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Supporting Information to

Screening of Panamanian Plant Extracts for Pesticidal Properties and HPLC-Based Identification of Active Compounds

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Tab. S1. List of the 19 active extracts from the extract screening

Plant name	Extract	Indication
Bocconia frutescens	MeOH (stem)	Fungicide
Miconia affinis	EtOAc (stem)	Fungicide
Bocconia frutescens	EtOAc (stem)	Fungicide
Miconia ligulata	EtOAc (leaves)	Fungicide
Piper gatunense	EtOAc (stem)	Fungicide
Clusia uvitana	EtOAc (leaves)	Fungicide
Salvia alvajaca	MeOH (root)	Insecticide
Simaba cedron	MeOH (stem)	Insecticide
Myrcia splendens	MeOH (leaves)	Insecticide
Psychotria erecta	MeOH (stem)	Insecticide
Psychotria suerrensis	MeOH (root)	Insecticide
Rollinia pittieri	EtOAc (leaves)	Insecticide
Rollinia mucosa	EtOAc (leaves)	Insecticide
Myrcia splendens	MeOH (branch)	Insecticide
Ocotea glaucosericea	EtOAc (stem)	Insecticide
Trichilia hirta	MeOH (stem)	Herbicide
Combretum aff. laxum	MeOH (leaves)	Herbicide
Erythroxylum macrophyllum	MeOH (leaves)	Herbicide
Picramnia antidesma	MeOH (root)	Herbicide

Fig. 1S. Profiles of the MeOH stem extracts of *Bocconia frutescens* for the plant pathogenic fungi *Botryotinia fuckeliana* (A), *Phytophthora infestans* (B), and *Septoria tritici* (C)

