

## LEGENDS TO THE TABLE

- \* Pheromone component, chemically identified in the pheromone gland.
- ( ) Optimized blend for attraction in a field or a flight tunnel.
- [ ] The ratio identified in a pheromone extract.
- E Pheromone candidate estimated by the EAG study.
- N No field attraction data, or no field attractancy.

The chemical formulae are symbolized by

- 1) the number before the hyphen giving the position of double bond [ $Z = (Z)$ -configuration,  $E = (E)$ -configuration,  $\Delta =$  terminal] or the following functional groups in the chain,  
≡ = triple bond  
epo = *cis*-epoxy ring  
tepo = *trans*-epoxy ring  
Me = branched methyl group
- 2) the number before the colon giving the carbon atoms in the straight chain,
- 3) the words after the colon giving the functional groups as follows,  
H = hydrocarbon  
OH = primary alcohol  
OFo = formate of alcohol  
OAc = acetate of alcohol  
OPr = propionate of alcohol  
OBu = butyrate of alcohol  
OisoBu = isobutyrate of alcohol  
OisoVa = isovalerate (3-methylbutanoate) of alcohol  
ONO<sub>2</sub> = nitrate  
Ald = aldehyde  
one = ketone  
CN = nitrile  
Ate = ester of a long chain acid

(In the case of secondary alcohols and ketones, the position of the functional group is indicated by inserting the number before its symbol, such as 2-one for a carbonyl group at the 2-position. Terminal functional groups are indicated by the symbols without the number.)

Distribution information in Japan.

- A This species is distributed in Japan, and Japanese common name is shown in < >.
- B Sub-species is distributed in Japan.
- C Species in the same genus is distributed in Japan.
- D Species in this genus is not distributed in Japan.

**Number of Species Counted in the List of Lepidopterous Sex Pheromones and Attractants**  
**Revised on 2025. 2. 8**

(Pheromones produced by male moths are not counted.)  
 Number in parenthesis indicates the species distributed in Japan.

[Superfamily] Family Subfamily		Number of species			
		Sex pheromone		Sex attractant	
[Eriocranioidea]	スイコバネガ上科				
Eriocraniidae	スイコバネガ科	3	(1)	1	(1)
[Nepticuloidea]	モグリチビ上科				
Nepticulidae	モグリチビガ科	1	(0)	2	(0)
[Incurvarioidea]	マガリガ上科				
Heliozelidae	ツヤコガ科	3	(0)	1	(0)
Prodoxidae	ホソヒゲマガリガ科	1	(0)	0	(0)
[Tischerioidea]	ムモンハモグリガ上科				
Tischeriidae	ムモンハモグリガ科	1	(0)	0	(0)
[Tineoidea]	ヒロズコガ上科				
Tineidae	ヒロズコガ科	4	(2)	22	(1)
Psychidae	ミノガ科	5	(1)	1	(0)
[Gracillarioidea]	ホソガ上科				
Bucculatricidae	チビガ科	1	(0)	0	(0)
Gracillariidae	ホソガ科	18	(5)	31	(8)
[Yponomeutoidea]	スガ上科				
Yponomeutidae	スガ科	14	(4)	26	(11)
Ypsolophidae	クチブサガ科	0	(0)	5	(1)
Plutellidae	コナガ科	1	(1)	1	(1)
Acrolepiidae	アトヒゲコガ科	3	(2)	3	(3)
Glyphipterigidae	ホソハマキモドキガ科	0	(0)	3	(2)
Lyonetiidae	ハモグリガ科	6	(1)	0	(0)
[Gelechioidea]	キバガ上科				
Ethmiidae	スヒロキバガ科	0	(0)	2	(0)
Elachistidae	クサモグリガ科	2	(0)	1	(0)
Xyloryctidae	ヒロバキバガ科	1	(0)	0	(0)
Oecophoridae	マルハキバガ科	1	(0)	8	(2)
Depressariidae	ヒラタマルハキバガ科	2	(0)	12	(4)
Stathmopodidae	ニセマイコガ科	2	(2)	1	(1)
Lecithoceridae	ヒゲナガキバガ科	0	(0)	2	(2)
Batrachedridae	ホソキバガ科	1	(0)	1	(1)
Coleophoridae	ツツミノガ科	1	(0)	45	(3)
Momphidae	アカバナキバガ科	0	(0)	1	(0)
Cosmopterigidae	カザリバガ科	1	(1)	13	(11)

Gelechiidae	キバガ科	15	(5)	56	(8)
[Zygaenoidea]	マダラガ上科				
Limacodidae	イラガ科	7	(2)	3	(2)
Himantopteridae	リボンマダラガ科	0	(0)	2	(0)
Zygaenidae	マダラガ科	3	(1)	46	(2)
[Sesioidea]	スカシバガ上科				
Sesiidae	スカシバガ科	28	(8)	86	(4)
Brachodidae	ヒロハマキモドキガ科	0	(0)	1	(0)
[Cossoidea]	ボクトウガ上科				
Cossidae	ボクトウガ科	12	(1)	4	(0)
[Tortricoidea]	ハマキガ上科				
Tortricidae	ハマキガ科				
Tortricinae	ハマキガ亜科	114	(10)	133	(46)
Olethreutinae	ノコメハマキガ亜科	64	(22)	230	(52)
Chlidanotinae	マダラハマキガ亜科	0	(0)	3	(0)
[Choreutoidea]	ハマキモドキガ上科				
Choreutidae	ハマキモドキガ科	1	(1)	3	(3)
[Schreckensteinoidea]	ホソマイコガ上科				
Schreckensteiniidae	ホソマイコガ科	0	(0)	1	(1)
[Pterophoroidea]	トリバガ上科				
Pterophoridae	トリバガ科	2	(1)	22	(8)
[Copromorpoidea]	マルバシンクイガ上科				
Carposinidae	シンクイガ科	3	(1)	4	(4)
[Thyridoidea]	マドガ上科				
Thyrididae	マドガ科	0	(0)	2	(1)
[Pyraloidea]	メイガ上科				
Pyralidae	メイガ科				
Galleriinae	ツヅリガ亜科	2	(0)	0	(0)
Pyralinae	シマメイガ亜科	1	(1)	3	(2)
Epipaschiinae	フトメイガ亜科	1	(0)	0	(0)
Phycitinae	マダラメイガ亜科	37	(11)	11	(1)
Crambidae	ツトガ科				
Schoenobiinae	オオメイガ亜科	3	(3)	0	(0)
Scopariinae	ヤマメイガ亜科	0	(0)	4	(1)
Crambinae	ツトガ亜科	19	(5)	8	(3)
Cybalomiinae	モンメイガ亜科	1	(1)	0	(0)
Acentropinae	ミズメイガ亜科	0	(0)	2	(1)
Glaphyriinae	ニセノメイガ亜科	2	(2)	4	(2)
Spilomelinae	ヒゲナガノメイガ亜科	26	(17)	7	(4)
Pyraustinae	ノメイガ亜科	13	(8)	20	(8)
[Lasiocampoidea]	カレハガ上科				
Lasiocampidae	カレハガ科	13	(3)	0	(0)
[Drepanoidea]	カギバガ上科				

Drepanidae	カギバガ科	0	(0)	6	(3)
[Geometroidea]	シャクガ上科				
Geometridae	シャクガ科	55	(14)	82	(33)
Uraniidae	ツバメガ科	0	(0)	2	(2)
[Bombycoidea]	カイコガ上科				
Endromidae		1	(0)	0	(0)
Bombycidae	カイコガ科	4	(2)	0	(0)
Saturniidae	ヤママユガ科	22	(4)	1	(0)
Sphingidae	スズメガ科	11	(7)	11	(3)
[Noctuoidea]	ヤガ上科				
Notodontidae	シャチホコガ科	11	(0)	1	(0)
Noctuidae	ヤガ科				
Dilobinae		0	(0)	1	(0)
Acronictinae	ケンモンヤガ亜科	0	(0)	5	(0)
Heliothinae	タバコガ亜科	11	(3)	7	(2)
Noctuinae	モンヤガ亜科	18	(5)	83	(7)
Hadeninae	ヨトウガ亜科	41	(9)	146	(37)
Cuculliinae	セダカモクメ亜科	4	(0)	44	(11)
Amphipyrynae	カラスヨトウガ亜科	6	(6)	24	(5)
Sarothripinae	キノカワガ亜科	0	(0)	1	(1)
Chloephorinae	リング亜科	2	(1)	1	(0)
Acontiinae	コヤガ亜科	1	(1)	9	(5)
Plusinae	キンウワバ亜科	24	(16)	26	(5)
Metoponiinae		1	(0)	0	(0)
Nolidae	コブガ科	1	(0)	1	(1)
Erebidae	トモエガ科				
Calpinae	エグリバ亜科	1	(1)	0	(0)
Catocalinae	シタバガ亜科	11	(3)	18	(4)
Ophiderinae	クチバ亜科	9	(3)	9	(6)
Hypeninae	アツバ亜科	0	(0)	4	(0)
Herminiinae	クルマアツバ亜科	1	(0)	9	(3)
Lymantriinae	ドクガ亜科	29	(16)	8	(1)
Arctiinae	ヒトリガ亜科				
Lithosiini	コケガ族	5	(4)	1	(1)
Synthomini	カノコガ族	3	(1)	2	(0)
Arctiini	ヒトリガ族	26	(4)	9	(0)
<b>Total</b>		<b>734</b>	<b>(219)</b>	<b>1348</b>	<b>(334)</b>

## LIST OF SEX PHEROMONES AND ATTRACTANTS

[Super-family]

(Family; Sub-family)

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Species Common name <Japanese common name>	Sex pheromone and sex attractant	Reference	Distribution in Japan
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(1) [Micropterigoidea] コバネガ上科

no species

(2) [Eriocranioidea] スイコバネガ上科  
(Eriocraniidae) スイコバネガ科

<i>Eriocrania cicatricella</i> Zett. phe.	*Z4-7:2-OH (2R)-isomer + *7:2-OH (2R)-isomer (20:3) + another component	Zhu, 1995(a)	C
<i>Eriocrania sangii</i> Wood phe.	*Z6-9:2-OH (2S)-isomer + other components	Kozlov, 1996 Lassance, 2019	C
<i>Eriocrania semipurpurella</i> Stephens <oo-suikobane> phe.	*Z6-9:2-OH (2R)-isomer + other components	Kozlov, 1996 Lassance, 2019	A
<i>Eriocrania sparrmannella</i> Bosc <kinmadara-suikobane> att.	Z4-7:2-OH (2S)-isomer + 7:2-OH (2S)-isomer (20:3)	Zhu, 1995(a)	A

(3) [Hepialoidea] コウモリガ上科

no species

(4) [Nepticuloidea] モグリチビガ上科  
(Nepticulidae) モグリチビガ科

<i>Stigmella crataegella</i> Klimesch att.	Z6,8-9:2-OH (2 <i>S</i> )-isomer + E6,8-9:2-OH (2 <i>S</i> )-isomer (1:1)	Tóth, 1995	C
<i>Stigmella malella</i> Stainton Klimesch banded apple pigmy phe.	*Z6,8-9:2-OH (2 <i>S</i> )-isomer + *E6,8-9:2-OH (2 <i>S</i> )-isomer (10:3)	Tóth, 1995	C
<i>Trifurcula melanoptera</i> att.	Z6,8-9:2-OH (2 <i>R</i> )-isomer + E6,8-9:2-OH (2 <i>R</i> )-isomer (1:1)	Tóth, 1995	C

(5) [Incurvarioidea] マガリガ上科  
(Heliozelidae) ツヤコガ科

<i>Antispila oinophylla</i> van Nieukerken & Wagner phe.	*Z7-14:Ald + *Z5-14:Ald (20:3)	Wang, 2019	C
<i>Antispila treitschkiella</i> Fr. att.	Z7-14:Ald	Tóth, 1992(d)	C
<i>Holocacista capensis</i> van Nieukerken & Greertsema phe.	*Z7-14:Ald + *Z5-14:Ald (3:1) + another component	Wang, 2015(b)	D
<i>Holocacista rivillei</i> Stainton phe.	*Z5-12:Ald + *Z7-14:Ald (50:3)	Wang, 2019	D

(Prodoxidae) ホソヒゲマガリガ科

<i>Lampronia capitella</i> Litner phe.	Z11-14:OAc	Löfstedt, in Arn, 1997	C
	*Z9,Z11-14:OH + *Z9,Z11-14:OAc + *Z9,Z11-14:Ald (100:26:13)	Löfstedt, 2004	

(6) [Tischerioidea] ムモンモグリガ上科  
(Tischeriidae) ムモンモグリガ科

<i>Tischeria ekebladella</i> Bjerkander oak leafminer phe.	*Z3,Z6,Z9,Z19-23:H + another component	Molnár, 2012	C
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(7) [Tineoidea] ヒロズコガ上科  
(Tineidae) ヒロズコガ科

<i>Archimeessia</i> sp. att.	E3,Z13-18:OAc + E2,Z13-18:OH (1:1)	Bûda, 1993	D
<i>Celestica angustipennis</i> att.	E3,Z13-18:OAc + E3,Z13-18:OH (1:1)	Bûda, 1993	D
<i>Ereunetis</i> (= <i>Decadarchis</i> ) <i>simulans</i> Butler att.	Z3,Z13-18:OAc	Brennan, 1977	D
<i>Infurcitinea albicomella</i> HS. att.	Z11-16:OH + Z11-16:Ald (1:1)	Tóth, 1992(d)	D
<i>Infurcitinea finalis</i> Gozm. att.	Z11-16:OH	Tóth, 1992(d)	D
<i>Kermania pistaciella</i> Amsel Klimesch pistachio twig borer Phe.	*Z12-17:2-OAc (2 <i>S</i> )-isomer + other components	Gries, 2006(b)	D
<i>Matratinea rufulicaput</i> att.	Z3,Z13-18:OH	Sziráki in Arn, 1992	D
<i>Monopsis monachella</i> Hübner att.	E2,Z13-18:OH + Z3,Z13-18:OH (9:1)	Karalius, 2001	C
<i>Monopsis palidella</i> Zagulajev att.	E2,Z13-18:Ald	Karalius, 2005	C
<i>Monopsis rusticella</i> Hübner att.	E2,Z13-18:OH + Z3,Z13-18:Ald (10:1–1:1)	Szöcs, 1989	C
<i>Nemapogon albipunctellus</i> Haworth att.	E3,Z13-18:OAc + Z3,Z13-18:OAc	Voerman, 1983	C
<i>Nemapogon apicisignalellus</i> Dietz att.	Z9-14:OAc	Roelofs, 1971(a)	C

<i>Nemapogon clematella</i> F. att.	Z3,Z13-18:OAc		Fassotte in Arn, 1986(a) Bûda, 1993	C
<i>Nemapogon falstriellus</i> Bang-Haas. att.	Z3,Z13-18:OAc + Z3,Z13-18:Ald (10:1–1:1)		Szöcs, 1989	C
<i>Nemapogon flavifrons</i> Pt. att.	Z3,Z13-18:OAc + Z3,Z13-18:OH (9:1)		Bûda, 1993	C
<i>Nemapogon granellus</i> L. European grain moth <kokuga> phe.	*Z3,Z13-18:OAc	N	Ohshima, 1993	A
<i>Nemapogon heydeni</i> Peterson att.	E3,Z13-18:OAc + Z3,Z13-18:OAc (19:1)		Voerman, 1983	C
<i>Nemapogon personellus</i> P. & M. att.	Z3,Z13-18:OH		Szöcs, 1989	C
<i>Nemapogon variatella</i> Clemens phe.	*Z3,Z13-18:OH	N	Radžiutė, 2023	C
<i>Nemaxera betulinella</i> F. att.	E2,Z13-18:OAc + E2,Z13-18:OH (9:1)		Bûda, 1993 Karalius, 2001	D
<i>Opogona sacchari</i> Bojer att.	Z11-16:Ald	E	Rotundo, 1982	C
<i>Opogona</i> sp. att.	Z8-12:OAc + E8-12:OAc (99:1)		Hall, 1984	
<i>Tinea nonimella</i> Zagulajev att.	E2,Z13-18:OH + E3,Z13-18:OH (9:1)		Karalius, 2001	C
<i>Tinea pellionella</i> L. (= <i>translucens</i> Meyrick) case-making cloth moth <iga> att.	E2-18:Ald		Yamaoka, 1990	A
<i>Tineola bisselliella</i> Hummel webbing clothes moth <koiga>	* E2,Z13-18:Ald + *E2-18:Ald	N	Yamaoka, 1985	A



phe.	+ *E2,Z13-18:OH (2:1)	Takács, 2001	
<i>Triaxomera fulvimitrella</i> Sod. att.	Z3,Z13-18:OAc	Mäeorg in Arn, 1992 Bûda, 1993	C
	+ Z3,Z13-18:OH (9:1) or + E3,Z13-18:OH (5:5)	Karalius, 2005	

(Psychidae) ミノガ科

<i>Clania</i> (= <i>Eumeta</i> ) <i>variegata</i> Snell. Paulownia bagworm <oo-minoga> phe.	* <b>(S)-1-ethyl-2-methylpropyl Me3,Me13-15:Ate</b>  (3 <i>R</i> ,13 <i>R</i> ,3' <i>S</i> )-isomer	Gries, 2006(a)  Mori, 2010	A
<i>Diplodoma laichartingella</i> Goeze att.	E11-14:Ald + Z11-14:Ald (20:1)	Ostrauskas, 2010(a)	C
<i>Megalophanes viciella</i> Denis & Schiffermüller phe.	* <b>isopropyl 8:Ate</b>	Subchev, 2000(a)	D
<i>Oiketicus kirbyi</i> Guilding bagworm phe.	* <b>(R)-1-methylbutyl 10:Ate</b> + other components	Rhains, 1994	D
<i>Thyridopteryx ephemeraeformis</i> Haworth bagworm moth phe.	* <b>(R)-1-methylbutyl 10:Ate</b>  <b>(R)-1-methylpentyl 10:Ate</b>	Leonhardt, 1983  Warthen, 1996	D
<i>Whittleia retiella</i> Newman phe.	* <b>(S)-sec-butyl Z5-10:Ate</b> + * <b>isopropyl Z5-10:Ate</b> (1:2)	Rahmani, 2020	D

(8) [Gracillarioidea] ホソガ上科  
(Bucculatrigenidae) チビガ科

<i>Bucculatrix thurberiella</i> Busck. cotton leafperforator phe.	* <b>Z9-14:ONO<sub>2</sub></b> + * <b>Z8-13:ONO<sub>2</sub></b> (20:1)	Hall, 1992	C
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(Gracillariidae) ホソガ科

a: Gracillariinae ホソガ亜科, b: Lithocolletinae キンモンホソガ亜科,  
c: Phyllocnistinae コハモグリガ亜科, d: Oecophyllembiinae オビギンホソガ亜科

<i>Acrocercops</i> <sup>a</sup> sp. 1 att.	E8,E10-14:Ald	Ando, 1987	A
<i>Acrocercops</i> sp. 2 att.	E8,E10-14:Ald	Ando, 1987	A
<i>Aspilapteryx</i> <sup>a</sup> <i>tringipennella</i> Zeller att.	Z11-14:OAc + E11-14:OAc (1:1)	Heikinheimo, 1978	D
<i>Caloptilia</i> <sup>a</sup> <i>fraxinella</i> Fly att.	Z11-16:Ald + Z11-16:OH (10:1)	Lemmen, 2009	C
<i>Caloptilia porphyretica</i> Braun blueberry leafminer phe.	*E11-16:Ald	Zhang, 2004	C
<i>Caloptilia theivora</i> Walsingham tea leafroller <chanohamaki-hosoga> phe.	E11-16:Ald *E11-16:Ald + Z11-16:Ald (9:1-7:3)	Ando, 1981 Ando, 1985(a)	A
<i>Calybites</i> <sup>a</sup> <i>auroguttella</i> Stephens att.	Z11-14:OAc + Z9-14:OAc + Z11-14:OH (18:1:1)	Hrdý, 1989	C
<i>Cameraria</i> <sup>b</sup> <i>ohridella</i> Deschka et Dimic horse-chestnut leafminer phe.	*E8,Z10-14:Ald	Svatos, 1999 Francke, 2002 Kalinová, 2003	C
<i>Conopomorpha</i> <sup>a</sup> <i>cramerella</i> Snellen cocoa pod borer moth phe.	*E4,E6,Z10-16:OAc + *E4,Z6,Z10-16:OAc + *E4,E6,Z10-16:OH + *E4,Z6,Z10-16:OH (30:20:3:2)	Beevor, 1986	D
	(55:40:6:4)	Niogret, 2022	
<i>Conopomorpha sinensis</i> Bradley litchi fruit borer att.	E4,E6,Z10-16:OAc + E4,Z6,Z10-16:OAc (3:2)	Hwang, 1996(b)	D

	+ E4,E6,Z10-16:OH + E4,Z6,Z10-16:OH	Hung, 2006	
<i>Gracillaria</i> <sup>a</sup> <i>elongella</i> att.	Z10,E12-16:Ald	Priesner in Arn, 1986(a)	C
<i>Gracillaria syringella</i> F. <ibota-hosoga> att.	E11-14:Ald + Z11-14:Ald (9:1)  E11-14:Ald	Ando, 1981  Knauf in Arn, 1986(a) Booij, 1985 Frerot, 1985	A
<i>Marmara</i> <sup>a</sup> <i>gulosa</i> Guillen & Davis citrus peelminer phe.	*E8,E10-14:OFo + other components	McElfresh, 2009	D
<i>Phyllocnistis</i> <sup>c</sup> <i>citrella</i> Stainton citrus leafminer moth <mikan-kohamoguri> phe. Japanese strain	Z7,Z11-16:Ald  *Z7,Z11-16:Ald	Ando, 1985(b)  Mafi, 2005	A
Brazil & USA strain	*Z7,Z11,E13-16:Ald + *Z7,Z11-16:Ald (3:1) + another component	Leal, 2006; Moreira, 2006 Lapointe, 2006	
Vietnam strain	Z7,Z11,E13-16:Ald + Z7,Z11-16:Ald (3:1)	Vang, 2008	
<i>Phyllocnistis insignis</i> Frey & Boll att.	Z7,Z11,E13-16:Ald + Z7,Z11-16:Ald (3:1)	Keathley, 2013 Kawahara, 2013	C
<i>Phyllocnistis vitegenella</i> Clemens att.	Z7,Z11,E13-16:Ald + Z7,Z11-16:Ald (3:1)	Kawahara, 2013	C
<i>Phyllocnistis wampella</i> Liu & Zeng. att.	Z7,Z11-16:Ald	Du, 1989	C
<i>Phyllocnistis</i> sp. att.	Z7,E11-16:Ald	Ando, 1985(b)	A

<i>Phyllonorycter</i> <sup>b</sup> <i>blancardella</i> F. spotted tentiform leafminer phe.	E10-12:OAc	Roelofs, 1977(b) Voerman, 1978(a) El-Sayed, 2004(b)	C
	E4,E10-12:OAc	Gries, 1993(d)	
	*E10-12:OAc + other components	Mozūraitis, 1999(b) El-Sayed, 2005(b)	
<i>Phyllonorycter crataegella</i> Clemens apple blotch leafminer phe.	*Z10,Z12-14:OAc + *E10,E12-14:OAc (10:1)	Ferrao, 1998	C
<i>Phyllonorycter coryli</i> att.	E9-14:OAc + Z10-14:OAc (10:1)	Mozūraitis, 1998	C
<i>Phyllonorycter</i> (= <i>Lithocolletis</i> ) <i>corylifoliella</i> Hübner att.	E4,Z7-13:OAc	Voerman, 1978(a)	C
	E4-12:OAc	Voerman, 1991	
<i>Phyllonorycter cydoniella</i> Den. & Schiff. att.	E10-12:OAc	Mozūraitis, 1998	C
<i>Phyllonorycter dubitella</i> att.	E9-14:OAc + Z10-14:OAc (10:1)	Mozūraitis, 1998	C
<i>Phyllonorycter elmaella</i> Doganlar & Mutuura att.	E10-12:OAc	Shearer, 1994	C
<i>Phyllonorycter emberizaepenella</i> Z. phe.	*E8,E10-14:OAc + *E8,E10-14:OH (minor) N	Mozūraitis, 2002	C
<i>Phyllonorycter harrisella</i> att.	E9-14:OAc + Z10-14:OAc (10:1)	Mozūraitis, 1998	C
<i>Phyllonorycter heegerella</i> Z. phe.	*Z8-14:OAc + *Z8-14:OH + *14:OAc (10:1:2)	Mozūraitis, 2000	C
<i>Phyllonorycter insignitella</i> Zeller phe.	*Z8,E10-14:OAc + *Z8,E10-14:OH + *E8,Z10-14:OAc (176:24:0.2)	Mozūraitis, 2008	C
<i>Phyllonorycter junoniella</i> Z.	Z10-12:OAc	Mozūraitis, 1998	C

<i>Phyllonorycter kleemanella</i> F. att.	Z10-14:OAc + E11-14:OAc (1:0–1:3)	Booij, 1984(a)	C
<i>Phyllonorycter mespilellus</i> Hübner tentiform leafminer phe.	E10-12:OAc *E4,E10-12:OAc + another component	Hrdý, 1989 Gries, 1993	C
<i>Phyllonorycter nigrescentella</i> Logan phe.	*Z8,E10-14:OAc + other components	Mozūraitis, 2008	C
<i>Phyllonorycter orientalis</i> Kumata <kaedekinmon-hosoga> att.	Z10-14:OAc	Ando, 1977	A
<i>Phyllonorycter oxyacanthae</i> Frey. att.	E10-12:OAc + E10-12:OH (10:1)	Mozūraitis, 1998	C
<i>Phyllonorycter platani</i> Staudinger phe.	*Z10-14:OAc	Subchev, 2003	C
<i>Phyllonorycter pulchra</i> Kumata <nakagurokinmon-hosoga> att.	E8,E10-14:OAc	Ando, 1987	A
<i>Phyllonorycter pygmaea</i> Kumata <himekinmon-hosoga> att.	Z8-14:OH	Ando, 1977	A
<i>Phyllonorycter pyrifoliella</i> att.	E10-12:OAc	Laanmaa in Arn, 1992	C
<i>Phyllonorycter ringoniella</i> Matsumura apple leafminer moth <kinmon-hosoga> phe.	*Z10-14:OAc + *E4,Z10-14:OAc	Ujiye, 1986 Sugie, 1986	A
	Japan (10:1)		
	Korea (2:3)	Boo, 1998(a)	
	China (0.5:10–0:10)	Du, 2013	
	epoxyfarnesol	Nagaki, 2009	

<i>Phyllonorycter saportella</i> Dup. att.	E8-14:OAc + E10-14:OAc (1:1)	Voerman, 1988	C
<i>Phyllonorycter sorbi</i> Frey. att.	E10-12:OH	Mozūraitis, 1998	C
<i>Phyllonorycter sylvella</i> Hübner (= <i>acerifoliella</i> Z.) phe.	*Z10-14:OAc + *Z8-14:OAc + *E10-14:OAc (46:3:1) N  (10:1:0)	Borg-Karlson, 1996  Mozūraitis, 2000	C
	E9-14:OAc + Z10-14:OAc (10:1)	Mozūraitis, 1998	
<i>Phyllonorycter ulmifoliella</i> Hübner <tsumasujikinmon-hosoga> phe.	Z10-14:OAc  *Z10-14:OAc	Voerman, 1988  Mozūraitis, 1997	A
<i>Phyllonorycter watanabei</i> Kumata <watanabekinmon-hosoga> att.	Z10-13:OAc	Ando, 1977	A
<i>Phyllonorycter</i> sp. 1 att.	E8,E10-14:OAc or E8,E10-14:Ald	Reed, 1985(b)	
<i>Phyllonorycter</i> sp. 2 att.	E10-12:OAc	Reed, 1985(b)	
<i>Phyllonorycter</i> sp. 3  att.	E8-14:OAc	Priesner in Arn, 1986(a)	
<i>Spulerina</i> <sup>a</sup> <i>astaurotata</i> Meyrick pear barkminer moth <nashikawa-hosoga> phe.	*Z9,Z11-14:OH + *Z9,Z11-14:OAc (7:3) + another component	Do, 2011	A

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(9) [Yponomeutoidea] スガ上科  
(Yponomeutidae) スガ科  
a: Yponomeutinae スガ亜科, b: Praydinae ニセスガ亜科, c: Argyresthiinae メムシガ亜科

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<i>Argyresthia</i> <sup>c</sup> <i>albistria</i> Haworth att.	Z7-12:OAc + Z7-12:OH	Tóth, 1992(d)	C
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	+ Z9-14:OAc (20:1:1)		
<i>Argyresthia beta</i> Friese & Moriuti <mochitsutsuji-memushiga> <a href="#">att.</a>	Z11-14:OH Z7,E11-16:OH	Ando, 1981 Ando, 1985(b)	A
<i>Argyresthia chamaecypariae</i> Moriuti <hinoki-hamoguriga> <a href="#">att.</a>	E11-16:Ald	Ando, 1981	A
<i>Argyresthia conjugella</i> Zeller apple fruitle moth <ringohime-shinkui> <a href="#">phe.</a>	Z11-16:OAc + Z13-18:OAc (3:1-1:3)  *Z11-16:OAc + other components	Booij, 1984(a)  Jaastad, 2002	A
<i>Argyresthia cornella</i> F. <a href="#">att.</a>	Z11-16:OAc or + Z13-18:OAc (1:1)	Booij, 1984(a)	C
<i>Argyresthia fundella</i> Fischer von Röslerstamm <a href="#">att.</a>	Z11-16:Ald	Booij, 1984(a)	C
<i>Argyresthia goedartella</i> L. <a href="#">att.</a>	Z11-16:OAc + Z11-16:Ald (3:1)	Booij, 1984(a)	C
<i>Argyresthia mendica</i> <a href="#">att.</a>	Z11-16:Ald	Subchev in Arn, 1992	C
<i>Argyresthia nemorivaga</i> Moriuti <todomatsu-memushiga> <a href="#">att.</a>	Z11-16:Ald	Ando, 1981	A
<i>Argyresthia pruniella</i> Clerck <a href="#">att.</a>	Z8-12:OAc or E8,E10-12:OH  Z11-16:Ald	Alford, 1978  Booij, 1984(a)	C
<i>Argyresthia retinella</i> Zeller <amimeshiro-memushiga> <a href="#">att.</a>	Z11-16:Ald	Tóth, 1992(d)	A
<i>Argyresthia semifusca</i> Haworth <a href="#">att.</a>	Z7-12:OAc	Tóth, 1992(d)	C
<i>Argyresthia semitestacella</i>	Z11-16:OAc	Priesner	C

<i>att.</i>			in Arn, 1986(a)	
<i>Argyresthia sorbiella</i> Tr. <i>att.</i>	Z7-12:OAc + Z9-12:OAc (20:1)		Tóth, 1992(d)	C
<i>Argyresthia thuiella</i> Packard <i>att.</i>	Z11-16:Ald		Booij, 1984(a)	C
<i>Euhyponomeutoides</i> <sup>a</sup> <i>albithoracellus</i> Gaj currant bud moth <i>phe.</i>	*Z11-14:OAc + *E11-14:OAc (3:1)		Svensson, 2023	C
<i>Euhyponomeutoides rufella</i> <i>att.</i>	Z11-14:OAc + E11-14:OAc		Peltotalo, 1986	C
<i>Euhyponomeutoides trachydeltus</i> Meyrick <hoso-suga> <i>att.</i>	Z11-14:OAc		Ando, 1981	A
<i>Ocnerostoma</i> <sup>a</sup> <i>friesei</i> Svensson <akamatsuhmoguri-suga> <i>att.</i>	E6-13:OAc		Willemse, 1987	A
<i>Paraargyresthia</i> <sup>c</sup> <i>japonica</i> Moriuti <nihonnise-memushiga> <i>att.</i>	E11-16:OAc		Ando, 1981	A
<i>Paraswammerdamia</i> <sup>a</sup> <i>lutarea</i> Hw. <i>att.</i>	Z7-14:OAc		Mozūraitis, 1998	C
<i>Prays</i> <sup>b</sup> <i>citri</i> Mill. citrus flower moth <i>phe.</i>	*Z7-14:Ald		Nesbitt, 1977 Sternlicht, 1978	C
<i>Prays endocarpa</i> Meyrick citrus pock caterpillar <i>phe.</i>	*Z7-14:Ald + other components		Vang, 2011	C
<i>Prays nephelomima</i> Meyrick citrus flower moth <i>phe.</i>	*Z7-14:Ald		Gibb, 2005	C



<i>Prays oleae</i> Bern. olive moth phe.	*Z7-14:Ald	Campion, 1979 Renou, 1979  Sakin, 2023	C
<i>Swammerdamia</i> <sup>a</sup> <i>compunctella</i> H. S. att.	Z11-14:OAc + Z11-14:OH (9:1)	Novotný, 1990	C
<i>Swammerdamia pyrella</i> Villers <usugurohime-suga> att.	Z5-14:OAc + Z7-14:OAc (1:1)	Tóth, 1991(b)	A
<i>Swammerdamia</i> sp. att.	Z11-14:OAc + Z7-14:OAc (3:2)	Szöcs, 1981	
<i>Thecobathra</i> <sup>a</sup> (= <i>Niphonympha</i> ) <i>anas</i> Stringer <maruginbane-suga> att.	E11-14:OAc + E11-14:Ald (9:1)	Ando, 1981	A
<i>Xyrosaris</i> <sup>a</sup> <i>lichneuta</i> Meyrick <hosobako-suga> att.	Z11-14:OAc  Z9,E11-14:OH	Ando, 1981  Ando, 1987	A
<i>Yponomeuta</i> <sup>a</sup> <i>cagnagellus</i> Hübner phe.	Z11-14:OAc  *Z11-14:OAc + *E11-14:OAc + *Z11-14:OH (200:3:40) + other components  (200:5:74)	Hendrikse, 1982  Löfstedt, 1985(a)  Löfstedt, 1988	C
<i>Yponomeuta evonymellus</i> L. <sakura-suga> phe.	Z12-15:OAc + E12-15:OAc (3:1)  *Z11-14:OAc + *E11-14:OAc + *Z11-14:OH + *14:OAc + *14:OH (10:2:2:6:1)	Ritter, 1975  Löfstedt, 1985(a)  Ostrauskas, 2010(b)	A

	+ Z11-14:Ald (100:2:0.75:1)	Ostrauskas, 2010(b)	
<i>Yponomeuta irrorellus</i> Hübner phe.	*Z11-14:OAc + *E11-14:OAc + *Z11-14:OH + *E11-14:OH (100:60:3:1.8) + other components	Löfstedt, 1988	C
<i>Yponomeuta malinellus</i> Zeller apple ermine moth <ringo-suga> phe.	Z11-14:OAc + E11-14:OAc (97:3)	Stockel, 1981	A
	Z11-14:OAc	Hendrikse, 1982	
	*Z11-14:OH + *Z9-12:OAc (500:3) + other components	McDonough, 1990(b)	
<i>Yponomeuta padellus</i> L. phe.	Z11-14:OAc + E11-14:OAc (4:1) or Z12-15:OAc + E12-15:OAc (1:3)	Herrebout, 1978 Hendrikse, 1982	B
	*Z11-16:OAc + *Z11-14:OAc + *E11-14:OAc (200:50:17) + other components	Löfstedt, 1985(a) Du, 1987(a)	
	+ Z9-14:OAc (400:100:34:5)	Löfstedt in Arn, 1986(a)	
<i>Yponomeuta padellus</i> Malinellus att.	Z11-14:OAc	Arn, 1974	B
<i>Yponomeuta plumbellus</i> Denis & Schiffermüller phe.	E12-15:OAc + Z12-15:OAc (3:1)	Ritter, 1975	C
	*E11-14:OAc + *Z11-14:OAc (3:2) + other components	Löfstedt, 1988	
<i>Yponomeuta rorellus</i> Hübner small ermine moth phe.	E12-14:OAc or Z12-14:OAc or E6-14:OAc	Hendrikse, 1982 Löfstedt, 1990	C
	*14:OAc	Löfstedt, 1986(a)	

	+ other components	Du, 1987(a)	
<i>Yponomeuta vigintipunctatus</i> Retzius <benkeisou-suga> phe.	*Z11-14:OAc + *E11-14:OAc + *Z11-14:OH (10:2:1) + other components	Löfstedt, 1985(a)	A
<i>Yponomeuta yanagawanus</i> Matsumura <tsumagurohai-suga> att.	Z11-14:OAc	Ando, 1977	A

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(Ypsolophidae) クチブサガ科

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<i>Ypsolopha dentella</i> att.	Z7-12:OAc or Z7-12:OH  + Z7-12:OH (1:1)	Roelofs, 1971(a)  Priesner in Arn, 1986(a)	C
<i>Ypsolopha falcella</i> att.	Z5-14:OAc or Z7-14:OAc	Priesner in Arn, 1986(a)	C
<i>Ypsolopha longus</i> Moriuti <mayumiookuchibusa-suga> att.	Z7-12:OAc	Ando, 1981	A
<i>Ypsolopha lucella</i> F. att.	Z11-16:OAc + Z11-16:Ald (20:1)	Tóth, 1992(d)	C
<i>Ypsolopha nemorella</i> att.	Z7-12:OAc + Z5-12:OAc (1:1)	Priesner in Arn, 1986(a)	C

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(Plutellidae) コナガ科

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<i>Leuroperna sera</i> Meyrick <hiroba-konaga> att.	Z11-16:Ald + Z9-16:Ald (19:1)	Kohno, 2014	A
<i>Plutella xylostella</i> L. diamondback moth <konaga> phe.	*Z11-16:OAc + *Z11-16:Ald (2:3–3:2)  (1:1)	Tamaki, 1977(b) Koshihara, 1978  Chow, 1977	A

	(3:2)	Zilahi-Balogh, 1995
+ Z11-16:OH	(10:10:1)	Ando, 1979
	(50:50:1)	Lin, 1982
+ Z9-14:OAc	(30:70:1:0.01)	Chisholm, 1983
or + Z9-14:OH	(30:70:1:10)	
+ *Z11-16:OH	(3:6:1)	Suckling, 2002
	[3:8:2]	Lee, 2005
	(10:90:1)	Yang, 2007
	(5:5:1)	Chi, 2024

(Acrolepiidae) アトヒゲコガ科

<i>Acrolepiopsis assectella</i> Zeller leek moth phe.	Z11-16:Ald *Z11-16:Ald + Z11-16:OAc (10:1)	Rahn, 1979 Renou, 1981(a) Minks, 1994	C
<i>Acrolepiopsis issikiella</i> Moriuti <tokoromi-koga> att.	Z11-16:Ald	Ando, 1981	A
<i>Acrolepiopsis nagaimo</i> Yasuda <nagaimo-koga> phe.	*Z11-16:OAc + *Z11-16:Ald + *Z11-16:OH (25:25:1)	Wakamura, 2001(b) Tanaka, 2001	A
<i>Acrolepiopsis sapporensis</i> Matsumura (= <i>alliella</i> Semenov & Kuznetsov) stone leek moth (allium leafminer) <negi-koga> phe.	Z11-16:Ald + Z11-16:OAc + Z11-16:OH (9:9:2)  (5:5:1)  (3:1:1)	Sato, 1979   Yamada, 1980  Ando, 1981	A
Korea strain	*Z11-16:OAc + *Z11-16:Ald + *Z11-16:OH (13:5:2)	Yang, 2008	

Japanese strain	(1:7:2)	Shimizu, 2009	
<i>Acrolepiopsis suzukiella</i> Matsumura <yamanoimo-koga> att.	Z11-16:Ald + Z11-16:OAc (9:1)	Ando, 1981	A
<i>Acrolepiopsis</i> sp. att.	Z11-16:OAc + Z11-16:OH (9:1)	Ando, 1981	A

(Glyphipterigidae) ホソハマキモドキガ科

<i>Glyphipterix eulucotoma</i> Diakonoff & Arita <atofutamom- hosohamakimodoki> att.	Z11-16:OAc + Z11-16:Ald (1:1)	Ando, 1981	A
<i>Glyphipterix nigromarginata</i> Issiki <heriguro-hosohamakimodoki> att.	Z11-16:OAc + Z11-16:Ald (1:1)	Ando, 1981	A
<i>Glyphipterix simplicella</i> Stephens att.	Z11-16:OAc + Z11-16:Ald (3:1)	Booij, 1984(a)	C

(Lyonetiidae) ハモグリガ科

<i>Leucoptera malifoliella</i> Costa (= <i>scitella</i> Zeller) mountain-ash bentwing phe.	*Me5,Me9-17:H (major) + *Me5,Me9-16:H  Me5,Me9-17:H (5S,9S)-isomer	Francke, 1987; 1988  Tóth, 1989(c)	C
	*Me5,Me9-17:H + *Me5,Me9-18:H (100:0.1–100:5)	Riba, 1990	
<i>Leucoptera sinuella</i> Reutti phe.	*Me3,Me7-15:H + *Me3,Me7-14:H + *Me7-15:H (95:2:3)	Barros-Parada, 2020	C
<i>Leucoptera spartifoliella</i> Hübner broom twig miner phe.	*Me5-17:H	El-Sayed, 2024	C

<i>Lyonetia clerkella</i> L. peach leafminer moth <momo-hamoguriga> phe.	* $\Delta 1, \text{Me}14 - 18:\text{H}$  (S)-isomer	Sugie, 1984(a)  Sato, 1985,1986	A
<i>Lyonetia prunifoliella</i> Hübner apple leafminer moth <ringo-hamoguriga> <ginmon-hamoguriga> phe.	* $\Delta 1, \text{Me}10, \text{Me}14 - 18:\text{H}$ + $\text{Me}5, \text{Me}9 - 18:\text{H}$ + $\text{Me}5, \text{Me}9 - 17:\text{H}$ (1:1:1)	Gries, 1997(b)	B
in Korea in Japan	$\Delta 1, \text{Me}10, \text{Me}14, -18:\text{H}$ (10S,14S)-isomer	Park, 2002 Taguri, 2014	
<i>Perileucoptera</i> (= <i>Leucoptera</i> ) <i>coffeella</i> Guér.-Ménev. coffee leafminer moth phe.	* $\text{Me}5, \text{Me}9 - 15:\text{H}$ (major) + * $\text{Me}5, \text{Me}9 - 16:\text{H}$  * $\text{Me}5, \text{Me}9 - 15:\text{H}$ (5S,9R)-isomer	Francke, 1988  Malo, 2009	D

(10) [Gelechioidea] キバガ上科  
(Ethmiidae) スヒロキバガ科

<i>Ethmia monticola</i> Walsingham att.	E11-14:OAc	Daterman, 1977	C
<i>Ethmia punctella</i> F. att.	E11-14:OAc	Löfstedt, 1988	C

(Elachistidae) クサモグリガ科

<i>Elachista consortella</i> Stainton att.	E11-14:Ald + Z11-14:Ald (20:1)	Ostrauskas, 2010(a)	C
<i>Stenoma catenifer</i> Walsingham avocado seed moth phe.	*Z9, $\equiv 11, \Delta 13 - 14:\text{Ald}$ + other components	Millar, 2008 Hoddle, 2009	D
<i>Stenoma cecropia</i> Meyrick phe.	*Z9,E11, $\Delta 13 - 14:\text{Ald}$ + *Z9,E11-14:Ald (83:17) + other components	Zagatti, 1996	D

(Xyloryctidae) ヒロバキバガ科

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<i>Opisina arenosella</i> Walker phe.	*Z3,Z6,Z9-23:H	N	Bhanu, 2018	D
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(Oecophoridae) マルハキバガ科

a: Oecophoriinae マルハキバガ亜科, b: Chimabachinae メスコバネマルハキバガ亜科,  
c: Amphisbatinae d Autostichinae ホシマルハキバガ亜科

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<i>Bisigna</i> <sup>a</sup> <i>procerella</i> Denis & Schiffermüller att.	E5-16:OAc		Willemse, 1987	D
<i>Cheimophila</i> <sup>b</sup> <i>salicella</i> Hübner phe.	*E11-14:OAc + *E11-14:OH + *14:OAc + *E11-14:Ald (100:15:10:2)		Gillespie, 1984	C
<i>Cheimophila</i> sp. att.	E11-14:OAc		Ando, 1977	A
<i>Diurnea</i> <sup>b</sup> (= <i>Xenomicta</i> ) <i>cupreifera</i> Butler <mesukobane- maruhakibaga> att.	Z11-14:OAc		Ando, 1977	A
<i>Diurnea phryganella</i> Hübner att.	Z11-14:OAc + E11-14:OAc (10:1)		Tóth, 1979 Priesner in Arn, 1986(a)	C
<i>Donaspastus</i> <sup>d</sup> <i>pannonicus</i> Gozm att.	Z8-13:OAc		Subchev, 1999	D
<i>Pseudatemelia</i> <sup>c</sup> <i>josephinae</i> Toll. att.	Z10-14:OAc + E9-14:OAc (10:1)		Mozūraitis, 1998	D
<i>Pseudatemelia</i> sp. 1 att.	Z9-13:OAc		Willemse, 1987	D
<i>Pseudatemelia</i> sp. 2	Z10-13:OAc		Willemse, 1987	D

att.

(Depressariidae) ヒラタマルハキバガ科

<i>Acria ceramitis</i> Meyrick <nezumiegurihirata- maruhakibaga> att.	E8,Z10-12:Ald + E8,Z10-12:OAc (1:1)	Ando, 1987	A
<i>Agonopterix alstroemeriana</i> Cl. att.	Z7-12:OAc + Z9-14:OAc (1:1)	Szöcs. 1981	C
<i>Agonopterix assimilella</i> att.	Z7-14:OAc + Z9-14:OAc	Priesner in Arn, 1986(a)	C
<i>Agonopterix encentra</i> Meyrick <yamaukogihirata- maruhakibaga> att.	Z7-12:OH + Z7-12:OAc (9:1)	Ando, 1981	A
<i>Agonopterix liturella</i> Denis & Schiffermüller att.	Z7-12:OAc + Z7-12:OH + Z9-14:OAc (1:1:1)	Tóth, 1992(d)	C
<i>Agonopterix ulicetella</i> gorse soft shoot moth att.	Z5-10:OAc + Z7-12:OH (1:1)	Suckling, 2000	C
<i>Agonopterix yeatiana</i> F. att.	Z3-10:OAc + Z5-10:OAc (1:1)	Priesner, 1988(b)	C
<i>Agonopterix</i> sp. 1 att.	Z7-10:OAc	Ando, 1977	A
<i>Agonopterix</i> sp. 2 att.	Z7-12:OAc + Z9-14:OAc (1:1)	Ando, 1981	A
<i>Agriophara rhombata</i> Meyr. tea grain moth phe.	*E5,Z7-12:OAc + *Z12-18:OAc N	Qu, 2024	C
<i>Cerconota anonella</i> Sepp. phe.	*Z9-18:OH + *Z9-18:Ald + *Z9-18:OAc (5:3:1)	Pires, 2016	D



<i>Depressaria depressana</i> att.	Z3-10:OAc	Sziráki in Arn,1997	C
<i>Depressaria olerella</i> Zeller att.	Z3-10:OAc	Priesner, 1988(b)	C
<i>Depressaria sordidatella</i> Tengström att.	E11-14:Ald + Z11-14:Ald (20:1)	Ostrauskas, 2010(a)	C

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(*Stathmopodidae*) ニセマイコガ科

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<i>Oedematopoda</i> (= <i>Atkinsonia</i> ) <i>ignipicta</i> Butler <segurobenitogeashiga> att.	E4,Z6-16:OAc	Kim, 2014(a)	A
<i>Stathmopoda auriferella</i> Walker (= <i>theoris</i> Meyrick) <kiiro-maikoga> phe.	Z7-16:OAc or Z7,Z11-16:OAc + Z7,E11-16:OAc  *E5-16:OAc + another component	Nagano, 1979  Yang, 2013	A
<i>Stathmopoda masinissa</i> Meyrick persimmon fruit moth <kakinohetamushiga> Japanese strain phe.	*E4,Z6-16:OAc + other components	Naka, 2003	A
Korean strain	*E4,Z6-16:OAc + *E4,Z6-16:OH (1:1)	Kim, 2014(a)	

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(*Lecithoceridae*) ヒゲナガキバガ科

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<i>Odites</i> (= <i>Protobathra</i> ) <i>leucostola</i> Meyrick <gomafushiro-kibaga> att.	Z7-12:OH	Ando, 1977	A
<i>Rhizosthenes falciformis</i> Meyrick <maechoo- hirobakibaga> att.	Z7-12:OAc + Z7-12:Ald (9:1)	Ando, 1981	A

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(Batrachedridae) ホソキバガ科

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<i>Batrachedra amydraula</i> Lesser date moth phe.	*Z4,Z7-10:OAc + *Z5-10:OAc + *Z4-10:OAc (1:2:1) + other components  + *Z5-10:OH (1:2:2) + other components	Levi-Zada, 2011(a);  Levi-Zada, 2013	C
<i>Batrachedra pinicolella</i> Zeller <usujiro-hosokibaga> att.	Z5-10:OAc + Z5-10:OH (1:1)	Willemse, 1987 Priesner, 1989(a)	A

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(Coleophoridae) ツツミノガ科

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<i>Augasma aeratellum</i> Zeller att.	Z7-12:OAc	Tóth, 1992(d)	D
<i>Coleophora albidella</i> Denis & Schiffermüller <yanagipisutoru-minoga> att.	E5-10:OAc + E5-10:OH (17:3)	Sziráki, 1980	A
<i>Coleophora alticolella</i> Zeller att.	Z5-10:OH	Priesner, 1987(a)	C
<i>Coleophora amellivora</i> Bald. att.	Z5-10:OH or Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora anatipennella</i> Hübner att.	E5-10:OAc + E5-10:OH (17:3)	Sziráki, 1980	C
<i>Coleophora arbitarsella</i> att.	Z5-10:OAc + Z7-12:OAc (1:1)	Subchev, 1990	C
<i>Coleophora artemisicolella</i> Bruand <yomogihana-tsutsuminoga> att.	E5-10:OAc + E5-10:OH (17:3)  Z9-14:OAc + Z7-12:OAc	Sziráki, 1980  Ostrauskas, 2003	A
<i>Coleophora auricella</i> F.	Z3-10:OAc	Priesner, 1988(b)	C

<i>Coleophora binderella</i> Koll. att.	Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora clypeiferrella</i> Hofm. att.	Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora coracipennella</i> Hübner att.	Z5-10:OH or Z5-10:OAc  + Z5-10:OAc + Z7-12:OAc (1:1:1)	Priesner, 1987(a)  Tóth, 1992(d)	C
<i>Coleophora dahurica</i> Flkv. att.	Z5-10:OH	Priesner, 1991	C
<i>Coleophora deauratella</i> Zeller red clover casebearer phe.	Z5-10:OAc + Z5-10:Ald + Z7-12:OAc (1:1:1)  *Z7-12:OAc + *Z5-12:OAc (10:1) + another component	Tóth, 1992(d)  Evenden, 2010	C
<i>Coleophora flavipennella</i> Dup. att.	Z5-10:OH	Priesner, 1987(a)	C
<i>Coleophora frischella</i> L. att.	Z5-12:OAc + Z7-12:OAc (1:1)	Willemse, 1987	C
<i>Coleophora glaucicolella</i> Wood att.	Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora glitzella</i> Hofm. att.	Z5-10:OH	Priesner, 1987(a)	C
<i>Coleophora gryhipennella</i> Hübner att.	Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora hemerobiella</i> Sc. att.	Z5-10:OH + Z7-12:OH (1:1)	Tóth, 1992(d)	C
<i>Coleophora juncicolella</i> Staint att.	Z5-10:OH or Z5-10:OAc	Priesner, 1987(a)	C

<i>Coleophora laricella</i> Hübner European larch casebearer moth <a href="#">att.</a>	Z5-10:OH	Priesner, 1982(b)	B
<i>Coleophora laripennella</i> Zeller <a href="#">att.</a>	E5-10:OAc + E5-10:OH (17:3)	Sziráki, 1980	C
<i>Coleophora lineolea</i> Haw. <a href="#">att.</a>	Z5-10:OH or Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora lithargyrinella</i> Zeller <a href="#">att.</a>	Z5-10:OH or Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora mayrella</i> Hübner <a href="#">att.</a>	Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora millefolii</i> Zeller <a href="#">att.</a>	E5-10:OAc + E5-10:OH (17:3)	Sziráki, 1980	C
<i>Coleophora obscenella</i> Herrich-Schäffer <a href="#">att.</a>	Z9-14:OAc + Z7-12:OAc	Ostrauskas, 2003	C
<i>Coleophora ochripennella</i> Zeller <a href="#">att.</a>	Z5-10:OH or Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora orbitella</i> Zeller <a href="#">att.</a>	Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora ornatipennella</i> Hübner <a href="#">att.</a>	Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora palliatella</i> Zink. <a href="#">att.</a>	E5-10:OH + E5-10:OAc (17:3)	Hrdý, 1989	C
<i>Coleophora peissoniella</i> Kasy <a href="#">att.</a>	E5-10:OAc + E5-10:OH (17:3)	Sziráki, 1980	C
<i>Coleophora prunifoliae</i> Doets <a href="#">att.</a>	Z5-10:OH or Z5-10:OAc	Priesner, 1987(a)	C
<i>Coleophora serpylletorum</i> E. Her. <a href="#">att.</a>	Z3-10:OAc	Priesner, 1988(b)	C
<i>Coleophora serratella</i> L.	Z5-10:OH	Priesner, 1987(a)	A

<ringo-tsutsuminoga>

att.

<i>Coleophora sinensis</i> Yang Chinese larch casebearer att.	Z5-10:OH	Zhang, 1993	C
<i>Coleophora sternipennella</i> Zett. att.	Z3-10:OAc	Priesner, 1988(b)	C
<i>Coleophora trigeminella</i> Fuchs att.	Z5-10:OH  Z7-12:OAc + Z7-12:OH + Z5-10:OAc (20:20:1)	Priesner, 1987(a)  Tóth, 1992(d)	C
<i>Coleophora unipunctella</i> Zeller att.	Z7-12:OAc + Z7-12:OH (1:1)	Tóth, 1992(d)	C
<i>Coleophora vacciniella</i> Herrich-Schäffer att.	Z5-10:OAc	Priesner, 1987(a) Willemse, 1987	C
<i>Coleophora versurella</i> att.	Z3-10:OAc	Capizzi in Arn, 1986(a)	C
<i>Coleophora viminetella</i> Zeller att.	Z5-10:OAc + Z3-10:OAc (1:1)	Priesner, 1988(b)	C
<i>Coleophora virgaureae</i> Staint att.	Z5-10:OAc	Priesner, 1987(a)	C
<i>Oecogonia decuratella</i> Herrich-Schaffer att.	Z8-13:OAc + Z10-15:OAc (10:1)	Subchev, 1999	D
<i>Oegoconia quadripuncta</i> Haworth att.	Z8-12:OAc + E8-12:OAc (24:1) or + E8,E10-12:OAc + 12:OAc (8:12:25)	Hrdý, 1989	D

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(Momphidae) アカバナキバガ科

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<i>Mompha sturnipennella</i> Treitschke	E11-14:Ald	Ostrauskas, 2010(a)	C
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att. + Z11-14:Ald (20:1)

(Cosmopterigidae) カザリバガ科

<i>Anatrachyntis</i> (= <i>Sathrobrotia</i> ) sp. 1 att.	E11-14:OAc	Ando, 1975	A
<i>Anatrachyntis</i> (= <i>Sathrobrotia</i> ) sp. 2 att.	E11-14:OH	Ando, 1977	A
<i>Anatrachyntis</i> sp. 3 att.	E11,Δ13-14:OAc	Ando, 1987	A
<i>Chrysochrista</i> sp. att.	Z8-13:OAc or E8-13:OAc	Ando, 1977	A
<i>Cosmopterix fulminella</i> Stringer <kazariba> att.	Z7-12:OAc  Z11-14:OAc + Z9-12:OAc + Δ11-12:OAc (30:3:1)	Ando, 1977  Shry, 1985	A
<i>Cosmopterix gemmiferella</i> Clemens att.	Z9,Δ11-12:OAc + E9,Δ11-12:OAc (2:1)	Chisholm, 1985(b)	C
<i>Cosmopterix victor</i> Stringer <usuiro-kazariba> att.	Z10-12:OAc or Z10-13:OAc	Ando, 1977	A
<i>Cosmopterix</i> sp. 1-4 att.	Z9-12:OAc	Ando, 1975;1977	A
<i>Labdia citracma</i> Meyrick <tsumaki-togarihosoga> att.	E11-14:Ald	Ando, 1981	A
<i>Labdia issikii</i> Kuroko <sejiro-togarihosoga> att.	Z11-16:Ald + Z9-16:Ald (19:1)	Kohno, 2014	A
<i>Labdia semicoccinea</i> Stainton <benimon-togarihosoga> att.	E11-14:Ald	Ando, 1981	A
<i>Limnaecia phragmitella</i> Stainton	E11-14:OAc	Struble, 1977(a)	A

<gama-togarihosoga> phe.	+ Z11-14:OAc (10:1)		
	*E11-14:OAc + *Z11-14:OAc (19:1)	Bestmann, 1993(c)	
<i>Pancalia leuwenhoeckella</i> L. att.	Z8-13:OAc	Subchev, 1999	C
<i>Stagmatophora niphosticta</i> Meyrick <ginsuji-togarihosoga> att.	E11-14:OAc + Z11-14:OAc (7:3)	Ando, 1981	A

(Gelechiidae) キバガ科

a: Gelechiinae, b: Teleiodinae, c: Metzneriinae, d: Anacampsinae, e: Aristotelinae,  
f: Dichomeridinae

<i>Acompsia</i> <sup>f</sup> <i>tripunctella</i> Denis & Schiffermüller att.	E11-14:OAc	Liska, 1990	D
<i>Anarsia</i> <sup>f</sup> <i>lineatella</i> Zeller peach twing borer phe.	*E5-10:OAc + *E5-10:OH (17:3) (5:1)	Roelofs, 1975(b) Rice, 1975	C
	+ other components	Millar, 1992(b)	
	+ *Me11-23:H + *18:OAc (body scale)	Schlamp, 2005	
<i>Anthistarcha</i> <sup>d</sup> <i>binocularis</i> Meyrick cashew stem borer phe.	*E6-12:OAc + *E6-12:OH (5:2)	Soares, 2020	D
<i>Aproaerema</i> <sup>d</sup> <i>anthyllidella</i> <kurochibi-kibaga> att.	Z3-12:OAc + Z3-14:OAc (1:1)	Priesner, 1987(b)	A
<i>Aproaerema modicella</i> phe.	*Z7,Δ9-10:OAc + *E7-10:OAc (5:1) + another component	Hall in Arn, 1997	C
<i>Argolamprotes</i> <sup>c</sup> <i>micella</i>	Z3-14:OAc	Priesner, 1987(b)	A

Denis & Schiffermüller  
<ginboshiakagane- kibaga>  
att.

