

## Supplementary Data

### Microbial oxidation of the fusidic acid side chain by *Cunninghamella echinulata*

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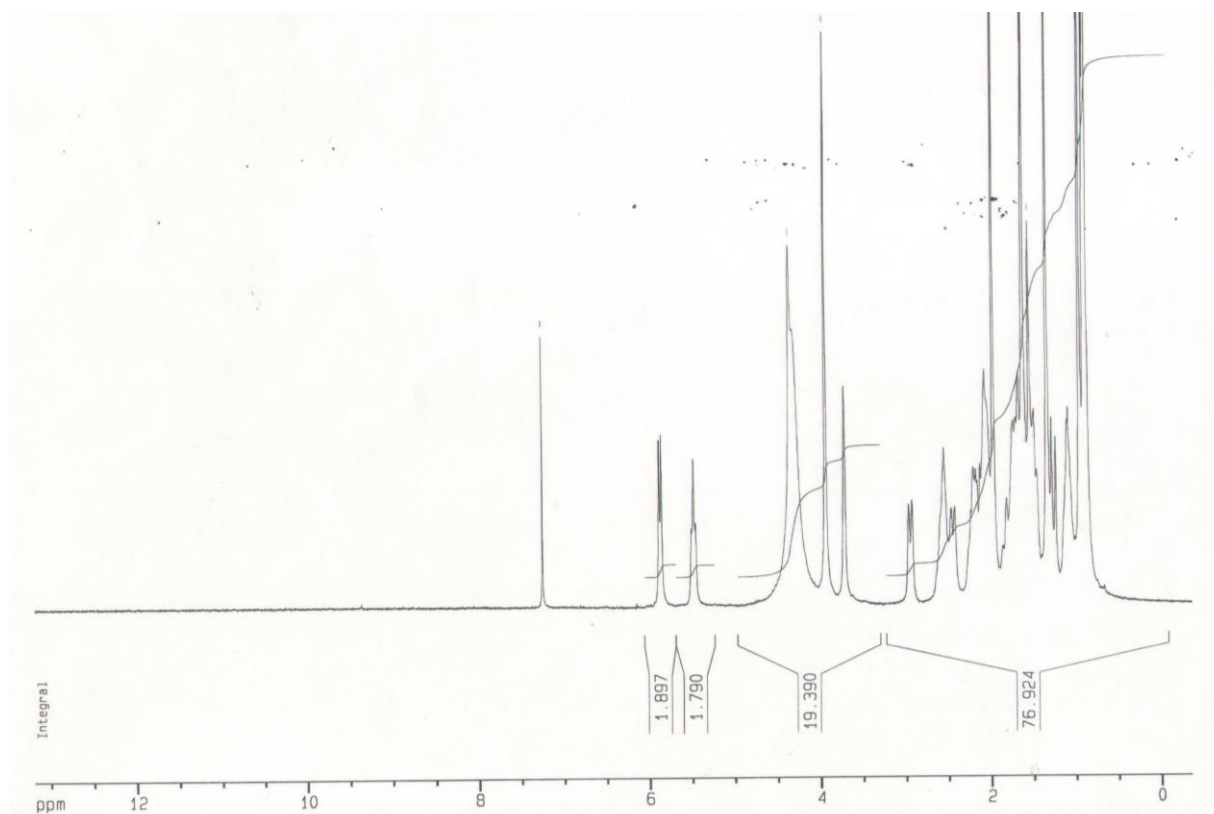
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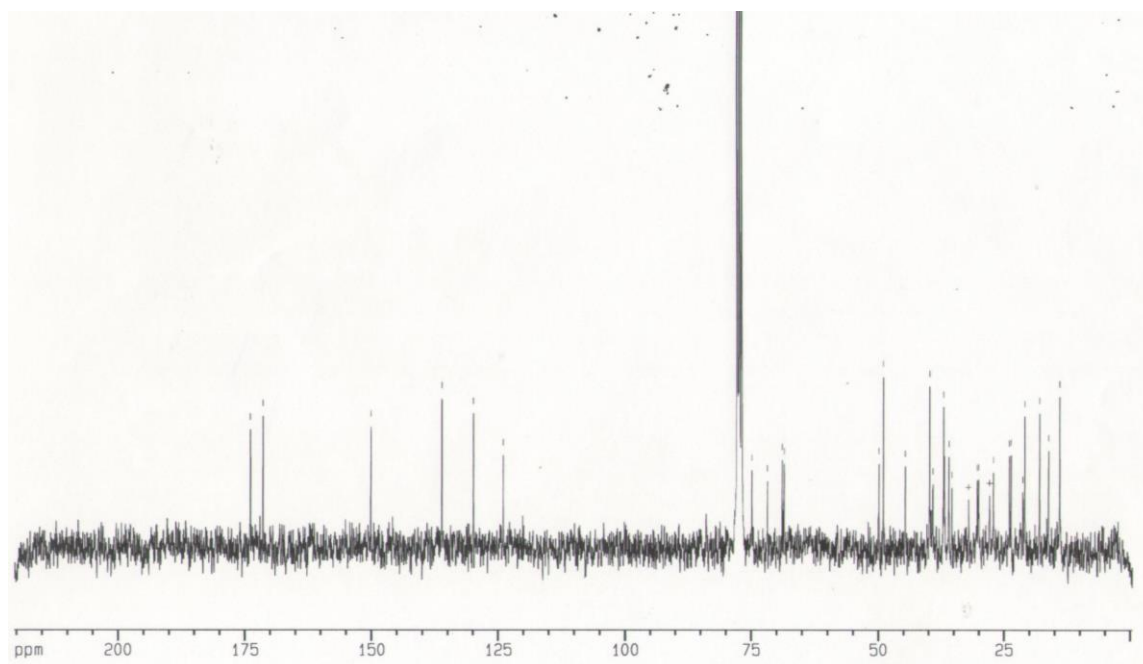
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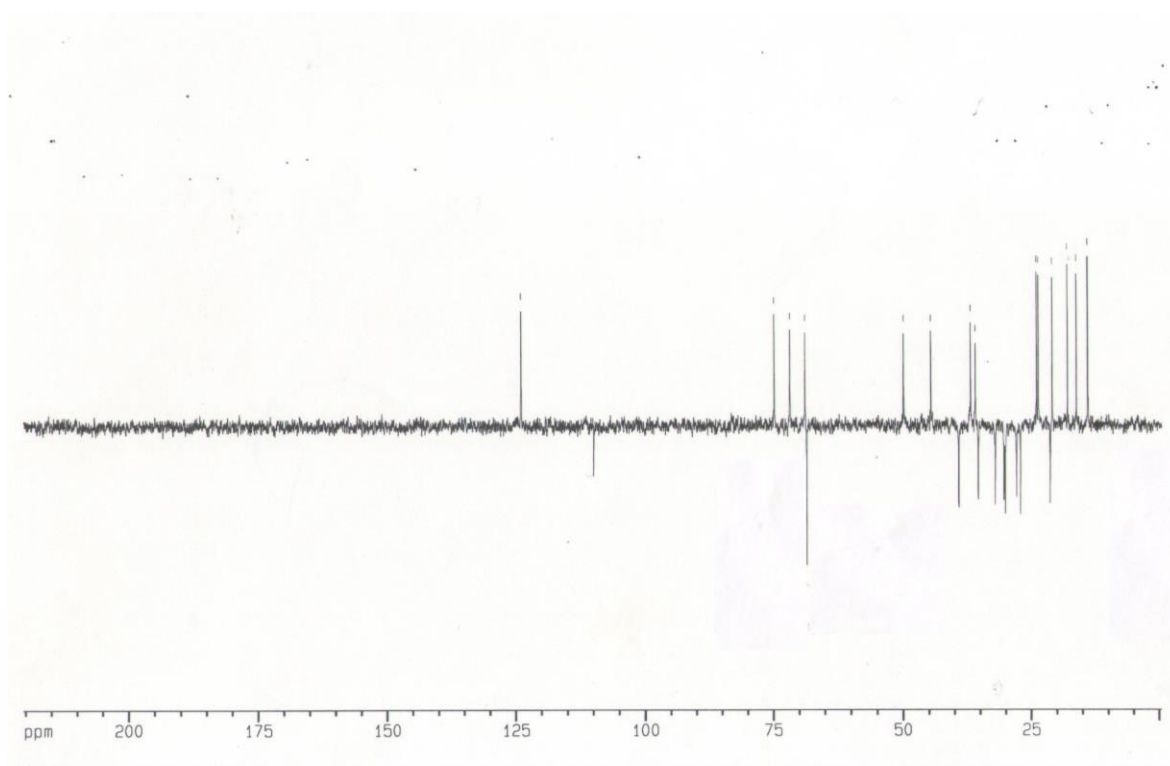




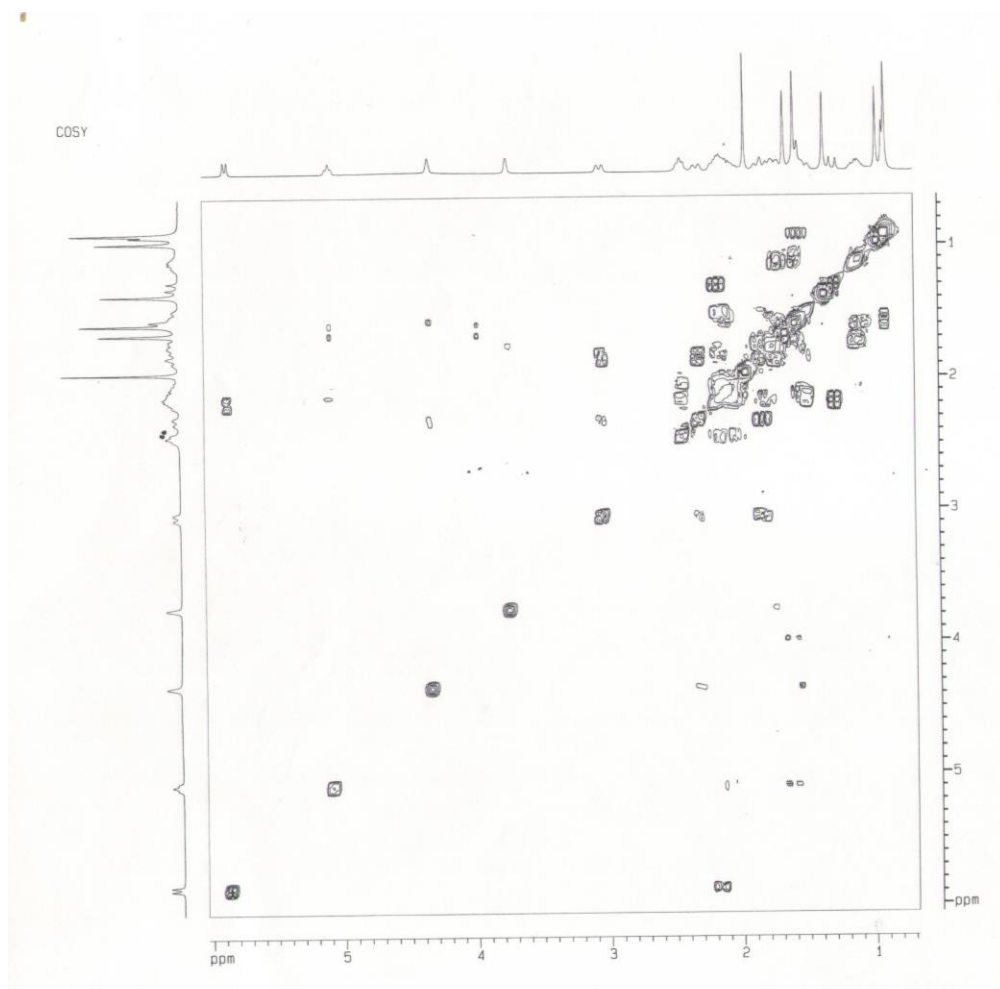
**Figure S1.**  $^1\text{H}$  NMR spectrum of (24*E*)- 27-hydroxyfusidic acid (**2**), ( $\text{CDCl}_3$ , 300 MHz)



