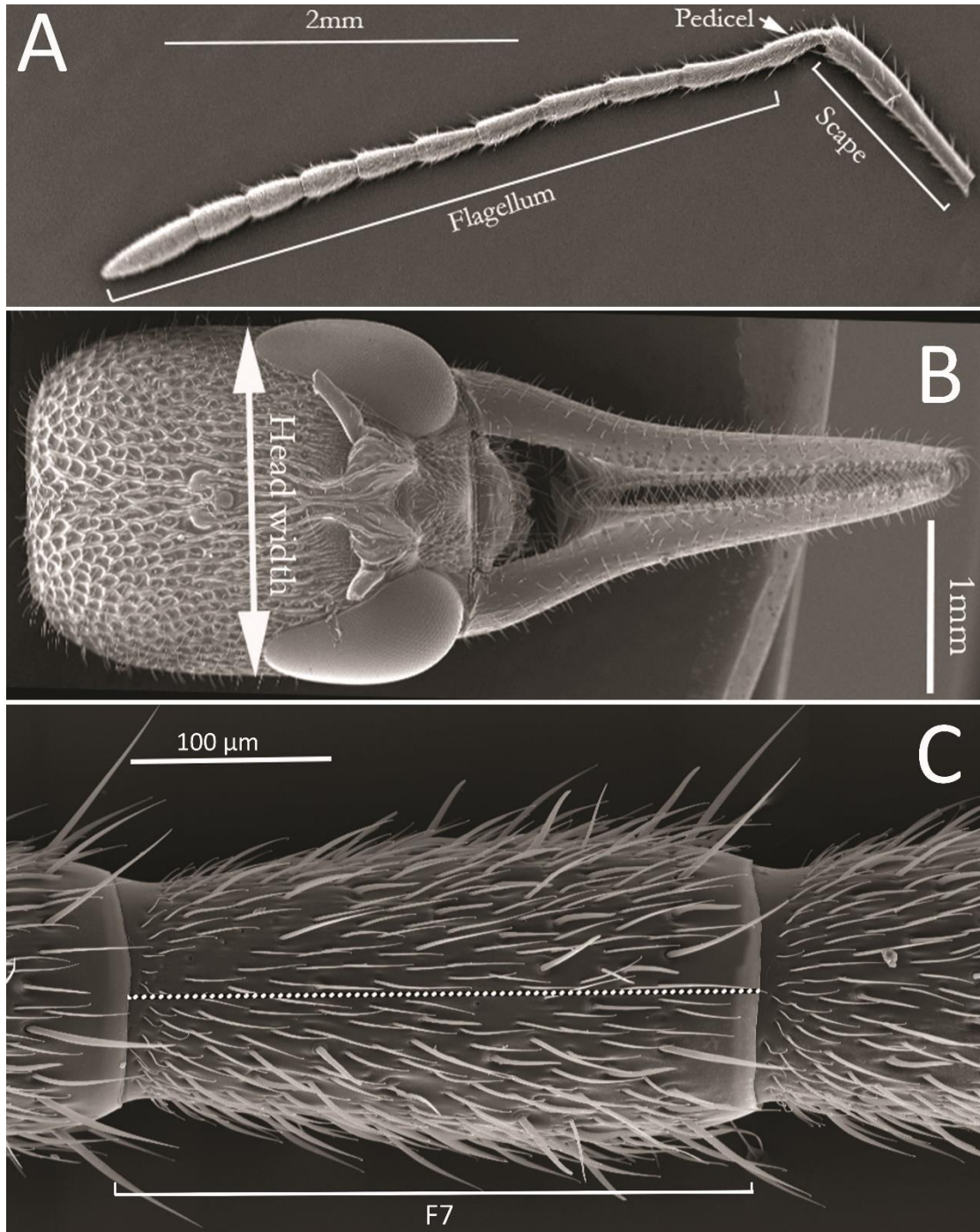


Chemosensory sensitivity reflects reproductive status in the ant *Harpegnathos saltator*

Majid Ghaninia^{1,2}, Kevin Haight¹, Shelley L. Berger³, Danny Reinberg⁴, Laurence J. Zwiebel⁵, Anandasankar Ray⁶, Jürgen Liebig^{1,*}



Supplementary Figure S1. Head and antenna characteristics of a worker of *Harpegnathos saltator*. (A) Profile view of the antenna indicating scape, pedicel, and 10 segments of the flagellum. (B) Dorsal view of head (C) Dorsal view of flagellum 7 with dotted line indicating the location of length measurements.

