

## Biological Activities for Extracts of *Clavillia (Mirabilis jalapa)*

Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Aerial Parts India	Toxicity Assessment (quantitative)	ETOH-H <sub>2</sub> O(1:1) Ext	IP Mouse	1.0 gm/kg	Active		A03335
Root Not Stated	Toxicity Assessment (quantitative)	ETOH-H <sub>2</sub> O(1:1) Ext	IP Mouse	500.0 mg/kg			A03335
Entire Plant Singapore	Toxic Effect (general)	Plant	Oral Human Adult	Not stated	Active		T15330
Aerial Parts India	Uterine Stimulant Effect	ETOH-H <sub>2</sub> O(1:1) Ext	Rat Female	Not stated	Inactive	Uterus(estrog).	A03335
Seed Brazil	Neurotoxic Effect	Not stated	Not stated	Not stated	Active	Contains neurotoxins.	AD1011
Entire Plant Taiwan	Antimutagenic Activity	Hot H <sub>2</sub> O Ext	Not stated	3.0 mg	Inactive	<i>Salmonella typhimurium</i> TA98. vs. picrolonic acid induced mutagenicity.	T14099
Branches Mexico	Antimutagenic Activity	Hot H <sub>2</sub> O Ext	Not stated	3.0 mg	Inactive	<i>Salmonella typhimurium</i> TA98. vs. benzopyrene induced mutagenicity.	T14099
Branches Mexico	Antibacterial Activity	ETOH(95%) Ext	Agar Plate	2.8 mg	Equivocal Equivocal Inactive Inactive	<i>Bacillus subtilis</i> <i>Staphylococcus aureus</i> <i>Escherichia coli</i> <i>Streptococcus faecalis</i>	L06056
Leaf Guatemala	Antibacterial Activity	ETOH-H <sub>2</sub> O(1:1) Ext	Agar Plate	50.0 microliters	Inactive	<i>Neisseria gonorrhoea</i>	K27236
Leaf Guatemala	Antibacterial Activity	Tincture	Agar Plate	30.0 microliters	Inactive	<i>Escherichia coli</i> <i>Pseudomonas aeruginosa</i> <i>Staphylococcus aureus</i>	T15445
Not Stated Brazil	Antibacterial Activity	Not stated	Not stated	Not stated	Inactive	<i>Escherichia coli</i> <i>Bacillus subtilis</i> <i>Staphylococcus aureus</i> <i>Streptococcus faecalis</i>	T15630

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Seed Zaire	Antibacterial Activity	H2O Ext	Agar Plate	14.0 ml	Active	<i>Escherichia coli</i>	M28301
		H2O Ext	Agar Plate	15.0 ml	Active	<i>Salmonella typhosa</i>	
		H2O Ext	Agar Plate	15.0 ml	Active	<i>Shigella flexneri</i>	
		H2O Ext	Agar Plate	16.0 ml	Active	<i>Vibrio cholera</i>	
		H2O Ext	Agar Plate	25.0 ml	Active	<i>Staphylococcus aureus</i>	
		H2O Ext	Agar Plate	25.0 ml	Active	<i>Streptococcus pyogenes</i>	
		H2O Ext	Agar Plate	25.0 ml	Inactive	<i>Enterobacter species</i>	
		MEOH Ext	Agar Plate	50.0 ml	Active	<i>Enterobacter species</i>	
		MEOH Ext	Agar Plate	50.0 ml	Active	<i>Escherichia coli</i>	
		MEOH Ext	Agar Plate	50.0 ml	Active	<i>Salmonella typhosa</i>	
		MEOH Ext	Agar Plate	50.0 ml	Active	<i>Shigella flexneri</i>	
		MEOH Ext	Agar Plate	50.0 ml	Active	<i>Streptococcus pyogenes</i>	
		MEOH Ext	Agar Plate	50.0 ml	Active	<i>Vibrio cholera</i>	
		MEOH Ext	Agar Plate	50.0 ml	Weak Activity	<i>Staphylococcus aureus</i>	
		MEOH-H2O(2:1)	Agar Plate	0.4 mg/ml	Active	<i>Staphylococcus aureus</i>	
		MEOH-H2O(2:1)	Agar Plate	4.0 mg/ml	Active	<i>Enterobacter species</i>	
		MEOH-H2O(2:1)	Agar Plate	4.0 mg/ml	Active	<i>Escherichia coli</i>	
		MEOH-H2O(2:1)	Agar Plate	4.0 mg/ml	Active	<i>Salmonella typhosa</i>	
		MEOH-H2O(2:1)	Agar Plate	4.0 mg/ml	Active	<i>Shigella flexneri</i>	
		MEOH-H2O(2:1)	Agar Plate	4.0 mg/ml	Active	<i>Streptococcus pyogenes</i>	
MEOH-H2O(2:1)	Agar Plate	4.0 mg/ml	Active	<i>Vibrio cholera</i>			
Not Stated Brazil	Antimycobacterial Activity	Not stated	Not stated	Not stated	Inactive	<i>Mycobacterium smegmatis</i>	T15630
Callus Tissue Japan	Antiviral Activity	Not stated	Not stated	Not stated	Active	Plant pathogens.	M28970
Root USA	Antiviral Activity	Not stated	Potato Plant	Not stated	Active	Inhibited viral infection when sprayed over potato plants.	AD1009
Not Stated Brazil	Antifungal Activity	Not stated	Not stated	Not stated	Inactive	<i>Neurospora crassa</i>	T15630
Flower + Leaf + Root Guatemala	Antifungal Activity	Hot H2O Ext	Broth Culture	1.0 ml	Active Active  Inactive Inactive	<i>Epidermophyton floccosum</i> <i>Trichophyton mentagrophytes; var. Algodonosa.</i> <i>Microsporum canis</i> <i>Trichophyton mentagrophytes; var. Granulare.</i>	M27151

