

Biological Activities of Mutamba (*Guazuma ulmifolia*)

IN VIVO RESEARCH

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Results	Notes/Organism tested	Ref #
Bark Brazil	Uterine Stimulant Effect	ETOH (95%) Ext H2O Ext	Rat Female Rat Female	1:1 1:1	Active Weak Activity	Uterus (non-preg).	W02690
Stembark Brazil	Uterine Stimulant Effect	H2O Ext	Rat Female	Not stated	Active	Uterus (estrog).	A03531
Leaf Mexico	Antihyperglycemic Activity	Decoction	Intragastric Rabbit	4.0 mg/kg	Active	vs. glucose-induced hyperglycemia.	L03570
Leaf Belize	Antispasmodic Activity	Hot H2O Ext	Rat Aorta	300.0 mcl	Inactive	vs. norepinephrine- and carbachol-induced contractions.	L16245
Bark Belize	Antispasmodic Activity	Hot H2O Ext	Rat Aorta	300.0 mcl	Inactive	vs. norepinephrine- and carbachol-induced contractions.	L16245
Bark Brazil	Smooth Muscle Relaxant Activity	ETOH (95%) Ext H2O Ext	Rabbit Rabbit	1:1 1:1	Weak Activity	Duodenum	W02690
Bark Brazil	Smooth Muscle Relaxant Activity	H2O Ext	Guinea Pig	1:1	Equivocal	Ileum	W02690
Bark Brazil	Smooth Muscle Stimulant Activity	ETOH (95%) Ext	Guinea Pig	1:1	Equivocal	Ileum	W02690
Bark Brazil	Cardiac Depressant Activity	ETOH (95%) Ext H2O Ext	Insect (heart) Insect (heart)	1:1 1:1	Inactive Equivocal	Heart - <i>Thermobia domes</i>	W02690
Bark Brazil	Cardiotonic Activity	ETOH (95%) Ext	Insect (heart)	1:1	Equivocal	Heart - <i>Thermobia domes</i>	W02690
Leaf Guatemala	Diuretic Activity	Decoction	Gastric Rat	1.0 gm/kg	Inactive		T15295
Bark Brazil	Fish Poison	ETOH (95%) Ext H2O Ext	Not stated	1:1 1:1	Inactive Inactive		W02690
Bark Brazil	Hypertensive Activity	ETOH (95%) Ext	IV Cat	Not stated	Inactive		W02690
Bark Brazil	Hypotensive Activity	H2O Ext ETOH (95%) Ext	IV Cat IV Cat	Not stated Not stated	Active Inactive		W02690

GI = Gastric Intubation IG = Intragastric NG = Nasogastric IP = Intraperitoneally IV = Intravenously SC = Subcutaneously IM = Intramuscular

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Results	Notes/Organism tested	Ref #
Stembark Mexico	Antisecretory Effect	ETOH(70%) Ext	Pig (intestine)	400.0 mcg/ml	Inactive	vs. PBE2-induced chloride secretion.	K23487
Stembark Mexico	Antisecretory Effect	ETOH(70%) Ext	Rabbit (intestine)	40.0 mcg/ml	Active	vs. cholera toxin-induced chloride secretion.	K23487
Stembark Mexico	Antisecretory Effect	ETOH (95%) Ext	Rabbit (colon)	Not stated	Active	vs. cholera toxin-induced secretion.	H18875
Bark Mexico	Antisecretory Effect	Not stated	Rabbit (colon)	Not stated	Active	vs. cholera toxin-induced secretion.	AG1025