Supplementary Table S1. Number of sensilla in the antennal flagellomeres (F1-F10) of *H. saltator* non-reproductive workers (n=5) and gamergates (n=5) (mean±SE)

Status	Non-reproductive worker			Gamergate		
Sensilla type	Trichoid	Basiconic	Coeloconic	Trichoid	Basiconic	Coeloconic
Flagellomere						
F1	4.8±1.85	2.4±0.75	6.8±1.73	3.2±1.50	2.8±1.02	0.4±0.40
F2	6.8±1.02	3.2±0.49	2.8±0.84	5.2±1.50	3.2±1.02	2±1.10
F3	5.6±1.17	6±1.41	5.2±2.01	5.6±1.72	5.6±1.47	0.4±0.40
F4	8.8±2.24	7.6±0.98	7.2±1.98	10±1.79	8±0.63	1.6±0.40
F5	10.4±2.99	7.6±1.72	4.8±3.17	15.6±2.48	7.6±1.17	1.6±1.17
F6	15.6±0.75	9.6±0.40	6.4±3.16	20.4±2.48	10.8±1.85	2.4±1.47
F7	35.6±4.17	11.6±1.60	6±3.27	38.4±3.06	13.2±1.20	2.8±0.49
F8	51.6±3.49	18±1.41	4±2.23	50±2.76	17.2±2.87	3.2±1.20
F9	74±11.33	18.4±3.66	2±1.39	71.2±8.80	16±1.67	6.8±2.94
F10	143.6±5.27	60.8±8.78	5.6±3.08	143.2±6.05	53.6±4.75	12±3.29
Total	356.8±34.28	145.2±21.20	50.8±22.86	362.8±32.13	138.0±17.65	33.2±12.84

Supplementary Table S2. Size of antennal flagellomeres (F1-F10) of *H. saltator* non-reproductive workers (n=5) and gamergates (n=5) (mean±SE)

Status	Non-reproductive worker	Gamergate
Head width (mm)	2.18±0.04	2.14±0.01
Flagellomere	Flagellomere length (um)	
F1	485.79±6.07	472.25±8.23
F2	440.58±4.37	423.34±6.63
F3	402.01±3.85	394.76±2.50
F4	391.29±3.07	381.58±6.89
F5	368.03±3.53	355.85±3.36
F6	353.96±3.82	341.47±5.33
F7	328.28±4.29	324.15±4.90
F8	313.31±2.33	309.65±3.37
F9	303.83±3.44	299.00±5.17
F10	457.34±6.13	454.35±8.54
Total	3844.45±40.89	3756.44±54.91

Supplementary Table S3. Test compounds and their characteristics for the extracellular recordings of *H. saltator*

Chemical class	Compound name	Heat shock applied	Amount loaded (μl)	Concentration (μg/μl)	Source	Cas number	Purity (%)	Solvent
General odor	4-Methyl-3-heptanol		20	10	Sigma-Aldrich	14979-39-6	≥99	Paraffin oil
	6-Methyl-5-hepten-2-one		20	10	SAFC	110-93-0	≥98	Paraffin oil
	Ethyl acetate		20	10	Sigma-Aldrich	141-78-6	99.8	Paraffin oil
	2,3-Butanedione		20	10	Sigma-Aldrich	431-03-8	97	Paraffin oil
	<u>2-Heptanone*</u>		20	10	Sigma-Aldrich	606-024-00-3	99	Paraffin oil
	<u>trans-2-hexen-1-al</u>		20	10	Sigma-Aldrich	6728-26-3	98	Paraffin oil
	Geranyl acetate		20	10	SAFC	105-87-3	≥98	Paraffin oil
	<u>1-Octen-3-ol</u>		20	10	Sigma-Aldrich	3391-86-4	98	Paraffin oil
	<u>Methyl salicylate</u>		20	10	Sigma-Aldrich	119-36-8	≥99	Paraffin oil
	<u>Isopentyl acetate</u>		20	10	Sigma-Aldrich	123-92-2	≥99	Paraffin oil
	<u>1-Hexanol</u>		20	10	Sigma-Aldrich	603-059-00-6	98	Paraffin oil
	<u>Propanal</u>		20	10	Sigma-Aldrich	123-38-6	≥97	Paraffin oil
	<u>Formic acid</u>		20	10	Sigma-Aldrich	64-18-6	98	Distilled water
	<u>Acetic acid</u>		20	10	Fisher	64-19-7	≥99.7	Distilled water
Methyl-branched alkane	<u>13,17-Dimethylnonacosane (13,17-Dime-C29)</u>	**	1	1	Synthesized ^{##}	n.a. ^{***}	>96.9 ^{###}	Pentane
	<u>12,16-Dimethyloctacosane (12,16-Dime-C28)</u>	**	1	1	Synthesized ^{##}	n.a. ^{***}	>89.4 ^{###}	Pentane
	S-3-Methylheptacosane (S-3-Me-C27)	**	1	1	Synthesized ^{##}	n.a. ^{***}	>95.1 ^{###}	Pentane
	<u>R-3-Methylheptacosane (R-3-Me-C27)</u>	**	1	1	Synthesized ^{##}	n.a. ^{***}	>95.1 ^{###}	Pentane
	<u>3,9-Dimethylheptacosane (3,9-Dime-C27)</u>	**	1	1	Synthesized ^{##}	n.a. ^{***}	>89.6 ^{###}	Pentane
	<u>3,7-Dimethylheptacosane (3,7-Dime-C27)</u>	**	1	1	Synthesized ^{##}	n.a. ^{***}	>90.9 ^{###}	Pentane
	<u>13-Methylheptacosane (13-Me-C27)</u>	**	1	1	Synthesized ^{##}	n.a. ^{***}	>99.1 ^{###}	Pentane
	9-Methylheptacosane (9-Me-C27)	**	1	1	Synthesized ^{##}	n.a. ^{***}	>97.2 ^{###}	Pentane
	<u>9-Methylpentacosane (9-Me-C25)</u>	**	1	1	Synthesized ^{##}	n.a. ^{***}	>99.3 ^{###}	Pentane