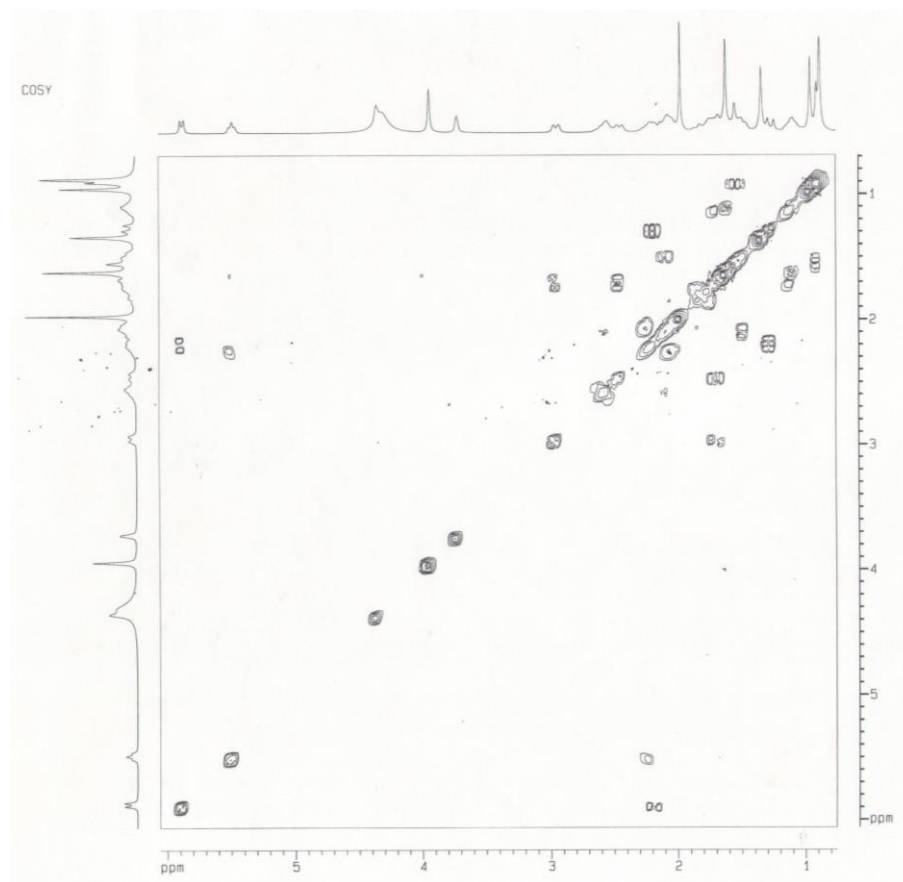
**Figure S2.**  $^{13}\text{C}$  NMR spectrum of (24*E*)- 27-hydroxyfusidic acid (**2**), ( $\text{CDCl}_3$ , 75 MHz)



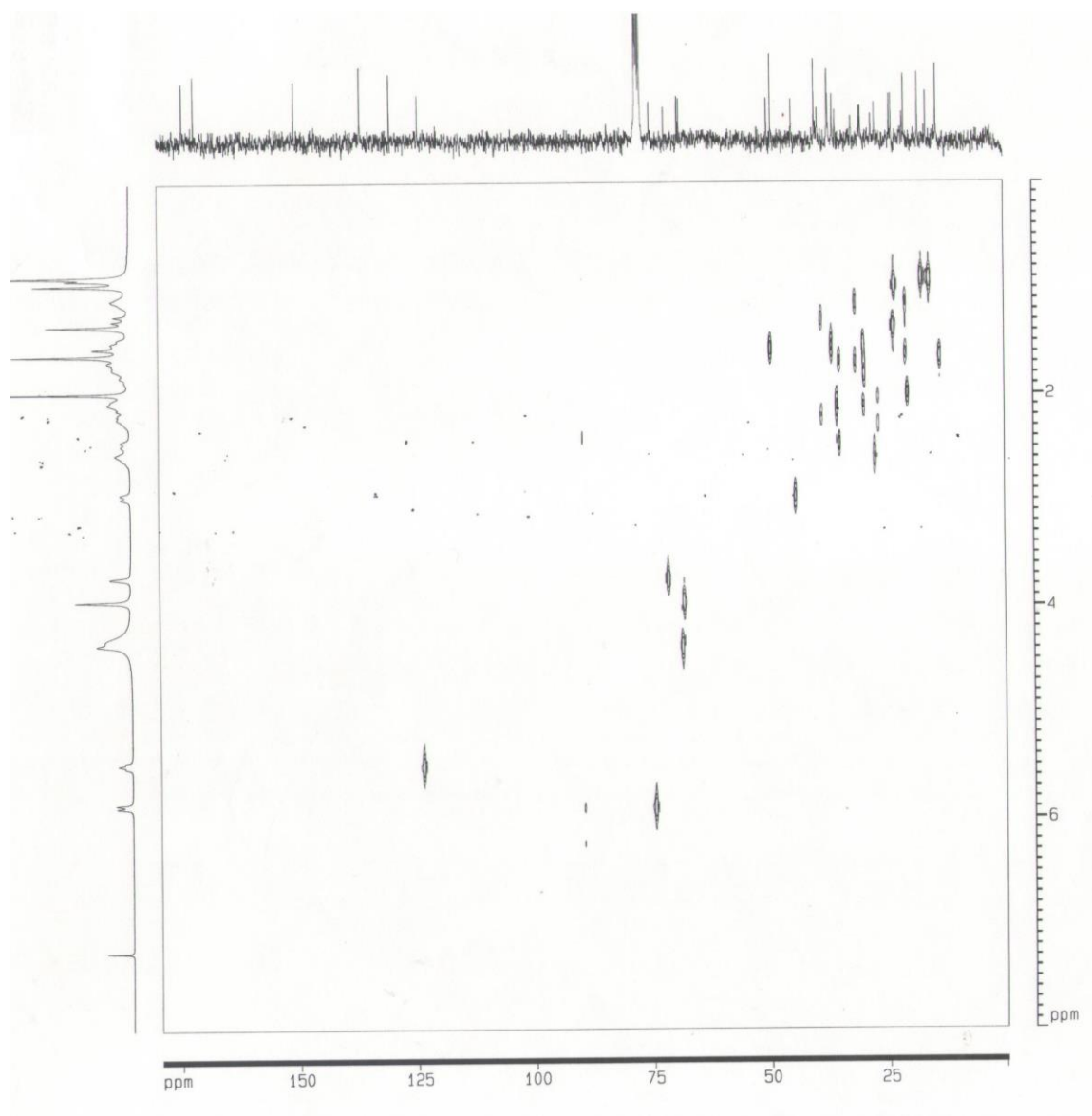
**Figure S3.** DEPT 135 spectrum of (*24E*)- 27-hydroxyfusidic acid (**2**)



