**S1. Supporting Information.**

**Synthetic Procedure and NMR Data for**

**Vapour Pressure Measurements and Attractiveness of Raspberry Ketone Analogs to Queensland Fruit Fly, *Bactrocera tryoni* (Froggatt).**

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**A. General Procedures**

1H and 13C Nuclear Magnetic Resonance (NMR) spectra were recorded using a Bruker Avance DPX 400 operating at 400 MHz for 1H NMR and at 101 MHz for 13C NMR. CDCl3 was used as a solvent for all NMR samples. 1H NMR chemical shifts are reported in parts per million (δ) referenced to the proton signal of the deuterated solvent (CDCl3; 7.26 ppm), whereas 13C NMR chemical shifts are reported with reference to the carbon signals of the deuterated solvent (CDCl3: 77.16 ppm) unless otherwise stated. High resolution mass spectrometry was performed on a Bruker Apex Qe 7T Fourier Transform Ion Cyclotron Resonance mass spectrometer equipped with a duel ESI/MALDI source at University of Sydney. Samples were infused at ~150uL/hr into the ESI source using a cole palmer syringe pump. Low resolution mass spectra were recorded on Shimadzu 2010 GCMS spectrometer. Ionization of samples was carried out using electron impact (EI). Infrared spectra were recorded using an Omnic FTIR spectrometer. Frequencies *ν* in IR spectra are given in cm-1. Flash column chromatography was performed using Biotage Isolora Four over Merck 60 silica gel 0.040–0.060 mm packed in a Biotage cartridge. Thin layer chromatography (TLC) was performed using Merck 60 silica gel precoated aluminium sheets (0.2 mm) and visualised with ultraviolet light at 254 nm. All reagents were purchased from Sigma-Aldrich, Merck, Ajax Finechem or Alfa-Aesar and used without further purification.

**B. Procedure for the Syntheses of Compounds**

4-(4-formyloxyphenyl)-2-butanone (ML)[1]



To a solution of formic acid (2.80 g, 61 mmol, 1 eq.) in DCM (200 mL) was added DMAP (0.744 g, 6 mmol, 0.1 eq.), followed by RK (10.0 g, 61 mmol, 1 eq.). DCC (13.8 g, 67 mmol, 1.1 eq.) was added to the mixture at 0 °C and the mixture was stirred for 5 minutes at 0 °C. The reaction mixture was allowed to increase temperature to room temperature (rt) and stirred for further 3 hours (h) at rt. Any solid was filtered off and filtrate was washed with 0.1 M HCl solution (200 mL), then 5% NaHCO3 solution (200 mL) and dried over anhydrous MgSO4. The solvent was removed under reduced pressure to give the crude product, which was purified by flash column chromatography eluted with 5 – 25% EtOAc in hexane to give the product as clear oil (10.1 g, 86% yield).

1H NMR (400 MHz, CDCl3) δ 2.14 (3 H, s, CCH3), 2.76 (2 H, t, *J* = 7.5, CH2), 2.90 (2 H, t, *J* = 7.5, CH2), 7.03 (2 H, d, *J* = 8.5, Har), 7.21 (2 H, d, *J* = 8.3, Har), 8.29 (1 H, s, HCO); 13C NMR (101 MHz, CDCl3) δ 29.1, 30.2, 45.1, 121.2, 129.7, 139.4, 148.3, 159.5, 207.6; IR *ν*max/cm-1 (neat) 2929, 1735, 1710, 1506, 1194, 1166, 1101; GCMS (EI) *m/z* (%) 192 (M+, 25), 107 (M+−HCO and CH2COCH3, 100). This compound is known, but spectroscopic data of the compound is not available in the literature.

4-(4-(2,2-difluoroacetoxyphenyl)-2-butanone (DF)



Followed the procedure for 4-(4-formyloxyphenyl)-2-butanone (ML), except the use of 2,2-difluoroacetic acid and obtained on a 24 mmol scale to give the product as clear oil (3.49 g, 61% yield)

1H NMR (400 MHz, CDCl3) δ 2.15 (3 H, s, CCH3), 2.78 (2 H, t, *J* = 7.5, CH2), 2.91 (2 H, t, *J* = 7.5, CH2), 6.13 (1 H, t, *J*(HCF) = 53, CHF2), 7.09 (2 H, m, Har), 7.25 (2 H, m, Har); 13C NMR (101 MHz, CDCl3) δ29.1, 30.2, 45.1, 103.4\* (*J*(HCF2) = 251), 106.8\* (*J*(HCF2) = 251), 109.2\* (*J*(HCF2) = 251), 120.9, 129.8, 140.0, 147.9, 171.2, 207.8; IR *ν*max/cm-1 (neat) 2939. 1785, 1712, 1507, 1217, 1193, 1119, 1076; GCMS (EI) *m/z* (%) 242 (M+, 60), 107 (M+ −F2HCO and CH2COCH3, 100); HRMS calcd. for C12H11F2O3Na+: 265.06467 and 266.06803, found: 265.06459 and 266.06810.

4-(4-(2,2,2-trifluoroacetoxyphenyl)-2-butanone (RKTA)[2]



Trifluoroacetic anhydride (6.40 g, 30 mmol, 1 eq) was added drop wise into an oven dried flask containing RK (5.02 g, 30 mmol, 1 eq) at 0 °C. The reaction mixture was allowed to increase temperature to 100 °C and refluxed for 2 h. TFA was removed by distillation and the crude product was purified by double distillation under reduced pressure (2 – 3 mbar, 150 – 170 °C) to give pure product as yellow oil (7.30 g, 95% yield).

