

## Biological Activities for Extracts of Amargo (*Quassia amara*)

Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Leaf India	Toxic Effect (general)	H2O Ext	Not Stated	0.01 gm/ml	Active	<i>Gambusia affinis</i>	M19731
Leaf India	Toxic Effect (general)	H2O Ext	Frog	0.01 gm/ml	Active	<i>Bufo melanostictus</i> tadpoles.	M19731
Leaf India	Toxic Effect (general)	H2O Ext	Frog	Not stated	Inactive	<i>Bufo melanostictus</i> tadpoles.	M19731
Leaf India	Toxic Effect (general)	H2O Ext	<i>Gambusia affinis</i>	Not stated	Inactive		M19731
Bark Brazil	Toxicity (general)	ETOH(70%) Ext ETOH(100%) Ext CH2Cl2 Ext Hex Ext	Oral Mice	5000 mg/kg	Inactive	No toxicity and death seen.	AC1006
Bark Brazil	Toxicity (general)	ETOH(70%) Ext ETOH(100%) Ext CH2Cl2 Ext Hex Ext	IP Mice	1000 mg/kg	Inactive	No toxicity and death seen.	AC1006
Wood Costa Rica	Toxicity (general)	H2O Ext	Oral Mice Male	250 mg/kg 500 mg/kg 750 mg/kg 1000 mg/kg	Inactive	No toxicity seen at any dose.	AC1010
Wood Costa Rica	Toxicity (general)	H2O Ext	IP Mice Male	500 mg/kg 1000 mg/kg	Active Active	Acute toxicity signs with a 24 hour recovery. Lethal to 100% within 24 hours.	AC1010
Not Stated	Anticoagulant Activity	Not stated	Not stated	Not stated	Active	May increase the risk of bleeding or potentiate the effects of warfarin therapy.	AC1008
Bark India	Blood Parameters	CHCl3 Ext	IM Rat	Not stated	Inactive	No change in cell counts, hemoglobin levels, bilirubin, SGPT, SGOT, protein and urea parameters.	AC1005
Stemwood Nigeria	Antifertility Effect	MEOH Ext	Rat Male	Not stated	Active	A reduction in the weight of the testis, epididymis and seminal vesicle seen, with an increase in the anterior pituitary gland.	J13814

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Bark India	Antifertility Activity	CHCl3 Ext	IM Rat Male	Not stated	Active Inactive Active Active Inactive	After 15 days a reduction in the weight of testis and epididymis was seen. No effect on seminal vesicle and prostate weight. Decrease in sperm count, motility and viability seen. An increase in double heads, double tails, detached heads and fragile tails seen. Alpha-glucosidase reduced. Prostatic acid phosphatase activity, citric acid levels and seminal vesicle fructose concentrations unchanged.	AC1005
Stemwood Nigeria	Sperm Count Decrease	MEOH Ext	PO Rat Male	100.0 mg/kg	Active		J13814
Stemwood Nigeria	FSH Levels Decreased	MEOH Ext	PO Rat Male	100.0 mg/kg	Active	Serum.	J13814
Stemwood Nigeria	LH Levels Decreased	MEOH Ext	PO Rat Male	100.0 mg/kg	Active	Serum.	J13814
Stemwood Nigeria	Testosterone Level Decreased	MEOH Ext	PO Rat Male	100.0 mg/kg	Active	Serum.	J13814
Stemwood Nigeria	Testosterone Release Inhibition	MEOH Ext	Rat Leydig Cells	150.0 mcg/ml	Active	Inhibited basal or LH-stimulated secretion.	K20214
Stemwood Nigeria	Testosterone Release Inhibition	MEOH Ext	PO Rat Male	100.0 mg/kg	Active	Leydig cells.	J13814
Rootbark Nigeria Rootwood	Testosterone Release Inhibition	MEOH Ext	Rat Leydig cells	150.0 mcg/ml	Inactive		K20214
Bark Bolivia	Antiviral Activity	H2O Ext	Cell Culture	50.0 microliters	Active	Virus- <i>HIV</i> . MT-2 T-lymphoblastoid cells infected with HIV.	K29837
Wood Not Stated	Antimalarial Activity	H2O Ext	PO Chicken	1.10 gm/kg	Inactive	<i>Plasmodium gallinaceum</i>	A00785