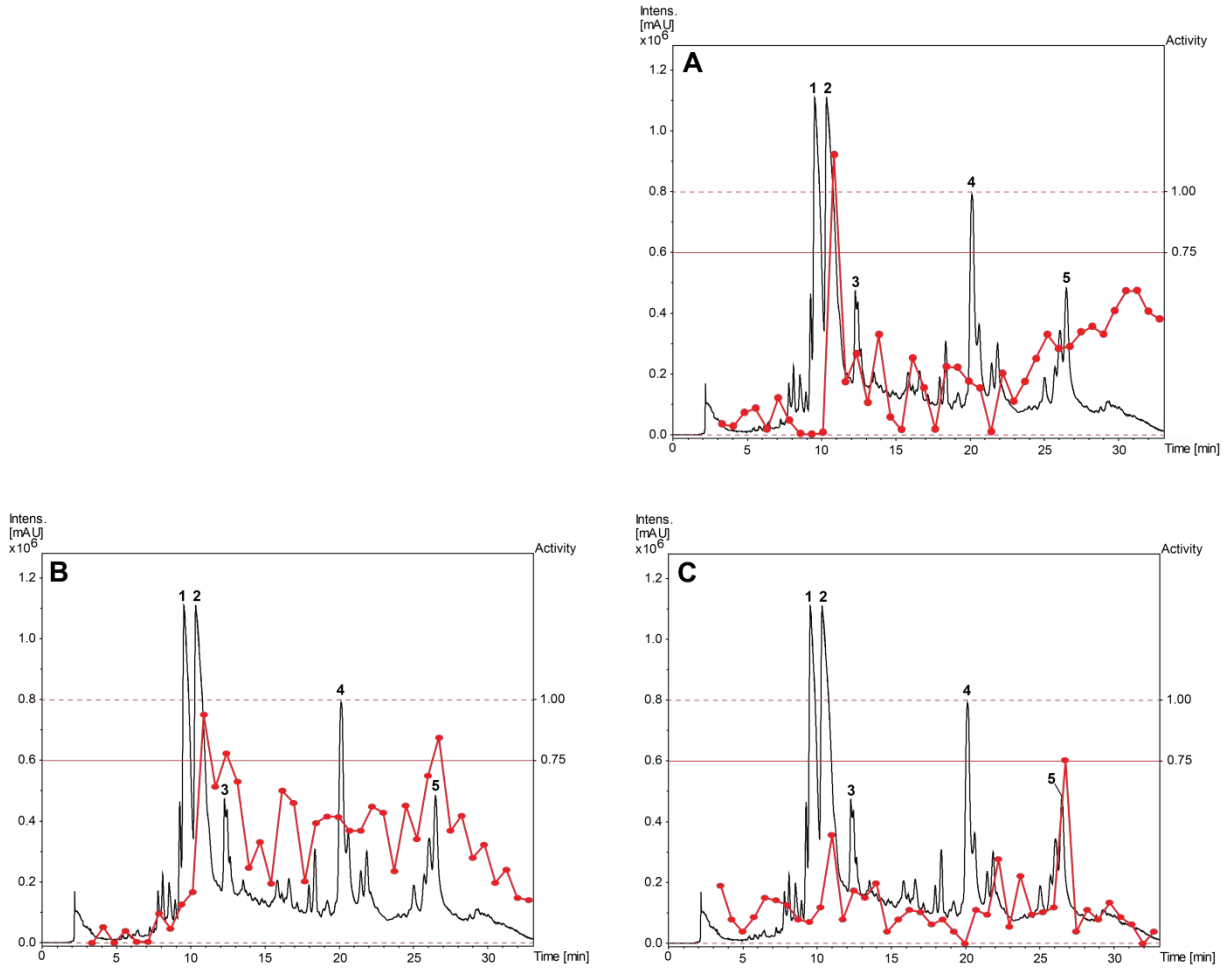


Fig. 2S. HPLC-DAD chromatograms of the crude extract and its polyamide fractions (PA1–PA5) of *Myrcia splendens*. SunFire C18 column (150 x 3 mm i.d., 3.5 µm); 5–100% MeCN/0.1% aqueous formic acid in 30min, 0.4 mL/min; detection: 210–700nm, maxplot.

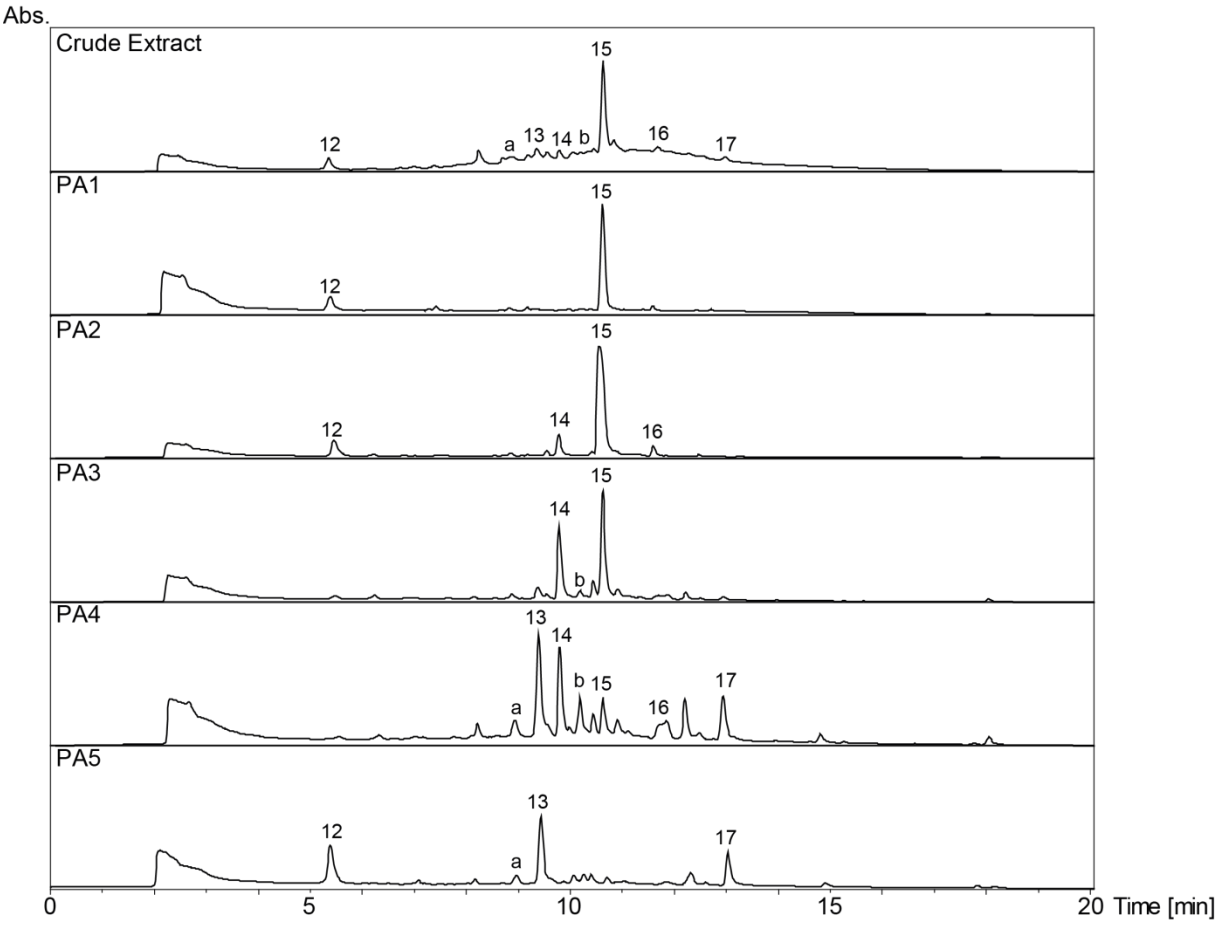


Fig. 3S. HPLC-DAD chromatograms of the crude extract and its polyamide fractions (PA1–PA5) of *Combretum aff. laxum*. SunFire C18 column (150 x 3 mm i.d., 3.5 µm); 5–100% MeCN/0.1% aqueous formic acid in 30min, 0.4 mL/min; detection: 210–700nm, maxplot.

