# Rice volatiles lure gravid malaria mosquitoes, *Anopheles arabiensis*

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## Supplementary Figure Legends

Supplementary Figure 1. **Attraction preference of *Anopheles arabiensis* to the booting, tillering and flowering stages of the MR1 (a, c, e) and MR3 (b, d, f) rice cultivars against hexane controls (HEX).** Headspace volatiles of the three phenological stages of MR1 and MR3 rice cultivars elicited release rate-dependent attraction (**a,** $\chi^2$=6.104, P=0.0135; **b**, $\chi^2$=13.55, P=0.0002; **c,** $\chi^2$=14.02, P=0.0002; **d**, $\chi^2$=13.13, P=0.0003; **e**, $\chi^2$=8.370, P=0.0038; **f**, $\chi^2$=8.349, P=0.0039). No significant difference in attraction was found between the phenological stages of either cultivar (MR1, Release rate, $\chi^2$=32.74, P<0.0001, Stage, $\chi^2$=0.2267, P=0.8928; MR3, Release rate, $\chi^2$=29.53, P<0.0001, Stage, $\chi^2$=0.3283, P=0.8486). Statistical significance was tested using nominal logistic regression (likelihood ratio test). Ten replicates, of 10 gravid mosquitoes each, were used for every behavioural experiment. Error bars represent standard errors of the mean.

Supplementary Figure 2. **Attraction preference of *Anopheles arabiensis* to the booting, tillering and flowering stages of the MR1 (a, c, e) and MR3 (b, d, f) rice cultivars against the headspace of breeding water (BW).** Headspace volatiles of the three phenological stages of MR1 and MR3 rice cultivars elicited release rate-dependent attraction (**a,** $\chi^2$=9.628, P=0.0019; **b,** $\chi^2$=13.18, P=0.0003;

**c**, $\chi^2$=8.207, P=0.0042; **d**, $\chi^2$=21.30, P<0.0001; **e**, $\chi^2$=18.26, P<0.0001; **f**, $\chi^2$=6.083, P=0.0136). No significant difference in attraction was found between the phenological stages of either cultivar (MR1, Release rate, $\chi^2$=30.63, P<0.0001, Stages, $\chi^2$=0.3287, P=0.8485; MR3, Release rate, $\chi^2$=42.90, P<0.0001, Stages, $\chi^2$=0.2532, P=0.8811). Statistical significance was tested using nominal logistic regression (likelihood ratio test). Ten replicates, of 10 gravid mosquitoes each, were used for every behavioural experiment. Error bars represent standard errors of the mean.

Supplementary Figure 3. **Oviposition preference of *Anopheles arabiensis* to the booting (a, b), tillering (c, d) and flowering (e, f) stages of the MR1 (left) and MR3 (right) rice cultivars against hexane controls (HEX).** Headspace volatiles of the three phenological stages of MR1 and MR3 rice cultivars added to distilled water elicited release rate-dependent oviposition (**a,** $\chi^2$=14.58, P<0.0001; **b,** $\chi^2$ =10.02, P=0.0015; **c,** $\chi^2$=9.607, P=0.0019; **d,** $\chi^2$=9.959, P=0.0016; **e,** $\chi^2$=13.34, P=0.0003; **f,** $\chi^2$=20.57, P<0.0001). No significant difference in oviposition was found between the phenological stages of either cultivar (MR1**,** Release rate, $\chi^2$=33.90, P<0.0001, Stage, $\chi^2$=0.5059, P=0.7765; MR3, Release rate, $\chi^2$=42.89, P<0.0001, Stage, $\chi^2$=5.426, P=0.0663). Statistical significance was tested using nominal logistic regression (likelihood ratio test). Ten replicates, of 10 gravid mosquitoes each, were used for every behavioural experiment. Error bars represent standard errors of the mean.

Supplementary Figure 4. **Oviposition preference of *Anopheles arabiensis* to the booting (a, b), tillering (c, d) and flowering (e, f) stages of the MR1 (left) and MR3 (right) rice cultivars against hexane controls in breeding water (BW).** Headspace volatiles of the three phenological stages of MR1 and MR3 rice cultivars added to breeding water elicited release rate-dependent oviposition (**a,** $\chi^2$=10.18, P=0.0014; **b,** $\chi^2$=9.631, P=0.0019; **c,** $\chi^2$=9.837, P=0.0017; **d,** $\chi^2$=9.200, P=0.0024; **e,** $\chi^2$=6.262, P=0.0123; **f,** $\chi^2$=10.03, P<0.0015). No significant difference in oviposition was found between the phenological stages of either cultivar (MR1, Release rate, $\chi^2$=29.64, P<0.0001, Stage, $\chi^2$=2.563, P=0.2776; MR3, Release rate, $\chi^2$=25.19, P<0.0001, Stage, $\chi^2$=5.686, P=0.0582). Statistical significance was tested using nominal logistic regression (likelihood ratio test). Ten replicates, of 10 gravid mosquitoes each, were used for every behavioural experiment. Error bars represent standard errors of the mean.

Supplementary Figure 5. **Attraction preference of *Anopheles arabiensis* to the pooled headspace of MR1 (a) and MR3 (b) rice cultivars compared to the headspace of breeding water (BW).** Headspace volatiles of the MR1 and MR3 rice cultivars elicited a release rate-dependent attraction to the headspace of the breeding water control (**a,** $\chi^2$=11.51, P=0.0007; **b,** $\chi^2$=11.88, P=0.0006). Statistical significance was tested using nominal logistic regression (likelihood ratio test). Ten replicates, of 10 gravid mosquitoes each, were used for every behavioural experiment. Error bars represent standard errors of the mean.

Supplementary Figure 6. **Oviposition preference of *Anopheles arabiensis* to the pooled headspace of MR1 (a) and MR3 (b) rice cultivars compared to hexane in breeding water (BW) and between the headspace of the cultivars in BW (c).** Headspace volatiles of the MR1 and MR3 rice cultivars elicited a release rate-dependent oviposition to the headspace of the breeding water control (**a,** $\chi^2$=11.34, P=0.0008; **b,** $\chi^2$=7.538, P=0.0060; **c**, $\chi^2$=4.740, P=0.0295). Statistical significance was tested using nominal logistic regression (likelihood ratio test). Ten replicates, of 10 gravid mosquitoes each, were used for every behavioural experiment. Error bars represent standard errors of the mean.