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Seed USA	Antifungal Activity	Not stated	Agar Plate	Not stated	Active	<i>Alternaria brassicola</i> <i>Ascochyta pisi</i> <i>Botrytis cinerea</i> <i>Cercospora beticola</i> <i>Colletotrichum lindemuthianum</i> <i>Fusarium culmorum</i> <i>Fusarium oxysporum</i> <i>Nectria haematocca</i> <i>Phoma betea</i> <i>Pyrenophora tritici-repentis</i> <i>Pyricularia oryzae</i> <i>Rhizoctonia solani</i> <i>Verticillium dahliae</i> <i>Venturia inaequalis</i>	AD1017
Not Stated Brazil	Antiyeast Activity	Not stated	Not stated	Not stated	Inactive	<i>Candida albicans</i>	T15630
Branches Mexico	Antiyeast Activity	ETOH(95%) Ext	Agar Plate	2.8 mg	Inactive	<i>Candida albicans</i>	L06056
Leaf Guatemala	Antiyeast Activity	Tincture	Agar Plate	30.0 microliters	Inactive	<i>Candida albicans</i>	T15445
Entire Plant Puerto Rico	Molluscicidal Activity	Aqueous slurry	Not stated	LD100=>1m ppm	Inactive Inactive	<i>Lymnaea columella</i> <i>Lymnaea cubensis</i>	T04621 T04621
Root Not Stated	Antispasmodic Activity	ETOH-H2O(1:1) Ext	Guinea Pig Ileum	Not stated	Active	vs. ACH- and histamine-induced spasms	A03335
Aerial Parts India	Cytotoxic Activity	ETOH-H2O(1:1) Ext	Cell Culture	ED50=>20.0 mcg/ml	Inactive	Ca-9kb.	A03335
Root Not Stated	Cytotoxic Activity	ETOH-H2O(1:1) Ext	Cell Culture	ED50=>20.0 mcg/ml	Inactive	Ca-9kb.	A03335
Leaf Malaysia(cult)	Epstein-barr Virus Early Antigen Induction	Ether Ext	Cell Culture	1.0 mcg/ml	Inactive	<i>Virus-Epstein-barr</i> . Assay designed to test for tumor promoting activity.	J13478
Leaf Malaysia	Inflammation Induction	Ether Ext	External Mouse Ear	10.0 microliters	Inactive	Assay designed to test for tumor promoting activity.	J13478