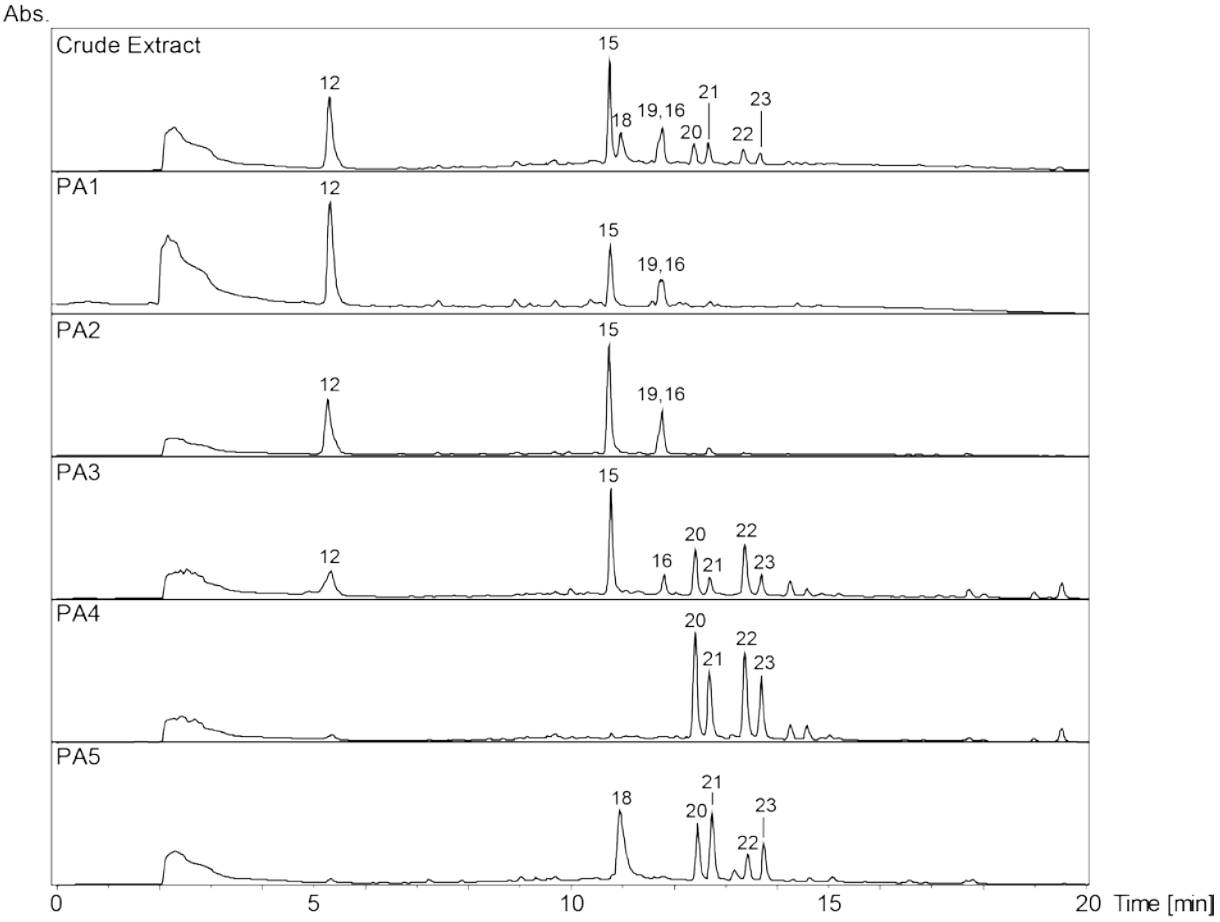
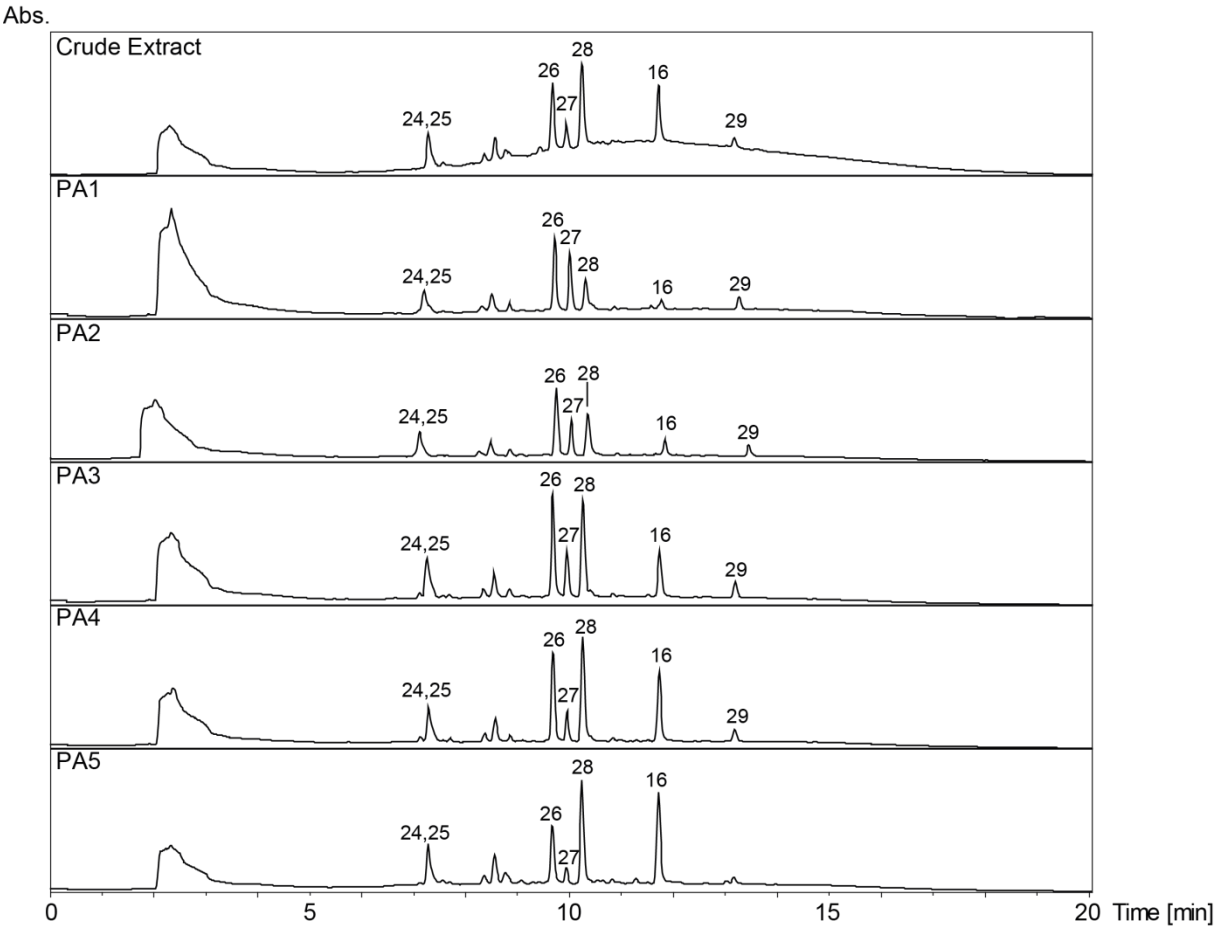