**Figure S4.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum of fusidic acid (**1**).

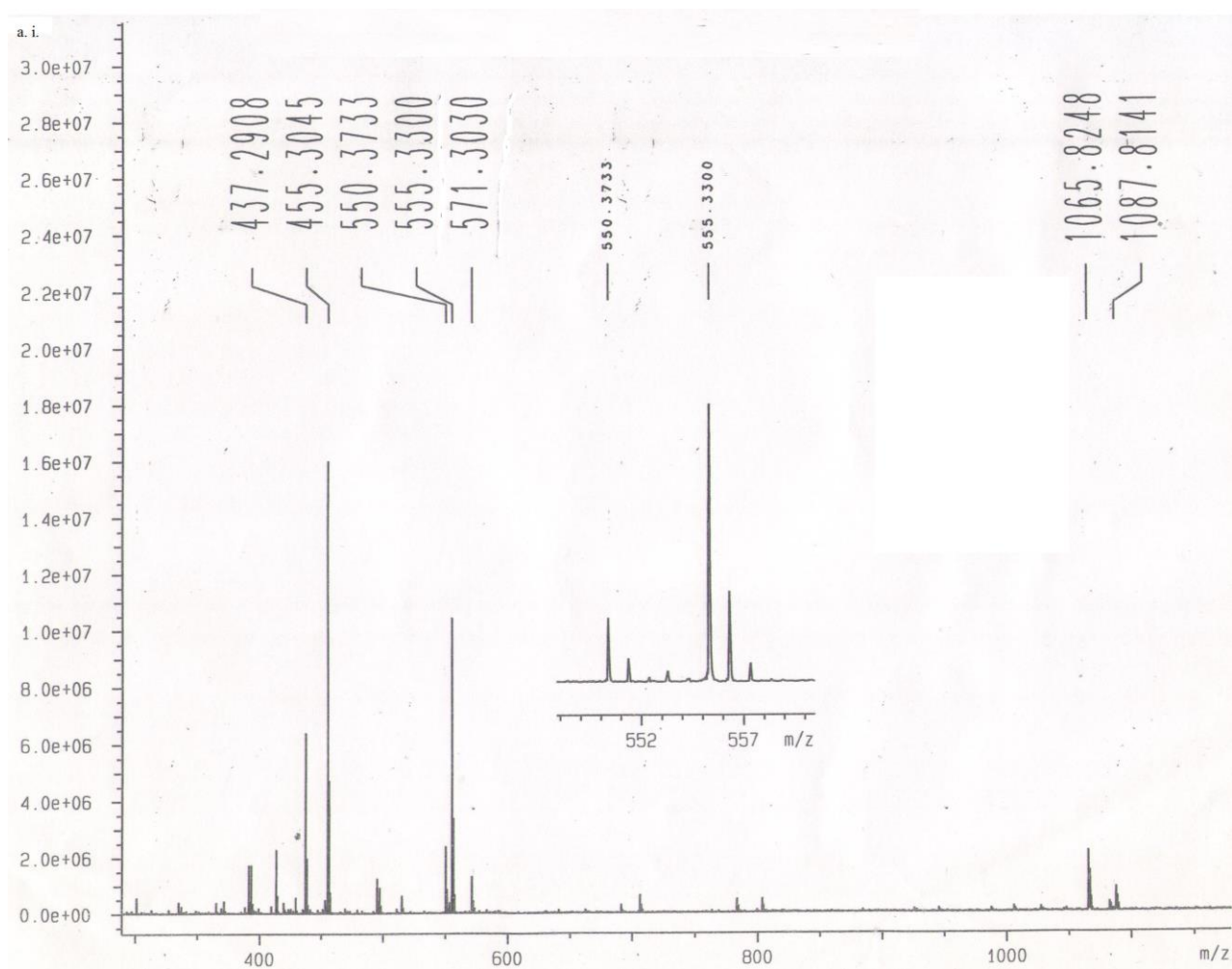


**Figure S5.** <sup>1</sup>H-<sup>1</sup>H COSY spectrum of (*24E*)-27-hydroxyfusidic acid (**2**).

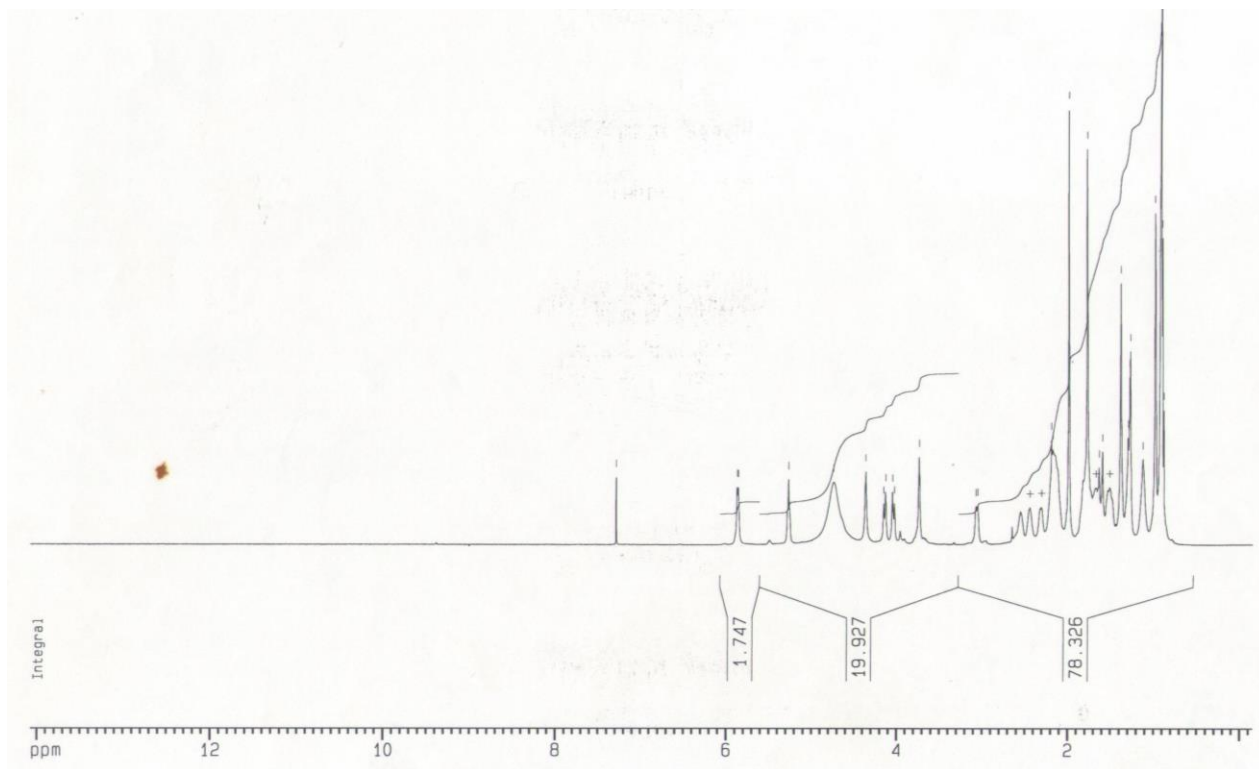


**Figure S6.** HSQC spectrum of (24*E*)- 27-hydroxyfusidic acid (**2**)

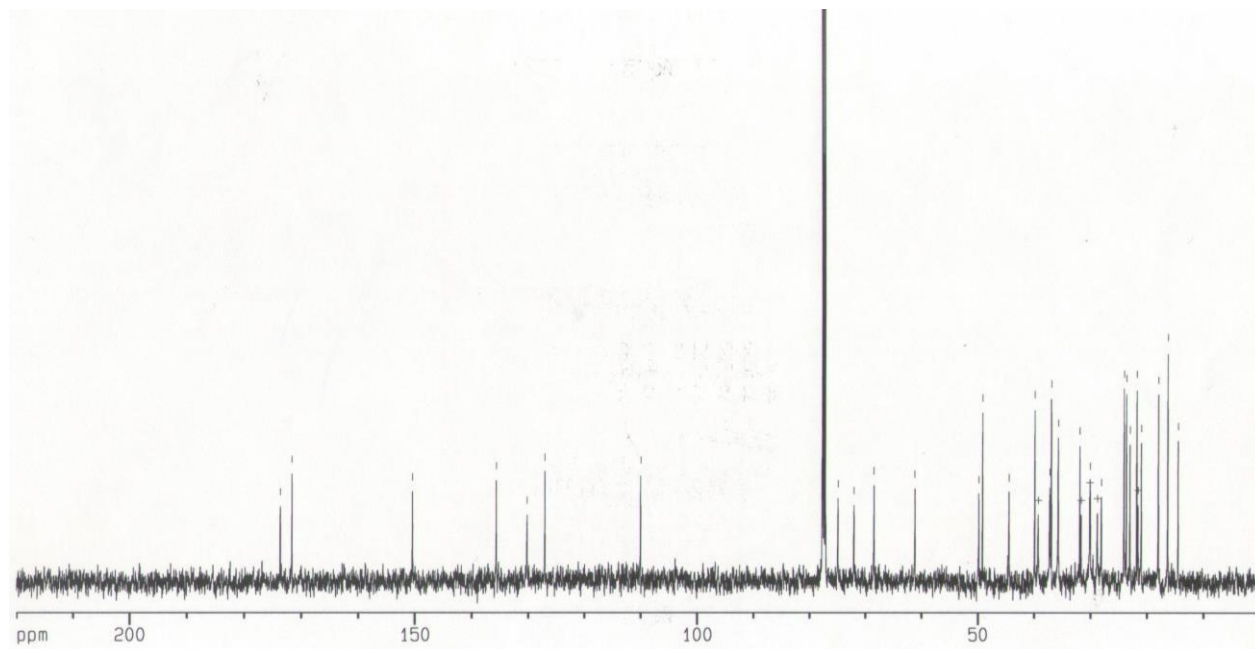




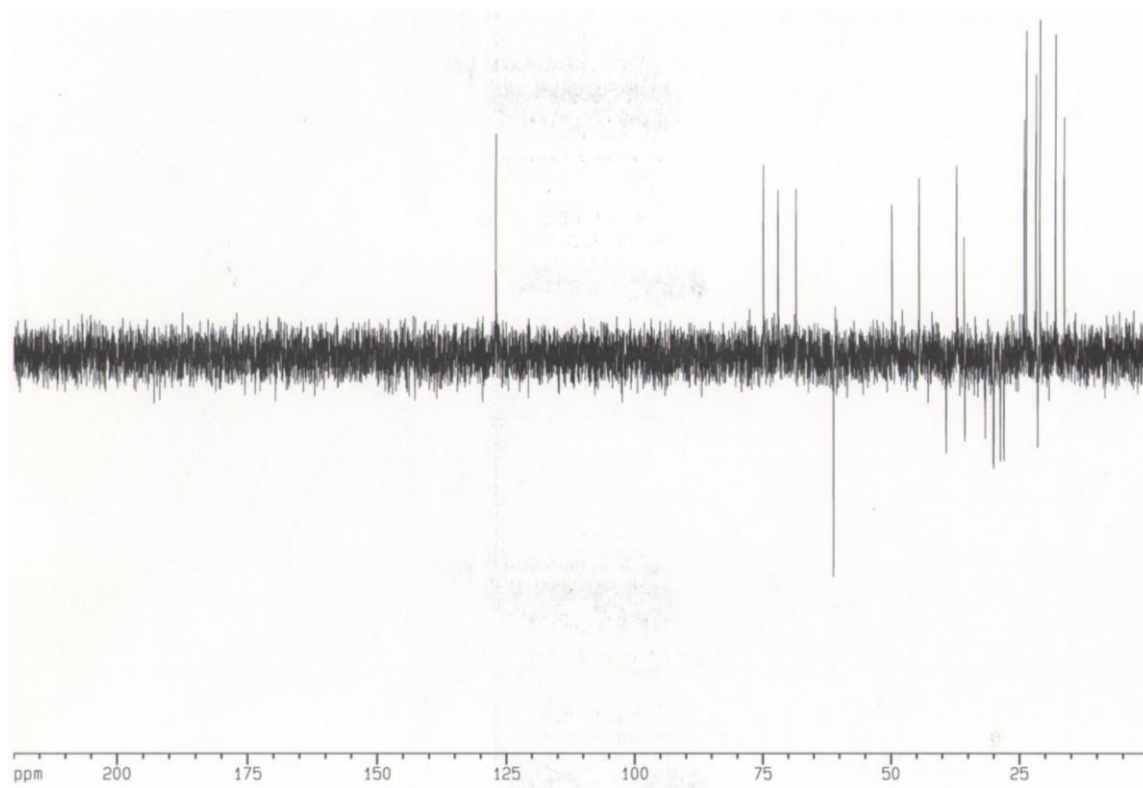
**Figure S7.** HRESI-MS spectrum of (24*E*)- 27-hydroxyfusidic acid (**2**)



