A 3-vinyl cephem derivative from *Aspergillus awamori* associated with banana fruit

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After the accidental discovery of penicillin, fungi have been historically found to be a promising source for bioactive compounds. In a way towards the search for bioactive compounds from Sri Lankan flora, we studied the secondary metabolites produced by a fungus associated with the fruits of banana *Musa aphthal16e* cv. *Ambul*. A pure culture of the *Aspergillus awamori* strain was isolated from the inner side of a sterilized, diseased banana fruit peel on potato dextrose agar medium (PDA). Cultivation of *A. awamori* was carried out on PDA and in potato dextrose broth (PDB) media for 4 weeks. The fungal media, as well as the mycelium of PDB, were extracted with EtOAc. Combined EtOAc extracts were chromatographed over silica gel, RP silica gel (C_{18}), Sephadex LH-20 and RP HPLC to furnish a cephem compound 4-methoxybenzyl-7-phenylacetamido-3-vinyl-3-cephem-4carboxylate (4-methoxybenzyl-7-(2-phenylacetamido)-8-oxo-3-vinyl-5-thia-1-aza-bicyclo [4.2.0]oct-2-ene-2-carboxylate) (**1**), together with three naphtha-γ-pyrones, flavasperone (**2**), foncesinone A (**3**) and aurasperone A (**4**), and three alkaloids, aspernigrin A (**5**), pestalamide C (**6**) and nigragillin (**7**). Although the compound **1** has been synthesized, this the first report on the isolation of **1** from a natural source. Further this is the first report of the isolation of a 3-vinyl cephem compound of microbial origin. Cephems are a sub-group of β-lactam antibiotics and they are important antibiotics in the treatment of a variety of infectious diseases because of their broad spectrum of activity and high therapeutic index. Identification of the genes responsible for the biosynthesis of the 3-vinyl moiety from *A. awamori* will open the way to produce the 3-vinyl cephem compound in quantity by fermentation through a genetic engineering study.

Keywords: *Aspergillus awamori; cepham antibiotics; fungal metabolites*