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Leaf Nigeria	Anti-malarial Activity	Hex Ext MEOH Ext	Oral Mice	100 mg/kg 200 mg/kg 100 mg/kg 200 mg/kg	Strong Activity	<i>Plasmodium berghei berghei</i>	AC1009
Wood Spain	Antiparasitic Activity	ETOH(75%) Ext	External Human Child	Not stated	Active	<i>Pediculus humanus humanus</i> . A double-blind, placebo controlled study was performed with 148 school children to assess the prophylactic action of quassia in pediculosis. The treated group had fewer numbers of new cases of lice infestation. No adverse effects were reported.	J11517
Wood Not stated	Antiparasitic Activity	Tincture	External Human	2 applications with an interval of 1 week	Active	454 patients were treated with quassia tincture for head lice ( <i>Pediculosis capitis</i> ). 1 week later only 3 had hatched lice with evidence they were reinfested. No side-effects seen.	AC1014
Wood Surinam	Insecticide Activity	H2O Ext	Not Stated	Not stated	Active	Used as an aphicide.	A07482
Leaf India	Larvicidal Activity	Ether Ext	Not Stated	Not stated	Weak Activity	<i>Culex quinquefasciatus</i>	M19731
Leaf India	Larvicidal Activity	ETOH(95%) Ext	Not Stated	Not stated	Active	<i>Culex quinquefasciatus</i>	M19731
Leaf India	Larvicidal Activity	H2O Ext	Not Stated	LC100=0.02 gm/ml	Active	<i>Culex quinquefasciatus</i>	M19731
Leaf India	Larvicidal Activity	Pet Ether Ext	Not Stated	Not stated	Weak Activity	<i>Culex quinquefasciatus</i>	M19731
Leaf + Bark + Wood + Flowers	Larvicidal Activity	Not stated	Not stated	Not stated	Active	<i>C. quinquefasciatus</i>	AC1013
Stemwood Nigeria	Cytotoxic Activity	MEOH Ext	Cell Culture Leydig cells	Not stated	Inactive		J13814
Trunkwood Costa Rica	Antitumor Activity	H2O Ext	IP Mouse	200.0 mg/kg	Active	26% inhibition Leukemia - P388.	T05868
Sap Costa Rica	Antitumor Activity	ETOH(95%) Ext	IP Mouse	Not stated	Active	Leukemia - P388.	K00622

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Sap Costa Rica	Antitumor Activity	ETOH(95%) Ext	IP Mouse	Not stated	Active	Leukemia - P388.	K00622
Sap Costa Rica	Antitumor Activity	Sap	IP Mouse	12.5 mg/kg	Active	81% inhibition of Leukemia - P388.	T05868
Sap Costa Rica	Crown Gall Tumor Inhibition	Sap	Potato Disc	2.0 mg/ml	Active	<i>Agrobacterium tumefaciens</i> . Assay system is intended to predict for antitumor activity.	T05868
Trunkwood Costa Rica	Crown Gall Tumor Inhibition	H2O Ext	Potato Disc	2.0 mg/ml	Inactive	<i>Agrobacterium tumefaciens</i> . Assay system is intended to predict for antitumor activity.	T05868
Wood Not Stated	Diuretic Activity	ETOH(95%) Ext	SC Mouse	Not stated	Inactive		N01301
Bark Brazil	Anti-ulcer Activity	ETOH(70%) Ext ETOH(100%) Ext CH2Cl2 Ext Hexane Ext	Oral Mice	100 mg/kg	Active	22.5% inhibition of ulcer. 23.4% inhibition of ulcer. 50.5% inhibition of ulcer. 46.8% inhibition of ulcer. vs. indomethacin/bethanechol-induced gastric ulcer.	AC1006
Bark Brazil	Anti-ulcer Activity	ETOH(70%) Ext ETOH(100%) Ext CH2Cl2 Ext Hexane Ext	Oral Mice	100 mg/kg	Active	70.7% inhibition of ulcer. 80% inhibition of ulcer. 60% inhibition of ulcer. 82.7% inhibition of ulcer. vs. gastric injury induced by hypothermic restrain-stress test.	AC1006
Bark Brazil	Anti-ulcer Activity	ETOH(70%) Ext ETOH(100%) Ext CH2Cl2 Ext Hexane Ext	IP Mice	100 mg/kg	Inactive Active Active Active	Gastric juice secretion. ETOH(100%), CH2Cl2 and Hex extracts decreased gastric juice content, increased pH values and decreased acid output.	AC1006
Bark Brazil	Anti-ulcer Activity	ETOH(70%) Ext ETOH(100%) Ext CH2Cl2 Ext Hexane Ext ETOH(70%) Ext ETOH(100%) Ext CH2Cl2 Ext Hex Ext	Oral Mice     Oral Mice	25, 50, 75, 100mg/kg 25, 50, 75, 100mg/kg 25, 50, 75, 100mg/kg 25, 50, 75, 100mg/kg 25, 50, 75, 100mg/kg 25, 50, 75, 100mg/kg 25, 50, 75, 100mg/kg 25, 50, 75, 100mg/kg	Inactive Active Active Active Active Active Active Active	HCl-ETOH-induced gastric ulcers.     All extracts increased gastric free mucous inhibited by indomethacin.	AC1006

