell Culture	ED50: 79.0 mcg/ml ED50: 3.0 mcg/ml ED50: 14.0 mcg/ml ED50: 7.0 mcg/ml ED50: 14.0 mcg/ml	Active Active Active Active Active	Parainfluenza Type 3 Parainfluenza Type 1 Respiratory syncytial Influenza A Influenza B	K10599
SP-303	Antiviral Activity	IP Rat IP Rat IG Rat IG Rat	ED50: 3.0 mcg/ml ED50: 3.0 mcg/ml ED50: 10.0 mcg/ml ED50: 10.0 mcg/ml	Active Active Active Active	Respiratory syncytial Parainfluenza Type 3 Respiratory syncytial Parainfluenza Type 3	K10599
SP-303	Antiviral Activity	Cell Culture	Not stated	Inactive Inactive	Adenovirus 5 Measles virus	H14332 K11125
SP-303	Antiviral Activity	IV Monkey IG Monkey	5.0 mg/kg 30.0 mg/kg	Active Active	Respiratory syncytial	H14332
SP-303	Antiviral Activity	IP Rat IG Rat	1 mg/kg 1 mg/kg	Active Active	Respiratory syncytial	H14332
SP-303	Antiviral Activity	IP Mouse IG Mouse	9 mg/kg 9 mg/kg	Active Active	Influenza A	H14332
SP-303	Antiviral Activity	IP Ferret	10 mg/kg	Inactive	Influenza A	H14332
SP-303	Antiviral Activity	Aerosol Rat	1 mg/kg	Active	Respiratory syncytial	H14332
SP-303	Antiviral Activity	IP Rat	10 mg/kg	Active	Parainfluenza Type 3	H14332
SP-303	Antiviral Activity	Vaginal Guinea Pig	30%	Inactive	Herpes Simplex I	H14332

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SP-303	Antiviral Activity	IP Mouse IG Mouse Vaginal Mouse Vaginal Guinea Pig	30 mg/kg 90 mg/kg 10% 10%	Active Active Active Active	Herpes Simplex 2	H14332
SP-303	Antiviral Activity	IP Rat IP Rat	1.0 mg/kg 3.4 mg/kg	Active Active	Respiratory syncytial Parainfluenza Type 3	K10657
SP-303	Antiviral Activity	Cell Culture	ED50: 9 mcg/ml ED50: 7 mcg/ml ED50: 11 mcg/ml ED50: 3 mcg/ml ED50: 98 mcg/ml ED50: 5 mcg/ml	Active Active Active Active Active Active	Influenza A - Taiwan Influenza A - Shanghai Influenza B - Yamagata Parainfluenza Type 1 Parainfluenza Type 3 Respiratory syncytial	K11125
SP-303	Antiviral Activity	Vaginal Mouse IG Mouse IP Mouse	10% 540 mg/kg 30 mg/kg	Active Active Active	Herpes Simplex 2	K13678
SP-303	Antiviral Activity	Cell Culture	IC50: 1 to 5 mmol IC50: 1 to 7 mmol	Active Active	Herpes Simplex 1 (various strains) Herpes Simplex 2 (various strains)	K13678
SP-303	Cytotoxic Activity	Cell Culture	Various	Inactive Inactive Inactive Inactive Inactive	Cells-Vero CA-A549 CA-HEP-2 Canine-Kidney Glioma-Human-ONS-12	K14332 K11125
SP-303	Cytotoxic Activity	Cell Culture	IC50: 4.0 mmol IC50: 3.0 mmol	Active Active	Hep2 Cells Cells-Vero	K13678

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