

SUPPLEMENTARY MATERIAL

Chemical Composition and Antibacterial Activity of the Essential Oils of the Amazon *Annona* Species

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Table 1. Chemical composition (%) of essential oils of leaves and branches from *A. amazonica* and fruits from *A. mucosa*

Compounds	RI	AaF	AaG	AMFr
α -pinene	930		1.9 $\pm$ 0.0	
camphene	945		0.9 $\pm$ 0.0	
β -pinene	973		1.3 $\pm$ 0.0	
myrcene	987	0.4 $\pm$ 0.1	1.9 $\pm$ 0.0	
α -phellandrene	1003		0.4 $\pm$ 0.0	
<i>o</i> -cymene	1021		8.7 $\pm$ 0.0	
limonene	1025	0.3 $\pm$ 0.2	1.7 $\pm$ 0.0	
1,8-cineol	1030			0.5 $\pm$ 0.2
(<i>Z</i>)- β -ocimene	1033		0.5 $\pm$ 0.3	
(<i>E</i>)- β -ocimene	1044		1.0 $\pm$ 0.1	
γ -terpinene	1058			0.3 $\pm$ 0.0
terpinolene	1085		0.5 $\pm$ 0.1	0.4 $\pm$ 0.0

linalool	1096	1.1 ± 0.3	11.4 ± 0.0	3.3 ± 0.2
<i>cis</i> -thujone	1101		0.2 ± 0.0	
<i>iso</i> -verbanol	1176			11.6 ± 0.4
α-terpineol	1187	1.3 ± 0.2	6.2 ± 0.1	
citronellol	1224		1.0 ± 0.1	0.6 ± 0.3
geraniol	1251	0.8 ± 0.0	3.0 ± 0.4	0.2 ± 0.1
bornyl acetate	1287			3.1 ± 0.0
citronelic acid	1313			0.5 ± 0.1
δ-elemene	1335		0.3 ± 0.0	
α-cubebene	1347	0.7 ± 0.3	0.3 ± 0.1	
cyclosativene	1365	1.1 ± 0.0		1.6 ± 0.0
α-copaene	1374	5.7 ± 0.2	0.8 ± 0.3	
8- <i>epi</i> -dictamnol	1378	0.4 ± 0.0		
β-elemene	1389	2.1 ± 0.0	0.8 ± 0.0	0.4 ± 0.0
cyperene	1397	0.3 ± 0.2		1.0 ± 0.3
(<i>Z</i>)-caryophyllene	1406			0.7 ± 0.2
α- <i>cis</i> -bergamotene	1413			0.7 ± 0.4
β-caryophyllene	1417	14.7 ± 0.4	1.7 ± 0.0	
β-copaene	1426	5.2 ± 0.3	0.7 ± 0.3	0.6 ± 0.1
α- <i>trans</i> -bergamotene	1433			0.6 ± 0.0
α-guaiene	1436	0.3 ± 0.0		0.2 ± 0.2
6,9-guaiadiene	1440	0.4 ± 0.1	0.2 ± 0.2	0.2 ± 0.0
<i>cis</i> -muurola-3,5-diene	1446	0.9 ± 0.0	0.4 ± 0.1	0.3 ± 0.3
α-humulene	1451	3.8 ± 0.1	0.8 ± 0.0	
ishwarene	1466	0.3 ± 0.2		
dauca-5,8-diene	1471		0.3 ± 0.0	0.4 ± 0.0
<i>trans</i> -cadina-1(6),4-diene	1474	4.1 ± 0.2	1.4 ± 0.1	0.3 ± 0.0
γ-murolene	1478	1.0 ± 0.3	5.7 ± 0.0	
α- amorphene	1483	5.4 ± 0.0	0.6 ± 0.1	2.0 ± 0.2
β-selinene	1488	0.7 ± 0.0	0.2 ± 0.2	0.6 ± 0.0