IN VITRO RESEARCH

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Results	Notes/Organism tested	Ref #
Leaf Brazil	Cytotoxic Activity	ETOH (95%) Ext	Cell Culture	Not stated	Strong Activity	Ca-9kb 97.3% inhibition of cell growth.	M25036
Leaf Panama	Cytotoxic Activity	H2O Ext MEOH Ext	Cell Culture	100.0 mcg/ml	Inactive	Cells - vero.	K28424
Root Brazil Stem Brazil	Cytotoxic Activity	ETOH (95%) Ext	Cell Culture	Not stated	Inactive	Ca-9kb (19.9% inhibition of cell growth).	M25036
Bark Brazil	Cytotoxic Activity	ETOH Ext	Cell Culture	5 mcg	Active	HEp-2 (human larynx carcinoma)	AG1027
Leaf Indonesia	Prostaglandin Synthetase Inhibition	ETOH-H2O (1:1) Ext		750.0 mcg/ml	Active	Activity was inhibited 61.8%.	M31096
Bark Mexico	Anti-inflammatory Activity	ETOH (95%) Ext		Not stated	Equivocal	In HET-CAM assay.	L07398
Bark + Fruit Mexico	Antifungal Activity	ETOH (95%) Ext	Agar Plate	10.0 mcg 25.0 mcg	Active Active	<i>Cladosporium cucumerinum</i> <i>Penicillium oxalicum</i>	K19153
Leaf + Stem India	Antifungal Activity	H2O Ext	Agar Plate	100.0 Mcg	Inactive	<i>Aspergillus flavus</i> <i>Geotrichum candidum</i>	M19808
Leaf + Stem India	Antiyeast Activity	H2O Ext	Agar Plate	100.0 Mcg	Inactive	<i>Candida albicans</i>	M19808
Shade Fruit Mexico	Antiyeast Activity	MEOH Ext	Agar Plate	1.25 Mg/ml	Inactive	<i>Candida albicans</i>	J12454

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Results	Notes/Organism tested	Ref #
Leaf Panama	Antiviral Activity	H2O Ext MEOH Ext	Agar Plate Agar Plate	100.0 mcg/ml 100.0 mcg/ml	Inactive Weak Activity	<i>Herpes simplex 1</i>	K28424
Bark Brazil	Antiviral Activity	ETOH Ext	Agar Plate	5 mcg / plate	Active	Inhibited replication of Bovine Herpesvirus by 100% and Polio virus by 99%.	AG1027
Bark Brazil	Antiviral Activity	Crude Ext	Agar Plate	5 mcg / plate	Active	Inhibited replication of Bovine Herpesvirus by 97% and Polio virus by 62%.	AG1027
Bark Brazil	Antiviral Activity	H2O Ext	Agar Plate	5 mcg / plate	Active	Inhibited replication of Bovine Herpesvirus by 99% and Polio virus by 96%.	AG1027
Bark Brazil	Antibacterial Activity	CH2CL2: MEOH (1:1) Ext	Agar plate	5 mg/plate	Strong Activity	<i>Staphylococcusa aureus</i>	ZZ1018
Bark Brazil	Antibacterial Activity	CH2CL2: MEOH (1:1) Ext	Agar plate	5 mg/plate	Active	<i>Bacillus cereus</i>	ZZ1018
Leaf Guatemala	Antibacterial Activity	ETOH Ext	Agar Plate	10.0 mcl 30.0 mcl 30.0 mcl	Active Active Active	<i>Bacillus subtilis</i> <i>Escherichia coli</i> <i>Staphylococcusa aureus</i>	T15445
Bark + Fruit Mexico	Antibacterial Activity	ETOH (95%) Ext	Agar Plate	10.0 mcg 20.0 mcg 20.0 mcg	Active Active Inactive	<i>Bacillus subtilis</i> <i>Micrococcus luteus</i> <i>Escherichia coli</i>	K19153
Bark Guatemala	Antibacterial Activity	ETOH - H2O (1:1) Ext	Agar Plate	50.0 mcl	Active	<i>Neisseria gonorrhoea</i>	K27236
Bark Guatemala	Antibacterial Activity	ETOH - H2O (50%) Ext	Agar Plate	50.0 mcl	Active Equivocal Inactive Inactive Inactive	<i>Shigella dysenteriae</i> <i>Salmonella typhosa</i> <i>Shigella flexneri</i> <i>Escherichia coli</i> <i>Salmonella enteritidis</i>	K24899
Leaf Guatemala	Antibacterial Activity	Acetone Ext	Agar Plate	50.0 mg	Weak Activity	<i>Staphylococcus aureus</i> <i>Streptococcus pneumoniae</i> <i>Streptococcus pyogenes</i>	K19264