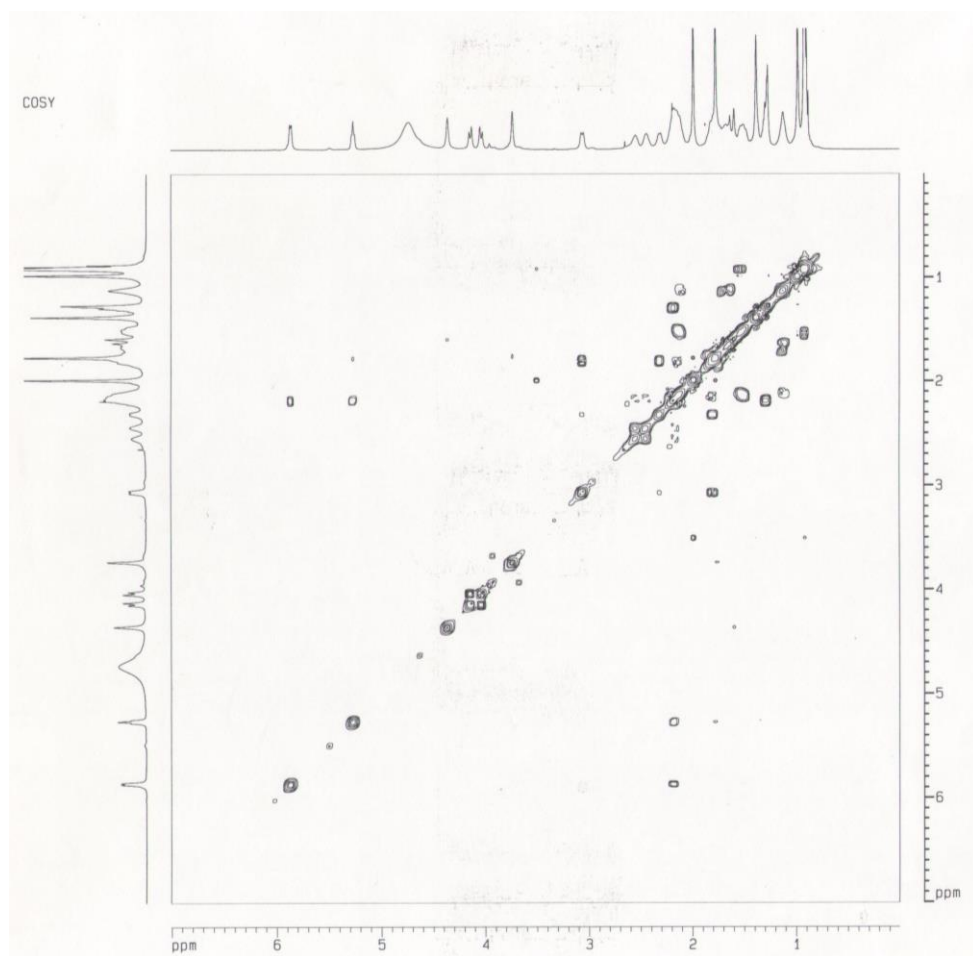
**Figure S8.**  $^1\text{H}$  NMR spectrum of (24Z)- 26-hydroxyfusidic acid (**3**), ( $\text{CDCl}_3$ , 500 MHz)



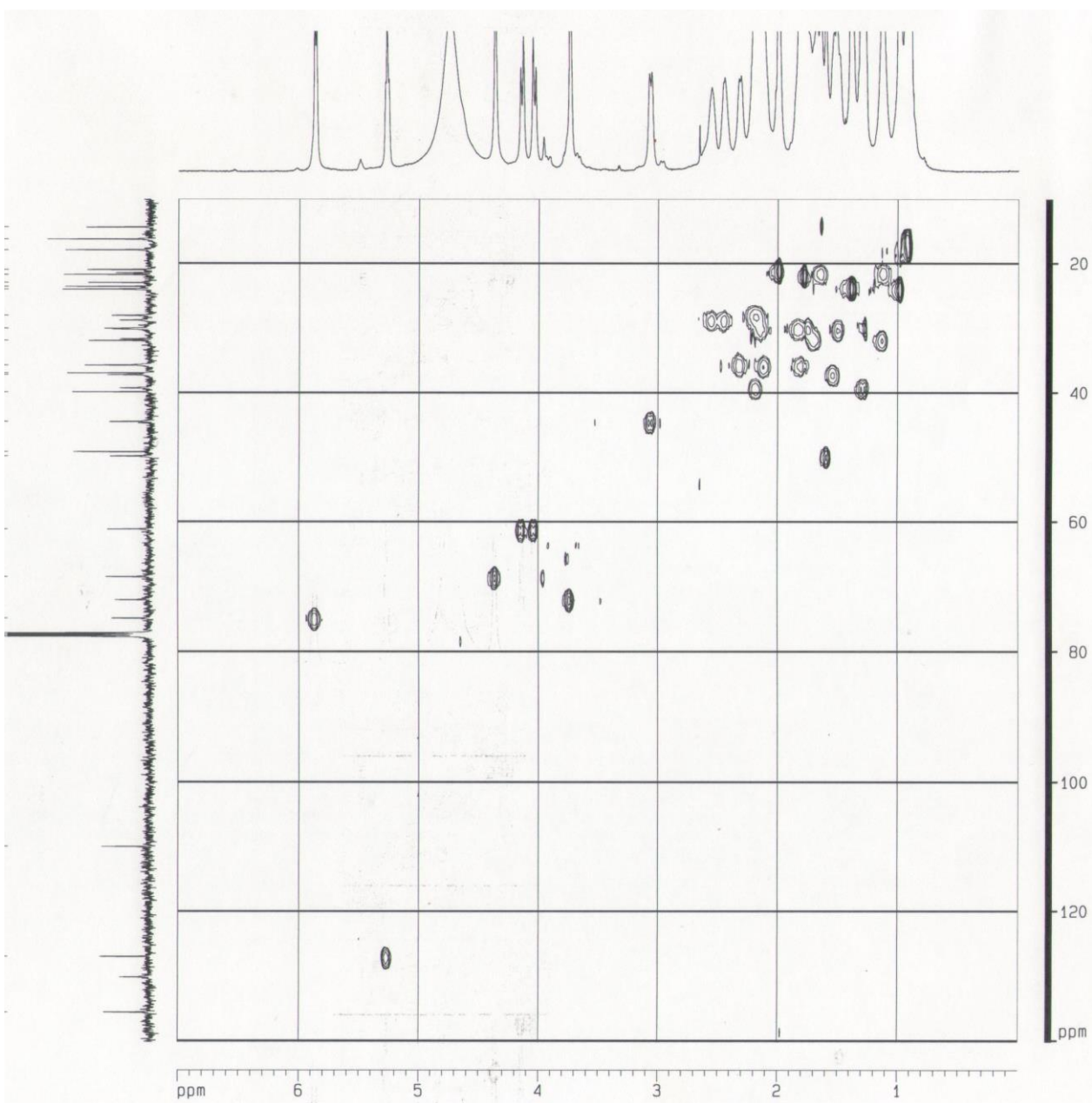
**Figure S9.**  $^{13}\text{C}$  NMR spectrum of (24Z)- 26-hydroxyfusidic acid (**3**), ( $\text{CDCl}_3$ , 125 MHz)



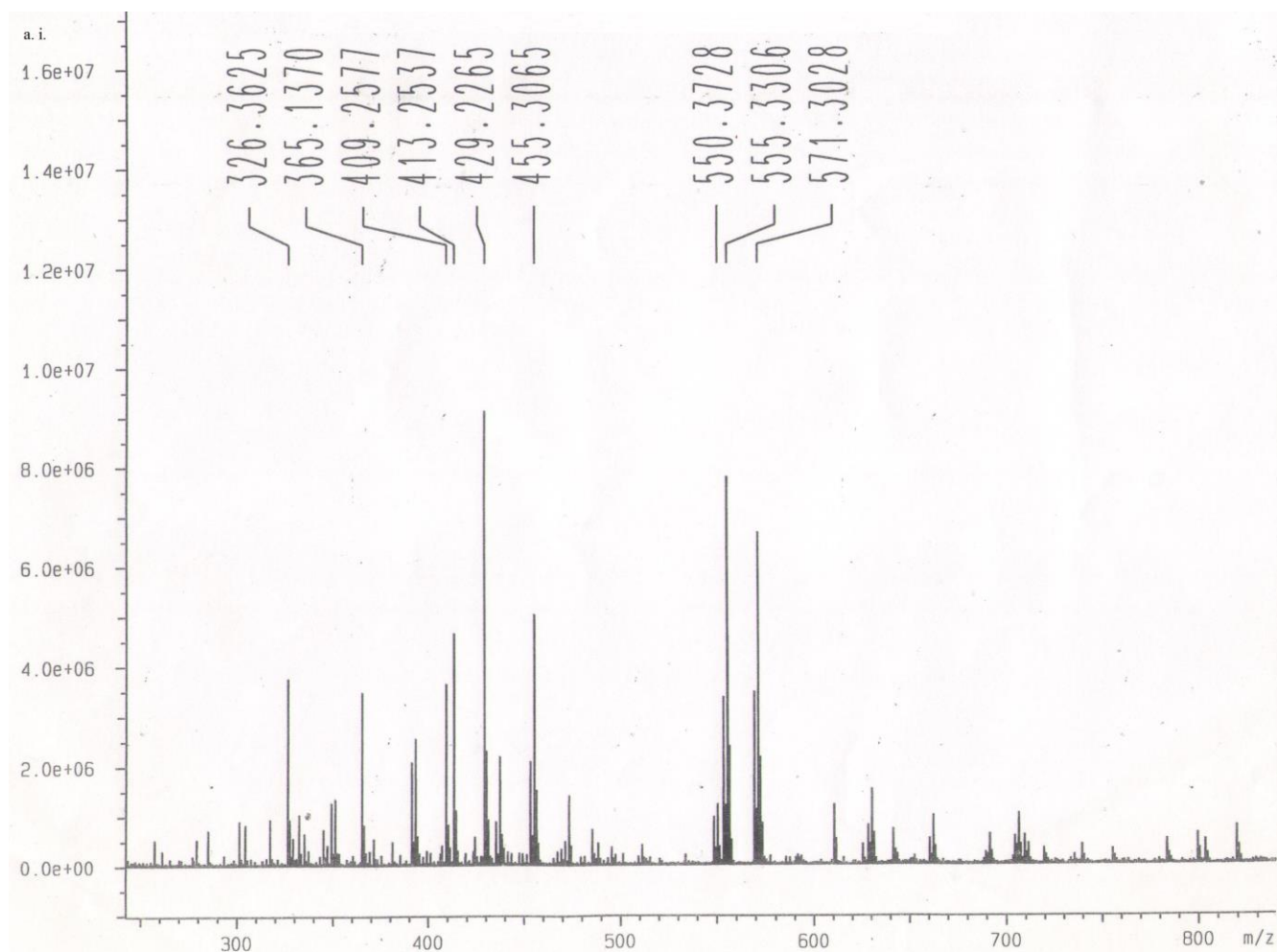
**Figure S10.** DEPT 135 spectrum of (24Z)- 26-hydroxyfusidic acid (**3**).