<i>Battaristis</i> <sup>d</sup> sp. att.	Z7-10:OAc	Roelofs, 1970(a)	D
<i>Brachmia</i> <sup>f</sup> <i>arotraea</i> Meyrick <tatejima-kibaga> att.	E7-14:OAc	Ando, 1977	A
<i>Brachmia blandella</i> F. att.	E9-13:OAc	Willemse, 1987	C
<i>Brachmia inornatella</i> Douglas att.	E9-13:OAc or E8-13:OAc	Willemse, 1987	C
<i>Brachmia triannulella macroscopa</i> Meyrick sweet potato leaf folder worm <imo-kibaga> phe.	*E11-16:OAc	Hirano, 1976	A
<i>Bryotropha</i> <sup>d</sup> <i>dryadella</i> Zeller att.	Z11-14:OAc	Tóth, 1992(d)	C
<i>Bryotropha galbanella</i> Zeller att.	E9-13:OAc	Willemse, 1987	C
	E9-14:OAc + Z10-14:OAc (1:1)	Mozūraitis, 1998	
<i>Bryotropha senectella</i> Zeller att.	Z9-14:OAc	Kovaleva, 1975	C
	E8-13:OAc	Willemse, 1987	
	E11-14:Ald + Z11-14:Ald (20:1)	Ostrauskas, 2010(a)	
<i>Bryotropha similis</i> Stain att. gray-race	Z9-14:OAc	Roelofs, 1969(b); 1970(a)	C
yellow-race	E9-14:OAc		



<i>Bryotropha terrella</i> Denis & Schiffermüller <a href="#">att.</a>	E9-14:OAc	Arn, 1974	C
<i>Bryotropha</i> sp. <a href="#">att.</a>	E9-14:OAc	Roelofs, 1970(a)	
<i>Caryocolum</i> <sup>a</sup> <i>alsinellum</i> <a href="#">att.</a>	Z5-12:OAc	Sziráki in Arn, 1997	C
<i>Caryocolum marmoreum</i> Haworth <a href="#">att.</a>	Z5-12:OAc	Tóth, 1992(d)	C
<i>Caryocolum proximum</i> Haworth <a href="#">att.</a>	Z5-12:OAc + Z7-12:OAc (1:1)	Tóth, 1992(d)	C
<i>Catelaphris</i> sp. <a href="#">att.</a>	Z7,Z11-16:OAc + Z7,E11-16:OAc (1:1)	Marks, 1976	D
<i>Chionodes</i> <sup>a</sup> <i>electella</i> Zeller <a href="#">att.</a>	Z3-14:OAc	Willemse, 1987 Priesner, 1987(b)	C
<i>Chionodes fuscomaculella</i> Chambers <a href="#">att.</a>	Z5-12:OAc	Roelofs, 1970(a)	C
<i>Chionodes holosericella</i> H. Sch. <a href="#">att.</a>	E3-12:OAc	Priesner, 1987(b)	C
<i>Chionodes luctuella</i> Hübner <a href="#">att.</a>	Z3-14:OAc	Priesner, 1987(b)	C
<i>Chionodes lugubrella</i> F. <a href="#">att.</a>	E3,Z5-12:OAc + Z3,E5-12:OAc (10:1)	Reed, 1985(b)	C
<i>Chionodes nebulosella</i> Hein. <a href="#">att.</a>	Z3-14:OAc	Priesner, 1987(b)	C
<i>Chionodes perpetuella</i> H. Sch. <a href="#">att.</a>	E3-14:OAc	Priesner, 1987(b)	C
<i>Chionodes psiloptera</i> Barnes & Busck <a href="#">att.</a>	Z7,E11-16:OAc	Oetting, 1977	C
<i>Chionodes</i> sp. 1 <a href="#">att.</a>	E11-14:OAc	Daterman, 1977	

<i>Chionodes</i> sp. 2 <a href="#">att.</a>	E3-12:OAc	Reed, 1985(b)	
<i>Dactylethrella</i> <sup>f</sup> (= <i>Dactylethra</i> , <i>Ethmiopsis</i> ) <i>tegulifera</i> Meyrick <kurokumoshiro-kibaga> <a href="#">att.</a>	E7-12:OAc	Ando, 1981	A
<i>Dichomeris</i> <sup>f</sup> <i>ligulella</i> <a href="#">att.</a>	E11-14:OAc	Roelofs, 1971(a)	C
<i>Dichomeris oceanis</i> Meyrick <fujifusa-kibaga> <a href="#">att.</a>	Z7,E11-16:OAc	Ando, 1985(b)	A
<i>Evippe</i> <sup>e</sup> <i>prunifoliella</i> <a href="#">att.</a>	Z3-12:OAc	Reed, 1985(b)	C
<i>Filatima</i> <sup>a</sup> sp. <a href="#">att.</a>	Z7-12:OAc	Roelofs, 1970(a)	D
<i>Gaesa</i> <sup>f</sup> <i>sparsella</i> Christoph <kurumioofusa-kibaga> <a href="#">att.</a>	Z8-11:OAc	Ando, 1977	A
<i>Gelechia</i> <sup>a</sup> <i>betulae</i> Haworth <a href="#">att.</a>	E9-14:OAc	Priesner, 1980(a)	C
<i>Gelechia sororculella</i> Hübner <a href="#">att.</a>	Z7-14:OAc + Z5-14:OAc	Priesner in Arn, 1986(a)	C
	Z5-12:OAc	Willemse, 1987	
<i>Gnorimoschemini</i> sp. <a href="#">att.</a>	Z5-12:OAc	Ando, 1977	A
<i>Hypatima</i> <sup>f</sup> <i>rhomboidella</i> L. <a href="#">att.</a>	E7-12:OAc	Booij, 1984(a)	C
<i>Isophrictis similiella</i> Chambers <a href="#">att.</a>	Z7-12:OAc + Z5-12:OAc (10:1)	Underhill, 1987(b)	D

<i>Isophrictis</i> sp. att.	Z5-12:OAc	Tóth, 1992(d)	D
<i>Keiferia</i> <sup>a</sup> <i>lycopersicella</i> Walsingham tomato pinworm phe.	*E4-13:OAc	Charlton, 1991	D
<i>Lixodessa ochrofasciella</i> Toll. att.	Z7-10:OAc	Kovaleva, 1975	D
<i>Metzneria</i> <sup>c</sup> sp. att.	E3-12:OAc	Renou, 1980	
<i>Monochroa</i> <sup>c</sup> <i>divisella</i> Douglas Iris gelechiid moth <ayame-kibaga> phe.	*Z3-12:OAc + *Z5-14:OAc (20:3)	Tabata, 2017	A
<i>Monochroa tenebrella</i> Hübner att.	Z3-14:OAc	Willemse, 1987 Priesner, 1987(b)	D
<i>Pectinophora</i> <sup>f</sup> <i>endema</i> Common att.	Z7,Z11-16:OAc + Z7,E11-16:OAc (2:1)	Rothschild, 1975	C
<i>Pectinophora gossypiella</i> Saunders pink bollworm moth <wataakamimushiga> phe.	Z7-16:OAc *Z7,Z11-16:OAc + *Z7,E11-16:OAc (1:1)  + other components	Green, 1969  Hummel, 1973 Bierl, 1974  Zhu, 1981	A
	In Malawi (11:9) In the world (1:1) In India (1:1)	Marks, 1976 Flint, 1979 Tamhankar, 1993	
<i>Pectinophora scutigera</i> Holdaway pink-spotted bollworm att.	Z7,Z11-16:OAc	Rothschild, 1975	C
<i>Pexicopia malvella</i> Hübner att.	Z7,E11-16:OAc + Z7,Z11-16:OAc (5:1-1:1)	Tóth, 1986(a)	D
<i>Pexicopia</i> sp. att.	Z7,E11-16:OAc + Z7,Z11-16:OAc (4:1)	Flint, 1979	D

<i>Phthorimaea</i> <sup>a</sup> <i>operculella</i> Zeller potato tuberworm <jagaimo-kibaga> phe.					A
	U.S.A.	Z7,Z11-13:OAc		Fouda, 1975	
	U.S.A.	*E4,Z7-13:OAc		Roelofs, 1975(c) Bacon, 1976	
	Japan	*4,7,10-13:OAc		Yamaoka, 1976	
	Cyprus	*E4,Z7,Z10-13:OAc + *E4,Z7-13:OAc (1:1)		Persoons, 1976(a,b)	
	Australia, Cyprus	E4,Z7,Z10-13:OAc + E4,Z7-13:OAc (1:1)		Voerman, 1978(c)	
	Peru		(3:2)	Raman, 1982	
	Australia	*E4,Z7,Z10-13:OAc + *E4,Z7-13:OAc (1:1)		Tóth, 1984	
	U.S.A.		[88:12 – 27:73]	Ono, 1990	
	Japan		[71:29 – 16:84]		
	Thailand		[36:64]	Ono, 1997	
	China	poteto field tobacco field	(7:1–4:1) (1:8–1:4)	Yan, 2022	
<i>Phthorimaea</i> sp. att.		Z5-12:OAc		Steck, 1979(c)	
<i>Platyedra subcinerea</i> Haworth att.		Z7,Z11-16:OAc		Tóth, 1986(a)	D
<i>Recurvaria</i> <sup>a</sup> <i>leucatella</i> Clerck white-barred groundling moth att.		E3,Z5-14:OAc		Tóth, 1992(b)	C
<i>Recurvaria nanella</i> Hübner lesser bud moth att.		E3-14:OAc		Tóth, 1992(b)	C
<i>Rhynchopacha</i> sp. att.		E5-14:OAc		Subchev, 1974	D

<i>Scrobipalpa</i> <sup>a</sup> <i>atriplicella</i> Fischer von Röslevstamm <i>att.</i>	Z5-12:OAc	Roelofs, 1970(a)	A
<i>Scrobipalpa heliopa</i> Lower tobacco stem borer <i>phe.</i>	*E3-13:OAc	Baker, 1985	C
<i>Scrobipalpa ocellatella</i> Boyd. sugar beet moth <i>phe.</i>	*E3-12:OAc	Renou, 1980	C
<i>Scrobipalpa salinella</i> Zeller <i>phe.</i>	*Z3-12:OAc + *Z5-12:OAc (20:1) + other components	Yang, 2011(c)	C
<i>Scrobipalpa</i> sp. <i>att.</i>	Z7,Z11-16:OAc + Z7,E11-16:OAc	Nagano, 1979	
<i>Scrobipalpuloides</i> <sup>a</sup> (= <i>Scrobipalpula</i> , = <i>Tuta</i> ) <i>absoluta</i> Meyrick tomato leafminer <i>phe.</i>	*E3,Z8,Z11-14:OAc  + *E3,Z8-14:OAc (9:1)	Attygalle, 1995; 1996 Filho, 2000 Ferrara, 2001  Svatos, 1996 Griepink, 1996	D
<i>Sitotroga</i> <sup>c</sup> <i>cerealella</i> Oliver Angoumois grain moth <bakuga> <i>phe.</i>	*Z7,E11-16:OAc  + Z7,E11-16:Ald (9:1)	Vick, 1974  Ando, 1985(b)	A
<i>Sophronia</i> <sup>d</sup> <i>semicostella</i> Hübner <i>att.</i>	Z4-13:OAc	Willemse, 1987	C
<i>Symmetrischema</i> <sup>a</sup> <i>tangolias</i> Gyen South American potato tuber moth <i>phe.</i>	*E3,Z7-14:OAc + *E3-14:OAc (2:1) + other components	Griepink, 1995	D
<i>Syncopacma</i> <sup>d</sup> <i>vorticella</i> Scopoli <i>att.</i>	Z7-10:OAc or Z7-11:OAc	Kovaleva, 1975	D

<i>Tecia</i> <sup>a</sup> (= <i>Scrobipalopsis</i> ) <i>solanivora</i> Povolny Guatemalan potato moth phe.	*E3-12:OAc + *Z3-12:OAc (49:1) + *12:OAc (100:1:20)	Nesbitt, 1985 Bosa, 2005	D
<i>Teleiodes</i> <sup>b</sup> <i>decorella</i> Haworth att.	E10-12:OAc	Hrdý, 1989	C

(11)[Zygaenoidea] マダラガ上科  
(Limacodidae) イラガ科

<i>Darna bradleyi</i> phe.	*isobutyl E7,Δ9-10:Ate + *metyl E7,Δ9-10:Ate (10:1)	Sasaerila, 2000(a)	D
<i>Darna pallivitta</i> Moore phe.	*butyl E7,Δ9-10:Ate + other components	Siderhurst, 2007	D
<i>Darna trima</i> phe.	*(E)-2-hexenyl E7,Δ9-10:Ate + *(S)-2-methylbutyl E7,Δ9-10:Ate (1:1–2:1)	Sasaerila, 2000(a)	D
<i>Heterogenea asella</i> Denis & Schiffermüller <kagiba-iraga> att.	Z9,E11-14:Ald	Priesner in Arn, 1986(a)	A
<i>Microleon longipalpis</i> Butler <tengu-iraga> att.	Z7-12:Ald	Ando, 1981	A
<i>Monema flavescens</i> Walker Oriental moth <iraga> phe.	*E8-10:OH + *E7,Δ9-10:OH (9:1)	Shibasaki, 2013	A
<i>Parasa lepida</i> Cramer blue-striped nettle grub moth <hiroheriao-iraga> phe.	*Z7,Δ9-10:OH	Wakamura, 2007(a) Islam, 2009	A
<i>Setora nitens</i> phe.	*Z9-12:Ald + *Z9,Δ11-12:Ald (1:1) + other components	Sasaerila, 2000(b)	D

<i>Setothosea asigna</i> Van Eecke nettle caperpillar phe.	*E9,Δ11-12:Ald + *E9-12:Ald (1:1) + other components	Sasaerila, 1997	D
<i>Tortricidia testacea</i> Packard att.	Z9,Δ11-12:Ald + E9,Δ11-12:Ald (10:1)	Chisholm, 1985(b)	D

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(Himantopteridae) リボンマダラガ科

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<i>Doratopteryx plumigera</i> Butler att.	Z11-14:OAc + E11-14:OAc (3:1)	Hall, 1979	D
<i>Staphylinochrous whytei</i> Butler att.	Z11-14:OAc or + Z11-14:OH (4:1)	Hall, 1979	D

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(Zygaenidae) マダラガ科

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<i>Acoloithus falsarius</i> Clemens att.	(R)-sec-butyl Z7-14:Ate	Landolt, 1986(a)	D
<i>Acoloithus novaricus</i> Barnes & McDunough att.	(S)-sec-butyl Z7-14:Ate	Landolt, 1991	D
<i>Acoloithus rectarius</i> Dyar att.	(R)-sec-butyl Z9-14:Ate	Tarmann in Subchev, 2014	D
<i>Adscita alpina</i> Alberti att.	(R)-sec-butyl 2-12:Ate	Efetov, 2020(b)	D
<i>Adscita bolivari</i> Agenjo att.	sec-butyl 2-12:Ate	Efetov, 2019	D
<i>Adscita geryon</i> Hübner att.	(S)-sec-butyl Z7-12:Ate	Subchev, 2010	D
<i>Adscita italica</i> Alberti att.	(R)-sec-butyl 2-12:Ate or (S)-sec-butyl 2-12:Ate	Efetov, 2020(b)	D
<i>Adscita manni</i> Lederer att.	(S)-sec-butyl Z7-12:Ate  + (S)-sec-butyl Z9-14:Ate  (R)-sec-butyl 2-12:Ate	Subchev, 2010  Razov, 2017  Efetov, 2020(b)	D

<i>Adscita obscura</i> Zeller att.	(R)-sec-butyl 2-12:Ate	Can, 2019	D
<i>Adscita statices</i> att.	(R)-sec-butyl 2-12:Ate	Efetov, 2020(a)	D
<i>Adscita subtristis</i> Staudinger att.	sec-butyl 2-12:Ate	Efetov, 2020(a)	D
<i>Goazrea lao</i> Mollet att.	sec-butyl 2-12:Ate	Efetov, 2020(a)	D
<i>Harrisina americana</i> Guénee att.	(R)-sec-butyl Z7-14:Ate	Landolt, 1986(a)	D
<i>Harrisina brillians</i> Barnes & McDunnough western grapeleaf skeletonizer phe.	*sec-butyl Z7-14:Ate (S)-(+)-isomer	Myerson, 1982 Soderstrom, 1985 Curtis, 1989	D
<i>Harrisina coracina</i> Clemens att.	(S)-sec-butyl Z7-14:Ate	Landolt, 1991	D
<i>Harrisina guatemalena</i> Druce att.	(S)-sec-butyl Z7-14:Ate	Landolt, 1991	D
<i>Illiberis pruni</i> Dyar <ringohamaki-kuroba> att.	(R)-sec-butyl Z7-12:Ate + (R)-sec-butyl Z9-14:Ate (10:1)	Subchev, 2013	A
<i>Illiberis rotundata</i> Jordan plum moth <umesukashi-kuroba> phe.	*(R)-sec-butyl Z7-12:Ate + *(R)-sec-butyl Z9-14:Ate (1:1)	Subchev, 2009	A
<i>Illiberis ulmivora</i> Graeser att.	(S)-sec-butyl Z7-12:Ate + (S)-sec-butyl Z9-14:Ate + (S)-sec-butyl Z5-10:Ate (8:4:1)	Liu, 2022	C
<i>Jordanita anatolica</i> Naufock att.	(S)-sec-butyl Z7-12:Ate + (R)-sec-butyl Z7-12:Ate (1:1)	Efetov, 2010	D
	sec-butyl 2-12:Ate	Can, 2019	
<i>Jordanita globulariae</i> att.	sec-butyl 2-12:Ate	Efetov, 2016	D



	(R)-sec-butyl 2-12:Ate	Efetov, 2021	
<i>Jordanita graeca</i> att.	sec-butyl 2-12:Ate	Efetov, 2014; 2016	D
	(R)-sec-butyl 2-12:Ate	Efetov, 2021	
<i>Jordanita horni</i> att.	(S)-sec-butyl Z7-12:Ate + (R)-sec-butyl Z7-12:Ate	Efetov in Subchev, 2014	D
<i>Jordanita notate</i> Zeller att.	(R)-sec-butyl Z7-12:Ate	Subchev, 2010	D
	+ (S)-sec-butyl Z7-12:Ate	Razov, 2017	
	sec-butyl 2-12:Ate	Efetov, 2016	
	(R)-sec-butyl 2-12:Ate	Efetov, 2021	
<i>Jordanita rietzsehi</i> Keil att.	sec-butyl 2-12:Ate	Keil in Efetov, 2020(a)	D
<i>Jordanita splendens</i> Staudinger att.	sec-butyl 2-12:Ate	Efetov, 2020(a)	D
<i>Jordanita subsolana</i> Staudinger att.	(R)-sec-butyl 2-12:Ate	Can, 2019 Efetov, 2020(b) Efetov, 2021	D
<i>Neoalbertia constans</i> att.	(S)-sec-butyl Z9-14:Ate	Tarmann in Subchev, 2014	D
<i>Neoilliberis fusca</i> att.	(R)-sec-butyl Z9-14:Ate	Tarmann in Subchev, 2014	D
<i>Neoprocris aversa</i> att.	(R)-sec-butyl Z9-14:Ate	Tarmann in Subchev, 2014	D
<i>Pyromorpha dyari</i> att.	(S)-sec-butyl Z7-12:Ate	Tarmann in Subchev, 2014	D
<i>Rhagades amasina</i> Herrich-Schäffer att.	(S)-sec-butyl 2-12:Ate	Can, 2019	D
<i>Rhagades predotae</i> att.	(S)-sec-butyl 2-12:Ate	Efetov, 2019	D
<i>Rhagades pruni</i>	(R)-sec-butyl Z7-12:Ate	Subchev, 2010; 2014	D

Denis & Schiffermüller <i>att.</i>	(S)-sec-butyl 2-12:Ate	Efetov, 2021	
<i>Theresimima ampellophaga</i> Bayle-Barella vine bud moth <i>phe.</i>	*(S)-sec-butyl Z7-14:Ate sec-butyl 2-12:Ate (R)-sec-butyl 2-12:Ate	Subchev, 1998 Efetov, 2014 Efetov, 2021	D
<i>Triplocris cyanea</i> <i>att.</i>	(S)-sec-butyl Z9-14:Ate	Tarmann in Subchev, 2014	D
<i>Zygaena carniolica</i> Scopoli <i>att.</i>	Z7-12:OAc + Z9-14:OAc + Z11-16:OAc (100:30:3)	Priesner, 1984(a)	C
<i>Zygaena ephialtes</i> L. <i>att.</i>	Z11-14:OAc + E11-14:OAc + 12:OAc (7:3:40)	Hrdý, 1979	C
	Z11-14:OAc + E11-14:OAc (1:1)	Konyukhov in Arn, 1986(a)	
	Z11-14:OAc	Decamps, 1981	
<i>Zygaena filipendulae</i> L. <i>att.</i>	Z7-12:OAc + Z9-14:OAc + Z5-12:OAc (100:10:3)	Priesner, 1984(a)	C
<i>Zygaena hippocrepidis</i> Hübner <i>att.</i>	Z11-14:OAc	Decamps, 1981	C
<i>Zygaena niphona</i> Butler <benimon-madara> <i>att.</i>	Z7-12:OAc + Z9-14:OAc	Toshova in Efetov, 2020(a)	A
<i>Zygaena purpuralis</i> Brunn <i>att.</i>	Z7-12:OAc + Z9-14:OAc + Z7-14:OAc (10:10:1)	Priesner, 1984(a)	C
<i>Zygaena scabiosae</i> Scheven <i>att.</i>	Z8-12:OAc + E8-12:OAc (24:1)	Hrdý, 1989	C
<i>Zygaena transalpina</i> Esper <i>att.</i>	Z11-14:OAc or Z11-14:OH	Benz, 1973	C

<i>Zygaena trifolii</i> Esper <i>att.</i>	Z7-12:OAc + Z5-12:OAc + Z9-14:OAc (10:10:3)	Priesner, 1984(a)	C
<i>Zygaena viciae</i> Denis & Schiffermüller <i>att.</i>	Z7-12:OAc + Z9-14:OAc + Z5-12:OAc (10:1:1)	Priesner, 1984(a)	C
<i>Zygaenoprocis chalcochlora</i> <i>att.</i>	( <i>R</i> )- <i>sec</i> -butyl Z7-12:Ate or + ( <i>R</i> )- <i>sec</i> -butyl Z9-14:Ate	Hofmann in Subchev, 2014	D
<i>Zygaenoprocis eberti</i> <i>att.</i>	( <i>R</i> )- <i>sec</i> -butyl Z7-12:Ate or + ( <i>R</i> )- <i>sec</i> -butyl Z9-14:Ate	Hofmann in Subchev, 2014	D
<i>Zygaenoprocis taftana</i> <i>att.</i>	( <i>R</i> )- <i>sec</i> -butyl Z7-12:Ate	Efetov in Subchev, 2014	D

(12) [Sesioidea] スカシバガ上科  
(Sesiidae; Sesiinae) スカシバガ科 ; スカシバガ亜科

<i>Aegeria apiformis</i> hornet clearwing moth <i>phe.</i>	*Z3,Z13-18:OH	Kovalev, 1988	C
<i>Albuna fraxini</i> Henry Edwards <i>att.</i>	Z3,Z13-18:OH + Z3,Z13-18:OAc (3:1)	Greenfield, 1979 Nielsen, 1979	D
<i>Albuna pyramidalis</i> Walker <i>att.</i>	E3,Z13-18:OH	Cambell in Arn, 1986(a)	D
<i>Alcathoe carolinensis</i> Engelhardt <i>att.</i>	E3,Z13-18:OAc + Z3,Z13-18:OAc (3:1)  (1:1)	Sharp, 1978  Snow, 1985	D
	E3,Z13-18:OAc	Brown, 1985(b)	
<i>Bembecia chalciformis</i> Esp. <i>att.</i>	Z3,Z13-18:OH + Z3,Z13-18:OAc or + E3,Z13-18:OAc	Bûda, 1993	C

<i>Bembecia ichneumoniformis</i> Denis & Schiffermüller <i>att.</i>	Z3,Z13-18:OH + E3,Z13-18:OAc (9:1)	Bûda, 1993	C
<i>Bembecia parthica</i> Led. <i>att.</i>	Z3,Z13-18:OAc + Z3,Z13-18:OH (9:1)	Bûda, 1993	C
<i>Bembecia puella</i> Lastuvka <i>att.</i>	Z3,Z13-18:OAc + Z3,Z13-18:OH (9:1)	Bûda, 1993	C
<i>Bembecia romanovi</i> Bartell <i>att.</i>	Z3,Z13-18:OAc + E3,Z13-18:OAc (9:1)	Bûda, 1993	C
<i>Bembecia scopigera</i> Scopoli <i>att.</i>	Z3,Z13-18:OH  Z3,Z13-18:OAc or + E2,Z13-18:OH (9:1)	Szöcs, 1989  Bûda, 1993	C
<i>Bembecia</i> (= <i>Synansphecina</i> ) <i>triannuliformis</i> Freyer <i>att.</i>	Z3,Z13-18:OH + E3,Z13-18:OH (9:1)	Szöcs, 1989  Bûda, 1993	C
<i>Bembecia zuwandica</i> Gorbunov <i>att.</i>	Z3,Z13-18:OAc + E3,Z13-18:OAc (9:1)	Bûda, 1993	C
<i>Carmenta anthracipennis</i> Boisduval <i>att.</i>	Z3,Z13-18:OAc + E3,Z13-18:OAc (1:1)	Leeuw, 1983  Snow, 1985	D
<i>Carmenta bassiformis</i> Walker <i>att.</i>	Z3,Z13-18:OA + Z3,Z13-18:OH  + E3,Z13-18:OAc (20:3:1)	Sharp, 1978  Neal, 1983	D
<i>Carmenta ithacae</i> Bentenmüller <i>att.</i>	Z3,Z13-18:OAc	Greenfield, 1979	D
<i>Carmenta laurelae</i> <i>att.</i>	E3,Z13-18:OAc	Greenfield, 1979	D
<i>Carmenta laurelae</i> <i>att.</i>	Z3,Z13-18:OAc	Brown, 1985(c)	D
<i>Carmenta mimosa</i> Eichlin & Passoa <i>phe.</i>	Z3,Z13-18:OAc  *Z3,Z13-18:OAc	Eichlin, 1983  Vang, 2012	D

<i>Carmenta mimuli</i> <a href="#">att.</a>	Z3,Z13-18:OAc	Meyer, 1988	D
<i>Carmenta odda</i> Duckworth & Eichlin <a href="#">att.</a>	Z3,Z13-18:OAc	Duckworth, 1977(b) Brown, 1986(a)	D
<i>Carmenta pyralidiformis</i> Walker <a href="#">att.</a>	E3,Z13-18:OH	Solomon, 1982	D
<i>Carmenta suffusata</i> Engelhardt <a href="#">att.</a>	E3,Z13-18:OH	Sharp, 1978	D
<i>Carmenta teta</i> <a href="#">att.</a>	Z3,Z13-18:OAc	Nielsen in Arn, 1986(a)	D
<i>Carmenta texana</i> Hy. Edwards <a href="#">att.</a>	Z3,Z13-18:OAc	Sharp, 1978	D
<i>Carmenta welchellorum</i> Duckworth & Eichlin <a href="#">att.</a>	Z3,Z13-18:OAc	Duckworth, 1977(a)	D
<i>Chamaesphecia</i> (= <i>Synansphecia</i> ) <i>affinis</i> Staud. <a href="#">att.</a>	E3,Z13-18:OAc + Z13-18:OH (1:1)	Bûda, 1993	D
<i>Chamaesphecia bibioniformis</i> Esper <a href="#">att.</a>	Z3,Z13-18:OAc + E3,Z13-18:OAc (9:1)	Karalius, 2001	D
<i>Chamaesphecia chalciformis</i> Esper <a href="#">att.</a>	Z3,Z13-18:OH + E2,Z13-18:OAc (1:1)	Mozūraitis, 1999(a)	D
<i>Chamaesphecia empiformis</i> Esper <a href="#">att.</a>	Z3,Z13-18:OH	Szöcs, 1989	D
<i>Chamaesphecia mezentzevi</i> Gorbunov <a href="#">att.</a>	Z3,Z13-18:OAc + Z3,Z13-18:OH (9:1)	Mozūraitis, 1999(a)	D
<i>Chamaesphecia schmidtiformis</i> Frr. <a href="#">att.</a>	Z3,Z13-18:OAc + Z3,Z13-18:OH (9:1)	Mozūraitis, 1999(a)	D
<i>Chamaesphecia speia nova</i> Gorbunov <a href="#">att.</a>	Z3,Z13-18:OH + E3,Z13-18:OAc (1:1)	Mozūraitis, 1999(a)	D
<i>Chamaesphecia tenthrediniformis</i>	E3,Z13-18:OAc	Voerman, 1983	D

Denis & Schiffermüller  
(and/or *empiformis* Esper)  
att.

<i>Chamaesphecia zimmermanni</i> Lederer att.	E3,Z13-18:OH + Z3,Z13-18:OAc (9:1)	Mozūraitis, 1999(a)	D
<i>Chamaesphecia</i> sp. att.	E3,Z13-18:OAc + E2,Z13-18:OAc (1:1)	Bûda, 1993	D
<i>Glossosphecia</i> (= <i>Toleria</i> ) <i>romanovi</i> Leech <kubiaka-sukashiba> phe. in Korea	*Z3,Z13-18:OH + *Z3,Z13-18:OAc (8:1) + other components  (9:1)	Arakawa, 2009 Naka, 2010  Yang, 2011(b)	A
<i>Macrosclesia japona</i> Hampson <momobuto-sukashiba> phe.	*E2,Z13-18:Ald + *E2,Z13-18:OH (10:1)	Naka, 2007 Islam, 2007	A
<i>Macrosclesia longipes</i> Moore <ashinagamomobuto-sukashiba> phe.	*E2,Z13-18:OH + *E2,Z13-18:Ald (20:1)	Naka, 2007	A
<i>Melittia cucurbitae</i> Harris squash vine bore phe.	E2,Z13-18:OAc + Z3,Z13-18:OAc (99:1)  *E2,Z13-18:OAc + *Z3,Z13-18:OAc (68.5:0.1) + other componets	Alm, 1989 Snow, 1991  Klun, 1990	C
<i>Melittia satyriniformis</i> Hübner squash vine borer phe.	*E2,Z13-18:OAc	Schwarz, 1983(b)	C
<i>Nokona feralis</i> Leech <kikubi-sukashiba> phe.	*E3,Z13-18:OAc + *E3,Z13-18:OH (7:3)	Naka, 2018	A
<i>Nokona pernix</i> Leech <himeato-sukashiba> phe.	*E3,Z13-18:OH + *Z3,Z13-18:OH (9:1)	Naka, 2006	A
<i>Nokona</i> (= <i>Paranthrene</i> ) <i>regalis</i> Butler vine tree borer <budou-sukashiba>	*E3,Z13-18:OH  E3,Z13-18:OH	Guo, 1990(b)  Zhou, 1995	A

			phe.	Shoji, 2009	
<i>Osminia ruficornis</i> Henry Edwards att.	E2,Z13-18:OH or + E2,Z13-18:OAc (1:1)			Snow, 1989	D
<i>Paranthrene asilipennis</i> Boisdural att.	Z3,Z13-18:OAc			Sharp, 1978	C
	E2,Z13-18:OAc + Z13-18:OAc (24:1)			Snow, 1989	
<i>Paranthrene dollii</i> Neumoegen att.	E3,Z13-18:OH + Z3,Z13-18:OH (3:1)			Nielsen, 1979	C
		(1:1)		Greenfield, 1979	
<i>Paranthrene pellucida</i> Greenfield & Karandinos att.	E3,Z13-18:OAc + Z3,Z13-18:OAc (4:1)			Greenfield, 1979	C
<i>Paranthrene robiniae</i> Hy. Edwards western poplar clearwing phe.	*E3,Z13-18:OH + *Z3,Z13-18:OH (4:1)			Cowles, 1996	C
<i>Paranthrene simulans</i> Grote oak borer att.	Z3,Z13-18:OAc + E2,Z13-18:OAc (1:1)			Nielsen, 1975 Snow, 1989	C
<i>Paranthrene tabaniformis</i> Rottemburg poplar twing clearwing moth phe.	E3,Z13-18:OH + Z3,Z13-18:OAc (9:1) + Z3,Z13-18:OH (9:1) *E3,Z13-18:OH + *Z3,Z13-18:OH + *E2,Z13-18:OH N + other components			Greenfield, 1979 Brown, 1986(b) Du in Arn, 1997 Nielsen, 1979 Karalius, 2001 Zhang, 1986 Mozūraitis, 2007	C
<i>Podosesia aureocincta</i> Purrington & Nielsen banded ash clearwing moth att.	Z3,Z13-18:OAc + E3,Z13-18:OAc + Z3,Z13-18:OH (20:1:3) Z3,Z13-18:OAc			Nielsen, 1978(b) Snow, 1985	D

	+ Z3,Z13-18:OH (1:1) or + E3,Z13-18:OH (1:1)		
<i>Podosesia syringae</i> Harris lilac borer att.	Z3,Z13-18:OAc	Nielsen, 1975 Adler, 1983	D
<i>Pyropteron</i> sp. att.	Z3,Z13-18:OH + Z3,Z13-18:OAc (9:1)	Bûda, 1993	D
<i>Sannina uroceriformis</i> Walker persimmon borer att.	E3,Z13-18:OH + Z3,Z13-18:OH (4:1)  + Z3,Z13-18:OAc (9:1)  E3,Z13-18:OH	Nielsen, 1979  Solomon, 1982  Snow, 1985	D
<i>Sesia apiformis</i> Cl. hornet moth phe.	*E2,Z13-18:Ald + *Z3,Z13-18:OH (3:2) + other components	Francke, 2004	C
<i>Sesia</i> (= <i>Aegeria</i> ) <i>rhynchioides</i> Butler <kashiwa-sukashiba> att.	E3,Z13-18:OAc + Z3,Z13-18:OAc (1:1)	Tamaki, 1977(c)	A
<i>Sesia tibialis</i> Harris cottonwood crown borer att.	Z3,Z13-18:OAc + Z3,Z13-18:OH (4:1)	Underhill, 1978	C
<i>Sesia yezoensis</i> Hampson <kita-sukashiba> att.	Z3,Z13-18:OAc + Z3,Z13-18:OH (9:1)	Bûda, 1993	A
<i>Sphecia</i> (= <i>Sesia</i> ) <i>siningenis</i> Hsu poplar pole clearwing moth phe.	*Z3,Z13-18:OH	Guo, 1990(a)	C
<i>Synanthedon acerni</i> Clemens maple callus borer att.	Z3,Z13-18:OAc + E3,Z13-18:OH (9:1)  + Z3,Z13-18:OH (1:1)	Nielsen, 1979  Snow, 1985	C
<i>Synanthedon acerrubi</i> Engelhardt att.	E2,Z13-18:OAc  + Z3,Z13-18:OAc (100:1)	Schwarz, 1983(b)  Alm, 1989	C



			Snow, 1991	
<i>Synanthedon alleri</i> Engelhardt <a href="#">att.</a>	E3,Z13-18:OAc + E3,Z13-18:OH (1:1)		Sharp, 1978 Snow, 1985	C
<i>Synanthedon andrenaeformis</i> Lasp. <a href="#">att.</a>	E3,Z13-18:OAc + E2,Z13-18:OAc (10:1)		Priesner, 1986(a)	C
<i>Synanthedon arkansasensis</i> Duckworth & Eichlin <a href="#">att.</a>	E3,Z13-18:OAc E3,Z13-18:OH		Sharp, 1978 Solomon, 1982	C
<i>Synanthedon bibionipennis</i> Boisduval strawberry crown moth <a href="#">att.</a>	E3,Z13-18:OAc + E3,Z13-18:OH (2:1)		Nielsen, 1978(a)	C
<i>Synanthedon bicingulata</i> Staudinger <a href="#">phe.</a>	*Z3,Z13-18:OAc + *E3,Z13-18:OAc (3:2)		Yang, 2011(a)	C
<i>Synanthedon bolteri</i> Hy. Edwards <a href="#">att.</a>	E2,Z13-18:OAc + Z3,Z13-18:OAc (99:1)		Taft, 2005	C
<i>Synanthedon castaneae</i> Busck clearwing chestnut moth <a href="#">att.</a>	E3,Z13-18:OH		Brown, 1986(b) Anagnostakis, 1994	C
<i>Synanthedon castanerora</i> <a href="#">att.</a>	E3,Z13-18:OH		Lin, 1993	C
<i>Synanthedon caucasicum</i> Gorbunov <a href="#">att.</a>	E3,Z13-18:OAc + Z3,Z13-18:OAc (9:1)		Mäeorg in Arn, 1992 Bûda, 1993	C
<i>Synanthedon conopiformis</i> Esp. <a href="#">att.</a>	E3,Z13-18:OH		Bûda, 1993	C
<i>Synanthedon culiciformis</i> L. <a href="#">att.</a>	Z3,Z13-18:OAc		Fassotte in Arn, 1986(a)	C
<i>Synanthedon decipiens</i> Henry Edwards <a href="#">att.</a>	E3,Z13-18:OAc + Z3,Z13-18:OAc (7:3) Z3,Z13-18:OAc		Sharp, 1978 Greenfield, 1979 Snow, 1985	C

	+ Z2,Z13-18:OAc (1:1)	Snow, 1989	
<i>Synanthedon dominicki</i> Duckworth <i>att.</i>	E2,Z13-18:OAc	Brown, 1985(d)	C
<i>Synanthedon exitiosa</i> Say peachtree borer <i>phe.</i>	*Z3,Z13-18:OAc + E3,Z13-18:OAc (24:1)	Tumlinson, 1974 Barry, 1978	C
<i>Synanthedon fatifera</i> Hodges viburnum borer <i>att.</i>	Z3,Z13-18:OAc + E3,Z13-18:OAc (9:1)	Nielsen, 1975 Adler, 1983 Greenfield, 1979	C
<i>Synanthedon flaviventris</i> Staudinger <i>att.</i>	E2,Z13-18:OAc + Z3,Z13-18:OAc (49:1)	Karalius, 2006	C
<i>Synanthedon formicaeformis</i> Esp. <i>att.</i>	E2,Z13-18:OAc + E3,Z13-18:OAc (1:1)	Priesner, 1986(a)	C
<i>Synanthedon fulvipes</i> Harris <i>att.</i>	Z3,Z13-18:OAc + other isomers	Nielsen, 1979	C
<i>Synanthedon haitangvora</i> Yang <i>phe.</i>	*Z3,Z13-18:OAc + *E2,Z13-18:OAc (1:1) + other components	Yang, 2009(b)	B
<i>Synanthedon hector</i> Butler cherry tree borer <ko-sukashiba> <i>phe.</i>	E3,Z13-18:OAc + Z3,Z13-18:OAc (1:1)  *E3,Z13-18:OAc + *Z3,Z13-18:OAc (1:1) + another component	Yaginuma, 1976 Naka, 2008	A
<i>Synanthedon kathyae</i> Duckworth & Eichlin <i>att.</i>	Z3,Z13-18:OAc or E3,Z13-18:OAc	Duckworth, 1977(b)	C
<i>Synanthedon mesiaeformis</i> <i>att.</i> Herrich-Schäffer	E2,Z13-18:OAc + Z3,Z13-18:OAc (1:1)	Karalius, 2006	C
<i>Synanthedon myopaeformis</i> Borkhausen apple clearwing moth <i>phe.</i>	Z3,Z13-18:OAc + Z3,E13-18:OAc + E3,Z13-18:OAc + E3,E13-18:OAc (95:2:2:1)	Voerman, 1978(b)	C

	*Z3,Z13-18:OAc + other components	Judd, 2011	
<i>Synanthedon novaroensis</i> Henry Edwards Douglas-fir pitch moth <a href="#">att.</a>	Z3,Z13-18:OAc	Rocchini, 2003	C
<i>Synanthedon pictipes</i> Grote & Robinson lesser peachtree borer <a href="#">phe.</a>	*E3,Z13-18:OAc + Z3,E13-18:OAc (1:1) Z3,Z13-18:OAc	Tumlinson, 1974 Karandinos, 1977 Adler, 1983	C
<i>Synanthedon proxima</i> Henry Edwards <a href="#">att.</a>	Z3,Z13-18:OAc + E3,Z13-18:OAc (3:7) E3,Z13-18:OAc	Nielsen in Arn, 1986(a) Greenfield, 1979 Brown, 1986(b)	C
<i>Synanthedon pyri</i> Harris <a href="#">att.</a>	E2,Z13-18:OAc + Z3,Z13-18:OAc (99:1)	Alm, 1989 Snow, 1991	C
<i>Synanthedon quercus</i> Matsumura <kashiko-sukashiba> <a href="#">att.</a>	Z3,E13-18:OAc + E3,E13-18:OAc (1:1)	Tamaki, 1977(c)	A
<i>Synanthedon refulgens</i> Henry Edwards <a href="#">att.</a>	E2,Z13-18:OAc + Z3,Z13-18:OAc (100:1)	Snow, 1991	C
<i>Synanthedon rhododendri</i> Beutenmüller rhododendron borer <a href="#">att.</a>	Z3,Z13-18:OAc + E3,Z13-18:OAc (49:1) Z3,Z13-18:OAc	Nielsen, 1979 Neal, 1981 Adler, 1983	C
<i>Synanthedon rileyana</i> Henry Edwards horse nettle borer <a href="#">att.</a>	E3,Z13-18:OH + E3,Z13-18:OAc (3:1) + Z3,Z13-18:OAc (1:1) E2,Z13-18:OAc	Nielsen, 1979 Williams, 1999 Snow, 1985 Snow, 1989	C
<i>Synanthedon rubrofascia</i> Henry Edwards	Z3,Z13-18:OAc	Brown, 1986(a)	C

	att.	+ E3,Z13-18:OAc (3:1)	Nielsen, 1975	
		(1:3)	Brown in Arn, 1992	
<i>Synanthedon sapygaeformis</i> Walker	att.	Z3,Z13-18:OAc	Sharp, 1978 Brown, 1986(a)	C
<i>Synanthedon scitula</i> Harris		Z3,Z13-18:OAc	Nielsen, 1975	C
dogwood borer	phe.	+ E2,Z13-18:OAc (1:100)	Alm, 1989 Snow, 1991	
		*Z3,Z13-18:OAc + *Z3,E13-18:OAc + *E2,Z13-18:OAc (44:3:3)	Zhang, 2005 Leskey, 2006	
<i>Synanthedon scoliaeformis</i> Borkh		E2,Z13-18:OAc	Bûda, 1993	C
Welsh clearwing	phe.	*E2,Z13-18:OAc + other components	Mozûraitis, 2013	
<i>Synanthedon sequoiae</i> Henry Edwards		Z3,Z13-18:OH	Nielsen, 1978(a)	C
sequoia pitch moth	att.			
<i>Synanthedon serica</i> Alpheraky	att.	E2,Z13-18:OAc + E3,Z13-18:OAc (1:1)	Karalius, 2001	C
<i>Synanthedon soffneri</i> Spatenka	att.	E2,Z13-18:OAc + Z3,Z13-18:OAc (10:1)	Priesner, 1993	C
<i>Synanthedon spuleri</i> Fuchs	att.	E3,Z13-18:OAc + E2,Z13-18:OAc (10:1)	Priesner, 1986(a)	C
<i>Synanthedon tenuis</i> Butler		Z3,Z13-18:OAc	Tamaki, 1977(c)	A
<hime-sukashiba>	phe.	*Z3,Z13-18:OAc	Naka, 2013	
Korean strain		*Z3,Z13-18:OH	Yang, 2012	
<i>Synanthedon tipuliformis</i> Clerck		E2,Z13-18:OAc	Voerman, 1984	C
currant borer	phe.	+ E3,Z13-18:OAc (100:3–100:10)	Priesner, 1986(a)	
		+ Z3,Z13-18:OAc (99:1)	Meyer, 1994	

	*E2,Z13-18:OAc + *Z13-18:OAc (93:7)	Szöcs, 1985	
	+ *E3,Z13-18:OAc (97:3)	James, 2001	
	+ *E3,Z13-18:OAc (100:0.7) + other components	Mozūraitis, 2006	
In Tasmania, Hungary	E2,Z13-18:OAc	Szöcs, 1990	
In New Zealand	+ E3,Z13-18:OAc (100:3)	Szöcs, 1990	
	(100:0)	Suckling, 2005(a)	
In Europe	+ E3,Z13-18:OAc (100:3)	Szöcs, 1991	
<i>Synanthedon typhiaeformis</i> att.	Z3,Z13-18:OAc + Z3,E13-18:OAc + E3,Z13-18:OAc + E3,E13-18:OAc (95:2:2:1)	Maini in Arn, 1986(a)	C
<i>Synanthedon vespiformis</i> L. yellow-legged clearwing phe.	E3,Z13-18:OAc + Z3,Z13-18:OAc (9:1)	Voerman, 1983	C
	*E3,Z13-18:OAc + *Z3,Z13-18:OAc (4:1)	Levi-Zada, 2011(b)	
<i>Synanthedon viburni</i> Engelhardt att.	E3,Z13-18:OAc + Z3,Z13-18:OAc (9:1)	Greenfield, 1979	C
<i>Vitacea polistiformis</i> Harris grape root borer phe.	*E2,Z13-18:OAc + Z3,Z13-18:OAc (99:1)	Schwarz, 1983(b)	D
<i>Vitacea scepiformis</i> Henry Edwards att.	E3,Z13-18:OAc + Z3,Z13-18:OAc (3:1–9:1)	Sharp, 1978	D
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(Sesiidae; Tinthiinae) スカシバガ科 ; ヒメスカシバ亜科			
<i>Microsphecia</i> (= <i>Tinthia</i> ) <i>brosiformis</i> Hübner att.	E3,Z13-18:OAc	Bûda, 1993	D

<i>Paradoxecia pieli</i> L. (= <i>Paradoxes prelle</i> L.) mulberry clearwing moth phe.	*E3,Z13-18:OAc + another component	Tan, 1992 Lin, 1993	D
<i>Pennisetia bohemica</i> Kralicek & Povolny att.	E3,Z13-18:OH + E3,Z13-18:OAc (100:1)	Priesner, 1990	C
<i>Pennisetia hylaeiformis</i> Laspeyres raspberry clearwing moth <karafuto-sukashiba> att.	E3,Z13-18:OAc + E3,Z13-18:OH (1:1)	Priesner, 1986(b)	A
<i>Pennisetia marginata</i> Harris blackberry clearwing borer phe.	E3,Z13-18:OH  *E3,Z13-18:Ald	Solomon, 1982 Brown, 1985(a)  Judd, 2012 Teasdale, 2013	C
<i>Similipepsis takizawai</i> Arita et Spatenka att.	E3,Z13-18:OH + E2,Z13-18:OAc (1:1)	Bûda, 1993	D
<i>Zenodoxus</i> (= <i>Tinthia</i> ) <i>hoplisiformis</i> Mann. att.	E3,Z13-18:OAc + E2,Z13-18:OAc (1:1)	Bûda, 1993	C
<i>Zenodoxus tineiformis</i> Esper att.	E3,Z13-18:OAc	Nielsen, 1979	C

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(*Brachodidae*) ヒロハマキモドキガ科

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<i>Brachodes appendiculata</i> Esper att.	E3,Z13-18:OAc	Karalius, 2005	D
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(13) [*Cossoidea*] ボクトウガ上科  
(*Cossidae*) ボクトウガ科

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<i>Acosus centerensis</i> Litner aspen carpenterworm att.	E3,E5-14:OAc	Doolittle, 1976(a)	D
<i>Chilecomadia valdiviana</i> Philippi	*Z7,Z10-16:Ald	Herrera, 2016	D

phe.	+ other components	Lapointe, 2017	
<i>Coryphodema tristis</i> Drury quince borer phe.	*Z9-14:OAc + *Z9-14:OH (47:3) + another component  + 14:OAc (38:1:1)	Bouwer, 2015  Bouwer, 2017	D
<i>Cossus cossus</i> L. European goat moth <oobokutou> phe.	Z5-12:OAc + Z3-10:OAc (4:1)  + Z5-14:OAc (4:1:1)  *Z5-12:OAc + Z3-12:OAc (4:1) + other components	Pasqualini in Arn, 1992  Sziráki in Arn, 1997  Capizzi, 1983	B
<i>Cossus insularis</i> Staudinger carpenterworm moth <hime-bokutou> phe.	*E3-14:OAc + other components	Chen, 2006	A
<i>Cossus mongolicus</i> att.	Z5-12:OAc	Qi in Arn, 1992	C
<i>Holcocerus arenicola</i> Staudinger sand <i>Salix</i> carpenterworm phe.	*Z7-14:OAc + *Z5-14:OAc + *Z7-14:OH (20:8:5) + another component	Jing, 2010	D
<i>Holcocerus artemisiae</i> Chou & Hua sand sagebrush carpenterworm phe.	*Z5-12:OAc + *Z5-14:OAc (5:3) + other components	Zhang, 2009	D
<i>Holcocerus hippophaecolus</i> Hua sandthorn carpenterworm phe.	*E3-14:OAc + *Z7-14:OAc (1:1) + other components  + *E7-14:OAc (10:10:1)	Fang, 2005  Cheng, 2007	D
<i>Holcocerus insularis</i> Staudinger carpenterworm moth phe.	*Z3-14:OAc + other components	Zhang, 2001	D
<i>Holcocerus vicarius</i> Walker	*Z7-14:OAc	Yang, 2015	D

carpenterworm moth phe.	+ *E3-14:OAc + *Z3,E5-14:OAc + *Z7-14:OH (50:22:17:10)		
<i>Isoceras sibirica</i> Alpheraky phe.	*Z9-14:OAc + *Z7-14:OAc + *Z9-16:OAc (10:5:1) + other components	Zhang, 2011	D
<i>Parahypopta caestrum</i> Hübner asparagus moth phe.	*Z9-14:OAc + *Z7-14:OAc + *Z5-14:OAc (85:5:10) + another component	Pistillo, 2024	D
<i>Prionoxystus piger</i> att.	Z3,E5-14:OAc	Landolt, 1985	D
<i>Prionoxystus robiniae</i> Peck carpenterworm att.	Z3,E5-14:OAc + E3,E5-14:OAc (9:1–3:7)  + E3-14:OAc (9:1)	Doolittle, 1976 (a,b) Solomon, 1978 Doolittle, 1986  Doolittle, 1986	D
<i>Zeuzera pyrina</i> L. leopard moth phe.	*E2,Z13-18:OAc + *Z13-18:OAc + *18:OAc N  + *Z2,Z13-18:OAc (97:1:2) N + *E3,Z13-18:OAc (39:9:2) N  E2,Z13-18:OAc + E2-18:OAc (19:1)  + E3,Z13-18:OAc (19:1)  + Z2,Z13-18:OAc (19:1:1)	Tonini, 1986  Frérot, 1986 Malosse, 1993  Castellari in Arn, 1992  Pasqualini in Arn, 1992,1997  Pasqualini in Arn, 1997	C

(14) [Tortricoidea] ハマキガ上科  
(Tortricidae; Tortricinae) ハマキガ科 ; ハマキガ亜科  
a: Archipini (カクモンハマキガ族) b: Cnephasiini (ハイイロハマキガ族),



c: Tortricini (ハマキガ族), d: Epitymbiini,\* e: Phricanthini,\* f: Schoenotenini\*  
g: Cochylini (ホソハマキガ族), h: Sparganothini (テングハマキガ族)  
\* Species in this tribe is not distributed in Japan.