<i>cis</i> - β -guaiene	1491	6.6 $\pm$ 0.3	0.9 $\pm$ 0.0	
γ -amorphene	1493			0.2 $\pm$ 0.3
α -muurolene	1497	4.4 $\pm$ 0.3	1.2 $\pm$ 0.2	0.3 $\pm$ 0.1
β -bisabolene	1506	2.1 $\pm$ 0.3		
δ -amorphene	1511	2.4 $\pm$ 0.4	0.4 $\pm$ 0.0	
γ -cadinene	1512		1.0 $\pm$ 0.0	
δ -cadinene	1521	3.5 $\pm$ 0.0	4.1 $\pm$ 0.2	
(<i>Z</i>)-nerolidol	1529			38.2 $\pm$ 0.1
<i>trans</i> -cadina-1,4-diene	1531	0.5 $\pm$ 0.3	0.2 $\pm$ 0.2	
10- <i>epi</i> -cubebol	1534	1.0 $\pm$ 0.0		
α -calacorene	1539	0.5 $\pm$ 0.1	0.6 $\pm$ 0.2	
elemol	1546		1.5 $\pm$ 0.1	
<i>cis</i> -muurol-5-en-4- β -ol	1549	0.4 $\pm$ 0.0	0.6 $\pm$ 0.2	
<i>trans</i> -dauca-4(11),7-diene	1553	0.4 $\pm$ 0.0	0.4 $\pm$ 0.2	
β -calacoreno	1559	0.3 $\pm$ 0.1		3.7 $\pm$ 0.2
α -cedrene epoxide	1569			0.2 $\pm$ 0.1
spathulenol	1574	2.1 $\pm$ 0.0	0.3 $\pm$ 0.3	0.7 $\pm$ 0.0
caryophyllene oxide	1580	6.3 $\pm$ 0.2	1.3 $\pm$ 0.0	2.3 $\pm$ 0.0
gleenol	1581		0.4 $\pm$ 0.1	
viridiflorol	1590	0.5 $\pm$ 0.1	1.0 $\pm$ 0.1	0.3 $\pm$ 0.2
salvial-4(14)-enone	1594			0.4 $\pm$ 0.0
fokienol	1598			0.5 $\pm$ 0.1
guaiol	1601	0.7 $\pm$ 0.0	0.5 $\pm$ 0.1	0.3 $\pm$ 0.0
humulene epoxide	1606	1.4 $\pm$ 0.3	1.1 $\pm$ 0.1	0.4 $\pm$ 0.0
<i>cis</i> -isolongifolanone	1610	0.2 $\pm$ 0.3	0.9 $\pm$ 0.1	0.6 $\pm$ 0.3
α -corocalene	1618		0.3 $\pm$ 0.0	2.0 $\pm$ 0.2
10- <i>epi</i> - γ -eudesmol	1621	0.9 $\pm$ 0.1	1.0 $\pm$ 0.3	
1- <i>epi</i> -cubenol	1625	1.4 $\pm$ 0.1	3.2 $\pm$ 0.3	
γ -eudesmol	1628	0.5 $\pm$ 0.1	1.2 $\pm$ 0.1	3.4 $\pm$ 0.0
gossonorol	1633	0.3 $\pm$ 0.2		0.7 $\pm$ 0.1
<i>epi</i> - α -cadinol	1638	1.4 $\pm$ 0.2	7.1 $\pm$ 0.0	0.2 $\pm$ 0.2

α -muurolol	1642	1.6 $\pm$ 0.3	2.8 $\pm$ 0.1	0.3 $\pm$ 0.0
β -eudesmol	1647	1.3 $\pm$ 0.2	0.3 $\pm$ 0.0	0.2 $\pm$ 0.0
pogostol	1648			1.3 $\pm$ 0.3
α -cadinol	1650.	2.6 $\pm$ 0.3	10.0 $\pm$ 0.3	
valerianol	1653	0.2 $\pm$ 0.2		0.9 $\pm$ 0.0
selin-11-en-4- α -ol	1658	0.5 $\pm$ 0.0		
<i>cis</i> -calamenen-10-ol	1662	0.6 $\pm$ 0.0		0.3 $\pm$ 0.2
14-hydroxy-(<i>Z</i>)-caryophyllene	1666	0.4 $\pm$ 0.1		0.6 $\pm$ 0.3
cadalene	1670	0.4 $\pm$ 0.0	0.2 $\pm$ 0.0	
guaia-3,10(14)-dien-11-ol	1674		0.5 $\pm$ 0.0	
mustacona	1676	0.6 $\pm$ 0.0		0.4 $\pm$ 0.2
helifolenol	1678	0.4 $\pm$ 0.2		0.5 $\pm$ 0.1
<i>epi</i> - α -bisabolol	1680	0.2 $\pm$ 0.0	0.8 $\pm$ 0.3	
acorenone	1690	1.2 $\pm$ 0.1		
eudesm-7(11)-en-4-ol	1695			0.4 $\pm$ 0.2
<i>cis</i> -thujopsenal	1707			0.3 $\pm$ 0.1
(<i>E</i>)- nerolidol acetate	1716	0.2 $\pm$ 0.1		0.2 $\pm$ 0.2
γ -curcumen-15-al	1764			0.3 $\pm$ 0.2
14- hydroxy- α -muurolene	1776			0.4 $\pm$ 0.2
7- hydroxycoumarin	1834			3.8 $\pm$ 0.0
Total identified (%)		99.0	98.6	94.6
Number of compounds		59	60	64

