Supporting Information

The manuscript title: Detecting host-plant volatiles with odorant receptors from *Grapholita molesta* (Busck) (Lepidoptera: Tortricidae)

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Table S1 Primers used in this study.

Primer name	Primer sequence (5′-3′)
OR12-F	CATGAGGAACAAAGTAGAAGC
OR12-R	GTCTTTAGCTGTCATTGTACA
OR20-F	ACGCCATGAAAACTTATAAAA
OR20-R	TATTGACTCCACCACAAAGT
OR21-F	TGTTCGGTTCCATATTAGAGC

OR21-R	TTCAAGCAACAACGTCGT
qActin-F	TGCGTGACATCAAGGAGAAG
qActin-R	TACCGATGGTGATGACCTGA
qEF1-α-F	AGGAGATCGAGCAACAGGAA
qEF1-α-R	CACGACTCTCGGGACTTCTC
qOR12-F	CGTTTACATTGGCCTCACGT
qOR12-R	GACCACAAAGCGAACACCTT
qOR20-F	AGGAGTTTAAGCCGTTTCGC
qOR20-R	TTACCACCAGTATCGCCAGG
qOR21-F	GTCGGTAGAAGCTTGGATGC
qOR21-R	GGTAATCGCCAGCAGTTGAG
cOR12-F	TCAACTAGTGCCACCATGAGGAACAAAGTAGAAG (SpeⅠ)
cOR12-R	TCAGCGGCCGCTTAGCTGTCATTGTACATAG (NotⅠ)
cOR20-F	TCAACTAGTGCCACCATGAAAACTTATAAAAGGAAG (SpeⅠ)
cOR20-R	TCAGCGGCCGCTTATTGACTCCACCACAA (NotⅠ)
cOR21-F	TCAACTAGTGCCACCATGTTCGGTTCCATATTAGA (SpeⅠ)
cOR21-R	TCAGCGGCCGCTCAAGCAACAACGTCGTTC (NotⅠ)

The restriction enzyme of each primer is marked in parenthesis behind the sequence, and the restriction sites are underlined.

Table S2 Odorants eliciting responses from GmolORs/Orco.

Class	Name	Molecular weight	Formula	Purity (%)	CAS
Sex pheromones	(*Z*)-8-Dodecenyl Acetate	226.36	$C_{14}H_{26}O_2$	>95.0	28079-04-1

	(*E*)-8-Dodecenyl Acetate	226.36	$C_{14}H_{26}O_2$	>95.0	38363-29-0
	(*Z*)-8-Dodecenyl alcohol	184.32	$C_{12}H_{24}O$	>98.0	40642-40-8
	1-Dodecanol	186.33	$C_{12}H_{26}O$	>99.5(GC)	112-53-8
Alcohols	1-Hexanol	102.17	$C_6H_{14}O$	>98.0(GC)	111-27-3
	Decanol	158.28	$C_{10}H_{22}O$	98.0	36729-58-5
	Tetradecanol	214.39	$C_{14}H_{30}O$	⩾99.5(AR)	27196-00-5
	Benzyl alcohol	108.14	C_7H_8O	⩾99.0(AR)	100-51-6
	3-Methyl-1-butanol	88.15	$C_5H_{12}O$	>98.0(GC)	123-51-3
	2-Ethyl-1-hexanol	130.23	$C_8H_{18}O$	>99.0(GC)	104-76-7
	(*Z*)-3-Hexenol	100.16	$C_6H_{12}O$	98.0(AR)	928-96-1
	Nerolidol	222.37	$C_{15}H_{26}O$	97.0	7212-44-4
	Linalool	154.25	$C_{10}H_{18}O$	98.0	78-70-6
Aldehydes	*E*-2-Hexenal	98.15	$C_6H_{10}O$	98.0	6728-26-3
	Benzaldehyde	106.12	C_6H_5CHO	⩾99.5(GC)	100-52-7
	Hexanal	100.16	$C_6H_{12}O$	95.0	66-25-1
	Heptanal	114.19	$C_7H_{14}O$	97.0(AR)	111-71-7
	Octanal	128.21	$C_8H_{16}O$	99.0	124-13-0
	Nonanal	142.24	$C_9H_{18}O$	95.0	124-19-6
	Decanal	156.27	$C_{10}H_{20}O$	>97.0(GC)	112-31-2
	γ-Undecanolactone	184.28	$C_{11}H_{20}O_2$	98.0	104-67-6
	Dodecanal	184.32	$C_{12}H_{24}O$	95.0	112-54-9
Esters	Butyl acetate	116.16	$C_6H_{12}O_2$	99.0(AR)	123-86-4

