

## Tested Biological Activities of *Abuta* (*Cissampelos pareira*)

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Leaf + Stem Jamaica	Toxicity Assessment (quantitative)	ETOH(95%) Ext	IP Mouse	1.0 ml	Inactive		A03360
Leaf + Stem Jamaica	Toxicity Assessment (quantitative)	H2O Ext	IP Mouse	1.0 ml	Inactive		A03360
Root Thailand	Toxic Effect (general)	ETOH-H2O (1:1) Ext	GI Mouse	10.0 gm/kg	Inactive	Dose expressed as dry weight of plant.	R00001
Root Thailand	Toxic Effect (general)	ETOH-H2O (1:1) Ext	SC Mouse	1.0 gm/kg	Inactive	Dose expressed as dry weight of plant.	R00001
Stem Brazil	Toxic Effect (general)	Hot H2O Ext	IV Rabbit	0.4 gm	Inactive		W01038
Stem Brazil	Respiration Inhibition Activity	Hot H2O Ext	IV Dog	0.4 gm	Active	Acceleration of respiratory rhythm followed by rhythm irregularity.	W01038
Not stated	Anti-implantation Effect	ETOH(95%) Ext	SC Rat	Not stated	Inactive		X01111
Leaf + Stem Jamaica	Uterine Relaxation Effect	ETOH(95%) Ext  H2O Ext	Rat  Rat	3.3 ml  3.3 ml	Weak Activity Weak Activity	Uterus (unspec.cond).  Uterus(unspec.cond).	A03360
Not stated Malawi	Uterine Stimulant Effect	H2O Ext	Guinea Pig (female)	0.1 ml	Inactive	Uterus(estrog).	T09487
Not stated Argentina	Uterine Stimulant Effect	H2O Ext	Guinea Pig (female)	Not stated	Active	Uterus(unspec.cond)	A03467
Entire Plant Panama	Cytotoxic Activity	H2O Ext MECL2 Ext MEOH Ext	Cell Culture	Not stated	Inactive	Ca-human-colon-co-115.	M18404
Root South America	Cytotoxic Activity	MEOH Ext	Cell Culture	Not stated	Active	Leuk-p388.	H17803
Root Tanzania	Cytotoxic Activity	ETOAC Ext	Cell Culture	IC50=19. mcg/ml IC50=8.5 mcg/ml MIC=12.4 mcg/ml	Active Active Active	Ca-9kb. Human colon cancer HT29. Human colon cancer HT29.	K23957

Root Mexico	Transcription Inhibition	ETOH(95%) Ext	Cell Culture	100.0 mcg/ml	Inactive	Ca-hela. Inhibited NF-kappa B activation.	L07398
Not stated	Antitumor Activity	Fraction	Not stated	Not stated	Active		AP1025
Not stated	Antileukemic Activity	Fraction	Not stated	Not stated	Active		AP1025
Not stated Japan	Antileukemic Activity	Fraction	Not stated	Not stated	Active		AP1002
Root Guatemala	Diuretic Activity	Decoction	NG Rat	1.0 gm/kg	Active		T15295
Root + Stem India-Madras	Diuretic Activity	Oral Rat	Not Stated	Not stated	Inactive		A05678
Stem Brazil	Cardiotonic Activity	Hot H2O Ext	Frog (heart)	Not stated	Active		W01038
Leaf + Stem Jamaica	Hypotensive Activity	ETOH(95%) Ext H2O Ext	IV Dog IV Dog	0.1 ml/kg 0.1 ml/kg	Active		A03360
Root Thailand	Hypotensive Activity	ETOH-H2O (1:1) Ext	IV Dog	Variable	Strong Activity		W3022A
Stem Brazil	Hypertensive Activity	Hot H2O Ext	IV Dog	0.36 gm	Active		W01038
Leaf + Stem Jamaica	Vasoconstrictor Activity	ETOH(95%) Ext	Rat	0.033 ml	Active	Hind quarter(isolated).	A03360
Root Mexico	Anti-inflammatory Activity	ETOH(95%) Ext	Not Stated	Not stated	Equiv.	In het-cam assay.	L07398
Leaf + Stem Jamaica	Smooth Muscle Relaxant Activity	ETOH(95%) Ext	Rabbit (duodenum)	0.33 ml/L	Active		A03360
Root Thailand	Antispasmodic Activity	ETOH-H2O (1:1) Ext	Guinea Pig (ileum)	0.001 gm/ml	Active		W3022A
Leaf + Stem Jamaica	Spasmolytic Activity	ETOH(95%) Ext H2O Ext	Guinea Pig IP Guinea Pig	0.1 ml/L 0.1 ml/L	Active Active	(ileum)	A03360
Leaf + Root + Stem Mexico	Antioxidant Activity	CHCL3-ME OH (3:2) Ext	Not Stated	Not stated	Active	vs. DPPH. vs. bleaching of beta-carotene.	L15716
Root India	Antihyperglycemic Activity	Hot H2O Ext	GI Rabbit	5.0 gm	Weak Activity		T03612
Root India	Hypoglycemic Activity	Hot H2O Ext	GI Rabbit	5.0 gm	Weak Activity		T03612