AaF- *A. amazonica* leaves; AaG - *A. amazonica* branches; AmFr- *A. mucosa* fruits;

Table 2. Chemical composition (%) of the essential oils of leaves from *A. exsucca* and *A. insignis*

Compounds	RI	AeF-I	AeF-U	AiF
α -thujeno	926	0.3 $\pm$ 0.0		
α -pinene	930	0.7 $\pm$ 0.1	0.4 $\pm$ 0.0	
sabinene	973	1.3 $\pm$ 0.1		
β -pinene	973	0.2 $\pm$ 0.0	0.5 $\pm$ 0.4	0.3 $\pm$ 0.2
myrcene	987	0.7 $\pm$ 0.0		0.2 $\pm$ 0.0
<i>o</i> -cymene	1021	2.1 $\pm$ 0.1		
limonene	1025	0.6 $\pm$ 0.3		1.2 $\pm$ 0.0
(<i>Z</i>)- β -ocymene	1033	0.2 $\pm$ 0.0		
γ -terpinene	1058	0.2 $\pm$ 0.4		
linalool	1096	0.5 $\pm$ 0.0		
<i>iso</i> -verbanol	1176	0,7 $\pm$ 0,2		
α -terpineol	1187	0.3 $\pm$ 0.3	0.3 $\pm$ 0.0	0.7 $\pm$ 0.3
bornyl acetate	1287	0.2 $\pm$ 0.2		
δ -elemene	1335		1.3 $\pm$ 0.1	
α -cubebene	1347	0.4 $\pm$ 0.0		0.4 $\pm$ 0.2
α -copaene	1374	2.1 $\pm$ 0.2	1.1 $\pm$ 0.1	2.1 $\pm$ 0.3
8- <i>epi</i> -dictamnol	1378			0.6 $\pm$ 0.0
β -bourbonene	1382	1.4 $\pm$ 0.2	0.6 $\pm$ 0.1	1.0 $\pm$ 0.3
β -elemene	1389	17,2 $\pm$ 0,0	9,9 $\pm$ 0,2	4,0 $\pm$ 0,3
α - <i>cis</i> -bergamotene	1413	0.6 $\pm$ 0.3		
β -caryophyllene	1417	22.2 $\pm$ 0.4	15.3 $\pm$ 0.0	12.8 $\pm$ 0.2
β -copaene	1426	0.8 $\pm$ 0.3	0.8 $\pm$ 0.2	0.6 $\pm$ 0.0
α - <i>trans</i> -bergamotene	1433	2.8 $\pm$ 0.2	0.6 $\pm$ 0.1	
α -guaiene	1436			0.4 $\pm$ 0.3
6,9-guaiadiene	1440			0.3 $\pm$ 0.1