	Hexyl acetate	144.21	$C_8H_{16}O_2$	99.0	142-92-7
	Isoamyl acetate	130.19	$C_7H_{14}O_2$	⩾99.5(GC)	123-92-2
	(*Z*)-3-Hexenyl acetate	142.2	$C_8H_{14}O_2$	98.0	3681-71-8
	Ethyl butyrate	116.16	$C_6H_{12}O_2$	99.0	105-54-4
	Butyl butyrate	144.21	$C_8H_{16}O_2$	>99.0(GC)	109-21-7
	Butyl propionate	130.19	$C_7H_{14}O_2$	99.0	590-01-2
	Ethyl hexanoate	144.21	$C_8H_{16}O_2$	99.0	123-66-0
	Ethyl heptanoate	158.24	$C_9H_{18}O_2$	⩾99.5	106-30-9
	(2*E*,4*Z*)-Ethyl decandienoate	196.29	$C_{12}H_{20}O_2$	⩾80.0	3025-30-7
	Methyl salicylate	152.15	$C_8H_8O_3$	99.0(GC)	119-36-8
	Methyl jasmonate	224.3	$C_{13}H_{20}O_3$	95.0	39924-52-2
	Methyl myristate	242.4	$C_{15}H_{30}O_2$	98.0(GC)	124-10-7
	Methyl palmitate	270.45	$C_{17}H_{34}O_2$	97.0	112-39-0
Terpenes	*α*-Pinene	136.23	$C_{10}H_{16}$	98.0	80-56-8
	α-Ocimene	136.23	$C_{10}H_{16}$	⩾90.0	13877-91-3
	Caryophyllene	204.35	$C_{15}H_{24}$	>90.0(GC)	87-44-5
	Squalene	410.72	$C_{30}H_{50}$	98.0	111-02-4
	Camphene	136.23	$C_{10}H_{16}$	95.0	79-92-5
Benzonitriles	Benzonitrile	103.12	C_7H_5N	>99.0(GC)	100-47-0
	Geranyl nitrile	149.23	$C_{10}H_{15}N$	97.0	5146-66-7
Alkanes	Decane	142.28	$C_{10}H_{22}$	98.0	124-18-5
	Tetradecane	198.39	$C_{14}H_{30}$	98.0	629-59-4

Pentadecane	212.41	$C_{15}H_{32}$	98.0	629-62-9
Hexadecane	226.44	$C_{16}H_{34}$	98.0(AR)	544-76-3

Table S3 All the ORs and their accession numbers used in phylogenetic analysis.

Species	Gene name	Acc. number	Species	Gene name	Acc. number
OR					
G. molesta	GmolOR12	MK910370	*G. molesta*	GmolOR20	QDQ17563.1
G. molesta	GmolOR21	QDQ17564.1	*B. mori*	BmorOR14	BAH66313.1
C. fagiglandana	CfagOR14	AST36307.1	*C. fagiglandana*	CfagOR25	AST36312.1
C. herana	CherOR59	AIT69903.1	*C. nigricana*	CnigOR14	AST36383.1
C. nigricana	CnigOR15	AST36384.1	*C. nigricana*	CnigOR59	AST36408.1
C. obliquana	CoblOR25	AIT71992.1	*C. obliquana*	CoblOR59	AIT72013.1
C. pomonella	CpomOR14	AFC91722.1	*C. pomonella*	CpomOR15	AFC91728.1
C. pomonella	CpomOR25	AFC91729.1	*C. pomonella*	CpomOR59	AFC91721.1
H. nubiferana	HnubOR14	AST36254.1	*H. nubiferana*	HnubOR25	AST36261.1
P. excessana	PexcOR14	AJE25873.1	*P. excessana*	PexcOR25	AJE25878.1
P. excessana	PexcOR59	AJE25899.1	*P. octo*	PoctOR59	AJF23815.1
Orco					
G. molesta	GmolOR2	AVZ44715.1	*B. mori*	BmorOR2	BAD69585.1
C. fagiglandana	CfagOrco	AST36341.1	*C. herana*	CherOR2	AET06155.1
C. nigricana	CnigOrco	AST36420.1	*C. obliquana*	CoblOR2	AET06157.1
C. pomonella	CpomOrco	AFC91712.1	*H. nubiferana*	HnubOrco	AST36292.1

P. excessana	PexcOrco	AJE25910.1	*P. octo*	PoctOrco	AJF23826.1

Species: *G. molesta*, *Grapholita molesta*; *B. mori*, *Bombyx mori*; *C. fagiglandana*, *Cydia fagiglandana*; *C. herana*, *Ctenopseustis herana*; *C. nigricana*, *Cydia nigricana*; *C. obliquana*, *Ctenopseustis obliquana*; *C. pomonella*, *Cydia pomonella*; *H. nubiferana*, *Hedya nubiferana*; *P. excessana*, *Planotortrix excessana*; *P. octo*, *Planotortrix octo*.