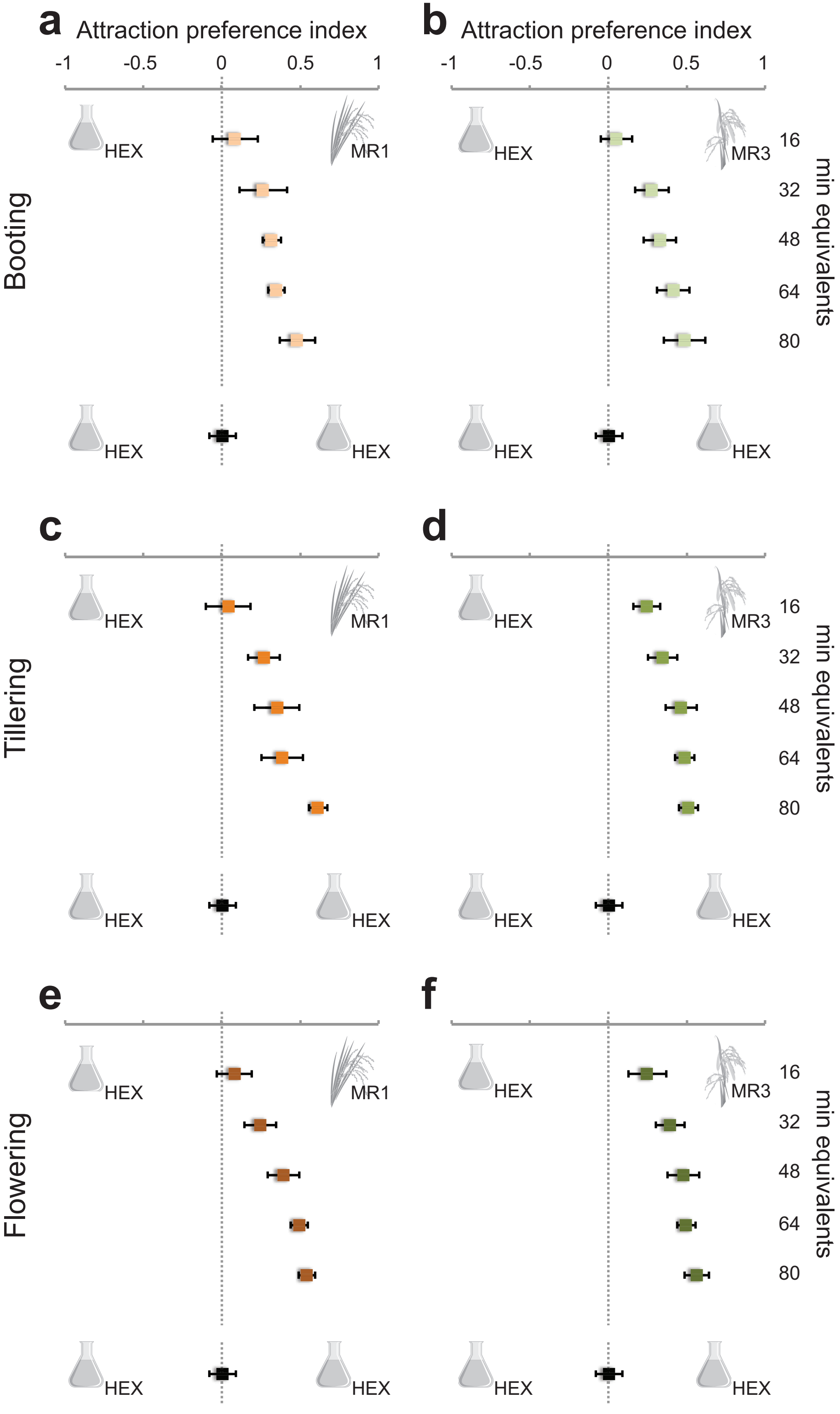
Supplementary Figure 7. **Relative release rates of individual components in the synthetic MR3 rice odour blend in the different assays.** Release rates were calculated as percentage of the release rate of α-pinene, after dispensing the full synthetic blend on water (green; oviposition assay) and by cotton wick (blue; attraction assay) and assaying the headspace; then comparing back to the full blend as synthesized (red).

Supplementary Figure 8. **Attraction preference of *Anopheles arabiensis* to the full and subtractive synthetic MR3 blends against pentane controls.** Overall, the subtractive blends were found to elicit an attraction comparable with the full blend ($\chi^2$=14.68, P=0.1002). Statistical significance was tested using nominal logistic regression (likelihood ratio test) between each treatment and the full blend (*** P<0.001; ** P<0.01; * P<0.05). The attraction to the nonanal-reduced blend was significantly different from that to the full blend (Odds ratio=3.105, P=0.0022). Nonanal by itself was unable to elicit attraction equivalent to that of the full blend (Odds ratio=2.306, P=0.0225). Ten replicates, of

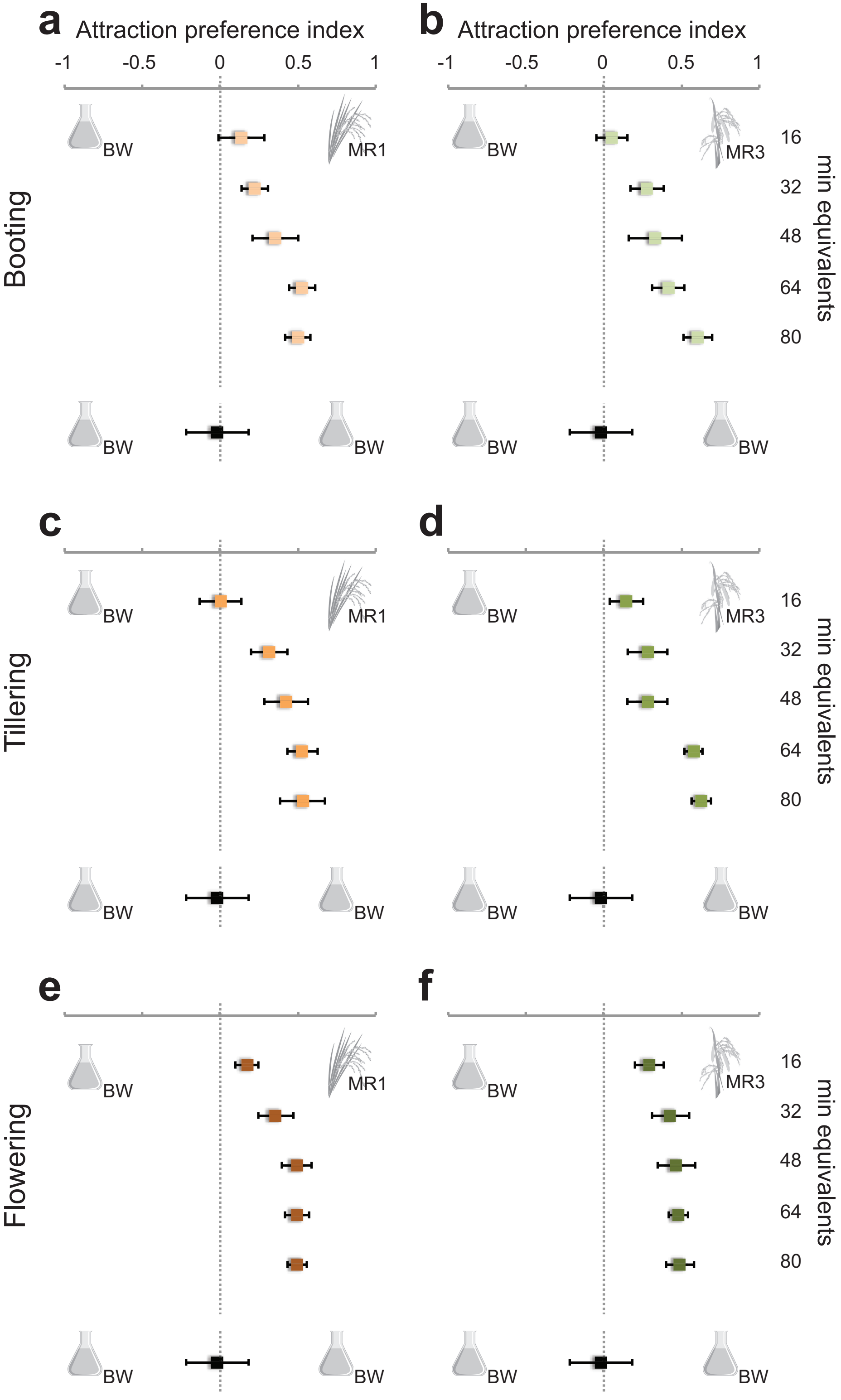
10 gravid mosquitoes each, were used for every behavioural experiment. Error bars represent standard errors of the mean. Box plots are shown with whiskers determined as Tukey inner fences.