<i>cis</i> -muurola-3,5-diene	1446		0.3 ± 0.1	
α-humulene	1451	5.3 ± 0.0	3.6 ± 0.2	3.0 ± 0.3
<i>cis</i> -cadina-1(6),4-diene	1460	0.2 ± 0.0	0.3 ± 0.0	
<i>trans</i> -cadina-1(6),4-diene	1474	0,8 ± 0,2	2,7 ± 0,4	
γ-muurolene	1478	15.4 ± 0.3	20.2 ± 0.0	1.2 ± 0.1
α-amorphene	1483		1.6 ± 0.1	
β-selinene	1488	0.5 ± 0.0	0.7 ± 0.1	0.5 ± 0.1
<i>cis</i> -β-guaiene	1491	0.7 ± 0.2		0.9 ± 0.0
γ-amorphene	1493	4.1 ± 0.2	7.0 ± 0.1	.
α-muurolene	1497	0.4 ± 0.3	1.0 ± 0.0	0.4 ± 0.0
α-patchoulene	1502	1.3 ± 0.0	2.8 ± 0.2	0.3 ± 0.3
β-bisabolene	1506	0.2 ± 0.0	0.3 ± 0.3	0.2 ± 0.2
δ-amorphene	1511	1.0 ± 0.3	0.3 ± 0.4	1.3 ± 0.0
γ-cadinene	1512		1.6 ± 0.2	
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germacrene B	1554	0.2 ± 0.0	2.0 ± 0.3	0.5 ± 0.2
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spathulenol	1574	1.9 ± 0.0	0.8 ± 0.1	2.1 ± 0.1
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<i>epi</i> - α -bisabolol	1680	0.3 $\pm$ 0.3	0.7 $\pm$ 0.2	0.5 $\pm$ 0.3
germacra-4(15),5,10(14)-trien-1- α -ol	1685			0.2 $\pm$ 0.0
acorenone	1690			0.4 $\pm$ 0.2
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Total identified (%)		99.5	99.4	93.2
Number of compounds		59	60	64

AeF-I - *A. exsucca* leaves INPA; AeF-U - *A. exsucca* leaves UFAM; AiF- *A. insignis* leaves

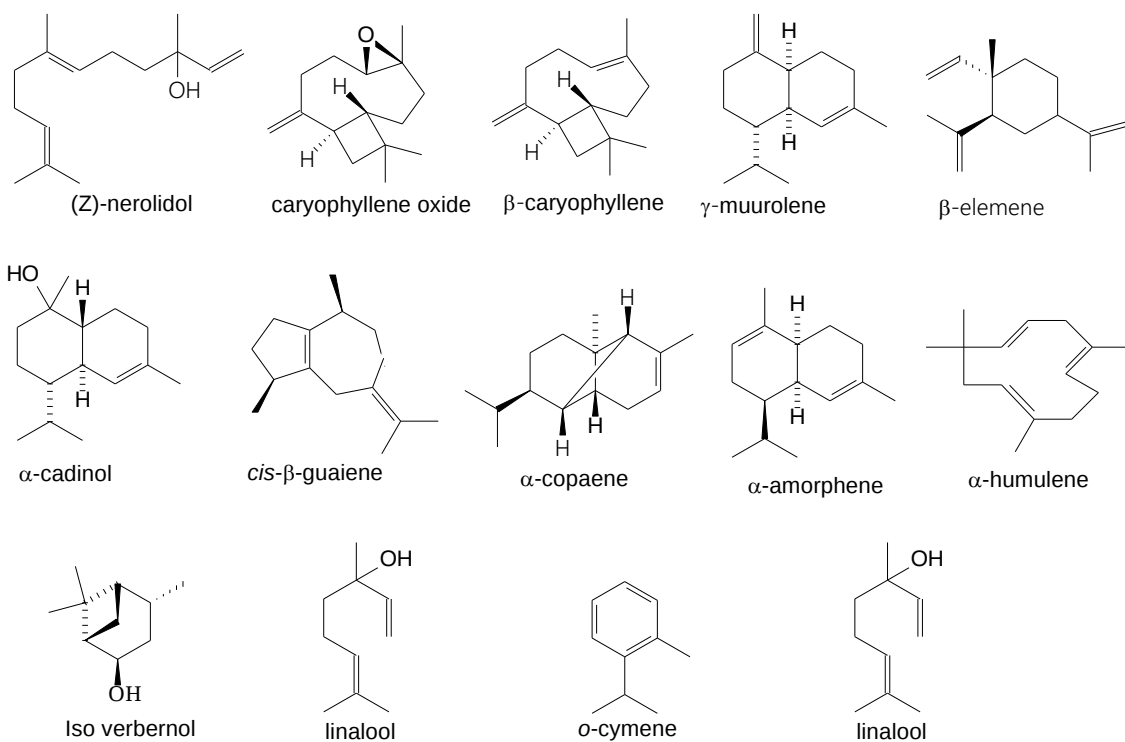


Figure 1. Major constituents of the essential oils of *Annona* spp (%> 5)