

Supplementary Information for

Cephalotane diterpenoids: structural diversity, biological activity, biosynthetic proposal, and chemical synthesis

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Table S1 Cephalotane diterpenes isolated from *Cephalotaxus* plants

Compound	Plant species	Plant part	Material weight (kg)	Yield (mg/kg)	Ref.
Harringtonolide (hainanolide, 1)	<i>C. harringtonia</i>	Seeds	2.5	12	1
	<i>C. harringtonia</i> var. <i>drupacea</i>	Seeds	10	75	2
	<i>C. hainanensis</i>	Barks	90	9.1	3
	<i>C. lanceolata</i>	Branches and leaves	9.3	0.8	4
	<i>C. lanceolata</i>	Twigs and leaves	19	33	5
	<i>C. fortunei</i>	Twigs and leaves	7	15	6
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	5.1	5
Fortunolide B (2)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	300	7
	<i>C. fortunei</i> var. <i>alpina</i>	Needles and stems	4.5	4.7	8
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	1.9	5
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	5.0	9
	<i>C. fortunei</i>	Twigs and leaves	7	0.3	6
Cephinoid F (3)	<i>C. sinensis</i>	Twigs and leaves	3.5	2.6	10
	<i>C. lanceolata</i>	Twigs and leaves	19	0.2	5
10-Hydroxyharringtonolide (4)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.4	7
	<i>C. mannii</i>	Twigs and leaves	5.2	0.4	11
Fortalpinoid J (5)	<i>C. fortunei</i>	Twigs and leaves	7	0.3	6
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.3	5
	<i>C. lanceolata</i>	Twigs and leaves	19	2.0	5
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	1.5	9
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.3	7
Cephinoid G (6)	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.1	12
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.6	5
3-Deoxyfortalpinoid F (7)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.8	7
Fortalpinoid F (8)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.5	7
Cephinoid H (9)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.5	7
	<i>C. lanceolata</i>	Twigs and leaves	19	0.5	5
Cephinoid I (10)	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.1	12
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.3	5
Hainanolidol (11)	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.1	12
	<i>C. hainanensis</i>	Barks	90	1.6	3
	<i>C. fortunei</i>	Twigs and leaves	7	0.4	6
	<i>C. fortunei</i> var. <i>alpina</i>	Needles and stems	4.5	3.6	8
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	6.9	5
Fortalpinoid C (12)	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.3	12
	<i>C. lanceolata</i>	Twigs and leaves	19	3.2	5
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	7
Fortunolide A (13)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	7
	<i>C. sinensis</i>	Twigs and leaves	3.5	2.6	10
	<i>C. lanceolata</i>	Twigs and leaves	19	0.5	5
	<i>C. fortunei</i> var. <i>alpina</i>	Needles and stems	4.5	8.0	8
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.3	5
Fortalpinoid A (14)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	35	7
	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.3	12
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	1.3	7
Cephinoid J (15)	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.2	5
Fortalpinoid E (16)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.6	7
	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.1	12
Fortalpinoid B (17)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.4	7
10-Hydroxyhainanolidol (18)	<i>C. fortunei</i>	Seeds	10	0.4	7
	<i>C. koreana</i>	Aerial parts	1.2	4.3	13
	<i>C. fortunei</i>	Twigs and leaves	7	0.4	6
20 α -Hydroxyhainanolidol (19)	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.2	5
	<i>C. fortunei</i>	Twigs and leaves	7	0.4	6
Cephinoid K (20)	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.3	5
	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.2	12
	<i>C. lanceolata</i>	Twigs and leaves	19	0.4	5