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<i>Acleris</i> <sup>c</sup> <i>affinitana</i> Snellen <puraiya-hamaki> att.	E11,Δ13-14:Ald	Ando, 1987	A
<i>Acleris</i> <i>chalybeana</i> Fernald att.	E11-14:Ald + Z11-14:Ald (19:1)	Sanders, 1993	C
<i>Acleris</i> <i>comariana</i> Lienig & Zeller strawberry tortrix <baremone-hamaki> phe.	*E11,Δ13-14:Ald	Svensson, 2019	A
<i>Acleris</i> <i>emargana</i> F. <eguri-hamaki> att.	E11-14:Ald	Weatherston, 1974(a)	A
<i>Acleris</i> <i>enitescens</i> Meyrick <seusuiro-hamaki> att.	E11-14:OAc + E11-14:Ald (1:1)	Ando, 1981	A
<i>Acleris</i> <i>ferrugana</i> Denis & Schiffermüller att.	E11-14:Ald + Z11-14:Ald (9:1)  (20:1)	Frerot, 1985  Ostrauskas, 2010(a)	B
<i>Acleris</i> <i>filipjevi</i> Obraztsov <kousuao-hamaki> att.	E11-14:Ald + E11-14:OAc (9:1)	Ando, 1981	A
<i>Acleris</i> <i>fimbriana</i> Thunberg & Becklin yellow tortrix phe.	*E11,Δ13-14:Ald + *E11,Δ13-14:OAc + *E11-14:OAc (6:4:1) + another component	Liu, 2002(a); 2002(b); 2003	C
<i>Acleris</i> <i>fuscana</i> Barnes & Busck att.	E11-14:Ald + Z11-14:Ald (19:1)	Sanders, 1993	C
<i>Acleris</i> <i>gloverana</i> Walsingham western blackheaded budworm phe.	*E11,Δ13-14:Ald + *Z11,Δ13-14:Ald (20:1) + other components	Gray, 1996	C

<i>Acleris hispidana</i> Christoph <haimidaremon-hamaki> <i>att.</i>	E11,Δ13-14:Ald + E11-14:Ald (1:1)	Ando, 1987	A
<i>Acleris japonica</i> Walsingham <nakajiro-hamaki> <i>att.</i>	E11,Δ13-14:Ald + E11-14:Ald (9:1)	Ando, 1987	A
<i>Acleris maccana</i> Tr. <i>att.</i>	E11-14:Ald + Z11-14:Ald (19:1)	Sanders, 1993	C
<i>Acleris maximana</i> Barnes & Busck <i>att.</i>	E11-14:Ald + Z11-14:Ald (19:1)	Sanders, 1993	C
<i>Acleris minuta</i> Robinson yellowheaded fireworm <i>phe.</i>	*E11,Δ13-14:Ald + other components	Schwarz, 1983(a)	C
<i>Acleris nigrilineana</i> Kawabe <sujiuro-hamaki> <i>att.</i>	E11,Δ13-14:Ald + E11-14:Ald (1:1)	Ando, 1987	A
<i>Acleris paradiseana</i> Walsingham <tsumamon-eguri-hamaki> <i>att.</i>	E11-14:OAc	Ando, 1978	A
<i>Acleris perfundana</i> Kuznetsov <narako-hamaki> <i>att.</i>	Z11-14:Ald + E11-14:Ald (1:1)	Ando, 1981	A
<i>Acleris rhombana</i> Denis & Shiffermüller <i>att.</i>	E11-14:OAc + Z11-14:OAc (4:1)	Frerot, 1979(b)	C
<i>Acleris scabrana</i> Denis & Shiffermüller <i>att.</i>	E11-14:Ald	Tagestad, 1975	C
<i>Acleris sparsana</i> Denis & Shiffermüller <i>att.</i>	E11-14:Ald + Z11-14:Ald (24:1) (9:1)	Knauf in Arn, 1986(a)  Booij, 1985 Frerot, 1985	C
<i>Acleris tripunctata</i> Hübner <i>att.</i>	E11-14:Ald + Z11-14:Ald (1:1)	Booij, 1985	C

<i>Acleris variana</i> Fern. eastern blackheaded budworm phe.	*E11, $\Delta$ 13-14:Ald	Gries, 1994(a)	C
<i>Acropolitis</i> <sup>a</sup> <i>ergophora</i> Meyrick phe.	*Z11-14:OAc E	Horak, 1988	D
<i>Acropolitis hedista</i> Turner phe.	*E11-14:OAc + *14:OAc (7:13) N	Horak, 1988	D
<i>Acropolitis rudisana</i> Walker phe.	*Z11-14:OAc + *E11-14:OAc (97:3) E	Horak, 1988	D
<i>Acropolitis xuthobapta</i> Turner phe.	*Z11-14:OAc + *E11-14:OAc (89:11)	Horak, 1988	D
<i>Adoxophyes</i> <sup>a</sup> <i>honmai</i> Yasuda smaller tea tortrix <chanokokakumon-hamaki> phe.	*Z9-14:OAc + *Z11-14:OAc (7:4)  + *E11-14:OAc + *Me10-12:OAc (63:31:4:2) R:S = 19:1  + other components	Tamaki, 1971(b)  Tamaki, 1979; 1980 Tamaki, 1983 Noguchi, 1985	A
Chinese strain	(47:50:1:2)	Hsiao, 1990	
Taiwanese strain	*Z9-14:OAc + *Z11-14:OAc (9:16)	Kou, 1990; 1992(c)	
Korean strain	(1:2) + other components	Yang, 2009(a)	
	Z9,E12-14:OAc + Me11,Z9, $\Delta$ 12-13:OAc + Z11-14:OAc (7:3:3)	Negishi, 1979	
<i>Adoxophyes orana</i> Fisher von Röslerstamm summerfruit tortrix phe.	*Z9-14:OAc + *Z11-14:OAc (3:1)  (9:1)	Meijer, 1972  Minks, 1973(a)	B
In Romania	(4:1)	Ghizdavu in Arn, 1997	

	+ *Z9-14:OH + *Z11-14:OH (155:27:4:0.4) + other components	Guerin, 1986(a)	
Korea strain	(4:1) + other components	Yang, 2009(a)	
<i>Adoxophyes orana fasciata</i> Walsingham <ringonokokakumon-hamaki> phe.	*Z9-14:OAc + *Z11-14:OAc (13:4) + other components	Tamaki, 1971(a)  Sugie, 1984(b) Noguchi, 1985	A
<i>Adoxophyes privatana</i> Walker phe.	Z9-14:OAc + Z11-14:OAc + E11-14:OAc + Me10-12:OAc (63:31:4:2)	Shry, 1985	C
	Z11-14:OAc + Z9-14:OAc (9:1)	Hai, 2002	
	*Z11-14:OAc + *Z9-14:OAc (9:1)	Vang, 2013	
<i>Adoxophyes privatara</i> att.	Z9-14:OAc + Z11-14:OAc + E11-14:OAc + Me10-12:OAc (63:31:4:2)	Shi in Arn, 1992	C
<i>Adoxophyes reticulana</i> Hübner att.	Z9-14:OAc + Z11-14:OAc (1:1)	Chambon, 1974	C
<i>Adoxophyes</i> sp. Korean strain phe.	*Z9-14:OAc + *Z11-14:OAc (1:40) + other components	Yang, 2009(a)	C
<i>Aethes</i> <sup>g</sup> <i>margarotana</i> Dup. att.	Z11-14:OAc + E11-14:OAc (3:2)	Frerot, 1982(a)	C
<i>Aethes rubigana</i> Treitschke <edaobi-hosohamaki> att.	Z11-14:OAc + Z11-14:OH (9:1)	Frerot, 1979(b)	A
	Z11-14:OAc	Ando, 1981	

	+ E11-14:OAc (1:1)		
<i>Agapeta</i> <sup>g</sup> <i>hamana</i> L. att.	Z11-14:OAc + Z11-14:OH (50:1) or + 12:OAc (50:1)	Tóth, 1985	D
<i>Agapeta zoegana</i> phe.	Z11-14:OAc  *Z11-14:OAc + other components	Maini in Arn, 1986(a) Tóth, 1985	D
<i>Aleimma</i> <sup>c</sup> <i>loeflingiana</i> L. att.	E11-14:OAc + Z11-14:OAc  E11-14:OAc + E11-14:Ald (1:1)	Frerot, 1979(b)  Booij, 1985	D
<i>Amorbia</i> <sup>h</sup> <i>cuneana</i> Walsingham western avocado leafroller phe.	*E10,Z12-14:OAc + *E10,E12-14:OAc (17:8) + other components  (53:47)  (63:37–11:89)	McDonough, 1982(a)  Hoffmann, 1983 Bailey, 1986	D
<i>Aphelia</i> <sup>a</sup> <i>paleana</i> Hübner att.	Z11-14:OAc  + E11-14:OAc (9:1)  + Z11-14:OH + Z11-14:Ald (100:2:0.75:1)	Hrdý, 1979  Booij, 1984(a) Peltotalo, 1986  Ostrauskas, 2010(b)	C
<i>Aphelia viburnana</i> Denis & Shiffermüller att.	Z11-14:Ald	Booij, 1985 Guerin, 1986(c)	C
<i>Archips</i> <sup>a</sup> <i>argyrosphilus</i> Walker fruittree leafroller phe.	*Z11-14:OAc + *E11-14:OAc (7:3) + other components  + *Z9-14:OAc + *12:OAc (15:10:1:50)	Roelofs, 1974(d)  Cardé, 1977(a)	C

	(100:64:2:1)	Deland, 1993	
<i>Archips asiaticus</i> Walsingham (= <i>audax</i> Razowski) <atoki-hamaki> <i>att.</i>	E11-14:OAc + Z11-14:OAc (9:1)  (7:3)	Ando, 1978  Mizukoshi, 2006	A
	Z9-14:OAc + Z11-14:OAc (9:1)	Mizukoshi, 2006	
<i>Archips atrolucens</i> Diakonoff <i>phe.</i>	Z11-14:OAc + E11-14:OAc (1:1)  *Z11-14:OAc + *E11-14:OAc + *14:OAc (2:1:1)	Hai, 2002  Vang, 2013	C
<i>Archips breviplicanus</i> Walsingham Asiatic leafroller <hosoatoki-hamaki> <ringomon-hamaki> <i>phe.</i>	*E11-14:OAc + *Z11-14:OAc (7:3)	Sugie, 1977	A
<i>Archips capsigeranus</i> Kennel <katakake-hamaki> <i>att.</i>	Z11-14:OAc + E11-14:OAc (1:1)  (1:4)	Ando, 1981  Kozaki, 1984	A
<i>Archips cerasivoranus</i> Fitch uglynest caterpillar <i>phe.</i>	*E11-14:OAc + *Z11-14:OAc (83:17)	Roelofs, 1980	C
<i>Archips crataegana</i> Hübner <i>att.</i>	Z11-14:OAc + Z9-14:OAc (3:1)  + E11-14:OAc + Z9-14:OH (82:9:9)  + Z9-14:OAc + Z11-14:OH (36:15:2)	Ghizdavu, 1987  Ryabchinskaya in Arn, 1992  Kovalev in Arn, 1992	C
<i>Archips fuscocupreanus</i> Walsingham <midarekakumon-hamaki> <i>att.</i>	Z11-14:OAc + E11-14:OAc (4:1)	Ando, 1981	A
<i>Archips griseus</i> Robinson	Z11-14:Ald	Grant, 1983	C

black-shield leafroller <i>att.</i>	+ E11-14:Ald (3:1)		
<i>Archips ingentanus</i> Christoph <ooatoki-hamaki> <i>att.</i>	Z11-14:OAc + Z11-14:OH (9:1)	Ando, 1978	A
<i>Archips micaceanus</i> Walker <i>att.</i>	Z11-14:OAc + E11-14:OAc + 12:OAc (7:3:40)	Zeleny, 1982 Spitzer, 1983	C
<i>Archips mortuanus</i> Kearfoot duskyback leafroller <i>att.</i>	Z11-14:OAc + E11-14:OAc + Z9-14:OAc (90:10:1)	Cardé, 1977(a)	C
<i>Archips oporana</i> L. <i>att.</i>	Z11-14:OAc + E11-14:OAc (9:1)	Booij, 1984(a)	B
<i>Archips oporanus</i> (= <i>piceanus</i> ) <i>similis</i> Butler <matsuatoki-hamaki> <i>att.</i>	Z11-14:OAc + E11-14:OAc (4:1) (1:1)	Ando, 1978 Kozaki, 1984	A
<i>Archips peratrata</i> Yasuda <kuroshio-hamaki> <i>att.</i>	Z11-14:OAc + E11-14:OAc (9:1)	Ando, 1981	A
<i>Archips podana</i> Scopoli fruittree tortrix <i>phe.</i>	*Z11-14:OAc + *E11-14:OAc (1:1) + *Z11-14:OH	Persoons, 1974 Safonkin, 2003	C
<i>Archips poraivora</i> Meyrick <i>att.</i>	Z11-14:OAc + E11-14:OAc + Z11-14:OH (97:3:5)	Bhardwaj, 1987	C
<i>Archips rosana</i> L. European leafroller filbert leafroller <i>phe.</i>	*Z11-14:OAc + *Z11-14:OH (9:1) (87:13) + *E11-14:OAc (10:1:0.01) + Z11-14:Ald (100:0.75:2:1)	Roelofs, 1976(a) AliNiazee, 1976 Guerin in Arn, 1986(a) Ostrauskas, 2010(b)	C

<i>Archips semiferanus</i> Walker oak leafroller phe.	*Z10-14:OAc + other components	Hendry, 1974 Hendry, 1975	C
	*E11-14:OAc + *Z11-14:OAc (2:1)	Miller, 1976	
<i>Archips seminubilis</i> Meyrick att.	Z11-14:OAc	Zeleny, 1982 Spitzer, 1983	C
<i>Archips semistructus</i> Meyrick <usuatoki-hamaki> att.	Z11-14:OAc	Ando, 1977	A
<i>Archips strojny</i> Razowski tea tortrix phe.	*Z11-14:OAc + another component	Fu, 2022	C
<i>Archips subrupanus</i> att.	Z11-14:OAc	Song in Arn, 1992	C
<i>Archips tsuganus</i> Powell att.	E11-14:OAc	Daterman, 1977	C
<i>Archips viola</i> Falkovitsh <urasakikakumon- hamaki> att.	E11-14:OAc + Z11-14:OAc (7:3)	Ando, 1981	A
<i>Archips xylosteanus</i> L. <kakumon-hamaki> phe.	Z11-14:OAc + E11-14:OAc (4:1)	Ando, 1978	A
	*Z11-14:OAc + *E11-14:OAc (23:2)	Frerot, 1983	
<i>Argyrotaenia</i> <sup>a</sup> (= <i>Neocalyptis</i> ) <i>angustilineata</i> Walsingham <kohosouji-hamaki> att.	Z11-14:OAc + Z9,E12-14:OAc (1:1)	Ando, 1978	A
	Z11-14:OAc + Z9-12:OAc (1:1)	Ando, 1981 Kim, 2014(b)	
	Z9-14:OAc + Z11-14:OAc (9:1)	Mizukoshi, 2006	
<i>Argyrotaenia citrana</i> Fernald orange tortrix phe.	*Z11-14:OAc + *Z11-14:Ald (15:1)	Hill, 1975(b)	C



<i>Argyrotaenia dorsalana</i> Dyar att.	Z11-14:OAc  + Z11-14:OH (1:1)	Steck, 1977(a) Daterman, 1977  Steck, 1977(a)	C
<i>Argyrotaenia liratana</i> Christoph (= <i>tricensa</i> Meyrick) <futamonko-hamaki> att.	Z9-12:OAc	Nagano, 1979	A
<i>Argyrotaenia pomililiana</i> L. phe.	*Z11-14:OAc + *Z11-14:Ald (20:1) + other components	Cichón, 2004	C
<i>Argyrotaenia pulchellana</i> Haworth phe.	Z11-14:OAc  + E11-14:OAc (9:1)  *Z11-14:OAc + *E11-14:OAc (76:19) + other components	Maini, 1973  Frerot, 1979(b)  Frerot, 1984	C
<i>Argyrotaenia quadrifasciana</i> att.	Z10-12:OAc	Roelofs in Arn, 1986(a)	C
<i>Argyrotaenia sphaleropa</i> Meyrick phe.	*Z11,Δ13-14:Ald + *Z11-14:Ald (9:1) + *Z11,Δ13-14:OAc + *Z11-14:OAc  *Z11,Δ13-14:Ald + *Z11,Δ13-14:OAc (10:1)  Z11,Δ13-14:Ald + Z11,Δ13-14:OAc (9:1-1:9)	Nunez, 2002     Legrand, 2004  Bavaresco, 2005	C
<i>Argyrotaenia velutinana</i> Walker redbanded leafroller phe.	*Z11-14:OAc  + 12:OAc (2:3)  + *E11-14:OAc + *12:OAc (88:12:125)  + other components	Roelofs, 1968(a); 1968(b)  Hamstead, 1972  Roelofs, 1975(a)  Bjostad in Arn, 1986(a)	C

<i>Arotrophora</i> <sup>b</sup> phe. <i>arcuatalis</i> Walker	*Z11-14:OAc + *E11-14:OAc (97:3) N	Horak, 1988	D
<i>Asthenoptycha</i> <sup>d</sup> phe. sp.	*Z8-14:OAc + *Z10-14:OAc (9:1) E	Horak, 1988	D
<i>Cacoecimorpha</i> <sup>a</sup> phe. <i>pronubana</i> Hübner European carnation tortrix	Z11-14:OAc + Z9-14:OAc  Z11-14:OAc  + Z11-14:OH + 14:OAc (18:1:1:20)  Z11-14:OAc + E11-14:OAc + Z11-14:OH  *Z11-14:OAc + *E11-14:OAc + *Z11-14:OH (87:3:10) + other components  + *Z9-14:OAc  [82:5:7:1] N (100:3:30:3)	Frerot, 1979(b)  Soldán, 1983  Arsura in Arn, 1986(a)  Frerot, 1982(b)  Descoins, 1985  Kovalev, 1985 Witzgall, 1989(a); 1990	D
<i>Capnoptycha</i> <sup>d</sup> phe. <i>ipnitis</i> Meyrick	*Z8-14:OAc + *Z10-14:OAc (83:17) N	Horak, 1988	D
<i>Catamacta</i> <sup>a</sup> phe. <i>gavisana</i>	*Z11-14:OAc + *E11-14:OAc (49:51–61:39) N	Foster, 1988	D
<i>Cenopis</i> <sup>h</sup> phe. <i>acerivorana</i> MacKay maple leafroller	Z11-14:Ald + E11-14:Ald (4:1)  *Z11-14:Ald + *E11-14:Ald + *Z11-14:OAc (13:7:2) + other components	Weatherston, 1978  Grant, 1983	C
<i>Choristoneura</i> <sup>a</sup> <i>biennis</i> Freeman	E11-14:Ald	Sanders, 1974; 1993	C

two-year-cycle spruce budworm

att.

<i>Choristoneura carnana</i> Barnes & Busck	E11-14:Ald + Z11-14:Ald (23:2)	Liebhold, 1985	C
att.			
<i>Choristoneura conflictana</i> Walker large aspen tortrix	Z11-14:Ald	Weatherston, 1976	C
phe.	*Z11-14:Ald + other components	Evenden, 2006	
<i>Choristoneura fractivittana</i> Clemens	Z11-14:OH	Roelofs, 1970(a)	C
att.		Comeau, 1973	
	+ Z11-14:Ald (19:1)	Weatherston, 1978	
<i>Choristoneura fumiferana</i> Clemens eastern spruce budworm	*E11-14:Ald	Weatherston, 1971	C
phe.	+ another component	Weatherston, 1974(b)	
	E11-14:Ald + Z11-14:Ald (19:1)	Sanders, 1976; 1984; 1993, Jennings, 1983	
	*E11-14:OAc N	Wiesner, 1979	
	*E11-14:Ald + *Z11-14:Ald (20:1) + other components	Silk, 1980	
	+ 14:Ald (19:1:1)	Alford, 1983	
	+ Z11-16:Ald (95:5:3.3)	Silk, 1988(b)	
	1,E11-15:H + 1,Z11-15:H (19:1)	Silk, 1985(a)	
<i>Choristoneura hebenstreitella</i> Müller	Z11-14:OH	Booij, 1985	C
att.	+ Z11-14:Ald (1:1)		
<i>Choristoneura lafauryana</i> Rag. oblique-banded leafroller	Z11-14:OH	Castellari, 1985	C
att.			
<i>Choristoneura lambertiana</i> Busck	E11-14:OAc or E11-14:Ald	Daterman, 1977	C
att.			

<i>Choristoneura lambertiana</i> <i>subretiniana</i> att.	E11-14:OAc + Z11-14:OAc + E11-14:OH + Z11-14:OH (30:20:3:2)	Silk, 1988(b)	C
<i>Choristoneura murinana</i> Hübner European fir budworm silver-fir shoot tortricid phe.	*Z9-12:OAc + Z11-14:OAc (10:1)  *Z9-12:OAc + Z11-13:OAc (10:1)  + *Δ11-12:OAc + *Z11-14:OAc + *E9-12:OAc (100:10:3:3)  Z11-14:OAc	Priesner, 1980(a)  Priesner, 1982(a)  Priesner, 1988(a)  Burghardt, 1980	C
<i>Choristoneura occidentalis</i> Freeman western spruce budworm phe.	E11-14:Ald  *E11-14:Ald + *Z11-14:Ald (10:1) + other components	Weatherston, 1971  Cory, 1982 Silk, 1982; 1988(b) Alford, 1984 Sweeney, 1990	C
<i>Choristoneura orae</i> Freeman phe.	*E11-14:OAc + *Z11-14:OAc + *E11-14:OH (82:9:9) + other components	Gray, 1984(a)	C
<i>Choristoneura parallela</i> Robinson spotted fireworm phe.	* E11-14:OH + *Z11-14:OH + *E11-14:OAc + *14:OH (84:0.7:8:9)  (100:5:4) + another component	Neal, 1982  Polavarapu, 1998	C
<i>Choristoneura pinus</i> <i>maritima</i> Freeman att.	E11-14:OAc + Z11-14:OAc + E11-14:OH + Z11-14:OH  (153:27:17:3)	Silk, 1988(b)  Liebhold, 1991	C

<i>Choristoneura pinus pinus</i> Freeman jack pine budworm phe.	*E11-14:OAc + *Z11-14:OAc + *E11-14:OH + *Z11-14:OH (77:13:9:1) + other components	Silk, 1985(b)	C
<i>Choristoneura retiniana</i> Walsingham modoc budworm phe.	*E11-14:OAc + *Z11-14:OAc + *E11-14:OH + *Z11-14:OH (92:8:9:1)	Daterman, 1984	C
<i>Choristoneura rosaceana</i> Harris obliquebanded leafroller phe. New York strain	*Z11-14:OAc  *Z11-14:OAc + *E11-14:OAc + *Z11-14:OH (95:5:0.5–95:5:10)	Roelofs, 1970(b)  Hill, 1979(a)	C
Michigan strain	+ E11-14:OAc + *Z11-14:OH (74:5:21)	Huang, 2022	
In Eastern Canada	(96.5:2:1.5)	Delisle, 1992	
Okanagan Valley strains	+ *Z11-14:Ald (96.5:2:1.5:4)	Vakenti, 1988	
British Columbia strains	(100:2:0.75:1)	Thomson, 1991	
In Eastern Canada	(97:2:1.5:1) + other components	El-Sayed, 2001; 2003	
<i>Choristoneura sorbiana</i> Hübner (= <i>C. hebenstreitella</i> ?) att.	Z11-14:OH + E11-14:OH (97:3)	Frerot, 1979(b)	C
<i>Choristoneura viridis</i> Freeman (= <i>C. retiniana</i> ?) green budworm att.	E11-14:OAc	Sanders, 1974	C
<i>Choristoneura n. sp.</i> CPG=Prince George phe.	*E11-14:OAc + *Z11-14:OAc (13:7) + other components	Gray, 1993	C
<i>Clepsis<sup>a</sup> dumicolana</i> Zeller att.	Z11-14:OAc + E11-14:OAc (1:1)	Frerot, 1979(b)	C

<i>Clepsis furcana</i> Walsingham <i>att.</i>	E11-14:OAc	Daterman, 1977	C
<i>Clepsis melaleucana</i> Walker <i>att.</i>	Z11-14:OH + Z11-14:OAc (1:1)	Roelofs, 1971(a)	C
<i>Clepsis rurinana</i> L. <usumon-hamaki> <i>att.</i>	Z11-14:Ald	Capizzi in Arn, 1986(a) Frerot, 1985	A
<i>Clepsis semialbana</i> Cuc. <i>att.</i>	Z11-14:OAc + Z11-14:OH + Z9-14:OAc (17:2:1)	Frerot, 1982(a)	B
<i>Clepsis spectrana</i> Treitschke <i>phe.</i>	*Z11-14:OAc + *Z9-14:OAc (3:1)	Minks, 1973(b)	C
<i>Clepsis strigana</i> Hübner <i>att.</i>	Z11-14:OAc	Maini, 1973	B
<i>Cnephasia</i> <sup>b</sup> <i>alticolana</i> Herrich-Schäffer <i>att.</i>	Z11-14:OAc + E11-14:OAc (1:1)	Olenici, 2007	C
<i>Cnephasia asseclana</i> Denis & Schiffermüller (= <i>interjectana</i> Haworth ?) <i>att.</i>	E9-12:OAc	Hrdý, 1989	C
<i>Cnephasia alternella</i> Stephens <i>att.</i>	Z8-12:OAc  + E8-12:OAc (18:7)	Chambon, 1974 Sziráki, 1978(a); (b)  Beauvais, 1977	C
<i>Cnephasia communana</i> Herrich & Schäffer <i>att.</i>	Z8-12:OAc  + E8-12:OAc	Alford, 1978  Frilli, 1974	C
<i>Cnephasia cupressivorana</i> <i>att.</i>	E9-12:OAc	Tóth in Arn, 1997	C
<i>Cnephasia ecullyana</i> Real. <i>att.</i>	Z9-12:OAc  + Z9-12:OH	Nässig, 1991  Tóth, 1992(d)	C
<i>Cnephasia genitalana</i>	Z9-12:OAc	Sziráki, 1980	C

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<i>Cnephasia</i> (= <i>Decodes</i> ) <i>horarianus</i> Walsingham	Z7-10:OAc	Steck, 1977(a)	C
<i>Cnephasia incertana</i> Treitschke	Z10-14:OAc	Frerot, 1985	C
	F <sub>2</sub> 11,11-Z9-12:OAc	Bengtsson, 1990	
	Z10-12:OAc	Witzgall, 1996	
<i>Cnephasia interjectana</i>	E10-12:OAc	Booij, 1984(a)	C
	E9-12:OAc + E9,Δ11-12:OAc (19:1)	Brewer, 1985	
	E9-12:OAc	Priesner in Arn, 1986(a)	
<i>Cnephasia jactatana</i> Walker	Z11-14:OAc + Z9-14:OAc (19:1)	Benn in Roelofs 1982(a)	C
	*Z11-14:OAc	Foster, 1993	
<i>Cnephasia longana</i> Haworth	Z9-12:OAc	Bathon, 1983	C
	+ Z9-12:OH (1:1)	Booij, 1984(a)	
	*Z9-12:OAc	Bestmann, 1985	
<i>Cnephasia pascuana</i> Hübner	Z8-12:OAc + E8-12:OAc (24:1)	Gigon, 1980	C
<i>Cnephasia pasiuana</i> Hübner	Z5-10:OAc + Z7-12:OAc (1:1)	Tóth, 1992(c)	C
	Z9-12:OAc + E9-12:OAc (1:1)	Toshova, 2017	
<i>Cnephasia pumicana</i> Zeller cereal tortrix	*Z9-12:OAc + *E9-12:OAc + *12:OAc (3:5:2)	Biwer, 1978(a)	C
<i>Cnephasia stephensiana</i> Doubleday	Z8-12:OAc	Alford, 1978	C

<i>att.</i>		Peltotalo, 1986	
	+ E8-12:OAc (1:1)	Witzgall, 1996	
	+ E8-12:OAc (93:7) + 12:OH	Hrdý, 1979	
	E11-14:Ald	Brewer, 1985	
	Z11-14:OAc	Olenici, 2007	
<i>Cnephasia stephensiana</i> <i>stolidana</i> Walker <hosobahaiiro-hamaki> <i>att.</i>	Z8-12:OAc + E8-12:OAc + Z8-12:OH (85.5:5.5:9)	Mizukoshi, 2006	A
<i>Cnephasia</i> sp. <i>att.</i>	E11-14:OAc	Klun, 1972	
<i>Cochylis</i> <sup>g</sup> <i>arthuri</i> Dang <i>phe.</i>	*Z11-14:OAc + *E11-14:OAc (4:1)	Foster, 2003	C
<i>Cochylis dubitana</i> Hübner <i>att.</i>	E11-14:OAc  + E11-14:OH (10:1)	Frerot, 1985  Mozūraitis, 1998	C
<i>Cochylis hospes</i> Walsingham banded sunflower moth <i>phe.</i>	*E11-14:OAc + *Z11-14:OAc (9:1–4:1)	Underhill, 1986	C
<i>Cochylis hybridella</i> Hübner <togari-hosohamaki> <i>att.</i>	Z11-14:Ald + E11-14:OAc (1:1)	Frerot, 1985	A
<i>Cochylis molliculana</i> <i>att.</i>	E11-14:OAc	Maini in Arn, 1986(a)	C
<i>Cochylis posterana</i> Zeller <i>att.</i>	Z8-12:OAc + E8-12:OAc + Z11-14:OAc (25:1:5)  Z11-14:OAc + Z9-12:OAc (10:1)	Tóth in Arn, 1986(a)  Tóth, 1992(d)	C
<i>Commophila</i> <sup>g</sup> <i>umbrabsana</i> Kearfott	E11-14:OAc	Daterman, 1977	D



	att.			
<i>Croesia</i> <sup>c</sup> <i>askoldana</i> Christoph <ginsujikaba-hamaki> att.	Z11-14:Ald + Z11-14:OAc (9:1)	Ando, 1978	A	
<i>Croesia bergmaniana</i> L. att.	E11-14:OAc  + 14:OAc (9:1)	Voerman in Arn, 1986(a)  Frerot, 1979(b)	B	
<i>Croesia conchyloides</i> Walsingham <neusu-hamaki> att.	Z11-14:Ald	Ando, 1978	A	
<i>Croesia curvalana</i> Kearfott blueberry leaftier moth phe.	*E11-14:Ald + *Z11-14:Ald + *E11-14:OAc + *Z11-14:OAc (810:90:85:15)	Lonergan, 1989; Ponder, 1991	C	
<i>Croesia dealbata</i> Yasuda <shiroobigin-hamaki> att.	E11-14:Ald	Ando, 1981	A	
<i>Croesia forskaleana</i> att.	E11-14:Ald + Z11-14:Ald (1:1–1:9)	Frerot, 1985	C	
<i>Croesia holmiana</i> L. att.	E11-14:OAc  + 14:OAc (9:1)  + Z11-14:Ald (1:1)  Z6-14:OAc + E6-14:OAc (9:1)	Arn, 1974  Frerot, 1979(b)  Frerot, 1985  Minks in Arn, 1986(a)	C	
<i>Croesia semipurpurana</i> Kearfott oak leaf shredder phe.	E11-14:Ald + Z11-14:Ald (9:1–8:2)  *E11-14:Ald + *Z11-14:Ald (17:3) + other components	Weatherston, 1978  Silk, 1997	C	
<i>Croesia tigricolor</i> Walsingham <torafu-hamaki> att.	E11-14:Ald + Z11-14:Ald (9:1)	Ando, 1981	A	

<i>Cryptoptila</i> <sup>a</sup> <i>australana</i> Lewin phe.	*Z11-14:OAc + *E11-14:OAc (19:1) E	Horak, 1988	D
<i>Cryptoptila immersana</i> Walker phe.	*Z11-14:OAc + *Z9-14:OAc (91:9) E	Horak, 1988	D
<i>Cryptoptila</i> sp. 1 phe.	*Z9-14:OAc + *Z11-14:OAc + *Z11-16:OAc (50:39:11) N	Horak, 1988	D
<i>Cryptoptila</i> sp.2 phe.	*Z9-14:OAc + *Z11-14:OAc + *E11-14:OAc + *Z11-16:OAc (38:49:7:6) N	Horak, 1988	D
<i>Ctenopseustis</i> <sup>a</sup> <i>herana</i> Felder & Rogenhofer att.	Z5-14:OAc	McLaren, 1993	D
<i>Ctenopseustis obliquana</i> Walker brownheaded leafroller phe.			D
Auckland strains Type I	*Z8-14:OAc + *Z5-14:OAc (4:1)	Young, 1985 Clearwater, 1991	
Christchurch strains Type II (= <i>C. herana</i> )	*Z5-14:OAc + another component	Foster, 1987(a); 1991 Clearwater, 1991	
Type III	*Z8-14:OAc + *Z5-14:OAc (9:1)	Foster, 1986	
Type IV (= <i>C. filicis</i> ?)	*Z10-16:OAc	Foster, 1986	
<i>Ctenopseustis servana</i> phe.	*Z7-14:OAc + *Z5-14:OAc (4:1–5:3) N	Foster, 1988; 1990	D
<i>Decodes</i> <sup>b</sup> <i>stevensi</i> Powell att.	Z9-12:OAc	Stevens, 1985	D

<i>Ditula</i> <sup>a</sup> <i>att.</i> <i>angustiorana</i> Haworth	Z10-14:OAc	Frerot, 1985	C
<i>Dyceratura</i> <sup>g</sup> <i>att.</i> <i>ostrinana</i> Guenée	Z11-14:OAc + E11-14:OAc (3:2)	Frerot, 1982(a)	D
<i>Eana</i> <sup>b</sup> <i>att.</i> <i>argentana</i> Clerck <ginmuji-hamaki>	Z7-12:OAc	Priesner in Arn, 1986(a)	A
<i>Eana derivana</i> La Harpe <i>att.</i>	E9-12:OAc + Z9-12:OAc (11:9)	Hrdý, 1989	C
<i>Ecclitica</i> <sup>a</sup> <i>phe.</i> <i>torogramma</i>	*E11-14:OAc + *Z11-14:OAc (25:0–23:2) N	Foster, 1988	D
<i>Epagoge</i> <sup>a</sup> <i>att.</i> <i>grotiana</i> F.	Z10-14:OAc + Z11-14:OAc (3:1–1:3) (10:1)	Booij, 1984(a) Frerot, 1985 Mozūraitis, 1998	D
<i>Epichoristodes</i> <sup>a</sup> <i>phe.</i> <i>acerbella</i> Walker	*Z11-14:OAc + *Z11-14:OH + *Z9-14:OAc (32:13:4) + other components  *Z11-14:OAc + Z9-14:OH (8:1:2:1)	L.-Cassou, 1980  Rossi, 1982 Dalla in Arn, 1992	D
<i>Epiphyas</i> <sup>a</sup> <i>phe.</i> <i>postvittana</i> Walker lightbrown apple moth <i>att.</i>	*E11-14:OAc + *E9,E11-14:OAc (20:1)  <i>phe.</i> (9:1) <i>att.</i> (19:1)  + *E11-14:OH + *E11-16:OAc (200:10:2:1) + other components	Bellas, 1983  Muggleston, 1989 Yazdani, 2024 El-Sayed, 2011	D
<i>Epiphyas pulla</i> Turner	E9,E11-14:OAc	Yazdani, 2024	

	att.	+ E11-14:OAc + 14:OAc + 12:OAc (16:10:10:1)		
<i>Epiphyas xylodes</i> Meyrick	phe.	*Z11-14:OAc + *E11-14:OAc (3:2)	Horak, 1988	D
<i>Epitymbia</i> <sup>d</sup> <i>alaudana</i> Meyrick	phe.	*Z5-14:OAc + *Z7-14:OAc (2:1) E	Horak, 1988	D
<i>Epitymbia cosmota</i> Meyrick	phe.	*Z7-14:OAc + *Z5-14:OAc (4:1) E	Horak, 1988	D
<i>Epitymbia eudrosa</i> Turner	phe.	*Z7-14:OAc E	Horak, 1988	D
<i>Eulia</i> <sup>b</sup> <i>ministrana</i> L. <bokashi-hamaki>	att.	Z11-14:OAc + Z9-14:OAc (9:1)	Booij, 1984(a)	A
		(10:1)	Priesner, 1984(c)	
		Z11-14:OAc + Z11-14:Ald (1:1)	Booij, 1985	
<i>Eupoecilia</i> <sup>g</sup> <i>ambiguella</i> Hübner European grape moth <budou-hosohamaki>	phe.	*Z9-12:OAc	Arn, 1976(b) Saglio, 1977(b)	A
		Z9-12:OAc + 12:OAc (1:1-1:5) or + Z10-13:OAc (5:1-2:1)	Rauscher, 1984	
		*Z9-12:OAc + *12:OAc + *18:OAc (1:1:2) + other components	Arn, 1986(b), 1988	
<i>Eupoecilia angustana</i> Hübner <tsumaobiki-hosohamaki>	att.	Z11-14:OAc + E11-14:OAc + 12:OAc (7:3:40)	Hrdý, 1979	A
<i>Eupoecilia kobeana</i> Razowski <akaobi-hosohamaki>	att.	Z11-14:OH	Ando, 1977	A

<i>Exapate</i> <sup>g</sup> <i>congelatella</i> Clerck att.	Z11-14:OAc + E11-14:OAc (4:1)	Velcheva, 1990	D
<i>Homona</i> <sup>a</sup> <i>coffearia</i> Neitner tea tortrix phe.	*E9-12:OAc + *12:OAc + *12:OH (1:1:3)	Kochansky, 1978	C
<i>Homona magnanima</i> Diakonoff oriental tea tortrix <cha-hamaki> phe.	*Z11-14:OAc + *Z9-12:OAc + *Δ11-12:OAc (30:3:1)	Noguchi, 1979; 1981	A
<i>Homona spargotis</i> Meyrick phe.	Z11-14:OAc + Z9-12:OAc (9:1)	Ando, 1981 Kim, 2014(b)	
<i>Homona spargotis</i> Meyrick phe.	*E9-12:OAc + *Z9-12:OAc + *E9-12:OH + *Z9-12:OH + *Z11-14:OAc (10:8:7:5:1) + other components	Whittle, 1987	C
<i>Homona tabescens</i> Meyrick phe.	*Z11-14:OAc + *Z9-12:OAc (9:1)	Vang, 2013	C
<i>Homonopsis</i> <sup>a</sup> <i>foederatana</i> Kennel <tsudurimon-hamaki> att.	Z11-14:OAc + E11-14:OAc (1:1)	Ando, 1978	A
<i>Homonopsis illotana</i> Kennel <tsuyasuji-hamaki> att.	Z11-14:OAc + Z11-14:OH (9:1)	Mizukoshi, 2006	
<i>Homonopsis illotana</i> Kennel <tsuyasuji-hamaki> att.	Z11-14:OAc + Z11-14:OH (9:1)	Ando, 1978	A
<i>Hoshinoa</i> <sup>a</sup> <i>adumbratana</i> Walsingham <oofutasuji-hamaki> att.	Z11-14:Ald	Ando, 1978	A
<i>Hoshinoa longicellana</i> Walsingham common apple leafroller <atoboshi-hamaki> phe.	Z11-14:OAc *Z11-14:OAc + *E11-14:OAc (5:1)	Ando, 1975 Kozaki, 1984	A
<i>Hysterosia</i> <sup>g</sup> <i>cartwrightana</i> Kearfott att.	E11-14:OAc	Struble, 1977(a)	C

<i>Hysterosia inopinana</i> att.	E11-14:OAc + E11-14:Ald (1:1)	Priesner in Arn, 1986(a)	C
<i>Isochorista</i> <sup>d</sup> <i>helota</i> Meyrick att.	Z5-14:OAc + Z7-14:OAc	Horak, 1988	D
<i>Kawabeia</i> <sup>b</sup> <i>ignavana</i> Christoph <usuobihairofuyu-hamaki> att.	Z7-12:OAc	Ando, 1981	A
<i>Kawabeia razowskii</i> Kawabe <hairofuyu-hamaki> att.	Z5-12:OAc	Ando, 1977	A
<i>Meridemis</i> <sup>a</sup> <i>furtiva</i> Diakonoff att.	Z11-14:OAc	Hai, 2002	D
<i>Meritastis</i> <sup>d</sup> <i>laganodes</i> Meyrick phe.	*Z9-14:OAc N	Horak, 1988	D
<i>Meritastis lythrodana</i> Meyrick phe.	*Z9-14:OAc E	Horak, 1988	D
<i>Meritastis pyrosemana</i> Meyrick phe.	*Z9-14:OAc N	Horak, 1988	D
<i>Meritastis</i> sp. phe.	*Z9-14:OAc E	Horak, 1988	D
<i>Merophyas</i> <sup>a</sup> <i>divulsana</i> Walker lucerne leafroller moth phe.	E-type *E11-14:OAc + *16:OAc + *14:OAc (10:20:7)	Whittle, 1991	D
	Z-type *Z11-14:OAc + *E11-14:OAc + *14:OAc (25:5:2)		
<i>Merophyas leucaniana</i> Walker phe.	*Z11-14:OAc + *E11-14:OAc + *Z11-14:OH	Foster, 1988; 1993	D

	+ *14:OAc (100:5:17:33) + another component		
<i>Merophyas</i> sp. phe.	*Z11-14:OAc + *E11-14:OAc (83:17) E	Horak, 1988	D
<i>Neosphaleroptera</i> <sup>b</sup> <i>nubilana</i> Stephens att.	Z5-10:OAc	Subchev, 1990 Tóth, 1992(d)	D
<i>Pandemis</i> <sup>a</sup> <i>borealis</i> att.	Z11-14:OAc	Daterman in Arn, 1992	C
<i>Pandemis canadana</i> Kearfott att.	Z11-14:OAc + Z9-14:OAc (9:1)	Steck, 1977(a)	C
<i>Pandemis cerasana</i> Hübner phe.	Z11-14:OAc + E11-14:OAc (1:1)	Konyukhov in Arn, 1986(a)	C
	*E11-14:OAc + *Z11-14:OAc (3:1) + other components	Tonini, 1982	
<i>Pandemis chlorograpt</i> Meyrick <usutobi-hamaki> att.	Z11-14:OAc + E11-14:OAc (4:1)	Ando, 1981	A
<i>Pandemis cinnamomeana</i> Treitschke <akatobi-hamaki> att.	Z11-14:OAc + E11-14:OAc (4:1)	Ando, 1978	A
<i>Pandemis heparana</i> Denis & Shiffermüller <tobi-hamaki> phe.	Z11-14:OAc + Z11-14:OH + Z9-14:OAc (17:2:1)  (2:1:1)	Frerot, 1979(b)  Voerman in Arn, 1986(a)	A
	*Z11-14:OAc + *Z11-14:OH + *Z9-14:OAc (18:1:1) + other components	Frerot, 1982(b)	
<i>Pandemis limitata</i> Robinson threelined leafroller	*Z11-14:OAc + *Z9-14:OAc (91:9)	Roelofs, 1976(b)	C

<i>Pandemis monticolana</i> Yasuda <yamatobi-hamaki> att. phe.	E11-14:OAc + Z11-14:OAc (7:3)	Mizukoshi, 2006	A
<i>Pandemis pyrusana</i> Kearfott phe.	*Z11-14:OAc + *Z9-14:OAc (47:3)	Roelofs, 1977(a)	C
<i>Parapandemis</i> <sup>a</sup> <i>borealis</i> Freeman att.	Z11-14:OAc	Daterman, 1977	D
<i>Parasyndemis</i> <sup>a</sup> (= <i>Dichelia</i> ) <i>histrionana</i> Frölich att.	Z11-14:OAc + E11-14:OAc  Z11-14:OAc  E11-14:Ald + Z11-14:Ald (20:1)	Frerot, 1979(b)  Priesner, 1980(a) <b>Olenici, 2007</b>  Ostrauskas, 2010(a)	D
<i>Phalonia</i> <sup>g</sup> sp. att.	E11-14:OAc	Roelofs, 1970(a)	
<i>Phalonia</i> <sup>g</sup> <i>manniana</i> att.	Z11-14:OAc + Z9,E11-14:OAc (10:1)	Priesner in Arn, 1986(a)	C
<i>Phalonia</i> <i>minimana</i> Caradja <mini-hosohamaki> att.	Z11-14:OAc	Ando, 1977	A
<i>Phricanthes</i> <sup>e</sup> <i>asperana</i> Meyrick phe.	*Z9-12:OAc N	Horak, 1988	D
<i>Phtheochroa</i> <sup>g</sup> (= <i>Bonagota</i> ) <i>cranaodes</i> Meyrick Brazilian apple leafroller phe.	*E3,Z5-12:OAc + *Z9-16:OAc (1:1) + other components  (9:1)  + *Z5-12:OAc + *E3,Z5-14:OAc (20:20:1:1)	Unelius, 1996 Eiras, 1999  Kovaleski, 2003  Coracini, 2001	D



		(20:1:1:1)	Coracini, 2003	
<i>Phtheochroides</i> <sup>g</sup> <i>clandestina</i> Razowski <yomogioo-hosohamaki> att.	Z11-14:OAc + Z9-14:OAc (1:1)		Ando, 1981	A
<i>Planotortrix</i> <sup>a</sup> <i>clarkei</i> Philpott phe.	*Z11-14:OAc + *E11-14:OAc (23:2) N		Foster, 1988	D
<i>Planotortrix excessana</i> Walker greenheaded leafroller phe. A-race (= <i>P. octo</i> ?)	*Z8-14:OAc + *14:OAc (10:3)		Galbreath, 1985	D
B-race	*Z5-14:OAc + *Z7-14:OAc (3:2)			
	(3:97 – 71:29) N		Foster, 1989	
	+ *Z9-14:OAc N		Foster, 1988	
<i>Planotortrix flammea</i> Salmon phe.	*Z5-14:OAc + *Z7-14:OAc (3:2–1:1) N		Foster, 1990	D
<i>Planotortrix notophaea</i> Turner phe.	*Z7-14:OAc N		Foster, 1990	D
<i>Planotortrix octo</i> Dugdale att.	Z8-14:OAc + 14:OAc		Park, 1998	D
<i>Planotortrix orthrocopa</i> Meyrick phe.	*Z11-14:OAc N		Foster, 1988	D
<i>Planotortrix orthropis</i> Meyrick phe. type 1	*Z11-14:OAc + *E11-14:OAc (87:13) N		Foster, 1988	D
type 2	*Z11-14:OAc + *Z9-14:OAc (95:5–82:18) N			
<i>Planotortrix spatiosa</i> Philpott phe.	*Z11-14:OAc + *E11-14:OAc (3:1–3:2) N		Foster, 1988	D

<i>Planotortrix</i> "MBS" phe.	*Z7-14:OAc + *Z5-14:OAc (50:1–12:1) N	Foster, 1990	D
<i>Planotortrix</i> sp. ("M") phe.	*Z5-14:OAc + *14:OAc (1:1)  + *Z7-14:OAc (20:20:1)	Foster, 1987(b)  Foster, 1990	D
<i>Platynota</i> <sup>h</sup> <i>flavedana</i> Clemens variegated leafroller phe.	*E11-14:OH + *Z11-14:OH (9:1) + other components	Hill, 1977	D
<i>Platynota</i> <i>idaeusalis</i> Walker tufted apple bud moth phe.	E11-14:OH + E11-14:OAc (1:1)  *E11-14:OH + *E11-14:OAc (2:1)	Bode, 1973  Hill, 1974	D
<i>Platynota</i> <i>stultana</i> Walsingham omnivorous leafroller phe.	*E11-14:OAc + *Z11-14:OAc (22:3)  + E & Z11-14:OH (1–0.2%)	Hill, 1975(a)  Baker, 1975	D
<i>Proeulia</i> <sup>a</sup> <i>auraria</i> Clarke phe.	*E11-14:OH	Bjostad in Roelofs, 1982(a)	D
<i>Proeulia</i> <i>triquetra</i> Obraztsov phe.	*Z11-14:OAc + *E9-12:OAc (10:1) + another component	Bergmann, 2016	D
<i>Proselena</i> <sup>f</sup> <i>tenella</i> Meyrick phe.	*Z11-14:OAc N	Horak, 1988	D
<i>Pseudargyrotoza</i> <sup>a</sup> <i>conwagana</i> F. <miyamamadaraaginsuji-hamaki> att.	Z11-14:OAc + Z11-14:OH (9:1)	Novotný, 1990	A
<i>Ptycholoma</i> <sup>a</sup> <i>lecheana</i> L. phe.	Z11-14:OH + Z11-14:OAc (3:1)  *Z11-14:OH	Frerot, 1979(b) Minks in Arn, 1986(a)  Descoins in Arn, 1986(a)	B

<i>Ptycholoma lecheana</i> <i>circumclusana</i> Christoph <ooginsujiaka-hamaki> att.	Z11-14:OH + Z11-14:OAc (9:1)	Ando, 1977 Ando, 1978	A
<i>Pyrgotis</i> <sup>a</sup> <i>chrysomela</i> phe.	*Z9-14:OAc + *Z11-14:OAc (100:0–99:1) N	Foster, 1988	D
<i>Pyrgotis plagiatana</i> phe.	*E11-14:OAc + *Z11-14:OAc (4:1) N	Foster, 1988	D
<i>Sparganothis</i> <sup>h</sup> <i>albicaudana</i> Busck att.	E11-14:OAc	Roelofs, 1971(a)	C
<i>Sparganothis directana</i> Walker chokecherry leafroller phe.	*E9,Δ11-12:OAc + *Z11-14:OAc + *E11-14:OAc (5:4:3) + other components	Bjostad, 1980(a)	C
<i>Sparganothis niveana</i> Walsingham (= <i>groteana</i> Fernald) att.	Z11-14:OH	Roelofs, 1970(a); 1982(a)	C
<i>Sparganothis pilleriana</i> Denis & Schiffermüller <tengu-hamaki> phe.	E9-12:OAc + E9-12:OH (8:2–9:1) E  Z11-14:Ald  *E9-12:OAc + *E9-12:OH + *E11-14:OAc + *Z11-14:OAc (4:1:4:20) + other components  *E9-12:OAc + *E9-12:OH + *E11-14:OAc + *14:OAc (4:1:4:4) + other components	Saglio, 1977(a)  Ando, 1978  Guerin, 1986(c)  Arn, 1988	A
<i>Sparganothis sulfureana</i> Clemens Sparganothis fruitworm phe.	E11-14:OAc  *E11-14:OAc + *Z11-14:OAc	Roelofs, 1970(a)  Zhu, 2009	C

	+ *Z9-14:OAc (100:1:1) + other components		
<i>Sparganothis tunicana</i> Walsingham <i>att.</i>	E11-14:OAc	Daterman, 1977	C
<i>Sparganothis</i> sp. woodbine leafroller <i>phe.</i>	*E11-14:OH + *Z11-14:OH + *E11-14:OAc (15:11:2) + other components	Bjostad, 1980(c)	
<i>Spatalistis</i> <sup>c</sup> <i>bifasciana</i> Hübner <ginsujikuro-hamaki> <i>att.</i>	Z11-14:OAc + Z9-14:OAc (1:1) or + Z9,E12-14:OAc (1:1)	Ando, 1978	A
	Z11-14:OAc + Z9-14:OAc + Z11-14:OH (18:1:1)	Hrdý, 1989	
<i>Sperchia</i> <sup>a</sup> <i>intractana</i> Walker <i>phe.</i>	E11-14:OAc + Z11-14:OAc (2:1)	Benn, 1981	D
	*E11-14:OAc + *Z11-14:OAc (69:31) E	Horak, 1988	
<i>Stenodes</i> <sup>g</sup> <i>alternana</i> <i>att.</i>	Z9-14:OAc + Z11-14:OAc + E11-14:OAc (10:9:1)	Safonkin, 1988	C
<i>Syllomatia</i> <sup>b</sup> <i>pertinax</i> Meyrick <i>phe.</i>	*Z9-14:OAc E	Horak, 1988	D
<i>Syndemis</i> <sup>a</sup> <i>musculana</i> Hübner <i>phe.</i>	E11-14:OAc + Z11-14:OAc	Frerot, 1979(b)	B
	*E11-14:OAc + *Z11-14:OAc (9:1)	Persoons, 1984	
<i>Taeniarchis</i> <sup>b</sup> <i>catenata</i> Meyrick <i>phe.</i>	*Z11-14:OAc + *E11-14:OAc (14:11) N	Horak, 1988	D
<i>Terricula</i> <sup>a</sup> <i>violetana</i> Kawabe	Z11-14:OAc	Ando, 1978	A

<kushihigemurasaki-hamaki> att.	+ Z9,E12-14:OAc (1:1) or + Z9-14:OAc (1:1)		
<i>Tortrix</i> <sup>c</sup> <i>sinapina</i> Butler <usuamime-hamaki> att.	Z11-14:OAc	Ando, 1978	A
<i>Tortrix viridana</i> L. phe.	Z11-14:OAc	Hrdý, 1979 Knauf, 1979	C
	Z11-13:OAc or E11-13:OAc	Arn, 1979	
	*Z11-14:OAc	Arn, 1979	
	+ Z11-14:OH (9:1)	Novotný, 1990	
" <i>Tortrix</i> " <i>constrictana</i> Walker phe.	*Z11-14:OAc + *Z9-14:OAc (22:3) E	Horak, 1988	C

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(*Tortricidae*; *Olethreutinae*) ハマキガ科 ; ノコメハマキガ亜科  
a: Eucosmini (モグリヒメハマキ族), b: Grapholitini (シンクイヒメハマキ族)  
c: Microcorsini (ハラブトヒメハマキ族), d: Olethreutini (ヒメハマキガ族)

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<i>Acanthoclit</i> <sup>b</sup> (= <i>Cydia</i> ) <i>phaulomorpha</i> Meyrick att.	Z8-12:OAc + E8-12:OAc (1:1)	Bourdouxhe, 1982	C
<i>Ancylis</i> <sup>a</sup> <i>achatana</i> F. att.	Z9-12:OAc + E9-12:OAc (7:3)	Biwer, 1978(a)	C
<i>Ancylis albafasciana</i> Heinrich att.	Z9-12:OAc	Stevens, 1985	C
<i>Ancylis apicella</i> Denis & Schiffermüller att.	Z8-12:OAc + Z9-12:OAc (1:1)	Booij, 1984(a)	C
<i>Ancylis burgessiana</i> Zeller att.	E9-12:OAc	Reed, 1985(b)	C

<i>Ancylis columbiana</i> McDunnough <a href="#">att.</a>	Z9-12:OAc	Stevens, 1985	C
<i>Ancylis geminana</i> Donovan <shiroobi-himehamaki> <a href="#">att.</a>	Z9-12:OH	Booij, 1984(a)	A
<i>Ancylis mediofasciana</i> Clemens <a href="#">att.</a>	E9-12:OAc	Stevens, 1985	C
<i>Ancylis nubeculana</i> Clemens <a href="#">att.</a>	Z9-12:OAc	Reed, 1985(b)	C
<i>Ancylis pacificana</i> Walsingham <a href="#">att.</a>	Z9-12:OAc	Stevens, 1985	C
<i>Ancylis sativa</i> Liu jujube leafroller <a href="#">phe.</a>	*E9-12:OAc + *Z9-12:OAc (4:1) + other components	Lin, 1984 Han, 1999	C
<i>Ancylis selenana</i> Guenée <futaboshi-himehamaki> <a href="#">att.</a>	Z9,E11-14:OAc	Nagano, 1979	A
<i>Ancylis simuloides</i> McDunnough <a href="#">att.</a>	Z9-12:OAc	Stevens, 1985	C
<i>Ancylis uncella</i> Denis & Schiffermüller <usubenikagiba-himehamaki> <a href="#">att.</a>	Z9-12:OH	Booij, 1984(a)	A
<i>Ancylis</i> sp. <a href="#">att.</a>	Z9,Δ11-12:OAc + Z9,Δ11-12:OH (10:1)	Chisholm, 1985(b)	C
<i>Aphania</i> <sup>a</sup> <i>infida</i> Heinrich <a href="#">att.</a>	Z8-12:OAc	Roelofs, 1971(a)	C
<i>Apotomis</i> <sup>d</sup> <i>betuletana</i> Haworth <tumajiro-himehamaki> <a href="#">att.</a>	Z10-14:OAc	Booij, 1984(a)	A
<i>Apotomis capreana</i> Hübner <yanagitsumajiro-himehamaki> <a href="#">att.</a>	Z11-14:OAc + E11-14:OAc	Bûda, 1987	A

<i>Apotomis corticana</i> Hübner <a href="#">att.</a>	Z10-14:OAc + E8,E10-12:OH ?	Arn, 1974	C
<i>Apotomis lineata</i> Schiffermüller <a href="#">att.</a>	Z8-12:OAc	Sziráki, 1978(a)	C
<i>Apotomis moestana</i> Wocke <a href="#">att.</a>	Z8-12:OAc	Linnaluoto, 1983	C
<i>Apotomis turbidana</i> Hübner <a href="#">att.</a>	Z10-14:OAc  Z8-14:OAc	Roelofs, 1982(a)  Fassotte in Arn, 1986(a)	C
<i>Apotomis</i> sp. <a href="#">att.</a>	Z8-12:OH or Z8-12:OAc	Ando, 1977	A
<i>Argyroploce</i> <sup>d</sup> <i>aurofasciana</i> Haworth <kokekiobi-himehamaki> <a href="#">att.</a>	E10-12:OAc	Arn, 1974	A
<i>Argyroploce lacunana</i> Denis & Schiffermüller <miyamaunmon-himehamaki> <a href="#">att.</a>	Z8-12:OAc	Sziráki, 1978(a)	A
<i>Argyroploce schistaceana</i> Snellen <a href="#">phe.</a>	*9-12:OAc	China, 1978	C
<i>Aterpia</i> <sup>d</sup> <i>issikii</i> Kawabe <isshiki-himehamaki> <a href="#">att.</a>	Z8,Z10-12:OH	Ando, 1987	A
<i>Bactra</i> <sup>d</sup> <i>lanceolana</i> Hübner <togariba-himehamaki> <a href="#">att.</a>	E10-14:OAc	Booij, 1984(a)	A
<i>Bactra verutana</i> Zeller <a href="#">phe.</a>	*Z10-14:OAc N	Roelofs, 1984	C
<i>Barbara</i> <sup>a</sup> <i>colfaxiana</i> Kearfott Douglas fir cone moth <a href="#">att.</a>	Z9-12:OH  + Z9-12:OAc (3:1)	Weatherston, 1977  Hedlin, 1983	D