Fig. 4S. HPLC-DAD chromatograms of the crude extract and its polyamide fractions (PA1–PA5) of *Erythroxylum macrophyllum*. SunFire C18 column (150 x 3 mm i.d., 3.5 µm); 5–100% MeCN/0.1% aqueous formic acid in 30min, 0.4 mL/min; detection: 210–700nm, maxplot.



Tab. 2S. ^{1}H and ^{13}C NMR[a] data (500 MHz) of compounds **1–5**

	1[b]		**2**[b]		**3**[c]		**4**[d]		**5**[c]	
Position	**δ_H**	**δ_C**	**δ_H**	**δ_C**	**δ_H**	**δ_C**	**δ_H**	**δ_C**	**δ_H**	**δ_C**
1	7.51 (s)	106.9	7.43 (s)	106.7	7.61 (s)	98.8	7.14 (s)	104.5	7.31 (s)	104.0
2	–	150.6	–	150.6	–	148.6	–	147.8	–	147.2
3	–	150.6	–	150.6	–	148.6	–	147.8	–	147.8
4	8.11 (s)	104.8	8.07 (s)	104.6	8.06 (s)	104.0	7.55 (s)	102.2	7.53 (s)	99.4
4a	–	121.4	–	121.5	–	120.7	–	118.9	–	124.9
4b	–	132.8	–	132.9	–	126.2	–	136.2	–	141.0
6	9.90 (s)	150.3	9.85 (s)	151.1	9.72 (s)	145.7	–	162.8	4.16 (s)	47.7
6a	–	110.9	–	120.6	–	109.8	–	111.1	–	112.3
7	–	147.8	–	147.1	–	139.0	–	146.6	–	144.2
8	–	149.2	–	151.6	–	147.5	–	146.6	–	146.6
9	7.93 (d, 8.8)	121.0	8.12 (d, 9.1)	127.2	7.83 (s)	103.8	7.22 (d, 8.6)	113.0	6.95 (d, 8.1)	107.1
10	8.47 (d, 8.8)	118.1	8.52 (d, 9.1)	119.4	–	152.8	7.74 (d, 8.6)	115.2	7.40 (d, 8.1)	116.1
10a	–	128.7	–	129.8	–	113.9	–	133.6	–	126.2
10b	–	127.3	–	126.6	–	123.5	–	115.9	–	123.7
11	8.56 (d, 8.9)	119.4	8.48 (d, 9.0)	119.1	8.71 (s)	99.6	7.96 (d, 8.6)	118.4	7.77 (d, 8.6)	120.0
12	8.16 (d, 8.9)	132.7	8.08 (d, 9.0)	132.2	–	155.0	7.51 (d, 8.6)	123.5	7.57 (d, 8.6)	123.9
12a	–	133.5	–	134.0	–	123.0	–	129.8	–	130.2
2,3-OCH_2O	6.28 (s)	104.0	6.24 (s)	103.8	6.32 (s)	102.3	6.08 (s)	101.1	6.14 (s)	100.9
5-NCH_3	4.93 (s)	52.7	4.94 (s)	52.8	4.78 (s)	51.5	3.89 (s)	40.7	2.53 (s)	41.1
7,8-OCH_2O	6.53 (s)	106.2	-	-	6.51 (s)	103.6	6.25 (s)	102.7	6.10 (s)	101.1
7-OCH_3	–	–	4.27 (s)	62.6	–	–	–	–	–	–
8-OCH_3	–	–	4.11 (s)	57.4	–	–	–	–	–	–
10-OCH_3	–	–	–	–	4.17 (s)	57.5	–	–	–	–
12-OCH_3	–	–	–	–	4.12 (s)	55.7	–	–	–	–

