

E2-18: A novel cytotoxic compound from a Sri Lankan *Usnea* sp

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Lichens produce a wide range of natural products among which over 350 metabolites have been identified. Many are unique to lichens and an appreciable number have been shown to have antimicrobial and other biological activities of potential economic value. The toxic properties of lichen products suggest that they might function in the chemical defence of lichen thalli against pathogens and grazing animals.

The present study describes the isolation of a novel endodisulphide from an *Usnea* species growing on a decaying, dead tree of *Acacia decurrens* in Ambewala, Central Province, Sri Lanka. The same *Usnea* species also grows on a variety of trees in the Horton Plains. The CH₂Cl₂ extract of the dried lichen when subjected twice to medium pressure liquid chromatography with solvent gradients ranging from hexane - 4% MeOH/CH₂Cl₂ and CH₂Cl₂ - 8% MeOH/CH₂Cl₂, flash chromatography (eluent CH₂Cl₂) followed by HPLC (normal phase) yielded the compound (30 mg).

The structure of the compound was elucidated by high resolution FAB mass spectroscopy, and by a combination of 1D and 2D NMR techniques including the homonuclear shift correlation (COSY), heteronuclear correlation (HETCOR) giving both one-bond and long range coupling. The final confirmation was arrived at by X-ray analysis. The compound showed antimitotic activity at 1 µg/ml concentration.

Apart from this compound, usnic acid, which is a known cytotoxic compound, and β-sitosterol was also isolated from the same extract.

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Table 1 ¹H and ¹³C NMR values for compound

Proton	¹ H NMR δppm	Carbon	¹³ C NMR δppm
H-14	t, 0.92	C-14	13.84
H-13	q, 1.68	C-13	18.43
H-16	s, 2.14	C-16	20.72
H-12	m, 2.35	C-12	35.81
H-10 & H-10'	s, s, 2.79, 2.81	C-10 & C-10'	54.80
H-8 & H-8'	Br s, 3.60	C-8 & C-8'	51.01
H-9 & H-9'	d, 3.70	C-9 & C-9'	36.92
H-4 (1) & H-4'	m, 4.33	C-4 & C-4'	56.14
H-4 (2) & H-4'	s, 4.42	C-7 & C-7'	64.71, 64.98
H-7 & H-7'	Br s, 5.66	C-6 & C-6'	120.26
H-6 & H-6'	Br s, 5.79	C-11	173.29
		C-15	170.60
		C-5 & C-5'	137.29
		C-3 & C-3'	75.80
		C-1 & C-1'	163.5