Table. Concentrations of NNN, NAT, NAB and NNK in the Tobacco Matrix Inhibition Experiments[a]

		Midrib					Lamina				
Compound	Molar equiv.[b]	NNN (μg/g)	NAT (μg/g)	NAB (μg/g)	NNK (μg/g)	TSNA (μg/g)	NNN (μg/g)	NAT (μg/g)	NAB (μg/g)	NNK (μg/g)	TSNA (μg/g)
Ascorbic acid	0	19.5	30.0	1.0	1.2	51.7	11.5	39.4	1.9	0.5	53.2
	2	18.2	29.0	0.9	1.0	49.2	10.3	35.5	1.7	0.4	48.0
	4	11.7	15.6	0.7	1.1	29.1	11.7	33.3	1.9	0.7	47.6
	10	7.4	6.9	0.6	1.1	16.0	7.1	17.2	1.2	0.5	26.1
Ascorbic acid[c]	0	35.6	35.0	1.1	1.1	72.8	19.5	42.5	1.5	0.5	63.9
	2	21.6	18.4	0.9	1.2	42.1	22.1	36.9	2.0	0.7	61.7
	4	10.7	6.5	0.4	0.9	18.5	10.9	17.8	1.3	0.4	30.3
	10	7.3	4.1	0.3	0.9	12.5	9.0	11.6	1.0	0.3	22.0
α-Tocopherol	0	19.5	31.0	1.0	1.4	52.9	13.7	43.5	2.6	0.6	60.4
	1	16.5	24.4	1.1	1.1	43.1	14.5	49.2	2.5	0.8	67.1
	3.6	12.5	17.0	0.8	1.3	31.5	15.9	48.6	2.8	1.0	68.3
	6	10.6	13.4	0.6	1.1	25.7	14.8	41.5	3.1	0.9	60.3
Caffeic acid	0	12.3	23.0	0.7	1.2	37.2	10.2	35.7	1.2	0.5	47.7
	0.1	11.0	21.1	0.8	1.1	34.0	9.0	32.0	1.1	0.5	42.5
	1	4.9	8.0	0.2	1.0	14.1	4.0	13.5	0.4	0.4	18.4
	3	3.3	4.7	0.1	0.9	8.9	2.4	8.0	0.1	0.4	10.9
Dihydrocaffeic acid	0	15.0	28.0	1.4	1.0	45.4	11.5	42.1	2.2	0.5	56.2
	1	7.9	14.8	0.8	1.0	24.5	9.5	34.4	1.8	0.5	46.2
	3	3.3	7.0	0.3	1.0	11.6	6.2	22.9	1.2	0.3	30.6
Chlorogenic acid	0	17.6	28.0	1.2	1.1	48.0	11.4	37.7	1.5	0.6	51.3
	0.1	17.7	28.0	0.8	1.1	47.6	9.3	34.2	1.1	0.5	45.2
	1	12.2	20.2	1.0	1.0	34.3	8.4	30.9	1.0	0.5	40.8
	3	8.7	15.2	0.5	0.8	25.2	7.9	27.8	0.9	0.5	37.1
Ferulic acid	0	11.8	21.8	0.6	1.2	35.4	9.9	34.1	1.0	0.5	45.6
	0.1	10.8	20.0	0.6	1.1	32.5	9.2	30.0	1.0	0.5	40.7
	1	4.6	7.3	0.3	1.2	13.5	4.9	16.4	0.6	0.5	22.4
	3	4.1	5.5	0.1	1.0	10.8	3.3	11.0	0.4	0.6	15.3
p-Coumaric acid	0	12.1	20.7	0.6	1.5	35.0	12.4	37.4	1.7	0.7	52.3
	1	9.3	15.0	0.5	1.2	26.1	9.9	30.3	1.4	0.7	42.3
	3	6.9	10.5	0.5	1.2	19.1	9.0	27.2	1.3	0.7	38.2
Cinnamic acid	0	15.3	28.6	1.2	1.1	46.2	12.1	45.1	2.3	0.5	60.0
	1	12.9	25.0	1.1	1.0	40.1	12.0	45.1	2.3	0.5	59.8
	3	9.6	25.6	0.9	1.6	37.6	12.3	44.8	2.3	0.5	60.0