Supplementary Figure 9. **Oviposition preference of *Anopheles arabiensis* to the full and subtractive synthetic MR3 blends against pentane controls in distilled water.** Overall, the subtractive blends elicited a positive oviposition preference compared with pentane ($\chi^2$=22.09, P<0.0001), however, not to the level of the full blend ($\chi^2$=4.82, P=0.0282). The oviposition response to the nonanal-reduced blend was significantly different from that to the full blend (Odds ratio=0.6510, P=0.0017). Statistical significance was tested using nominal logistic regression (likelihood ratio test) between each treatment and the full blend (*** P<0.001; ** P<0.01; * P<0.05). Ten replicates, of 10 gravid mosquitoes each, were used for every behavioural experiment. Box plots are shown with whiskers determined as Tukey inner fences.

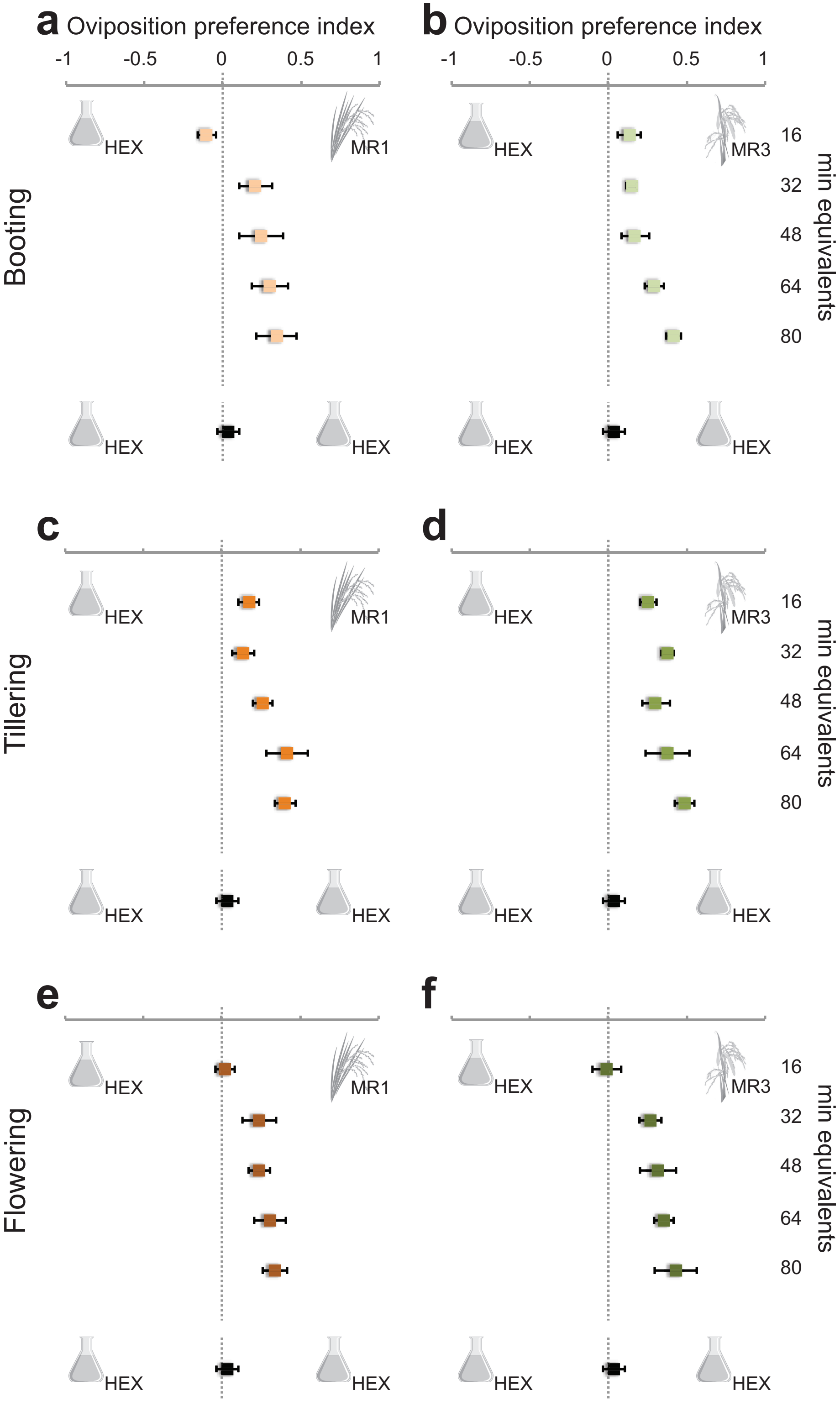
Supplementary Figure 10. **Experiment to determine the effective release rate of the synthetic MR3 odour blend under semi-field conditions.** The release rates indicated are based on those of α-pinene in heptane. The ratio among the compounds within the blend was maintained as a constant across all doses. Statistical significance was tested with nominal logistic regression (likelihood ratio test) ($\chi^2$=137.1, P<0.0001). Different lowercase letters indicate significant differences by Odds ratio pairwise comparisons (likelihood ratio test). Error bars denote standard error of the mean.