[a] ^{13}C NMR data derived from HSQC and HMBC experiments; [b] recorded in CD_3OD; [c] recorded in DMSO-d_6; [d] recorded in $CDCl_3$.

Tab. 3S. ^{1}H and ^{13}C NMR[a] data (500 MHz) of compound **6** in DMSO-d_6

	6	
Position	**δ_H**	**δ_C**
1	–	196.7
2	3.04 (t, 6.4)	40.6
3	3.76 (t, 6.4)	57.0
1'	–	127.6
2'	7.43 (d, 1.7)	110.9
3'	–	147.5
4'	–	152.6
5'	6.84 (d, 8.3)	114.8
6'	7.49 (dd, 8.3, 1.7)	123.1
3'-OCH_3	3.81 (s)	55.3

[a] ^{13}C NMR data derived from HSQC and HMBC experiments.

Tab. 4S. ^{1}H and ^{13}C NMR[a] data (500 MHz) of compounds **12** and **25**

	12[b]		**25**[c]	
Position	**δ_H**	**δ_C**[a]	**δ_H**	**δ_C**
1	–	119.4	–	123.2
2	7.09 (s)	107.8	7.36 (s)	116.6
3	–	143.9	-	144.6
4	–	136.7	–	149.1
5	–	143.9	6.77 (d, 8.1)	114.8
6	7.09 (s)	107.8	7.28 (d, 8.1	121.4
7	–	167.4	–	168.3

[a] ^{13}C NMR data derived from HSQC and HMBC experiments; [b]recorded in CD_3OD; [c]recorded in DMSO-d_6.

Tab. 5S. ^{1}H and ^{13}C NMR[a] (500 MHz) of compound **7** and **10**

	7[b]		**10**[c]	
Position	**δ_H**	**δ_C**[a]	**δ_H**	**δ_C**
1	–	n.d.	–	114.5
2	–	n.d.	–	132.4
3	–	138.3	–	138.8
4	–	150.2	–	151.3
5	7.44 (s)	103.3	7.57 (s)	105.0
6	–	n.d.	–	115.7
7	–	n.d.	–	158.6
1'	–	108.5	–	113.0
2'	–	n.d.	–	137.9
3'	–	141.4	–	147.6
4'	–	n.d.	–	148.6
5'	7.47 (s)	113.2	–	154.3
6'	–	n.d.	–	105.9
7'	–	n.d.	–	154.9
3,4-OCH_2O	6.34 (s)	103.6	6.27 (s)	104.2
3'-OCH_3	4.04 (s)	60.2	4.25 (s)	62.3
4'-OCH_3	–	–	4.00 (s)	62.3
5'-OCH_3	–	–	4.02 (s)	62.6

[a] ^{13}C NMR data derived from HSQC and HMBC experiments; [b]recorded in DMSO-d_6; [c]recorded in $CDCl_3$; n.d.: not detected.