	Z9-12:OAc	Stevens, 1985	
<i>Barbara mappana</i> Freeman att.	E9-12:OAc	Reed, 1985(b)	D
<i>Blastesthia</i> <sup>a</sup> <i>posticana</i> Zetterstedt att.	E9-12:OAc + E9-12:OH (9:1)	Booij, 1984(a) Booij, 1986	D
<i>Blastesthia turionella</i> L. att.	E9-12:OAc	Booij, 1984(a)	D
<i>Celypha</i> <sup>d</sup> <i>purpurana</i> Haw. att.	Z8-12:OH	Tóth, 1992(d)	C
<i>Celypha rosaceana</i> Schläger att.	Z8-12:OAc	Alford, 1978	C
<i>Celypha rurestrana</i> Dup. att.	Z8-12:OAc Z8-12:OH	Sziráki, 1978(a) Tóth, 1992(d)	C
<i>Celypha striana</i> Denis & Schiffermüller att.	Z8-12:OH	Arn, 1974	C
<i>Centroxena</i> <sup>b</sup> sp. <mayapushiki-himeshinkui> phe.	*E8,E10-12:OAc + other components	Vang, 2005	A
<i>Cryptasasma</i> <sup>c</sup> sp. phe.	*Z9-14:OAc N	Horak, 1988	C
<i>Cryptophlebia</i> <sup>b</sup> <i>amamiana</i> Komai & Nasu <mehirugiashibuto-himehamaki> phe.	*Z8-12:OAc + other components	Vang, 2005	A
<i>Cryptophlebia horii</i> Kawabe <ohirugiashibuto-himehamaki> phe.	*Z8-12:OH + other components	Vang, 2005	A
<i>Cryptophlebia imicella</i> Zeller att.	Z8-12:OAc	Dix, 1984	C



<i>Cryptophlebia illepada</i> Butler koa seedworm <i>att.</i>	Z8-12:OAc + E8-12:OAc + Z8-12:OH + Z7-12:OAc (93:4:1:2)	Chang, 1995	C
<i>Cryptophlebia ombrodelta</i> Lower macadamia nut borer litchi fruit moth <ashibuto-himehamaki> <i>att.</i>	Z8-12:OAc  + E8-12:OAc + Z8-12:OH + Z7-12:OAc (93:4:1:2)	Ando, 1975 Sinclair, 1980  Chang, 1995	A
<i>Cryptophlebia palustris</i> Komai & Nasu <yaeyamahirugiashibuto- himehamaki> <i>phe.</i>	*Z8-12:OAc + other components	Vang, 2005	A
<i>Cryptophlebia peltastica</i> Meyrick litchi moth <i>att.</i>	Z8-12:OAc	Newton, 1993	C
<i>Cydia</i> <sup>b</sup> <i>americana</i> Walsingham <i>att.</i>	E8,E10-12:OAc	Stevens, 1985	C
<i>Cydia blackmoreana</i> Walsingham <i>att.</i>	E8,E10-12:OAc	Witzgall, 1996	C
<i>Cydia bracteata</i> Fernald <i>att.</i>	Z9-12:OAc	Dix, 1984	C
<i>Cydia caryana</i> Fitch hickory shuckworm <i>phe.</i>	E8,E10-12:OAc or Z9-12:OAc  *E8,E10-12:OAc	Smith, 1987  McDonough, 1990(a)	C
<i>Cydia colorana</i> Kearfott <i>att.</i>	E8,E10-12:OAc	Stevens, 1985	C
<i>Cydia coniferana</i> Ratzeburg <i>att.</i>	E8-12:OAc + E10-12:OAc (1:1)  (9:1) or + E8-12:OH (9:1)	Booij, 1984(a)  Voerman in Arn, 1992	C
<i>Cydia coronilana</i> <i>att.</i>	Z8-12:OAc + E8-12:OAc	Hrudová, 2003	C

<i>Cydia cosmophorana</i> Treitschke att.	E8-12:OAc + E10-12:OAc (1:1)	Booij, 1984(a)	C
	E9-12:OAc	Tóth in Arn, 1997	
<i>Cydia cupressana</i> Kearfott att.	Z9-12:OAc	Stevens, 1985	C
<i>Cydia duplicana</i> Zett. att.	E8,E10-12:OAc	Witzgall, 1996	C
<i>Cydia exquisitana</i> att.	E8,E10-12:OH	Chambon, 1978	C
<i>Cydia fagiglandana</i> Zeller phe.	E8,E10-12:OAc + E8,E10-12:OH (3:1) *E8,E10-12:OAc + other components	Rotundo, 1984 Rotundo, 1988 Witzgall, 1996	A
<i>Cydia fletcherana</i> Kearfott att.	E8-12:OAc	Reed, 1985(b)	C
<i>Cydia flexiloqua</i> Heinrich att.	Z5,E7-12:Ald + Z5,Z7-12:Ald + Z7-12:Ald (10:1:1)	Chisholm, 1985(a)	C
<i>Cydia illutana</i> H.-S. att.	E8,E10-12:OAc	Priesner in Arn, 1986(a) Witzgall, 1996	C
<i>Cydia indivisa</i> Danilevski att.	Z8-12:OH + E8-12:OH (1:1)	Booij, 1984(d)	C
	Z8-12:OAc + E8-12:OAc (1:1)	Witzgall, 1996	
<i>Cydia ingrata</i> Heinrich att.	E8,E10-12:OAc + E8,Z10-12:OAc (10:1)	Chisholm, 1985(a)	C
	(1:1)	Reed, 1985(b)	
<i>Cydia intexta</i> Kuznetsov att.	E8,E10-12:OAc	Witzgall, 1996	C

<i>Cydia latiferreana</i> Walsingham (= <i>Melissopus latiferreanus</i> ) filbertworm phe.	E8,E10-12:OAc *E8,Z10-12:OAc + *E8,E10-12:OAc (43:10)	Davis, 1981 Davis, 1984	C
<i>Cydia lautiuscula</i> Heinrich att.	E8,E10-12:OAc	Chisholm, 1985(a)	C
<i>Cydia leucostoma</i> Meyrick <minamitumajiro-himehamaki> att.	Z8,E10-12:OAc	Witzgall, 1996	A
<i>Cydia medicaginis</i> Kuznetsov att.	E8,E10-12:OAc	Frerot, 1979(a) Wall, 1987	C
<i>Cydia millenniana</i> Adamoz. att.	E8,E10-12:OAc + Z8,Z10-12:OAc (1:1)	Witzgall, 1996	C
<i>Cydia nigricana</i> F. pea moth <endou-shinkui> phe.	E8,E10-12:OAc or Z8-12:OAc or E10-12:OAc *E8,E10-12:OAc E10-12:OAc *E8,E10-12:OAc + other components	Lewis, 1975 Wall, 1976 Greenway, 1984 Horák, 1988 Witzgall, 1993; 1996	A
<i>Cydia orobana</i> Treitschke att.	E8,E10-12:OH	Rotundo, 1988	C
<i>Cydia oxytropidis</i> Martini att.	E8,E10-12:OAc	Witzgall, 1996	C
<i>Cydia pactolana</i> Zeller <todomatsumiki-moguriga> att.	Z8-12:OH	Booij, 1984(a)	B
<i>Cydia piperana</i> Kearfott seed worm att.	E9-12:OAc + Z9-12:OAc (7:3) (1:1)	Sartwell, 1985 Stevens, 1985	C

<i>Cydia pomonella</i> L. codling moth phe.	E8,E10-12:OH	Roelofs, 1971(e)	C
	*E8,E10-12:OH	Beroza, 1974 McDonough, 1974 Buser, 1975	
	+ *12:OH (3:1) + other components	Einhorn, 1984(b); 1986 Arn, 1985	
	+ *14:OH (10:5:1)	Bartell, 1988	
	E8,E10-12:OH	McDonough, 1993; 1995	
<i>Cydia populana</i> Busck att.	E8,E10-12:Ald	Chisholm, 1985(a)	C
	E8,E10-12:OAc	Stevens, 1985	
<i>Cydia pyrivora</i> Danil. phe.	E8,E10-12:OAc	Priesner in Arn, 1986(a)	C
	*E8,E10-12:OAc + other components	Witzgall, 1996	
<i>Cydia servillana</i> Dup. att.	E8,E10-12:OAc	Priesner in Arn, 1986(a) Witzgall, 1996	C
<i>Cydia splendana</i> Hübner chestnut codling moth phe.	E8,E10-12:OAc	Rotundo, 1988	C
	*E8,E10-12:OAc + E8,E10-12:Ald (9:1)	Frérot, 1995	
	+ *E8,Z10-12:OAc (1:1) + other components	Witzgall, 1996	
<i>Cydia strobilella</i> L. spruce seed moth <ezomatsukasaga> phe.	Z8-12:OH	Booij, 1984(a)	A
	E8-12:OAc	Grant, 1989	
	*E8-12:OAc	Bédard, 2002	
	E8,E10-12:OAc + E8,Z10-12:OAc (1:1)	Witzgall, 1996	

	*E8,E10-12:OAc + *E8,Z10-12:OAc (3:2)	Wang, 2010	
<i>Cydia</i> (= <i>Grapholita</i> ) <i>succedana</i> Denis & Shiffermüller <i>att.</i>	E8,E10-12:OAc + E8,Z10-12:OAc (1:1)	Hrdý, 1989 Witzgall, 1996	C
<i>Cydia toreuta</i> Grote eastern pine seed worm <i>phe.</i>	E8,Z10-12:OAc *E8,Z10-12:OAc	Chisholm, 1985(a) Katovich, 1989	C
<i>Cydia trasias</i> Meyrick <i>phe.</i>	*E8,E10-12:OAc + *E8,E10-12:OH + *E8,E10-12:Ald (10:9:1)	Fu, 2002	C
<i>Cydia turciana</i> e Chambon <i>att.</i>	E8,E10-12:OAc + E8,Z10-12:OAc (1:1)	Witzgall, 1996 Chambon in Arn, 1997	C
<i>Cydia youngana</i> Kearfott spruce coneworm <i>att.</i>	E7-12:OH	Weatherston, 1977	C
<i>Cydia zebeana</i> Ratzeburg <i>att.</i>	E8-12:OAc + E10-12:OAc (1:1)  (9:1)	Booij, 1984(a)  Booij, 1986	C
<i>Cydia</i> (= <i>Laspeyresia</i> ) sp. <i>att.</i>	Z8-12:OAc	Roelofs, 1971(a)	
<i>Cymolomia</i> <sup>d</sup> <i>hartigiana</i> Saxesen <touhi-himehamaki> <i>att.</i>	Z10-12:OAc	Witzgall, 1996	A
<i>Dichrorampha</i> <sup>b</sup> <i>acuminatana</i> Lienig & Zeller <i>att.</i>	Z9,Δ11-12:OAc E9,Δ11-12:OAc + Z9,Δ11-12:OAc (4:1)	Chisholm, 1985(b) Rotundo, 1985(b) Ulenberg in Arn, 1997	C
<i>Dichrorampha gueneana</i> Obraztsov <kokiobiheroshi-himehamaki> <i>att.</i>	Z9,Δ11-12:OAc + E9,Δ11-12:OAc (1:4)	Chisholm, 1985(b) Ulenberg in Arn, 1997	A

<i>Dichrorampha incursana</i> H.-S. att.	E9-12:OAc + Z9-12:OAc (11:9)	Hrdý, 1989	C
<i>Dichrorampha petiverella</i> L. <hosokiobiharihoshi- himehamaki> att.	E9-12:OAc + E11-14:OAc (10:1)  Z11-14:Ald + E11-14:Ald (9:1)  E11-14:OAc + E11-14:OH (10:1)	Priesner in Arn, 1986(a)  Frerot, 1985  Mozūraitis, 1998	A
<i>Dichrorampha plumbana</i> Scopoli att.	E9-12:OAc + Z9-12:OAc (9:1)	Booij, 1984(a)	C
<i>Dichrorampha sedatana</i> (= <i>sedetana</i> ?) Busck att.	E8,E10-12:OAc	Stevens, 1985	C
<i>Dichrorampha simpliciana</i> Haworth att.	E9-12:OAc + E9,Δ11-12:OAc (19:1)	Brewer, 1985	C
<i>Dichrorampha simulana</i> Clemens att.	E9,Δ11-12:OAc + E9,Δ11-12:OH (10:1)	Chisholm, 1985(b)	C
<i>Dichrorampha</i> sp. att.	E9-12:OAc + E9-12:OH	Roelofs, 1971(a)	
<i>Ecdytolopha</i> <sup>b</sup> <i>aurantiana</i> citrus borer moth phe.	*E8-12:OAc + *E8-12:OH (100:1 - 10:1)	Leal, 2001 Ono, 2001	D
<i>Ecdytolopha insiticihana</i> Zeller att.	E8-12:OAc	Roelofs, 1971(a)	D
<i>Ecdytolopha torticornis</i> Meyrick macadamia nut borer phe.	*E8-12:OAc + other components	Chamberlain, 2003	D
<i>Enarmonia</i> <sup>a</sup> <i>formosana</i> Scopoli cherry bark tortrix phe.	Z9-12:OAc + E9-12:OAc (1:1)  Z8-12:OAc  *Z9-12:OAc	Minks, 1976 Toshova, 2017  Hrdý, 1979  McNair, 1999	C

	+ *E9-12:OAc (6:4-5:5) + other components		
	Z9-12:OAc + Z11-14:OAc + E11-14:OAc + 12:OAc + 14:OAc (5:3:2:3:1)	Olenici, 2007	
<i>Endopiza</i> <sup>d</sup> <i>att.</i> <i>caraduana</i> Busck	Z9-12:OAc	Dix, 1984	D
<i>Endothenia</i> <sup>d</sup> <i>att.</i> <i>benausopsis</i> Meyrick	Z10-14:OAc	Ando, 1977	A
<i>Endothenia ericetana</i> <i>att.</i> Humpr. & Westw.	Z10-14:OAc + E10-14:OAc (1:1)	Priesner in Arn, 1986(a)	C
	E10-14:OAc	Mozūraitis, 1998	
<i>Endothenia gentianaeana</i> Hübner <i>att.</i>	Z10-14:OAc	Frerot, 1985	A
<i>Endothenia nigricostana</i> Haworth <kuromadara-shinmushiga> <i>att.</i>	Z11-14:OAc + E11-14:OAc	Frerot, 1979(b)	A
<i>Endothenia quadrimaculana</i> Haworth <i>att.</i>	E10-14:OAc + Z10-14:OAc (3:1)	Booij, 1984(a)	C
	(9:1)	Capizzi in Arn, 1992	
<i>Endothenia ustulana</i> (= <i>carbonana</i> ) Haworth <i>att.</i>	Z10-14:OAc	Arn, 1974	C
<i>Epiblema</i> <sup>a</sup> <i>att.</i> <i>confusana</i> H.-S.	E8,Z10-12:OAc + Z8,Z10-12:OAc (1:1)	Witzgall, 1996	C
<i>Epiblema desertana</i> Zeller <i>att.</i>	Z8-12:OAc	Roelofs, 1971(a)	C
<i>Epiblema foenella</i> L. <yomogi-nemushiga> <i>phe.</i>	Z8-12:OAc + E8-12:OAc (18:7)	Ando, 1977 Beauvais, 1977	A

	*Z8,Z10-12:OAc + E8,Z10-12:OAc (1:1) or + *E8,E10-12:OAc (1:1) + other components	Witzgall, 1996	
<i>Epiblema fuchsiana</i> Rössl. <a href="#">att.</a>	Z8,Z10-12:OAc	Witzgall, 1996	C
<i>Epiblema resumptana</i> Walker <a href="#">att.</a>	Z9-12:OAc + E9-12:OAc (1:1)	Stevens, 1985	C
<i>Epiblema scudderiana</i> Clemens <a href="#">att.</a>	Z8-12:OH	Roelofs, 1971(a)	C
<i>Epiblema scutulana</i> Denis & Schiffermüller <a href="#">att.</a>	Z8-12:OAc	Chambon, 1974 Sziráki, 1978(a) Hrdý, 1979 Tóth, 1992(d)	C
	Z8-12:OAc + E8-12:OAc + 12:OH (97:3:300)	Olenici, 2007	
<i>Epiblema</i> sp. <a href="#">att.</a>	E11-14:OAc	Daterman, 1977	
<i>Epinotia</i> <sup>a</sup> <i>aporema</i> Walsingham <a href="#">phe.</a>	*Z7,Z9-12:OH + *Z7,Z9-12:OAc (15:1)	Altesor, 2009	C
<i>Epinotia</i> <sup>a</sup> <i>atistriga</i> (= <i>atistriga</i> ?) Clarke <a href="#">att.</a>	Z7-12:OAc	Roelofs, 1971(a)	C
<i>Epinotia columbia</i> Kearfott <a href="#">att.</a>	Z9-12:OAc + E9-12:OAc (1:1)	Stevens, 1985	C
<i>Epinotia criddleana</i> <a href="#">att.</a>	E9-12:OAc	Reed, 1985(a)	C
<i>Epinotia leucantha</i> Meyrick <hanaudo-moguriga> <a href="#">att.</a>	Z9-12:OH	Ando, 1981	A
<i>Epinotia miscana</i> Kearfott	E9-12:OAc	Stevens, 1985	C



<i>att.</i>				
<i>Epinotia nanana</i> Treitschke <i>att.</i>	E8-12:OAc + E10-12:OAc (1:1)	Booij, 1984(a)	C	
<i>Epinotia rubiginosana</i> Herr. & Schaffer <matsunokuromadara- himehaamaki> <i>att.</i>	Z9-12:OAc + Z7-12:OAc (1:1)  Z8-12:OAc + Z10-12:OAc (1:1)	Booij, 1984(a)  Witzgall, 1996	A	
<i>Epinotia silvertoniensis</i> Kearfott <i>att.</i>	Z7,Z9-12:OAc	Reed, 1985(a)	C	
<i>Epinotia sollicitana</i> <i>att.</i>	E8-12:OAc	Miller in Arn, 1992	C	
<i>Epinotia tedella</i> Clerck European spruce budmoth <i>phe.</i>	E9-12:OAc + Z9-12:OAc (9:1)  *Z7,Z9-12:OAc + another component	Booij, 1984(a)  Priesner, 1989(b)	C	
<i>Epinotia tenerana</i> Denis & Shiffermüller <hanno-memushiga> <i>att.</i>	E10,E12-14:OAc + Z10,Z12-14:OAc (1:1)	Witzgall, 1996	A	
<i>Epinotia zandana</i> Kearfott <i>att.</i>	Z7-12:OAc	Roelofs, 1971(a)	C	
<i>Epinotia</i> sp. 1 ( <i>zandana</i> ?) <i>att.</i>	Z7,Z9-12:OAc	Reed, 1985(a)		
<i>Epinotia</i> sp. 2 ( <i>removana</i> ?) <i>att.</i>	Z7,Z9-12:OAc or Z7,Z9-12:OH	Reed, 1985(a)		
<i>Epinotia</i> sp. 3 <i>att.</i>	E8,E10-12:OAc	Stevens, 1985		
<i>Episimus</i> <sup>d</sup> <i>argutanus</i> Clemens <i>att.</i>	Z9-12:OAc  + Z11-14:OAc (11:2)	Roelofs, 1971(a) Jurb, 1973  Jordan, 2013	D	

<i>Eucosma</i> <sup>a</sup> <i>aemulana</i> Schläger <shirozusosomon-himehamaki> <i>att.</i>	E8,E10-12:OAc + Z8,Z10-12:OAc (1:1)	Rotundo, 1985(b) Witzgall, 1996	A
<i>Eucosma bobana</i> Kearfott <i>att.</i>	Z9-12:OAc	Stevens, 1985 Rotundo in Arn, 1992	C
<i>Eucosma campoliliana</i> Denis & Shiffermüller <nisemonshirosusomon- himehamaki> <i>att.</i>	E8,E10-12:OH Z8,E10-12:OAc	Fassotte in Arn, 1986(a) Olenici, 2007 Priesner in Arn, 1986(a)	A
<i>Eucosma cana</i> Haworth <azamisusomon- himehamaki> <i>att.</i>	Z8,E10-12:OAc E8,E10-12:OAc + Z8-12:OAc + E8-12:OAc + 12:OAc (44:30:10:18)	Priesner in Arn, 1986(a) Witzgall, 1996 Fassotte in Arn, 1992	A
<i>Eucosma conioграмма</i> Clarke <ohirugi-himeshinkui> <i>phe.</i>	*E9-12:OAc	Vang, 2005	A
<i>Eucosma delericta</i> Heinrich <i>att.</i>	E7,E9-12:OAc + Z7,E9-12:OAc (1:1)	Chisholm, 1985(a)	C
<i>Eucosma giganteana</i> Riley <i>att.</i>	E8-12:OAc	Ruiz, 2022	C
<i>Eucosma gloriola</i> Heinrich <i>att.</i>	Z9-12:OAc + E9-12:OAc (9:1) (10:3)	Grant, 1985 Grant, 2002	C
<i>Eucosma hohenwartiana</i> Denis & Shiffermüller <hosobaunmon-himehamaki> <i>att.</i>	E8,E10-12:OAc E8,Z10-12:OAc + Z8,Z10-12:OAc (1:1)	Rotundo, 1985(b) Witzgall, 1996	A
<i>Eucosma monitorana</i> Heinrich <i>att.</i>	Z9-12:OAc + E9-12:OAc	Grant, 2002	C

	+ Z9-12:OH (20:1:3)		
<i>Eucosma nigromaculana</i> (= <i>campoliliana</i> ?) att.	E8,E10-12:OH	Chambon, 1974	C
<i>Eucosma notanthes</i> Meyrick carambola fruit borer phe.	Z8-12:OAc *Z8-12:OAc + *Z8-12:OH (1:1)	Hwang, 1996(a) Hung, 2001	C
<i>Eucosma ponderosa</i> Powell att.	Z9-12:OAc	Stevens, 1985	C
<i>Eucosma recissoriana</i> (complex) att.	Z9-12:OAc	Stevens, 1985	C
<i>Eucosma sonomana</i> Kearfott Western pine shoot borer att.	Z9-12:OAc + E9-12:OAc (2:1)	Sower, 1979	C
<i>Eucosma tocullionana</i> Heinrich att.	Z9-12:OAc + E9-12:OAc (2:1)	Grant, 2002	C
<i>Eucosma womonana</i> Kearfott phe.	*Z7-12:OAc + *Z7,Z9-12:OAc + *Z7,E9-12:OAc + *Z5-12:OAc + *12:OAc (10:4:1:1:4) + other components	Underhill, 1987(b)	C
<i>Eucosmomorpha</i> <sup>a</sup> <i>albersana</i> Hübner att.	E9-12:OAc + Z9-12:OAc (9:1)	Booij, 1984(a)	C
<i>Eudemis</i> <sup>d</sup> <i>porphyrana</i> Hübner att.	Z10-14:OAc + E10-14:OAc (10:1)	Mozūraitis, 1998	C
<i>Exartema</i> <sup>d</sup> (= <i>Olethreutes</i> ) <i>appendiceum</i> Zeller att.	E9-14:OAc	Steck, 1977(a)	C
<i>Exartema fusticanum</i> McDunnough att.	Z7-12:OH	Weatherston, 1974(a)	C

<i>Grapholita</i> <sup>b</sup> <i>caeruleana</i> Walsingham <i>att.</i>	E8,E10-12:OAc	Stevens, 1985	C
<i>Grapholita compositella</i> F. <i>att.</i>	E8,E10-12:OAc	Witzgall, 1996	C
<i>Grapholita conversana</i> Walsingham <i>att.</i>	E8,E10-12:OAc	Stevens, 1985	C
<i>Grapholita dimorpha</i> Komai <sumomohime-shinkui> <bokehime-shinkui> <i>phe.</i>	Z8-12:OAc + E8-12:OAc (4:1–2:3)  *Z8-12:OAc + *E8-12:OAc (17:3) + other components	Mochizuki, 2003  Murakami, 2005	A
<i>Grapholita endrosias</i> Meyrick <sesshimofuri-himehamaki> <i>att.</i>	E7-12:OAc	Ando, 1981	A
<i>Grapholita funebrana</i> Treitschke plum fruit moth <i>phe.</i>	Z8-12:OAc  Z10-12:OAc + codling moth  Z8-12:OAc + E8-12:OAc (25:1)  + E10-12:OAc (1:1)  *Z8-12:OAc + *E8-12:OAc (10:1) + other components	Granges, 1971  Arn, 1974  Arn, 1976(a) Biwer, 1978(b)  Witzgall, 1996  Guerin, 1986(b)	B
<i>Grapholita</i> (= <i>Cydia</i> ) <i>gemmiferana</i> Treischke <i>att.</i>	E8,E10-12:OAc	Hrdý, 1989 Tóth, 1992(d) Witzgall, 1996	C
<i>Grapholita inopinata</i> Heinrich <ringoko-shinkui> <i>phe.</i>	Z8-12:OAc  *Z8-12:OAc + other components	Ando, 1977  Tanaka, 2007	A
<i>Grapholita janthinana</i> Duponchel <i>att.</i>	Z8-12:OAc + E8-12:OAc (7:3–8:2)	Beauvais, 1977 Biwer, 1978(b)	C

		(1:1)	Witzgall, 1996	
<i>Grapholita</i> (= <i>Cydia</i> ) <i>jungiella</i> Clerck <i>att.</i>		E8,Z10-12:OAc  + Z8,E10-12:OAc (1:1)	Priesner in Arn, 1986(a) Wang, 2010  Witzgall, 1996	C
<i>Grapholita</i> <i>libertina</i> Heinrich <i>att.</i>		E8-12:OAc + Z8-12:OAc + Z8-12:OH (17:2:1)	Hillier, 2002	C
<i>Grapholita</i> <i>lobarzewskii</i> <i>phe.</i>		E8-12:OAc + Z8-12:OAc (9:1)  *E8-12:OAc + *Z8-12:OAc (9:1) + other components	Biwer, 1978(b)  Witzgall, 1989(b)	C
<i>Grapholita</i> <i>lunatana</i> Walsingham <i>att.</i>		E8,E10-12:OAc	Chisholm, 1985(a)	C
<i>Grapholita</i> <i>molesta</i> Busck Oriental fruit moth <nashihime-shinkui> <i>phe.</i>	U.S.A Australia U.S.A. U.S.A. U.S.A. France France U.S.A. Korea U.S.A.	*Z8-12:OAc + *E8-12:OAc [25:1] + 12:OH (98:2:1000) + 12:OH (93:7:100) + Z8-12:OH (311:22:1) (9:1) + *Z8-12:OH [46:4:1] (50:3:50) (95:5:1) + *12:OH [100:7:30:6]	Roelofs, 1969(a) Lacey, 1992 Beroza, 1973(c) Cardé, 1975(b) Cardé, 1975(c) Biwer, 1978(b) Biwer, 1979 Linn, 1983 Han, 2001 Cardé, 1979	A
<i>Grapholita</i> <i>packardii</i> Zeller cherry fruitworm		F <sub>2</sub> -7,7-Z8-12:OAc E8-12:OAc	Masnyk, 1989 Roelofs, 1970(a)	C

<i>Grapholita prunivora</i> Walsingham lesser appleworm <i>att.</i>	Z8-12:OAc + E8-12:OAc (49:1) (40:1)	Roelofs, 1970(a) Roelofs, 1974(a) Chisholm, 1985(a)	C
<i>Grapholita tenebrosana</i> Duponchel <ibara-himeshinkui> <i>att.</i>	Z8-12:OAc  E8,E10-12:OAc + E8-12:OAc + Z8-12:OH (85.5:5.5:9)  Z8-12:OAc + E8-12:OAc + 12:OH (97:3:300)	Chambon, 1974 Alford, 1978 Hrdý, 1979  Peltotalo, 1986  Mizukoshi, 2006  Olenici, 2007	A
<i>Grapholita</i> sp. 1 <i>att.</i>	Z8-12:OAc	Ando, 1981	A
<i>Grapholita</i> sp. 2 <i>att.</i>	E8,E10-12:Ald + E8,E10-12:OAc (10:1)	Chisholm, 1985(a)	
<i>Grapholita</i> sp. 3 <i>att.</i>	E8-12:OAc	Chisholm, 1985(a)	
<i>Gravitarmata</i> <sup>a</sup> <i>margarotana</i> Heinemann <matsutobi-himehamaki> <i>phe.</i>	*Z9-12:OAc + *E9-12:OAc + *12:OAc (5:1:3) + other components	Löfstedt in Arn, 1992	A
<i>Gretchena</i> <sup>a</sup> <i>bolliana</i> Slingerland pecan bud moth <i>att.</i>	Z8-12:OAc + E8-12:OAc + 12:OH (100:7:1000)	Gentry, 1975	D
<i>Gretchena semialba</i> McD. <i>att.</i>	E11-14:Ald + Z11-14:Ald (19:1)	Sanders, 1993	D
<i>Griselda</i> <sup>a</sup> <i>myrtillana</i> Hump. & Westw. <i>att.</i>	Z11-14:OH	Booij, 1984(a)	C

<i>Gypsonoma</i> <sup>a</sup> <i>aceriana</i> Duponchel poplar shoot-borer <i>att.</i>	E10-12:OAc + E10-12:OH (3:1)  (7:3)	Booij, 1984(a)  Booij, 1984(d)	C
<i>Gypsonoma dealbana</i> Frölich <i>att.</i>	Z11-14:OAc + E11-14:OAc (3:2)  (1:10)  E11-14:OAc  E10-12:OAc + E8-12:OAc (1:1)	Frerot, 1982(a)  Mozūraitis, 1998  Möttus in Arn, 1992  Booij, 1984(a) Witzgall, 1996	C
<i>Gypsonoma minutana</i> Hübner <popura-himehamaki> <i>att.</i>	Z11-14:OAc + E11-14:OAc + 12:OAc (9:1:10)  E10-14:OAc + Z11-14:OAc (10:1)	Safonkin, 1988  Mozūraitis, 1998	A
<i>Gypsonoma sociana</i> Haworth <i>att.</i>	E10-12:OAc  E9-12:OAc + Z9-12:OAc (9:1)	Booij, 1984(a)  Safonkin, 1988	C
<i>Hedya</i> <sup>d</sup> (= <i>Aphania</i> ) <i>auricristana</i> Walsingham <gumioousutsuma-himehamaki> <i>att.</i>	Z9-14:OAc + Z11-14:OAc (9:1-7:3)	Ando, 1975 Nagano, 1979	A
<i>Hedya chionosema</i> Zeller <i>att.</i>	E8-12:OAc + E8-12:OH  E8,E10-12:OAc + Z8-12:OAc + E8-12:OAc (100:35:3)	Roelofs, 1971(a)  Roelofs, 1982(a)	C
<i>Hedya dimidiana</i> Clerck <shiromon-himehamaki> <i>att.</i>	E8,E10-12:OAc + E8-12:OAc (10:1)	Ando, 1987 Priesner in Arn, 1992	A

	+ Z8,Z10-12:OAc (1:1)	Witzgall, 1996	
	Z8-12:OAc + E8-12:OAc + 12:OH (97:3:300)	Olenici, 2007	
<i>Hedya dimidioalba</i> Retz. att.	E8,E10-12:OAc + Z8,E10-12:OAc (1:1)	Witzgall, 1996	C
<i>Hedya nubiferana</i> Haworth green budworm moth phe.	E8,E10-12:OH  *E8,E10-12:OAc + *Z8-12:OAc + *12:OAc (48:32:100)  + *E8-12:OAc (55:32:9:5)  + Z8-12:OAc (2:1)	Arn, 1974 Chambon, 1974  Frerot, 1979(a)  Roelofs, 1982(a)  Rotundo, 1988	C
<i>Hedya ochroleucana</i> Frölich <shibechatsumajiro- himehamaki> att.	Z8,E10-12:OAc + Z8,Z10-12:OAc (10:1)	Frerot, 1979(a) Chisholm, 1985(a)	A
<i>Hedya pruniana</i> Hübner att.	Z8,E10-12:OAc	Witzgall, 1996	C
<i>Hedya salicella</i> L. att.	E8,E10-12:OH	Olenici, 2007	A
<i>Hedya separatana</i> Kearfott att.	Z10-12:OAc	Reed, 1985(b)	C
<i>Latronympha</i> <sup>b</sup> <i>strigana</i> F. att.	Z8,Z10-12:OAc	Witzgall, 1996	C
<i>Leguminivora</i> <sup>b</sup> <i>glycinivorella</i> Matsumura soybean pod borer <name-shinkuiga> phe. in China	*E8,E10-12:OAc + other components  E8,E10-12:OAc + E10-12:OAc (10:1)	Vang, 2006  Hu, 2012	A



	or + E10-12:Ald (1:1)		
<i>Lobesia</i> <sup>d</sup> <i>aeolopa</i> Meyrick <hosobachibi-himehamaki> att.	Z7-10:OAc	Ando, 1975	A
<i>Lobesia</i> <i>bicinctana</i> (= <i>bicincta</i> ?) Dup. phe.	*Z9-12:OAc + another component	Frérot, 1990(b)	C
<i>Lobesia</i> <i>botrana</i> Denis & Shiffermüller European grapevine moth phe.	*E7,Z9-12:OAc  + Z9-12:OAc + E9-12:OAc + 12:OAc  + *E7,Z9-12:OH + *Z9-12:OAc (100:20:5–100:5:1) + other components  ≡7,Z9-12:OAc  + *E7-12:OAc + *E7,E9,Δ11-12:OAc + *Z7,E9,Δ11-12:OAc N	Roelofs, 1973 Buser, 1974; 1975  Guerin in Arn, 1992  Arn, 1988 El-Sayed, 1999  Brückner, 1988  Witzgall, 2005	C
<i>Lobesia</i> sp. att.	Z9-12:OH	Ando, 1977	A
<i>Matsumuraeses</i> <sup>b</sup> <i>falcana</i> Walsingham podborer <nisemamesaya- himehamaki> phe.	*E8,E10-12:OAc + *E8-12:OAc (15:17) + other components  + *E7,Z9-12:OAc (1:1:1)	Wakamura, 1985  Wakamura, 1986(b)	A
<i>Matsumuraeses</i> <i>ussuriensis</i> Caradja <niseazukisaya- himehamaki> att.	E8-12:OAc	Ando, 1981	A
<i>Metendothenia</i> <sup>d</sup> <i>atropunctana</i> Zetterstedt <kurotentumaki- himehamaki> att.	Z10-12:OAc  + E10-12:OAc (1:1)	Booij, 1984(a) Voerman in Arn, 1986(a)  Rotundo, 1985(b)	A

<i>Microcorses</i> <sup>c</sup> sp. att.	Z7-12:OAc + Z9-14:OAc (1:1)	Ando, 1981	A
<i>Notocelia</i> <sup>a</sup> <i>incarnatana</i> Hübner att.	E10,E12-14:OAc + E10,Z12-14:OAc (1:1)	Witzgall, 1996	C
<i>Notocelia purpurissatana</i> Heinrich att.	Z10,Z12-14:OAc or Z10,Z12-14:OH	Reed, 1985(b)	C
<i>Notocelia roborana</i> Denis & Shiffermüller phe.	*Z10-14:OAc + *Z8,Z10-12:OAc [19:5] + other components N	Witzgall, 1996	C
<i>Notocelia rosaecolana</i> Doubleday <barashiro-himehamaki> att.	E8,E10-12:OAc  E8,Z10-12:OAc + Z8,E10-12:OAc (1:1)  Z8-12:OAc + E8-12:OAc	Booij, 1984(a)  Witzgall, 1996  Hrudová, 2003	A
<i>Notocelia trimaculana</i> Haworth att.	Z10,Z12-14:OAc	Witzgall, 1996	C
<i>Notocelia uddmanniana</i> L. phe.	Z10,E12-14:OAc  *Z10,Z12-14:OAc + other components	Priesner in Arn, 1986(a)  Witzgall, 1991(b)	C
<i>Olethreutes</i> <sup>d</sup> <i>bifasciana</i> Haworth att.	E10-14:OAc + Z10-14:OAc (3:1)	Booij, 1986	C
<i>Olethreutes bipunctana</i> F. <shiromadara-himehamaki> att.	Z8-14:OAc + Z10-14:OAc (1:1)	Booij, 1986	B
<i>Olethreutes decrepitana</i> att.	E10-14:OAc + Z10-14:OAc (3:1)	Voerman in Arn, 1986(a)	C
<i>Olethreutes humeralis</i> Walsingham <kiobikimadara-himehamaki> att.	Z8-12:OAc + Z8-12:OH (1:1)	Ando, 1981	A

<i>Olethreutes siderana</i> Treitchke <ginboshimotoki-himehamaki> att.	Z8-12:OAc	Booij, 1984(a)	A
<i>Pammene</i> <sup>b</sup> <i>albuginana</i> Guenée att.	Z8-12:OAc	Chambon, 1974 Sziráki, 1978(a); (b) Witzgall, 1996	C
<i>Pammene amygdalana</i> Duponchel att.	E8-12:OAc + Z8-12:OAc (9:1)	Biwer, 1978(b)	C
<i>Pammene argyrana</i> Hübner att.	Z8-12:OAc	Chambon, 1974 Sziráki, 1978(b) Witzgall, 1996	C
	+ E8-12:OAc (18:7)	Beauvais, 1977	
<i>Pammene</i> (= <i>Cydia</i> ) <i>aurana</i> F. att.	Z8-12:OAc	Alford, 1978 Hrdý, 1979	C
	Z9-12:OAc	Voerman in Arn, 1992	
	Z8-12:OAc + Z10-12:OAc (1:1)	Witzgall, 1996	
<i>Pammene aurita</i> (= <i>aurantiana</i> ) Staudinger att.	Z8-12:OAc	Sziráki, 1978(a)	C
	+ E8,E10-12:OAc (100:3)	Priesner in Arn, 1986(a)	
	+ E8-12:OAc (1:1)	Witzgall, 1996	
<i>Pammene fasciana</i> L. att.	Z8-12:OAc	Chambon, 1974 Sziráki, 1978(b) Rotundo, 1984	C
	+ Z8-12:OH + 12:OAc (15:5:8)	Rotundo, 1991	
<i>Pammene</i> (= <i>Cydia</i> ) <i>gallicana</i> Guenée att.	Z8-12:OAc	Sziráki, 1978(a)	C
	+ E8-12:OAc (1:1)	Witzgall, 1996	
<i>Pammene gallicolana</i> Lienig & Zeller att.	Z8-12:OAc	Sziráki, 1978(a); (b)	C

<i>Pammene giganteana</i> (= <i>inquilina</i> ) Fletcher <a href="#">att.</a>	Z8-12:OAc	Chambon, 1974	C
<i>Pammene insulana</i> Guenée <a href="#">att.</a>	Z8-12:OAc	Sziráki, 1978(a)	C
<i>Pammene juniperana</i> <a href="#">att.</a>	Z8-12:OAc + E8-12:OAc + Z8-12:OH + 12:OH	Mariani in Arn, 1986(a)	C
<i>Pammene nemorosa</i> Kuznetzov <nemorosa-himehamaki> <a href="#">att.</a>	Z8-12:OAc	Ando, 1975	A
<i>Pammene obscurana</i> Stephens <usuguro-himehamaki> <a href="#">att.</a>	Z8-12:OAc + Z8-12:OH (1:1)	Booij, 1984(a)	A
<i>Pammene populana</i> F. <a href="#">att.</a>	Z8-12:OH	Booij, 1984(a)	C
<i>Pammene querceti</i> Gozmany <a href="#">att.</a>	Z8-12:OAc	Sziráki, 1978(a); (b)	C
<i>Pammene regiana</i> Z. <a href="#">att.</a>	Z8-12:OAc	Witzgall, 1996	C
<i>Pammene rhediella</i> Clerck <a href="#">att.</a>	E8,E10-12:OH  Z8,E10-12:OH	Brakefield in Arn, 1986(a)  Guerin, 1983	C
<i>Pammene spiniana</i> Duponchel <a href="#">att.</a>	Z8-12:OAc  + E10-12:OAc (1:1)	Sziráki, 1978(a)  Witzgall, 1996	C
<i>Pammene splendidulana</i> Guenée <a href="#">att.</a>	Z8-12:OAc	Sziráki, 1978(a)	C
<i>Pammene suspectana</i> Lienig & Zeller <a href="#">att.</a>	Z8-12:OAc  Z9-12:OAc + Z11-14:OAc + E11-14:OAc	Sziráki, 1978(a)  Olenici, 2007	C

	+ 12:OAc + 14:OAc (5:3:2:3:1)		
<i>Pammene</i> sp. att.	Z8-12:OAc	Ando, 1977	A
<i>Paralobesia</i> <sup>d</sup> (= <i>Endopiza</i> ) <i>viteana</i> Clemens grape berry moth phe.	*Z9-12:OAc  + *Z11-14:OAc (20:1) + other components	Roelofs, 1971(c)  Witzgall, 2000	D
	Z9-12:OAc + E9-12:OAc (24:1)	Taschenberg, 1974	
<i>Pelochrista</i> <sup>a</sup> <i>scintillana</i> <i>randana</i> Kearfott att.	E8,E10-12:OAc + Z8-12:OAc + E8-12:OAc (2:40:1)	Chisholm, 1985(a)	C
<i>Petrova</i> <sup>a</sup> <i>albicapitana</i> Busck att.	Z7,E9-12:OAc	Wong, 1985(a)	C
<i>Petrova burkeana</i> Kearfott att.	E8,E10-12:OAc	Chisholm, 1985(a)	C
<i>Petrova luculentana</i> Heinrich att.	Z7-12:OH + Z7-12:OAc + E9-12:OAc	Dix in Arn, 1986(a)	C
<i>Petrova</i> (= <i>Retinia</i> ) <i>metallica</i> Busck metallic pitch nodule moth phe.	Z7-12:OH + Z7-12:OAc  E9-12:OAc  Z7,E9-12:OAc  *Z7,E9-12:OAc + other components	Dix in Arn, 1986(a)  Stevens, 1985  Wong, 1985(a)  Dix, 1988	C
<i>Petrova piciolana</i> Dyar att.	Z9-12:OAc + E9-12:OAc (1:1)	Stevens, 1985	C
<i>Petrova</i> (= <i>Retinia</i> ) <i>resinella</i> L. att.	Z9-12:OAc + E9-12:OAc (1:1)	Booij, 1984(a) Toshova, 2017	C

	Z9-12:OAc + Z11-14:OAc + E11-14:OAc + 12:OAc + 14:OAc (5:3:2:3:1)	Olenici, 2007	
<i>Phaneta</i> <sup>a</sup> <i>att.</i> <i>alterana</i> Heinrich	E8,E10-12:OAc + E10-12:OAc (10:1)	Reed, 1985(b)	C
<i>Phaneta columbiana</i> Walsingham <i>att.</i>	E8,E10-12:OAc	Stevens, 1985	C
<i>Phaneta latens</i> Heinrich <i>att.</i>	E8,E10-12:OH	Hathaway, 1981	C
<i>Phaneta ochroterminana</i> Kearfott <i>att.</i>	Z8,Z10-12:OAc + E8,E10-12:OAc (10:1)	Chisholm, 1985(b)	C
<i>Phaneta roseotermianana</i> Kearfott <i>att.</i>	Z8,Z10-12:OH	Chisholm, 1985(b)	C
<i>Proschistis</i> <sup>d</sup> <i>att.</i> <i>marmaropa</i> Meyrick <hirobakuro-himehamaki>	Z8,Z10-12:OH	Ando, 1987	A
<i>Proteoteras</i> <sup>a</sup> <i>phe.</i> <i>crescentana</i> Kearfott	*Z8-12:OAc + *Z8-12:OH (4:1)	Underhill in Roelofs, 1982(a)	D
<i>Proteoteras willingana</i> Kearfott <i>phe.</i>	*Z8-12:OH + *Z8-12:OAc (9:1)	Underhill in Roelofs, 1982(a)	D
<i>Pseudexentera</i> <sup>a</sup> <i>phe.</i> <i>mali</i> Freeman pale apple budworm	*Z8,Z10-16:OAc	Hill in Roelofs, 1982(a)	D
	Z8,Z10-16:OAc	Grant, 1991	
<i>Pseudexentera maracana</i> Kearfott <i>att.</i>	Z8-12:OAc	Roelofs, 1971(a)	D
<i>Pseudexentera oregonana</i> Walsingham <i>phe.</i> aspen leafroller	*Z8-14:OAc + other components	Grant, 1991	D

<i>Pseudexentera spoliata</i> Clemens oak olethreutid leafroller phe.	Z8-14:OAc  *Z10-16:OAc + other components	Hill in Roelofs, 1982(a)  Grant, 1991	D
<i>Pseudohermenias</i> <sup>d</sup> <i>clausthaliana</i> Saxesen <amimemon-himehamaki> att.	Z8-14:OAc  + Z10-14:OAc (1:1)	Voerman in Arn, 1986(a)  Booij, 1986	A
<i>Pseudosciaphila</i> <sup>d</sup> <i>brandneriana</i> L. <doro-himehamaki> att.	Z8,E10-12:OAc	Witzgall, 1996	A
<i>Pseudosciaphila duplex</i> Walsingham att.	Z8,E10-12:OAc + Z8,E10-12:Ald (1:1)	Chisholm, 1985(a)	C
<i>Retinia</i> <sup>a</sup> <i>perangustana</i> Snellen att.	Z8-12:OAc + E8-12:OAc + 12:OH (93:7:300)	Olenici, 2007	C
<i>Rhadinocolops</i> <sup>a</sup> <i>koenigianus</i> F. <sendan-himehamaki> att.	E8,E10-12:OAc	Vang, 2005	A
<i>Rhopobota</i> <sup>a</sup> <i>naevana</i> Hübner blackheaded fireworm <kuronehaiiro-himehamaki> phe.	Z9-12:OAc  E8,E10-12:OH  *Z11-14:OAc + *Z11-14:OH + Z9-12:OAc (9:3:1)  (0:49:1)  (69:23:8)	Ando, 1977  Guerin in Arn, 1986(a)  Slessor, 1987  McDonough, 1987  Fitzpatrick, 1992	A
<i>Rhopobota ustomaculana</i> Curtis <seshiro-himehamaki> att.	Z9-12:OH	Booij, 1984(a)	A

<i>Rhyacionia</i> <sup>a</sup> <i>adana</i> Heinrich <i>att.</i>	E9-12:OAc + E9-12:OH (9:1)	Grant, 1985	C
<i>Rhyacionia buoliana</i> Denis & Schiffermüller European pine shoot moth <i>phe.</i>	*E9-12:OAc + *E9-12:OH (10:1)	Smith, 1974 Gray, 1984(b)	C
<i>Rhyacionia busckana</i> Heinrich <i>att.</i>	E8,E10-12:OAc  E9-12:OAc + E9-12:OH (9:1)	Stevens, 1980  Grant, 1985	C
<i>Rhyacionia bushnelli</i> Busck <i>att.</i>	Δ9-10:OAc or Z9-12:OAc	Dix, 1984	C
<i>Rhyacionia duplana</i> Hübner <i>att.</i>	E9-12:OAc	Tóth in Arn, 1986(a)	B
<i>Rhyacionia duplana</i> <i>simulata</i> Heinrich <matsutsumaaka-shinmushi> <i>att.</i>	Z8,E10-12:OAc	Ando, 1987	A
<i>Rhyacionia frustrana</i> Comstock nantucket pine tip moth <i>phe.</i>	*E9-12:OAc + *E9,Δ11-12:OAc (24:1) + other components	Hill, 1981(a)	C
	[17:1 – 23:1]	Asaro, 2001	
<i>Rhyacionia fumosana</i> Powell <i>att.</i>	E8,E10-12:OAc	Stevens, 1980	C
<i>Rhyacionia granti</i> Miller <i>att.</i>	E8,E10-12:OAc	Grant, 1985	C
<i>Rhyacionia jenningsi</i> <i>att.</i>	E9-12:OAc + Z9-12:OAc (1:1)	Stevens, 1980	C
<i>Rhyacionia monophylliana</i> Kearfott <i>att.</i>	E9-12:OAc	Stevens, 1980	C
<i>Rhyacionia multilineata</i> <i>att.</i>	E9-12:OAc	Stevens, 1980	C
<i>Rhyacionia neomexicana</i> Dyar	E9-12:OAc	Jacobson, 1978	C



southwestern pine tip moth phe.	+ Z9-12:OAc (1:1)	Stevens, 1980	
	*E9-12:OAc + *Z9-12:OAc (4:1) + other components	Niwa, 1992	
<i>Rhyacionia rigidana</i> Fernald pitch pine tip moth phe.	*E8,E10-12:OAc	Hill, 1976	C
<i>Rhyacionia salmonicolor</i> Powell att.	Z9-12:OAc	Stevens, 1980	C
<i>Rhyacionia subtropica</i> Miller subtropical pine tip moth phe.	*E9-12:OAc	Roelofs, 1979	C
<i>Rhyacionia zozana</i> Kearfott phe.	E9-12:OAc + Z9-12:OAc (1:1)	Sower, 1979 Stevens, 1980	C
	*E9-12:OAc + *E9-12:OH (19:1–14:6)	Niwa, 1987	
<i>Serda</i> <sup>b</sup> <i>tautana</i> Clemens att.	E8,E10-12:OAc	Stevens, 1985	C
<i>Spilonota</i> <sup>a</sup> <i>laricana</i> Hein. phe.	Z8-14:OAc E	Priesner in Arn, 1986(a)	B
	*Z8-14:OAc + *Z8-14:OH (10:1–1:1) + another component	Witzgall, 1991(a)	
<i>Spilonota ocellana</i> Denis & Shiffermüller eyespotted bud moth <ringoshiro-himehamaki> phe.	Z8-14:OAc *Z8-14:OAc Z8-12:OAc + E8-12:OAc (9:1)	Arn, 1974 Arn, 1975 Minks in Arn, 1986(a)	A
	*Z8-14:OAc + *Z8-14:OH (10:1–1:1) + another component	Witzgall, 1991(a)	

	(99:1–95:5)	McBrien, 1992; 1994	
<i>Statherotis</i> <sup>d</sup> <i>discana</i> Felder & Rogenhofer <reishi-himehamaki> phe.	*E8-14:OAc + *E8-12:OAc (4:1)	Wakamura, 1997	A
<i>Strepsicrates</i> <sup>a</sup> <i>semicanella</i> Walker <banjiroutsunoeguri- himehamaki> phe.	*Z7-12:OAc + *Z7-12:OH (9:1)	Wakamura, 2005(b)	A
<i>Strophedra</i> <sup>b</sup> <i>nitidana</i> F. <kashiwaginobi- himehamaki> att.	E8-12:OH or E8-12:OAc	Ando, 1977	A
<i>Strophedra quercivora</i> Meyrick (= <i>S.</i> sp. 2) att.	E8-12:OAc	Ando, 1977 Komai, 1999	A
<i>Strophedra weirana</i> F. att.	E8-12:OAc + E8-12:OH (1:1)	Booij, 1984(a)	C
	E8-12:OAc	Witzgall, 1996	
<i>Strophedra</i> sp. 1 att.	E8-12:OH	Ando, 1977	A
<i>Tetramoera</i> <sup>a</sup> <i>schistaceana</i> Snellen sugarcane shoot borer <kanshanoshinkui-hamaki> phe.	*Z9-12:OAc + *E9,Δ11-12:OAc + E7,Δ9-10:OAc (100:10:1)	Kinjo, 1996	A
<i>Thaumatotibia</i> <sup>b</sup> (= <i>Cryptophlebia</i> ) <i>batrachopa</i> Meyrick phe.	*Z8-12:OAc	Hall, 1984 La Croix, 1985	C
<i>Thaumatotibia</i> (= <i>Cryptophlebia</i> ) <i>leucotreta</i> Meyrick false codling moth phe.	*E7-12:OAc  *Z8-12:OAc  + E8-12:OAc (1:1)	Read, 1974  Persoons, 1976(c); 1977  Bourdouxhe, 1982	C

	+ *E8-12:OAc (3:7-7:3)	Hall, 1984 La Croix, 1985	
	(1:8)	Newton, 1993	
	+ *12:OAc	Zagatti, 1983(a)	
	+ other components	Attygalle, 1986 Bestmann, 1988(b)	
<i>Thiodia</i> <sup>a</sup> <i>alterana</i> Heinrich att.	E10-12:OAc	Roelofs, 1974(b)	C
<i>Thiodia</i> sp. att.	E8,E10-12:OH	Roelofs, 1974(b)	
<i>Zeiraphera</i> <sup>a</sup> <i>canadensis</i> Mutuura & Freeman spruce budmoth phe.	E9-14:OAc *E9-14:OAc + another component	Turgeon, 1988 Silk, 1989	C
<i>Zeiraphera</i> <i>diniana</i> Guenée grey larch bud moth phe. (cembran pine-race)	E11-14:OAc E9-12:OAc	Roelofs, 1971(d)	B
(larch-race)	*E11-14:OAc + other components	Guerin, 1984 Baltensweiler, 1988	
(cembran pine-race)	*E9-12:OAc	Guerin, 1984 Baltensweiler, 1988	
(spruce-race)	E9-12:OAc	Vrkoc in Arn, 1992	
(= <i>griseana</i> Hübner ?) <haiiroamime-himehamaki> att.	E11-14:OAc or E9-12:OAc	Liska, 1990	A
<i>Zeiraphera</i> <i>isertana</i> F. att.	Z9-14:OAc + Z11-14:OAc (9:1)	Hrdý, 1989	C
<i>Zeiraphera</i> <i>unfortunana</i> Powell purplestriped shootworm phe.	*E9-12:OAc	Silk, 1988(a)	C

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(Tortricidae; Chlidanotinae) ハマキガ科 ; マダラハマキガ亜科

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<i>Isotrias hybridana</i> Hübner <i>att.</i>	Z9-14:OAc + Z11-16:OAc (1:1)	Szöcs, 1981; 1983	D
<i>Isotrias rectifasciana</i> Haworth <i>att.</i>	Z9-14:OAc + Z11-16:OAc (1:1)	Priesner, 1984(c)	D
<i>Olindia schumacherana</i> L. <i>att.</i>	Z11-16:OAc	Priesner, 1984(c)	D

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(15) [Galacticoidea] ネムスガ上科

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no species

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(16) [Choreutoidea] ハマキモドキガ上科  
(Choreutidae) ハマキモドキガ科

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<i>Homadaula anisocentra</i> Meyrick mimosa webworm <nemusuga> <i>phe.</i>	E11-14:OAc + E11-14:OH (1:1)  *E11-14:OAc + other components	Song, 1978  Kuenen, 1990	A
<i>Prochoreutis myllerana</i> F. <shiroheri-hamakimodoki> <i>att.</i>	E2,Z13-18:OH	Karalius, 2005	A
<i>Prochoreutis sehestediana</i> F. <atoshirosuji-hamakimodoki> <i>att.</i>	E3,Z13-18:OAc + E2,Z13-18:OH (1:1)  E2,Z13-18:OH + E2,Z13-18:Ald + Z3,Z13-18:OH (1:1:1)	Bûda, 1993  Karalius, 2005	A
<i>Prochoreutis ultimana</i> Krulikovsky <ginsuji-hamakimodoki> <i>att.</i>	E2,Z13-18:OH	Karalius, 2005	A

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(17) [Schreckenseinoidea] ホソマイコガ上科  
(Schreckensteiniidae) ホソマイコガ科

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<i>Schreckensteinia festaliella</i> Hübner <tatejima-hosomaikoga> <a href="#">att.</a>	E10,E12-16:Ald	Priesner in Arn, 1986(a)	A
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(18) [Epermeinoidea] ササベリガ上科

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no species

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(19) [Alucitoidea] ニジュウトリバガ上科

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no species

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(20) [Pterophoroidea] トリバガ上科  
(Pterophoridae) トリバガ科

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<i>Amblyptilia acantodactyla</i> Hübner (= <i>Amblyptilia acanthadactyla</i> ?) <a href="#">att.</a>	Z11-16:OAc	Subchev, 1981	D
<i>Buckleria</i> (= <i>Trichoptilus</i> ) <i>wahlbergi</i> Zeller <kinbanechibi-toriba> <a href="#">att.</a>	Z7-12:Ald + Z7-12:OH (9:1)	Ando, 1981	A
<i>Emmelina</i> (= <i>Pterophorus</i> ) <i>jezonica</i> Matsumura <hirugao-toriba> <a href="#">att.</a>	Z9-12:Ald	Ando, 1981	A
<i>Emmelina monodactyla</i> <a href="#">att.</a>	Z9-12:Ald + Z9-12:OH (20:1)	Tóth, 1992(d)	C
<i>Merrifieldia leucodactyla</i> Denis & Schiffermüller <a href="#">att.</a>	E11-14:Ald + Z11-14:Ald (20:1)	Ostrauskas, 2010(a)	D
<i>Nippopectia issikii</i> Yano <isshikibudou-toriba> <a href="#">att.</a>	Z7-12:OAc	Ando, 1975	A

<i>Nippopectia vitis</i> Sasaki <budou-toriba> att.	Z7-12:OAc	Ando, 1977	A
<i>Ochyrotica concursa</i> Walsingham <satsumaimo-toriba> att.	Z9-12:OAc + E9,Δ11-12:OAc + E7,Δ9-10:OAc (100:10:1)	Kinjo, 1996	A
<i>Oidaematophorus guttatus</i> Walsingham att.	E11-14:Ald	Daterman, 1977	C
<i>Oidaematophorus homodactylus</i> Walker att.	E11-14:Ald	Daterman, 1977	C
<i>Oidaematophorus mathewianus</i> Zeller att.	E11-14:OAc	Daterman, 1977	C
<i>Oidaematophorus monodactylus</i> L. att.	Z9-12:Ald	Kamm, 1979(a)	C
<i>Oidaematophorus</i> sp. 1 att.	E11-14:Ald	Daterman, 1977	
<i>Oidaematophorus</i> sp. 2 ( <i>O. cretidactylus</i> Fitch or <i>O. rileyi</i> Fern. ?) att.	E11-14:OAc	Daterman, 1977	
<i>Oxyptilus tristis</i> Zeller att.	Z7-12:OAc + Z7-12:OH (1:1)	Tóth, 1992(d)	D
<i>Platyptilia carduidactyla</i> Riley artichoke plume moth phe.	*Z11-16:Ald	Klun, 1981	C
<i>Platyptilia ignifera</i> Meyrick <budouoo-toriba> phe.	*Z7-12:OAc + *Z9-12:OAc + another component	Fujii, 2010(a)	A
<i>Platyptilia jezoensis</i> Matsumura <odamaki-toriba> att.	Z11-16:OAc + Z11-16:Ald (9:1)	Ando, 1981	A
<i>Platyptilia</i> (= <i>Cnaemidophorus</i> )	Z11-14:Ald	Frerot, 1985	A

*rhododactyla*  
 Denis & Schiffermüller  
 <chousen-toriba>  
 att.

