

Biological Activities for Extracts of *Mullaca (Physalis angulata)*

IN VIVO RESEARCH

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Entire Plant Taiwan	Antitumor Activity	ETOH(95%)Ext	IP Mouse	75 mg/kg	Active	Leukemia -P388	K07329
Leaf Not Stated	Antitumor Activity	Fraction: Physalin F	IP Mice	Not stated	Active	P388 lymphocytic leukemia.	AC1009
Part Not Stated China	Cytotoxic Activity	Fraction: Withangulatin A	IP Rat	Not stated	Active	In 9L rat brain tumor cells inhibited Topoisomerase II	AC1011
Leaf USA	Cytotoxic Activity	MEOH Ext	Cat	IC50=3.93 mcg/ml	Active	Cancer cells: CA-A549	H28598
Root Not Stated	Antileukemic Activity	Fraction: Physalin B	Mouse	Not stated	Weak Activity	3PS murine leukemia	AC1016
Entire Plant Taiwan	Protein Synthesis inhibition Activity	ETOH(95%)Ext	IP Mouse	20 mg/kg	Active	Leukemia -P388	K07329
Entire Plant USSR	Immunomodulatory Activity	Not stated	IP Mouse	50 mg/kg	Active	Blastogenic transformation of human lymphocytes was assayed.	M30421
Entire Plant USSR	Lymphocyte Blastogenesis Inhibition	Not stated	IP Mouse	50 mg/kg	Active		M30421
Entire Plant Samoa	CNS Effects(general)	Not stated	Gastric Mouse IP Mouse	1 gm/kg 1 gm/kg	Inactive Inactive	Hippocratic Screen Hippocratic Screen	J11102
Entire Plant Samoa	Spasmolytic Activity	Not stated	Guinea Pig Ileum	2 mg/ml	Active	vs. electrical stimulation.	J11102
Fruit Brazil	Contracting Effect (non-specific)	H2O Ext	Rat	Not stated	Active	Blocked by gallamine or atropine.	M10843
Fruit Brazil	Contracting Effect (non-specific)	H2O Ext	Toad	Not stated	Active	Isotonic contraction of isolated rectus abdominis.	M10843
Fruit Brazil	Contracting Effect (non-specific)	H2O Ext	Toad (Heart)	Not stated	Active	Blocked by gallamine or atropine	M10843

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Fruit Brazil	Hypotensive Activity	H2O Ext	Cat	Not stated	Active	Blocked by gallamine or atropine	M10843
Not Stated Brazil	Colony-stimulating factor production stimulation	Infusion	IP Mouse	0.5 ml/animal	Equivocal	vs. IPS-induced proliferation	L07194
Entire Plant Surinam	Binding Effect	ETOH(80%)Ext	Human Adult	10.0 mcg/ml	Inactive	Inhibited radioligand binding to adrenergic-receptor in human frontal cortex.	J12451
Entire Plant Surinam	Binding Effect	ETOH(80%)Ext	Human Adult	10.0 mcg/ml	Inactive	Inhibited radioligand binding to serotonin receptor in human frontal cortex.	J12451
Entire Plant Surinam	Binding Effect	ETOH(80%)Ext	Human Adult	10.0 mcg/ml	Inactive	Inhibited radioligand binding to dopamine receptor in human frontal cortex.	J12451
Entire Plant Surinam	Binding Effect	ETOH(80%)Ext	Human Adult	10.0 mcg/ml	Inactive	Inhibited radioligand binding to muscarinic receptor in human hippocampus tissues.	J12451
Entire plant Surinam	Binding Effect	ETOH(80%)Ext	Human Adult	10.0 mcg/ml	Inactive	Inhibited radioligand binding to adenosine nmdr receptor channel complex.	J12451
Entire plant Surinam	Binding Effect	ETOH(80%)Ext	Human Adult	10.0 mcg/ml	Inactive	Inhibited radioligand binding to beta-2-adrenergic receptor.	J12451
Entire plant Surinam	Serotonin (5-ht) receptor binding activity	CHCL3 Ext	Calf	100mcg/ml	Weak Activity	Hippocampus	J0986
Root Not Stated	Antihyperglycemic Activity	H2O Ext	Intragastric Mouse	Not stated	Weak Activity		J17961