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Table (continued)

Protocatechuic acid	0	16.9	26.9	1.0	1.6	46.4	12.4	36.8	1.8	0.7	51.8
	1	9.5	15.2	0.7	1.3	26.7	11.1	35.3	1.8	0.9	49.0
	3	6.0	8.9	0.5	1.1	16.5	9.8	31.0	1.4	0.7	42.8
Vanillic acid	0	15.7	28.8	1.3	1.1	46.9	12.4	42.5	2.2	0.6	57.7
	1	21.5	25.8	1.4	1.2	49.9	12.4	42.6	2.2	0.5	57.7
	3	12.9	18.4	0.7	1.6	33.7	13.5	43.0	2.3	0.5	59.3
Eugenol	0	13.9	22.5	0.6	1.3	38.4	11.4	34.3	1.6	0.7	48.0
	1	13.0	22.2	0.5	1.6	37.4	12.4	39.6	1.8	0.8	54.6
	3	12.6	23.0	0.9	1.5	38.1	12.2	37.5	1.8	0.9	52.4
Catechin	0	14.6	28.0	0.7	1.2	44.5	12.8	46.1	1.6	0.5	61.0
	1	10.3	14.5	0.5	1.1	26.4	7.4	24.3	0.8	0.5	33.0
	3	4.5	5.3	0.0	1.1	10.8	3.6	10.8	0.0	0.2	14.6
Rutin	0	15.9	27.9	1.0	1.2	46.0	10.5	38.3	1.4	0.3	50.4
	0.1	14.5	25.5	0.9	1.2	42.0	11.7	42.0	1.5	0.4	55.7
	1	10.8	19.6	0.8	1.1	32.2	11.5	43.1	1.8	0.6	57.1
Glutathione	0	16.0	26.2	0.9	1.2	44.2	13.9	47.7	1.3	0.5	63.5
	1	15.0	24.3	0.8	1.2	41.3	11.0	37.5	1.4	0.5	50.4
	4	9.1	13.5	0.5	1.0	24.1	8.0	24.6	1.1	0.5	34.1
Cysteine	0	15.9	27.8	0.8	1.1	45.6	10.4	34.3	1.3	0.5	46.5
	1	15.0	26.1	0.8	1.2	43.0	9.8	32.6	1.2	0.5	44.2
	5	11.2	17.9	0.6	1.1	30.8	8.1	25.6	1.0	0.5	35.2
Alanine	0	17.3	28.2	1.2	0.9	47.7	11.3	37.3	1.6	0.4	50.6
	1	17.8	28.0	1.2	0.9	48.0	11.0	37.8	1.7	0.4	51.0
	5	15.2	26.3	1.2	1.3	43.9	10.9	37.5	1.8	0.5	50.7
Proline	0	18.2	29.4	1.3	1.0	50.0	11.5	40.2	2.0	0.4	54.2
	1	17.9	29.1	1.3	1.0	49.3	10.7	37.1	2.0	0.4	50.3
	5	15.8	26.2	1.2	1.0	44.1	10.7	37.9	2.0	0.5	51.0
Serine	0	17.4	28.2	1.2	1.2	48.1	11.8	40.9	2.1	0.6	55.4
	1	16.9	27.2	1.3	1.1	46.5	9.6	35.4	1.8	0.4	47.2
	5	13.6	23.1	1.1	1.0	38.7	9.9	36.0	1.5	0.5	47.9

[a] Measured after 5 days of incubation with 1500 µg/g sodium nitrite at 25 °C. [b] Molar equivalent of test compound with respect to nitrite. [c] Ascorbic acid added simultaneously with nitrite at the experimental start.