<i>Platyptilia williamsii</i> Grinnell calendula plume moth att.	Z11-16:Ald	Haynes, 1987	C
<i>Pselnophorus vilis</i> Butler <fuki-toriba> att.	Z9,E11-14:Ald + Z9,E11-14:OAc (9:1)	Ando, 1987	A
<i>Pterophorus tenuidactylus</i> Fitch. att.	Z7-12:OAc	Roelofs, 1971(a)	C
<i>Stenoptilia paludicola</i> att.	Z9-14:OH + Z9-14:Ald (1:1)	Tóth, 1992(d)	C
<i>Trichoptilus lobidactylus</i> Fitch. att.	E11-14:OAc + Z11-14:OAc (19:1)	Sanders, 1993	C

(21) [Copro-morphoidea] マルバシンクイガ上科  
 (Carposinidae) シンクイガ科

<i>Carposina coreana</i> <sanshuyu-shinkui> att.	Z7-20:11-one + Z7-23:H (1:4)	Fujii, 2013(a)	A
<i>Carposina maritima</i> Ponomarenko <kousuguro-shinkui> att.	Z7-20:11-one	Nasu, 2010	A
<i>Carposina niponensis</i> Walsingham <nipponshiro-shinkui> att.	Z7-20:11-one	Nasu, 2010	A
<i>Carposina sasakii</i> Matsumura (= <i>niponensis</i> ) peach fruit moth <momonohime-shinkui> phe.	*Z7-20:11-one (=Z13-20:10-one) + *Z7-19:11-one (=Z12-19:9-one) (20:1) + another component	Tamaki, 1977(a) Honma, 1978	A
in Korea	*Z7-20:11-one + another component	Han, 2000	

<i>Coscinoptycha improbana</i> Meyrick Australian guava moth phe.	*Z7-18:11-one (=Z11-18:8-one) + *Z7-19:11-one + *Z7-23:11-one + *Z7-23:H (235:15:100:650)	Gibb, 2006(a)	D
<i>Heterocrossa rubophaga</i> Dugdale New Zealand raspberry bud moth Phe.	*Z7-19:11-one + *Z7-23:H (1:1)	Foster, 2000 Twidle, 2020	D
<i>Meridarchis excisa</i> Walsingham <kobushiro-shinkui> Att.	Z7-20:11-one	Mizukoshi, 2006	A

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(22) [Hyblaeoidea] セセリモドキガ上科

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no species

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(23) [Thyridoidea] マドガ上科  
(Thyrididae) マドガ科

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<i>Thyris maculata</i> Harris att.	Z11-14:OAc Z3,Z13-18:OAc	Roelofs, 1971(a) Leeuw, 1983	C
<i>Thyris usitata</i> Butler <madoga> att.	Z11-14:OH	Ando, 1977	A

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(24) [Pyraloidea] メイガ上科  
(Pyralidae; Galleriinae) メイガ科 ; ツヅリガ亜科

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<i>Aphomia sociella</i> L. bumble bee wax moth phe.	*6:OH + *Me6,Me10,Me14-15:2-OH + *Me6,Me10,Me14-15:2-one (5:5:1) <ultrasonic signaling>	Kindl, 2012	C
	*Me6,Me10,Me14-15:2-OH (2R,6R,10R)-isomer	Wallin, 2020	



<i>Corcyra cephalonica</i> Stainton rice moth phe.	*Me6,Me10,Me14-15:2-OH <short-range attraction>  (2R,6R,10R)-isomer	Hall, 1987  Mori, 1991	D
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(Pyralidae; Pyralinae)   メイガ科 ; シマメイガ亜科

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<i>Endotricha flammealis</i> Denis & Schiffermüller att.	E5-14:OH	Voerman, 1988	C
<i>Orthopygia</i> (= <i>Herculia</i> ) <i>glaucinalis</i> L. <futasuji-shimameiga> att.	Z7-12:OAc	Nagano, 1979	A
<i>Pyralis farinalis</i> L. meal moth <kashino-shimameiga> phe.	Z11,Z13-16:Ald  + Z3,Z6,Z9,Z12,Z15-23:H + Z3,Z6,Z9,Z12,Z15-25:H + other components  *Z11,Z13-16:Ald + *Z3,Z6,Z9,Z12,Z15-23:H + other components	Landolt, 1982  Leal, 2005  Kuenen, 2010	A
<i>Tegulifera bicoloralis</i> Leech <maemon-shimameiga> att.	E11,Δ13-14:Ald + E11-14:Ald (9:1)	Ando, 1987	A

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(Pyralidae; Epipaschiinae)   メイガ科 ; フトメイガ亜科

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<i>Orthaga achatina</i> Butler <nakatobi-futomeiga> phe.	*Z11-16:OAc  + *Z3,Z6,Z9,Z12,Z15-23:H (2:1) + another component	He, 2016  Yan, 2018(b)	B
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(Pyralidae; Phycitinae)   メイガ科 ; マダラメイガ亜科

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<i>Acrobasis nuxvorella</i> Neunzig	*E9,Z11-16:Ald	Millar, 1996	C
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pecan nut casebearer phe. Mexico strain	+ E9,Z11-16:OAc	Harris, 2008	
<i>Acrobasis pyrivorella</i> Matsumura pear fruit moth <nashi-madaramaiga> phe.	*Z9-15:OAc + *15:OAc (100:7)	Tabata, 2009	A
<i>Acrobasis rufilimbalis</i> Wileman <himetobine-madaramaiga> att.	Z9-15:OAc	Ando, 1977	A
<i>Acrobasis vaccinii</i> Riley cranberry fruitworm phe.	*E8,Z10-15:OAc + *E9-15:OAc (25:1) + other components	McDonough, 1994	C
<i>Amyelois transitella</i> Walker navel orangeworm phe.	*Z11,Z13-16:Ald + *Z3,Z6,Z9,Z12,Z15-23:H + *Z3,Z6,Z9,Z12,Z15-25:H + other components	Coffelt, 1979 Leal, 2005	D
	*Z11,Z13-16:Ald + *Z11,Z13-16:OH + *Z11,E13-16:OH + *Z3,Z6,Z9,Z12,Z15-23:H (20:20:3:1) + other components	Kuenen, 2010 Kanno, 2010	
<i>Cactoblastis cactorum</i> Berg cactus moth phe.	*Z9,E12-14:OAc + *Z9,E12-14:OH + *Z9-14:OAc (27:21:2)	Heath, 2006	D
<i>Cadra calidella</i> Guenée att.	Z9,E12-14:OAc	Boughdad in Arn, 1997	C
<i>Cadra</i> (= <i>Ephestia</i> ) <i>cautella</i> Walker almond moth <suji-madaramaiga> phe.	*Z9,E12-14:OAc  att.  + *Z9-14:OAc (minor) + another component	Kuwahara, 1971(a) Brady, 1971(a)  Zeleny, 1982  Brady, 1973 Kuwahara, 1973 Read, 1976,1979 Allison, 2006	A

		[22:3]	Barrer, 1987	
		(2:1)	Quartey, 1993	
<i>Cadra figulilella</i> Gregson raisin moth <hoshibudou-madaramaiga> phe.	*Z9,E12-14:OAc N		Brady, 1972(b)	A?
	Z9,E12-14:OAc		Soldán, 1983 Kehat, 1992	
<i>Citripestis sagittiferella</i> Moore citrus fruit borer phe.	*E11-14:OAc (main) + *Z11-14:OAc + *Z9,E11-14:OAc N		Dung, 2021	A
<i>Cryptoblabes gnidiella</i> Miller honeydew moth phe.	*Z11-16:Ald + *Z13-18:Ald + E11-16:Ald + E13-18:Ald (10:10:1:1)		Bjostad, 1981 Anshelevich, 1993	C
	(5:1:5:1)		Gurevitz in Arn, 1986(a)	
<i>Dioryctria abietella</i> Denis & Schiffermüller spruce coneworm <matsuno-madaramaiga> phe.	*Z9,E11-14:OAc + another component + *Z3,Z6,Z9,Z12,Z15-25:H (1:10–1:30)		Löfstedt, 1983 Löfstedt, 2012 Lee, 2022	A
<i>Dioryctria abietivorella</i> Grote fir coneworm phe.	*Z9,E11-14:OAc + *Z3,Z6,Z9,Z12,Z15-25:H (1:5–1:10)		Millar, 2005 Strong, 2008	C
<i>Dioryctria amatella</i> Hulst southern pine coneworm phe.	Z11-16:OAc *Z11-16:OAc + Z3,Z6,Z9,Z12,Z15-25:H (1:10)		Hanula, 1984 Meyer, 1986 Miller, 2010	C
<i>Dioryctria aurantiella</i> Grote ponderosa pine coneworm att.	Z9-14:OAc		Pasek, 1989	C
<i>Dioryctria clarioralis</i> Walker blister coneworm phe.	Z9-14:OAc *Z9-14:OAc + *E9-14:OAc		Hanula, 1984 Meyer, 1984	C

	+ Z11-16:OAc (44:6:5)		
<i>Dioryctria disclusa</i> Heinrich webbing coneworm phe.	*Z9-14:OAc Z9-14:OAc	Meyer, 1982 DeBarr, 1982 Hanula, 1984	C
<i>Dioryctria mendacella</i> Staudinger cone moth phe.	*Z9,E11-14:OAc + *Z3,Z6,Z9,Z12,Z15-25:H (1:10)	Hall, 2017	C
<i>Dioryctria merkei</i> Mutuura & Munroe att.	Z9-14:OAc + E9-14:OAc (20:3)	Hanula, 1984 Meyer, 1984	C
<i>Dioryctria reniculelloides</i> Mutuura & Munroe spruce coneworm phe.	*Z9-14:OAc + Z7-12:OAc (20:1)	Grant, 1987(a)	C
<i>Dioryctria resinosella</i> Mutuura red pine shoot moth phe.	*Z9-14:OAc + *Z9-14:OH + E9-14:OAc + Z9-12:OAc (60:10:3:20)	Grant, 1993	C
<i>Dioryctria rubella</i> Hampson pine tip moth att.	Z11-16:Ald + Z11-16:OAc + Z9,E11-14:OAc (7:1:2)	Wu, 1986(b)	C
<i>Ectomyelois ceratoniae</i> Zeller carob moth phe.	*Z9,E11,Δ13-14:Ald + *Z9,E11-14:Ald + *Z9-14:Ald (8:1:1)	Baker, 1989; 1991	C
<i>Elasmopalpus lignosellus</i> Zeller lesser cornstalk borer phe.	*Z11-16:OAc + *Z7-14:OAc + *Z9-14:OAc + *Z9-14:OH (8:8:4:1) + other components	Lynch, 1984	C
Brazil strain	*Z11-16:OAc + other components E	Jham, 2005; 2007	
<i>Ephestia elutella</i> Hübner tobacco moth (cacao moth, chocolate moth) <cha-madaramaiga>	*Z9,E12-14:OAc + *Z9,E12-14:OH (19:5)	Brady, 1971(b) Kuwahara, 1973	A

phe.	(5:1–1:1)	Krasnoff, 1984	
	Z9,E12-14:OAc	Soldán, 1983	
<i>Ephestia</i> (= <i>Anagasta</i> ) <i>kuehniella</i> Zeller	*Z9,E12-14:OAc	Kuwahara, 1971(b)	A
Midditeranea flour moth <sujikona-madaramaiga> phe.	+ *Z9,E12-14:OH (14:3)	Kuwahara, 1973	
<i>Ephesiodes infimella</i> Ragonot att.	Z9,E12-14:OAc	Adler, 1976	D
<i>Episcythrastis</i> (= <i>Myelopsis</i> ) <i>tetricella</i> Denis & Schiffermüller att.	Z9,E11-14:OAc	Tóth, 1992(d)	D
<i>Etiella behrii</i> Zeller pod borer phe.	*Z11-14:OAc + *E9-12:OAc + *E11-14:OAc + *12:OAc (90:10:6.3:0.7) + another component	Wakamura, 1999 Hattori, 2001	C
<i>Etiella zinckenella</i> Treitschke lima-bean pod borer <shiroichimonji-madaramaiga> phe.	*Z11-14:OAc + *E11-14:OAc + *Z9-14:OAc (10:1:1) + other components (100:0:3)	Tóth, 1989(a) Hattori, 2001  Tóth, 1996	A
Japanese strain	*Z11-14:OAc + *Z9-14:OAc + *Z9-12:OAc (120:40:1) + other components	Tabata, 2008(a)	
<i>Eurhodope advenella</i> Zck. att.	Z7-14:OAc + Z10-16:OAc (1:1)	Kovalev, 1987	C
<i>Eurythmia hospitella</i> Zeller att.	Z9,E12-14:OAc	Steck, 1977(a)	D
<i>Euzophera batangensis</i> Caradja persimmon bark borer <kurofutamon-madaramaiga> phe.	*Z9,E12-14:OH (major) + *Z9-14:OH E  *Z9,E12-14:OH + another component	Kalinová, 2006  Wen, 2009	A

<i>Euzophera bigella</i> att.	Z9-14:OH + Z9-14:OAc (3:1)	Maini in Arn, 1986(a)	C
<i>Euzophera punicaella</i> M. phe.	*Z9,E12-14:OH + *Z9,E12-14:OAc (4:1)	Bestmann, 1993(b)	C E
<i>Euzophera pyriella</i> Yang phe.	*Z9,E12-14:OH + another component	Ma, 2014	C
<i>Euzophera semifuneralis</i> Walker American plum borer phe.	*Z9,E12-14:Ald + *Z9,E12-14:OH + *Z9-14:Ald + *Z9-14:OH (2:2:1:1)	Biddinger, 1994	C
<i>Glyptoteles leucacrinella</i> Zeller att.	Z9-14:Ald + Z9-14:OH (20:1)	Tóth, 1992(d)	D
<i>Homoeosoma electellum</i> Hulst sunflower moth phe.	*Z9-14:OH + *Z9,E12-14:OH (10:1)	Underhill, 1979	C
<i>Homoeosoma nebulellum</i> Denis & Schiffermüller European sunflower moth phe.	Z9,E12-14:OH	Underhill, 1982	
<i>Homoeosoma nebulellum</i> Denis & Schiffermüller European sunflower moth phe.	*Z11-16:Ald + *Z13-18:Ald + *Z9-14:Ald + *Z9,E12-14:Ald (10:7:2:1)	Zagatti, 1991	C
<i>Hulstia undulatella</i> Clemens sugar beet crown borer phe.	*Z9-14:OAc + *Z11-16:OAc + *Z9-14:OH (100:21:8)	Davis, 1993	D
<i>Hypsipyla grandella</i> Walker phe.	*Z9,E12-14:OH E + other components	Borek, 1991 Pineda-Rios, 2016	D
<i>Hypsipyla robusta</i> Moore mahogany shoot borer phe.	*Z9,E12-14:OAc + *Z9-14:OAc + *Z11-16:OAc (5:3:2)	Bosson, 1982	D N
<i>Hypsipyla robusta</i> Moore mahogany shoot borer phe.	+ *Z9-14:OH (2:3:3:2)	Ma, 2015	
<i>Maliarpha separatella separatella</i> African white rice stem borer phe.	*Z9,E12-14:OH + *E9,E12-14:OH (9:1) + other components	Cork, 1991	D
<i>Maliarpha separatella vectiferella</i>	Z9,E12-14:Ald	Guerin	D

			in Arn, 1986(a)	
		*Z9,E12-14:Ald + *Z9,E12-14:OH (5:1)	Arn, 1992	
<i>Myelois cribrella</i> Hübner <goma-madaramaiga> phe.		Z11-16:OAc	Subchev, 1981	A
		*Z9,E12-14:OAc + *Z9-14:OAc + *Z11-16:OAc (2:1:1)	Attygalle, 1988(b)	
<i>Plodia interpunctella</i> Hübner Indian meal moth <noshime-madaramaiga> phe.		*Z9,E12-14:OAc	Kuwahara, 1971(a) Brady, 1971(a) Dahm, 1971	A
		Z9,E12-14:OAc	Soldán, 1983	
		+ *Z9,E12-14:OH (8:3)	Kuwahara, 1973	
		+ *Z9,E12-14:Ald N	Teal, 1995	
		+ *Z9-14:OAc (100:18:11:12) + another component	Zhu, 1999	
		(8:2:1:0.8)	Hu, 2005	
<i>Vitula edmandsae serratilineella</i> Ragonot driedfruit moth phe.		*Z9,E12-14:OH + *Z9,E12-14:Ald (100:1) + other components	Struble, 1983(b)	D
		+ *Z11-16:OH (20:1)	Scott, 1984	

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(Crambidae; Schoenobiinae) ツトガ科 ; オオメイガ亜科

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<i>Scirpophaga excerptalis</i> Walker sugarcane tip borer <shiro-oomeiga> phe.		*E11-16:Ald + *Z11-16:Ald (4:1)	Wu, 1990(b)	A
	India	(7:3)	Mukunthan, 2005	
<i>Scirpophaga incertulas</i> Walker yellow stem borer <itten-oomeiga> <sankameichuu>		*Z11-16:Ald + *Z9-16:Ald (3:1) + *Z9-18:Ald (20:5:2)	Cork, 1985(a) Tatsuki, 1985	A

phe.	+ other components		
	+ *16:Ald (6:3:2)	Du, 1987(b)	
<i>Scirpophaga nivella</i> F. <tsumaki-oomeiga> phe.	*E11-16:Ald + *Z11-16:Ald (39:11)	Wu in Arn, 1992	A

(Crambidae; Scopariinae) ツトガ科 ; ヤマメイガ亜科

<i>Eudonia</i> sp. att.	Z11-16:OAc	Clearwater, 1986	
<i>Scoparia biplagiata</i> att.	Z11-16:OAc	Davis in Arn, 1992	C
<i>Scoparia</i> sp. att.	Z11-16:OAc + Z9-16:OAc (4:1)	Ando, 1980(a)	A
<i>Witlesia crataegella</i> Hübner (= <i>Dipleurina lacustrata</i> ) att.	Z11-16:OAc	Subchev, 1981	C

(Crambidae; Crambinae) ツトガ科 ; ツトガ亜科

<i>Agriphila aeneociliella</i> Eversmann eastern grass veneer <shirofutasuji-tutoga> phe.	*Z9,Z12,Z15-18:Ald + *Z9-16:OAc (16:1)	Zhan, 2023	A
<i>Agriphila straminella</i> Denis & Schiffermüller att.	Z11-16:Ald	Booij, 1984(c)	C
<i>Catoptria permutatella</i> Herrich-Schäfer att.	Z11-16:Ald	Booij, 1984(c)	C
<i>Chilo auricilius</i> Dudgeon sugarcane stalk borer phe.	*Z7-12:OAc + *Z8-13:OAc + *Z9-14:OAc + *Z10-15:OAc (4:8:4:1)	David, 1985	C



	*Z8-13:OAc + *Z9-14:OAc + *Z10-15:OAc (8:4:1) + another component	Nesbitt, 1986	C
<i>Chilo hyrax</i> Bleszynski reed stalk borer <nikameigamodoki> att.	Z9-16:Ald	Wu, 1993	A
<i>Chilo influscatellus</i> Snellen sugarcane stem borer phe.	*Z11-16:OH	Wu, 1984	C
<i>Chilo partellus</i> Swinhoe spotted stalk borer corn stemborer phe.	*Z11-16:Ald + another component  + Z11-16:OH (1:1)	Nesbitt, 1979(a) Hansson, 1995  Guleria, 2023	C
<i>Chilo sacchariphagus</i> Bojer sugarcane internode borer <suji-tsutoga> phe.	*Z13-18:OAc + *Z13-18:OH (7:1)	Nesbitt, 1980(a)	A
<i>Chilo sacchariphagus indicus</i> Kapur phe.	*Z13-18:OAc + *Z13-18:OH (5:1)	David, 1985	B
<i>Chilo suppressalis</i> Walker rice stem borer <nika-meiga> <nikameichiu> phe.	*Z11-16:Ald + *Z13-18:Ald (5:1)  (9:2)  + *Z9-16:Ald (50:6:5) + other components	Nesbitt, 1975(b) Ohta, 1976  Beever, 1977  Tatsuki, 1983 Mochida, 1984	A
<i>Chilo</i> (= <i>Proceras</i> ) <i>venosatus</i> Walker (= <i>C. sacchariphagus</i> ?) sugarcane striped borer phe.	Z13-18:OAc + Z11-16:OAc + Z13-18:OH (2:2:1)  *Z13-18:OAc + *Z11-16:OAc + *Z13-18:OH (7:8:42)	Wu, 1982  Wu, 1990(a)	A
<i>Chilo zacconius</i> Blesz. African rice borer	*Z11-16:OH + *16:OH	Zagatti, 1983(b)	C

	phe.	+ Z13-18:OH (7:2:1)		
<i>Chrysoteuchia topiaria</i> Zeller		*Z11-16:Ald	McDonough, 1979	C
cranberry girdler			Kamm, 1979(b)	
	phe.	+ Z9-16:Ald (40:1–100:1)	Kamm, 1980; 1989	
		Z11-16:CN	Ujváry, 1993	
		+ Z9-16:CN (100:3)		
<i>Chrysoteuchia</i> sp.		Me2,epo7-18:H	Nagano, 1979	A
	att.			
<i>Coniesta (= Acigona) ignefusalis</i>		Z7-12:OH	Youm, 1995	D
Hampson		+ Z5-10:OH		
millet stem borer		+ Z7-12:Ald (500:25:17)		
	phe.	*Z7-12:OH	Beevor, 1999	
		+ *Z5-10:OH		
		+ *Z7-12:Ald (100:5:3.3)		
		+ other components		
<i>Crambus cypridalis</i> Hulst		Z11-16:OAc	Landolt, 2012	C
	att.	+ Z11-16:Ald (10:1)		
<i>Crambus nemorella</i> Hübner		Z11-16:OAc	Booij, 1984(c)	C
	att.			
<i>Deanolis sublimbalis</i> Snellen		*Z11-16:Ald	Gibb, 2007(a)	D
red banded mango caterpillar		+ *Z3,Z6,Z9-23:H (1:1)		
	phe.	+ other components		
<i>Diatraea considerata</i> Heinrich		*Z11-16:Ald	Gries, 1998	D
	phe.	+ *Z7-16:Ald		
		+ *Z13-18:Ald (100:30:4)		
		+ other components		
<i>Diatraea flavipennella</i> Box		*Z11-16:Ald	Kalinová, 2012	D
sugarcane borer		+ *Z9-16:Ald (3:1)		
	phe.	+ other components		
<i>Diatraea grandiosella</i> Dyar		*Z11-16:Ald	Hedin, 1986	D
southwestern corn borer		+ *Z9-16:Ald		
	phe.	+ *Z13-18:Ald (71:22:8)		
		+ other components		

	+ Z9-18:Ald (33:10:4:3)	Davis, 1986	
<i>Diatraea indigenella</i> Dyar & Heinrich phe.	*Z9,E11-16:Ald + another component	Palacio-Cortes, 2014	D
<i>Diatraea saccharalis</i> sugar cane borer phe.	* Z9,E11-16:Ald  + other components	Carney, 1982 Svatos, 2001  Santangelo, 2002 Batista-Pereira, 2002	D
Brazillian and Columbian strains	+ * Z11-16:Ald (10:1)  + *Z11-16:Ald (9:1-3:1) N  + *Z9-16:Ald + *16:Ald (10:1:1:1)	Kalinová, 2005  Cortés, 2010  Silva, 2021	
<i>Eoreuma</i> (= <i>Chilo</i> or <i>Acigona</i> ) <i>loftini</i> Dyar Mexican rice borer phe.	*Z13-18:OAc + *Z13-18:Ald + *Z11-16:OAc (8:1.3:1)	Shaver, 1988; 1990 Robacker, 1989	D
<i>Parapediasia teterella</i> Zincken bluegrass webworm <shiba-tsutoga> phe.	Z11-16:Ald + Z9-16:Ald (20:1)  *Z11-16:Ald + *Z9-16:Ald + *Z11-16:OH (20:1:0.002) + another component	Clark, 1990  Sugie, 1994	A
<i>Pareromene exsectella</i> Christoph <shiroeguri-tsutoga> att.	Z11-16:OAc	Ando, 1977	A
<i>Tehama bonifatella</i> Hulst western lawn moth att.	Z11-16:Ald + Z13-18:Ald (1:1)	McDonough, 1982(c)	D

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(Crambidae; Cybalomiinae) ツトガ科 ; モンメイガ亜科

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<i>Trichophysetis cretacea</i> Butler jasmine bud borer <futaobi-nomeiga>	*Z11-16:OAc + *Z11-16:Ald + *Z11-16:OH (10:10:1)	Peng, 2012	A
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phe.

(5:2:1)

Gu, 2013

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(Crambidae; Acentropinae) ツトガ科 ; ミズメイガ亞科

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<i>Nymphicula mesorphna</i> Meyrick <koatomon-mizunomeiga> att.	Z11-16:OAc + Z11-16:OH (8:1)	Peng, 2012	A
<i>Parapoynx</i> sp.	Z7-12:OAc	Zeleny, 1982	C

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(Crambidae; Glaphyriinae) ツトガ科 ; ニセノメイガ亞科

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<i>Crocidolomia binotalis</i> Zeller (= <i>pavonana</i> F.) cabbage-heart caterpillar <kebuka-nomeiga> phe. Indonesia strain	*Z11-16:OAc + *Z9-14:OAc (20:1)  (10:1)	Usui, 1987  Adati, 2013	A
<i>Evergestis aenealis</i> att.	Z7-12:OAc + Z9-14:OAc (1:1)	Tóth, 1994(b)	C
<i>Evergestis extimalis</i> Scopoli <usubeni-nomeiga> att.	Z9-14:OAc  + Z7-12:OAc (1:1)	Konstantin in Arn, 1986(a)  Tóth, 1994(b)	A
<i>Evergestis forficalis</i> L. garden pebble moth <na-nomeiga> att.	E11-14:OAc	Lester in Hall, 1979 Priesner, 1980(a) Arn in Arn, 1986(a) Voerman in Arn, 1986(a)	A
<i>Evergestis frumentalis</i> att.	Z11-16:Ald + Z9-14:Ald (20:1)	Tóth, 1994(b)	C
<i>Hellula undalis</i> F. cabbage webworm <haimadara-nomeiga> phe.	*E11,E13-16:Ald  + Z11-16:Ald (100:3)  + *Z11-14:OAc	Arai, 1982  Sugie, 2003  Vang, 2020	A

+ \*E11-16:Ald  
 + \*Z3,Z6,Z9-23:H (7:3:3:1)

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(Crambidae; Spilomelinae) ツトガ科 ; ヒゲナガメノメイガ亜科

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<i>Agathodes ostentalis</i> Geyer <benimon-nomeiga> phe.	*E10,E12-16:Ald + *E11-16:Ald (1:1)	Wakamura, 2004	A
<i>Bradina</i> sp. att.	E11-16:Ald	Ando, 1981	A
<i>Cnaphalocrocis medinalis</i> Guenée rice leaffolder moth <kobu-nomeiga> phe.	Z13-18:OAc	Kang, 1985	A
Indian	*Z11-16:OAc + *Z13-18:OAc (49:1) E	Ramachandran, 1990	
Philippine	(1:10) (1:10–20) + another component	Raina in Arn, 1997 Rao, 1993: 1995	
Japanese	*Z13-18:Ald + *Z13-18:OH + *Z11-18:Ald + *Z11-18:OH (100:36:11:24)	Kawazu, 2000; 2002	
Indonesia	(100:37:10:26)	Kawazu, 2009	
China	(100:24:10:18)	Lu, 2024	
<i>Cnaphalocrocis pilosa</i> (= <i>Marasmia latimarginalis</i> ) <hanenagakobu-nomeiga> att.	Z11-16:OAc + Z13-18:OAc (50:1)	Kawazu, 2001	A
<i>Conogethes pluto</i> Butler Alpinia stem borer phe.	*E10-16:Ald + *E10,E12-16:Ald + *Z3,Z6,Z9-23:H (100:2:3) + othre components	El-Sayed, 2013	C
<i>Conogethes</i> (= <i>Dichocrocis</i> )	*E10-16:Ald	Konno, 1982	A

<i>punctiferalis</i> Guenée yellow peach moth <momonomomadara-nomeiga> phe.	+ Z10-16:Ald (9:1) + *Z3,Z6,Z9-23:H + * Z9-27:H N  (9:1:10:100)	Xiao, 2012  Nam, 2022	
<i>Cydalima</i> (= <i>Glyphodes</i> ) <i>perspectalis</i> Walker box tree pyralid <tsuge-nomeiga> phe. In Korea	*Z11-16:Ald + *E11-16:Ald (4:1) + another component  (5:1, 7:1)	Kawazu, 2007  Kim, 2013	A
<i>Desmia funeralis</i> Hübner grape leaffolder phe.	*Z11,Z13-16:Ald + *≡11-16:Ald + *Z11-16:Ald (3:1:1) + another component	Millar, 2002	D
<i>Diaphania angustalis</i> Snellen phe.	*E10,E12-16:Ald + *E10,E12-16:OH (9:1)	Ma, 2017	C
<i>Diaphania glauculalis</i> att.	E11-16:Ald + E10,E12-16:Ald	Wen, 2014	C
<i>Diaphania hyalinata</i> L. melonworm phe.	*E11-16:Ald + *E10,E12-16:Ald (5:4) + other components	Raina, 1986(a)	C
<i>Diaphania</i> (= <i>Palpita</i> ) <i>indica</i> Saunders cotton caterpillar moth <wataherikuro- nomeiga> <uri-nomeiga> phe. In Korea	*E11-16:Ald + *E10,E12-16:Ald (2:1) + another component  (7:3)	Wakamura, 1998  Choi, 2009(a)	A
<i>Diaphania nitidalis</i> Stoll pickleworm phe.	*E11-16:Ald + *Z11-16:Ald + *E10,Z12-16:Ald (75:3.3:0.2) + other components	Klun, 1986	C
<i>Diasemia litterata</i> Scopoli <shiroayahime-nomeiga> att.	E11-16:OAc	Ando, 1977	A
<i>Duponchelia fovealis</i> Zeller	*E13-18:Ald	Molnár, 2018	D

European pepper moth phe.	+ *Z13-18:Ald + *Z11-16:Ald (100:10:1)		
<i>Glyphodes pyloalis</i> Walker mulberry pyralid <chibisukashi-nomeiga> <kuwa-nomeiga> phe.	*10,12,14-16:OAc *E10,E12,Z14-16:OAc + *E10,E12,E14-16:OAc (7:1)	Seol, 1987 Honda, 1990 Guo, 2022	A
<i>Haritalodes</i> (=Notarcha) <i>Basipunctalis</i> Brem. phe.	*E10,Z12-16:Ald + *E10,E12-16:Ald (4:1)	Honda, 1994	A
<i>Haritalodes</i> (=Notarcha) <i>derogata</i> F. cotton leaf-roller <wata-nomeiga> phe.	*E10,Z12-16:Ald + *E10,E12-16:Ald (3:1) + other components *E10,Z12-16:Ald	Himeno, 1992 Honda, 1994	A
<i>Herpetogramma licarsisalis</i> Walker grass webworm <kuroobikuro-nomeiga> phe.	*Z11,E13-16:OAc + other components	Gibb, 2007(b)	A
<i>Herpetogramma submarginale</i> Swinhoe <herigurokiiro-nomeiga> phe.	*Z13-16:OAc + other components	Yan, 2015(b)	A
<i>Leucinodes orbonalis</i> Guenée eggplant borer <nasu-nomeiga> phe.	*E11-16:OAc + another component + *E11-16:OH (100:1) + *Z3,Z6,Z9-23:H (10:1) + another component	Zhu, 1987(a) Kong, 1990 Attygalle, 1988(a) Cork, 2001 Vang, 2018	A
<i>Maruca vitrata</i> (= <i>testulalis</i> ) F. legume pod borer <mame-nomeiga> phe.	*E10,E12-16:Ald + *E10,E12-16:OH + E10-16:Ald (20:1:1)	Adati, 1999 Downham, 2003 Schläger, 2015	A
China (Wuhan strain)	*E10,E12-16:Ald + *E10,E12-16:OH	Lu, 2013	

	(Huazhou strain)	+ *E10-16:Ald (10:1:8) (10:1:1)		
<i>Mnesictena flavidalis</i>		E11-16:OAc	Clearwater, 1986	D
att.		+ Z11-16:OAc (10:1)		
<i>Neoleucinodes elegantalis</i>		*E11-16:OH	Cabrera, 2001	D
tomato fruit borer		+ *Z3,Z6,Z9-23:H (20:1)		
phe.		+ other components		
<i>Omphisa anastomosalis</i> Guenée		*E10,E14-16:Ald	Wakamura, 2010	A
sweetpotato vine borer moth		+ other components		
<satsumaimo-nomeiga>				
phe.		+ *Z3,Z6,Z9-23:H (1:2)	Yan, 2014	
		+ other components		
		+ *Z3,Z6,Z9-23:H (1:2 – 1:5)	McQuate, 2019	
<i>Palpita nigropunctalis</i> Bremer		*E11-16:Ald	Yan, 2018(c)	A
<maekasukashi-nomeiga>		+ *E11-16:OAc		
phe.		+ *E11-16:OH (100:20:1)	N	
<i>Palpita unionalis</i> Hübner		*E11-16:OAc	Mazomenos, 1994	C
jasmine moth		+ *E11-16:Ald (7:3)		
phe.				
<i>Patania</i> (= <i>Pleuroptya</i> , <i>Dichocrocis</i> )		E10-16:Ald	Konno, 1982	A
<i>chlorophanta</i> Butler			Honda, 2004	
<hosomisuji-nomeiga>				
att.				
<i>Patania</i> (= <i>Pleuroptya</i> ) <i>ruralis</i> Scopoli		*E10-16:Ald	Mochizuki,	A
bean webworm		+ *Z10-16:Ald (21:4)	2009(a); (b)	
<ukon-nomeiga>				
phe.				
<i>Rehimena surusalis</i> Walker		*E10,Z12-16:OAc	Honda, 2015	A
hibiscus flower-bud borer		+ *E10,Z12-16:Ald		
<kakumon-nomeiga>		+ *Z3,Z6,Z9-23:H (5:1:14)		
phe.				
<i>Sceliodes cordalis</i> Doubleday		*E11-16:OAc	Clearwater, 1986	D
phe.		+ *E11-16:OH (1:1)		
<i>Terastia subjectalis</i> Lederer		*E10,E12-16:Ald	Wakamura, 2004	A
<ooguri-nomeiga>		+ *E11-16:Ald (19:1)		



phe.

*Udea lutealis* Z11-16:OAc Myttus C  
att. in Arn, 1986(a)

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(Crambidae; Pyraustinae) ツトガ科 ; ノメイガ亜科

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*Achyra rantalis* Guenée Z7-12:OAc Keaster, 1996 D  
att. + Z9-14:OAc (3:1)

*Anania verbascalis* Z9,E12-14:OAc Tóth, 1992(d) B  
Denis & Schiffermüller + Z9,E12-14:OH (100:1)  
<himetogari-nomeiga>  
att.

*Fumibotys fumalis* Guenée \*E10,E12-14:OAc Davis, 1991 D  
mint root borer + \*Z11-14:OAc  
phe. + \*Z9-14:OAc (50:9:2)  
+ another component

*Loxostege* (= *Sitochroa*) E9-12:OAc Roelofs, 1971(a) C  
*chortalis* Grote Steck, 1977(a)  
att. + Z9-12:OAc (1000:1) Steck, 1980(a)

*Loxostege neoblitalis* Capps E9-14:OAc Roelofs, 1970(a) C  
att.

*Loxostege sticticalis* L. E11-14:OAc Struble, 1977(a) C  
beet webworm  
att.

*Marasmia patnalis* \*Z13-18:OAc Ramachandran, 1990 C  
rice leaffolder + \*Z11-16:OAc (24:1) E  
phe.

*Mutuuraia mysippusalis* Walker Z7-10:OAc Steck, 1977(a) C  
att. + Z7-12:OAc (1:1)

*Mutuuraia* (= *Phlyctaenia*) Z7-12:OAc Roelofs, 1970(a) A  
*terrealis* Treitschke  
<sujimagari-nomeiga>  
att.

<i>Ostrinia furnacalis</i> Guenée oriental (Asian) corn borer <ajiaawa-nomeiga> phe. Japan	*Z12-14:OAc + *E12-14:OAc + another component (3:2)	Ando, 1980(b) Huang, 1998(a)	A
Philippines	(1:1)	Klun, 1980(a)	
China	(1:1)	Cheng, 1981 Cheng, 1989	
Taiwan	(3:1)	Yeh, 1989	
	(1:1)	Kou, 1992(a)	
Korea	(2:1)	Boo, 1998(b)	
China	+ * 14:OAc (21:16:13) (13:7:10)	Du, 1986 Deng, 2023	
<i>Ostrinia latipennis</i> Warren <usujiroki-nomeiga> phe.	*E11-14:OH	Ishikawa, 1999(b) Takanashi, 2000	A
<i>Ostrinia nubilalis</i> Hübner European corn borer <awa-nomeiga> "Z"-race phe.	*Z11-14:OAc + *E11-14:OAc (97:3)  + other components	Klun, 1970  Klun, 1973 Cheng, 1989  Klun, 1977 Attygalle, 1987 Struble, 1987(a) Kalinová, 1994	C
"E"-race	E11-14:OAc	Roelofs, 1972 Cardé, 1975(a) Klun, 1975	
	*E11-14:OAc + *Z11-14:OAc (24:1)  + other components	Kochansky, 1975(a)  Peña, 1988	

hybrid	Z11-14:OAc + E11-14:OAc (1:1–7:13)	Klun, 1975 Anglade, 1984 Maini in Arn, 1986(a)	
	*E11-14:OAc + *Z11-14:OAc (13:7)	Klun, 1979(a) Buechi, 1982	
maize race mugwort and hop races	*Z11-14:OAc *E11-14:OAc	Pelozuelo, 2004	
<i>Ostrinia obumbratalis</i> Lederer att.	Z11-14:OAc + E11-14:OAc (1:1)	Klun, 1972	C
<i>Ostrinia orientalis</i> Mutuura & Munroe <onamomi-nomeiga> phe.	*Z11-14:OAc + *E11-14:OAc (98:2) + another component	Ishikawa, 1999(b) Fu, 2004	A
<i>Ostrinia palustralis</i> Hübner <yuugumo-nomeiga> phe.	*E11-14:OAc + *Z11-14:OAc (99:1) + another component	Huang, 1998(b)	A
<i>Ostrinia scapulalis</i> Walker adzuki bean borer <azuki-nomeiga> phe. Z-type	*Z11-14:OAc + *E11-14:OAc (97:3) + another component	Huang, 1997	A
E-type	(1:99)	Huang, 2002 Tabata, 2003	
I-type	(36:64)		
<i>Ostrinia zaguliaevi</i> Mutuura & Munroe butterbur borer <fuki-nomeiga> phe.	*Z11-14:OAc + *Z9-14:OAc + *E11-14:OAc (10:9:1) + another component	Huang, 1998(c) Tabata, 2006	A
<i>Ostrinia zealis</i> Guenée burdock borer <gobou-nomeiga> phe.	*Z9-14:OAc + *E11-14:OAc + *Z11-14:OAc (70:24:6) + another component	Ishikawa, 1999(a)	A
<i>Ostrinia</i> sp. phe.	*Z11-14:OAc + *Z9-14:OAc	Tabata, 2008(b)	A

	+ *E11-14:OAc (76:18:6) + other components		
<i>Pagyda arbiter</i> Butler <futamata-nomeiga> <a href="#">att.</a>	Z11-14:Ald + Z11-14:OAc (9:1)	Ando, 1981	A
<i>Paliga minnehaha</i> Pryer <maebeni-nomeiga> <a href="#">att.</a>	E11-14:OAc	Ando, 1981	A
<i>Phlyctaenia coronata tertialis</i> Guenée <a href="#">att.</a>	Z9-12:OAc	Reed, 1985(b)	C
<i>Pyrausta aurata</i> Scopoli <hakka-nomeiga> <a href="#">att.</a>	E11-14:OAc	Maini in Arn, 1986(a) Stockel, 1977 Mozūraitis, 1998	A
<i>Pyrausta cingulata</i> <a href="#">att.</a>	E11-14:OAc + Z11-14:OAc (1:1)	Arn in Arn, 1986(a)	C
<i>Pyrausta fodinalis</i> Lederer <a href="#">att.</a>	E10,E12-14:OAc	Reed, 1985(b)	C
<i>Pyrausta machaeralis</i> Walker <a href="#">phe.</a>	*E11-14:OAc + *Z11-14:OAc (24:1)	Qian, 2024	C
<i>Pyrausta ochosalis</i> <a href="#">att.</a>	E11-14:OAc	Roelofs, 1971(a)	C
<i>Pyrausta ostrinalis</i> Hübner <a href="#">att.</a>	E11-14:OAc	Bûda, 1987	C
<i>Pyrausta panopealis</i> Walker perilla leaf pyralid moth <benifuki-nomeiga> <a href="#">phe.</a>	*E11-14:OAc + *Z11-14:OAc N	Kang, 1995	A
<i>Pyrausta purpuralis</i> L. <a href="#">att.</a>	E11-14:OAc + Z11-14:OAc (3:2)	Anglade in Arn, 1986(a) Frerot, 1982(a)	C
<i>Pyrausta</i> (= <i>Ecpyrrhorhoe</i> ) <i>rubiginalis</i> Hübner <akamyaku-nomeiga> <a href="#">att.</a>	Z11-14:OAc + E11-14:OAc + 12:OAc (7:3:40)	Hrdý, 1979	A

<i>Sitochroa verticalis</i> L. <kuromyaku-nomeiga> att.	E9-12:OAc + E9-12:OH	Tóth, 1994(b) Roehrich in Arn, 1986(a)	A
<i>Sufetula sunidesalis</i> Walker <shirosujeguri-nomeiga> att.	Z11-16:Ald + Z9-16:Ald (19:1)	Kohno, 2014	A

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(25) [Calliduloidea] イカリモンガ上科

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no species

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(26) [Lasiocampoidea] カレハガ上科  
(Lasiocampidae) カレハガ科

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<i>Dendrolimus houi</i> Lajonquiere Yunnan pine caterpillar phe.	*E5,Z7-12:OH + *E5,Z7-12:OAc + *E5,Z7-12:Ald (20:1:1) + other components	Kong, 2007(a)	C
<i>Dendrolimus kikuchii</i> Matsumura phe.	*Z5,E7-12:OAc + *Z5,E7-12:OH + *Z5-12:OH (20:4:5)	Kong, 2005; 2011	C
<i>Dendrolimus pini</i> L. European pine moth phe.	*Z5,E7-12:Ald  + *Z5,E7-12:OH (3:2)  + other components	Bestmann, 1982(b) Priesner, 1984(d)  Kovalev, 1993  Rudziński, 2022	C
<i>Dendrolimus punctatus</i> Walker pine-caterpillar moth masson pine moth phe.	*Z5,E7-12:OH + *Z5,E7-12:OAc  + Z5,E7-12:OPr  (28:25:10)  + *Z5,E7-12:OPr + *Z5-12:OH + *Z5-12:OAc (19:15:7:7:3)	China, 1979  Meng, 1983(a)  Zhang, 2003(a)  Zhao, 1993	C

<i>Dendrolimus spectabilis</i> Butler pine moth <matsu-kareha> phe.	*Z5,E7-12:OH	Vu, 1980 Ando, 1982	A
<i>Dendrolimus superans</i> Butler larch caterpillar moth <tuga-kareha> phe.	*Z5,E7-12:Ald + other components	Kong, 2007(b)	A
<i>Dendrolimus superans</i> <i>sibiricus</i> Butler Siberian moth phe.	Z5,E7-12:Ald + Z5,E7-12:OH + other components	Klun, 2000	B
	*Z5,E7-12:Ald + *Z5,E7-12:OH (1:1) + other components	Pletnev, 2000	
<i>Dendrolimus tabulaeformis</i> Tsai & Liu Chinese pine caterpillar phe.	Z5,E7-12:OH + Z5,E7-12:OAc + Z5,E7-12:OPr (1:1:1)	Meng, 1983(b)	C
	*Z5,E7-12:OH + *Z5,E7-12:OAc + *Z5,E7-12:OPr (20:20:1)	Kong, 2012(a)	
<i>Gastropacha quercifolia</i> L. lappet moth <birodo-kareha> phe.	*Z5-12:Ald + *Z5-12:OH + another component E	Bestmann, 1993(d)	B
<i>Malacosoma americanum</i> F. eastern tent caterpillar phe.	*E5,Z7-12:Ald + *Z5,E7-12:OH + *E5,Z7-12:OH (10:1-1:1)	Roelofs in Arn, 1986(a) Kochansky, 1996	C
<i>Malacosoma californicum</i> Packard western tent caterpillar phe.	*Z5,E7-12:Ald	Underhill, 1980	C
<i>Malacosoma disstria</i> Hübner forest tent caterpillar phe.	*Z5,E7-12:OH + *Z5,E7-12:Ald (10:1) Z5,E7-12:Ald	Chisholm, 1980(a) Chisholm, 1982	C

	+ Z5,Z7-12:Ald + Z7-12:Ald (10:1:1)	(100:1:10)	Schmidt, 2003	
<i>Malacosoma neustria</i> L. lackey moth <obi-kareha> phe.	*E5,Z7-12:Ald + *E5,Z7-12:OH (8:5) + other components		Konyukhov, 1988 Rotundo, 2004	A

(27) [Drepanoidea] カギバガ上科  
(Drepanidae) カギバガ科 + (Thyatiridae) トガリバガ科

<i>Cilix glaucata</i> Scopoli att.	E11-14:OAc + E11-14:Ald (9:1)	(1:1)	Booij, 1985	C
	+ E11-14:OH (1:1)		Frerot, 1985 Capizzi in Arn, 1986(a)	
<i>Epipsestis perornata</i> Inoue <usumurasaki-togariba> att.	Z9-14:Ald		Ando, 1981	A
<i>Drepana bilineata</i> Packard att.	Z9,E11-14:Ald		Reed, 1985(b)	C
<i>Drepana lacertinaria</i> att.	Z9,E11-14:Ald		Priesner in Arn, 1986(a)	C
<i>Macrauzata maxima</i> Inoue <sukashi-kagiba> att.	Z9,E11-14:Ald		Ando, 1987	A
<i>Tethea or</i> Denis & Schiffermüller <akan-togariba> att.	Z9-14:Ald		Capizzi in Arn, 1986(a)	A

(28) [Geometroidea] シャクガ上科  
(Geometridae) シャクガ科  
a: Alsophilinae; フユジャク亜科, b: Geometrinae; アオジャク亜科,  
c: Sterrhinae; ヒメジャク亜科, d: Larentiinae; ナミジャク亜科,

e: Ennominae; エダシヤク亜科, f: Orthostixinae; ホシシヤク亜科

<i>Abraxas</i> <sup>e</sup> <i>grossulariata</i> L. currant moth <sugurishiro-edashaku> phe.	*epo3,Z6,Z9-17:H (3 <i>S</i> ,4 <i>R</i> )-isomer + *Z3,Z6,Z9-17:H (10:1)	Tóth, 1992(a); 1994(a)	B
<i>Abraxas niphonibia</i> Wehrli <himemadara-edashaku> att.	epo3,Z6,Z9-18:H	Ando, 1995(a)	A
<i>Abraxas sylvata</i> Scop. <kimadara-edashaku> att.	epo3,Z6,Z9-17:H (3 <i>R</i> ,4 <i>S</i> )-isomer	Tóth, 1994(a)	A
<i>Agathia</i> <sup>b</sup> <i>carissima</i> Butler <chizumon-aoshaku> att.	Z3,Z6,Z9-20:H	Ando, 1993	A
<i>Agathia visenda visenda</i> Prout <ashibutochizumon-aoshaku> att.	Z6,Z9-20:H or Z6,Z9-21:H	Ando, 1993	A
<i>Agriopis</i> <sup>e</sup> <i>aurantiaria</i> Hübner phe.	*epo3,Z6,Z9-19:H (3 <i>S</i> ,4 <i>R</i> )-isomer	Szöcs, 1993(b)	C
<i>Agriopis</i> (= <i>Erannis</i> ) <i>bajaria</i> Schiff. phe.	*Z3,Z6,Z9-18:H + *Z3,Z6,Z9-19:H  (1:1–1:5)	Szöcs in Arn, 1997  Lecheva, 1999	C
<i>Agriopis leucophearia</i> Denis & Schiffermüller <shirofufuyu-edashaku> att.	epo3,Z6,Z9-19:H (3 <i>S</i> ,4 <i>R</i> )-isomer	Szöcs, 1993(b)	B
<i>Agriopis marginaria</i> F. att.	Z3,epo6,Z9-19:H + Z3,Z6,Z9-19:H (10:3)  Z3,epo6,Z9-19:H (6 <i>S</i> ,7 <i>R</i> )-isomer + Z3,Z6,Z9-19:H (10:3)	Hansson, 1990(b)  Szöcs, 1993(b)	C
<i>Alcis</i> <sup>e</sup> <i>angulifera</i> Butler	epo3,Z6,Z9-19:H	Ando, 1993	A



<nakausu-edashaku> att.	(3 <i>S</i> ,4 <i>R</i> )-isomer	Ando, 1997	
<i>Alcis</i> (= <i>Boarmia</i> ) <i>repandata</i> L. att.	Z6,Z9-19:H + Z3,Z6,Z9-19:H (2:1-1:1) or + Δ1,Z3,Z6,Z9-19:H (2:1-1:1)	Bogenschütz, 1985 Subchev, 1986(a)	C
<i>Alsophila</i> <sup>a</sup> <i>japonensis</i> Warren <shiroobi-fuyushaku> att.	Z3,Z6,Z9-19:H	Ando, 1993	A
<i>Alsophila</i> <i>pometaria</i> Harris fall cankerworm moth phe.	*Z3,Z6,Z9-19:H + *Z3,Z6,Z9,E11-19:H (1:2) or + *Z3,Z6,Z9,Z11-19:H (1:6)	Wong, 1984(a); (b)	C
<i>Alsophila</i> <i>quadripunctata</i> Esper att.	Z3,Z6,Z9-19:H + Z6,Z9-19:H (1:1)	Szöcs, 1984	C
<i>Anacamptodes</i> <sup>e</sup> <i>humaria</i> Guenée phe.	*epo6,Z9-19:H (6 <i>R</i> ,7 <i>S</i> )-isomer	Millar, 1991(a)	D
<i>Anavitrinella</i> <sup>e</sup> <i>pampinaria</i> Guenée att.	epo3,Z6,Z9-19:H + Z3,epo6,Z9-19:H (19:1) (6 <i>S</i> ,7 <i>R</i> )-isomer	Millar, 1990(c)	D
<i>Anisodes</i> <sup>c</sup> sp. att.	E11-16:OAc + E11-16:Ald (7:3)	Mazomenos, 1994	C
<i>Anticlea</i> <sup>d</sup> <i>vasiliata</i> Guenée att.	Z3,Z6,Z9-21:H	Millar, 1991(c)	D
<i>Ascotis</i> <sup>e</sup> (= <i>Boarmia</i> ) <i>selenaria</i> Denis & Schiffermüller giant looper phe.	*Z3,Z6,Z9-19:H E  epo3,Z6,Z9-19:H + Z3,epo6,Z9-19:H + Z3,Z6,epo9-19:H (1:1:1)  *epo3,Z6,Z9-19:H (3 <i>S</i> ,4 <i>R</i> )-isomer  + another component	Becker, 1983  Becker in Arn, 1986(a)  Becker, 1990  Cossé, 1992	B