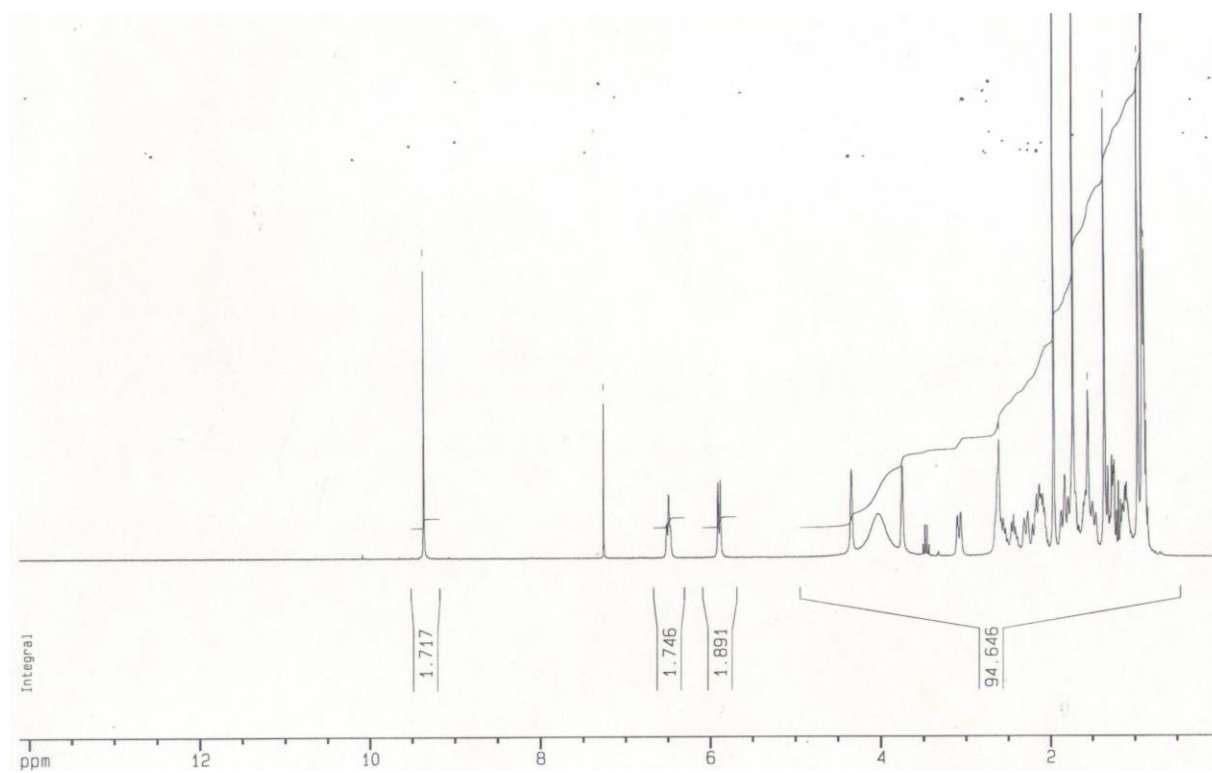
**Figure S11.** <sup>1</sup>H-<sup>1</sup>H COSY spectrum of (24Z)- 26-hydroxyfusidic acid (**3**).



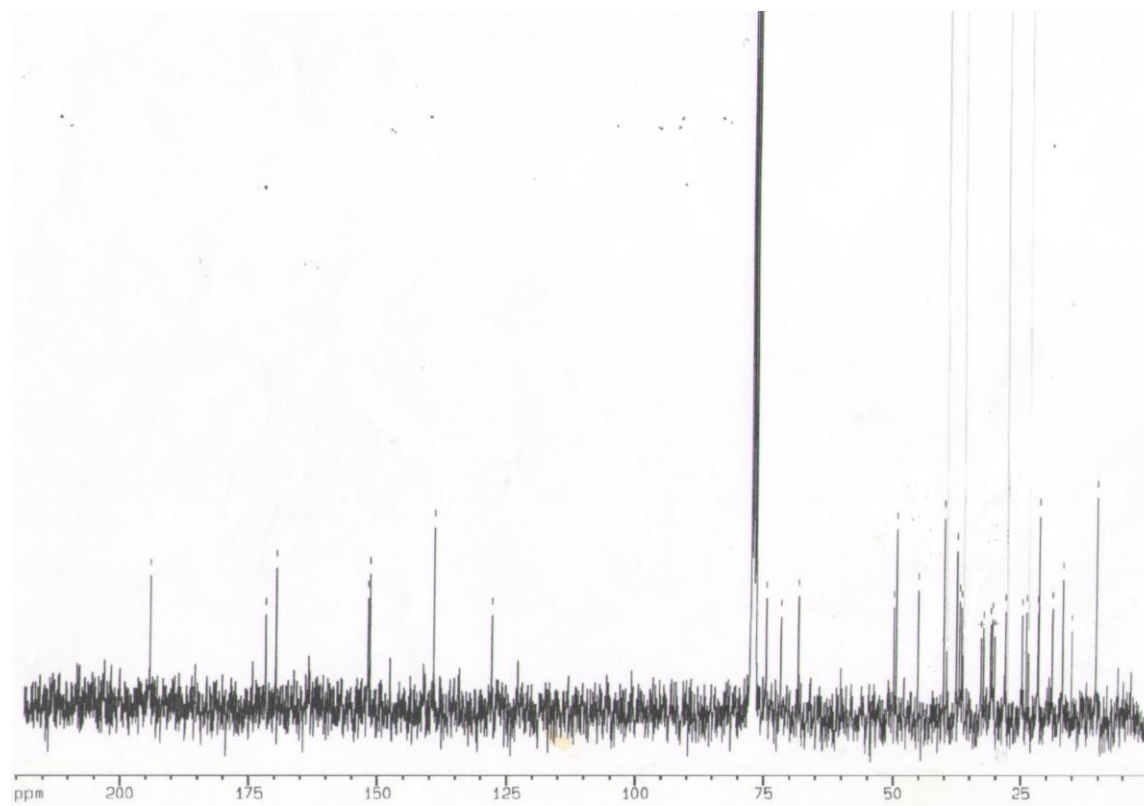
**Figure S12.** Gradient HMQC spectrum of (24Z)- 26-hydroxyfusidic acid (**3**)



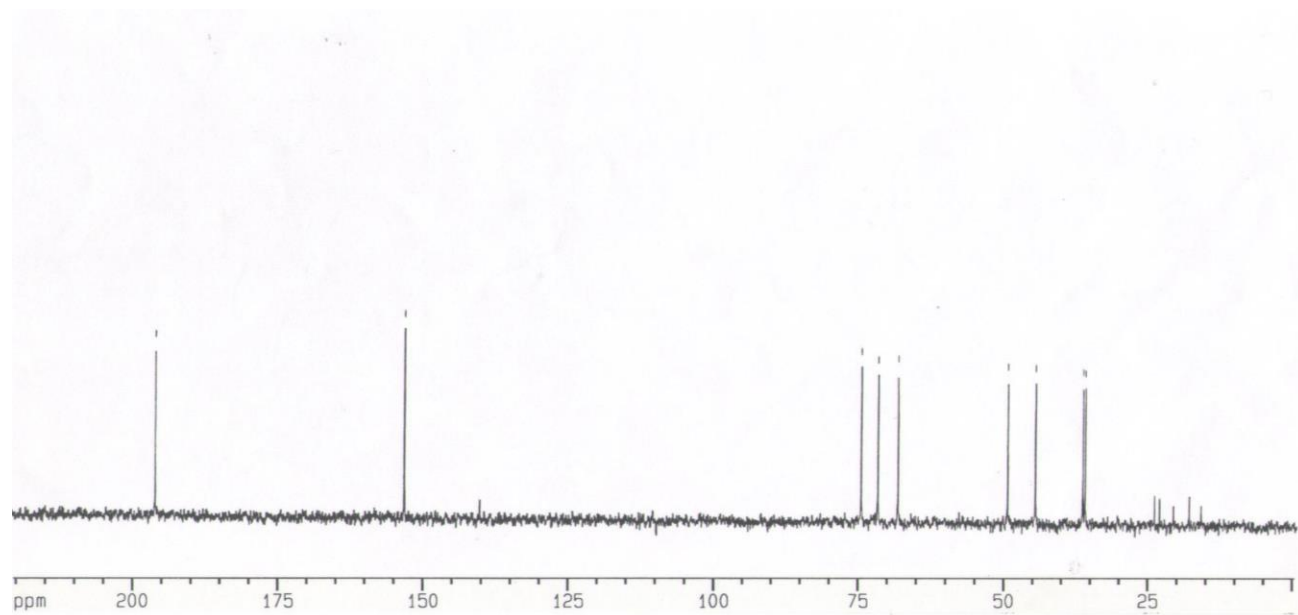
**Figure S13.** HRESI-MS spectrum of (24Z)- 26-hydroxyfusidic acid (**3**)