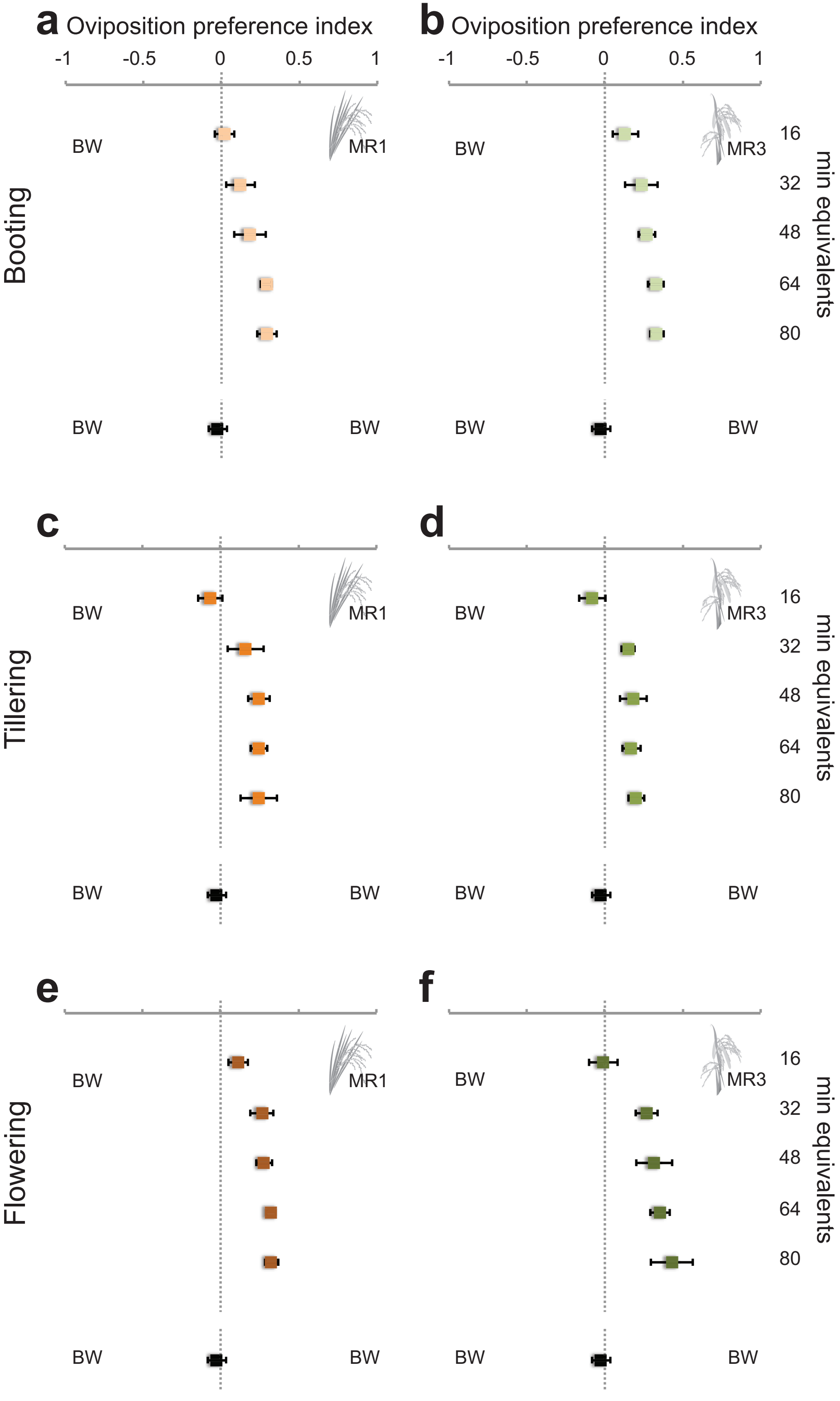


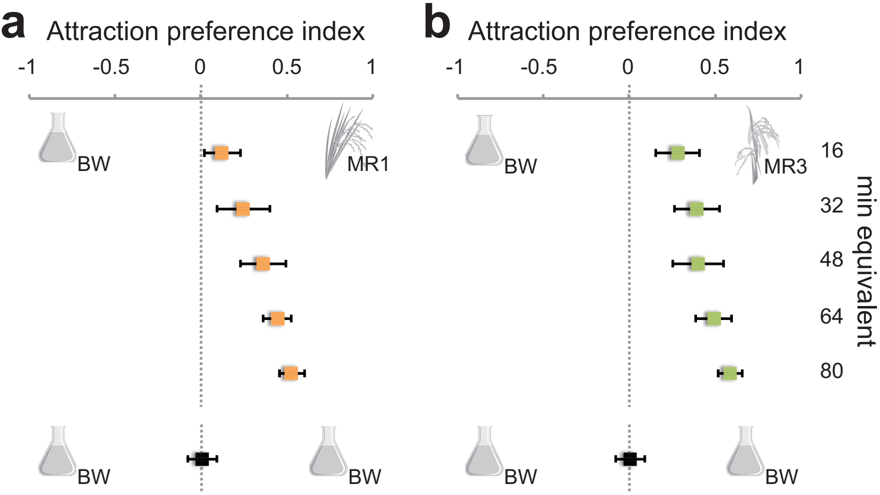
a
b
c
d
e
f
Attraction preference index
Attraction preference index
-1
-0.5
0
0.5
1
HEX
MR1
MR3
16
32
48
64
80
min equivalents
Booting
Tillering
Flowering