IN VITRO RESEARCH

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Not Stated Brazil	Mitogenic Activity	Infusion	Cell Culture	Not stated	Inactive	Mouse splenocytes	L07194
Entire Plant Taiwan	Cytotoxic Activity	ETOH(95%)Ext	Cell Culture	10.0 mcg/ml 10.0 mcg/ml 10.0 mcg/ml 10.0 mcg/ml 10.0 mg/ml 100 mcg/ml 100 mcg/ml	Active Active Active Active Active Equivocal Equivocal	CA-9KB CA-HUMAN-COLON CA-HUMAN-LUNG LU-1 HELA CELLS HEPATOMA-2 HEPATOMA-HA22T GLIOMA-8401 MELANOMA-H1477	K07329
Leaf USA	Cytotoxic Activity	MEOH Ext	Cell Culture	IC50=2.5 mcg/ml	Active	Leukemia cells: LEUK-P388	H28598
Leaf USA	Cytotoxic Activity	MEOH Ext	Cell Culture	IC50=3.15 mcg/ml	Active	Cancer cells: CA-KB-16	H28598
Aerial Parts Indonesia	Cytotoxic Activity	H2O Ext MEOH Ext	Cell Culture Cell Culture	4 mcg/ml 4 mcg/ml	Active Active	Cells-MT-4 Cells-MT-4	K21579
Not Stated Thailand	Cytotoxic Activity	Not stated	Cell Culture	Not stated	Active	CA-9KB (Data incomplete from abstract)	P00044
Root Not Stated	Cytotoxic Activity	Fraction: Physalin B	Cell Culture	Not stated	Active	9KB and 9PS tumor cells	AC1016
Leaf China	Antitumor Activity	Fraction: Withangulatin A	Cell Culture	0.5 ul 20 ul	Active Active	Acts on Topoisomerase II-mediated DNA damage.	AC1012
Entire Plant Taiwan	Antibody Formation Enhancement	ETOH(95%)Ext	Cell Culture	10 mcg/well	Active	Lymphocytes-B	K09956
Entire Plant Taiwan	Lymphocyte Blastogenesis Stimulant	ETOH(95%)Ext	Cell Culture	0.39 mcg/well	Active	CA-HTB43	K09956
Entire Plant Taiwan	Lymphocyte Blastogenesis Stimulant	ETOH(95%)Ext	Cell Culture T Lymphocytes	0.39 mcg/well	Active	T lymphocytes lipopolysaccharide induced blastogenesis was enhanced by treatment with extract	K09956
Entire Plant Taiwan	Lymphocyte Blastogenesis Stimulant	ETOH(95%)Ext	Cell Culture T Lymphocytes	0.39 mcg/well	Active	Phytohemagglutinin induced blastogenesis was enhanced by treatment with extract.	K09956

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Entire Plant Taiwan	Lymphocyte blastogenesis stimulant	ETOH(95%)Ext	Cell Culture	20 mcg/well	Active	Lymphocytes-B	K09956
Entire Plant Taiwan	RNA Polymerase I stimulation	ETOH-H2O (1:1) Ext	Cell Culture Cells-rat-liver	1.0 Mg/ml	Inactive	vs. PGE-1-induced pedal edema	T14999
Not Stated China	Phosphorylation Enhancement Activity	Fraction: Withangulatin A	Cell Culture	Not Stated	Active	9L rat brain tumor cells	AC1021
Not Stated	Phosphorylation Enhancement Activity	Fraction: Withangulatin A	Cell Culture	50-100 ul	Active	Concentration dependent alteration of vimentin molecules.	AC1022
Leaf Not Stated	Antimycobacterial Activity	ETOH Ext + fractions	Agar Plate	32 mcg/ml	Active	<i>Mycobacterium tuberculosis</i> H(37)Rv strain	AC1010
Aerial Parts Brazil	Antimycobacterial Activity	CHCL3 Ext CHCL3 Ext CHCL3 Ext CHCL3 Ext CHCL3 Ext Hydroalcoholic Ext Hydroalcoholic Ext Hydroalcoholic Ext Hydroalcoholic Ext Hydroalcoholic Ext	Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate	128.0 mcg/ml 156.3 mcg/ml 32.0 mcg/ml 625.0 mcg/ml 78.1 mcg/ml 400 mg/ml 500.0 mcg/ml 250.0 mcg/ml 2500 mcg/ml 2500 mcg/ml	Active Active Active Active Active Equivocal Active Active Inactive Inactive	<i>Mycobacterium intracellulare</i> <i>Mycobacterium malmoeense</i> <i>Tubercule bacillus</i> H-37-RV <i>Mycobacterium avium</i> <i>Mycobacterium kansasii</i> <i>Mycobacterium intracellulare</i> <i>Tubercule bacillus</i> H-37-RV <i>Mycobacterium malmoeense</i> <i>Mycobacterium avium</i> <i>Mycobacterium kansasii</i>	L09660
Aerial Parts Indonesia	Antiviral Activity	H2O Ext MEOH Ext	Cell Culture Cell Culture	4 mcg/ml 4 mcg/ml	Inactive	Virus- HTLV-I	K21579
Aerial Parts Japan	Antiviral Activity	Hot H2O Ext Hot H2O Ext Hot H2O Ext	Cell Culture Cell Culture Cell Culture	0.1 mg/ml 0.5 mg/ml 0.5 mg/ml	Active Inactive Inactive	Virus- <i>Poliovirus 1</i> Virus- <i>Herpes simplex 1</i> Virus-Measles	K16835
Aerial Parts Indonesia	Protease(HIV) Inhibition	H2O Ext MEOH Ext	Not stated Not stated	500 mcg/ml 340 mcg/ml	Inactive Active		K08273
Aerial Parts Indonesia	Reverse Transcriptase Inhibition Activity	H2O Ext MEOH Ext	Cell Culture Cell Culture	1000 mcg/ml 1000 mcg/ml	Inactive Inactive	Virus-avian myeloblastosis	K08721