Fortalpinoid D (21)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	2.8	7
6-en-Harringtonolide (22)	<i>C. mannii</i>	Twigs and leaves	5.2	0.6	11
	<i>C. fortunei</i>	Twigs and leaves	7	0.3	6
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.4	5
	<i>C. lanceolata</i>	Twigs and leaves	19	0.1	5
Fortalpinoid H (23)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.8	7
Cephinoid L (24)	<i>C. lanceolata</i>	Twigs and leaves	19	0.8	5
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.2	5
Cephanolide J (25)	<i>C. sinensis</i>	Twigs and leaves	3.5	2.0	10
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.3	7
Fortalpinoid I (26)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	7
20-Oxohainanolidol (cephinoid M, 27)	<i>C. fortunei</i>	Twigs and leaves	7	0.6	6
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.6	5
	<i>C. lanceolata</i>	Twigs and leaves	19	0.1	5
Cephinoid N (28)	<i>C. lanceolata</i>	Twigs and leaves	19	0.2	5
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.4	7
Fortalpinoid G (29)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	7
Cephinoid O (30)	<i>C. lanceolata</i>	Twigs and leaves	19	0.1	5
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.1	5
Fortalpinoid M (31)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.3	7
Fortalpinoid N (32)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	1.0	7
Fortalpinoid O (33)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	7
Cephafortoid A (gongshanolide, 34)	<i>C. lanceolata</i>	Branches and leaves	9.3	3.4	4
	<i>C. fortunei</i>	Twigs and leaves	7	2.9	6
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.4	5
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.8	7
	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.1	12
14- <i>epi</i> -Cephafortoid A (cephinoid Q, 35)	<i>C. fortunei</i>	Twigs and leaves	7	0.4	6
	<i>C. lanceolata</i>	Twigs and leaves	19	0.9	5
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.3	5
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.5	7
	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.3	12
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.1	5
Cephinoid R (36)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	7
	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.1	5
Cephinoid S (37)	<i>C. lanceolata</i>	Twigs and leaves	19	0.3	5
Fortalpinoid P (38)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.3	7
Fortalpinoid Q (39)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	7
Cephinoid P (40)	<i>C. lanceolata</i>	Twigs and leaves	19	0.2	5
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.7	7
Fortalpinoid K (41)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	7
Fortalpinoid L (42)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	7
Ceforloid B (43)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.8	14
Ceforloid C (44)	<i>C. sinensis</i>	Twigs and leaves	8.0	0.4	14
Mannolide A (45)	<i>C. mannii</i>	Twigs and leaves	5.2	1.9	11
	<i>C. fortunei</i>	Twigs and leaves	7	0.4	6
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.4	15
Mannolide B (46)	<i>C. mannii</i>	Twigs and leaves	5.2	0.4	11
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	15
Mannolide C (47)	<i>C. mannii</i>	Twigs and leaves	5.2	0.6	11
Fortalide A (48)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.6	15
Fortalide B (49)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.7	15
Cephanolide G (50)	<i>C. sinensis</i>	Twigs and leaves	3.5	1.4	10
Cephanolide F (51)	<i>C. sinensis</i>	Twigs and leaves	3.5	2.0	10
Fortalide C (52)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	15
Fortalide D (53)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	1.2	15
Fortalide E (54)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	15
Fortalide F (55)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	15
Cephanolide E (56)	<i>C. sinensis</i>	Twigs and leaves	3.5	2.9	10

	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.1	12
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.8	15
Fortalide G (57)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.6	15
Fortalide H (58)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.7	15
Fortalide I (59)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	15
Cephinoid B (60)	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.1	5
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.9	15
Cephinoid A (61)	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.5	5
	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	1.2	15
Fortalide J (62)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	1.1	15
Fortalide K (63)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	15
Fortalide L (64)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.4	15
Fortalide M (65)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	15
Fortalpinoid R (66)	<i>C. fortunei</i> var. <i>alpina</i>	Twigs	20.0	0.1	16
Cephinoid C (67)	<i>C. lanceolata</i>	Twigs and leaves	19	2.0	5
Cephinoid D (68)	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.2	5
Cephinoid E (69)	<i>C. fortunei</i> var. <i>alpina</i>	Twigs and leaves	39	0.1	5
Fortalide N (70)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	15
Fortalide O (71)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	15
Cephafortunoid C (72)	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.2	12
Cephafortunoid D (73)	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.2	12
Fortalide P (74)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.3	15
Fortalide Q (75)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	15
Cephanolide H (76)	<i>C. sinensis</i>	Twigs and leaves	3.5	1.1	10
Cephanolide I (77)	<i>C. sinensis</i>	Twigs and leaves	3.5	0.6	10
Ceforloid G (78)	<i>C. sinensis</i>	Twigs and leaves	8.0	0.3	14
Cephasinenoside A (79)	<i>C. sinensis</i>	Twigs and leaves	43	0.3	17
	<i>C. sinensis</i>	Twigs and leaves	8.0	0.5	14
Ceforloid F (80)	<i>C. sinensis</i>	Twigs and leaves	8.0	0.3	14
Ceforloid D (81)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.4	14
Ceforloid E (82)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	14
Cephafortunoid A (83)	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.1	12
Cephafortunoid B (84)	<i>C. fortunei</i> var. <i>alpina</i>	Branches and leaves	40	0.1	12
Cephanolide D (85)	<i>C. sinensis</i>	Twigs and leaves	3.5	1.4	10
Ceforalide A (86)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.6	18
Ceforalide B (87)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	18
Ceforalide C (88)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.4	18
Cephanolide C (89)	<i>C. sinensis</i>	Twigs and leaves	3.5	2.3	10
Cephanolide B (90)	<i>C. sinensis</i>	Twigs and leaves	3.5	1.7	10
Ceforalide D (91)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	18
Ceforalide E (92)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	18
Ceforalide F (93)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	18
Ceforalide G (94)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	18
Cephanolide A (95)	<i>C. sinensis</i>	Twigs and leaves	3.5	2.3	10
Ceforalide H (96)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.9	18
Ceforloid A (97)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.3	14
Cephalotanin A (98)	<i>C. sinensis</i>	Leaves	4.0	1.3	19
Cephalotanin B (99)	<i>C. sinensis</i>	Leaves	4.0	2.5	19
Ceforalide I (100)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	18
Cephalotanin C (101)	<i>C. sinensis</i>	Leaves	4.0	0.5	19
	<i>C. lanceolata</i>	Twigs and leaves	19	0.1	5
Cephalotanin D (102)	<i>C. sinensis</i>	Leaves	4.0	2.5	19
Cephalodione A (103)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.3	9
Cephalodione B (104)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.1	9
Cephalodione C (105)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.2	9
Cephalodione D (106)	<i>C. fortunei</i> var. <i>alpina</i>	Seeds	10	0.3	9

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