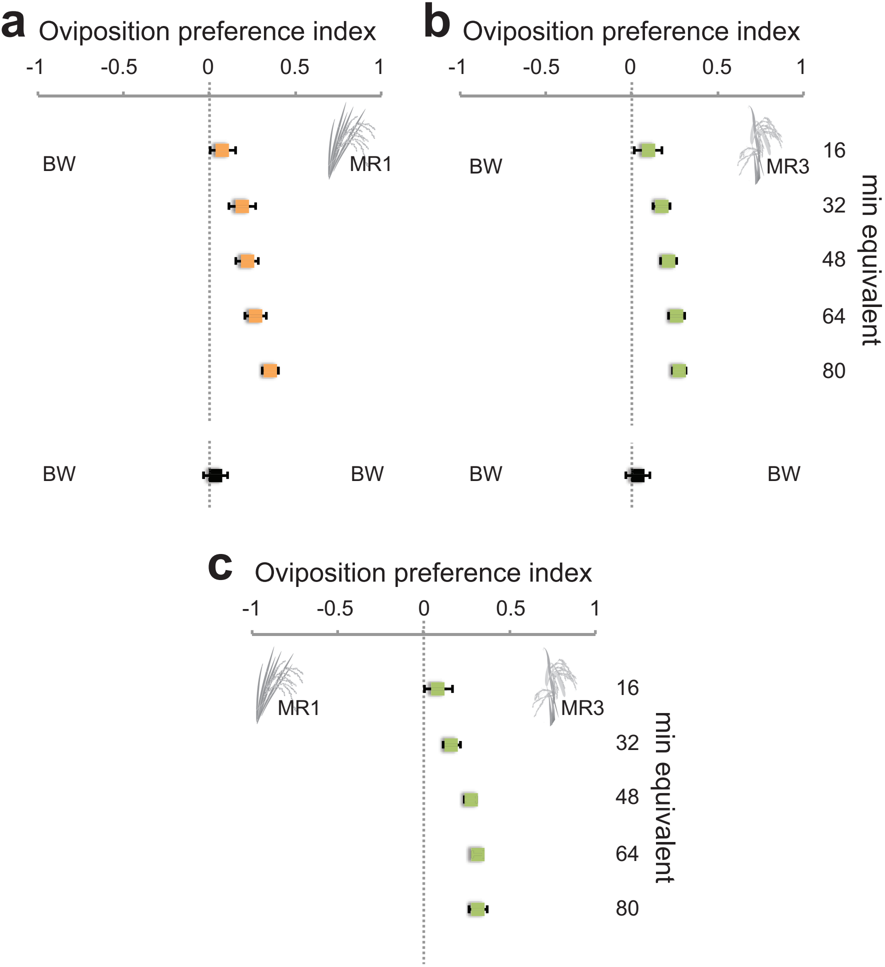


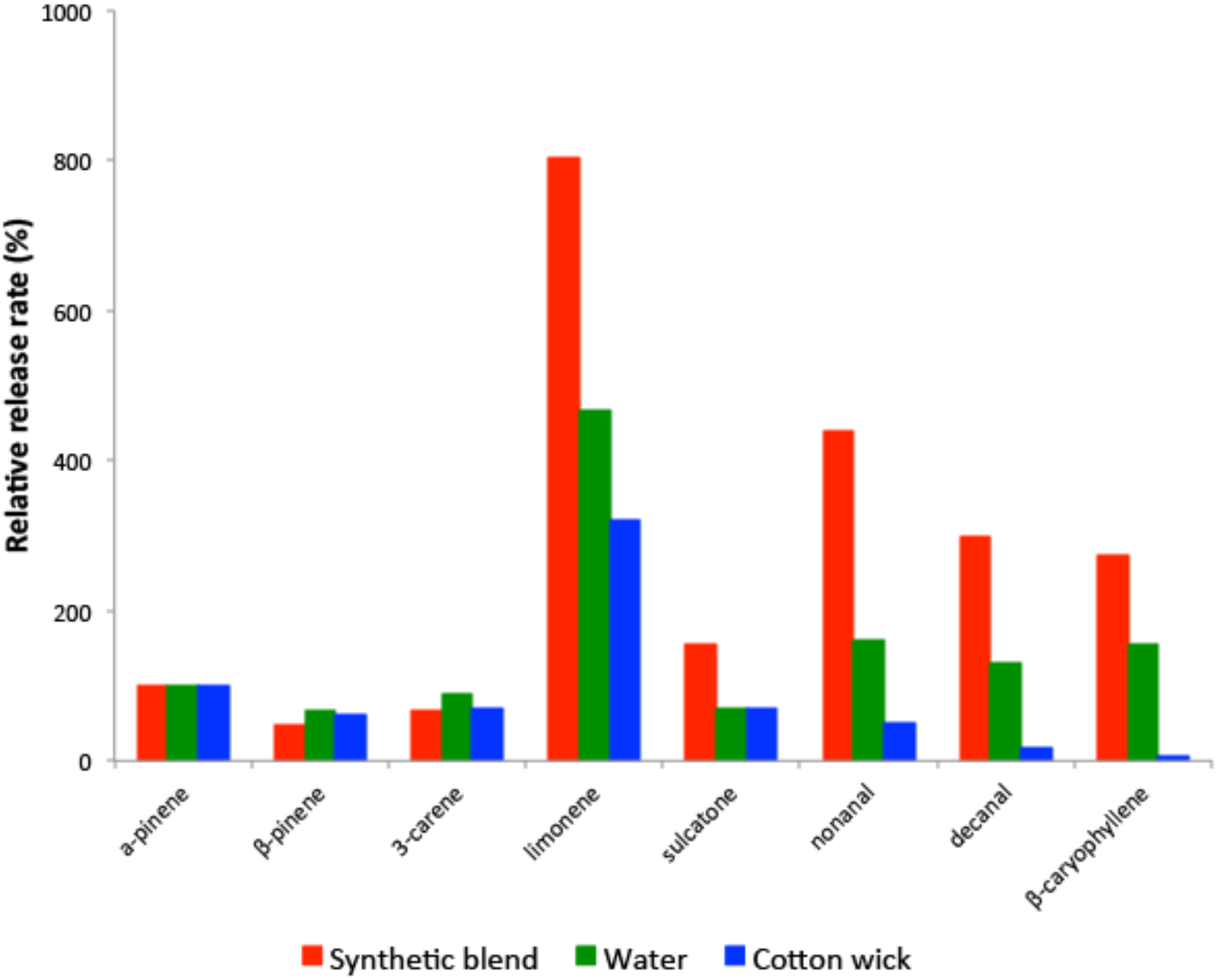
a
Attraction preference index
-1
-0.5
0
0.5
1
BW
MR1
b
Attraction preference index
-1
-0.5
0
0.5
1
BW
MR3
16
32
48
64
80
min equivalents
Booting
BW
BW
c
d
Tillering
e
f
Flowering


a
b
Oviposition preference index
-1
-0.5
0
0.5
1
HEX
MR1
MR3
16
32
48
64
80
min equivalents
Booting
c
d
Tillering
e
f
Flowering

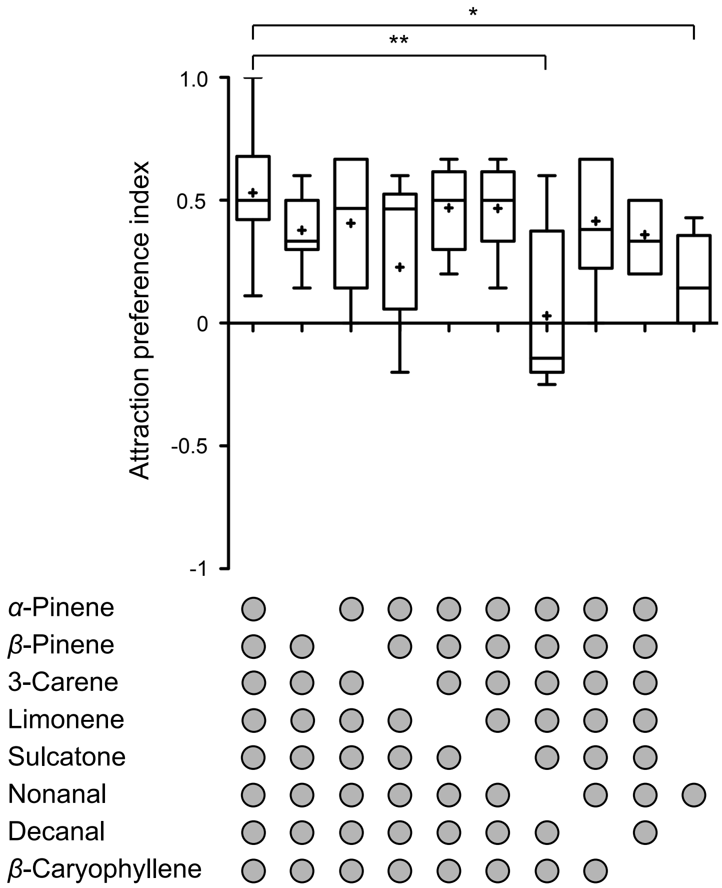

a
Oviposition preference index
-1
-0.5
0
0.5
1
BW
MR1
BW
BW
b
Oviposition preference index
-1
-0.5
0
0.5
1
BW
MR3
BW
BW
16
32
48
64
80
min equivalents
Booting
c
BW
MR1
BW
BW
d
BW
MR3
BW
BW
16
32
48
64
80
min equivalents
Tillering
e
BW
MR1
BW
BW
f
BW
MR3
BW
BW
16
32
48
64
80
min equivalents
Flowering


a
Attraction preference index
-1
-0.5
0
0.5
1
BW
MR1
BW
BW
b
Attraction preference index
-1
-0.5
0
0.5
1
BW
MR3
BW
BW
16
32
48
64
80
min equivalent