1H NMR (400 MHz, CDCl3) δ 2.24 (3 H, s, CCH3), 2.56 (2 H, m, CH2), 2.91 (2 H, m, CH2), 7.12 (2 H, d, *J* = 8.2, Har), 7.24 (2 H, d, *J* = 8.6, Har); 13C NMR (101 MHz, CDCl3) δ 29.1, 30.2, 45.0, 110.5\* (*J*CF = 287), 113.3\* (*J*CF = 287), 116.2\* (*J*CF = 287), 119.0\* (*J*CF = 287), 120.6, 129.9, 140.6, 147.8, 156.1 (q, *J*CCF = 44) , 207.5; IR *ν*max/cm-1 (neat) 2936. 1796, 1715, 1507, 1357, 1188, 1160, 1122; GCMS (EI) *m/z* (%) 260 (M+, 100); HRMS calcd. for C12H11F3O3Na+: 283.05525 and 284.05861 found: 283.05527 and 284.05856.

4-(4-propionyloxyphenyl)-2-butanone (PRK)



Followed the procedure for 4-(4-formyloxyphenyl)-2-butanone (ML), except the use of propanoic acid and obtained on a 91 mmol scale to give the product as white prism (18.2 g, 91% yield)

M.P. 48-50 °C (lit. data not available); 1H NMR (400 MHz, CDCl3) δ 1.26 (3 H, t, *J* = 7.6, CH2CH3), 2.14 (3 H, s, COCH3) 2.37 (2 H, q, *J* = 7.6, CH2CH3), 2.75 (2 H, t, *J* = 7.8, CH2), 2.88 (2 H, t, *J* = 7.7, CH2), 6.98 (2 H, d, *J* = 8.6, Har), 7.18 (2 H, d, *J* = 8.6, Har); 13C NMR (101 MHz, CDCl3) δ 9.2, 27.9, 29.2, 30.2, 45.2, 121.6, 129.4, 138.6, 149.2, 173.2, 207.8; IR *ν*max/cm-1 (neat) 2936. 1796, 1715, 1507, 1357, 1188, 1160, 1122; GCMS (EI) *m/z* (%) 220 (M+, 15), 107 (M+−CH3CH2CO and CH2COCH3, 100). This compound is known, but spectroscopic data of the compound is not available in the literature.

4-(4-((Trimethylsilyl)oxy)phenyl)-2-butanone (TMSRK)[3]



To a stirred solution of RK (0.857 g, 5.2 mmol, 1 eq.) and TEA ( 0.792 g, 7.7 mmol, 1.5 eq.) in dry THF (20 mL) was added chlorotrimethylsilane (0.680 g, 6.6 mmol, 1.2 eq.) dropwise at rt. The reaction mixture was stirred at rt for 5 h. Any solid was filtered off and the residue was washed with diethyl ether (20 mL). Solvents and any volatile substances were evaporated under reduced pressure to give the crude product, which was purified by flash column chromatography (0 – 20% EtOAc in hexane, gradient) to give the product as clear oil (1.06 g, 86% yield).

1H NMR (400 MHz, CDCl3) δ 0.25 (9 H, s, (CH3)3Si), 2.13 (3 H, s, CCH3), 2.71 (2 H, m, CH2), 2.82 (2 H, m, CH2), 6.75 (2 H, m, Har), 7.03 (2 H, m, Har); 13C NMR (101 MHz, CDCl3) δ 0.34, 29.1, 30.2, 45.5, 120.2, 129.3, 133.9, 153.6, 208.4; IR *ν*max/cm-1 (neat) 2959, 1715, 1509, 1249, 911, 840; GCMS (EI) *m/z* (%) 236 (M+, 40), 179 (M+ − CH2COCH3, 100) . Spectral data match with those in the literature [4, 5].

Methyl 3-(4-acetoxyphenyl) propionate (MAPP)



Followed the procedure for 4-(4-formyloxyphenyl)-2-butanone (ML), except the use of methyl 3-(4-hydroxyphenyl) propionate and acetic acid and obtained on a 24 mmol scale to give the product as clear oil (3.49 g, 61% yield)

1H NMR (400 MHz, CDCl3) δ 2.28 (3 H, s, COCH3), 2.62 (2 H, t, *J* = 7.7, CH2), 2.94 (2 H, t, *J* = 7.7, CH2), 3.67 (3 H, s, COOCH3), 7.00 (2 H, d, *J* = 8.3, Har), 7.20 (2 H, d, *J* = 8.3, Har); 13C NMR (101 MHz, CDCl3) δ 21.3, 30.5, 35.8, 51.8, 121.7, 129.4, 138.2, 149.2, 169.8, 173.3; IR *ν*max/cm-1 (neat) 2952. 1760, 1734, 1507, 1190, 1165; GCMS (EI) *m/z* (%) 222 (M+, 10), (M+−CH3CO and CH2COCH3, 100). This compound is known, but spectroscopic data of the compound is not available in the literature.

**C. NMR Spectra for the novel compounds**





Figure S1. 1H NMR spectrum of 4-(4-(2,2-difluoroacetoxyphenyl)-2-butanone (DF)





Figure S2. 13C NMR spectrum of 4-(4-(2,2-difluoroacetoxyphenyl)-2-butanone (DF)





Figure S3. 1H NMR spectrum of 4-(4-(2,2,2-trifluoroacetoxyphenyl)-2-butanone (RKTA)





Figure S4. 13C NMR spectrum of 4-(4-(2,2,2-trifluoroacetoxyphenyl)-2-butanone (RKTA)

**D. References**

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