Root Thailand	Antihistamine Activity	ETOH-H2O (1:1) Ext	Guinea Pig (ileum)	0.001 gm/ml	Active		W3022A
Leaf Nigeria	Antiulcer Activity	MEOH Ext	IG Mouse	100.0 mg/kg	Active		L11721
Root Mexico	Fibrinolytic Activity	ETOH(95%) Ext	Agar Plate	25.0 mcg	Active	vs. <i>Cladosporium cucumerinum</i> in hepatic cells.	K19153
Stem Brazil	Skeletal Muscle Stimulant Activity	Hot H2O Ext	Rabbit	0.04 gm	Inactive		W01038
Not stated	Neuromuscular Activity	Not stated	Not stated	Not stated	Active	Neuromuscular blocking action.	ZZ1038
Root Nigeria	CNS Depressant Activity	ETOH(70%) Ext	IP Mouse	Variable	Active		T06510
Not stated	CNS Stimulant Activity	Not stated	Not stated	Not stated	Active		AP1004
Root Nigeria	Anticonvulsant Activity	ETOH(70%) Ext	IP Mouse	Variable	Active	vs. metrazole- and strychnine-induced convulsions.	T06510
Stem Brazil	Neuroleptic Activity	Hot H2O Ext	Frog Nerve (sciatic)	Not stated	Inactive		W01038
Root Not stated	Antimalarial Activity Antimalarial Activity Antimalarial Activity Antimalarial Activity Antimalarial Activity	CHCL3 Ext CHCL3 Ext H2O Ext H2O Ext H2O Ext	Oral Chicken SC Duckling Oral Chicken Oral Duckling Oral Duckling	572.0 mg/kg 282.0 mg/kg 1.20 gm/kg 1.52 gm/kg 1.52 gm/kg	Active Active Active Inactive Inactive	<i>Plasmodium gallinaceum</i> <i>Plasmodium cathemerium</i> <i>Plasmodium gallinaceum</i> <i>Plasmodium cathemerium</i> <i>Plasmodium lophurae</i>	A00785
Root Tanzania	Antimalarial Activity	ETOAC Ext	Not Stated	ED50: 10.38 mcg/ml	Active	<i>Plasmodium falciparum</i>	K15971
Root Tanzania	Antimalarial Activity	ETOAC Ext	IG Mouse	500.0 mg/kg	Active	58.5% suppression of parasitemia.	K23957
Root Tanzania	Antimalarial Activity	ETOH(95%) H2O Ext Pet Ether	Not Stated Not Stated Not Stated	ED50=1.3 mcg/ml ED50=1.2 mcg/ml ED50=8.0 mcg/ml	Active Active Active	<i>Plasmodium falciparum</i> <i>Plasmodium falciparum</i> <i>Plasmodium falciparum</i>	K15971
Leaf Nigeria	Antibacterial Activity	MEOH Ext	Agar Plate	100.0 mg/ml	Active	<i>Escherichia coli</i> <i>Klebsiella pneumoniae</i> <i>Pseudomonas aeruginosa</i> <i>Salmonella typhi</i> <i>Staphylococcus aureus</i>	L11721