Tab. 6S. ^{1}H and ^{13}C NMR data (500 MHz) of compound **8** in DMSO-d_6

	8	
Position	**δ_H**	**δ_C**
1a	0.73 (m)	46.7
1b	1.75 (dd, 12.5, 4.4)	
2	3.49 (ddd, 11.0, 9.3, 4.4)	67.4
3	3.18 (d, 9.3)	75.5
4	–	42.5
5	1.22 (m)	46.0
6a	1.24 (m)	17.5
6b	1.41 (m)	
7a	1.19 (m)	31.9
7b	1.44 (m)	
8	–	38.9
9	1.55 (t, 8.8)	47.1
10	–	37.4
11	1.84 (m)	23.0
12	5.18 (t, 3.3)	121.5
13	–	143.9
14	–	41.4
15a	0.99 (m)	27.2
15b	1.68 (m)	
16a	1.49 (m)	22.6
16b	1.91 (td, 13.5, 3.7)	
17	–	45.4
18	2.76 (dd, 13.7, 3.9)	40.8
19a	1.07 (m)	45.7
19b	1.62 (m)	
20	–	30.4
21a	1.14 (m)	33.3
21b	1.32 (td, 13.6, 3.6)	
22a	1.44 (m)	32.1
22b	1.63 (m)	
23a	3.06 (d, 10.6)	63.9
23b	3.32 (d, 10.6)	
24	0.56 (s)	13.7
25	0.93 (s)	16.8
26	0.72 (s)	16.9
27	1.10 (s)	25.7
28	–	178.6
29	0.88 (s)	32.9
30	0.88 (s)	23.4

Tab. 7S. ^{1}H and ^{13}C NMR[a] (500 MHz) of compounds **13** and **14** in CD_3OD

	13		**14**	
Position	**δ_H**	**δ_C**	**δ_H**	**δ_C**
2	–	158.8	–	n.d.
3	–	135.9	–	135.8
4	–	n.d.	–	n.d.
5	–	n.d.	–	162.7
6	6.17 (d, 1.8)	99.8	6.17 (s)	99.5
7	–	n.d.	–	165.7
8	6.35 (d, 1.8)	94.6	6.35 (s)	94.3
9	–	n.d.	–	158.3
10	–	n.d.	–	105.5
1'	–	121.5	–	121.3
2'	7.34 (s)	110.0	7.37 (s)	109.7
3'	–	146.3	–	145.8
4'	–	139.8	–	137.8
5'	–	146.3	–	145.8
6'	7.34 (s)	110.0	7.37 (s)	109.7
1''	5.15 (d, 7.9)	105.2	5.13 (d, 7.8)	105.2
2''	3.87 (dd, 9.5, 7.9)	73.0	3.85 (dd, 9.5, 7.8)	72.9
3''	3.62 (dd, 9.5, 2.9)	74.8	3.61 (m)	74.6
4''	3.91 (d, 2.9)	69.9	3.89 (d, 2.5)	69.6
5''	3.81 (t, 6.4)	74.3	3.52 (t, 6.1)	76.6
6''a	4.25 (dd, 11.1, 5.9)	63.6	3.61 (m)	61.6
6''b	4.33 (dd, 11.1, 6.9)		3.67 (dd, 11.2, 5.9)	
1'''	–	121.1	–	–
2'''	6.91	110.0	–	–
3'''	–	146.3	–	–
4'''	–	138.2	–	–
5'''	–	146.3	–	–
6'''	6.91	110.0	–	–
7'''	–	167.8	–	–

[a] ^{13}C NMR data derived from HSQC and HMBC experiments; n.d.: not detected.

Tab. 8S. ^{1}H and ^{13}C NMR[a] (500 MHz) of compounds **15–17** in CD_3OD

	15		**16**		**17**	
Position	**δ_H**	**δ_C**	**δ_H**	**δ_C**	**δ_H**	**δ_C**
2	–	158.9	–	158.9	–	n.d.
3	–	135.9	–	135.8	–	n.d.
4	–	179.2	–	n.d.	–	n.d.
5	–	163.2	–	163.6	–	n.d.
6	6.20 (d, 2.0)	99.6	6.20 (d, 1.7)	99.7	6.18 (s)	99.2
7	–	165.5	–	165.4	–	n.d.
8	6.36 (d, 2.0)	94.5	6.36 (d, 1.7)	94.6	6.37 (s)	94.2
9	–	158.0	–	158.2	–	n.d.
10	–	105.4	–	105.6	–	n.d.
1'	–	121.5	–	n.d.	–	123.3
2'	6.95 (s)	109.3	7.34 (d, 2.1)	116.9	7.35 (s)	108.5
3'	–	146.4	–	146.2	–	147.5
4'	–	137.4	–	149.1	–	137.1
5'	–	146.4	6.92 (d, 6.3)	116.2	–	147.5
6'	6.95 (s)	109.3	7.30 (dd, 6.3, 2.1)	122.7	7.35 (s)	108.5
1''	5.32 (d, 1.5)	103.4	5.36 (d, 1.3)	103.3	–	–
2''	4.23 (dd, 3.3, 1.5)	71.7	4.23 (dd, 3.1, 1.3)	71.7	–	–
3''	3.79 (dd, 9.5, 3.3)	71.9	3.76 (dd, 9.3, 3.1)	72.1	–	–
4''	3.35 (t, 9.6)	73.2	3.35 (9.4)	73.2	–	–
5''	3.52 (dq, 9.7, 6.2)	71.8	3.43 (dq, 9.6, 6.1)	71.8	–	–
6''	0.97 (d, 6.2)	17.6	0.95 (d, 6.1)	17.5	–	–

[a] ^{13}C NMR data derived from HSQC and HMBC experiments; n.d.: not detected.