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Table. Concentrations of NNN, NAT, NAB and NNK in the Tobacco Matrix Inhibition Experiments[a]

		Midrib					Lamina				
Compound	Molar equiv.[b]	NNN (μg/g)	NAT (μg/g)	NAB (μg/g)	NNK (μg/g)	TSNA (μg/g)	NNN (μg/g)	NAT (μg/g)	NAB (μg/g)	NNK (μg/g)	TSNA (μg/g)
Ascorbic acid	0	19.5	30.0	1.0	1.2	51.7	11.5	39.4	1.9	0.5	53.2
	2	18.2	29.0	0.9	1.0	49.2	10.3	35.5	1.7	0.4	48.0
	4	11.7	15.6	0.7	1.1	29.1	11.7	33.3	1.9	0.7	47.6
	10	7.4	6.9	0.6	1.1	16.0	7.1	17.2	1.2	0.5	26.1
Ascorbic acid[c]	0	35.6	35.0	1.1	1.1	72.8	19.5	42.5	1.5	0.5	63.9
	2	21.6	18.4	0.9	1.2	42.1	22.1	36.9	2.0	0.7	61.7
	4	10.7	6.5	0.4	0.9	18.5	10.9	17.8	1.3	0.4	30.3
	10	7.3	4.1	0.3	0.9	12.5	9.0	11.6	1.0	0.3	22.0
α-Tocopherol	0	19.5	31.0	1.0	1.4	52.9	13.7	43.5	2.6	0.6	60.4
	1	16.5	24.4	1.1	1.1	43.1	14.5	49.2	2.5	0.8	67.1
	3.6	12.5	17.0	0.8	1.3	31.5	15.9	48.6	2.8	1.0	68.3
	6	10.6	13.4	0.6	1.1	25.7	14.8	41.5	3.1	0.9	60.3
Caffeic acid	0	12.3	23.0	0.7	1.2	37.2	10.2	35.7	1.2	0.5	47.7
	0.1	11.0	21.1	0.8	1.1	34.0	9.0	32.0	1.1	0.5	42.5
	1	4.9	8.0	0.2	1.0	14.1	4.0	13.5	0.4	0.4	18.4
	3	3.3	4.7	0.1	0.9	8.9	2.4	8.0	0.1	0.4	10.9
Dihydrocaffeic acid	0	15.0	28.0	1.4	1.0	45.4	11.5	42.1	2.2	0.5	56.2
	1	7.9	14.8	0.8	1.0	24.5	9.5	34.4	1.8	0.5	46.2
	3	3.3	7.0	0.3	1.0	11.6	6.2	22.9	1.2	0.3	30.6
Chlorogenic acid	0	17.6	28.0	1.2	1.1	48.0	11.4	37.7	1.5	0.6	51.3
	0.1	17.7	28.0	0.8	1.1	47.6	9.3	34.2	1.1	0.5	45.2
	1	12.2	20.2	1.0	1.0	34.3	8.4	30.9	1.0	0.5	40.8
	3	8.7	15.2	0.5	0.8	25.2	7.9	27.8	0.9	0.5	37.1
Ferulic acid	0	11.8	21.8	0.6	1.2	35.4	9.9	34.1	1.0	0.5	45.6
	0.1	10.8	20.0	0.6	1.1	32.5	9.2	30.0	1.0	0.5	40.7
	1	4.6	7.3	0.3	1.2	13.5	4.9	16.4	0.6	0.5	22.4
	3	4.1	5.5	0.1	1.0	10.8	3.3	11.0	0.4	0.6	15.3
p-Coumaric acid	0	12.1	20.7	0.6	1.5	35.0	12.4	37.4	1.7	0.7	52.3
	1	9.3	15.0	0.5	1.2	26.1	9.9	30.3	1.4	0.7	42.3
	3	6.9	10.5	0.5	1.2	19.1	9.0	27.2	1.3	0.7	38.2
Cinnamic acid	0	15.3	28.6	1.2	1.1	46.2	12.1	45.1	2.3	0.5	60.0
	1	12.9	25.0	1.1	1.0	40.1	12.0	45.1	2.3	0.5	59.8
	3	9.6	25.6	0.9	1.6	37.6	12.3	44.8	2.3	0.5	60.0