Chemical class	Compound name	Heat shock applied	Amount loaded (µl)	Concentration (µg/µl)	Source	Cas number	Purity (%)	Solvent
Straight chain alkane	<u>Hentetracontane (C41)</u>	**	1	1	Fluka	7194-87-8	≥99	Pentane
	<u>Nonatriacontane (C39)</u>	**	1	1	Fluka	7194-86-7	≥97	Pentane
	<u>Heptatriacontane (C37)</u>	**	1	1	Fluka	7194-84-5	≥99.5	Pentane
	<u>Hexatriacontane (C36)</u>	**	1	1	Fluka	630-06-8	≥99.5	Pentane
	<u>Pentatriacontane (C35)</u>	**	1	1	Fluka	630-07-9	≥99.5	Pentane
	<u>Tetratriacontane (C34)</u>	**	1	1	Fluka	14167-59-0	≥99.5	Pentane
	Tritriacontane (C33) [#]	**	1	1	Aldrich	630-05-7	98	Pentane
	<u>Dotriacontane (C32)</u>	**	1	1	Aldrich	544-85-4	97	Pentane
	<u>Hentriacontane (C31)</u> [#]	**	1	1	Sigma-Aldrich	630-04-6	≥98	Pentane
	<u>Triacontane (C30)</u> [#]	**	1	1	Fluka	638-68-6	≥98	Pentane
	<u>Nonacosane (C29)</u> [#]	**	1	1	Sigma-Aldrich	630-03-5	99	Pentane
	<u>Octacosane (C28)</u> [#]	**	1	1	Fluka	630-02-4	≥99.5	Pentane
	<u>Heptacosane (C27)</u> [#]	**	1	1	Sigma-Aldrich	593-49-7	≥98	Pentane
	Hexacosane (C26) [#]	**	1	1	Sigma-Aldrich	630-01-3	99	Pentane
	<u>Pentacosane (C25)</u> [#]	**	1	1	Sigma-Aldrich	629-99-2	99	Pentane
	Tricosane (C23) [#]	**	1	1	Aldrich	638-67-5	99	Pentane
	<u>Pentadecane (C15)</u>		20	1	Aldrich	629-62-9	99+	Pentane
	<u>Tridecane (C13)</u>		20	1	Aldrich	629-50-5	≥99	Pentane
	Undecane (C11)		20	1	Sigma-Aldrich	1120-21-4	≥99	Pentane
	<u>Decane (C10)</u>		20	1	Sigma-Aldrich	124-18-5	99+	Pentane
Alkene	<u>Z-9-Tricosene (C23:1)</u>		20	1	Bedoukian	27519-02-4	98	Paraffin oil
Control	Pentane		20		Sigma-Aldrich	109-66-0	≥99	
	Paraffin oil		20		Sigma-Aldrich	8012-95-1		
	Water		20					
	Blank							
	Heated blank cartridge							

* Underlined bold compounds were not delivered to 1- and 7-month old workers, and 7-month old gamergates

** Heat shock was applied to these compounds

*** Not available

[#] Present on the cuticle of *Harpegnathos saltator* (see Liebig et al. 2000)

^{##} For synthesis information see (see Sharma et al. 2015)

^{###} Determined by GC/MS, enantiopurity of R- and S-3-methylheptacosane is 99% (see Sharma et al. 2015)