Korean strain 1	$(3R,4S):(3S,4R) = 9:1$	Choi, 2012	
Korean strain 2	$(3R,4S):(3S,4R) = 5:5$		
<i>Ascotis selenaria cretacea</i> Butler	epo3,Z6,Z9-19:H	Ando, 1993	A
Japanese giant looper			
mugwort looper	*epo3,Z6,Z9-19:H	Ando, 1997	
<yomogi-edashaku>	(3R,4S)-isomer		
phe.	+ another component		
	+ *Z3,Z6,Z9-19:H (100:5–100:1)	Witjaksono, 1999	
<i>Biston<sup>e</sup> robustum</i> Butler	*epo6,Z9-19:H	Yamamoto, 2000	A
giant geometrid moth	(6S,7R)-isomer		
<tobimonoo-edashaku>	+ *Z3,epo6,Z9-19:H (9:1)		
phe.	+ other components		
<i>Bupalus<sup>e</sup> piniarius</i> L.	Z6,Z9-19:H	Bestmann, 1982(a)	C
phe.			
	*tepo4,Z6,Z9-19:H	Chittamuru	
	(4S,5S)-isomer	in Pherobase	
	+ other components		
<i>Cabera<sup>e</sup> erythemaria</i> Guenée	Z3,Z6,epo9-19:H	Wong, 1985(b)	C
att.	(9S,10R)-isomer		
	+ (9R,10S)-isomer (1:1)		
<i>Caripeta<sup>e</sup> angustiorata</i> Walker	Z3,Z6,Z9-19:H	Millar, 1990(a)	D
att.	+ Z3,epo6,Z9-19:H (1:1)		
<i>Caustoloma<sup>e</sup> flavicaria</i>	Z6,epo9-21:H	Kovalev, 1986	D
att.			
<i>Colotois<sup>e</sup> pennaria</i> L.	*Z3,epo6,Z9-19:H	Hansson, 1990(b)	B
phe.	+ Z3,Z6,Z9-19:H (10:3)		
	*Z3,epo6,Z9-19:H	Szöcs, 1993(b)	
	(6R,7S)-isomer		
	+ *Z3,Z6,Z9-19:H		
	+ Z3,Z6,Z9-21:H (10:3:10)		
<i>Colotois pennaria</i>	epo3,Z6,Z9-20:H	Ando, 1993	A
<i>ussuriensis</i> Bang-Haas	or Z3,epo6,Z9-19:H		
<kaba-edashaku>			

att.	Z3,epo6,Z9-20:H	Ando, 1995(a)	
<i>Costaconvexa</i> <sup>d</sup> <i>polygrammata</i> Bkh. att.	Z3,Z6,Z9-20:H	Szöcs, 1987	C
<i>Culpinia</i> <sup>b</sup> <i>diffusa</i> Walker <akaashi-aoshaku> att.	Z6,Z9,E11-17:H	Yamamoto, 2008	A
<i>Cystidia</i> <sup>e</sup> <i>couaggaria</i> <i>couaggaria</i> Guenée <ume-edashaku> phe.	*Z3,Z6,Z9-23:H + *Z3,Z6,Z9-21:H (3:2) + other componentns	Yamakawa, 2012(a)	A
<i>Dysstroma</i> <sup>d</sup> <i>brunneata ethela</i> Hulst att.	Z3,Z6,epo9-20:H (9 <i>S</i> ,10 <i>R</i> )-isomer	Wong, 1985(b)	C
<i>Dysstroma</i> sp. ( <i>citrata</i> ?) att.	Z3,Z6,Z9-20:H or Z3,Z6,Z9-21:H	Wong, 1985(b)	
<i>Ectropis</i> <sup>e</sup> <i>excellens</i> Butler <ootobisuji-edashaku> att.	epo6,Z9-18:H	Ando, 1995(a)	A
<i>Ectropis</i> <i>grisescens</i> Warren phe.	*Z3,epo6,Z9-18:H + *Z3,Z6,Z9-18:H (4:1)  (4:1, 3:2)	Ma, 2016  Han, 2024	C
<i>Ectropis obliqua</i> Prout tea looper <usujiro-edashaku> phe.	*Z3,epo6,Z9-18:H + *Z3,Z6,Z9-18:H + another component N  (3:2)  (6 <i>S</i> ,7 <i>R</i> )-isomer E	Yao, 1991  Yang, 2016  Yu, 2017	A
	+ *Z3,epo6,Z9-19:H (2:1:2)	Luo, 2017	
<i>Ennomos</i> <sup>e</sup> <i>subsignaria</i> Hübner elm spanworm phe.	*Z6,epo9-19:H (9 <i>S</i> ,10 <i>R</i> )-isomer + another component	Ryall, 2010	C
<i>Epelis</i> <sup>e</sup> <i>truncataria</i> Walker	epo3,Z6,Z9-17:H	Millar, 1990(c)	D

att.			
<i>Epirrhoe</i> <sup>d</sup> phe.	<i>sperryi</i> Herbulot	Z3,Z6,Z9-19:H  *Z3,Z6,Z9-19:H + other components	Wong, 1985(b) C  Millar, 1992(a)
<i>Epirrita</i> <sup>d</sup> phe.	<i>autumnata</i> Borkhausen <aki-namishaku>	*Δ1,Z3,Z6,Z9-21:H	Zhu, 1995(b) A
<i>Epirrita</i> att.	<i>viridipurpurescens</i> Prout <midoriaki-namishaku>	Z3,Z6,Z9-21:H	Ando, 1993 A
<i>Erannis</i> <sup>e</sup> phe.	<i>defoliaria</i> Clerck mottled umber moth <oochabanefuyu-edashaku>	*Z3,epo6,Z9-19:H + *Z3,Z6,Z9-19:H (10:3)  *Z3,epo6,Z9-19:H (6 <i>S</i> ,7 <i>R</i> )-isomer + *Z3,Z6,Z9-19:H (1:1)	Hansson, 1990(b) B  Szöcs, 1993(b)
<i>Erannis</i> att.	<i>golda</i> Djakonov <chabanefuyu-edashaku>	Z3,epo6,Z9-18:H	Ando, 1995(a) A
<i>Esakiopteryx</i> <sup>d</sup> att.	<i>volitans</i> Butler <usubenisuji-namishaku>	Z3,Z6,Z9-19:H	Ando, 1993 A
<i>Euchlaena</i> <sup>e</sup> att.	<i>madusaria</i> Walker	Z6,epo9-19:H (9 <i>S</i> ,10 <i>R</i> )-isomer + (9 <i>R</i> ,10 <i>S</i> )-isomer (1:1)	Millar, 1991(a) D
<i>Eufidonia</i> <sup>e</sup> phe.	<i>convergaria</i> Walker	*Z3,Z6,Z9-19:H + *Z3,epo6,Z9-19:H (6 <i>S</i> ,7 <i>R</i> )-isomer (1:1)	Millar, 1990(a) D
<i>Eulithis</i> <sup>d</sup> att.	<i>testata</i> L. <kimadara-namishaku>	Z3,Z6,Z9-20:H or Z3,Z6,Z9-21:H + epoxydienes	Wong, 1985(b) A

<i>Eupithecia</i> <sup>d</sup> <i>abietaria</i> Götze cloaked pug moth phe.	*Z3,Z6,Z9-19:H + *Z3,Z6,epo9-19:H (9 <i>S</i> ,10 <i>R</i> )-isomer (19:1) + other components	Wang, 2015(a)	B
<i>Eupithecia</i> <i>annulata</i> Hulst att.	epoxydienes of Z3,Z6,Z9-20:H + epoxydienes of Z3,Z6,Z9-19:H or Z3,Z6,Z9-21:H  Z3,Z6,epo9-20:H (9 <i>S</i> ,10 <i>R</i> )-isomer	Wong, 1985(b)  Millar, 1991(b)	C
<i>Eupithecia</i> <i>assimilata</i> Doubleday currant pug moth phe.	*Z3,Z6,epo9-21:H (9 <i>S</i> ,10 <i>R</i> )-isomer + other components	Campbell, 2007	C
<i>Eupithecia</i> <i>subnotata</i> Hübner att.	Z3,Z6,Z9-19:H	Szöcs, 1987	C
<i>Eupithecia</i> <i>vulgata</i> Haworth att.	Z9,Z12,Z15-18:Ald + Z3,Z6,epo9-21:H + Δ1,Z3,Z6,epo9-21:H (8:1:1)	Ostrauskas, 2004	C
<i>Hemithea</i> <sup>b</sup> <i>tritonaria</i> Walker <herigurohime-aoshaku> phe.	*Z6,Z9,Z12-18:H  + *(3 <i>E</i> ,6 <i>E</i> )-β-farnesene	Yamakawa, 2009 Yamakawa, 2011(a)	A
<i>Hydriomena</i> <sup>d</sup> <i>furcata</i> Thunbery <yanagi-namishaku> att.	E9-12:OAc	Liska, 1990	A
<i>Hydriomena</i> <i>ruberata</i> Freyer att.	Z11-16:OAc	Frérot, 1987(a)	C
<i>Hypagyrtis</i> <sup>e</sup> <i>piniata</i> att.	Z3,Z6,Z9-19:H + Z3,epo6,Z9-19:H (6 <i>S</i> ,7 <i>R</i> )-isomer (10:1)	Underhill in Arn, 1986(a)	D
<i>Idaea</i> <sup>c</sup> <i>aversata</i> L. <ezoki-himeshaku> phe.	*Z9,Z11-14:OAc + E9,Z11-14:OAc + *Z7,Z9-12:OAc (100:7:10)	Zhu, 1996	B

<i>Idaea</i> (= <i>Sterrha</i> ) <i>biselata</i> Hufnagel <usuki-himeshaku> phe.	E7,Z9-12:OAc  + E7,Z9-12:Ald (1:1)  Z7-12:OAc  *Z7,Z9-12:OAc	Biwer, 1975 Szöcs, 1987  Ando, 1987  Priesner in Arn, 1986(a)  Zhu, 1996	A
<i>Idaea emarginata</i> att.	Z9,Z11-14:OAc + Z7,Z9-12:OAc + Z7,E9-12:OAc (10:10:1)	Zhu, 1996	C
<i>Idaea</i> (= <i>Sterrha</i> ) <i>imbecilla</i> Inoue <oosumonki-himeshaku> att.	Z7-12:OAc	Ando, 1977	A
<i>Idaea</i> (= <i>Sterrha</i> ) <i>rubraria</i> Stgr. att.	E7,Z9-12:OAc	Szöcs, 1987	C
<i>Idaea straminata</i> Borkhausen phe.	*Z7,Z9-12:OAc + *E7,Z9-12:OAc + *Z9,Z11-14:OAc (10:1:10) + another component	Zhu, 1996	C
<i>Idaea trisetata</i> Prout <mijinki-himeshaku> att.	E7,Z9-12:OH	Ando, 1987	A
<i>Idiochlora</i> <sup>b</sup> <i>ussuriaria</i> Bremer <namisujiko-aoshaku> att.	Z6,Z9,Z12-17:H	Yamakawa, 2011(a)	A
<i>Inurois</i> <sup>a</sup> <i>fletcheri</i> Inoue <usuba-fuyushaku> att.	Z3,Z6,Z9,E11-20:H	Yamamoto, 2008	A
<i>Inurois fumosa</i> Inoue <usumon-fuyushaku> att.	epo3,Z6,Z9-21:H	Ando, 1993	A
<i>Inurois membranaria</i> Christoph <kuroten-fuyushaku> att.	epo3,Z6,Z9-21:H	Ando, 1993	A

<i>Itame</i> <sup>e</sup> <i>argillacearia</i> Packard blueberry spanworm phe.	* <i>epo3,Z6,Z9-17:H</i> (3 <i>R</i> ,4 <i>S</i> )-isomer + * <i>Z3,Z6,Z9-17:H</i> (1:1)	Silva, 2013	D
<i>Itame brunneata</i> Thunberg att.	<i>epo3,Z6,Z9-17:H</i> (3 <i>S</i> ,4 <i>R</i> )-isomer	Millar, 1990(c)	D
<i>Itame occiduaria</i> Packard att.	<i>epo3,Z6,Z9-17:H</i> (3 <i>R</i> ,4 <i>S</i> )-isomer + <i>Z3,Z6,Z9-17:H</i> (9:2)	Millar, 1990(c)	D
<i>Jodis</i> <sup>b</sup> <i>lactearia</i> L. <namigatausuki-aoshaku> att.	Z11-14:OAc + Z9,E11-14:OAc  <i>Z3,Z6,Z9,Z12-20:H</i>	Priesner in Arn, 1986(a)  Yamakawa, 2011(a)	A
<i>Lambdina</i> <sup>e</sup> <i>athasaria</i> Walker spring hemlock looper phe.	* <i>Me7-17:H</i> + * <i>Me7,Me11-17:H</i> (1:1) + another component  (7 <i>S</i> )-isomer + 7,11-meso (25:8)	Gries, 1994(b)  Duff, 2001	D
<i>Lambdina fiscellaria</i> <i>fiscellaria</i> Guenée eastern hemlock looper phe.	* <i>Me5,Me11-17:H</i> + * <i>Me2,Me5-17:H</i> (1:1) + other components  <i>Me5,Me11-17:H</i> (5 <i>R</i> ,11 <i>S</i> )-isomer  <i>Me2,Me5-17:H</i> (5 <i>R</i> )-isomer	Gries, 1991  Li, 1993(a) Silk in Arn, 1997  Silk in Arn, 1997	D
<i>Lambdina fiscellaria</i> <i>lugubrosa</i> Hulst western hemlock looper phe.	* <i>Me5,Me11-17:H</i> + * <i>Me2,Me5-17:H</i> + * <i>Me7-17:H</i> (1:1:1)  <i>Me5,Me11-17:H</i> + <i>Me2,Me5-17:H</i> (1:1)  <i>Me5,Me11-17:H</i> (5 <i>R</i> ,11 <i>S</i> )-isomer  + <i>Me2,Me5-17:H</i> (5 <i>S</i> )-isomer	Gries, 1993(b)  Evenden, 1995  Li, 1993(a)  Li, 1993(b)	D

	+ Me7-17:H (7S)-isomer		
<i>Lambdina pellucidaria</i> Grote & Robinson pitch pine looper phe.	*Me7-17:H + *Me7,Me11-17:H (1:1) + another component	Maier, 1998	D
	(7S)-isomer + 7,11-meso (25:8)	Duff, 2001	
<i>Leptostales<sup>c</sup> ferruminaria</i> Packard att.	Z9,Z11-14:Ald + Z9,Z11-14:OH (10:1)	Reed, 1985(b)	D
<i>Lobophora<sup>d</sup> nivigerata</i> Walker phe.	Z3,Z6,Z9-21:H + Z6,Z9-21:H (19:1)	Underhill in Arn, 1986(a)	C
	*Z3,Z6,Z9-21:H + Z6,Z9-21:H (19-4:1)	Millar, 1992(a)	
<i>Lomographa<sup>e</sup> semiclarata</i> Walker phe.	*Z3,Z6,Z9-17:H	Millar, 1990(b)	C
<i>Lycia<sup>e</sup> ursaria</i> Walker att.	epo3,Z6,Z9-19:H (3S,4R)-isomer + Z3,Z6,Z9-19:H	Millar, 1990(c)	C
<i>Maxates<sup>b</sup> versicausa</i> <i>microptera</i> Inoue <sakishimatsubame-aoshaku> phe.	*Z6,Z9,Z12-20:H E	Yamakawa, 2009; 2011(a)	A
<i>Menophra<sup>e</sup> (= Hemerophila)</i> <i>atrilineata</i> Butler mulberry looper <kuwa-edashaku> phe.	*Z3,Z6,epo9-18:H + *Z6,epo9-18:H (10:1) (9S,10R)-isomer	Tan, 1996 Pu, 1999	A
<i>Menophra senilis</i> Butler <usukumo-edashaku> att.	epo6,Z9-19:H	Ando, 1995(a)	A
<i>Mesoleuca<sup>d</sup> ruficillata</i> Guenée att.	Z3,Z6,Z9-21:H + Z3,Z6,Z9-22:H (4:1)  + Z3,Z6,Z9-20:H	Wong, 1985(b)  Millar, 1991(c)	C



	+ Z3,epo6,Z9-21:H (5:50:1) (6R,7S)-isomer		
<i>Metanema</i> <sup>e</sup> <i>inatomaria</i> Guenée att.	Z3,Z6,epo9-19:H + Z3,Z6,epo9-20:H (4:1) (9R,10S)-isomers or + Z3,Z6,Z9,E11-19:H (4:1)	Wong, 1985(b)	D
<i>Milionia</i> <sup>e</sup> <i>basalis pryeri</i> Druce <kiobi-edashaku> phe.	*epo3,Z6,Z9-19:H (3S,4R)-isomer	Yasui, 2005	A
<i>Mnesampela</i> <sup>e</sup> <i>privata</i> Guenée autumn gum moth phe.	*Z3,Z6,Z9-19:H + *Z3,Z6,Z9-21:H (16:1)	Steinbauer, 2004 Walker, 2009	D
<i>Naxa seriaria</i> Motschulsky dotted white geometrid <hoshishaku> phe.	*Z3,Z6,Z9,Z12,Z15-21:H	Lee, 2020	A
<i>Nepytia</i> <sup>e</sup> <i>freemani</i> Munroe western false hemlock looper phe.	*Me3,Me13-17:H (3S,13R)-isomer	Gries, 1993(c) King, 1995	D
<i>Operophtera</i> <sup>d</sup> <i>bruceata</i> Hulst Bruce spanworm phe.	Δ1,Z3,Z6,Z9-19:H *Δ1,Z3,Z6,Z9-19:H	Roelofs, 1982(b) Underhill, 1987(a)	C
<i>Operophtera brumata</i> L. winter moth phe.	*Δ1,Z3,Z6,Z9-19:H	Roelofs, 1982(b) Bestmann, 1982(c) Albert, 1984 Knauf, 1984	C
<i>Operophtera fagata</i> Scharf. northern winter moth phe.	*Z6,Z9-19:H + *Δ1,Z3,Z6,Z9-19:H (10:1) + other components	Szöcs, 2004	C
<i>Operophtera occidentalis</i> att.	Δ1,Z3,Z6,Z9-19:H	Roelofs, 1982(b)	C
<i>Operophtera rectipostmediana</i> Inoue <ichimojifuyu-namishaku> att.	Δ1,Z3,Z6,Z9-19:H	Yamamoto, 2008	A

<i>Operophtera relegata</i> Prout <kuroobifuyu-namishaku> att.	Z3,epo6,Z9-19:H or Z3,Z6,epo9-19:H or epo3,Z6,Z9-19:H	Ando, 1993	A
	Z3,Z6,epo9-19:H (9S,10R):(9R,10S) = 1:1	Qin, 1997	
<i>Ourapteryx</i> <sup>e</sup> <i>sambucaria</i> L. att.	Z3,Z6,Z9-19:H	Subchev, 1986(a)	C
<i>Pachyerannis</i> <sup>e</sup> <i>obliquaria</i> Motschulsky <kurosujifuyu-edashaku> att.	epo3,Z6,Z9-19:H (3R,4S)-isomer	Qin, 1997	A
<i>Pachyligia</i> <sup>e</sup> <i>dolosa</i> Butler <atojiro-edashaku> att.	Z3,Z6,epo9-21:H or Z3,epo6,Z9-21:H	Ando, 1993	A
<i>Pachyodes</i> <sup>b</sup> <i>superans</i> Butler <oo-aoshaku> att.	Z3,Z6,Z9-20:H	Ando, 1993	A
<i>Paleacrita</i> <sup>e</sup> <i>vernata</i> Peck spring cankerworm phe.	*Z3,Z6,Z9-20:H + *Z3,Z6,Z9-19:H + *Z6,Z9-19:H (8:2:1)	Underhill in Arn, 1986(a) Millar, 1990(d)	D
<i>Pamphlebia</i> <sup>b</sup> <i>rubrolimbraria</i> <i>rubrolimbraria</i> Guenée <herigurotogari-aoshaku> phe.	*Z6,Z9,Z12-18:H + other components E	Yamakawa, 2009; 2011(a)	A
<i>Peribatodes</i> <sup>e</sup> <i>rhomboidaria</i> Denis & Schiffermüller phe.	*Z3,Z6,Z9-19:H + *Z6,Z9-19:3-one (5:1) (1:1-1:4)	Buser, 1985 Tóth, 1987	C
<i>Perizoma</i> <sup>d</sup> <i>grandis</i> Hulst att.	E11-14:Ald	Daterman, 1977	C

<i>Plagodis</i> <sup>e</sup> <i>alcoolaria</i> Guenée att.	Z3,Z6,Z9-20:H + Z3,epo6,Z9-20:H (6 <i>R</i> ,7 <i>S</i> )-isomer (1:1)	Millar, 1991(c)	C
<i>Probole</i> <sup>e</sup> <i>alienaria</i> Herrich-Schäffer att.	Z3,epo6,Z9-19:H (6 <i>R</i> ,7 <i>S</i> ):(6 <i>S</i> ,7 <i>R</i> ) = 1:1	Landolt, 1996	D
<i>Probole</i> <i>amicaria</i> Herrich-Schäffer phe.	*epo3,Z6,Z9-19:H (3 <i>S</i> ,4 <i>R</i> )-isomer + Z3,epo6,Z9-19:H (6 <i>R</i> ,7 <i>S</i> )-isomer + *Z3,Z6,Z9-19:H (9:1:8)	Millar, 1990(b); (c)	D
<i>Prochoerodes</i> <sup>e</sup> <i>transversata</i> Drury large maple spanworm att.	Z3,Z6,epo9-19:H (9 <i>S</i> ,10 <i>R</i> )-isomer + Z3,Z6,Z9-19:H (4:1)	Wong, 1985(b)	D
<i>Pseudocoremia</i> <sup>e</sup> <i>fenerata</i> Felder & Rogenhofer att.	Z6,epo9-19:H	Gibb, 2006(b)	D
<i>Pseudocoremia</i> <i>leucelaea</i> Meyrick att.	Z6,epo9-19:H	Gibb, 2006(b)	D
<i>Pseudocoremia</i> <i>suavis</i> Butler common forest looper phe.	*Z3,Z6,epo9-19:H + other components	Gibb, 2006(b)	D
<i>Rhynchobapta</i> <sup>e</sup> <i>cervinaria</i> <i>bilineata</i> Leech <futasujio-edashaku> att.	Z6,Z9-17:H	Ando, 1995(a)	A
<i>Sabulodes</i> <sup>e</sup> <i>caberata</i> Guenée omnivorous looper phe.	*Z6,Z9-19:H + other components	McDonough, 1986	D
<i>Scopula</i> <sup>c</sup> <i>personata</i> Prout <namisujichibi-himeshaku> att.	Z9,E11-14:OAc	Nagano, 1979	A
<i>Semiothisa</i> <sup>e</sup> <i>bicolorata</i> F.	Z3,Z6,Z9-17:H	Millar, 1987	C

	att.	+ Z3,epo6,Z9-17:H (10:1)		
<i>Semiothisa cineraria</i> Bremer & Grey		*epo3,Z6,Z9-17:H	Li, 1993(c)	C
scholar tree looper		+ *Z3,Z6,Z9-17:H (6:1)		
phe.		(3R,4S)-isomer	Kong, 2012(b)	
<i>Semiothisa</i> (= <i>Chiasmia</i> ) <i>clathrata</i> L.		*epo3,Z6,Z9-17:H	Tóth, 1991(a); 1994(a)	A
<himeamime-edashaku>		(3R,4S)-isomer		
phe.		+ *Z3,Z6,Z9-17:H (3:1)		
<i>Semiothisa delectata</i> Hulst		Z3,epo6,Z9-17:H	Millar, 1987	C
att.		+ Z3,Z6,Z9-17:H (10:1)		
<i>Semiothisa marmorata</i> Ferguson		epo3,Z6,Z9-17:H	Gries, 1993(a)	C
att.		(3R,4S)-isomer		
		+ Z3,Z6,Z9-17:H (9:1–1:1)		
<i>Semiothisa neptaria</i> Guenée		*Z3,Z6,Z9-17:H N	Millar, 1987	C
phe.		epo3,Z6,Z9-17:H	Gries, 1993(a)	
		(3R,4S):(3S,4R) = 2:1		
<i>Semiothisa sexmaculata</i> Packard		*epo3,Z6,Z9-17:H	Gries, 1993(a)	C
phe.		(3R,4S)-isomer		
<i>Semiothisa signaria</i>		*epo3,Z6,Z9-17:H	Millar, 1987	C
<i>dispuncta</i> Walker		+ *Z3,Z6,Z9-17:H (10:1)		
phe.		or		
		epo3,Z6,Z9-18:H		
		+ Z3,Z6,Z9-18:H (9:1)		
<i>Semiothisa ulsterata</i> Pearsall		Z3,epo6,Z9-17:H	Millar, 1987	C
att.		(6S,7R)-isomer	Millar, 1990(c)	
<i>Sibatania</i> <sup>d</sup> <i>mactata</i>		Z3,Z6,Z9-21:H	Ando, 1993	A
Felder & Rogenhofer				
<birodo-namishaku>				
att.				
<i>Sicya</i> <sup>e</sup> <i>macularia</i> Harris		epo3,Z6,Z9-19:H	Millar, 1990(b), (c)	D
att.		(3S,4R)-isomer		
		+ Z3,Z6,Z9-19:H (9:1)		

<i>Synaxis</i> <sup>e</sup> <i>jubararia</i> Hulst att.	Z3,Z6,Z9-19:H + Z3,Z6,epo9-19:H (4:1-1:1)	Wong, 1985(b)	D
<i>Synegia</i> <sup>e</sup> <i>esther</i> Butler <kurohaguruma-edashaku> att.	Z6,Z9-21:H	Ando, 1995(a)	A
<i>Tephrina</i> <sup>e</sup> <i>arenacearia</i> Hübner phe.	*epo3,Z6,Z9-17:H (3 <i>S</i> ,4 <i>R</i> )-isomer + Z3,epo6,Z9-17:H	Tóth, 1991(a); 1994(a) C	
<i>Thalassodes</i> <sup>b</sup> <i>immissaria</i> <i>intaminata</i> Inoue <sazanamishiro-aoshaku> phe.	*Z3,Z6,Z9,Z12-20:H	Yamakawa, 2009	A
<i>Theria</i> <sup>e</sup> <i>rupicapraria</i> phe.	*Z6,Z9-20:H + *Z6,Z9-21:H N + other components	Szöcs in Arn, 1997	D
<i>Trichopteryx</i> <sup>d</sup> <i>carpinata</i> Borkhausen att.	Z6,Z9-19:H	Oleander, 2019	C
<i>Trichopteryx</i> <i>polycommata</i> Denis & Schiffermüller barred tooth striped moth <hanenagakobane-namishaku> phe.	*Z6,Z9-19:H	Oleander, 2019	B
<i>Triphosa</i> <sup>d</sup> <i>haesitata</i> <i>affirmata</i> Guenée att.	Z9,Z12,Z15-18:OAc + Z3,Z6,Z9-20:H (1:20) or + Z3,Z6,Z9-21:H (1:20)	Wong, 1985(b)	C
<i>Wilemania</i> <sup>e</sup> <i>nitobei</i> Nitobe <nitobe-edashaku> att.	Z3,Z6,Z9,E11-19:H	Yamamoto, 2008	A
<i>Xanthorhoe</i> <sup>d</sup> <i>abrasaria aquilonaria</i> Herrich-Schiffermüller att.	Z3,Z6,Z9-21:H + its epoxydienes (4:1)  Z3,epo6,Z9-21:H (6 <i>S</i> ,7 <i>R</i> )-isomer + Z3,Z6,epo9-21:H (9 <i>S</i> ,10 <i>R</i> )-isomer	Wong, 1985(b)  Millar, 1991(c)	C

		(10:1)		
<i>Xanthorhoe ferrugata</i> Clerck <i>att.</i>	Z3,epo6,Z9-21:H (6 <i>S</i> ,7 <i>R</i> )-isomer		Millar, 1991(c)	C
<i>Xanthorhoe iduata</i> Guenée <i>att.</i>	Z3,Z6,Z9-21:H + its epoxydienes (1:1)		Wong, 1985(b)	C
<i>Xanthorhoe munitata</i> Hübner <i>att.</i>	epoxydienes of Z3,Z6,Z9-21:H		Wong, 1985(b)	C
	Z3,epo6,Z9-21:H (6 <i>S</i> ,7 <i>R</i> )-isomer + Z3,Z6,Z9-21:H (10:1)		Millar, 1991(c)	
<i>Xanthotype</i> <sup>e</sup> <i>sospeta</i> Drury <i>att.</i>	Z6,epo9-19:H (9 <i>S</i> ,10 <i>R</i> )-isomer		Millar, 1991(a)	D
<i>Zethenia</i> <sup>e</sup> <i>albonotaria</i> <i>nesiotis</i> Wehrlic <monshirotsamakiri-edashaku> <i>att.</i>	epo3,Z6,Z9-19:H (3 <i>S</i> ,4 <i>R</i> )-isomer		Qin, 1997	A

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(Uraniidae) ツバメガ科

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<i>Epilema moza</i> Butler <kurohoshi-futao> <i>att.</i>	E11-16:OAc		Ando, 1975	A
<i>Epilema plaqifera</i> Butler <kuroobishiro-futao> <i>att.</i>	E9-14:OH		Ando, 1977	A

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(29) [Bombycoidea] カイコガ上科  
(Endromidae)

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<i>Andraca bipunctata</i> Walker tea cluster caterpillar <i>phe.</i>	*E11,E14-18:Ald + other components		Ho, 1996	D
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(Bombycidae) カイコガ科

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<i>Bombyx mandarina</i> Moore <kuwako> phe.	*E10,Z12-16:OH  + another component  *E3,Z13-18:OH	Kuwahara, 1979 Daimon, 2012(b)  Kuwahara, 1984  Gao in Arn, 1997	A
<i>Bombyx mori</i> L. silkworm moth <kaiko> phe.	*E10,Z12-16:OH  + *E10,Z12-16:Ald  + another component	Butenandt, 1959; 1961 A  Kaissling, 1978 Kasang, 1978(a)  Kasang, 1978 (b)	
<i>Rondotia menciata</i> Moore mulberry white caterpillar phe.	*E10,Z12-16:OAc	Dai, 1988	D
<i>Trilocha varians</i> Walker <ichijikukasan> phe.	*E10,Z12-16:Ald + *E10,Z12-16:OAc (5:2)	Daimon, 2012(a)	D

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(Saturniidae = Attacidae) ヤママユガ科

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<i>Actias luna</i> L. luna moth phe.	*E6,Z11-18:Ald + *E6-18:Ald (4:1) + another component	Millar, 2016	C
<i>Antheraea pernyi</i> Guérin-Méneville <saku-san> phe.	E6,Z11-16:OAc E E6,Z11-16:Ald E  *E6,Z11-16:Ald + *E6,Z11-16:OAc + *E4,Z9-14:OAc (5:1:2) E + other components	Kaissling in Arn, 1986(a)  Bestmann, 1987	A
<i>Antheraea polyphemus</i> Cramer phe.	*E6,Z11-16:OAc + *E6,Z11-16:Ald (9:1)	Kochansky, 1975(b)	C
<i>Callosamia promethea</i> Drury promethea moth phe.	*E4,E6,Z11,Z13-16:Ald	Gago, 2013	D

<i>Coloradia pandora pandora</i> Blake pandora moth phe.	*E10,Z12-16:Ald + *E10,Z12-16:OAc + *E10,E12-16:OAc (10:5:1) + other components	McElfresh, 2000	D
<i>Coloradia velda</i> Johnson & Walter common sheep moth phe.	*E10,Z12-16:OAc + *E10,E12-16:OAc + *E10,Z12-16:OH (10:1:0.33) + other components	McElfresh, 1999(c)	D
<i>Graellsia isabellae</i> Spanish moon moth phe.	*E4,E6,Z11-16:Ald	Millar, 2010	D
<i>Hemileuca burnsi</i> Watson phe.	E10,Z12-16:OAc + E10,Z12-16:OH + E10,Z12-16:Ald + other components	McElfresh, 1999(d)	D
	*E10,Z12-16:OAc + *E10,Z12-16:OH + *E10,Z12-16:Ald + *E10,E12-16:OAc + *16:OAc (100:14:0.4:23:232)	McElfresh, 2008	
<i>Hemileuca eglanterina</i> Boisduval common sheep moth phe.	*E10,Z12-16:OAc + *E10,Z12-16:OH + *E10,Z12-16:Ald (100:10:1) + other components	McElfresh, 1999(a)	D
<i>Hemileuca electra electra</i> Wright phe.	*E10,Z12-16:OAc (main) + *E10,Z12-16:OH + *E10,Z12-16:Ald + other components	McElfresh, 1999(d)	D
<i>Hemileuca electra mojavensis</i> Tuskes & McElfresh phe.	*E10,Z12-16:OAc (main) + *E10,Z12-16:OH + *E10,Z12-16:Ald + other components	McElfresh, 1999(d)	D
<i>Hemileuca maia</i> Drury buck moth phe.	*E10,Z12-16:Ald + *E10,Z12-16:OH + *E10,Z12-16:OAc (20:5:2) + other components	McElfresh, 2001(b)	D
<i>Hemileuca nevadensis</i> Strecker	*E10,Z12-16:Ald	McElfresh, 2024	D



Nevada buckmoth phe.	+ other components		
<i>Hemileuca nuttalli</i> Strecker Nuttall's sheep moth phe.	*E10,Z12-16:OAc + *E10,E12-16:OAc (2:1-1:2) + other components	McElfresh, 1999(b)	D
<i>Loepa sakaei</i> Inoue <haguruma-yamamayu> phe.	*E4,Z9-14:OAc	Yan, 2015(a)	A
<i>Lonomia obliqua</i> Walker phe.	*E11-16:OAc + *E11-16:OH (20:7)	Zarbin, 2007	D
<i>Nudaurelia cytherea cytherea</i> F. pine tree emperor moth phe.	*Z5-10:OisoVa	Henderson, 1972; 1973	D
<i>Rhodinia fugax</i> Butler pellucid silk moth <usutabiga> phe.	*E6,Z11-16:Ald	Yan, 2015(a)	A
<i>Samia cynthia ricini</i> Donovan eri-silkworm moth <eri-san, hima-san> phe.	*E4,E6,Z11-16:OAc (major) + *E4,E6,Z11-16:Ald N	Bestmann, 1989	A
<i>Saturnia albofasciata</i> Johnson phe.	*E4,Z9-14:Ald + another component	McElfresh, 2001(a)	C
<i>Saturnia mendocino</i> Behrens phe.	*E4,Z9-14:Ald + another component	McElfresh, 2001(a)	C
<i>Saturnia</i> (= <i>Eudia</i> ) <i>pavonia</i> att.	Z6,Z11-16:OAc	Bestmann, 1982(d)	C
<i>Saturnia walterorum</i> Hogue & Johnson phe.	*E4,Z9-14:Ald + another component	McElfresh, 2001(a)	C

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(Sphingidae) スズメガ科

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<i>Agrius convolvuli</i> L. sweetpotato hornworm	*E11,E13-16:Ald	Wakamura, 1996(a)	A
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<ebigara-suzume> phe.				
<i>Amphion floridensis</i> Clark att.	E10,Z12-16:Ald		Landolt, 1989(a)	D
<i>Deilephila elpenor</i> L. elephant hawk-moth phe.	*E11-16:Ald + *E10,E12-16:Ald	N	Bestmann, 1992(b)	B
<i>Deilephila elpenor lewisii</i> Butler <beni-suzume> phe.	*E11-16:Ald + *E10,E12-16:Ald	(17:3)	Uehara, 2012	A
<i>Deilephila porcellus</i> att.	E10,E12-16:Ald		Priesner in Arn, 1986(a)	C
<i>Dolbina tancrei</i> Staudinger <sazanami-suzume> phe.	*E9,Z11-15:Ald + *Z9,Z11-15:Ald	(9:1)	Uehara, 2013	A
<i>Hemaris affinis</i> Bremer <kurosukiba-houjaku> phe.	*Z11-16:Ald + *E10,E12-16:Ald + *E10,Z12-16:Ald	(9:7:4)	Uehara, 2015	A
<i>Hemaris diffinis</i> Boisduval att.	Z10,E12-16:Ald		Reed, 1987	C
<i>Hemaris fuciformis</i> L. att.	Z10,E12-16:Ald		Priesner in Arn, 1986(a)	C
<i>Hippotion celerio</i> L. silver-striped hawk-moth phe.	*E10,E12-16:Ald	N	Bestmann, 1992(b)	C
<i>Hyles gallii</i> Rottenburg <ibuki-suzume> att.	E10,E12-16:Ald E10,Z12-16:Ald	E E	Reed, 1987	A
<i>Hyloicus pinastri</i> L. <matsukuro-suzume> att.	E10,E12-16:Ald E10,Z12-16:Ald	E E	Priesner in Arn, 1986(a)	A
<i>Manduca sexta</i> L. tobacco hornworm moth phe.	*E10,Z12-16:Ald + *E10,E12,Z14-16:Ald	(2:1)	Starratt, 1979 Tumlinson, 1989;	D

	+ other components	1994	
<i>Neogurelca himachala</i> <i>sangaica</i> Butler <hoshihime-houjaku> phe.	E10,Z12-16:Ald  *E10,Z12-16:Ald	Daimon, 2012(b) Uehara, 2015  Uehara, 2016	A
<i>Pachysphinx modesta</i> Harris att.	Z10,E12-16:OAc	Reed, 1987	D
<i>Proserpinus flavofasciata</i> Walker att.	E10,E12-16:Ald	Reed, 1987	D
<i>Smerinthus cerisyi</i> Kirby att.	Z10,E12-16:OAc + Z10,E12-16:Ald (10:1)	Reed, 1987	C
<i>Smerinthus jamaicensis</i> Drury att.	Z10,E12-16:Ald + Z10,Z12-16:Ald (10:1)	Reed, 1987	C
<i>Smerinthus tokyonis</i> Matsumura <kouchi-suzume> phe.	*Z10,Z12-16:OAc + *E10,Z12-16:OAc + *Z10,E12-16:OAc [87:7:6]	Kosaki, 2021	A
<i>Sphinx drupiferarum</i> J. E. Smith phe.	*E10,Z12-16:Ald N	Reed, 1987	C
<i>Theretra japonica</i> Boisduval <ko-suzume> att.	E10,Z12-16:Ald	Uehara, 2015	A
<i>Theretra oldenlandiae</i> <i>oldenlandiae</i> F. <sesuji-suzume> phe.	*E10,Z12-16:Ald + *E10,E12-16:Ald + *E11-16:Ald (4:3:3)	Uehara, 2012	A

(30) [Noctuoidea] ヤガ上科  
(Notodontidae) シヤチホコガ科

<i>Heterocampa guttivitta</i> Walker saddled prominent moth phe.	*≡11,Z13-16:Ald + *≡11-16:Ald (9:1) + another component	Silk, 2000	C
<i>Micromelalopha siversi</i> Staudinger phe.	*Z13,E15-18:Ald + other component	Liu, 2019; 2021	C

<i>Notodonta dromedarius</i> phe.	*Z11,Z13-16:Ald + other components	Bestmann, 1993(a)	C
<i>Notodonta torva</i> Hübner <tobimadara-shachihoko> phe.	*Z11,Z13-16:OAc + other components	Bestmann, 1991	B
<i>Schizura semirufescens</i> att.	Z7-12:OH	Roelofs, 1971(a)	D
<i>Thaumetopoea bonjeani</i> Powell phe.	*Z11,Z13-16:Ald + *Z11,Z13-16:OH (9:1)	Frérot, 1990	D
<i>Thaumetopoea jordana</i> Stgr. phe.	*≡11,Z13-16:OH + *≡11,Z13-16:Ald + *≡11,Z13-16:OAc [5:4:1] N	Frerot, 1993(c)	D
<i>Thaumetopoea pinivora</i> Treischke phe.	Z11,Z13-16:Ald + Z11,Z13-16:OH (9:1)	Frérot, 1990	D
	*Z11,Z13-16:OH + *Z11,Z13-16:Ald [4:1] N	Frerot, 1993(c)	
<i>Thaumetopoea pityocampa</i> Denis & Schiffermüller processionary moth phe.	*≡11,Z13-16:OAc	Guerrero, 1981 Einhorn, 1983 Quero, 1997	D
	≡11,Z13-16:OAc	Cuevas, 1983 Tiberi, 1984	
	≡11-16:OAc	Quero, 1995	
<i>Thaumetopoea processionea</i> L. oak processionary moth phe.	≡11,Z13-16:OAc	Tiberi, 1984	D
	*Z11,Z13-16:OAc + *Z11,Z13-16:OH [19:1] N	Frerot, 1993(c)	
	*Z11,Z13-16:OAc + other components	Quero, 2003 Breuer, 2003	
	+ *Z11,E13,Δ15-16:OAc (1:1)	Gries, 2004	
<i>Thaumetopoea solitaria</i> Fr. phe.	*Z13,Z15-18:Ald N	Frerot, 1993(c)	D
<i>Thaumetopoea wilkinsoni</i> Tams.	≡11,Z13-16:OAc	Halperin, 1982	D

phe.

\*=11,Z13-16:OAc N

Frerot, 1993(c)

(Noctuidae) ヤガ科  
(Noctuidae; Dilobinae) ヤガ科;

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<i>Diloba caeruleocephala</i> L. figure-of-eight moth att.	Z8-13:OAc	Subchev, 2000(b)	D
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(Noctuidae; Acronictinae) ヤガ科 ; ケンモンヤガ亜科

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<i>Acronicta grisea</i> Walker att.	Z7-12:OAc + Z9-12:OAc (1:1)	Steck, 1977(a)	C
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<i>Acronicta sperata</i> Grote dagger moth att.	Z7-12:OAc + Z7-12:Ald (9:1)	Underhill, 1977(a)	C
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<i>Acronicta tridens</i> att.	Z9-14:Ald	Tóth in Arn, 1986(a)	C
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<i>Raphia frater</i> Grote att.	Z7-12:OH + Z7-12:OAc	Weatherston, 1974(a) McLeod, 1982	D
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<i>Simyra henrici</i> Grote att.	Z7-14:Ald	Steck, 1982(a)	C
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(Noctuidae; Heliothinae) ヤガ科 ; タバコガ亜科

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<i>Helicoverpa</i> (=Heliopsis) <i>armigera</i> Hübner old world bollworm cotton bollworm <oo-tabakoga> phe.	*Z11-16:Ald + Z11-14:Ald (1:1) + Z9-14:Ald (100:1–100:5) + Z9-16:Ald (25:1) (10:1)	Piccardi, 1977 Gothilf, 1978 Rothschild, 1978 Kehat, 1980 Buleza	A
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		in Arn, 1992	
	+ *Z11-14:Ald (1:3) + other components	Konjuchoy, 1983	
	+ *Z9-16:Ald (20:1-97:3) + other components	Nesbitt, 1979(b); 1980(b) Dunkelblum, 1980 Kehat, 1990	
	+ *Z9-16:Ald + *Z9-14:Ald (98.3:1.4:0.3) + other components	Zhang, 2012	
<i>Helicoverpa (=Heliothis)</i>			A
<i>assulta</i> Guenée			
oriental tobacco budworm			
<tabakoga>			
phe.			
Japan strain	*Z9-16:Ald + *Z9-16:OAc + *Z11-16:Ald + *16:Ald (100:15:3:8) + other components	Sugie, 1991(b)	
Korea strain	+ *Z11-16:OAc (100:30:5:1.5) + other components	Cork, 1992 Park, 1996	
	Z9-16:Ald + Z11-16:Ald (25:1)	Park, 1994	
Thailand strain	+ Z9-16:OAc (7:5:1)	Cork, 1992	
China strain	Z9-16:Ald + Z11-16:Ald (20:1)	Cork, 1992	
	(100:9.5)	Cai in Arn, 1997	
<i>Helicoverpa gelatopoen</i> Dyar	*16:Ald + *Z9-16:Ald (1:1) + another component	Cork, 2003	C
phe.			
<i>Helicoverpa (=Heliothis)</i>			
<i>punctigera</i> Wallengren			
Australian bollworm			
phe.	Z11-16:Ald + Z11-16:OAc + Z9-14:Ald (50:50:1)	Rothschild, 1978	C

	*Z11-16:Ald + *Z11-16:OAc + Z9-14:Ald (20:20:1) + other components	Rothschild, 1982	
<i>Helicoverpa</i> (= <i>Heliothis</i> ) <i>zea</i> Boddie corn earworm phe.	Z9-14:OFo E  *Z11-16:Ald  + *Z9-16:Ald (65:1–40:1) + other components  + *Z11-16:OH + *16:Ald N  + Z9-16:Ald + Z7-16:Ald + 16:Ald (87:3:2:8)	Priesner, 1975  Roelofs, 1974(c)  Klun, 1979(b); 1980(b) Pope, 1984 Teal, 1984  Descoins, 1988  Lopez, 1990	C
<i>Heliothis belladonna</i> Henry & Edwards att.	Z11-16:Ald + Z9-16:Ald + Z7-16:Ald + 16:Ald	Landolt in Pherobase	C
<i>Heliothis maritima</i> Graslin fulvous clover moth phe.	*Z11-16:Ald + other components E  + *Z11-16:OH + *16:Ald (100:5:6)	Kovalev, 1991  Szöcs, 1993(a)	B
<i>Heliothis maritime adaucta</i> Butler flax budworm <tsumekusaga> phe.	*Z11-16:Ald + *Z11-16:OH (100:1) + another component	Kakizaki, 2003	A
<i>Heliothis ononis</i> Denis & Schiffermüller att.	Z11-16:Ald	Steck, 1982(a)	C
<i>Heliothis peltigera</i> Denis & Schiffermüller phe.	Z11-16:Ald + Z9-14:Ald (16:1)  *Z11-16:Ald + *Z9-14:Ald + *Z11-16:OH (10:5:3)	Nesbitt, 1979(b)  Dunkelblum, 1989	C

	+ other components		
<i>Heliothis phloxiphaga</i> Grote & Robinson phe.	*Z11-16:Ald + *Z11-16:OH + *Z9-16:Ald (482:15:3)	Raina, 1986(b)	C
<i>Heliothis subflexa</i> Guenée phe.	*Z11-16:Ald + *Z9-16:Ald + *Z7-16:OAc + *Z9-16:OAc + *Z11-16:OAc (41:15:3:6:26) + other components  + *Z11-16:OH + *Z11-16:OAc (10:5:1:1) wind tunnel  + other components	Teal, 1981 Klun, 1982  Vickers, 2002  Nojima, 2018	C
<i>Heliothis virescens</i> F. tobacco budworm phe.	*Z11-16:Ald + *Z9-14:Ald (16:1)  (15:1)  + other components  + Z11-16:OH (15:1:0.04)  + *Z11-16:OH (100:5:1)  Z9-14:OFo + Z9-14:Ald (32:1-16:1)	Roelofs, 1974(c) Tumlinson, 1975  Hendricks, 1989  Klun, 1979(b); 1980(c) Pope, 1982 Vetter, 1983 Ramaswamy, 1985 Teal, 1986  Shaver, 1989  Groot, 2018  Mitchell, 1978	C
<i>Protoschinia scutosa</i> Denis & Schiffermüller <yomogiga> att.	Z11-16:OH  + Z7-12:OAc + Z9-14:OAc (1:3:1)	Konstantin in Arn, 1986(a)  Li, 1993(d)	A
<i>Pyrrhia umbra</i> Hufnagel	Z11-16:OAc	Stan, 1992	A



<ki-tabakoga>  
att.

<i>Schinia bina</i> Guenée att.	Z11-16:OAc + Z11-16:Ald (7:3)	Underhill, 1977(a)	D
<i>Schinia meadi</i> Grote att.	Z11-16:Ald	Steck, 1982(a)	D
<i>Schinia sueta</i> Grote att.	Z9-14:OAc + Z11-16:OAc + Z11-16:OH	Byers, 1987	D

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(Noctuidae; Noctuinae) ヤガ科 ; モンヤガ亜科

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<i>Abagrotis placida</i> att.	Z7-14:OAc + Z11-14:OAc (10000:1)	Steck, 1982(b)	D
<i>Actebia</i> (= <i>Ochropleura</i> ) <i>fennica</i> Tauscher black army cutworm <atousu-yaga> phe.	Z11-14:OAc + Z7-12:OAc (1:1)  *Z11-14:OAc + *Z7-12:OAc (20:1) + other components	Steck, 1979(c)  Struble, 1989	A
<i>Agrotis clavis</i> Hufnagel att.	Z11-14:OAc  Z5-10:OAc	Hrdý, 1979  Tóth, 1992(c)	C
<i>Agrotis collaris</i> Wallengren att.	Z7-14:OAc + Z5-14:OAc (20:1)	Steck in Arn, 1986(a)	C
<i>Agrotis confuse</i> Stephens att.	Z7-12:OAc	Il'icheva in Arn, 1992	C
<i>Agrotis</i> (= <i>Scotia</i> ) <i>crassa</i> Hübner att.	Z7-12:OAc + Z9-12:OAc (1:1)	Szöcs, 1981	C
<i>Agrotis</i> (= <i>Scotia</i> ) <i>exclamationis</i> L. heart-and-dart moth <senmon-yaga> phe.	*Z5-14:OAc + *Z9-14:OAc (19:1)  (9:1)  (20:3)	Bestmann, 1980  Vrkoc, 1983  Priesner, 1985(b)	B

	(25:4)	Grodner, 2018	
	+ other components	Lebedeva, 2000(b)	
<i>Agrotis fucosa</i> Butler (= <i>segetum</i> ?) common cutworm moth <kabura-yaga> phe.	*Z5-10:OAc + *Z7-10:OAc (1:9)	Wakamura, 1978; 1980	A
<i>Agrotis ipsilon</i> Hufnagel black cutworm <tamana-yaga> phe.	Z7-12:OAc  *Z7-12:OAc + *Z9-14:OAc (3:1)  + Z11-16:OAc (3:4:2)  (3:1:15)  + Z11-16:OH + 16:OAc (8:4:4:1:2)	Steck, 1979(c)  Hill, 1979(b)  Causse in Arn, 1986(a)  Wakamura, 1986(a)  Buleza, 1991	A
European strain	+*Z11-16:OAc + other components	Picimbon, 1997	
American strain other strains	+*Z11-16:OAc (3:1:6)	Gemeno, 1998; 2000	
<i>Agrotis obliqua</i> Smith att.	Z5-14:OAc	Steck, 1982(a)	C
<i>Agrotis orthogonia</i> Morrison pale western cutworm att.	Z7-12:OAc + Z5-12:OAc (2:1)	Struble, 1978(a)	C
<i>Agrotis</i> (= <i>Scotia</i> ) <i>segetum</i> Denis & Schiffermüller turnip moth white-line dart moth phe.	*Z5-10:OAc  + *Z9-16:OAc  *Z7-12:OAc + *Z9-14:OAc (4:1-1:1)  *Z7-12:OAc	Bestmann, 1978(a)  Voronkova in Arn, 1992  Tóth, 1980  Arn, 1980	B?