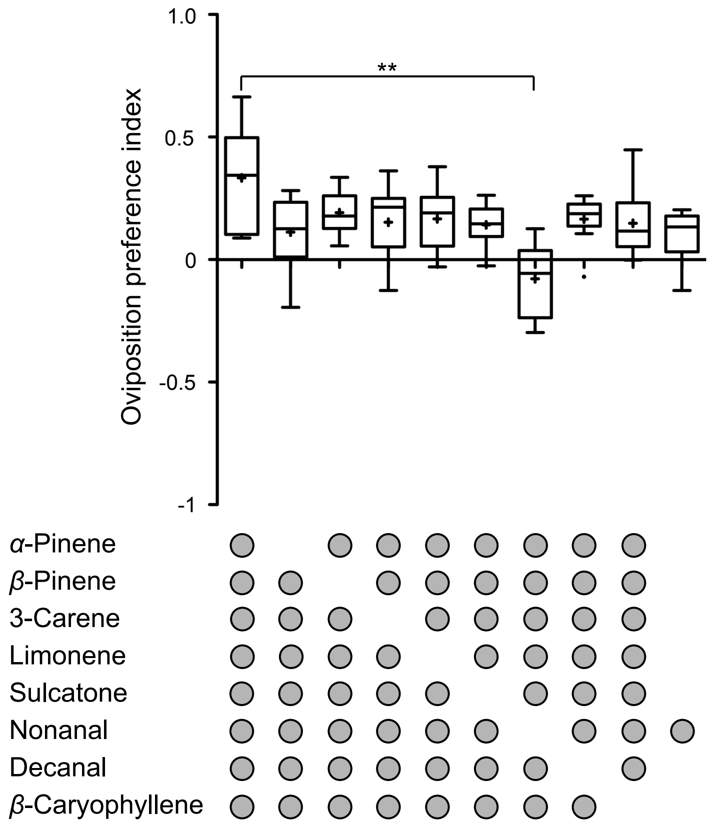

a
Oviposition preference index
-1
-0.5
0
0.5
1
BW
MR1
BW
BW
b
Oviposition preference index
-1
-0.5
0
0.5
1
BW
MR3
16
32
48
64
80
min equivalent
BW
BW
c
Oviposition preference index
-1
-0.5
0
0.5
1
MR1
MR3
16
32
48
64
80
min equivalent



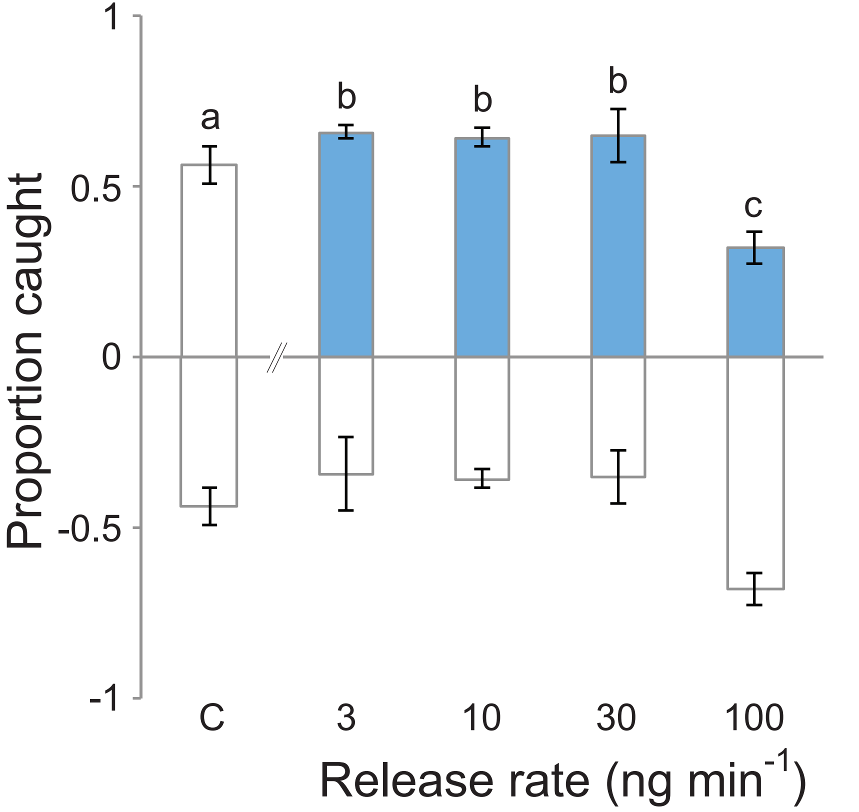
1000
800
600
400
200
0
Relative release rate (%)
a-pinene
β-pinene
3-carene
limonene
sulcatone
nonanal
decanal
β-caryophyllene
Synthetic blend
Water
Cotton wick



*
**
Attraction preference index
1.0
0.5
0
-0.5
-1
α-Pinene
β-Pinene
3-Carene
Limonene
Sulcatone
Nonanal
Decanal
β-Caryophyllene



1.0
0.5
0
-0.5
-1
**
Oviposition preference index
α-Pinene
β-Pinene
3-Carene
Limonene
Sulcatone
Nonanal
Decanal
β-Caryophyllene



Proportion caught
1
0.5
0
-0.5
-1
a
b
b
b
c
C
3
10
30
100
Release rate (ng min-1)

**Supplementary Table 1: Number of gravid *Anopheles arabiensis* responding in the attraction assay to extracts of rice cultivars at different phenological stages.**

| | Attraction response | | |
|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** |
| ***Suppl. Fig. 1a*** | *min equivalents* | *Hexane* | *Booting rice extract (MR1)* |
| | 0 | 15 | 15 |
| | 16 | 18 | 26 |
| | 32 | 19 | 39 |
| | 48 | 21 | 42 |
| | 64 | 24 | 50 |
| | 80 | 16 | 50 |
| ***Suppl. Fig. 1b*** | *min equivalents* | *Hexane* | *Booting rice extract (MR3)* |
| | 0 | 15 | 15 |
| | 16 | 19 | 21 |
| | 32 | 25 | 42 |
| | 48 | 22 | 50 |
| | 64 | 16 | 48 |
| | 80 | 20 | 65 |
| ***Suppl. Fig. 1c*** | *min equivalents* | *Hexane* | *Tillering rice extract (MR1)* |
| | 0 | 15 | 15 |
| | 16 | 23 | 28 |
| | 32 | 25 | 40 |
| | 48 | 17 | 34 |
| | 64 | 21 | 46 |
| | 80 | 14 | 59 |
| ***Suppl. Fig. 1d*** | *min equivalents* | *Hexane* | *Tillering rice extract (MR3)* |
| | 0 | 15 | 15 |
| | 16 | 20 | 32 |
| | 32 | 22 | 39 |
| | 48 | 17 | 44 |
| | 64 | 18 | 50 |
| | 80 | 20 | 61 |

| | Attraction response | | |
|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** |
| ***Suppl. Fig. 1e*** | *min equivalents* | *Hexane* | *Flowering rice extract (MR1)* |
| | 0 | 15 | 15 |
| | 16 | 22 | 26 |
| | 32 | 21 | 34 |
| | 48 | 18 | 47 |
| | 64 | 18 | 53 |
| | 80 | 17 | 59 |
| ***Suppl. Fig. 1f*** | *min equivalents* | *Hexane* | *Flowering rice extract (MR3)* |
| | 0 | 15 | 15 |
| | 16 | 19 | 28 |
| | 32 | 19 | 39 |
| | 48 | 19 | 50 |
| | 64 | 18 | 52 |
| | 80 | 16 | 49 |