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Results	Notes/Organism tested	Ref #
Leaf Guatemala	Antibacterial Activity	Hexane Ext	Agar Plate	50.0 mg	Weak Activity	<i>Staphylococcus aureus</i> <i>Streptococcus pneumoniae</i> <i>Streptococcus pyogenes</i>	K19264
Leaf Guatemala	Antibacterial Activity	MEOH Ext	Agar Plate	50.0 mg	Weak Activity	<i>Staphylococcus aureus</i> <i>Streptococcus pneumoniae</i> <i>Streptococcus pyogenes</i>	K19264
Leaf Guatemala	Antibacterial Activity	MEOH Ext	Agar Plate	Not stated	Equivocal	<i>Escherichia coli</i> <i>Salmonella typhimurium</i> <i>Shigella flexneri</i>	K11657
Leaf Guatemala	Antibacterial Activity	ETOH Ext	Agar Plate	0.1 ml	Inactive	<i>Proteus vulgaris</i> <i>Pseudomonas aeruginosa</i> <i>Salmonella typhi</i> <i>Shigella flexneri</i> <i>Streptococcus pyogenes</i>	T15445
Shade Fruit Mexico	Antibacterial Activity	MEOH Ext	Agar Plate	10.0 mg/ml	Inactive	<i>Staphylococcus aureus</i> <i>Escherichia coli</i> <i>Pseudomonas aeruginosa</i>	J12454
Leaf + Stem India	Antibacterial Activity	H2O Ext	Agar Plate	100.0 mcg	Inactive	<i>Bacillus megaterium</i> <i>Bacillus subtilis</i> <i>Escherichia coli</i> <i>Pseudomonas sp</i> <i>Staphylococcus aureus</i> <i>Streptococcus sobrinus</i> <i>Xanthomonas rryzae</i>	M19808
Leaves + bark Belize	Antibacterial Activity	Not stated	Agar plate	Not stated	Active Active Active Inactive	<i>E. coli</i> ATCC 25922 <i>P. aeruginosa</i> ATCC 27853 <i>S. aureus</i> ATCC 25923 <i>E. faecalis</i> ATCC 29212	AG1023
Bark Mexico	Transcription Inhibition	ETOH (95%) Ext	Cell Culture	100.0 mcg/ml	Inactive	Ca-HeLa vs. inhibited NF-kappa B activation.	L07398
Bark Panama	Radioligand-Receptor-Binding Inhibition Activity	H2O Ext	Cell Culture	1000 mcg/ml	Weak Activity	AT-1 Receptor Inhibition	L18181
Bark Panama	Radioligand-Receptor-Binding Inhibition Activity	Acetone Ext	Cell Culture (hamster ovary cells)	10.0 mcg/ml	Active	Inhibited binding to Angiotensin II receptor cells by more than 50%.	L12353

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Results	Notes/Organism tested	Ref #
Bark Panama	Radioligand-Receptor-Binding Inhibition Activity	CHCL3 Ext ETOAC Ext H2O Ext Hexane Ext MEOH-CH2CL2 (1:1) Ext	In vitro	10.0 mcg/ml	Inactive	AT-1 Receptor Inhibition	L18181
Bark Panama	Radioligand-Receptor-Binding Inhibition Activity	ETOH (80%) Ext	In vitro	100.0 mcg/ml	Inactive	ET-A Receptor Inhibition	L18181
Bark Panama	Radioligand-Receptor-Binding Inhibition Activity	CHCL2 Ext ETOAC Ext H2O Ext MEOH-CH2Cl2 (1:1) Ext	In vitro	10.0 mcg/ml	Inactive	Y-1 Receptor Inhibition	L18181
Bark Panama	Radioligand-Receptor-Binding Inhibition Activity	Hexane Ext	In vitro	10.0 mcg/ml	Weak Activity	Y-1 Receptor Inhibition	L18181
Bark Not stated	Angiotensin II binding- inhibition activity	Fraction: Acetone 70%	In vitro	Not stated	Active	AT 1 receptor site	AG1024
Bark + Fruit Mexico	Antiamebic Activity	ETOH (95%) Ext	In vivo	MIC > 250 mcg/ml	Inactive	<i>Entamoeba histolytica</i>	K19153
Fresh Fruit + Leaf India	Antifilarial Activity	Not stated	In vivo	Not stated	Inactive	<i>Setaria gigitata</i> (worm)	M25236
Trunkbark Brazil	Molluscicidal Activity	ETOH (95%) Ext H2O Ext	In vivo	1000 ppm	Weak Activity	<i>Biomphalaria glabrata</i> <i>Biomphalaria straminea</i>	W02949
Bark Not stated	Plant Germination Inhibition	MEOH Ext	Plant culture	50.0 ppm	Active	Tested on bean plants.	T09735
Not stated Guatemala	Antioxidant Activity	MEOH Ext H2O Ext	In vitro	Not stated	Active	DPPH & OH	AG1026

Biological Activities for Compounds in Mutamba (*Guazuma ulmifolia*)