Root India	Antibacterial Activity	ETOH(95%) ETOH(95%) Hot H2O Ext Hot H2O Ext	Agar Plate Agar Plate Agar Plate Agar Plate	Undiluted Undiluted Undiluted Undiluted	Active Active Active Inactive	<i>Escherichia coli</i> <i>Staphylococcus aureus</i> <i>Escherichia coli</i> <i>Staphylococcus aureus</i>	W03693
Bark India	Antibacterial Activity	ETOH(95%) Ext	Agar Plate	20.0%	Weak Activity	<i>Escherichia coli</i> <i>Klebsiella species</i> <i>Shigella boydii</i> <i>Shigella dysenteriae</i> <i>Shigella flexneri</i> <i>Shigella sonnei</i> <i>Vibrio cholera</i>	L13625
Leaf + Stem India	Antibacterial Activity	ETOH(80%) ETOH(80%) ETOH(80%) ETOH(80%)	Agar Plate Agar Plate Agar Plate Agar Plate	12.5 mg/ml 25.0 mg/ml 25.0 mg/ml 25.0 mg/ml	Equiv. Equiv. Equiv. Equiv.	<i>Bacillus subtilis</i> <i>Escherichia coli</i> <i>Pseudomonas aeruginosa</i> <i>Staphylococcus aureus</i>	L15872
Leaf + Root + Stem Mexico	Antibacterial Activity	CHCL3-ME OH (3:2) Ext	Agar Plate	Not stated	Active Inactive Inactive Inactive	<i>Staphylococcus aureus</i> <i>Bacillus subtilis</i> <i>Escherichia coli</i> <i>Pseudomonas aeruginosa</i>	L15716
Leaf Guatemala	Antibacterial Activity	ETOH-H2O (50%)Ext	Agar Plate	50.0 microliters	Inactive	<i>Escherichia coli</i> <i>Salmonella enteritidis</i> <i>Salmonella typhosa</i> <i>Shigella dysenteriae</i> <i>Shigella flexneri</i>	K24899
Root Argentina	Antibacterial Activity	Decoction	Agar Plate	Not stated	Inactive	<i>Pseudomonas aeruginosa</i>	K17523
Root Argentina	Antibacterial Activity	Hot H2O Ext	Agar Plate	62.5 mg/ml	Inactive	<i>Escherichia coli</i> <i>Staphylococcus aureus</i>	K14683
Root + Twig Argentina	Antibacterial Activity	H2O Ext	Agar Plate	1.0 mg/ml	Inactive	<i>Salmonella typhi</i>	J11153
Root Mexico	Antibacterial Activity	ETOH(95%)	Agar Plate Agar Plate Agar Plate	10.0 mcg 20.0 mcg 20.0 mcg	Inactive Inactive Inactive	<i>Bacillus subtilis</i> <i>Escherichia coli</i> <i>Micrococcus luteus</i>	K19153
Bark India	Antimycobacterial Activity	ETOH(95%)	Agar Plate	Not stated	Inactive	<i>Mycobacterium tuberculosis</i>	W00143
Root Mexico	Antiamoebic Activity	ETOH (95%)	Not Stated	MIC=>250 mcg/ml	Inactive	<i>Entamoeba histolytica</i>	K19153
Root Mexico	Antifungal Activity	ETOH (95%)	Agar Plate	30.0 mcg	Inactive	<i>Penicillium oxalicum</i>	K19153
Leaf Nigeria	Antifungal Activity	MEOH Ext	Agar Plate	100.0 mg/ml	Inactive	<i>Aspergillus niger</i>	L11721
Root Argentina	Antifungal Activity	Hot H2O Ext	Agar Plate	62.5 mg/ml	Inactive	<i>Aspergillus niger</i>	K14683

Root Guatemala	Antiyeast Activity	ETOH (60%)	Agar Plate	Not stated	Inactive	<i>Candida albicans</i>	M31296
Leaf Nigeria	Antiyeast Activity	MEOH Ext	Agar Plate	100.0 mg/ml	Inactive	<i>Candida albicans</i>	L11721
Leaf + Root + Stem Mexico	Antiyeast Activity	CHCL3-ME OH (3:2) Ext	Agar Plate	Not stated	Inactive	<i>Candida albicans</i> <i>Saccharomyces cerevisiae</i>	L15716
Not stated	Insecticide Activity	H2O Ext H2O Ext	Variable Variable	Not stated 40.0 ml/kg	Inactive Weak Activity	<i>Blatella germanica</i> <i>Periplaneta americana</i>	W03405
Entire Plant Puerto Rico	Molluscicidal Activity	Aqueous slurry	Not Stated	LD100= >1000 ppm	Inactive	<i>Lymnaea columella</i> <i>Lymnaea cubensis</i>	T04621
Leaf + Root + Stem Mexico	Beta-glucosidase Inhibition	CHCL3-MEOH (3:2)	Not Stated	Not stated	Active		L15716

## Biological Activities for Compounds of Abuta (*Cissampelos pareira*)

(Please note: The following is just a representation of some of the published research on compounds in Abuta. Over 400 clinical studies have been published on various alkaloid compounds naturally found in Abuta, including those compounds shown below)

Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Total Alkaloids	Toxicity Assessment (quantitative)	IV Mouse	50.0 mg/kg	Not Stated		W00803
Total Alkaloids	Respiratory Depressant	IV Cat	2.0 mg/kg	Weak Activity		W00803
Pareirubrine A & B	Antileukemic Activity	Not stated	Not stated	Active		H12546
Grandirubrine	Antileukemic Activity	Not stated	Not stated	Active		H12546
Isoimerubrine	Antileukemic Activity	Not stated	Not stated	Active		H12546
Tetrandrine	Antileukemic Activity	Cell Culture	2.5 mcg/ml	Active	Human leukemic U937 cells.	AP1022
Tetrandrine	Antileukemic Activity	Cell Culture	Not stated	Active	Human leukemic HL-60 cells.	AP1023
Tetrandrine	Cytotoxic Activity	Not stated	Not stated	Active	Walker carcinoma 256; ehrlich ascites carcinoma and SA; KB; HeLa; various liver carcinoma strains; lung tumor.	AP1024

Cissampereine	Cytotoxic Activity	Not stated	Not stated	Active		AP1005
Tetrandrine	Cytotoxic Activity	Cell Culture	Not stated	Active Inactive	Malignant lymphoid and myeloid cells. Epstein-Barr virus-transformed lymphoblastoid cells.	AP1006
Dicentrine	Cytotoxic Activity	Cell Culture	Not stated	Active	Several mouse tumor cell lines, leukemia P388 and L1210, melanoma B16, bladder cancer MBC2 and colon cancer colon 26.	AP1012
Tetrandrine	Cytotoxic Activity	Cell Culture	IC50=9 mcM	Active	Human hepatoma cell HepG2 cells.	AP1015
Tetrandrine	Cytotoxic Activity	Mice	2.5 micromol/L	Active	vs. MCF-7/ADR cell xenografts. Inhibited P-glycoprotein mediated multidrug resistance. Potentiated the cytotoxicity of doxorubicin, reversing resistance by 20.4-fold.	AP1016
Tetrandrine	Cytotoxic Activity	Cell Culture	10 mumol/L	Active	Reversed adriamycin and vincristine resistance in resistant MCF-7/Adr and KBv200 cell lines.	AP1017
Tetrandrine	Cytotoxic Activity	Mice	Not stated	Active	Reversed adriamycin resistance in multi-drug resistant MCF-7/Adr solid tumor.	AP1017
Tetrandrine	Cytotoxic Activity	Cell Culture	5 and 7.5 eg/ml	Active	Enhanced the growth-inhibiting effect of radiation in human glioblastoma U128MG cells. Eliminated the cell cycle perturbation induced by radiation.	AP1020
Berberine	Cytostatic Activity	Cell Culture	Not stated	Active	Macrophage activation resulted in their cytostatic activity against tumor cells.	ZZ1010
Tetrandrine	Anti-tumor Activity	Not stated	Not stated	Active		AP1005
Berberine	Antitumor Activity	Cell Culture	150 mcg/ml	Active	6 human malignant brain tumor cell lines and rat 9L brain tumor cells. Berberine showed an average cell kill of 91%.	ZZ1010
Berberine	Antitumor Activity	Rat	10 mg/kg	Active	81% cell kill.	ZZ1010
Berberine	Antitumor-Promoting Activity	Mice	Not stated	Active	Inhibited the effects of tumor promoters 12-O-tetradecanoylphorbol-13-acetate and teleocidin.	ZZ1010
Berberine	Antitumor-Promoting Activity	Mice	Not stated	Active	Inhibited the promoting effect of teleocidin on skin tumor formation.	ZZ1010
Alkaloid fraction	Analgesic Activity	Oral Mouse	500.0 mg/kg	Inactive		A05678

