

Short report

Antimicrobial activity of the *Derris elliptica*,
Derris indica and *Derris trifoliata* extractives

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Abstract

Various parts of *Derris elliptica*, *Derris indica* and *Derris trifoliata* on fractionation with a number of solvents (petrol, dichloromethane, ethyl acetate, butanol and methanol) gave fractions which demonstrated a varied level of broad spectrum antibacterial activity. Good activity was exhibited by the methanol fractions of the leaves and root heart-wood, petrol, butanol and methanol fractions of the root bark of *D. indica* and petrol and ethyl acetate fractions of *D. trifoliata*. None of the plants showed antifungal activity.

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Keywords: *Derris elliptica*; *Derris indica*; *Derris trifoliata*; Antibacterial activity

1. Plant

Derris elliptica (Wall.) Benth., *Derris indica* (Lamk.) Bennet and *Derris trifoliata* Lour. (Fabaceae), leaves, stem and root barks and heart-woods, collected in September 2001, from Lababia in Papua New Guinea (PNG), were identified at the Forestry Department, PNG University of Technology, Lae, where voucher specimens are deposited.

2. Uses in traditional medicine and reported activities

Derris spp. are known as insecticides and for stunning fish. *D. elliptica* is used for scabies, as abortifacient, as purgative, in stomachache, to stop bleeding, for toothache and for sickness of breasts. *D. trifoliata* is applied to cuts and wounds, used to treat calculus and asthma [1,2]. *D. elliptica* has been reported as molluscidal [3], antimycotic against plants fungi [4] and anti *Escherichia coli* [5].

3. Previously isolated classes of constituents

Rotenone, triterpenoids, tannins, saponins and sugars [1,2].

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Table 1

Antimicrobial activity of the *D. elliptica*, *D. trifoliata* and *D. indica* extracts^a