**Figure S14.**  $^1\text{H}$  NMR spectrum of 26-formylfusidic acid (**4**), ( $\text{CDCl}_3$ , 300 MHz)

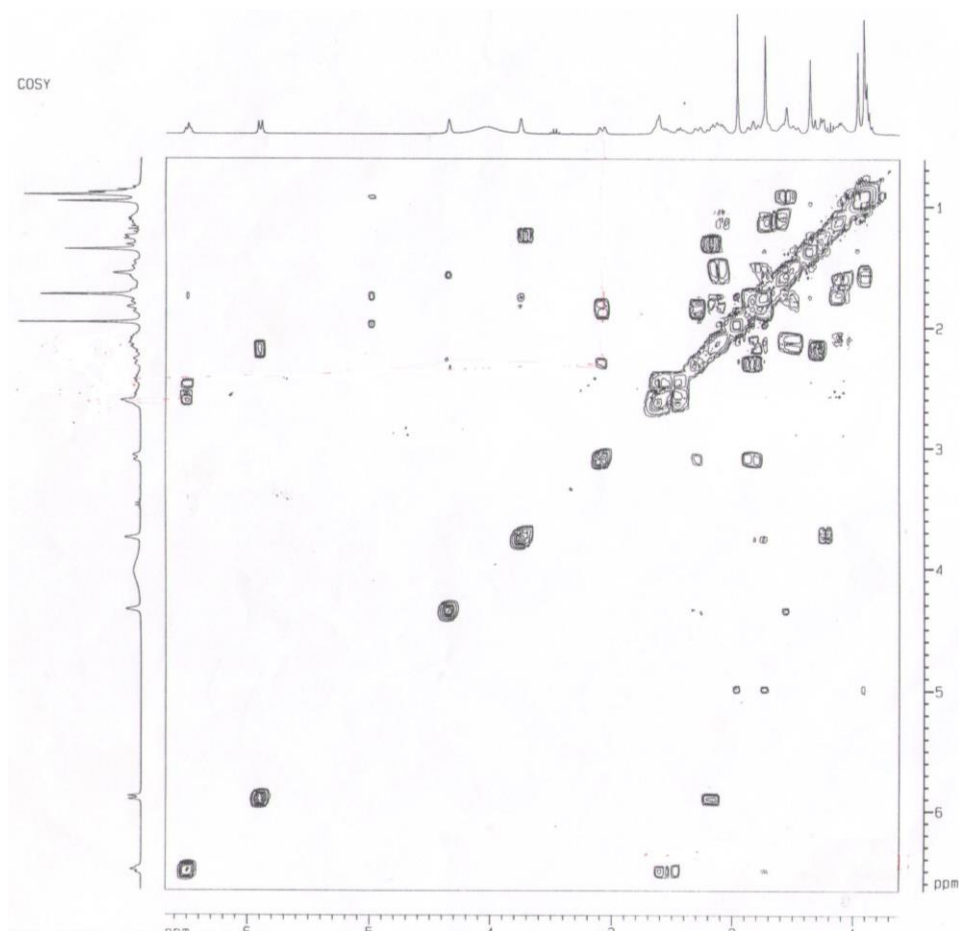


**Figure S15.**  $^{13}\text{C}$  NMR spectrum of 26-formylfusidic acid (**4**), ( $\text{CDCl}_3$ , 75 MHz)

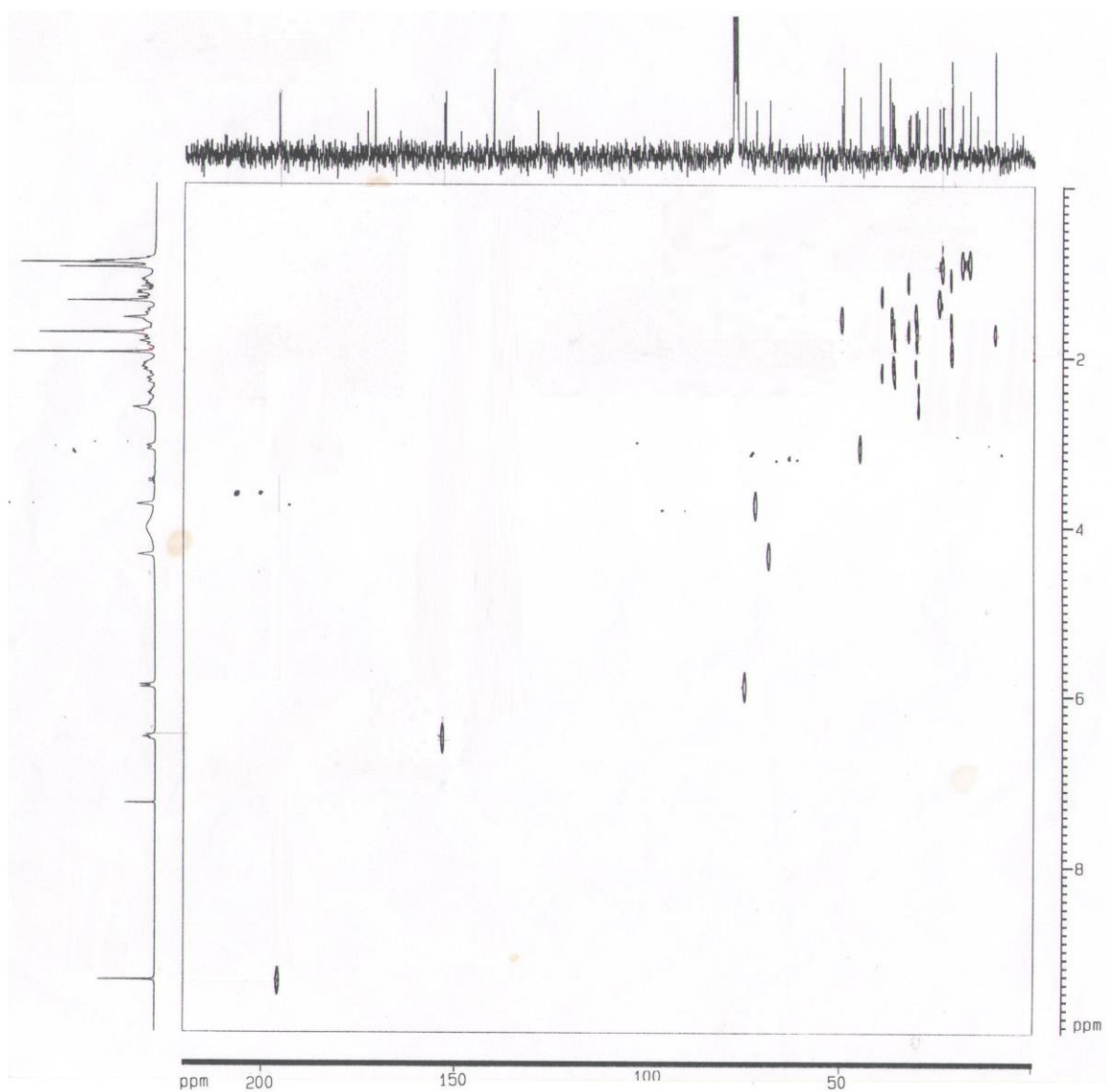


**Figure S14.** DEPT 90 spectrum of 26-formylfusidic acid (**4**)

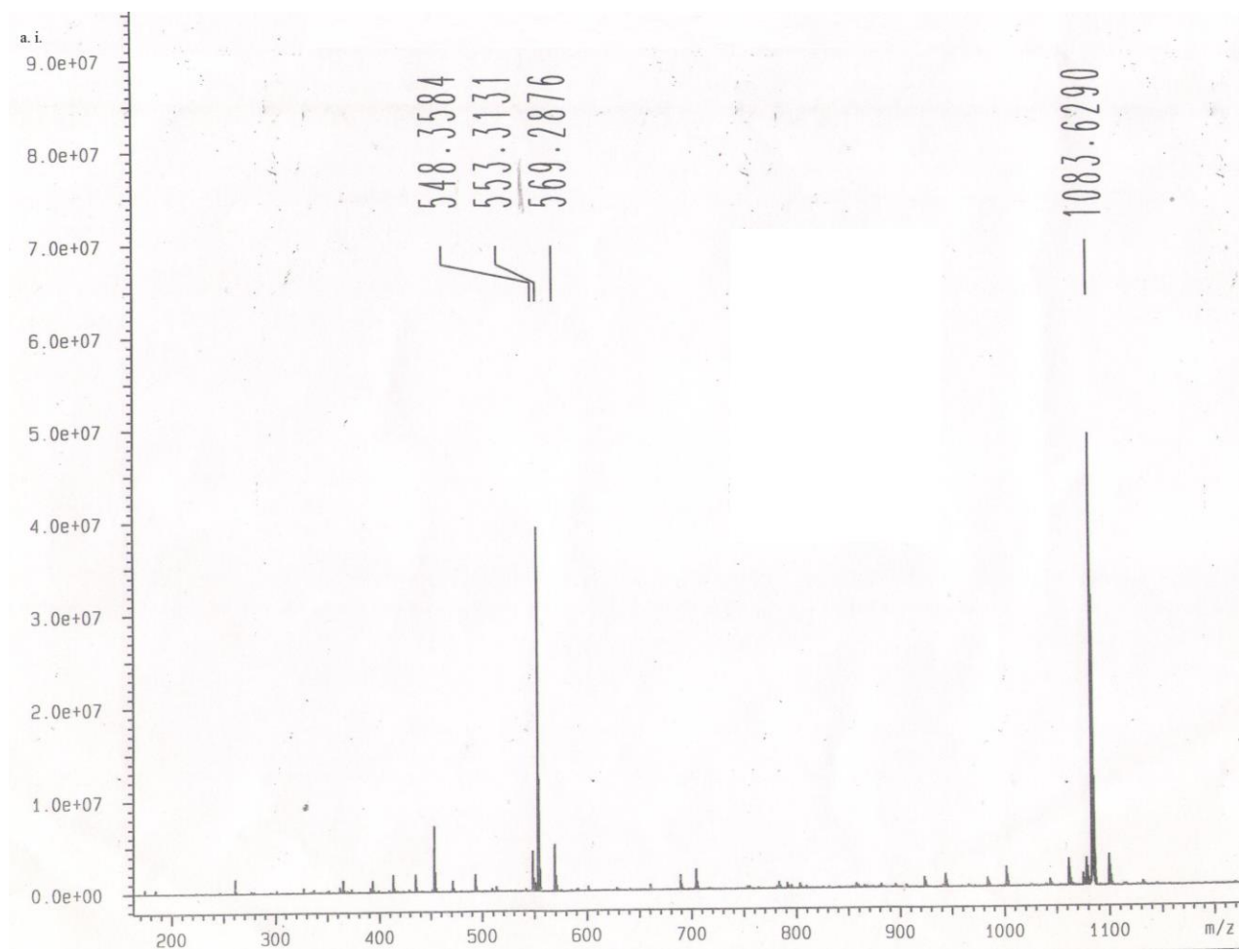




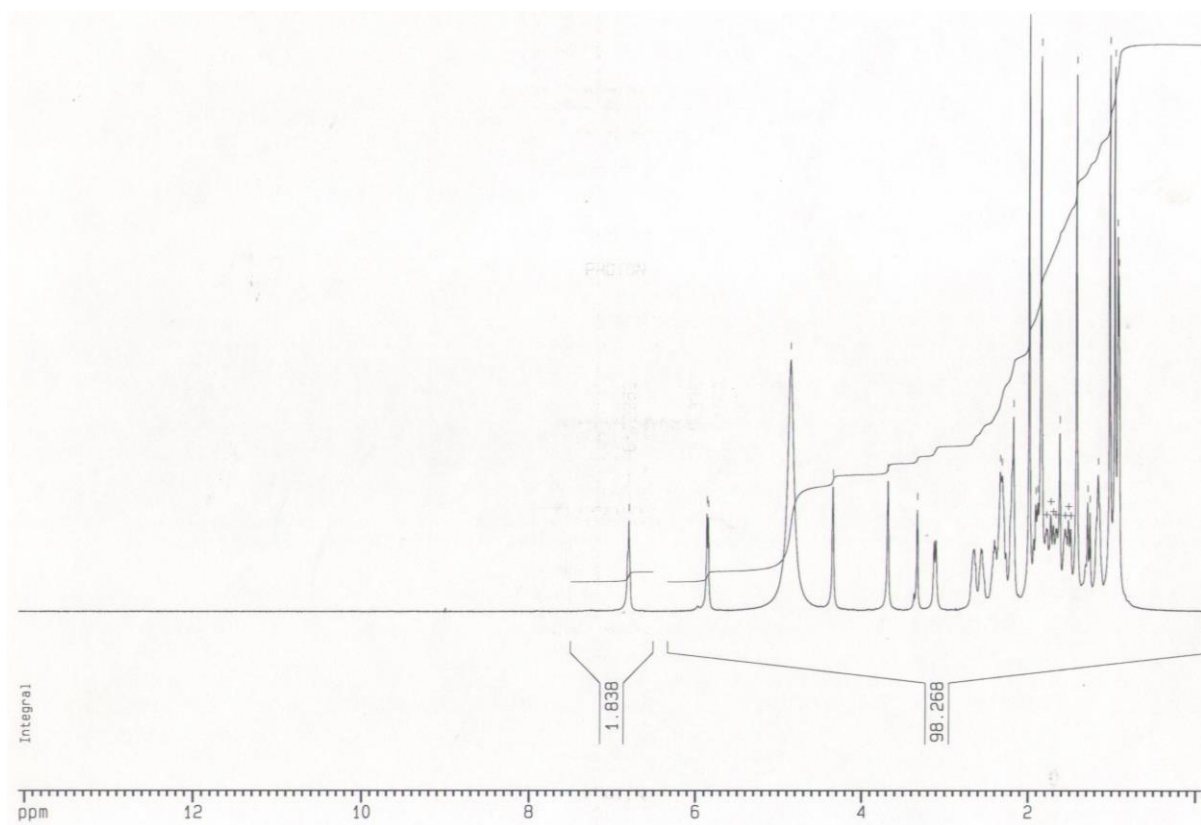