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Root Taiwan	Glutamate-pyruvate-trans-aminase Inhibition	ETOH-H2O(1:1) Ext	Cell Culture	1.0 mg/ml	Inactive	Cells-rat-liver. Vs.CCl4-induced hepatotoxicity.	T14999
Root Taiwan	Glutamate-pyruvate-trans-aminase Inhibition	ETOH-H2O(1:1) Ext	Cell Culture	1.0 mg/ml	Inactive	Cells-rat-liver. vs. PGE-1-induced pedal edema.	T14999
Aerial Parts South Korea	Tyrosinase Inhibition	MEOH(80%) Ext	Not stated	100.0 mcg/ml	Weak Activity		J16249

## Biological Activities for Compounds of Clavillia (*Mirabilis jalapa*)

Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Mirabilis antiviral protein (MAP)	Abortifacient Activity	Mice pregnant	Not stated	Active		K09120
Antimicrobial peptides Mj-AMP1 and Mj-AMP2	Neurotoxic Effect	Insects	Not stated	Inactive	No effect on pulse transmission in insect nerves.	H08273
Mirabilis antiviral protein (MAP)	Ribosome-Inactivating Protein Activity	Not stated	Not stated	Active Active	Inhibits ribosome activity, therefore protein synthesis. Inhibits poly(A), DNA and tobacco mosaic virus RNA.	AD1007
Mirabilis antiviral protein (MAP)	Ribosome-Inactivating Protein Activity	Rabbit reticulocyte	Not stated	Active	Inactivates both eukaryotic and prokaryotic ribosomes through RNA N-glycosidase activity.	AD1012
Mirabilis antiviral protein (MAP)	Ribosome-Inactivating Protein Activity	Prokaryote Eukaryote	Not stated	Active Active	<i>E. coli</i> Not stated.	AD1014
Mirabilis antiviral protein (MAP)	Ribosome-Inactivating Protein Activity	Prokaryote Eukaryote	IC50=200 nM Not stated	Active Active	<i>E. coli</i> Rabbit reticulocyte.	AD1015
Mirabilis antiviral protein (MAP)	Protein Synthesis Inhibition	Not stated	Not stated	Active	Type 1 ribosome-inactivating protein.	K09120
Mirabilis antiviral protein (MAP)	Protein Synthesis Inhibition	Rabbit reticulocyte	IC50=3.5 nM	Active	Inhibited protein synthesis, with 1/30 the activity of the ricin A chain.	AD1013
Antimicrobial peptides Mj-AMP1 and Mj-AMP2	Antibacterial Activity	Agar Plate	Not stated	Active Inactive	Gram-positive bacteria. Gram-negative bacteria.	H08273

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Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Antimicrobial peptides Mj-AMP1 and Mj-AMP2	Antibacterial Activity	Agar Plate	IC50=2-500 mu.g/ml	Inactive Active	Gram negative bacteria <i>E. coli</i> and <i>Erwinia carotovora</i> . Gram positive bacteria <i>Bacillus megaterium</i> and <i>Sarcina lutea</i> .	AD1016
2'-o-methylabronisoflavone	Antifungal Activity	Agar Plate	IC50=25 mcg/mL	Active	<i>Candida albicans</i> DSY1024	H27962
4-hydroxy-9-o-methyl boeravinone b	Antifungal Activity	Agar Plate	IC50=48 mcg/mL	Active	<i>Candida albicans</i> DSY1024	H27962
6-methoxy-boeravinone c	Antifungal Activity	Agar Plate	IC50=200 mcg/mL	Inactive	<i>Candida albicans</i> DSY1024	H27962
Antimicrobial Peptide Mj-AMP2	Antifungal Activity	Agar Plate	Not stated	Active		H20571
Mj-AMP1	Antifungal Activity	Agar Plate	IC50=6-300 mcg/mL	Active	13 plant pathogenic fungi.	H08273
Mj-AMP2	Antifungal Activity	Agar Plate	IC50=0.5-20 mcg/mL	Active	13 plant pathogenic fungi.	H08273
Antimicrobial peptides Mj-AMP1 and Mj-AMP2	Antifungal Activity	Agar Plate	20 mu.l	Active	<i>Fusarium culmorum</i>	AD1016
Mj-AMP1	Antifungal Activity	Agar Plate	IC50=20 mu.g/ml IC50=200 mu.g/ml IC50=60 mu.g/ml IC50=6 mu.g/ml IC50=30 mu.g/ml IC50=15 mu.g/ml IC50=200 mu.g/ml IC50=15 mu.g/ml IC50=25 mu.g/ml IC50=300 mu.g/ml IC50=6 mu.g/ml IC50=12 mu.g/ml l IC50=12 mu.g/ml	Active	<i>Alternaria brassicola</i> <i>Ascochyta pisi</i> <i>Botrytis cinerea</i> <i>Colletotrichum lindemuthianum</i> <i>Fusarium culmorum</i> <i>F. oxysporum f. sp pisi</i> <i>F. oxysporum f. sp. Lycopersici</i> <i>Nectria haematococca</i> <i>Phoma betae</i> <i>Pyrenophora tritici-repentis</i> <i>Pyricularia oryzae</i> <i>Verticillium dahliae</i> <i>Venturia inaequalis</i>	AD1016