Tetrandrine	Analgesic Activity	Not stated	Not stated	Active		AP1024
Berberine	Antinociceptive Activity	Oral Mice	Not stated	Active	vs. p-benzoquinone-induced writhing movements.	AP1013
Tetrandrine	Anti-inflammatory Activity	Cell Culture	5 mcg/mL	Active	Suppressed nitric oxide production for 48 hours.	AP1003
Tetrandrine	Anti-inflammatory Activity	Cell Culture	0.1-5 mcg/ml	Active	Inhibited the capacity of monocytes to produce TNF-alpha.	AP1008
Tetrandrine	Anti-inflammatory Activity	Cell Culture	Not stated	Active	Suppression of prostaglandin generation. Inhibition of histamine release, platelet-activating-factor and interleukin 1.	AP1009
Berberine	Anti-inflammatory Activity	Oral and Topical Mice	Not stated	Active Active	vs. serotonin-induced hind paw edema. vs. acetic acid-induced increase in vascular permeability.	AP1013
Tetrandrine	Anti-inflammatory Activity	Mouse	Not stated Not stated 12.5 microM 6 microM	Active Inactive Active Active	vs. croton-induced mouse ear edema. Cyclooxygenase inhibition. 95% inhibition of murine IL-5 activity. 86% inhibition of human IL-6 activity.	AP1019
Corytuberine	Lipoxygenase Inhibitory Activity	Not stated	Not stated	Active		AP1011
Berberine	Lipoxygenase Inhibitory Activity	Not stated	Not stated	Weak Activity		AP1011
Magnoflorine	Lipoxygenase Inhibitory Activity	Not stated	Not stated	Weak Activity		AP1011
Total Alkaloids	Smooth Muscle Relaxant Activity	Cat	1-99 M	Active	Intestine (small)	W00803
Total Alkaloids	Smooth Muscle Relaxant Activity	IV Cat	1.5 mg/kg	Active	Intestine (small)	W00803
Total Alkaloids	Uterine Relaxation Effect	Cat (female)	1-99 M	Active	Uterus (non-preg).	W00803
Total Alkaloids	Uterine Relaxation Effect	IV Cat (female)	3.0 mg/kg	Weak Activity	Uterus (non-preg).	W00803
Total Alkaloids	Uterine Stimulant Effect	Cat (female)	1-99 M	Inactive	Uterus (non-preg).	W00803
Total Alkaloids	Uterine Stimulant Effect	IV Cat (female)	1.0 mg/kg	Inactive	Uterus (non-preg).	W00803
Berberine	Antipyretic Activity	Oral Mice	Not stated	Active	vs. FCA-induced increased rectal temperature.	AP1013

Tetrandrine	Immunosuppressive Activity	Mice	Not stated	Active	Caused suppression of delayed-type hypersensitivity responses to sheep red blood cell antigens.	AP1007
Tetrandrine	Immunosuppressive Activity	Cell Culture	Not stated	Active	Inhibited CD28-costimulated T-cell proliferation and cytokine production. Down-regulated T helper 1 and T helper 2 cytokine production in CD4+ and CD8+ T-cell subpopulations.	AP1021
Dauricine	Immunosuppressive Activity	Cell Culture	Not stated	Active	Inhibited CD28-costimulated T-cell activities.	AP1021
Berberine	Immunostimulant Activity	Cell Culture	Not stated	Active	Activation of macrophages.	ZZ1010
Berberine	Antimicrobial Activity	Agar Plate	Not stated	Active		ZZ1010
Berberine	Antibacterial Activity	Agar Plate	Not stated	Active	<i>Streptococci</i>	ZZ1010
Berberine	Antiparasitic Activity	Human Child	10 mg/kg	Active	After 10 days, 90% of the berberine treated <i>giardia</i> patients had negative stool cultures compared to 95% of the metronidazole group.	ZZ1010
Tetrandrine	Antimalarial Activity	Agar Plate	IC50=5.09 x 10(-7) M IC50=1.51 x 10(-7) M	Active Strong Activity	<i>Plasmodium falciparum</i> chloroquine sensitive. <i>Plasmodium falciparum</i> chloroquine resistant.	AP1010
Berberine	Antifungal Activity	Agar Plate	10-25 mcg/ml	Active	<i>Candida albicans</i> 10 other fungi.	ZZ1010
Total Alkaloids	Bradycardia Activity	IV Cat	2.5 mg/kg	Active		W00803
Tetrandrine	Calcium Channel Blocker	Cell Culture	Not stated	Active		AP1014
Tetrandrine	Antifibrotic Activity	Rat	10 mg/kg	Active	In liver fibrosis reduced serum aspartate aminotransferase, alanine aminotransferase and alkaline phosphatase levels to 72%, 52% and 51% of controls.	AP1018
Total Alkaloids	Diuretic Activity	IV Cat	2.0 mg/kg	Inactive		W00803
Alkaloid fraction	CNS Depressant Activity	Oral Mouse	500.0 mg/kg	Weak Activity		A05678

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