**Figure S17.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum of 26-formylfusidic acid (**4**)



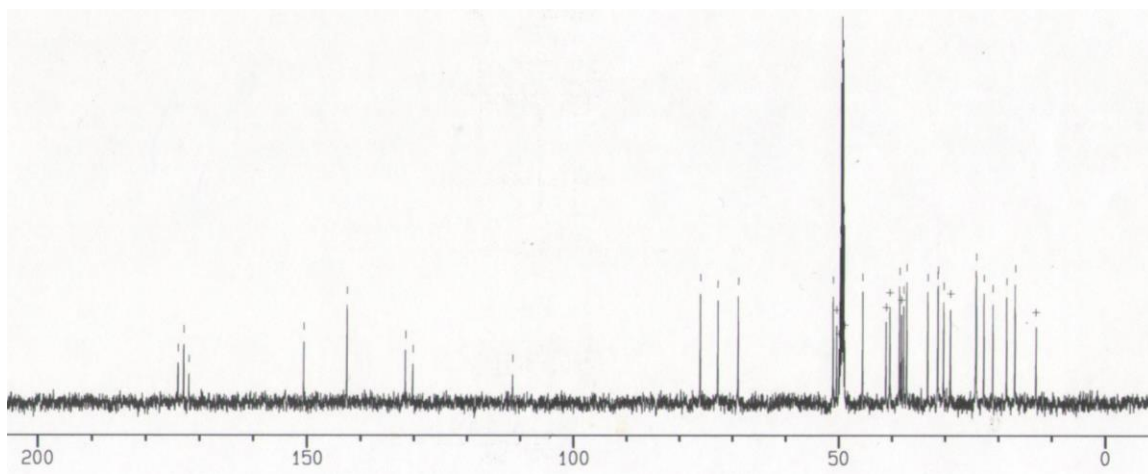
**Figure S18.** HSQC spectrum of 26-formylfusidic acid (**4**)



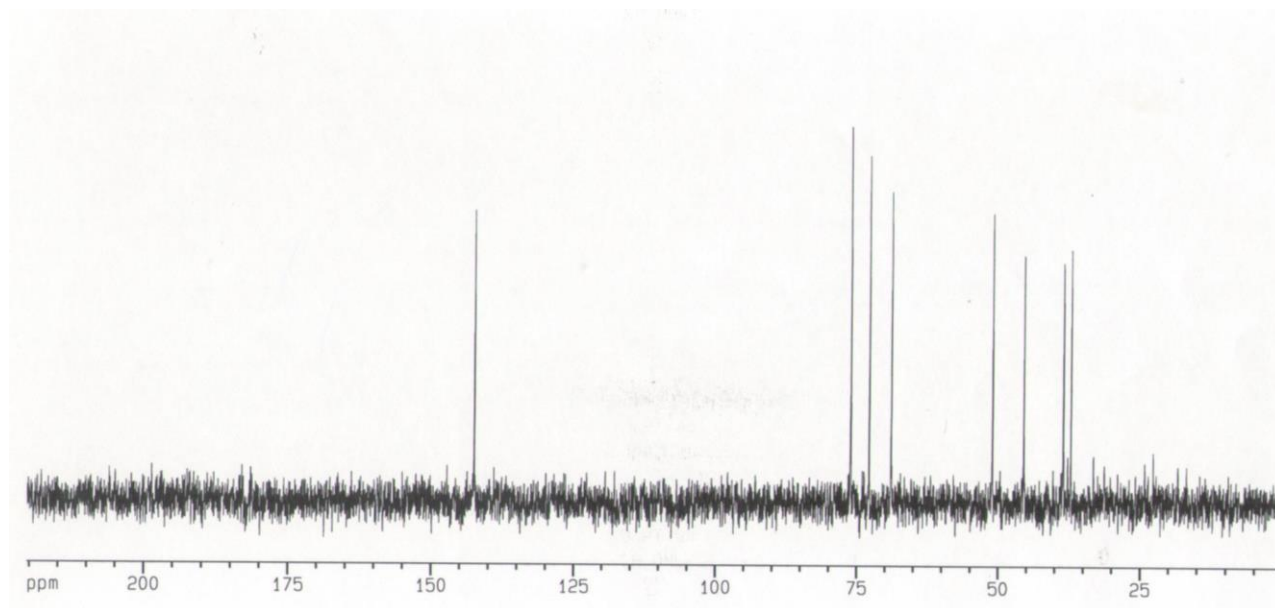
**Figure S19.** HRESI-MS spectrum of 26-formylfusidic acid (**4**)



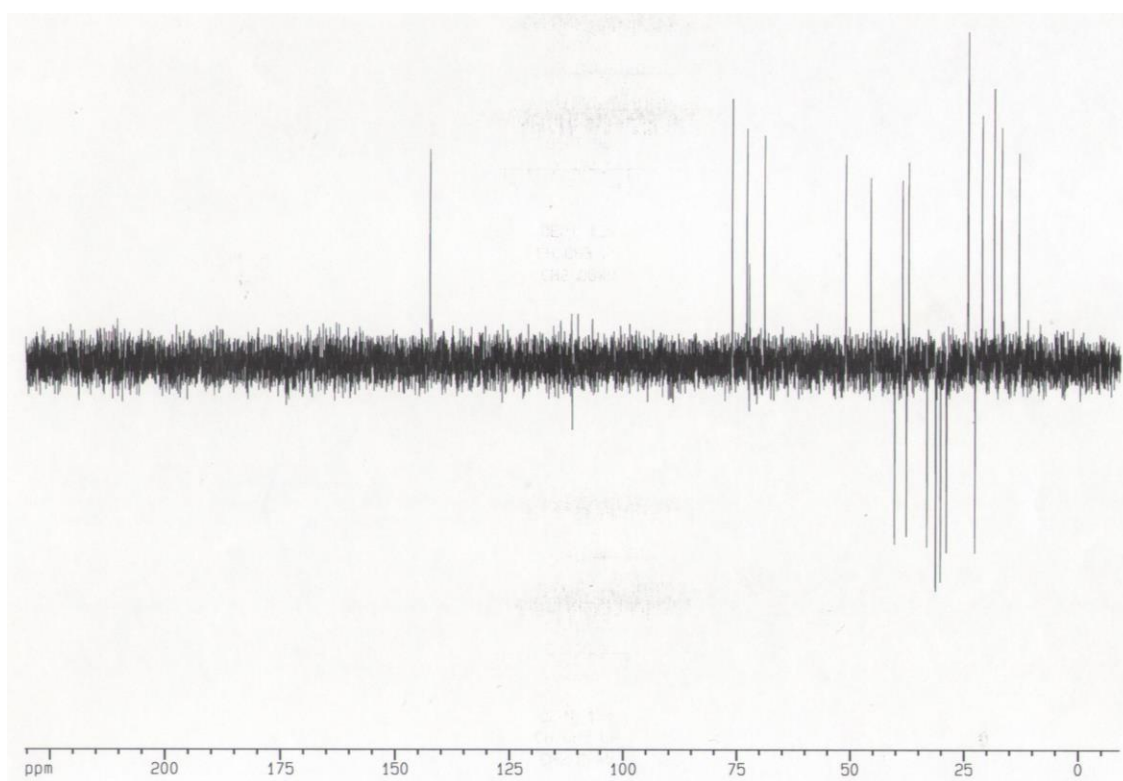
**Figure S20.** <sup>1</sup>H NMR spectrum of 26-carboxyfusidic acid (**5**), (methanol-*d*<sub>4</sub>, 500 MHz)