	+ *Z5-10:OAc (2:1) + other components		
	+ Z9-14:OAc (1:1:1)	Arn, 1983 Grodner, 2018	
	+ *Z9-14:OAc (1:1:1) + other components	Löfstedt, 1982, 1985(b), (c);1986(b) Hansson, 1990(a) Lebedeva, 1991 Svensson, 1997	
	+ *Z5-12:OAc (50:10:25:1)	Wu, 1995	
in Zimbabwe	(25:100:3:10)	Wu, 1999	
	Z7-12:OH	Tóth, 1991(c)	
(tests in the world)	Z5-10:OAc + Z7-12:OAc + Z9-14:OAc	Tóth, 1992(c)	
<i>Agrotis venerabilis</i> Walker dusky cutworm <a href="#">att.</a>	Z5-10:OAc + Z7-12:OAc (20:1)  + Z5-12:OAc (100:10:1)  + Z7-12:Ald (100:10:1)	Steck, 1979(d)  Steck, 1982(b)  Steck, 1982(a)	C
<i>Agrotis vetusta</i> Walker <a href="#">att.</a>	Z11-16:OAc + Z9-14:OAc (50:1)	Steck, 1982(a)	C
<i>Agrotis volubilis</i> Harvey <a href="#">att.</a>	Z5-14:OAc + Z5-14:Ald (1:1)  + Z7-14:OAc (100:1)	Underhill, 1977(a)  Steck, 1982(a)	C
<i>Chersotis juncta</i> Grote <a href="#">att.</a>	Z11-16:OAc + Z11-16:Ald	Steck, 1982(a)	C
<i>Chersotis multangula</i> Hübner <a href="#">att.</a>	Z11-16:OAc E  + Z5-10:OAc (10:1)	Priesner, 1975  Subchev, 1990	C
<i>Cryptocala acadensis</i> Bethune <a href="#">att.</a>	Z9-14:OAc + Z11-16:OAc	Steck, 1976	D

	+ Z9-14:Ald	Steck, 1982(a)	
<i>Diarsia brunnea</i> Denis & Schiffermüller <miyamaaka-yaga> <a href="#">att.</a>	Z11-16:OAc  + Z11-16:Ald (3:1)	Subchev in Arn, 1992  Priesner in Arn, 1986(a)	A
<i>Diarsia dahlia</i> Hübner barred chestnut moth <ezoohbako-yaga> <a href="#">att.</a>	Z7-14:OAc + Z9-14:OAc + Z5-14:OAc (10:2:1)	Priesner, 1985(a)	A
<i>Diarsia deparca</i> Butler <kousucha-yaga> <a href="#">att.</a>	Z9-14:OAc	Ando, 1977	A
<i>Diarsia pseudorosaria</i> Hardwick <a href="#">att.</a>	Z11-16:OAc + Z9-16:OAc (3:1)	Kamm, 1985	C
<i>Diarsia rubi</i> Vieweg <a href="#">att.</a>	Z11-16:OAc	Terytze in Pherobase	C
<i>Euagrotis tepperi</i> Smith <a href="#">att.</a>	Z11-16:OAc + Z9-14:OAc + Z7-12:OAc (10:1:1)	Steck, 1982(a)	D
<i>Eurois astricta</i> Morrison <a href="#">att.</a>	Z11-16:OAc + Z9-14:OAc + Z11-16:Ald (8:2:1)	Underhill, 1977(a)	C
<i>Eurois occulta</i> L. <ooshirahoshi-yaga> <a href="#">att.</a>	Z9-14:OAc + Z11-16:OAc (3:1)  or + Z11,E14-16:OAc (3:1)	Steck, 1976  Chisholm, 1980(b)	A
in Canada	+ Z11-16:Ald (100:30:1)	Steck, 1982(b)	
in Europa	Z9-14:OAc + Z11-16:OAc (1:1)	Priesner in Arn, 1986(a)	
<i>Euxoa acornis</i> Smith <a href="#">att.</a>	Z9-14:OAc + Z9-14:Ald + Z11-16:OAc (6:3:2)	Underhill, 1977(a)	C

<i>Euxoa albipennis</i> Grote <a href="#">att.</a>	Z5-10:OAc + Z7-12:OAc + Z7-12:OH (10:1:1)	Steck, 1979(d)	C
<i>Euxoa altera</i> Smith <a href="#">att.</a>	Z11-16:OAc + Z9-14:OAc (5:1)	Steck, 1982(a)	C
<i>Euxoa auxiliaris</i> Grote army cutworm <a href="#">att.</a>	Z5-14:OAc + E7-14:OAc (1:19)  + Z7-14:OAc + Z9-14:OAc (100:1:10)	Struble, 1977(b)  Struble, 1981(a)	C
<i>Euxoa basalis</i> Grote <a href="#">att.</a>	Z7-12:OAc + Z7-12:OH + Z5-10:OAc (5:5:1) or + Z5-12:OAc (5:5:1)	Steck, 1982(a)	C
<i>Euxoa campestris</i> Grote <a href="#">att.</a>	Z5-10:OAc or + Z5-12:Ald (10:1)	Byers, 1981 Underhill, 1981	C
<i>Euxoa cicatricosa</i> Grote & Robinson <a href="#">att.</a>	Z7-12:OAc	Steck, 1982(a)	C
<i>Euxoa dargo</i> Strecker <a href="#">att.</a>	Z11-16:OAc  + Z9-14:OAc (1:9)	Steck, 1979(c)  Steck, 1982(a)	C
<i>Euxoa declarata</i> Walker <a href="#">att.</a>	Z5-10:OAc or + Z5-12:Ald (10:1)	Byers, 1981 Underhill, 1981	C
<i>Euxoa distinguenda</i> Lederer <a href="#">att.</a>	Z3-10:OAc	Priesner, 1988(b)	C
<i>Euxoa divergens</i> Walker <a href="#">att.</a>	Z9-12:OAc + Z7-10:OAc  + Z7-12:OAc (200:1)	Steck, 1979(c)  Steck, 1982(a)	C
<i>Euxoa drewseni</i> Staudinger <a href="#">phe.</a>	*Z5-12:OAc + *Z7-14:OAc + *12:OAc (6:1:2) + other components	Struble, 1983(a)	C
<i>Euxoa eruta</i> Hübner <a href="#">att.</a>	Z3-10:OAc + Z5-10:OAc (1:1)	Priesner, 1988(b)	C

<i>Euxoa flavicollis</i> Smith att.	Z9-14:OAc + Z7-12:OAc (1000:1)	Steck, 1979(c) Steck, 1982(a)	C
<i>Euxoa hastifera</i> Donzel att.	Z5-10:OAc + Z7-12:OAc (1:1)  (2:1)	Tóth in Arn, 1986(a) Subchev, 1990  Coroiu, 1986	C
<i>Euxoa idahoensis</i> Grote att.	Z5-10:OAc + Z5-12:OAc + Z7-12:OAc + Z9-12:OAc	Byers, 1987	C
<i>Euxoa lutulenta</i> Smith att.	Z9-14:OAc + Z11-16:OAc	Steck, 1976	C
<i>Euxoa maimes</i> Smith phe.	*Z9-14:OAc + *Z11-14:OAc + *Z7-14:OAc (200:2:1) + other components	Struble, 1985	C
<i>Euxoa manitobana</i> McDunough att.	Z9-14:OAc + Z7-14:OAc (4:1)	Steck, 1982(a)	C
<i>Euxoa messoria</i> Harris darksided cutworm phe.	Z11-16:OAc + Z7-16:OAc (40:1) or + Z7,Z11-16:OAc (9:1)  + Z7-14:OAc	Struble, 1977(c)  Steck, 1979(c)	C
	Z11,E14-16:OAc + Z7-16:OAc (25:1)	Chisholm, 1980(b)	
	Z11-16:OAc + Z7-16:OAc (20:1)	Ayre, 1982(b)	
	*Z11-16:OAc + *Z7-16:OAc + *Z11-16:OH + Z11-16:Ald (1000:25:2:20) + other components	Struble, 1987(b)	
<i>Euxoa mimallonis</i> Grote att.	Z5-10:OAc	Steck, 1982(a)	C

<i>Euxoa nigricans</i> L. att.	Z7-12:OAc + Z5-10:OAc (1:1)	Arn, 1983 Szöcs, 1983	C
<i>Euxoa obeliscoides</i> Guenée att.	Z9-14:OAc + Z11-16:Ald (1:1) + Z7-12:OAc (500:1)	Underhill, 1977(a) Steck, 1982(b)	C
<i>Euxoa ochrogaster</i> Guenée redbacked cutworm phe.	Z5-12:OAc + Z8-12:OAc (1:2) + Z5-11:OAc (25:50:1) + Z7-12:OAc (200:1)  *Z5-12:OAc + *Z7-12:OAc + *Z9-12:OAc + Z5-10:OAc (200:2:1:1) + other components  (400:4:1:1)	Struble, 1978(b) Ayre, 1982(b) Steck, 1980(b)  Struble, 1980(a); 1981(b)  Steck, 1982(b)	C
<i>Euxoa olivia</i> Morrison att.	Z5-10:OAc	Underhill, 1981	C
<i>Euxoa perolivalis</i> Smith att.	Z9-14:OAc	Struble, 1987(c)	C
<i>Euxoa pestula</i> Grote att.	Z5-10:OAc + Z7-12:OAc + Z7-12:Ald (100:1:1)	Steck, 1982(a)	C
<i>Euxoa plagigera</i> Morrison att.	Z9-14:OAc + Z9-14:OH (5:1)	Steck, 1982(a)	C
<i>Euxoa pleuritica</i> Grote att.	Z7-12:OAc + Z7-12:OH  + Z5-12:OAc (5:1:1–5:5:1) or + Z5-10:OAc (25:5:5:2)	Underhill, 1977(a) Steck, 1978	C
<i>Euxoa ridingsiana</i> Grote phe.	Z9-14:OAc + Z7-12:OAc	Steck, 1979(c)	C

	+ Z11-16:OAc (500:1:20)	Steck, 1982(a)	
	*Z9-14:OAc + *Z7-14:OAc + *Z7-12:OAc (40:2:1) + other components	Struble, 1985	
<i>Euxoa rockburnei</i> Hardwick <a href="#">att.</a>	Z5-10:OAc + Z5-12:Ald (10:1)	Byers, 1981 Underhill, 1981	C
<i>Euxoa scandens</i> Riley white cutworm <a href="#">att.</a>	Z7-12:OH	McLeod, 1982	C
<i>Euxoa seliginis</i> Duponchel <a href="#">att.</a>	Z5-10:OAc	Nagy, 2023	C
<i>Euxoa servita</i> Smith <a href="#">att.</a>	Z7-14:OAc  + Z7-14:Ald	Steck, 1979(c)  Steck, 1982(a)	C
<i>Euxoa siccata</i> Smith <a href="#">att.</a>	Z5-12:OAc + Z7-12:OAc	Byers, 1987	C
<i>Euxoa tessellata</i> Harris striped cutworm <a href="#">att.</a>	Z7-16:OAc  + Z5-14:OAc (200:1) or + Z5-16:OAc (1:1)	Roelofs, 1970(a)  Struble, 1982	C
<i>Euxoa tritici</i> L. <a href="#">att.</a>	Z5-10:OAc	Nagy, 2023	C
<i>Euxoa tristicula</i> Morrison early cutworm <a href="#">att.</a>	Z9-12:OAc + 12:OAc (1:3)  + Z7-12:OAc + Z9-14:OAc (2:5:0.01)	Steck, 1979(a)  Steck, 1982(a)	C
<i>Euxoa</i> sp. 1 <a href="#">att.</a>	E11-14:Ald	Daterman, 1977	
<i>Euxoa</i> sp. 2 <a href="#">att.</a>	E11-14:Ald	Daterman, 1977	
<i>Euxoa</i> sp. 3	Z7-16:OAc	Underhill, 1977(a)	



<i>Euxoa</i> sp. 4 att.	Z5-12:OAc	Underhill, 1977(a)	
<i>Feltia ducens</i> Walker att.	Z11-16:OAc + Z9-14:Ald (1:1)  + Z7-12:OAc + Z9-14:OAc (2000:1:1)	Underhill, 1977(a)  Steck, 1982(a)	D
<i>Feltia jaculifera</i> Guenée dingy cutworm phe.	*Z11-16:OAc + Z9-14:OAc + Z7-12:OAc (1000:1:1)	Steck, 1986	D
species A	+ *Z9-14:OAc	Byers, 1990	
species B	+ *Z7-12:OAc (0:1:10) (2000:1:1)	Gemeno, 1998	
<i>Hermonassa cecilia</i> Butler <kurokumo-yaga> att.	Z9-14:OAc  + Z9-14:Ald (9:1)	Ando, 1975  Ando, 1981	A
<i>Loxagrotis albicosta</i> Smith western bean cutworm phe.	*Z5-12:OAc + *Z7-12:OAc + *Δ11-12:OAc (5:1:5)	Klun, 1983	D
<i>Macronoctua onusta</i> Grote iris borer phe.	*Z11-16:Ald + *Z11-16:OH + *Z9-14:Ald (47:2:1) + other components	Klun, 1989	D
<i>Mesogona acetosellae</i> Denis & Schiffermüller att.	Z11-16:OAc	Stan in Arn, 1992	D
<i>Noctua comes</i> Hübner lesser yellow underwing moth att.	Z5-14:OAc	Priesner, 1985(a)	C
<i>Noctua fimbriata</i> Schreber att.	Z11-14:OAc  + Z9-14:OAc  (9:1)	Konstantin in Arn, 1986(a)  Frerot, 1982(a)  Ghizdavu, 1985	C

<i>Noctua fissipuncta</i> Haworth <a href="#">att.</a>	Z11-16:Ald	Grichanov in Pherobase	C
<i>Noctua interjecta</i> Hübner <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc	Priesner in Arn, 1986(a)	C
<i>Noctua janthina</i> Dennis & Schiffermüller <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc (9:1)	Szöcs, 1983 Frerot, 1982(a) Ghizdavu, 1985	C
<i>Noctua orbona</i> Hufnagel <a href="#">att.</a>	Z7-12:OAc	Subchev, 1990 Coroiu in Arn, 1997	C
<i>Noctua pronuba</i> L. large yellow underwing <a href="#">att.</a>	Z11-14:OAc Z9,Z12,Z15-18:Ald + Z3,Z6,epo9-21:H + $\Delta$ 1,Z3,Z6,epo9-21:H (8:1:1)	Hrudová, 2003 Ostrauskas, 2004	C C
<i>Ochropleura plecta</i> L. <maejiro-yaga> <a href="#">att.</a>	Z11-16:OAc + E11-16:OAc (1:1) + Z11-16:Ald (20:1) (100:3–100:1)	Subchev, 1981 Voerman in Arn, 1986(a) Priesner in Arn, 1986(a) Tóth, 1986(b) Stan in Arn, 1992	B
<i>Ochropleura signifera</i> Denis & Schiffermüller <a href="#">att.</a>	Z9-14:OAc + Z9-14:OH	Subchev, 1990	C
<i>Ochropleura triangularis</i> Moore <kokimae-yaga> <a href="#">att.</a>	Z9-14:OAc	Ando, 1977	A
<i>Opigena polygona</i> Denis & Schiffermüller <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc	Peltotalo, 1986	D
<i>Paradiarsia littoralis</i> Packard	Z7-12:OAc	Steck, 1982(a); (b)	C

		+ Z5-12:OAc (100:1)		
<i>Peridroma saucia</i> Hübner variegated cutworm <nisetamana-yaga> phe.		Z11-16:OAc + Z9-14:OAc (2:1–1:1)  (15:2)	Struble, 1976 Descoins, 1978  Landolt, 2003	A
		*Z11-16:OAc + *Z9-14:OAc (3:1)	Inomata, 2002	
	In Korea	(2:1)	Choi, 2009(b)	
<i>Rhyacia</i> (=Diarsia) <i>rubi</i> Viewg. att.		Z11-16:OAc	Terytze, 1987	C
<i>Sineugraphe disgnosta</i> Boursin <usuirokabasuji-yaga> att.		Z7-12:OH	Ando, 1981	A
<i>Spaelotis clandestina</i> Harris w-marked cutworm phe.		Z7-14:Ald  *Z7-14:Ald + other components	Steck, 1979(c)  Steck, 1982(c)	C
<i>Tmetolophota atristriga</i> Walker pink grass worm phe.	strain A	*Z11-16:OAc + *Z11-16:Ald (3:1)	El-Sayed, 2022	D
	strain B	*Z11-16:OAc + *Z11-16:Ald + *Z3,Z6,Z9-23:H (3:1:0.2) + other components		
<i>Xestia</i> (=Amathes, <i>Rhyacia</i> ) <i>baja</i> Schifferrmüller dotted clay moth att.		Z9-14:OAc + Z7-12:OAc + Z5-12:OAc (1000:100:1)	Priesner, 1984(b)	C
<i>Xestia</i> (=Amathes) <i>candellarum</i> Staudinger att.		Z7-14:OAc E  + Z5-14:OAc	Priesner, 1977  Priesner in Arn, 1986(a)	C
<i>Xestia</i> (=Amathes) <i>c-nigrum</i> L. spotted cutworm <shiromon-yaga>				A

	phe.	U.S.A (small sp.)	E7-14:OAc		Roelofs, 1970(a)	
		U.S.A (large sp.)	Z7-14:OAc			
		Japan	Z7-14:OAc		Fujimura, 1976 Ando, 1977	
		Japan	*Z7-14:OAc		Hirai in Arn, 1986(a)	
		Germany			Bestmann, 1979	
		Canada	+ Z5-14:OAc	(100:9–100:1)	Steck, 1982(d)	
		U.S.A.		(100:1)	Landolt, 2011	
		Bulgaria, Romania, Hungary	Z7-14:OAc		Subchev, 1996	
		<i>Xestia (=Amathes) collaris</i> Grote & Robinson	Z7-14:OAc + Z9-14:OAc	(1:1)	Steck, 1979(c)	C
		att.				
		<i>Xestia ditrapezium</i> Denis & Schiffermüller <tanpo-yaga>	Z7-14:OAc + Z9-14:OAc + Z5-14:OAc	(10:2:1)	Priesner, 1985(a)	B
		att.				
		<i>Xestia dolosa</i> Franclemont phe.	*Z7-14:OAc		Bjostad in Arn, 1986(a)	C
		<i>Xestia rhomboidea</i> Esper att.	Z5-14:OAc + Z9-14:OAc	(20:1)	Priesner, 1985(a)	C
		<i>Xestia triangulum</i> Hufnagel att.	Z5-14:OAc		Priesner, 1985(a)	C
		<i>Xestia xanthographa</i> Denis & Schiffermüller att.	Z9-14:OAc + Z11-14:OAc	(9:1)	Booij, 198	C
			Z11-16:OAc + Z11-16:Ald	(10:3)	Priesner in Arn, 1986(a)	
		<i>Xestia</i> sp. att.	E11-14:Ald		Daterman, 1977	

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(Noctuidae; Hadeninae) ヤガ科; ヨトウガ亜科

<i>Acantholeucania</i> (= <i>Mythimna</i> ) <i>loreyi</i> Duponchel lorey leafworm <kusashiroki-yotou> phe.	Z9-12:OAc  *Z9-14:OAc + *Z11-16:OAc  + *Z7-12:OAc (20:5:2)  (100:20:9)  Z9-14:OAc + Z11-14:OAc  + Z7-12:OAc (9:1)  + other components	Ando, 1977  Takahashi, 1979  Takahashi, 1980; 1983 Sato, 1980  Wang, 2023  Soldán, 1983  Lin, 1982  Ho, 2002	A
<i>Acosmetia caliginosa</i> Hübner att.	E9-14:OAc E	Priesner, 1975	D
<i>Agrochola circellaris</i> Hufnagel att.	Z11-16:OAc	Stan, 1992	C
<i>Agrochola helvola</i> L. att.	Z9-14:Ald + Z11-16:Ald (1:1)	Priesner in Arn, 1986(a)	C
<i>Agrochola humilis</i> Dennis & Shiffermüller att.	Z11-16:Ald + Z9-14:Ald (100:3)	Subchev, 1994	C
<i>Agrochola litura</i> L. att.	Z9-14:Ald  + Z11-16:Ald (10:1)	Subchev, 1994  Priesner in Arn, 1986(a)	C
<i>Agrochola lota</i> Clerck att.	Z9-14:OAc	Subchev, 1990	C
<i>Agrochola lychnidis</i> Dennis & Shiffermüller att.	Z9-14:Ald	Subchev, 1994	C

<i>Agrochola macilenta</i> Hübner <a href="#">att.</a>	Z11-16:OAc	Tóth, 1979 Stan in Arn, 1992	C
<i>Aletia oxygala</i> Grote <a href="#">att.</a>	Z11-16:Ald + Z11-16:OAc (20:1)	Chisholm, 1979 Steck, 1982(a)	C
<i>Amphipoea americana</i> Speyer <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc (5:1)	Struble, 1987(c)	C
<i>Amphipoea fucosa</i> Freyer <kitashoubu-yotou> <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc  (9:1)	Peltotalo, 1986  Mizukoshi, 2006	A
<i>Amphipoea oculea</i> L. <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc (10:1)	Priesner in Arn, 1986(a)	C
<i>Anarta melanopa</i> Thunberg <a href="#">att.</a>	Z11-16:OAc + Z11-16:Ald	Linnaluoto, 1983	D
<i>Anarta myrtilli</i> L. <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc	Austara in Pherobase	D
<i>Andropolia contacta</i> Walker <a href="#">att.</a>	Z5-12:OAc + Z7-12:OAc (1:1)	Steck, 1977(a)	D
<i>Anhimella contrahens</i> Walker <a href="#">att.</a>	Z11-16:Ald + Z11-16:OH (10:1)	Steck, 1982(a)	D
<i>Apamea anceps</i> Denis & Shiffermüller <a href="#">att.</a>	Z11-16:Ald  + Z11-16:OH (1:3)	Grichanov in Arn, 1992  Sorochinskaya in Arn, 1992	C
<i>Apamea indela</i> Smith <a href="#">att.</a>	Z11-16:OAc + Z11-16:OH + Z11-16:Ald (200:50:1)	Steck, 1982(b)	C
<i>Apamea inordinate</i> Morrison <a href="#">att.</a>	Z11-16:OAc + Z11-16:OH	Byers, 1987	C
<i>Apamea (= Amphipoea)</i> <i>interoceanica</i> Smith strawberry cutworm <a href="#">att.</a>	Z9-14:OAc  + E11-14:OAc (5:1)	Roelofs, 1970(a)  Struble, 1987(c)	C

<i>Apamea monoglypha</i> Hufnagel <i>att.</i>	Z11-16:OAc + Z11-16:Ald (100:1)  (1000:1)  + Z7-12:OAc (1:1)	Priesner in Arn, 1986(a)  Stan in Arn, 1992  Stan in Arn, 1992 Subchev in Arn, 1992	C
<i>Apamea oblonga</i> Haworth <ishikari-yotou> <i>att.</i>	Z11-16:OAc + Z11-16:OH	Stan in Arn, 1992	A
<i>Apamea sordens</i> Hufnagel <shiomimihaiiro-yotou> <i>att.</i>	Z11-16:OAc + Z11-16:OH + Z11-16:Ald	Subchev in Arn, 1992	A
<i>Apamea</i> (= <i>Amphipoea</i> ) <i>velata</i> Walker <i>att.</i>	Z11-16:OAc	Roelofs, 1971(a)	C
<i>Axylia</i> (= <i>Rhyathia</i> ) <i>putris</i> L. <mokume-yoto> <i>att.</i>	Z9-14:OAc   12,12,12-F <sub>3</sub> -Z9-12:OAc	Descoins, 1978 Szöcs, 1981 Ando, 1981  Bengtsson, 1990	A
<i>Brithys crini</i> F. <hamaomoto-yotou> <i>phe.</i>	*Z11-16:Ald N	Kou, 1989; 1991	A
<i>Caradrina clavipalpis</i> Scopoli <i>att.</i>	Z7-12:OAc + Z9-14:OAc (4:1)	Szöcs, 1981	D
<i>Caradrina morpheus</i> Hufnagel <i>att.</i>	E9-12:OAc  + Z9-12:OAc (1:4)  Z9-14:OAc + Z11-14:OAc (9:1)	Arn, 1974  Brewer, 1985  Ghizdavu, 1985	D
<i>Celaena haworthii</i> <i>att.</i>	Z11-16:Ald + Z11-16:OAc (3:1)	Bykhovets in Arn, 1992	C
<i>Celaena leucostigma</i> Hübner <shoubuoo-yotou>	Z11-16:OAc	Krivokhizhin, 1984	A

<a href="#">att.</a>	+ Z11-17:OAc	Möttus in Arn, 1986(a)	
<i>Ceramica picta</i> Harris zebra caterpillar moth	Z11-14:OAc	Roelofs, 1971(a)	C
<a href="#">att.</a>	+ Z11-14:Ald (1:1)	Underhill, 1977(a)	
	+ Z11-16:OAc	Steck, 1982(a)	
	+ Z9-14:OAc (200:2:1)		
<i>Ceramica</i> (=Mamestra, Polia) pisi L. <mame-yotou>	Z9-14:OAc	Priesner, 1980(b)	B
<a href="#">att.</a>	+ Z11-14:OAc (1:1)		
	(3:1)	Renou, 1981(b)	
<i>Cerapteryx graminis</i> L. antler moth	Z11-16:OAc	Myttus in Arn, 1986(a)	D
<a href="#">att.</a>	+ Z11-16:Ald (1:1)	Priesner in Arn, 1986(a)	
	(6:4–3:7)	Möttus, 1998	
<i>Cosmia trapezina</i> L.	Z11-14:Ald	Booij, 1985	B
<a href="#">att.</a>	Z11-16:Ald	Subchev in Arn, 1992	
	+ Z11-16:OAc	Priesner in Arn, 1986(a)	
<i>Dargida diffusa</i> Walker	Z11-16:OAc	Landolt	D
<a href="#">att.</a>	+ Z11-16:Ald	in Pherobase	
<i>Dargida terrapictalis</i> Buckett	Z11-16:OAc	Landolt	D
<a href="#">att.</a>	+ Z11-16:Ald	in Pherobase	
<i>Discestra</i> (=Scotogramma) farnhami Grote	Z11-16:Ald	Steck, 1979(c)	C
<a href="#">att.</a>	+ Z9-14:Ald	Steck, 1982(b)	
	+ Z9-16:Ald (100:1:1)		
<i>Discestra</i> (=Scotogramma) trifolii Hufnagel clover cutworm	Z11-16:OAc	Roelofs, 1970(a) Subchev, 1981 Krivokhizhin, 1984	C
<a href="#">phe.</a>	+ Z11-16:OH (9:1)	Struble, 1975(a)	



	+ Z5-16:OAc (100:1)	Subchev, 1987	
	*Z11-16:OAc + *Z11-16:OH (9:1)	Underhill, 1976 Ayre, 1982(a)	
	Z11-14:OAc	Boness, 1978 Hrdý, 1979	
	Z11,E14-16:OAc + Z11,E14-16:OH (10:1)	Chisholm, 1980(b)	
<i>Dypterygia scabriuscula</i> L. <a href="#">att.</a>	Z11-16:OAc + Z9-14:Ald	Stan, 1992	C
<i>Egira pulla</i> Denis & Schiffermüller <a href="#">att.</a>	Z9-14:OAc	Subchev in Arn, 1992	C
<i>Enargia infumata</i> Grote <a href="#">att.</a>	Z11-16:OAc + Z9-14:OAc (500:1)	Steck, 1982(b)	C
<i>Euplexia lucipara</i> L. <akagane-yotou> <a href="#">att.</a>	Z11-16:Ald + Z11-16:OAc (10:1)	Priesner in Arn, 1986(a) Subchev in Arn, 1992	A
<i>Eupsilia quadrilinea</i> Leech <yosujinokome-kiriga> <a href="#">att.</a>	Z11-16:OH or E11-16:OH	Ando, 1977	A
<i>Eupsilia transversa</i> Hufnagel <ezomitsuboshi-kiriga> <a href="#">att.</a>	Z11-16:OH	Priesner in Arn, 1986(a) Subchev in Arn, 1992	A
<i>Eupsilia tripunctata</i> Butler <mitsuboshi-kiriga> <a href="#">att.</a>	Z11-16:OAc + Z11-16:Ald + Z11-16:OH (9:9:2)	Ando, 1981	A
<i>Faronta diffusa</i> Walker wheat head armyworm <a href="#">att.</a>	Z11-16:OAc + Z11-16:Ald (9:1)	Underhill, 1977(a)	D
<i>Graphania bromias</i> Meyrick <a href="#">phe.</a>	*Z9-14:OAc + *Z9-14:OH (2:1) + another component	Frérot, 1993(b)	D
<i>Graphania insignis</i> Walker	*Z7-12:OH	Frérot, 1993(b)	D

	phe.	+ *Z9-14:OH (1:1)		
<i>Graphania mutans</i> Walker			Frérot, 1991	D
	phe.			
Auckland population		*Z9-14:OH + *Z9-14:OAc + *Z7-14:OH + *Z7-14:OAc (100:50:13:3)		
Lincoln population		+ *Z9-14:Ald (15:35:14:5:100)		
<i>Graphania plena</i> Walker			Frérot, 1993(b)	D
	phe.	*Z7-12:OAc + *Z9-14:OAc (100:33) + other components		
<i>Graphania ustistriga</i> Walker			Frérot, 1993(b)	D
	phe.	*Z7-12:OAc + *Z7-12:OH N		
<i>Hada (=Polia) nana</i> Hufnagel		Z9-14:OAc E	Priesner, 1975	C
	att.			
<i>Heliophobus reticulata</i> Gze.		Z9-14:OAc	Szöcs, 1983	C
	att.			
<i>Helotropha reniformis</i> Grote		Z11-16:OAc + Z7-16:OAc (40:1)	Struble, 1977(c)	C
	att.			
		+ Z11-16:OH (40:1:0.08)	Struble, 1987(b)	
<i>Hemiglaea (=Blepharosis) costalis</i> Butler		Z9-14:Ald + Z9-14:OAc (9:1)	Ando, 1981	A
	<kimae-kiriga>			
	att.			
<i>Hoplodrina alsines</i> Brahm		Z7-12:OAc + Z9-14:OAc (1:1)	Arn, 1983	C
	att.			
		+ Z11-16:OAc (1:1:1)	Szöcs, 1983	
<i>Hoplodrina ambigua</i> Denis & Schiffermüller		Z11-16:OAc + Z11-16:OH	Sherman in Pherobase	C
	att.			
<i>Hoplodrina blanda</i> Denis & Schiffermüller		Z9-14:OAc	Arn, 1983	C
	att.	+ Z9,E11-14:OAc	Ostrauskas, 2003	

	+ Z9,E12-14:OAc		
<i>Hoplodrina octogenaria</i> Goeze <i>att.</i>	Z11-16:OAc	Stan, 1992	C
	Z9-14:OAc + Z9,E11-14:OAc + Z9,E12-14:OAc	Ostrauskas, 2003	
<i>Hoplodrina superstes</i> Ochseneheimer <i>att.</i>	Z5-10:OAc + Z7-12:OAc (1:1)	Szöcs, 1983	C
	(1:10)	Subchev, 1990	
<i>Hydraecia micacea</i> Esper potato stem borer <i>phe.</i>	*E11-14:OAc + *Z11-14:OAc + *Z9-14:OAc + *14:OAc (15:13:3:69)	Teal, 1983	C
	Z11-14:OAc + Z9-14:OAc + 14:OAc (13:3:69)	Burns, 1989	
<i>Hypocoena rufostrigata</i> Packard <i>att.</i>	Z11-16:Ald + Z11-16:OH + Z9-14:Ald (100:1:1)	Steck, 1982(a)	D
<i>Hyssia cavernosa</i> Eversmann <i>att.</i>	Z9-14:OAc E	Priesner, 1975	D
<i>Ipimorpha pleonectusa</i> Grote <i>att.</i>	Z11-16:Ald + Z11-16:OH (100:1)	Steck, 1982(a)	C
<i>Ipimorpha retusa</i> L. <yanagi-kiriga> <i>att.</i>	Z11-16:OAc + Z11-16:OH (9:1)	Stan in Arn, 1992	A
<i>Ipimorpha subtusa</i> Denis & Schiffermüller <doro-kiriga> <i>att.</i>	Z11-16:Ald  + Z9-16:Ald (19:1)	Grichanov in Pherobase  Bulyginskaya in Pherobase	A
<i>Lacanobia subjuncta</i> Grote & Robinson <i>phe.</i>	*Z11-16:OAc + *Z11-16:Ald + *Z11-16:OH (3:1:0.08)	Landolt, 1998	C

<i>Lacinipolia lorea</i> Guenée att.	Z7-14:OAc	Roelofs, 1971(a)	D
<i>Lacinipolia renigera</i> Stephens bristly cutworm phe.	Z9-14:OAc *Z9-14:OAc + *Z9,E12-14:OAc (100:3)	Steck, 1982(a) Haynes, 1990	D
<i>Lacinipolia vicina</i> Grote att.	Z9-14:OAc + Z11-16:OAc + Z7-14:OAc (5:5:1)	Steck, 1982(a)	D
<i>Leucania anteoclara</i> Smith phe.	*Z11-16:OAc + *Z11-16:Ald + *Z9-14:OAc (10:4:1) + other components	Byers, 1997	C
<i>Leucania commoides</i> Guenée phe.	Z9-14:OAc + Z11-16:OAc + Z11-16:OH (5:4:1)  *Z9-14:OAc + *Z11-16:OAc + *Z11-16:OH (5:4:1) + other components	Struble, 1977(d)  Byers, 1997	C
<i>Leucania linda</i> Franclemout att.	Z9-14:OAc + Z11-14:OAc (19:1)	Roelofs, 1976(b)	C
<i>Leucania lithargyria</i> Esper att.	Z11-16:Ald	Grichanov in Arn, 1992	C
<i>Leucania multilinea</i> Walker att.	Z9-14:OAc + Z11-16:OAc + Z11-16:OH (4:4:1)	Struble, 1977(d)	C
<i>Leucania phragmitidicola</i> Guenée att.	Z9-14:OAc  Z11-16:OAc	Roelofs, 1971(a)  Fleischer, 2005	C
<i>Lithomoia solidaginis</i> Hübner <shirosuji-kiriga> att.	Z11-16:Ald	Underhill, 1977(a)	A
<i>Lithophane ornitopus</i> Hufnagel att.	Z9-14:OAc + Z9-14:Ald (10:1–2:1)	Subchev, 1990	C

<i>Lithophane thaxteri</i> Grote att.	Z9-14:OAc	Steck, 1979(c)	C
<i>Lithophane unimoda</i> Lintner att.	Z9-14:OAc	Steck, 1982(a)	C
<i>Mamestra biren</i> Goeze phe.	Z9-14:OAc + Z11-14:OAc (20:1)  *Z9-14:OAc + *Z7-14:OAc + *14:OAc + *Z9-14:OH [72:11:15:2] N	Priesner in Arn, 1986(a)  Frerot, 1987(b)	C
<i>Mamestra blenna</i> Hübner att.	Z11-16:OAc + Z11-16:OH + Z11-16:Ald (10:3:1)	Tóth, 1986(b)	C
<i>Mamestra brassicae</i> L. cabbage armyworm <yotouga> phe.	Z11-16:OAc  *Z11-16:OAc  + other components  + Z11-16:Ald (100:0.1)  + Z11-16:OFo (100:0.1)  + *Z11-17:OAc [19:1] N  (8:1)  (4:1)  + Z7-12:OAc (5:1) or + Z9-14:OAc (1000:1)  Z11-14:OAc	Ando, 1977  Bestmann, 1978(b) Descoins, 1978 Hirai, 1978  Struble, 1980(b) Attygalle, 1987 Farine, 1981 Sugie, 1993  Subchev, 1984 Stan in Arn, 1992  Subchev, 1984  Novák, 1979  Van de Veire, 1986  Nedopekina in Arn, 1992  Subchev, 1987  Hrdý, 1979	A

<i>Mamestra cappa</i> Hübner att.	Z7-12:OAc + Z11-16:OAc + Z11-16:OH	Sherman in Pherobase	C
<i>Mamestra configurata</i> Walker bertha armyworm phe.	Z10-16:OAc  *Z11-16:OAc + E11-16:OAc (17:3)  + *Z9-14:OAc (19:1)  (15:2)  + *Z7-12:OAc (500:26:0.1) or + Z11-16:Ald (500:26:1)  Z11-16:OAc + Z9-14:OAc + Z7-12:OAc + Z7-12:OH (250:13:20:10)	Struble, 1975(b)  Chisholm, 1975  Underhill, 1977(b)  Landolt, 2003  Struble, 1984  Byers, 1987	C
<i>Mamestra contigua</i> Denis & Schiffermüller att.	Z11-16:OAc + Z11-16:OH (9:1)	Stan in Arn, 1992	C
<i>Mamestra</i> (= <i>Lacanobia</i> ) <i>oleracea</i> L. phe.	*Z11-16:OAc + *Z11-16:OH [1:1] N  (9:1)	Descoins, 1978 Kovalev in Arn, 1986(a)  Sans, 1997	C
<i>Mamestra</i> (= <i>Melanchra</i> ) <i>persicariae</i> L. att.	Z11-16:OAc	Möttus in Arn, 1986(a)	C
<i>Mamestra suasa</i> Denis & Schiffermüller phe.	Z11-16:OAc  *Z11-16:OAc  + Z11-16:Ald (1:1)  (10:1)	Subchev, 1981  Vrkoc, 1981  Szöcs, 1983  Subchev, 1984 Priesner in Arn, 1986(a)	C

	+ *Z11-16:Ald (10:1) + other components	Tóth, 1986(b) Frerot, 1988(c)	
	+ Z7-12:OAc (10:3)	Subchev, 1987	
	+ Z7-12:OAc + Z11-16:Ald (100:100:1)	Subchev in Arn, 1997	
<i>Mamestra thalassina</i> Hufnagel phe.	Z11-16:OAc	Möttus in Arn, 1986(a)	C
	*Z11-16:OAc + *Z11-16:Ald + *Z11-16:OH E	Renou, 1991	
<i>Mamestra w-latinum</i> Hufnagel att.	Z11-16:OAc	Subchev, 1981 Szöcs, 1983	C
<i>Mesapamea secalis</i> L. att.	Z11-14:OH + E11-14:OH (97:3)	Fassotte in Arn, 1986(a)	C
	Z11-16:OAc + Z11-16:OH	Subchev in Arn, 1992	
<i>Mniotype versuta</i> Smith att.	Z9-14:OAc + Z11-16:OAc	Byers, 1987	C
<i>Morrisonia confusa</i> Hübner att.	Z11-16:OAc	Roelofs, 1970(a)	D
<i>Mythimna albipuncta</i> Denis & Schiffermüller att.	Z11-16:OH + Z11-16:Ald (1:1)	Tóth in Arn, 1986(a) Subchev in Arn, 1992	C
<i>Mythimna conigera</i> Denis & Schiffermüller att.	Z11-16:Ald	Subchev in Arn, 1992	C
<i>Mythimna farrago</i> F. att.	Z11-16:Ald	Tóth in Arn, 1986(a)	C
<i>Mythimna hamifera</i> Walker <uki-yotou> att.	Z11-16:Ald + Z9-16:Ald (19:1)	Kohno, 2014	A
<i>Mythimna pallens</i> L.	Z11-16:OAc	Tóth in Arn, 1986(a)	C

<i>att.</i>	+ Z11-16:Ald (1:1)	Subchev in Arn, 1992 Stan in Arn, 1992	
<i>Mythimna turca</i> L. <futaobiki-yotou> <i>att.</i>	Z11-16:OAc + Z11-16:Ald + Z7-16:OAc	Subchev in Pherobase	A
	Z11-16:Ald + Z9-16:Ald (19:1)	Kohno, 2014	
<i>Mythimna vitellina</i> Hübner <i>att.</i>	Z11-16:OAc + Z11-16:Ald	Subchev in Arn, 1992	C
<i>Nedra ramosula</i> Guenée <i>att.</i>	Z11-14:OH	Roelofs, 1970(a)	D
<i>Nephelodes emmedonia</i> Cramer bronze cutworm <i>att.</i>	Z11-16:Ald	Underhill, 1977(a)	D
<i>Nephelodes minians</i> Guenée bronzed cutworm <i>phe.</i>	Z11-16:Ald + Z11-16:OAc	Steck, 1977(b)	D
	*Z11-16:Ald + *Z11-16:OAc (5:1)	Zhu, 2004	
<i>Oligia bridghami</i> Grote & Robinson <i>att.</i>	Z11-16:OAc + Z11-16:OH (500:1)	Steck, 1982(a)	C
<i>Oligia egens</i> Walker <i>att.</i>	Z11-16:OAc + Z7-16:OAc	Byers, 1987	C
<i>Oligia fascinucula</i> Haworth <i>att.</i>	Z9-14:OAc + Z11-14:OAc (9:1)	Boness, 1978	C
<i>Oligia furuncula</i> Hw. <i>att.</i>	Z11-16:OAc + Z11-16:Ald (10:1–10:3)	Tóth, 1986(b)	C
	+ Z11-16:OH	Subchev in Arn, 1992	
<i>Oligia latruncula</i> Denis & Schiffermüller <i>att.</i>	Z9-14:OAc + Z11-16:OAc (1:1)	Priesner, Töth in Arn, 1986(a)	C
	+ Z11-14:OAc (17:20:3)	Guerin in Arn, 1986(a)	



<i>Oligia mactata</i> Guenée <a href="#">att.</a>	Z11-16:OAc + Z11-16:OH (500:1)	Steck, 1982(a)	C
<i>Oligia strigilis</i> L. <a href="#">att.</a>	Z11-16:OAc + Z9-14:OAc (9:1)	Szöcs, 1983	C
<i>Oligia versicolor</i> Borkhausen <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc (10:1)	Priesner in Arn, 1986(a)	C
<i>Orbona fragariae pallidior</i> Warren <ichigo-kiriga> <a href="#">att.</a>	Z11-16:Ald + Z9-16:Ald (19:1)	Kohno, 2014	A
<i>Orthodes crenulata</i> Butler <a href="#">att.</a>	Z11-16:OAc	Roelofs, 1970(a)	D
<i>Orthodes vecors</i> Guenée <a href="#">att.</a>	Z11-16:OAc	Roelofs, 1970(a)	D
<i>Orthosia angustipennis</i> Matsumura <hosoba-kiriga> <a href="#">att.</a>	Z9,E12-14:OAc	Ando, 1977	A
<i>Orthosia carnipennis</i> Butler <akaba-kiriga> <a href="#">att.</a>	Z9-14:OAc + Z11-16:OAc (1:1)  + Z11-14:OAc (9:1)	Ando, 1981  Mizukoshi, 2006	A
<i>Orthosia cruda</i> Denis & Schiffermüller <a href="#">att.</a>	Z11-16:OAc + Z9-14:OAc (9:1)  (20:1)	Booij, 1984(b)  Tóth, 1993	C
<i>Orthosia ella</i> Butler <yomogi-kiriga> <a href="#">att.</a>	Z11-16:OAc  + Z11-16:Ald (1000:1)	Ando, 1977  Kakizaki in Pherobase	A
<i>Orthosia evanida</i> Butler <kaba-kiriga> <a href="#">att.</a>	Z9-14:Ald	Ando, 1981	A
<i>Orthosia gothica</i> L. <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc (20:1)	Austara in Arn, 1986(a) Bradshaw, 1983	B

	+ Z9-14:OH + Z5-14:OAc (20:1:20:1)	Tóth, 1992(f)	
<i>Orthosia gothica</i> <i>askoldensis</i> Staudinger <kashiwa-kiriga> <a href="#">att.</a>	Z9-14:Ald + Z9-14:OAc (9:1)	Ando, 1981	A
<i>Orthosia</i> (= <i>Monima</i> ) <i>gracilis</i> Denis & Schiffermüller <a href="#">att.</a>	Z11-16:OAc E Z11-16:OAc	Priesner, 1975 Struble in Arn, 1986(a) Subchev in Arn, 1992	C
<i>Orthosia hibisci</i> Guenée speckled green fruitworm <a href="#">att.</a>	Z9,E12-14:Ald or Z9-14:Ald Z9-14:Ald + Z11-14:Ald (100:1)	Hill, 1978 Steck, 1982(a)	C
<i>Orthosia incerta</i> Hufnagel <miyamakaba-kiriga> <a href="#">att.</a>	Z9-14:Ald + Z11-16:Ald (9:1)	Booij, 1984(b)	A
<i>Orthosia limbata</i> Butler <shiroheri-kiriga> <a href="#">att.</a>	Z9-14:OAc + Z9-14:Ald (9:1)	Ando, 1981	A
<i>Orthosia lizetta</i> Butler <kuromimi-kiriga> <a href="#">att.</a>	Z11-16:OAc + Z11-16:Ald (1:1)	Ando, 1981	A
<i>Orthosia miniosa</i> Denis & Schiffermüller <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc (20:1)	Priesner in Arn, 1986(a)	C
<i>Orthosia munda</i> Denis & Schiffermüller <sumomo-kiriga> <a href="#">att.</a>	Z11-16:OH + Z11-16:Ald (20:1) + Z11-16:OAc (9:9:2)	Tóth, 1993 Ando, 1981	A
<i>Orthosia odiosa</i> Butler <chairo-kiriga> <a href="#">att.</a>	Z7-12:OAc	Ando, 1977	A

<i>Orthosia paromoea</i> Hampson <buna-kiriga> att.	Z7-14:OAc	Ando, 1977	A
<i>Orthosia stabilis</i> Denis & Schiffermüller att.	Z11-16:Ald + Z9-14:Ald (100:1)	Subchev, 1986(b) Tóth, 1993	C
<i>Pachetra sagittigera</i> (= <i>fulminea</i> ) Hufnagel att.	Z7-12:OAc E Z7-12:OAc + Z5-12:OAc	Priesner, 1975 Priesner in Arn, 1986(a)	D
<i>Panolis flammea</i> Denis & Shiffermüller pine beauty moth <matsu-kiriga> phe.	Z9-14:OAc + Z11-14:OAc (20:1)  or +Z11-16:OAc (20:1)  Z9-14:OAc or Z9,E12-14:OAc  *Z9-14:OAc + *Z11-16:OAc + *Z11-14:OAc (100:5:1)	Priesner, 1978  Priesner, 1983  Knauf, 1979  Baker, 1982	B
<i>Parastichtis discivaria</i> Walker att.	Z11-16:OAc + Z11-16:Ald	Steck, 1982(a)	C
<i>Parastichtis suspecta</i> Hübner <haiiro-yotou> att.	Z11-16:OAc	Myttus in Arn, 1986(a)	A
<i>Polia assimilis</i> Morrison att.	Z11-14:OAc + Z9-14:OAc (100:1)	Steck, 1982(b)	C
<i>Polia</i> (= <i>Lacanobia</i> ) <i>atlantica</i> Grote att.	Z11-16:OAc + Z7-12:OAc (9:1)  + Z11-16:Ald + Z11-14:Ald (200:1:1)	Steck, 1977(a)  Steck, 1980(a)	C
<i>Polia bombycina</i> Hufnagel <oochairo-yotou> att.	Z9-14:OAc + Z9-14:Ald (1:1)	Tóth in Arn, 1986(a)	A

<i>Polia discalis</i> Grote <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc (10:1)	Steck, 1982(a)	C
<i>Polia grandis</i> Boisduval <a href="#">att.</a>	E9-14:OAc	Roelofs, 1970(a)	C
<i>Polia ingravis</i> Smith <a href="#">att.</a>	Z9-14:OAc + Z11-16:OAc (100:1)	Steck, 1982(b)	C
<i>Polia lilacina</i> Harvey <a href="#">att.</a>	Z7-14:OAc + Z9-14:OAc (10:1)	Steck, 1982(a)	C
<i>Polia nebulosa</i> Hufnagel <ooshirahoshi-yotou> <a href="#">att.</a>	Z11-14:OAc + E11-14:OAc + Z9-14:OAc (100:10:3)	Subchev in Pherobase	A
<i>Polia</i> (= <i>Lacanobia</i> ) <i>nevadae</i> Grote <a href="#">att.</a>	Z11-16:OAc + Z11-16:Ald	Steck, 1982(a)	C
<i>Polia purpurissata</i> Grote <a href="#">att.</a>	Z9-14:OAc + Z7-14:OAc (100:1)	Steck, 1982(a)	C
<i>Polia segregata</i> Smith <a href="#">att.</a>	Z7-14:OAc  + Z11-14:OAc (10:1)	Steck, 1979(c)  Steck, 1982(a)	C
<i>Polia tacoma</i> Strecker <a href="#">att.</a>	Z9-14:OAc + Z9-14:Ald (9:1)  (100:1)	Underhill, 1977(a)  Steck, 1982(b)	C
<i>Pseudaletia</i> (= <i>Leucania</i> , <i>Mythimna</i> ) <i>separata</i> Walker oriental armyworm <awa-yotou> <a href="#">phe.</a>			A
Japan strain	*Z11-16:OAc + *Z11-16:OH (4:1-9:1)	Takahashi, 1979; 1980	
China strain	(4:1)  + *16:Ald + *Z11-16:OH (100:10:0.1)  *Z11-16:Ald	Lin in Arn, 1992  Zhu, 1987(c)  Wei, 1985	

	+ another component	Wang, 1997	
Taiwan strain	*Z11-16:OAc + *Z11-16:OH (2:1) + other components	Kou, 1992(b)	
Russian strain	*Z11-16:Ald + *Z11-16:OAc (20:1) + other components	Lebedeva, 2000(a)	
<i>Pseudaletia</i> (= <i>Mythimna</i> ) <i>unipuncta</i> Haworth armyworm moth phe.	*Z11-16:OAc + other components	Hill, 1980 McDonough, 1980 Farine in Arn, 1992	C
	Z11-16:OAc	Soldán, 1983	
	+ Z11-16:OH (100:0.2)	Steck, 1980(a)	
	+ Z11-16:Ald + Z9-14:OAc (100:0.2:0.05:0.01)	Steck, 1982(e)	
	+ Z9-14:OAc + 16:OAc (1:5:2:1)	Guerrero, 1986	
	+ Z11-16:Ald + 12:OAc (9:1:1:2)	Rotundo in Arn, 1992	
<i>Rhynchaglaea fuscipennis</i> Sugi <kurochamadara-kiriga> att.	Z7-12:OAc	Ando, 1977	A
	Z9-14:Ald	Ando, 1981	
<i>Rhynchaglaea scitula</i> Butler <chamadara-kiriga> att.	Z9,E12-14:OH	Ando, 1977	A
<i>Sarcopolia</i> (= <i>Mamestra</i> ) <i>illoba</i> Butler <shiroshita-yotou> att.	Z11-16:OAc	Ando, 1977	A
<i>Sesamia calamistis</i> Hampson phe.	*Z11-16:OAc + *Z9-14:OAc (3:1) + other components	Zagatti, 1988	C
<i>Sesamia cretica</i> Lederer durra stemborer	Z9-14:OH + Z9-14:OAc (3:1)	Arsura, 1977	C

phe. in Italy	*Z9-14:OH + *Z9-14:OAc + *Z11-16:OH (90:1:9)	Germinara, 2007	
in Iran, Egypt	(8:1:1)	Avand-Faghieh, 2008	
<i>Sesamia grisescens</i> Walker phe.	*Z11-16:OAc + *Z11-16:OH (3:2) + other components	Whittle, 1995	C
<i>Sesamia inferens</i> Walker purple stem borer pink borer <ine-yotou> phe. China	*Z11-16:OAc  + Z11-16:OH (4:1)  + *Z11-16:OH + *Z11-16:Ald (4:1:0.1)	Nesbitt, 1976  Wu, 1986(a)  Zhu, 1987(b)	A
Japan	+ *Z11-16:OH (3:1)	Nagayama, 2006	
<i>Sesamia nonagrioides</i> Lefèbvre corn stalk borer phe.	*Z11-16:OAc + *Z11-16:OH (4:1–9:1)  (19:1)  + *Z11-16:Ald + *12:OAc (9:1:1:2) + another component  (2:3:4:5)  (8.5:1:1:2)  (77:8:10:5)	Sreng, 1985  Rotundo in Arn, 1986(a)  Mazomenos, 1989(a) Krokos, 2002  Mazomenos, 1989(b)  Rotundo in Arn, 1992  Sans, 1997	C
<i>Sideridis rosea</i> Harvey att.	Z9-14:OAc + Z11-16:OAc (2:1)	Struble, 1976	C
<i>Spodoptera androgea</i> Stoll att.	Z9-14:OAc + Z9,E12-14:OAc	L.-Cassou in Pherobase	C
<i>Spodoptera ciliium</i> Guenée <kushinashisujikiri-yotou>	Z9,E12-14:OAc	Soldán, 1983	A

<i>att.</i>	Z9-14:OAc (main) + Z9,E11-14:OAc	Campion, 1975	
<i>Spodoptera cosmioides</i> Walker black armyworm <i>phe.</i>	*Z9-14:OAc + *Z9,E12-14:OAc (10:1) + other components	Blassioli- Moraes, 2016	C
<i>Spodoptera</i> (= <i>Rusidrina</i> , <i>Sidemia</i> ) <i>depravata</i> Butler lawn grass cutworm moth <sujikiri-yotou> <i>phe.</i>	Z9,E12-14:OAc  *Z9,E12-14:OAc + another component  + *Z9-14:OAc (5:5–4:6)	Ando, 1975  Kurihara, 1991  Wei, 2003	A
<i>Spodoptera descoinsi</i> Lalanne-Cassou <i>phe.</i>	*Z9,E12-14:OAc + *Z9-14:OAc (1:1) + other components	Monti, 1995	C
<i>Spodoptera dolichos</i> F. <i>att.</i>	Z9,E12-14:OAc  + Z9-14:OAc	Mitchell, 1973  L.-Cassou In Pherobase	C
<i>Spodoptera</i> (= <i>Prodenia</i> ) <i>eridania</i> Cramer southern armyworm <i>phe.</i>	*Z9-14:OAc + *Z9,E12-14:OAc (4:1) (1:1)  + *Z9,E11-14:OAc (7:3:1) + other components  + Z11-16:OAc (56:21:9:14)	Jacobson, 1970  Redfern, 1971  Teal, 1985  Mitchell, 1994	C
<i>Spodoptera evanida</i> <i>att.</i>	Z9-14:OAc + Z9,E12-14:OAc	L.-Cassou in Pherobase	C
<i>Spodoptera exempta</i> Walker African armyworm <afuricashirona-yotou> <i>phe.</i>	*Z9-14:OAc + *Z9,E12-14:OAc (20:1)  (99:1–9:1)  + *Z11-16:OAc (20:1:1) + other components	Beevor, 1975  Wakamura, 2011  Cork, 1989	A
<i>Spodoptera exigua</i> Hübner beet armyworm <shiroichimoji-yotou>	*Z9,E12-14:OAc  + other componets	Brady, 1972(a)  Persoons, 1981	A

	+ *Z9-14:OH (5:4)	Tumlinson, 1981	
	+ other componets		
	att. (10:1)	Mitchell, 1983	
	att. (9:1–7:3)	Wakamura, 1987	
	+ *Z9,E12-14:OH	Mochizuki, 1993	
	+ other components		
	att. (7:3-3:7)	Mochizuki, 1994	
	*Z9,E12-14:OAc	Tumlinson, 1990	
	+ *Z9-14:OH	Mitchell, 1994	
	+ *Z11-16:OAc (87.2:2.5:10.3)		
	+ other components		
	att. (7:3:1–7:3:5)	Jung, 2003	
	phe. (56:37:7)	Acin, 2010	
	+ other componets		
<i>Spodoptera frugiperda</i> J. E. Smith fall armyworm	Z5,Z9-13:OAc or E5,Z9-13:OAc	Warthen, 1967	C
phe.	*Z9-14:OAc	Sekul, 1967	
	+ Z9,E12-14:OAc (24:1)	Mitchell, 1976	
	+ Z9-12:OAc (1:20)	Jones, 1979	
	+ Z9-12:OAc	Mitchell, 1985	
	+ Z7-12:OAc		
	+ Z11-16:OAc (81.61:0.25:0.45:17.69)		
	+ *Z7-12:OAc (30:1)	Tumlinson, 1986	
	+ other components	Descoins, 1988	
	+ *9:Ald (1000:5.8:10)	Saveer, 2023	
Brazil strain	+ *Z7-12:OAc	Batista-Pereira, 2006	
	+ *E7-12:OAc (100:1:1)		
	+ other components		
Invasive strain in Japan	+ *Z7-12:OAc (100:1)	Wakamura, 2021	
	+ other components		
	+ *Z11-16:OAc	Tabata, 2023	



	+ *Z9-12:OAc + *Z9,E12-14:OAc (200:2:40;1:1)		
China strain	(25:1) + other components	Jiang, 2022	
China strain	+ *Z11-16:OAc (88:1:11) + other components	Wang, 2022	
strains in Kenya	+ *Z7-14:OAc + *Z11-14:OAc + *Z11-16:OAc N	Sisay, 2024	
<i>Spodoptera latifascia</i> Walker phe.	*Z9-14:OAc + *Z9,E12-14:OAc N  (19:1) + other components	Teixeira, 1989  Monti, 1995	C
<i>Spodoptera littoralis</i> Boisduval cotton leafworm phe.	*Z9,E11-14:OAc + other components  + *Z9,E12-14:OAc (10:1)  (100:1) + other components  + *E10,E12-14:OAc N	Nesbitt, 1973 Campion, 1974; 1980 Dunkelblum, 1987(b)  Tamaki, 1974(a) Yushima, 1974  Kehat, 1976; 1977 Dunkelblum, 1982  Navarro, 1997	C
<i>Spodoptera litura</i> F. common cutworm <hasumon-yotou> phe.	*Z9,E11-14:OAc + *Z9,E12-14:OAc (9:1)	Tamaki, 1973 1974(b)	A
<i>Spodoptera pectinicornis</i> Hampson <ukikusa-yoto> att.	Z7-12:OAc	Hai, 2002	C
<i>Spodoptera</i> (= <i>Prodenia</i> ) <i>praeifica</i> Grote western yellow-striped armyworm phe.	Z7-12:OAc  *Z7-12:OAc + *Z9-14:OAc (50:1) + other components	Birch, 1977  Landolt, 2003	C

<i>Spodoptera sunia</i> Guenée phe.	*Z9-14:OAc (major) + *Z9-14:OH + *Z11-16:OAc + *Z9,E12-14:OAc N	Bestmann, 1988(a)	C
<i>Spodoptera triturrata</i> Walker att.	Z9-14:OAc (major) + Z9,E12-14:OAc  + E9-14:OAc (17:3)	Campion, 1975  Blair, 1978	C
<i>Tholera cespitis</i> Denis & Schiffermüller att.	Z11-16:Ald	Subchev in Pherobase	D
<i>Trachea atriplicis</i> L. <shirosujiao-yotou> att.	Z11-16:OAc + Z11-16:OH (8:1)  (4:1) + Z11-16:Ald (10:1:1)	Stan in Arn, 1992  Li, 1993(d)  Subchev, 1992	B
<i>Xanthia icteritia</i> Hufnagel <monki-kiriga> att.	Z11-16:Ald  + Z9-16:Ald (19:1)	Grichanov in Pherobase  Bulyginskaya in Pherobase	A
<i>Xanthia lutea</i> Ström att.	Z9,E12-14:Ald	Steck, 1982(a)	C
<i>Xylena exoleta</i> L. att.	Z11-16:Ald	Subchev in Pherobase	C
<i>Xylena formosa</i> Butler <kibaramokume-kiriga> att.	Z11-16:Ald  + Z9-16:Ald (19:1)	Ando, 1977  Kohno, 2014	A
<i>Xylena fumosa</i> Butler <ayamokume-kiriga> att.	Z11-16:Ald + Z9-16:Ald (19:1)	Kohno, 2014	A
<i>Xylomyges curialis</i> Grote phe.	*Z11-16:OH	McDonough, 1982(b)	C
<i>Xylomyges dolosa</i> Grote att.	Z7-12:OAc	Steck, 1979(c)	C

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(Noctuidae; Cuculliinae) ヤガ科 ; セダカモクメ亜科

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<i>Allophyes oxyacanthae</i> L. <i>att.</i>	Z9-14:OAc + Z9-14:OH (1:1)	Tóth in Arn, 1986(a)	D
<i>Ammoconia caecimacula</i> Denis & Shiffermüller <i>att.</i>	Z9-14:OAc	Tóth, 1979	D
<i>Antivaleria</i> (= <i>Valeriodes</i> ) <i>viridimacula</i> Graeser <aobahagata-kiriga> <i>att.</i>	Z11-16:OAc	Ando, 1977	A
<i>Atethmia ambusta</i> F. <i>att.</i>	Z7-14:OAc + Z5-14:OAc (10:1)	Subchev, 1995	D
<i>Blepharita solieri</i> Boisduval <i>phe.</i>	*Z11-16:Ald	Rotundo, 1983	C
<i>Callierges ramosa</i> Esper <i>att.</i>	Z11-16:OAc + Z11-16:Ald	Subchev, 1986(b)	D
<i>Calophasia platyptera</i> Esper <i>att.</i>	Z9-14:OAc + Z9-14:Ald (1:1)	Tóth in Arn, 1986(a)	D
<i>Conistra grisescens</i> Draudt <miyamaobi-kiriga> <i>att.</i>	Z7-12:OAc	Ando, 1977	A
<i>Conistra rubiginea</i> Denis & Schiffermüller <i>att.</i>	Z11-16:OAc + Z11-16:Ald	Subchev in Arn, 1992	C
<i>Conistra torida</i> L. <i>att.</i>	Z11-16:OAc + Z11-16:Ald	Subchev in Pherobase	C
<i>Conistra unimacula</i> Sugi <hoshiobi-kiriga> <i>att.</i>	Z11-16:OAc	Ando, 1977	A
<i>Conistra vaccinii</i> L. <i>att.</i>	Z7-14:OAc	Priesner in Arn, 1986(a)	C

<i>Conistra veronicae</i> Hübner <a href="#">att.</a>	Z7-12:OAc	Subchev, 1990	C
<i>Copitarsia decolora</i> Guenée <a href="#">phe.</a>	*Z9-14:OAc + *Z9-14:OH (100:1 – 4:1)	Rojas, 2006	D
<i>Copitarsia uncialata</i> Burgos & Leiva <a href="#">phe.</a>	*Z9-14:OAc or *E9-14:OAc + other components N	Altamar-Varón, 2016	D
<i>Cucullia argentea</i> Hufnagel <aomongsedakamokume> <a href="#">att.</a>	Z7-12:OFo	Szöcs, 1981	A
<i>Cucullia chamomilliae</i> Denis & Schiffermüller <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc (9:1)	Frerot, 1982(a)	C
<i>Cucullia florea</i> Guenée <a href="#">att.</a>	Z9-14:OAc	Steck, 1982(a)	C
<i>Cucullia intermedia</i> Speyer <a href="#">att.</a>	Z9-14:OAc	Roelofs, 1971(a)	C
<i>Cucullia lucifuga</i> Denis & Schiffermüller <miyamasedakamokume> <a href="#">att.</a>	Z9-14:OAc + Z7-14:OAc + 14:OAc (8:1:1)	Frérot, 1987(a)	A
	12,12,12-F <sub>3</sub> -Z9-12:OAc	Bengtsson, 1990	
<i>Cucullia lychnitis</i> Rambur <a href="#">att.</a>	Z9-14:OH E	Priesner, 1975	C
<i>Cucullia omissa</i> Dod <a href="#">att.</a>	Z9-14:OAc	Steck, 1982(a)	C
<i>Cucullia postera</i> Guenée <a href="#">att.</a>	Z9-14:OAc + Z9-14:Ald (100:1)	Steck, 1982(a)	C
<i>Cucullia speyeri</i> Lintner <a href="#">att.</a>	Z9-14:OAc	Steck, 1982(a)	C
<i>Cucullia tanacetii</i> Denis & Schiffermüller <a href="#">att.</a>	Z9-14:OAc + Z7-12:OAc (5:1)	Konstantin in Arn, 1986(a)	C
<i>Cucullia umbratica</i> L.	Z9-14:OAc E	Priesner, 1975	C