**Supplementary Table 2: Number of gravid *Anopheles arabiensis* responding in the attraction assay to extracts of rice cultivars at different phenological stages.**

| | Attraction response | | |
|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** |
| ***Suppl. Fig. 2a*** | *min equivalents* | *Extract of breeding water* | *Booting rice extract (MR1)* |
| | 0 | 13 | 11 |
| | 16 | 17 | 26 |
| | 32 | 23 | 37 |
| | 48 | 24 | 51 |
| | 64 | 18 | 51 |
| | 80 | 20 | 61 |
| ***Suppl. Fig. 2b*** | *min equivalents* | *Extract of breeding water* | *Booting rice extract (MR3)* |
| | 0 | 13 | 11 |
| | 16 | 19 | 21 |
| | 32 | 25 | 42 |
| | 48 | 22 | 50 |
| | 64 | 16 | 48 |
| | 80 | 17 | 70 |
| ***Suppl. Fig. 2c*** | *min equivalents* | *Extract of breeding water* | *Tillering rice extract (MR1)* |
| | 0 | 13 | 11 |
| | 16 | 19 | 21 |
| | 32 | 25 | 42 |
| | 48 | 22 | 50 |
| | 64 | 16 | 48 |
| | 80 | 17 | 48 |
| ***Suppl. Fig. 2d*** | *min equivalents* | *Extract of breeding water* | *Tillering rice extract (MR3)* |
| | 0 | 13 | 11 |
| | 16 | 21 | 28 |
| | 32 | 22 | 36 |
| | 48 | 21 | 44 |
| | 64 | 14 | 49 |
| | 80 | 13 | 68 |

| | Attraction response | | |
|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** |
| ***Suppl. Fig. 2e*** | | *Extract of breeding water* | *Flowering rice extract (MR1)* |
| | 0 | 13 | 11 |
| | 16 | 23 | 34 |
| | 32 | 17 | 38 |
| | 48 | 18 | 48 |
| | 64 | 18 | 50 |
| | 80 | 21 | 62 |
| ***Suppl. Fig. 2f*** | *min equivalents* | *Extract of breeding water* | *Flowering rice extract (MR3)* |
| | 0 | 13 | 11 |
| | 16 | 20 | 31 |
| | 32 | 18 | 47 |
| | 48 | 21 | 53 |
| | 64 | 19 | 53 |
| | 80 | 20 | 56 |

**Supplementary Table 3: Number of eggs laid in the oviposition assay by gravid *Anopheles arabiensis* to extracts of rice cultivars at different phenological stages.**

| | Oviposition response | | |
|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** |
| ***Suppl. Fig. 3a*** | *min equivalents* | *Hexane* | *Booting rice extract (MR1)* |
| | 0 | 3738 | 3811 |
| | 16 | 5339 | 4396 |
| | 32 | 3624 | 5514 |
| | 48 | 3396 | 5920 |
| | 64 | 3506 | 6456 |
| | 80 | 3273 | 6595 |
| ***Suppl. Fig. 3b*** | *min equivalents* | *Hexane* | *Booting rice extract (MR3)* |
| | 0 | 3738 | 3811 |
| | 16 | 4092 | 5419 |
| | 32 | 4570 | 6129 |
| | 48 | 4290 | 5837 |
| | 64 | 3638 | 6570 |
| | 80 | 2816 | 6691 |
| ***Suppl. Fig. 3c*** | *min equivalents* | *Hexane* | *Tillering rice extract (MR1)* |
| | 0 | 3738 | 3811 |
| | 16 | 4076 | 5668 |
| | 32 | 4130 | 5581 |
| | 48 | 3647 | 6172 |
| | 64 | 3365 | 5780 |
| | 80 | 3037 | 6855 |
| ***Suppl. Fig. 3d*** | *min equivalents* | *Hexane* | *Tillering rice extract (MR3)* |
| | 0 | 3738 | 3811 |
| | 16 | 3675 | 6106 |
| | 32 | 3079 | 6722 |
| | 48 | 3271 | 5888 |
| | 64 | 2831 | 6129 |
| | 80 | 2404 | 7048 |

| | Oviposition response | | |
|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** |
| ***Suppl. Fig. 3e*** | *min equivalents* | *Hexane* | *Flowering rice extract (MR1)* |
| | 0 | 3738 | 3811 |
| | 16 | 4900 | 5062 |
| | 32 | 3883 | 5711 |
| | 48 | 3955 | 6304 |
| | 64 | 3486 | 6379 |
| | 80 | 3270 | 6201 |
| ***Suppl. Fig. 3f*** | *min equivalents* | *Hexane* | *Flowering rice extract (MR3)* |
| | 0 | 3738 | 3811 |
| | 16 | 5200 | 5111 |
| | 32 | 3777 | 6391 |
| | 48 | 3247 | 6298 |
| | 64 | 3340 | 6749 |
| | 80 | 2888 | 7192 |

**Supplementary Table 4: Number of eggs laid in the oviposition assay by gravid *Anopheles arabiensis* to extracts of rice cultivars at different phenological stages.**

| | Oviposition response | | |
|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** |
| ***Suppl. Fig. 4a*** | *min equivalents* | *Extract of breeding water* | *Booting rice extract (MR1)* |
| | 0 | 4902 | 4669 |
| | 16 | 4962 | 5137 |
| | 32 | 4378 | 5475 |
| | 48 | 4142 | 5922 |
| | 64 | 3613 | 6497 |
| | 80 | 3658 | 6633 |
| ***Suppl. Fig. 4b*** | *min equivalents* | *Extract of breeding water* | *Booting rice extract (MR3)* |
| | 0 | 4902 | 4669 |
| | 16 | 4315 | 5626 |
| | 32 | 3986 | 6201 |
| | 48 | 3795 | 6466 |
| | 64 | 3378 | 6501 |
| | 80 | 3294 | 6344 |
| ***Suppl. Fig. 4c*** | *min equivalents* | *Extract of breeding water* | *Tillering rice extract (MR1)* |
| | 0 | 4902 | 4669 |
| | 16 | 5350 | 4672 |
| | 32 | 4377 | 6002 |
| | 48 | 3896 | 6353 |
| | 64 | 3895 | 6333 |
| | 80 | 3824 | 6450 |
| ***Suppl. Fig. 4d*** | *min equivalents* | *Extract of breeding water* | *Tillering rice extract (MR3)* |
| | 0 | 4902 | 4669 |
| | 16 | 5932 | 5051 |
| | 32 | 4566 | 6198 |
| | 48 | 4240 | 6056 |
| | 64 | 4541 | 6489 |
| | 80 | 4331 | 6451 |

| Figure | Oviposition response<br>Dose | Control | Test |
|---|---|---|---|
| ***Suppl. Fig. 4e*** | *min equivalents* | *Extract of breeding water* | *Flowering rice extract (MR1)* |
| | 0 | 4902 | 4669 |
| | 16 | 4594 | 5736 |
| | 32 | 3466 | 5915 |
| | 48 | 3438 | 6143 |
| | 64 | 3491 | 6826 |
| | 80 | 3497 | 6825 |
| ***Suppl. Fig. 4f*** | *min equivalents* | *Extract of breeding water* | *Flowering rice extract (MR3)* |
| | 0 | 4902 | 4669 |
| | 16 | 4400 | 5473 |
| | 32 | 3746 | 5978 |
| | 48 | 3687 | 6427 |
| | 64 | 3731 | 6325 |
| | 80 | 3185 | 6700 |