Tab. 9S. ^{1}H and ^{13}C NMR[a] (500 MHz) of compounds **19** and **26** in DMSO-d_6

	19		**26**	
Position	**δ_H**	**δ_C**	**δ_H**	**δ_C**
2	–	157.1	–	n.d
3	–	n.d.	–	135.0
4	–	n.d.	–	n.d
5	–	n.d.	–	n.d
6	6.24 (d, 1.2)	98.5	6.44 (d, 1.6)	99.1
7	–	n.d.	–	n.d
8	6.44 (d, 1.2)	93.2	6.75 (d, 1.6)	94.1
9	–	n.d.	–	n.d
10	–	104.2	–	105.6
1'	–	n.d.	–	n.d
2'	6.86 (s)	107.8	7.36 (d, 1.8)	115.5
3'	–	150.7	–	145.0
4'	–	137.9	–	148.1
5'	–	150.7	6.89 (d, 8.2)	115.2
6'	6.86 (s)	107.8	7.30 (dd, 8.2, 1.8)	120.9
1''	5.16 (d, 1.0)	101.8	5.28 (s)	101.6
2''	4.00 (m)	69.7	4.00 (bs)	69.8
3''	3.56 (m)	70.1	3.55 (dd, 9.2, 3.1)	70.2
4''	3.16 (m)	71.0	3.18 (m)	71.0
5''	3.22 (m)	70.0	3.28 (m)	70.2
6''	0.83 (d, 6.1)	17.1	0.85 (d, 6.1)	17.3
1'''	–	–	5.55 (s)	98.2
2'''	–	–	3.86 (bs)	69.5
3'''	–	–	3.65 (dd, 9.2, 3.0)	70.0
4'''	–	–	3.32 (m)	71.4
5'''	–	–	3.46 (m)	69.8
6'''	–	–	1.14 (d, 6.1)	17.6
4'-OCH_3	3.75 (s)	59.3	–	–

[a] ^{13}C NMR data derived from HSQC and HMBC experiments; n.d.: not detected.

Tab. 10S. ^{1}H and ^{13}C NMR[a] (500 MHz) of compounds **20–23** in CD_3OD

	20		**21**		**22**		**23**	
Position	**δ_H**	**δ_C**	**δ_H**	**δ_C**	**δ_H**	**δ_C**	**δ_H**	**δ_C**
2	–	158.7	–	158.9	–	158.9	–	159.3
3	–	135.1	–	135.7	–	135.2	–	135.9
4	–	178.9	–	n.d.	–	178.7	–	n.d.
5	–	163.3	–	163.6	–	163.4	–	163.9
6	6.18 (d, 1.8)	99.3	6.21 (s)	99.3	6.19 (d, 1.9)	99.6	6.21 (s)	99.8
7	–	165.5	–	165.3	–	165.2	–	165.8
8	6.35 (d, 1.8)	94.2	6.37 (s)	94.2	6.36 (d, 1.9)	94.4	6.38 (s)	94.7
9	–	157.9	–	157.8	–	158.0	–	158.3
10	–	105.4	–	105.6	–	105.4	–	106.0
1'	–	121.6	–	121.7	–	n.d.	–	n.d.
2'	7.00 (s)	109.3	7.02 (s)	109.3	7.37 (d, 2.0)	116.7	7.40 (m)	116.9
3'	–	146.2	–	146.4	–	146.0	–	146.5
4'	–	137.2	–	137.5	–	149.3	–	149.6
5'	–	146.2	–	146.4	6.94 (d, 8.3)	116.2	6.96 (d, 8.7)	116.5
6'	7.00 (s)	109.3	7.02 (s)	109.3	7.33 (dd, 8.3, 2.0)	122.6	7.40 (m)	123.0
1''	5.51 (d, 1.1)	100.0	5.34 (d, 1.1)	103.0	5.50 (d, 1.5)	100.2	5.41 (bs)	103.3
2''	5.64 (dd, 3.1, 1.1)	73.0	4.51 (dd, 2.8, 1.1)	69.5	5.64 (dd, 3.2, 1.5)	73.3	4.49 (m)	69.9
3''	4.08 (dd, 8.9, 3.1)	70.2	5.27 (dd, 8.9, 2.8)	75.0	4.04 (dd, 8.9, 3.2)	70.5	5.24 (9.7, 3.0)	75.3
4''	3.50 (m)	73.4	3.70 (m)	70.5	3.47 (m)	73.5	3.69 (t, 9.7)	70.9
5''	3.53 (m)	71.7	3.70 (m)	71.8	3.47 (m)	71.9	3.59 (m)	72.2
6''	1.05 (d, 5.6)	17.2	1.02 (d, 4.5)	17.1	1.04 (d, 5.4)	17.4	1.01 (d, 6.1)	17.6
1'''	–	120.8	–	121.2	–	121.0	–	121.7
2'''	7.09 (s)	110.0	7.19 (s)	110.1	7.09 (s)	110.2	7.19 (s)	110.5
3'''	–	145.6	–	145.8	–	146.0	–	146.3
4'''	–	139.3	–	139.5	–	139.4	–	139.9
5'''	–	145.6	–	145.8	–	146.0	–	146.3
6'''	7.09 (s)	110.0	7.19 (s)	110.1	7.09 (s)	110.2	7.19 (s)	110.5
7'''	–	166.9	–	168.2	–	167.1	–	168.4

[a] ^{13}C NMR data derived from HSQC and HMBC experiments; n.d.: not detected.