Compound	Activity Tested For	Test Model	Dosage	Results	Notes/Organism tested	Ref #
Procyanidin B-2	Antitumor Activity	Cell Culture	Not stated	Active	Inhibited 12-O-tetradecanoylphorbol-13-acetate-induced activation of epstein-barr virus early antigen in Raji cells.	AG1009
Procyanidin B-2	Antitumor Activity	Cell Culture	ED50=1-4 mcg/ml	Active	PRMI-7951 melanoma cells.	AG1021
Procyanidin B-2	Antitumor Activity	Cell Culture	ED50=1-4 mcg/ml	Inactive	Lung carcinoma (A-549). Ileocecal adenocarcinoma (HCT-8). Epidermoid carcinoma of nasopharynx (KB). Medulloblastoma (TE-671) .	AG1021
Procyanidin B-2	Mutagenic Effect	Cell Culture	Not stated	Inactive	Bacteria	AG1015
Procyanidin B-2	Toxic Effect	CHL cells	Not stated	Inactive	Caused no structural aberrations	AG1015
Procyanidin B-2	Toxic Effect	Mice	Not stated	Inactive	Micronucleus test.	AG1015
Procyanidin B-2	Toxic Effect	SC Rat	LD >2gm/kg	Inactive		AG1015
Procyanidin B-2	Toxic Effect	Guinea Pig	Not stated	Inactive	No sensitization.	AG1015
Procyanidin B-2	Toxic Effect	Rabbits	Not stated	Weakly Active	Slight irritation of conjunctiva, thought to be caused by ethanol.	AG1015
Procyanidin B-2	Toxic Effect	Rabbits	Not stated	Inactive	No primary irritation.	AG1015
Procyanidin B-2	Neuroprotective Effect	Cell Culture	100-300 mM	Active	Protected against glutamate-induced neuronal death in cultured cerebellar granule cells by inhibition of calcium influx.	AG1012
Procyanidin B-2	Antihypertensive Effect	IV Rat	Not stated	Active	Lowered blood pressure through decrease of sympathetic tone and direct vasodilatation.	AG1017
Procyanidin B-2	Protein Kinase C Inhibitory Activity	Not stated	Not stated	Active		AG1014
Procyanidin B-2	Hair Growth promoter Effect	Human Adult (male)	1% External	Active	Increase in number of total hairs and terminal hairs (hairs more than 60 mm in diameter).	AG1013

Compound	Activity Tested For	Test Model	Dosage	Results	Notes/Organism tested	Ref #
Procyanidin B-2	Hair Growth Promoter Effect	Human Adult (male)	1% External	Active	No adverse effects. 78.9% had increase in hair diameter (30% in placebo) and an increase in number of total hairs.	AG1011
Procyanidin B-2	Hair growth promoter Effect	in vitro in vivo	Not stated Not stated	Active Active	Promoted hair epithelial cell proliferation and stimulated anagen induction.	AG1014
Procyanidin B-2	Hair growth promoter Effect	Mouse	Not stated	Active	Growth-promoting activity 300% (controls 100%).	AG1016
Procyanidin B-2	Hair growth promoter Effect	Cell culture	Not stated	Active	Neutralized growth inhibiting effects and protected cells from induced apoptosis.	AG1028
Procyanidin B-2	Hair Growth Promoter Effect	Cell Culture	Not stated	Active	Down regulates protein kinase C (PKC) isozymes (-alpha, -beta1, -beta2, -eta) in hair cells, promoting hair cell growth. Inhibition of PKC isozyme translocation to the particulate fraction of hair epithelial cells.	AG1010
Procyanidin C-1	Hair Growth Promoter Effect	Mouse	Not stated	Active	Growth-promoting activity 220%.	AG1016
Procyanidin C-1	Hair growth promoter Effect	In vitro In vivo	Not stated Not stated	Active Active	Promote hair epithelial cell proliferation Stimulate anagen induction.	AG1014
Procyanidin C-1	Anticoagulant Activity	In vitro	Not stated	Active	Inhibited platelet aggregation. Comparable with aspirin.	AG1019
Procyanidin C-1	Antiviral Activity	Cell Culture	Not stated	Active	<i>Herpes simplex virus type 1.</i>	AG1020
Procyanidin C-1	Protein Kinase C Inhibitory Activity	Not stated	Not stated	Active		AG1014
Procyanidin C-1	Antioxidant Activity		Not stated	Active	Lipid peroxidation and hydroxyl radical scavenging assay.	AG1020

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