Microorganisms	<i>D. elliptica</i>										<i>D. trifoliata</i>										<i>D. indica</i>										Ref ^b						
	Leaves					Stem					Leaves					Root					Leaves					Root bark						Root heart-wood					
	P	D	E	B	M	P	D	E	B	M	P	D	E	B	M	P	D	E	B	M	P	D	E	B	M	P	D	E	B	M		Chl					
<i>Bacillus cereus</i>	G+	10	0	0	8	8	0	10	0	0	10	12	12	14	12	12	12	10	12	8	10	10	10	8	12	14	14	10	8	14	14	10	10	8	10	14	16
<i>Bacillus coagulans</i>	G+	8	0	0	8	10	0	8	0	0	10	12	10	14	8	12	12	8	14	12	12	10	10	10	10	14	14	8	8	14	14	12	10	8	10	14	18
<i>Bacillus megaterium</i>	G+	10	0	0	8	12	0	8	0	0	12	10	10	14	8	12	12	8	14	12	12	8	8	10	12	14	14	8	8	14	14	12	10	8	10	16	16
<i>Bacillus subtilis</i>	G+	10	0	0	10	10	0	8	0	0	10	12	10	16	10	12	14	10	14	10	12	10	10	10	12	14	16	10	10	16	16	12	10	8	12	14	16
<i>Lactobacillus casei</i>	G+	12	8	0	12	12	0	10	0	0	12	12	10	16	10	12	14	8	12	10	12	10	10	10	16	14	8	8	16	16	12	10	10	12	14	18	
<i>Micrococcus luteus</i>	G+	12	8	0	12	12	0	10	0	0	12	12	10	18	12	14	12	8	14	8	10	8	8	10	10	14	14	8	10	14	14	12	10	8	10	16	16
<i>Micrococcus roseus</i>	G+	10	0	0	10	12	0	10	0	0	10	14	10	14	10	14	14	10	14	10	10	10	8	10	10	14	12	8	10	14	14	10	10	8	10	14	6
<i>Staphylococcus albus</i>	G+	12	0	0	10	12	0	8	0	0	12	14	12	14	8	12	14	10	14	12	10	10	8	8	10	16	16	8	8	18	16	12	8	8	10	16	16
<i>Staphylococcus aureus</i>	G+	12	0	0	12	12	0	10	0	0	12	12	12	16	10	10	14	8	16	10	10	10	10	10	12	16	16	10	8	16	16	12	10	8	10	16	18
<i>Staphylococcus epidermidis</i>	G+	10	0	8	12	8	0	10	0	0	10	14	12	16	10	12	14	8	14	8	10	8	8	8	12	14	14	8	10	14	18	12	10	10	12	16	0
<i>Streptococcus faecalis</i>	G+	10	0	0	10	10	0	10	8	0	10	14	14	18	12	12	12	10	16	10	12	10	8	8	10	14	14	10	8	14	14	12	10	8	10	14	0
<i>Streptococcus pneumoniae</i>	G+	8	8	8	12	10	0	10	0	8	12	14	12	16	10	12	12	10	12	8	12	10	8	8	10	14	14	10	8	14	16	10	12	10	10	14	18
<i>Agrobacterium tumefaciens</i>	G−	10	0	0	12	10	0	8	8	0	12	12	10	14	12	10	14	8	14	8	10	8	8	10	10	14	14	10	10	16	16	10	10	8	12	16	12
<i>Citrobacter freundii</i>	G−	10	0	0	12	10	0	8	0	0	10	14	10	16	12	10	14	8	14	10	10	10	10	10	12	16	16	8	10	16	16	12	10	8	10	16	16
<i>Enterobacter aerogenes</i>	G−	12	0	0	8	8	0	8	0	0	10	14	10	16	12	10	14	10	16	12	10	10	8	8	10	16	14	10	10	16	14	12	10	8	10	14	18
<i>Escherichia coli</i>	G−	12	0	0	10	10	0	10	0	0	12	14	12	18	10	12	12	10	14	10	12	8	10	8	10	16	14	10	10	18	14	10	12	8	10	14	18
<i>Klebsiella pneumonia</i>	G−	10	8	8	10	10	0	8	0	0	12	14	10	18	18	10	12	10	14	8	12	10	10	10	10	14	16	8	8	16	16	10	10	8	12	16	0
<i>Neisseria gonorrhoeae</i>	G−	10	0	8	10	8	0	10	0	0	10	14	12	18	12	12	14	10	14	10	12	8	8	10	12	14	16	8	8	18	18	10	10	10	12	16	18
<i>Proteus mirabilis</i>	G−	12	0	8	10	8	0	10	0	0	10	14	10	14	8	10	14	10	16	10	12	8	8	8	10	14	16	8	8	16	16	10	10	10	10	14	16
<i>Proteus vulgaris</i>	G−	10	8	0	10	12	8	8	0	0	10	14	10	18	10	10	12	10	14	10	10	10	8	8	10	14	16	10	8	16	14	10	10	8	10	14	18
<i>Pseudomonas aeruginosa</i>	G−	12	8	8	10	12	0	8	8	0	12	12	12	16	10	10	12	8	14	10	10	8	8	8	10	14	14	10	10	18	14	12	12	8	10	14	24
<i>Salmonella typhi</i>	G−	10	0	0	10	10	0	10	8	0	12	14	10	16	12	10	12	10	12	10	12	10	10	10	10	14	14	8	10	18	14	12	12	8	12	16	16
<i>Salmonella typhimurium</i>	G−	10	0	0	8	10	0	10	0	0	10	14	10	14	12	12	12	10	14	12	12	10	8	10	10	16	14	8	8	18	14	10	10	10	10	14	16
<i>Serratia marcescens</i>	G−	10	0	0	10	10	0	10	0	0	10	14	10	14	12	10	14	10	14	8	12	8	10	10	12	16	14	8	8	16	14	10	10	10	10	14	0
<i>Trichomonas vaginalis</i>	Pz	12	8	8	10	12	8	10	8	8	12	14	12	18	12	10	14	10	16	12	12	10	10	10	10	16	16	10	10	18	16	10	10	8	12	14	16

^a Values are inhibition zone (mm) and an average of triplicate. P, petrol (60–80 °C) fraction; D, CH₂Cl₂ fraction; E, ethyl acetate fraction; B, butanol fraction and M, methanol fraction (conc. 4 mg/disc); G, gram reaction of bacterium; Pz, protozoan.

^b Chl, chloramphenicol (10 µg disc Oxoid B42960).

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