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Entire Plant Nigeria	Antibacterial Activity	MEOH Ext MEOH Ext MEOH Ext MEOH Ext MEOH Ext MEOH Ext MEOH Ext MEOH Ext	Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate Agar Plate	2.0 mg/ml 2.0 mg/ml 2.0 mg/ml 2.0 mg/ml 2.0 mg/ml 2.0 mg/ml 2.0 mg/ml 2.0 mg/ml	Active Active Active Active Active Active Inactive Inactive	<i>Corynebacterium diphtheriae</i> <i>Klebsiella</i> species <i>Neisseria</i> species <i>Pseudomonas aeruginosa</i> <i>Staphylococcus aureus</i> <i>Streptococcus</i> species <i>Salmonella</i> species <i>Streptobacillus</i> species	M27767
Leaf Guatemala	Antibacterial Activity	ETOH-H2O (1:1) Ext	Agar Plate	50 ul / disc	Inactive	<i>Neisseria gonorrhoea</i>	K27236
Leaf Nigeria	Antibacterial Activity	MEOH(50%)Ext	Broth Culture	Not stated	Active Inactive Inactive Inactive Inactive	<i>Bacillus subtilis</i> <i>Escherichia coli</i> <i>Proteus</i> species <i>Pseudomonas aeruginosa</i> <i>Staphylococcus albus</i> <i>Staphylococcus aureus</i>	J00209
Entire plant Taiwan	Glutamate-Pyruvate- Transaminase Inhibition	ETOH-H2O (1:1) Ext	Cell Culture Cells-rat-liver	1.0 Mg/ml	Inactive	vs. CCL4-induced hepatotoxicity	T14999
Entire Plant Samoa	Prostaglandin Synthesis Inhibition Activity	ETOH(100%)Ext	Not stated	100.0 mcg/ml	Inactive	vs. COX-1 catalysed prostaglandin biosynthesis	L14626
Entire Plant Puerto Rico	Molluscicidal Activity	Aqueous Slurry	Not stated	LD100 >1M ppm	Inactive	Fruits, roots and leaves were tested vs <i>Lymnaea columella</i> and <i>Lymnaea cubensis</i>	T04621
Aerial Parts Tanzania	Antitrypanosomal Activity	CH2CL2 Ext H2O Ext MEOH Ext Pet Ether Ext	In vitro	19 mcg/ml 56 mcg/ml 19 mcg/ml 19 mcg/ml	Active Active Active Active	<i>Trypanosoma brucei</i> <i>rhodesiense</i>	L13940
Leaf Tanzania	Antitrypanosomal Activity	CH2CL2 Ext H2O Ext Pet Ether Ext	In vitro	19 mcg/ml 56 mcg/ml 19 mcg/ml	Active Active Active	<i>Trypanosoma brucei</i> <i>rhodesiense</i>	L13940
Root Tanzania	Antitrypanosomal Activity	CH2CL2 Ext H2O Ext MEOH Ext Pet Ether Ext	In vitro	19 mcg/ml 19 mcg/ml 56 mcg/ml 19 mcg/ml	Active Active Active Active	<i>Trypanosoma brucei</i> <i>rhodesiense</i>	L13940

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Fruit Tanzania	Antitrypanosomal Activity	CH ₂ CL ₂ Ext H ₂ O Ext MEOH Ext Pet Ether Ext	In vitro	19 mcg/ml 167 mcg/ml 19 mcg/ml 19 mcg/ml	Active Inactive Active Active	<i>Trypanosoma brucei</i> <i>rhodesiense</i>	L13940
Leaf Ivory Coast	Anticoagulant Activity	not stated	Blood-human-whole	50%	Active		T15327

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