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Table (continued)

Protocatechuic acid	0	16.9	26.9	1.0	1.6	46.4	12.4	36.8	1.8	0.7	51.8
	1	9.5	15.2	0.7	1.3	26.7	11.1	35.3	1.8	0.9	49.0
	3	6.0	8.9	0.5	1.1	16.5	9.8	31.0	1.4	0.7	42.8
Vanillic acid	0	15.7	28.8	1.3	1.1	46.9	12.4	42.5	2.2	0.6	57.7
	1	21.5	25.8	1.4	1.2	49.9	12.4	42.6	2.2	0.5	57.7
	3	12.9	18.4	0.7	1.6	33.7	13.5	43.0	2.3	0.5	59.3
Eugenol	0	13.9	22.5	0.6	1.3	38.4	11.4	34.3	1.6	0.7	48.0
	1	13.0	22.2	0.5	1.6	37.4	12.4	39.6	1.8	0.8	54.6
	3	12.6	23.0	0.9	1.5	38.1	12.2	37.5	1.8	0.9	52.4
Catechin	0	14.6	28.0	0.7	1.2	44.5	12.8	46.1	1.6	0.5	61.0
	1	10.3	14.5	0.5	1.1	26.4	7.4	24.3	0.8	0.5	33.0
	3	4.5	5.3	0.0	1.1	10.8	3.6	10.8	0.0	0.2	14.6
Rutin	0	15.9	27.9	1.0	1.2	46.0	10.5	38.3	1.4	0.3	50.4
	0.1	14.5	25.5	0.9	1.2	42.0	11.7	42.0	1.5	0.4	55.7
	1	10.8	19.6	0.8	1.1	32.2	11.5	43.1	1.8	0.6	57.1
Glutathione	0	16.0	26.2	0.9	1.2	44.2	13.9	47.7	1.3	0.5	63.5
	1	15.0	24.3	0.8	1.2	41.3	11.0	37.5	1.4	0.5	50.4
	4	9.1	13.5	0.5	1.0	24.1	8.0	24.6	1.1	0.5	34.1
Cysteine	0	15.9	27.8	0.8	1.1	45.6	10.4	34.3	1.3	0.5	46.5
	1	15.0	26.1	0.8	1.2	43.0	9.8	32.6	1.2	0.5	44.2
	5	11.2	17.9	0.6	1.1	30.8	8.1	25.6	1.0	0.5	35.2
Alanine	0	17.3	28.2	1.2	0.9	47.7	11.3	37.3	1.6	0.4	50.6
	1	17.8	28.0	1.2	0.9	48.0	11.0	37.8	1.7	0.4	51.0
	5	15.2	26.3	1.2	1.3	43.9	10.9	37.5	1.8	0.5	50.7
Proline	0	18.2	29.4	1.3	1.0	50.0	11.5	40.2	2.0	0.4	54.2
	1	17.9	29.1	1.3	1.0	49.3	10.7	37.1	2.0	0.4	50.3
	5	15.8	26.2	1.2	1.0	44.1	10.7	37.9	2.0	0.5	51.0
Serine	0	17.4	28.2	1.2	1.2	48.1	11.8	40.9	2.1	0.6	55.4
	1	16.9	27.2	1.3	1.1	46.5	9.6	35.4	1.8	0.4	47.2
	5	13.6	23.1	1.1	1.0	38.7	9.9	36.0	1.5	0.5	47.9

[a] Measured after 5 days of incubation with 1500 µg/g sodium nitrite at 25 °C. [b] Molar equivalent of test compound with respect to nitrite. [c] Ascorbic acid added simultaneously with nitrite at the experimental start.

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