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Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Mj-AMP2	Antifungal Activity	Agar Plate	IC50=6 mu.g/ml IC50=6 mu.g/ml IC50=2 mu.g/ml IC50=1 mu.g/ml IC50=3 mu.g/ml IC50=5 mu.g/ml IC50=10 mu.g/ml IC50=0.5 mu.g/ml IC50=6 mu.g/ml IC50=20 mu.g/ml IC50=0.5 mu.g/ml IC50=1 mu.g/ml	Active	<i>Alternaria brassicola</i> <i>Ascochyta pisi</i> <i>Botrytis cinerea</i> <i>Colletotrichum lindemuthianum</i> <i>Fusarium culmorum</i> <i>F. oxysporum f. sp pisi</i> <i>F. oxysporum f. sp. Lycopersici</i> <i>Nectria haematococca</i> <i>Phoma betae</i> <i>Pyrenophora tritici-repentis</i> <i>Pyricularia oryzae</i> <i>Verticillium dahliae</i> <i>Venturia inaequalis</i>	AD1016
Mj-AMP1	Antifungal Activity	Wheat Grapevine Sugarbeet	100 mu.g/ml	Active	<i>Septoria nodorum</i> <i>Plasmopara viticola</i> <i>Cercospora beticola</i>	AD1016
Antimicrobial peptides Mj-AMP1 and Mj-AMP2	Antifungal Activity	Agar Plate	10 mg/ml	Active Active Active Active Active Active Active Active	<i>Penicillium pinophilum</i> <i>Aureobasidium pullulans</i> <i>Aspergillus niger</i> <i>Penicillium digitatum</i> <i>Colletotrichum musae</i> <i>Botrytis cinerea</i> <i>Fusarium culmorum</i> <i>Geotrichum cnaididum</i> <i>Verticillium albo-atrum</i>	AD1016
Antimicrobial peptides Mj-AMP1 and Mj-AMP2	Antifungal Activity	Agar Plate	2.5 mg/ml	Active Active Active Active Active Active Active Active	<i>Penicillium pinophilum</i> <i>Aureobasidium pullulans</i> <i>Aspergillus niger</i> <i>Penicillium digitatum</i> <i>Colletotrichum musae</i> <i>Botrytis cinerea</i> <i>Fusarium culmorum</i> <i>Geotrichum cnaididum</i> <i>Verticillium albo-atrum</i>	AD1016
Antimicrobial peptides Mj-AMP1 and Mj-AMP2	Antiyeast Activity	Agar Plate	500 mu.g/ml	Active	<i>Saccharomyces cerevisiae</i>	AD1016

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Mirabilis antiviral protein (MAP)	Antiviral Activity	Not stated	Not stated	Active	<i>Tobacco mosaic virus</i> <i>Potato virus X</i> <i>Potato virus Y</i> <i>Potato spindle tuber viroid</i> Activity due to its ribosome-inactivating protein activity.	AD1009
Mirabilis antiviral protein (MAP)	Antiviral Activity	Not stated	Not stated	Active		K09120
Mirabilis antiviral protein (MAP)	Antiviral Activity	In vitro	Not stated	Active	Endogenous MAP can enter the cytoplasm of a cell and induce viral resistance by causing the cell to undergo apoptosis.	AD1010
Mirabilis antiviral protein (MAP)	Antiproliferative Activity	Not stated	Not stated	Active	Tumor cells.	K09120

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