<i>att.</i>	Z9-14:OAc + Z9-14:OH (1:4)	Platia in Arn, 1986(a)	
	+ Z7-12:OAc (1:1) or + Z7-14:OAc (1:1)	Szöcs, 1983	
	+ Z7-12:OAc + Z5-10:OAc (1:1:1)	Coroiu, 1986	
	+ Z7-12:OAc + Z11-14:OAc	Priesner in Arn, 1986(a)	
	+ Z7-12:OAc	Ostrauskas, 2003	
<i>Epiglaea apiata</i> Grove cranberry blossom worm <i>phe.</i>	*Z9-16:OAc + *Z9-14:OAc + *14:OAc	Zhang, 2003(b)	D
<i>Fishia derelicta</i> Hampson <i>att.</i>	Z7-12:OAc + Z9-14:OAc (3:1)	Steck, 1982(a)	D
	+ Z9-14:Ald (4:8:1)	Underhill, 1977(a)	
<i>Fishia evelina hanhami</i> Grote <i>att.</i>	Z5-14:OAc + Z9-14:OAc (8:1)	Steck, 1979(c)	D
<i>Homoglaea</i> sp. <i>att.</i>	E11-14:OAc	Daterman, 1977	D
<i>Homohadena infixa</i> Walker <i>att.</i>	Z7-14:OAc + Z9-14:OAc (100:1)	Steck, 1982(b)	D
<i>Isopolia strigidisca</i> Moore <himarayahagata-yotou> <i>att.</i>	Z11-14:OAc	Ando, 1981	A
<i>Jodia croceago</i> Denis & Schiffermüller <i>att.</i>	Z11-16:OAc	Subchev, 1990	C
<i>Oncocnemis chandleri</i> Grote <i>att.</i>	E5,Z7-12:OAc	Reed, 1984	C
<i>Oncocnemis cibalis</i> Grote <i>att.</i>	E5,Z7-12:OAc + Z7-12:OAc (1:1)	Reed, 1984	C

<i>Oncocnemis lepipuloides</i> McDunnough <a href="#">att.</a>	Z7-12:OAc + Z9-14:OAc	Steck, 1982(a)	C
<i>Oncocnemis mackiei</i> Barnes & Benjamin <a href="#">att.</a>	E5,Z7-12:OAc	Reed, 1984	C
<i>Oncocnemis piffardi</i> Walker <a href="#">att.</a>	Z9-12:OAc  Z9-14:OAc + Z7-12:OAc (500:1)	Underhill, 1977(a)  Steck, 1982(b)	C
<i>Polymixis polymita</i> L. <a href="#">att.</a>	Z9-14:OAc + Z11-14:OAc (1:1)	Ghizdavu, 1985	D
<i>Pyreferra citrombra</i> Franclemont <a href="#">att.</a>	Z9-14:OAc  + Z7-12:OAc	Roelofs, 1971(a)  Steck, 1982(a)	D
<i>Rancora albida</i> Guenée <a href="#">att.</a>	Z9-14:OAc	Steck, 1982(a)	D
<i>Sunira bicolorago</i> Guenée <a href="#">att.</a>	Z9-16:OAc + Z11-16:OAc	Steck, 1982(a)	D
<i>Sutyna profunda</i> Smith <a href="#">att.</a>	Z9-16:OAc + Z11-16:OAc	Steck, 1982(a)	D
<i>Sympistis heliophila</i> Paykull <takane-yotou> <a href="#">att.</a>	Z7-12:OAc	Linnaluoto, 1983	A
<i>Telorta acuminata</i> Butler <usukitogari-kiriga> <a href="#">att.</a>	Z11-16:Ald  + Z9-16:Ald (19:1)	Ando, 1981  Kohno, 2014	A
<i>Telorta divergens</i> Butler <nokometogari-kiriga> <a href="#">att.</a>	Z11-16:OAc	Ando, 1975	A
<i>Telorta edentata</i> Leech <kitogari-kiriga> <a href="#">att.</a>	E11-16:OAc  or Z11-16:OAc	Ando, 1975  Ando, 1977	A

<i>Teratoglaea pacifica</i> Sugi <eguri-kiriga> att.	Z9-14:OAc or Z9,E12-14:OAc	Ando, 1977	A
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(Noctuidae; Amphipyrinae) ヤガ科 ; カラスヨトウ亜科

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<i>Agroperina cogitata</i> Smith att.	Z11-16:OAc + Z9-14:OAc (20:1)	Steck, 1982(a) Byers, 1987	C
<i>Agroperina dubitans</i> Walker att.	Z11-16:OAc + Z9-14:OAc (20:1)	Underhill, 1977(b)	C
<i>Agroperina indela</i> Smith att.	Z11-16:OAc + Z11-16:OH (9:1)	Ayre, 1982(a)	C
<i>Agroperina popofensis indela</i> Smith att.	Z11-16:OAc + Z11-16:OH	Byers, 1987	C
<i>Amphipyra monolitha</i> Guenée <ooshimakarasu-yotou> att.	Z11-16:OAc	Ando, 1975	A
<i>Amphipyra pyramidea</i> L att.	Z11-16:OAc	Subchev in Pherobase	B
<i>Athetis dissimilis</i> Hampson <ten-usuiro-yotou> att.	Z9-14:OH  Z9,E12-14:OH + Z9-14:OH (9:1)	Ando, 1977  Kim, 2016	A
<i>Athetis hospes</i> Freyer att.	Z9-14:OH	Capizzi, Guerrero in Arn, 1986(a) Albages, 1988 Guerrero, 1986	C
<i>Athetis lepigone</i> Möschler <kousuiro-yotou> phe.	Z7-12:OAc + Z9-14:OAc (1:1)  *Z9-14:OAc + *Z7-12:OAc (7:3)	Szöcs, 1981 Li, 1993(d)  Yan, 2018(a)	A
<i>Athetis (= Dadica) lineosa</i> Moore <shikomori-yotou> att.	Z9-14:OAc + Z11-14:OAc (1:1)	Ando, 1981	A

<i>Athetis pallustris</i> Hübner att.	Z9-14:OAc + Z7-14:OAc (9:1)	Frérot, 1987(a)	C
<i>Athyra pulmonaris</i> Esper att.	Z11-16:OAc + Z11-16:OH (1:1)	Priesner in Arn, 1986(a)	D
<i>Busseola fusca</i> Fuller maize stalk borer phe.	*Z11-14:OAc + *E11-14:OAc + *Z9-14:OAc (5:1:1)  + *Z11-16:OAc (62:15:13:10)	Nesbitt, 1980c Hall, 1981  Félix, 2009	D
<i>Busseola segeta</i> Bowden phe.	*Z11-14:OAc + *E11-14:OAc + *Z11-16:OAc + *Z9-14:OAc + *Z11-14:OH (62:20:10:5:5)	Félix, 2011	D
<i>Busseola</i> sp. phe.	*Z11-14:OAc + *E11-14:OAc + *Z11-16:OAc + *Z9-14:OAc + *Z11-14:OH (62:20:10:5:5)	Félix, 2011	D
<i>Charanyca trigrammica</i> Hufnagel att.	Z5-10:OAc + Z7-12:OAc + Z9-14:OAc (3:1:1)	Arn, 1983	D
<i>Crymodes devastator</i> Brace glassy cutworm att.	Z11-16:Ald + Z11-16:OAc + Z11-16:OH (100:50:3)	Steck, 1980(c)	C
<i>Dicycla oo</i> L. att.	Z9-14:OAc + Z11-16:OAc (9:1)	Szöcs, 1983	D
<i>Diparopsis castanea</i> Hmpson red bollworm phe.	*E9,Δ11-12:OAc + *Δ11-12:OAc (4:1)  + *Z9,Δ11-12:OAc (16:4:5) + other components	Nesbitt, 1973  Nesbitt, 1975(a)	D
<i>Gortyna flavago</i> Schiffermüller att.	Z11-16:Ald + Z9-16:Ald (25:1)	Subchev, 1994	C
<i>Gortyna leucostigma</i> Hübner	Z11-16:OAc	Priesner	C



			in Arn, 1986(a)	
<i>Gortyna xanthenes</i> Germar artichoke moth phe. att.	*Z11-16:Ald + *Z9-16:Ald + *Z11-16:OH + *16:Ald (500:15:12:15)		Rotundo, 1985(a)	C
<i>Oria musculosa</i> Hübner att.	Z11-16:OAc		Subchev, 1981 Tóth, 1992(e)	D
<i>Orthogonia sera</i> Felder & Felder <nokomesedaka-yotou> att.	Z7-12:OAc		Ando, 1975	A
<i>Panemeria tenebrata</i> Scopoli att.	Z9-14:OAc + Z11-14:OAc (9:1)		Szöcs, 1983 Ghizdavu, 1985	D
<i>Platysenta videns</i> Guenée att.	Z11-16:Ald + Z9-14:Ald + 16:Ald + 14:Ald (12:4:3:6)		Teal, 1982	C
<i>Protagrotis niveivenosa</i> Grote att.	Z11-16:Ald + Z9-14:OAc		Steck, 1982(a)	D
<i>Protagrotis obscura</i> Barnes & McDunnough att.	Z11-16:Ald		Kamm, 1982	D
<i>Thalpophila matura</i> Hufnagel att.	Z11-16:OAc		Subchev in Arn, 1992	D

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(Noctuidae; Sarrothripinae) ヤガ科 ; キノカワガ亜科

<i>Nolathripa</i> (= <i>Lamprothripa</i> ) <i>lactaria</i> Graeser <komabashiro-kinokawaga> att.	Z9,E12-14:OPr		Ando, 1977	A
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(Noctuidae; Chloephorinae) ヤガ科 ; リンガ亜科

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<i>Earias biplaga</i> Walker att.	Z11-16:Ald	Nesbitt, 1979(b)	C
<i>Earias insulana</i> Boisduval spiny bollworm phe.	*E10,E12-16:Ald + E10,Z12-16:Ald + Z11-16:Ald (10:1:2)	Hall, 1980 Cork, 1988	C
<i>Earias vittella</i> F. spotted bollworm <kusaobi-ringa> phe.	*E10,E12-16:Ald + *Z11-16:Ald + *Z11-18:Ald (5:1:1) + another component	Cork, 1985(b); 1988	A

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(Noctuidae; Acontiinae) ヤガ科 ; コヤガ亜科

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<i>Deltotes candidula</i> Denis & Schiffermüller att.	Z9-16:Ald	Capizzi in Arn, 1986(a)	D
<i>Emmelia</i> (= <i>Acontia</i> ) <i>trabealis</i> Scopoli <kimadara-koyaga> att.	Z5-10:OAc  Z11-16:OAc + Z5-10:OAc (10:1)	Arn, 1983 Szöcs, 1983 Nagy, 2023  Subchev, 1987	A
<i>Eustrotia uncula</i> Clerck <suji-koyaga> att.	Z5-10:OAc + Z3-10:OAc (10:1)	Priesner, 1988(b)	A
<i>Lithacodia albidula</i> Guenée att.	Z5-12:OAc + Z7-14:OAc	Steck, 1982(a)	C
<i>Lithacodia deceptor</i> Scopoli att.	Z7-12:OH	Priesner in Arn, 1986(a)	C
<i>Lithacodia pygarga</i> Hufnagel marbled white-spot moth <shirofu-koyaga> att.	Z7-14:OAc + Z5-14:OAc (10:1)	Priesner, 1985(a)	A
<i>Lithacodia signifera</i> Scopoli att.	Z9-14:OAc	Li, 1993(d)	C

<i>Micardia argentata</i> Butler <shirohishimon-koyaga> att.	E7-12:OAc or Z7-12:OAc	Ando, 1977	A
<i>Naranga aenescens</i> Moor rice green caterpillar <futaobi-koyaga> phe.	*Z11-16:OAc + *Z9-16:OAc + *Z9-14:OAc (4:1:1)	Ando, 1980(a)	A
	Korean strain (4:1:2)	Cho, 2014	
<i>Phyllophila obliterata</i> <i>cretacea</i> Butler <yomogi-koyaga> att.	Z9-14:OAc or Z9,E12-14:OAc	Nagano, 1979	A

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(Noctuidae; Plusiinae) ヤガ科 ; キンウワバ亜科

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<i>Anadevidia peponis</i> F. <urikin-uwaba> phe.	*Z7-12:OAc + *Z5-10:OAc + *Z7-12:OH (10:5:1) + other components	Inomata, 2000	A
<i>Anagrapha falcifera</i> Kirby celery looper att.	Z7-12:OAc + Z7-12:OFo (1:1) + Z7-12:OH (10:1)	Roelofs, 1970(a) Butler, 1977 Steck, 1979(b)	D
<i>Argyrogramma signata</i> F. att.	Z5-10:OAc	Hai, 2002	D
<i>Argyrogramma verruca</i> F. phe.	Z7-12:OAc + E7-12:OAc (47:3)  *Z5-10:OAc	McLaughlin, 1975  Heath, 1987	D
<i>Autographa aemula</i> Denis & Schiffermüller att.	Z7-12:OH	Priesner in Arn, 1986(a)	C
<i>Autographa ampla</i> Walker att.	Z7-12:OAc	Roelofs, 1970(a)	C
<i>Autographa biloba</i> Stephens	*Z7-12:OAc N	Berger, 1968	C

<i>Autographa bractea</i> Denis & Schiffermüller <i>att.</i>	Z7-12:OH	Priesner in Arn, 1986(a)	C
<i>Autographa californica</i> Speyer alfalfa looper <i>phe.</i>	Z7-12:OAc + Z7-12:OFo (5:1) *Z7-12:OAc + Z7-12:OH (10:1) + Z9-14:OAc + Z11-16:OAc (80:6:2:13)	Shorey, 1965 Butler, 1977 Kaae, 1973(b) Steck, 1979(b) Landolt, 2003	C
<i>Autographa</i> (= <i>Autoplusia</i> ) <i>egena</i> Guenée <i>att.</i>	Z5-12:OAc	Kaae, 1973(a)	C
<i>Autographa flagellum</i> Walker <i>att.</i>	Z7-12:OAc + Z7-14:OAc	Steck, 1979(c)	C
<i>Autographa gamma</i> L. silver Y moth <gamakin-uwaba> <i>phe.</i>	Z7-12:OAc + Z7-12:OH (20:1)  Z7-14:OAc + E7-14:OAc  *Z7-12:OAc + *Z7-12:OH (10:1–19:1)	Ghizdavu, 1979 Priesner in Arn, 1986(a)  Soldán, 1983  Dunkelblum, 1983 Tóth, 1983 Mazor, 1992	A
<i>Autographa nigrisigna</i> Walker semi-looper <tamanagin-uwaba> <i>phe.</i>	*Z7-12:OAc + *Z7-12:OH + *Z5-12:OAc + *Z7-14:OAc (100:62:2:4) + other components	Sugie, 1991(a)	A
<i>Autographa precatationis</i> Guenée <i>att.</i>	Z7-12:OAc	Roelofs, 1971(a)	C
<i>Autographa pulchrina</i> Haworth	Z7-12:OAc E	Priesner, 1977	C

<i>att.</i>				
<i>Chryspidia bractea</i> Schiffermüller <i>att.</i>	Z11-16:OAc	Bykhovets in Pherobase		D
<i>Chryspidia contexta</i> Grote <i>att.</i>	Z7-12:OAc	Roelofs, 1970(a)		D
<i>Chryspidia festucae</i> L. <i>att.</i>	Z11-17:OH	Bykhovets in Pherobase		D
<i>Chryspidia venusta</i> Walker <i>att.</i>	Z5-12:OAc + Z7-12:OAc (1:1)	Steck, 1977(a)		D
<i>Chrysodeixis acuta</i> Walker <hosobanekin-uwaba> <i>att.</i>	Z5-10:OAc + Z7-12:OAc (1:1)	Tóth, 1992(c)		A
<i>Chrysodeixis argentifera</i> Guenée <i>att.</i>	Z7-12:OAc	Tóth in Arn, 1986(a)		C
<i>Chrysodeixis eriosoma</i> Doubleday New Zealand silver Y moth <ichijikukin-uwaba> <i>phe.</i>	*Z7-12:OAc + *Z9-12:OAc (50:1) or + Z9-14:OAc (5:1)	Benn, 1982		A
	Z7-12:OAc + Z9-12:OAc (17:3)	Sugie, 1990		
	+ Z9-14:OAc + Z11-16:OAc (10:2:1)	Inomata, 2000		
<i>Cornutiplusia</i> (= <i>Syngrapha</i> ) <i>circumflexa</i> L. <i>phe.</i>	Z7-12:OH + Z7-12:OAc (5:1)	Dunkelblum in Arn, 1986(a)		C
	*Z7-12:OH + *Z7-12:OAc (5:1)	Mazor, 1991		
<i>Ctenoplusia</i> (= <i>Acanthoplusia</i> ) <i>agnata</i> Staudinger three-spotted plusia <mitsumonkin-uwaba> <i>phe.</i>	*Z7-12:OAc + *Z9-12:OAc (10:1)	Sugie, 1990		A
in Vietnam	Z7-12:OAc	Hai, 2002		
<i>Ctenoplusia albostrigata</i>	*Z9,E12-14:OAc N	Boughdad		A

Bremer & Grey <ezogikukin-uwaba> phe.	Z7-12:OAc + Z5-10:OAc (2:1)	in Arn, 1997 Inomata, 2000	
in Vietnam	(9:1)	Hai, 2002	
in Japan	*Z7-12:OAc + other components	Inomata, 2005	
<i>Diachrysia chrysitis</i> L. burnished brass moth <ezohisagokin-uwaba> phe.	Z7-10:OAc + Z5-12:OAc (1:9)  + Z5-10:OAc (1:10)	Capizzi in Arn, 1986(a)  Priesner, 1985(c) Tóth, 1988	A
	*Z7-10:OAc + *Z5-10:OAc	Hansson in Arn, 1992 Löfstedt, 1994	
<i>Diachrysia chryson</i> Esper <ookin-uwaba> att.	Z7-12:OAc + Z7-12:OH (1:1)	Priesner, 1985(c)	A
<i>Diachrysia nadeja</i> Oberthür <kohisagokin-uwaba> att.	Z7-10:OAc + Z5-10:OAc	R.-Reser in Pherobase	A
<i>Diachrysia stenochrysis</i> Warren <oohisagokin-uwaba> phe.	*Z7-10:OAc + other components	Inomata, 2005	A
<i>Diachrysia tutti</i> Kostr. phe.	Z7-10:OAc + Z5-10:OAc (50:1)  *Z7-10:OAc + *Z5-10:OAc	Priesner, 1985(c) Tóth, 1988  Hansson in Arn, 1992 Löfstedt, 1994	C
<i>Macdunnoughia confusa</i> Stephens <kikugin-uwaba> phe.	Z7-12:OAc  + Z9-14:OAc (1:1)  + Z7-14:OAc	Booij, 1984(a)  Ando, 1981 Li, 1993(d)  Szöcs, 1983	A

	*Z7-12:OAc + *Z9-14:OAc (5:1) + other components	Inomata, 2000	
<i>Macdunnoughia crassisigna</i> Warren <ookikugin-uwaba> phe.	*Z7-12:OAc + *Z9-14:OAc (3:1) + another component	Wang, 2024	A
<i>Macdunnoughia purissima</i> Butler <ginmonshiro-uwaba> phe.	Z7-12:OAc + Z5-10:OAc + Z7-12:OH + Z5-12:OAc (10:5:1:1)	Inomata, 2000	A
	*Z7-12:OAc + *Z7-12:OH + *Z5-12:OAc (5:4:1)	Inomata, 2005	
<i>Plusia aereoides</i> Grote att.	Z7-12:OAc	Roelofs, 1970(a)	C
<i>Plusia</i> (= <i>Chrysodeixis</i> ) <i>chalcites</i> Esper tomato looper phe.	*Z7-12:OAc + *Z9-14:OAc (5:1) + other components	Dunkelblum, 1981	C
	+ *Z9-12:OAc (10:1:1)	Dunkelblum, 1987(a); 1993	
<i>Plusia festucae</i> L. rice looper <inekin-uwaba> phe.	*Z5-12:OAc + *Z7-14:OAc + *Z5-12:OH (100:15:6) + another component	Ando, 1995(b)	A
<i>Plusia</i> (= <i>Chryspidia</i> ) <i>putnami</i> Grote att.	Z5-12:OAc + Z7-12:OAc (100:1)	Steck, 1977(a) Steck, 1982(b)	B
<i>Pseudoplusia includens</i> Walker soybean looper phe.	*Z7-12:OAc  + *12:OAc + *Δ11-12:OAc + *Z7-12:OPr + *Z7-12:OBu (93.2:1.2:0.7:0.9:0.2)	Berger, 1968 Tumlinson, 1972  Linn, 1987	D
<i>Rachiplusia ou</i> Guenée	*Z7-12:OAc N	Berger, 1968	D

<i>Sclerogenia</i> (= <i>Autographa</i> ) <i>jessica</i> Butler <waiginmon-uwaba> att.	Z7-12:OAc + Z7-12:OH (9:1)	Ando, 1981	A
<i>Syngrapha ain</i> Hochenwarth <kishitagin-uwaba> phe.	Z7-12:OH + Z7-12:OAc (3:1)	Priesner in Arn, 1986(a)	A
	*Z7-12:OAc + *Z7-12:OH (3:2)	Inomata, 2005	
<i>Syngrapha epigaea</i> Grote att.	Z7-12:OAc + 14:OAc (20:1)	Steck, 1982(a)	C
<i>Syngrapha parilis</i> Hübner att.	Z7-12:OAc	Linnaluoto, 1983	C
<i>Syngrapha rectangula</i> Kirby att.	Z7-12:OAc	Steck, 1982(a)	C
<i>Syngrapha variabilis</i> att.	Z7-14:OAc E	Priesner, 1977	C
<i>Thysanoplusia intermixta</i> Warren chrysanthemum golden plusia <kikukin-uwaba> phe.	*E5,Z7-12:OAc + *E5,Z7-12:OH + *Z7-12:OAc (100:13:18) + another component	Ando, 1998	A
<i>Thysanoplusia orichalcea</i> F. <nettaikikukin-uwaba> phe.	*Z7-12:OAc + *E5,Z7-12:OAc (100:11) + other components	Ando, 1998	A
<i>Trichoplusia ni</i> Hübner cabbage looper <irakusagin-uwaba> phe.	*Z7-12:OAc  + *12:OAc (9:1) + other components  + Z7-14:OAc (200:1)  Z7-12:OAc	Berger, 1966 Kaae, 1973(b)  Bjostad, 1980(b); 1984 Dunkelblum, 1993 Linn, 1984  Steck, 1980(a)  Mayer, 1995	A



<i>Trichoplusia oxygramma</i> Geyer att.	Z7-12:OAc + E7-12:OAc (47:3) + Z9-14:OAc (10:0.9)	Mitchell, 1972; 1973 McLaughlin, 1975 Landolt, 1986(c)	C
<i>Zonoplusia ochureata</i> Walker <koseakakin-uwaba> att.	Z7-12:OAc + Z5-12:OAc (1:1)	Hai, 2002	A

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<i>Tyta luctuosa</i> Denis & Schiff. phe.	*Z11-16:Ald + * Z9-14:Ald (5:1) N + other components	Cao, 2002, 2003	D
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(Nolidae) コブガ科

<i>Nola confusalis</i> Herrich-Schäffer <hime-kobuga> att.	E10,Z12-16:Ald	Priesner in Arn, 1986(a)	A
<i>Uraba lugens</i> Walker gum leaf skeletonizer phe.	E10,Z12-16:OAc + E10,Z12-16:OH (3:1)  *E10,Z12-16:OAc + *E10,Z12-16:OH (3:1) + another component	Suckling, 2005(b)  Gibb, 2008	D

(Erebidae; Calpinae) トモエガ科 ; エグリバ亜科

<i>Rusicada privata</i> Walker hibiscus-leaf caterpillar moth <ooaka-kiriba> phe.	*Me7-17:H	Kim, 2023	A
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(Erebidae; Catocalinae) トモエガ科 ; シタバガ亜科

<i>Achaea janata</i> L. castor semilooper	*Z3,Z6,Z9-21:H + *Z6,Z9-21:H	Persoons, 1993 Krishnakumari, 1998	A
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<shirahoshiashibuto-kuchiba> phe.	+ *21:H + *Z9,Z12-18:Ald (65:1:1:1)		
<i>Anticarsia gemmatalis</i> Hübner velvetbean caterpillar phe.	*Z3,Z6,Z9-20:H + *Z3,Z6,Z9-21:H (5:3)  (39:11)	Heath, 1983  McLaughlin, 1989	C
<i>Bastilla arctotaenia</i> Guenée <hosoobiashibuto-kuchiba> phe.	*Z3,Z6,Z9-21:H	Abubaker, 2024(a)	A
<i>Caenurgina distincta</i> Neumuller phe.	Z3,Z6,Z9-20:H + Z3,Z6,epo9-20:H (1:1) (9S,10R)-isomer  *Z3,Z6,Z9-20:H + *Z3,Z6,epo9-20:H (8:1) + other components	Wong, 1985(b)  Millar, 1991(b)	D
<i>Caenurgina erechtea</i> Cramer forage looper phe.	*Z3,Z6,Z9-21:H + *Z3,Z6,Z9-20:H (4:1)	Underhill, 1983	D
<i>Euclidia cuspidata</i> Hübner phe.	Z3,Z6,Z9-21:H + Z3,Z6,epo9-21:H  + Z3,Z6,Z9-20:H (45:1:1)  *Z3,Z6,Z9-21:H + *Z3,Z6,epo9-21:H (10:1) + other components	Wong, 1985(b)  Underhill in Arn, 1986(a)  Millar, 1991(b)	C
<i>Eulepidotis addens</i> Walker att.	Z3,Z6,epo9-21:H (9S,10R)-isomer E	Renou, 1988	D
<i>Gonodonta bidens</i> Geyer att.	Z3,Z6,Z9-21:H E	Renou, 1988	D
<i>Gonodonta incurva</i> Sepp att.	Z3,Z6,Z9-21:H E	Renou, 1988	D
<i>Gonodonta parens</i> Guenée att.	Z3,Z6,Z9-21:H E	Renou, 1988	D

<i>Gonodonta sicheas</i> Cramer att.	Z3,Z6,Z9-21:H E	Renou, 1988	D
<i>Grammodes geometrica</i> F. <nakaguro-kuchiba> phe.	*Z3,Z6,Z9-21:H + *Z3,Z6,Z9-23:H + *Z3,Z6,Z9-20:H (50:2:1)	Abubaker, 2024(b)	A
<i>Hypenomorpha calamina</i> Butler <hirobachibitogari-atsuba> att.	Z6,epo9-20:H	Ando, 1995(a)	A
<i>Lesmone formularis</i> Geyer att.	Z3,Z6,epo9-21:H (9S,10R)-isomer E	Renou, 1988	D
<i>Massala obvertens</i> Walker att.	Z3,Z6,Z9-20:H E	Renou, 1988	D
<i>Melipotes fasciolaris</i> Hübner att.	Z3,Z6,epo9-21:H (9S,10R)-isomer E	Renou, 1988	D
<i>Melipotes januaris</i> Guenée att.	Z3,Z6,Z9-21:H E	Renou, 1988	D
<i>Mocis disseverans</i> Walker phe.	*Z3,Z6,Z9-21:H + *Z3,Z6,Z9-20:H (49:1)  Z3,Z6,Z9-21:H	Landolt, 1986(b)  McLaughlin, 1989	C
<i>Mocis latipes</i> Guenée phe.	*Z3,Z6,Z9-21:H + *Z6,Z9-21:H (3:1)  (4:1)	Descoins, 1986  Landolt, 1989(b)	C
<i>Mocis marcida</i> Guenée phe.	*Z3,Z6,Z9-21:H + *Z3,Z6,Z9-20:H N	Landolt, 1986(b)	C
<i>Mocis megas</i> Guenée phe.	*Z3,Z6,Z9-21:H + *Z3,Z6,epo9-21:H (9S,10R)-isomer E	Descoins, 1990	C
<i>Neachrostia bipuncta</i> Sugi <futatenchibi-atsuba> att.	Z3,Z6,Z9-18:H	Ando, 1995(a)	A

<i>Ophisma tropicalis</i> Guenée att.	Z3,Z6,epo9-21:H (9S,10R)-isomer E	Renou, 1988	C
<i>Pangrapta trimantesalis</i> Walker <unmontsumakiri-atsuba> att.	Z3,Z6,epo9-23:H	Ando, 1995(a)	A
<i>Paragabara flavomacula</i> Oberthür <kiboshi-atsuba> att.	Z3,epo6,Z9-21:H	Ando, 1993	A
<i>Syllectra erycata</i> Cramer att.	Z3,Z6,epo9-21:H E	Renou, 1988	D
<i>Zale duplicata</i> Bethune att.	Z3,Z6,epo9-21:H (9R,10S)-isomer	Wong, 1985(b)	D
<i>Zale fictilis</i> Guenée att.	Z3,Z6,epo9-21:H (9S,10R)-isomer E	Renou, 1988	D
<i>Zale lunifera</i> Hübner att.	Z3,Z6,epo9-21:H (9R,10S)-isomer	Landolt, 1996	D

(Erebidae; Ophiderinae) トモエガ科 ; クチバ亜科

<i>Aedia leucomelas</i> L. <nakajiro-shitaba> phe.	*Z3,Z6,Z9-21:H	Tamaki, 1996	A
<i>Alabama argillacea</i> Hübner phe.	*Me9-19:H (S)-isomer + other components	Hall, 1993	D
<i>Anomis sabulifera</i> Guenée jute semilooper phe.	*Z6,Z9-21:H + *Z3,Z6,Z9-21:H (3:1)	Babu, 2021	C
<i>Anomis texana</i> phe.	*Me7-17:H (S)-isomer + another component	Hall, 1993	C
<i>Hypersynoides submarginata</i> Walker <ooshiroten-kuchiba> att.	epo3,Z6,Z9-19:H + Z3,Z6,Z9-19:H (1:1-1:0.1)	Witjaksono, 1999	A

<i>Hypocala andremona</i> Stoll att.	Z3,Z6,epo9-21:H (9 <i>S</i> ,10 <i>R</i> )-isomer E	Renou, 1988	C
<i>Hypocala rostrata</i> F. <indokishita-kuchiba> att.	Z3,epo6,Z9-21:H (6 <i>S</i> ,7 <i>R</i> )-isomer + epo3,epo6,Z9-21:H (10:1)	Wakamura, 2002	A
<i>Luceria</i> sp. att.	Z3,Z6,epo9-18:H	Hai, 2002	C
<i>Oraesia excavata</i> Butler fruit-piercing moth <akaeguriba> phe.	*Z6,epo9-21:H + *Z3,Z6,epo9-21:H (20:0-17:3)  (9 <i>S</i> ,10 <i>R</i> )-isomer	Ohmasa, 1991  Yamamoto, 1999	A
<i>Rivula leucanioides</i> Walker <take-atsuba> att.	Z3,epo6,Z9-18:H	Ando, 1995(a)	A
<i>Rivula propinqualis</i> Guenée att.	epoxydienes of Z3,Z6,Z9-19:H  Z3,Z6,Z9-19:H + Z3,epo6,Z9-19:H (6 <i>S</i> ,7 <i>R</i> )-isomer (10:1)	Wong, 1985(b)  Millar, 1990(a)	C
<i>Rivula sasaphila</i> Sugi <kuriiro-atsuba> att.	Z3,epo6,Z9-19:H	Ando, 1993	A
<i>Rivula sericealis</i> Scopoli <tenkuro-atsuba> att.	Z3,epo6,Z9-19:H	Ando, 1993	A
<i>Scoliopteryx libatrix</i> L. herald moth <hagata-kiriba> phe.	*Z6,Me13-21:H  ( <i>S</i> )-isomer	Francke, 2000  Toshova, 2003	A
Gen et sp. att.	$\Delta$ 1,Z3,Z6,Z9-19:H	Yamamoto, 2008	A

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(Erebidae; Hypeninae) トモエガ科 ; アツバ亜科

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<i>Bomolocha palparia</i> Walker (?) att.	Z3,Z6,epo9-20:H (9 <i>S</i> ,10 <i>R</i> )-isomer	Wong, 1985(b)	C
<i>Hypena</i> sp. att.	Z3,Z6,epo9-21:H	Hai, 2002	C
<i>Lomanaltes eductalis</i> Walker att.	Z3,Z6,epo9-21:H (9 <i>S</i> ,10 <i>R</i> )-isomer	Wong, 1985(b)	D
<i>Spargaloma sexpunctata</i> Grote att.	Z3,Z6,epo9-20:H (9 <i>S</i> ,10 <i>R</i> )-isomer	Wong, 1985(b)	D

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(Erebidae: *Herminiinae*) トモエガ科 ; クルマアツバ亜科

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<i>Adrapsa notigera</i> Butler <fujiro-atsuba> att.	Z3,epo6,Z9-23:H	Ando, 1995(a)	A
<i>Bleptina caradrinalis</i> Guenée att.	epoxydienes of Z3,Z6,Z9-21:H  Z3,epo6,Z9-21:H (6 <i>R</i> ,7 <i>S</i> ):(6 <i>S</i> ,7 <i>R</i> ) = 4:1 or Z3,epo6,Z9-20:H (6 <i>R</i> ,7 <i>S</i> ):(6 <i>S</i> ,7 <i>R</i> ) = 1:1	Wong, 1985(b)  Millar, 1991(c)	C
<i>Idia aemula</i> Hübner att.	epoxydienes of Z3,Z6,Z9-21:H	Wong, 1985(b)	D
<i>Idia americalis</i> Guenée att.	epoxydienes of Z3,Z6,Z9-20:H  Z3,epo6,Z9-20:H (6 <i>S</i> ,7 <i>R</i> )-isomer + Z3,epo6,Z9-21:H (6 <i>S</i> ,7 <i>R</i> )-isomer (1:1)	Wong, 1985(b)  Millar, 1991(c)	D
<i>Palthis angulalis</i> Hübner att.	epo6,Z9-19:H (6 <i>S</i> ,7 <i>R</i> )-isomer	Millar, 1991(a)	D
<i>Paracolax pryeri</i> Butler <shirotenmurasaki-atsuba> att.	Z3,epo6,Z9-20:H	Ando, 1993	A

<i>Renia salusalis</i> Walker att.	Z3,epo6,Z9-19:H (6 <i>S</i> ,7 <i>R</i> )-isomer	Landolt, 1996	D
<i>Tetanolita mynesalis</i> Walker phe.	*Z3,epo6,Z9-21:H (6 <i>S</i> ,7 <i>R</i> )-isomer + *Z3,Z6,Z9-21:H (1:1)	Haynes, 1996	D
<i>Zanclognatha lunaris</i> Scopoli <kobuhige-atsuba> att.	Me2,epo7-18:H	Minyailo, 1977	A
<i>Zanclognatha</i> sp. att.	Z3,epo6,Z9-19:H	Hai, 2002	C

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(Erebidae: Lymantriinae) トモエガ科 ; ドクガ亜科

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<i>Arna</i> (=Euproctis) <i>pseudoconspersa</i> Strand tea tussock moth <cha-dokuga> phe.	*Me10,Me14-15:OisoBu + *Me14-15:OisoBu (20:1-5:1) + another component  (10 <i>R</i> :10 <i>S</i> = 10:0-1:9)	Wakamura, 1994  Ichikawa, 1995 Wakamura, 1996(b) Zhao, 1998 Tsai, 1999	A
<i>Artaxa</i> (=Euproctis) <i>subflava</i> Bremer oriental tussock moth <dokuga> phe.	*Me10,Me14-15:OisoBu ( <i>R</i> )-isomer + another component	Wakamura, 2007(b)	A
<i>Dasychira baibarana</i> Matsumura tea black tussock moth phe.	*Z3,Z6,epo9-21:H + *Z3,Z6,epo9,E11-21:H + *Z3,Z6-21:11-one (5:4:11)	Magsi, 2022	C
<i>Dasychira grisefacta ella</i> Bryk. att.	Z6-21:11-one	Daterman, 1976	C
<i>Dasychira plagiata</i> Walker att.	Z6-21:11-one + E6-21:11-one (100:1)	Grant, 1977	C
<i>Dasychira vagans grisea</i> Barnes & McDunnough att.	Z6-21:11-one	Daterman, 1976	C

<i>Euproctis chrysorrhoea</i> L. browntail moth phe.	*Z7,Z13,Z16,Z19-22:OisoBu	Leonhardt, 1991 Khrimian, 2008	C
<i>Euproctis terminalis</i> Walker pine browntail moth phe.	*Z7,Z13,Z16,Z19-22:OisoBu	Bouwer, 2021	C
<i>Gynaephora ginghamensis</i> phe.	*Z3,Z6,Z9-21:H + Z3,Z6,Z9-20:H (100:1)	Chen in Arn, 1986(a)	C
<i>Leucoma salicis</i> L. satin moth <yanagi-dokuga> phe. In Canada In Hungary	*Z3,epo6,epo9-21:H + other components  (6 <i>S</i> ,7 <i>R</i> ,9 <i>S</i> ,10 <i>R</i> )-isomer (6 <i>R</i> ,7 <i>S</i> ,9 <i>R</i> ,10 <i>S</i> )-isomer	Gries, 1997(c)  Holden, 2000 Szöcs, 2005	A
<i>Lymantria bantaizana</i> Matsumura <bantai-maimai> phe.	*Me2,Z7,E9-18:H	Gries, 2005(c)	A
<i>Lymantria concolor</i> Walker att.	Me2,epo7-18:H	Bhardwaj, 1987	C
<i>Lymantria</i> (= <i>Porthetria</i> ) <i>dispar</i> L. gypsy moth phe.	*Me2,epo7-18:H  (7 <i>R</i> ,8 <i>S</i> )-(+)-isomer	Bierl, 1970; 1972 Klimetzek, 1976 Cardé, 1977(b) Miller, 1978	B
	+ *Me2,epo7,Δ17-18:H (7 <i>R</i> ,8 <i>S</i> )-(+)-isomer + other components	Gries, 2005(a)	
<i>Lymantria dispar asiatica</i> Vnukovskij Asian gypsy moth att.	Me2,epo7-18:H (7 <i>R</i> ,8 <i>S</i> )-isomers  + Me2,epo7,Δ17-18:H (10:1) (7 <i>R</i> ,8 <i>S</i> )-isomers	Wallner, 1984  Park, 2019	B
<i>Lymantria dispar japonica</i> Motschulsky Japanese gypsy moth <maimaiga>	Me2,epo7-18:H  (7 <i>R</i> ,8 <i>S</i> )-(+)-isomer	Beroza, 1973(a) Iwaki, 1974	A



att.

<i>Lymantria fumida</i> Butler <haraaka-maimai> phe.	Me <sub>2</sub> ,epo7-18:H *Me <sub>2</sub> ,epo7-18:H (7R,8S)-(+)-isomer + *Me <sub>2</sub> ,Z7-18:H (10:1)	Beroza, 1973(a) Schaefer, 1999	A
<i>Lymantria lucescens</i> Butler phe. <ooyama-maimai>	*Me <sub>2</sub> ,Z7-18:H	Gries, 2002	A
<i>Lymantria mathura</i> L. rosy (pink) gypsy moth <kashiwa-maimai> phe.	Me <sub>2</sub> ,epo7-18:H (7R,8S)-(+)-isomer *Z <sub>3</sub> ,Z <sub>6</sub> ,epo9-19:H (9S,10R)-isomer + another component  (9S,10R):(9R,10S) = (4:1)	Odell, 1992 Oliver, 1999 Gries, 1999(b)	A
<i>Lymantria monacha</i> L. nun moth <nonne-maimai> phe.	Me <sub>2</sub> ,epo7-18:H *Me <sub>2</sub> ,epo7-18:H  (-):(+) = 9:1 E  (+)-isomer + Me <sub>2</sub> ,Z7-18:H (1:3)  (+)-isomer + *epo7-18:H (7R,8S)-(+)-isomer + *Me <sub>2</sub> ,Z7-18:H (10:10:1)	Schönherr, 1972 Klimetzek, 1976 Minyailo, 1976 Bierl, 1975 Hansen, 1984 Grant, 1996 Gries, 1996; 2001	A
<i>Lymantria obfuscata</i> Walker Indian gypsy moth phe.	Me <sub>2</sub> ,epo7-18:H *Me <sub>2</sub> ,epo7-18:H (7R,8S)-(+)-isomer + *Me <sub>2</sub> ,Z7-18:H (2:1)	Beroza, 1973(b) Gries, 2007	C
<i>Lymantria serva</i> phe.	*Me <sub>2</sub> ,Z7-18:H	Gries, 2002	C

<i>Lymantria xyli</i> Swinhoe Casuarina moth <maeguro-maimai> phe.	*Me <sub>2</sub> ,epo <sub>7</sub> -20:H	Gries, 1999(c)	A
<i>Orgyia antiqua</i> L. rusty tussock moth att.	Z <sub>6</sub> -21:11-one	Daterman, 1976	C
<i>Orgyia cana</i> Edwards western tussock moth att.	Z <sub>6</sub> -21:11-one	Daterman, 1976	C
<i>Orgyia detrita</i> Guérin-Ménéville phe.	*Z <sub>6</sub> ,Z <sub>9</sub> -21:11-OH S:R = 1:1 [S:R = 7:2] + *Z <sub>6</sub> ,Z <sub>9</sub> -20:11-OH + *Z <sub>6</sub> ,Z <sub>9</sub> -22:11-OH (10:1:1)	Gries, 2003	C
<i>Orgyia ericae</i> Germar grey-spotted tussock moth phe.	*Z <sub>6</sub> ,Z <sub>9</sub> -21:H + *Z <sub>6</sub> -21:11-one (10:1) + another component	Chen, 2010	C
<i>Orgyia gonostigma</i> att.	Z <sub>6</sub> -21:11-one	Kovalev in Arn, 1992	C
<i>Orgyia leucostigma</i> J. E. Smith white-marked tussock moth phe.  (scale extract)	Z <sub>6</sub> -21:11-one  *Z <sub>6</sub> ,Z <sub>9</sub> -21:11-one + other components  *24:H + *25:H + other components	Grant, 1977  Grant, 2003; 2008  Grant, 1987(b)	C
<i>Orgyia postica</i> Walker <koshiromon-dokuga> phe. Okinawa strain Ishigaki strain  Taiwan strain	*Z <sub>6</sub> ,Z <sub>9</sub> ,tepo <sub>11</sub> -21:H (11S,12S)-isomer + other components  + *Z <sub>6</sub> -21:11-one	Wakamura, 2001(a); 2005(a)  Chow, 2001	A
<i>Orgyia pseudotsugata</i> McDunnough Douglas-fir tussock moth phe.	*Z <sub>6</sub> -21:11-one  + *Δ <sub>1</sub> ,Z <sub>6</sub> -21:11-one	Smith, 1975  Smith, 1978	C

	+ *Z6,E8-21:11-one (100:1)	Gries, 1997(a)	
<i>Orgyia thyellina</i> Butler white-spotted tussock moth <himeshiromon-dokuga> phe.	*Z6-21:11-one + *Z6-21:9-one (20:1)	Gries, 1999(a)	A
<i>Orgyia vetusta</i> Boisduval western tussock moth phe.	*Z6,E8-21:11-one + other components	Gries, 2005(d)	C
<i>Orvasca</i> (=Euproctis) <i>taiwana</i> Shiraki <taiwanki-dokuga> phe.	*Z9,Me16-17:OisoBu + another component	Yasuda, 1995	A
<i>Perina nuda</i> F. clear-winged tussock moth <sukiba-dokuga> phe.	*Z3,epo6,Z9-21:H (6S,7R)-isomer + *epo3,epo6,Z9-21:H (10:1) [(3S,4R,6S,7R): (3R,4S,6S,7R) = 3:2]	Yamazawa, 2001 Wakamura, 2002	A
<i>Somena</i> (=Euproctis) <i>pulverea</i> Leech <gomafuri-dokuga> phe.	*Z11,Z14,Z17-20:OisoBu + *Z11,Z14,Z17-20:O-Me4'Va (2:1) + other components	Wakamura, 2001(c)	A
<i>Sphrageidus</i> (=Euproctis) <i>similis</i> Fuessly browntail moth <monshiro-dokuga> phe.	*Z7-18:O-Me2'Bu (2'S:2'R = 7:2) + *Z7-18:OisoVa + *Z7-18:OBu + *Z7-18:OisoBu (20:12:1:1) + other components	Yasuda, 1994	A
<i>Sphrageidus</i> (=Euproctis) <i>similis xanthocampa</i> Dyar <monshiro-dokugamodoki> phe.	*Z7-18:OisoVa + other components	Tan, 1984	A
<i>Teia anartoides</i> Walker painted apple moth phe.	*Z6,Z9-21:11-one + *Z6,epo9-21:H (9R,10S)-isomer + *Z6,Z9-21:H + other components	El-Sayed, 2004(a); 2005(a) Gries, 2005(b)	D

(Erebidae: Arctiinae: Lithosiini) トモエガ科 ; ヒトリガ亜科 ; コケガ族

<i>Barsine aberrans aberrans</i> Butler <hagatabeni-kokega> att.	17:7-OPr (S)-isomer + 17:8-OPr (S)-isomer (1:1)	Fujii, 2013(b)	A
<i>Barsine expressa</i> Inoue <sakishimabeni-kokega> phe.	*17:7-OPr (S)-isomer + *17:8-OPr (S)-isomer (1:1) + other components	Fujii, 2013(b)	A
<i>Eilema japonica</i> Leech <kimae-hosoba> phe.	*Z6,Z9-21:H + *Z3,Z6,Z9-21:H + *Z6,Z9-22:H + *Z3,Z6,Z9-22:H (86:17:59:57) + other components	Fujii, 2010(b)	A
<i>Lyclene dharmia dharmia</i> Moore <himehoshiki-kokega> phe.	*Me6-18:2-one (S)-isomer + *Me14-18:2-one (2:1) (S)-isomer + another component	Yamamoto, 2007 Do, 2009 Adachi, 2010	A
<i>Miltochrista calamina</i> Butler <hagataki-kokega> phe.	*Me5-17:7-OH (5R,7R)-isomer	Yamakawa, 2011(b) Muraki, 2014	A
<i>Miltochrista striata</i> Bremer & Grey phe.	*Z3,Z6,epo9-18:H + *Z3,Z6,Z9-18:H (3:2)	Luo, 2019	B

(Erebidae: Arctiinae: Synthomini) トモエガ科 ; ヒトリガ亜科 ; カノコガ族

<i>Amata</i> (= <i>Syntomis</i> ) <i>phegea</i> L. att.	Me2,epo7-18:H  Z3,Z6,Z9-21:H	Capek, 1979  Szöcs, 1987	C
<i>Dysauxes ancilla</i> L. att.	$\Delta$ 1,Z3,Z6,Z9-19:H + Z3,Z6,Z9-19:H (1:1)	Szöcs, 1987	D
<i>Empyreuma mucro</i> Zerny phe.	*Z3,Z6,epo9-21:H (major) + *Z3,Z6,Z9-21:H N	Descoins, 1989	D
<i>Syntomeida epilais</i> Walker phe.	*Z3,Z6,epo9-21:H (major) + *Z3,Z6,Z9-21:H N	Descoins, 1989	D

<i>Syntomoides imaon</i> Cramer <muramatsu-kanoko> phe.	* $\Delta$ 1,Z3,Z6,Z9-21:H + *Z3,Z6,Z9-21:H + other components	Matsuoka, 2008	A
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(Erebidae: Arctiinae: Arctiini) トモエガ科 ; ヒトリガ亜科 ; ヒトリガ族

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<i>Amsacta albistriga</i> Walker	*Z3,Z6,Z9-21:H + *Z9,Z12,Z15-18:Ald + *Z9,Z12-18:Ald + *18:Ald (24:11.5:1:1)	Persoons, 1993	D
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<i>Arctia caja</i> L. <hitoriga> phe.	*Z3,Z6,Z9-21:H + *Z3,Z6,epo9-21:H + *Z3,Z6,epo9-20:H N	Bestmann, 1992(a)	B
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<i>Arctia plantaginis</i> wood tiger moth <himekishita-hitori> phe.	*Z3,Z6,Z9-21:H + *E4,Z6,Z9-21:H + * $\Delta$ 1,Z3,Z6,Z9-21:H + *Z2,E4,Z6,Z9-21:H E [30:3:5:1]	Muraki, 2017	A
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<i>Arctia villica</i> phe.	*Z3,Z6,Z9-21:H + * $\Delta$ 1,Z3,Z6,Z9-21:H N	Einhorn, 1984(a)	C
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<i>Callimorpha dominula</i> L. scarlet tiger moth phe.	*Z3,Z6,epo9-21:H N (9S,10R)-isomer	Clarke, 1996	C
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<i>Cretonotos gangis</i> L. <kurosui-hitori> phe.	*Z3,Z6,epo9-21:H (major) + *Z3,Z6,Z9-21:H + *Z3,Z6,Z9-23:H N	Bell, 1986 Wunderer, 1986	A
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<i>Cretonotos transiens</i> Walker <haiiro-hitori> phe.	*Z3,Z6,epo9-21:H (major) + *Z3,Z6,Z9-21:H + *Z3,Z6,Z9-23:H N	Bell, 1986 Wunderer, 1986	A
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<i>Cyana</i> sp. att.	Z3,Z6,epo9-18:H	Hai, 2002	C
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<i>Cymbalophora pudica</i> Esper phe.	*Z3,Z6,epo9-21:H (9S,10R)-isomer E	Frerot, 1988(b)	D
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<i>Diacrisia oblique</i> Walker Bihar hairy caterpillar phe.	*Z3,Z6,Z9-21:H + *Z3,Z6,epo9-21:H + *Δ1,Z3,Z6,epo9-21:H + *Z9,Z12,Z15-18:Ald + *Z9,Z12-18:Ald (26:10:5:30:10)	Persoons, 1993 Yadav, 2001	C
<i>Estigmene acrea</i> saltmarsh caterpillar moth phe.	*Z3,Z6,epo9-21:H + *Z9,Z12,Z15-18:Ald + *Z9,Z12-18:Ald (27:6:1)	Hill, 1981(b)	D
<i>Euchaetes egle</i> Drury milkweed tussock moth phe.	*Z3,Z6,Z9-21:H + *Δ1,Z3,Z6,Z9-21:H [5:2] + other components N	Simmons, 1998	D
<i>Eurata patagiata</i> Burmeister phe.	*Z9,Z12,Z15-18:OH + * Z9,Z12,Z15-18:Ald (3:1)	Rodríguez, 2018	D
<i>Halysidota leda</i> Druce neo-tropical tiger moth phe.	*Z3,Z6,epo9-21:H (major) + *Z3,Z6,Z9-21:H + other components N	Descoins, 1989	D
<i>Halysidota tessellaris</i> Smith att.	Z3,Z6,epo9-21:H (9R,10S)-isomer	Landolt, 1996	D
<i>Holomelina aurantiaca</i> phe.	*Me2-17:H	Roelofs, 1971(b)	D
<i>Holomelina ferruginosa</i> phe.	*Me2-17:H N	Roelofs, 1971(b)	D
<i>Holomelina fragilis</i> phe.	*Me2-17:H N	Roelofs, 1971(b)	D
<i>Holomelina immaculata</i> phe.	*Me2-17:H	Roelofs, 1971(b)	D
<i>Holomelina laeta</i> att.	Me2-17:H E	Roelofs, 1971(b)	D
<i>Holomelina lamae</i> phe.	*Me2-17:H N + other components	Roelofs, 1971(b) Schal, 1987	D
<i>Holomelina nigricans</i> phe.	*Me2-17:H N	Roelofs, 1971(b)	D

<i>Holomelina rubicundaria</i> att.	Me2-17:H		Roelofs, 1971(b)	D
<i>Holomelina</i> sp. att.	Me2-17:H		Weatherston, 1974(a)	D
<i>Hyphantria cunea</i> Drury fall webworm moth American white moth <amerikashiro-hitori> phe	*Z3,Z6,epo9-21:H + *Z9,Z12,Z15-18:Ald + *Z9,Z12-18:Ald	U.S.A. (27:6:1) U.S.S.R. [13:6:5]	Hill, 1982	A
		France [52:41:7]	Einhorn, 1982	N
	+ *Δ1,Z3,Z6,epo9-21:H + *Z3,Z6,epo9-20:H + *Δ1,Z3,Z6,epo9-20:H		Tóth, 1989(b)	
		Hungary [60:40:5:8:0.4:0.04]		N
	+ other components			
	Z3,Z6,epo9-21:H + Δ1,Z3,Z6,epo9-21:H + Z9,Z12,Z15-18:Ald (5:2:2)		Senda, 1991	
		China (1:1:8)	Zhang, 1996	
	*Z3,Z6,epo9-21:H (9 <i>S</i> ,10 <i>R</i> )-isomer + *Δ1,Z3,Z6,epo9-21:H (9 <i>S</i> ,10 <i>R</i> )-isomer + *Z9,Z12-18:Ald + *Z9,Z12,Z15-18:Ald (10:2:5:4)		Yamakawa, 2012(b)	N
	*Z3,Z6,epo9-21:H + *Δ1,Z3,Z6,epo9-21:H + *Z9,Z12,Z15-18:Ald + *Z9,Z12-18:Ald (279:1:66:6)	New Zealand	El-Sayed, 2005(c)	
		China (58:6:34:2)	Su, 2008	
<i>Isia</i> (= <i>Pyrrharctia</i> ) <i>isabella</i> phe.	*Me2-17:H + other components		Roelofs, 1971(b)	D
			Krasnoff, 1988	

<i>Panaxia</i> (= <i>Callimorpha</i> ) <i>quadripunctaria</i> phe.	*Z6,Z9-21:H + *Z6,Z9-20:H N	Schneider, 1998	C
<i>Pareuchaetes pseudoinsulata</i> Rego Barros phe.	*Z3,Z6,Z9-21:H N + other components  *Δ1,Z3,Z6,Z9-21:H N + other components	Schneider, 1992  Frérot, 1993(a)	D
<i>Phragmatobia fuliginosa</i> ruby tiger moth <ama-hitori> phe. Europe strain	*Z3,Z6,epo9-21:H + *Z3,Z6,Z9-21:H + *Z6,epo9-21:H + *Z6,Z9-21:H N  + Z9,Z12,Z15-18:Ald + Z9,Z12-18:Ald (21:8:1)	Descoins in Arn, 1992  Kovalev, 1986	B?
New York strain	*Z3,Z6,Z9-21:H + *Z3,Z6,epo9-21:H (5:1) N	Rule, 1989	
<i>Schistophleps</i> sp. 1 att.	Z3,Z6,epo9-19:H	Hai, 2002	C
<i>Schistophleps</i> sp. 2 att.	Z3,Z6,Z9-19:H	Hai, 2002	C
<i>Schistophleps</i> sp. 3 att.	Z3,Z6,Z9-21:H	Hai, 2002	C
<i>Spilosoma lubricipeda</i> L. att.	Z9,Z12,Z15-18:Ald + Z3,Z6,epo9-21:H + Δ1,Z3,Z6,epo9-21:H (8:1:1)	Ostrauskas, 2004	B
<i>Tyria jacobaeae</i> L. cinnabar moth phe.	*Z3,Z6,epo9-21:H (9 <i>S</i> ,10 <i>R</i> )-isomer + other components N	Frérot, 1988(a) Bestmann, 1994 Clarke, 1996	D
<i>Utetheisa ornatix</i> phe.	*Z3,Z6,Z9-21:H  *Δ1,Z3,Z6,Z9-21:H + *Z6,Z9-21:H	Conner, 1980  Jain, 1983	C