Tab. 11S. ^{1}H and ^{13}C NMR[a] (500 MHz) of compounds **24** in DMSO-d_6

	24	
Position	**δ_H**	**δ_C**
1	–	n.d.
2a 2b	1.71 (d, 12.8) 1.89 (m)	37.2
3	3.76 (m)	68.1
4	3.63 (m)	70.6
5	5.26 (bs)	70.4
6a 6b	1.85 (m) 1.93 (m)	35.6
1'	–	165.6
2'	6.20 (d, 15.9)	114.6
3'	7.47 (d, 15.9)	144.1
4'	–	125.2
5'	7.04 (s)	114.4
6'	–	145.3
7'	–	147.6
8'	6.78 (d, 7.9)	115.6
9'	6.96 (d, 7.9)	120.7
1-COOH	–	n.d.

[a] ^{13}C NMR data derived from HSQC and HMBC experiments; n.d.: not detected.

Tab. 12S. ^{1}H and ^{13}C NMR (500 MHz) of compounds **27–29** in DMSO-d_6

	27		**28**		**29**	
Position	**δ_H**	**δ_C**	**δ_H**	**δ_C[a]**	**δ_H**	**δ_C[a]**
2	–	154.7	–	156.2	–	n.d.
3	–	136.0	–	n.d.	–	n.d.
4	–	173.2	–	n.d.	–	n.d.
5	–	158.4	–	160.9	–	n.d.
6	6.86 (s)	102.4	6.19 (s)	98.5	6.35 (s)	97.5
7	–	163.8	–	163.9	–	164.6
8	–	95.7	–	93.3	–	91.6
9	–	157.7	–	156.0	–	n.d.
10	–	109.0	–	103.5	–	n.d.
1'	–	122.5	–	120.9	–	121.8
2'	7.57 (s)	115.8	7.54 (m)	116.0	7.56 (s)	115.3
3'	–	145.9	–	144.4	–	145.5
4'	–	150.0	–	147.6	–	149.7
5'	7.03 (d, 8.5)	111.3	6.85 (d, 7.8)	114.9	7.04 (d, 8.7)	110.9
6'	7.74 (d, 8.5)	121.5	7.54 (m)	121.2	7.72 (d, 8.7)	120.9
1''	5.25 (d, 6.9)	101.4	5.34 (bd)	101.0	5.39 (d, 6.6)	100.6
2''	3.26 (m)	74.1	3.25 (m)	73.8	3.22 (m)	73.5
3''	3.27 (m)	75.7	3.24 (m)	76.1	3.23 (m)	75.8
4''	3.12 (m)	69.8	3.30 (m)	70.3	3.10 (m)	69.4
5''	3.28 (m)	76.5	3.26 (m)	75.6	3.25 (m)	75.4
6''a	3.34 (m)	66.9	3.30 (m)	66.8	3.31 (m)	66.4
6''b	3.71 (d, 11.1)		3.72 (d, 10.8)		3.69 (m)	
1'''	4.42 (bs)	100.8	4.40 (s)	100.4	4.39 (s)	100.3
2'''	3.42 (m)	70.4	3.42 (m)	70.1	3.41 (m)	69.9
3'''	3.33 (m)	70.7	3.08 (m)	69.8	3.29 (m)	70.1
4'''	3.10 (m)	71.9	3.09 (m)	71.6	3.08 (m)	71.3
5'''	3.30 (m)	68.3	3.29 (m)	67.8	3.27 (m)	67.8
6'''	0.99 (d, 5.9)	17.9	1.00 (d, 4.4)	17.5	0.97 (d, 6.0)	17.4
1''''	4.84 (d, 7.4)	103.7				
2''''	3.42 (m)	73.6				
3''''	3.34 (m)	75.9				
4''''	3.21 (m)	69.9				
5''''	3.41 (m)	77.7				
6''''a	3.53 (dd, 11.1, 6.0)	60.9				
6''''b	3.77 (d, 11.1)					
7-OCH_3	3.89 (s)	56.2	–	–	3.86 (s)	55.3
4'-OCH_3	3.86 (s)	55.7	–	–	3.86 (s)	55.3

[a] ^{13}C NMR data derived from HSQC and HMBC experiments; n.d.: not detected.