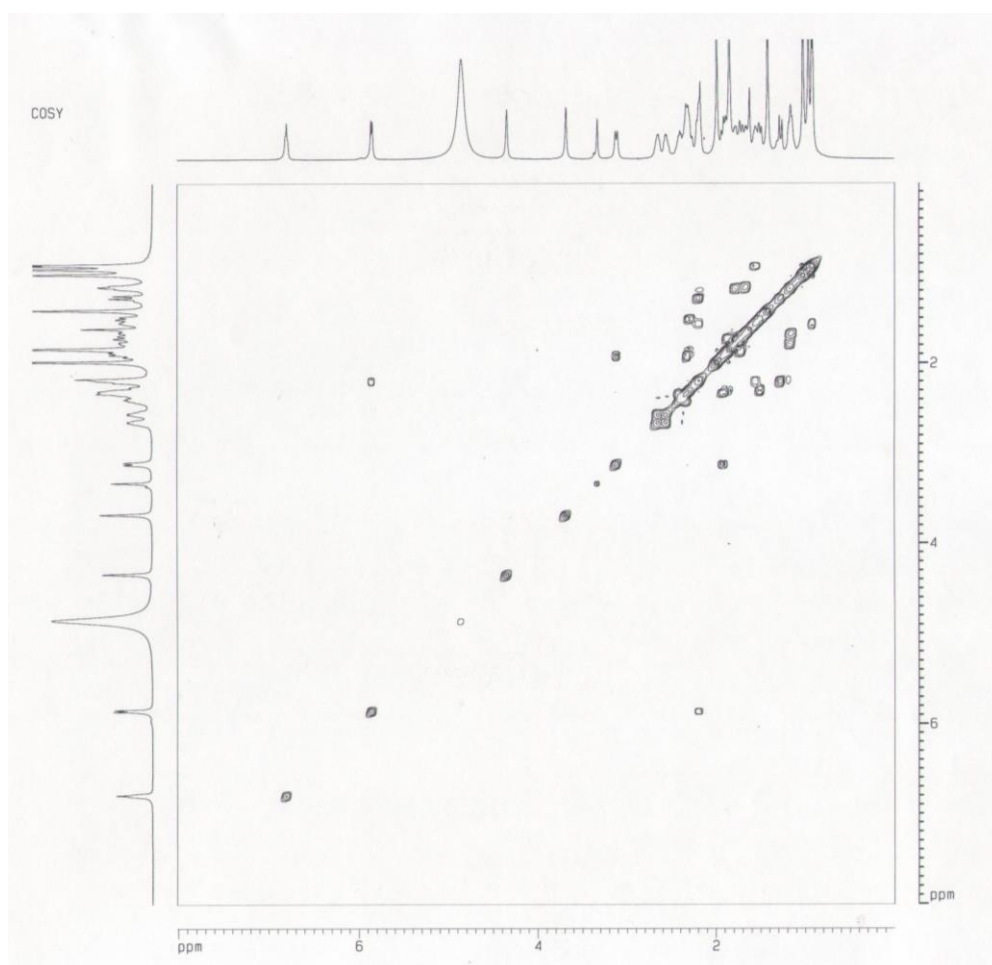
**Figure S21.** <sup>13</sup>C NMR spectrum of 26-carboxyfusidic acid (**5**), (methanol-*d*<sub>4</sub>, 125 MHz)



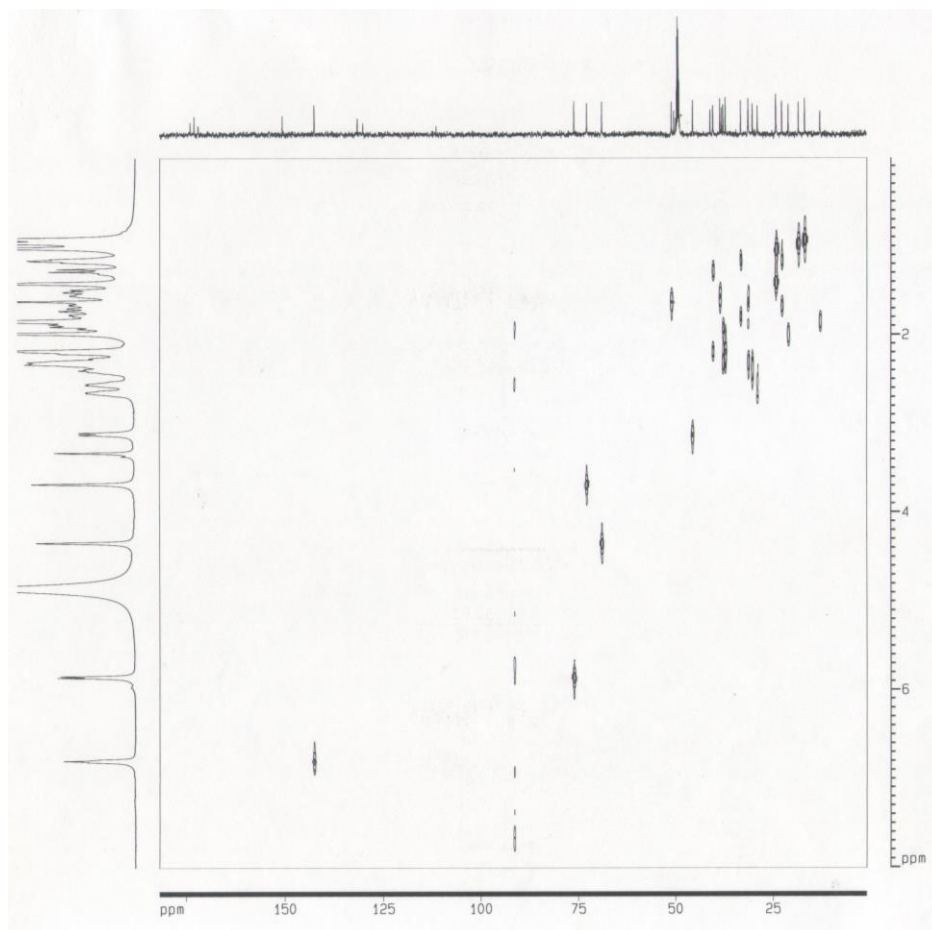
**Figure S22.** DEPT 90 spectrum of 26-carboxyfusic acid (**5**)



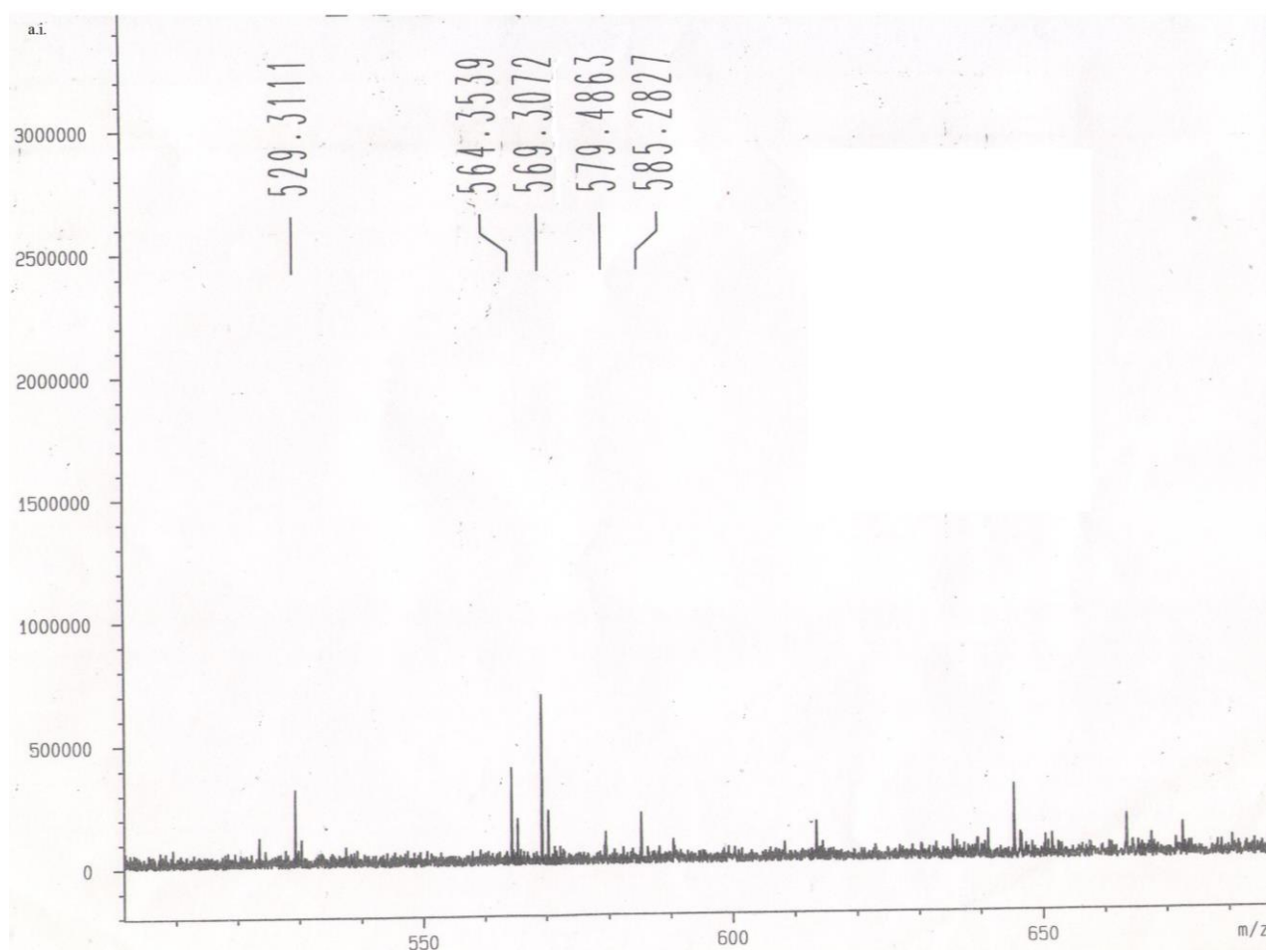
**Figure S23.** DEPT 135 spectrum of 26-carboxyfusic acid (**5**).



**Figure S24.** <sup>1</sup>H-<sup>1</sup>H COSY spectrum of 26-carboxyfusic acid (**5**).



**Figure S25.** HSQC spectrum of 26-carboxyfusic acid (**5**)



**Figure S26.** HRESI-MS spectrum of 26-carboxyfusidic acid (**5**)



## A list of screened strains:

- 1- *Aspergillus alliaceous* NRRL 315
- 2- *Aspergillus flavipes* ATCC 11013
- 3- *Aspergillus niger* NRRL 599
- 4- *Aspergillus niger* NRRL 2295
- 5- *Aspergillus niger* ATCC 10549
- 6- *Aspergillus ochraceous* NRRL 398
- 7- *Aspergillus ochraceous* NRRL 405
- 8- *Candida albicans* (lab isolate)
- 9- *Cunninghamella bainari* UI 3605
- 10- *Cunninghamella blackesleeana* 8688a
- 11- *Cunninghamella blackesleeana* MR 398
- 12- *Cunninghamella echinulata* NRRL 1382
- 13- *Cunninghamella elegans* NRRL 1392
- 14- *Gymnascella citrina* NRRL 6050
- 15- *Lindera pinnespora* NRRL 2237
- 16- *Penicillium chrysogenum* ATCC 10002
- 17- *Penicillium chrysogenum* ATCC 10002-K
- 18- *Penicillium chrysogenum* ATCC 9480
- 19- *Penicillium purpureus* UI 193
- 20- *Penicillium vermiculatum* NRRL 1009
- 21- *Rhizopus nigricans* NRRL 1477
- 22- *Rhizopus species* 36060
- 23- *Rhodotorula rubra* NRRL 1592
- 24- *Saccharomyces cerevisiae* (Baker's yeast)
- 25- *Streptomyces fulvissimus* NRRL 1453B