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Bark Brazil	Anti-ulcer Activity	Hex Ext	Oral Mice	100 mg/kg	Active	Increased prostaglandin synthesis inhibited by indomethacin by 52.3%.	AC1006
Bark Brazil	Anti-inflammatory Activity	ETOH(70%) Ext ETOH(100%) Ext CH <sub>2</sub> Cl <sub>2</sub> Ext HEX Ext ETOH(70%) Ext ETOH(100%) Ext CH <sub>2</sub> Cl <sub>2</sub> Ext HEX Ext	Oral Not Stated  IP Not Stated	100, 250, 500 mg/kg 100, 250, 500 mg/kg 100, 250, 500 mg/kg 100, 250, 500 mg/kg 100, 250, 500 mg/kg 100, 250, 500 mg/kg 100, 250, 500 mg/kg 100, 250, 500 mg/kg 100, 250, 500 mg/kg	Inactive Inactive Inactive Inactive Inactive Inactive Inactive Inactive Active	Paw edema induced by carrageenan.	AC1004
Bark Brazil	Antinociceptive Activity	Hex Ext	IP Not Stated	100, 250, 500 mg/kg	Active	vs. hot-plate test and acetic acid-induced writhing.	AC1004
Bark Brazil	Sedative Effect	Hex Ext	IP Not Stated	100, 250, 500 mg/kg	Active	Sedative effect on pentobarbital-induced sleep.	AC1004
Bark Brazil	Muscle Relaxant Activity	Hex Ext	IP Not Stated	100, 250, 500 mg/kg	Active		AC1004
Wood Costa Rica	Gastrointestinal Effect	H <sub>2</sub> O Ext	Oral Mice Male	500 mg/kg 1000 mg/kg	Active	Both doses increased intestinal movement. Only statistically significant at 1000 mg/kg.	AC1010

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## Biological Activities for Compounds of Amargo (*Quassia amara*)

Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Quassin	Antifertility Activity	Rat Male	Not stated	Active	Reduced the weight of the testis, epididymis and seminal vesicle; increased weight of the anterior pituitary. Reduced sperm count, serum testosterone, LH and FSH.	J13814
Quassin	Antifertility Activity	Cell Culture	Not stated	Active	Inhibited basal or LH-stimulated secretion.	K20214
Simalikalactone D	Antimalarial Activity	in vitro	Not stated	Active		AC1011
Simalikalactone D	Antimalarial Activity	in vitro	IC50=0.0008-0.0009 mcg ml <sup>-1</sup>	Active	<i>Plasmodium falciparum</i>	AC1017
Simalikalactone D	Antimalarial Activity	in vitro	IC100=0.005 mcg/ml	Active	<i>Plasmodium falciparum</i> (chloroquine-resistant).	AC1018
Simalikalactone D	Antiviral Activity	in vitro	0.2-20 ug/ml	Active	<i>Poliomyelitis</i> <i>Semliki forest virus</i> <i>Herpes simplex virus type 1 (HSV-1)</i> <i>Vesicular stomatitis (VSV)</i> At 0.2 ug/ml it reduced HSV-1 and VSV viral titer by 99%.	AC1007
Quassin	Antiviral Activity	in vitro	0.2-20 ug/ml	Inactive	<i>Herpes simplex virus type 1</i> <i>Vesicular stomatitis</i> <i>Poliomyelitis</i> <i>Semliki forest virus</i>	AC1007
Simalikalactone D	Anti-HIV Activity	in vitro	0.2-20 ug/ml	Inactive	<i>HIV</i> strain IIIB.	AC1007
Quassin	Anti-HIV Activity	in vitro	0.2-20 ug/ml	Inactive	<i>HIV</i> strain IIB.	AC1007
Quassin	Larvicidal Activity	in vitro	Not stated	Active	<i>Culex quinquefasciatus</i>	AC1012
Quassin	Larvicidal Activity	in vitro	6 ppm	Active	Mosquito larvae.	AC1013
Quassinoids	Anti-ulcer Activity	Oral or IM Rat	1-2500 mg	Active	Effective in the prophylaxis or treatment of the peptic ulcers such as a gastric or duodenal ulcer.	AC1019
Simalikalactone D	Cytotoxic Activity	in vitro	5 ug/ml 1.02 ug/ml	Active Strong Activity		AC1007

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Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Quassin	Cytotoxic Activity	in vitro	CC50=134 ug/ml	Active		AC1007
Quassin	Cytotoxic Activity	in vitro	Not stated	Inactive	Artemia salina (brine shrimp) assay.	AC1015
Quassamarin	Antitumor Activity	Cell Culture	ED50=0.26-0.012 g/mL	Active	Human tumor cell lines KB, A-549, HCT-8, CAKI-1, MCF-7, SK-MEL-2.	AC1016
Simalikalactone D	Antitumor Activity	Cell Culture	ED50=0.26-0.012 g/mL	Active	Human tumor cell lines KB, A-549, HCT-8, CAKI-1, MCF-7, SK-MEL	AC1016

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