**Supplementary Table 5: Number of gravid *Anopheles arabiensis* and eggs counted in the attraction and oviposition assays in response to the pooled rice headspace extracts of cultivars MR1 and MR3.**

| Attraction response | | | | Oviposition response | | | |
|---|---|---|---|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** | **Figure** | **Dose** | **Control** | **Test** |
| ***Fig. 1c*** | *min equivalents* | *Hexane* | *Pooled rice extract (MR1)* | ***Fig. 1d*** | *min equivalents* | *Hexane* | *Pooled rice extract (MR1)* |
| | 0 | 15 | 15 | | 0 | 3738 | 3811 |
| | 16 | 14 | 24 | | 16 | 3975 | 6106 |
| | 32 | 18 | 39 | | 32 | 3979 | 6522 |
| | 48 | 19 | 52 | | 48 | 3448 | 5888 |
| | 64 | 17 | 49 | | 64 | 2831 | 6129 |
| | 80 | 11 | 54 | | 80 | 2604 | 7248 |
| ***Fig. 1e*** | *min equivalents* | *Hexane* | *Pooled rice extract (MR3)* | ***Fig. 1f*** | *min equivalents* | *Hexane* | *Pooled rice extract (MR3)* |
| | 0 | 15 | 15 | | 0 | 3738 | 3811 |
| | 16 | 14 | 23 | | 16 | 4077 | 5125 |
| | 32 | 22 | 39 | | 32 | 3726 | 6131 |
| | 48 | 20 | 35 | | 48 | 3272 | 5883 |
| | 64 | 17 | 52 | | 64 | 2688 | 6280 |
| | 80 | 16 | 49 | | 80 | 2884 | 6988 |
| ***Fig. 1g*** | *min equivalents* | *Pooled rice extract (MR1)* | *Pooled rice extract (MR3)* | ***Fig. 1h*** | *min equivalents* | *Pooled rice extract (MR1)* | *Pooled rice extract (MR3)* |
| | 16 | 20 | 29 | | 16 | 4030 | 5581 |
| | 32 | 24 | 43 | | 32 | 3947 | 5772 |
| | 48 | 23 | 45 | | 48 | 3265 | 6080 |
| | 64 | 26 | 56 | | 64 | 3014 | 6755 |
| | 80 | 14 | 61 | | 80 | 2578 | 5955 |
| ***Fig. 1k*** | *log (dose(ng))* | *Full synthetic blend* | *Pentane* | ***Fig. 1l*** | *log (dose(ng))* | *Full synthetic blend* | *Pentane* |
| | 0.1 | 26 | 24 | | 0.1 | 4435 | 4297 |
| | 0.3 | 40 | 21 | | 0.3 | 4916 | 3705 |
| | 1 | 59 | 19 | | 1 | 5174 | 3324 |
| | 3 | 38 | 17 | | 3 | 5447 | 2759 |
| | 10 | 36 | 16 | | 10 | 4752 | 2941 |
| | 30 | 18 | 27 | | 30 | 4354 | 4810 |
| | 100 | 9 | 20 | | 100 | 2352 | 5569 |

**Supplementary Table 6: Number of gravid *Anopheles arabiensis* responding in the attraction assay to the extracts of pooled rice cultivars MR1 and MR3.**

| | Attraction response | | |
|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** |
| ***Suppl. Fig. 5a*** | *min equivalents* | *Extract of breeding water* | *Pooled rice extract (MR1)* |
| | 0 | 21 | 21 |
| | 16 | 25 | 32 |
| | 32 | 17 | 28 |
| | 48 | 21 | 43 |
| | 64 | 21 | 53 |
| | 80 | 18 | 56 |
| ***Suppl. Fig. 5b*** | *min equivalents* | *Extract of breeding water* | *Pooled rice extract (MR3)* |
| | 0 | 21 | 21 |
| | 16 | 22 | 36 |
| | 32 | 21 | 44 |
| | 48 | 21 | 45 |
| | 64 | 18 | 59 |
| | 80 | 15 | 53 |

**Supplementary Table 7: Number of gravid *Anopheles arabiensis* responding in the oviposition assay to the headspace extracts of pooled rice cultivars MR1 and MR3.**

| | Oviposition response | | |
|---|---|---|---|
| **Figure** | **Dose** | **Control** | **Test** |
| ***Suppl. Fig. 6a*** | *min equivalents* | *Extract of breeding water* | *Pooled rice extract (MR1)* |
| | 0 | 5532 | 5051 |
| | 16 | 4556 | 5177 |
| | 32 | 3877 | 5802 |
| | 48 | 3792 | 5802 |
| | 64 | 3696 | 6353 |
| | 80 | 3044 | 6298 |
| ***Suppl. Fig. 6b*** | | *Extract of breeding water* | *Pooled rice extract (MR3)* |
| | 0 | 5532 | 5051 |
| | 16 | 4415 | 5371 |
| | 32 | 4366 | 6198 |
| | 48 | 4141 | 6489 |
| | 64 | 3831 | 6451 |
| | 80 | 3557 | 6182 |
| ***Suppl. Fig. 6c*** | | *Pooled rice extract (MR1)* | *Pooled rice extract (MR3)* |
| | 16 | 4132 | 4751 |
| | 32 | 3849 | 5300 |
| | 48 | 3458 | 6032 |
| | 64 | 3421 | 6534 |
| | 80 | 3301 | 6311 |

**Supplementary Table 8: Number of gravid *Anopheles arabiensis* responding in the attraction assay to synthetic full and subtractive blends.**

| Attraction response | | | |
|---|---|---|---|
| ***Figure*** | *Synthetic blend* | *Control (Pentane)* | *Test (synthetic blend)* |
| **Suppl. Fig. 8** | Full blend | 19 | 59 |
| | Reduced α-pinene | 14 | 30 |
| | Reduced β-pinene | 18 | 42 |
| | Reduced 3-carene | 16 | 31 |
| | Reduced limonene | 14 | 39 |
| | Reduced sulcatone | 14 | 38 |
| | Reduced nonanal | 28 | 28 |
| | Reduced decanal | 19 | 45 |
| | Reduced β-caryophyllene | 14 | 29 |
| | Only nonanal | 26 | 35 |

**Supplementary Table 9: Number of eggs laid by gravid *Anopheles arabiensis* in the oviposition assay to the full and subtractive synthetic blends.**

| **Oviposition response** | | | |
|---|---|---|---|
| ***Figures*** | *Synthetic blend* | *Control (Pentane)* | *Test (synthetic blend)* |
| **Suppl. Fig. 9** | Full blend | 3324 | 6474 |
| | Reduced α-pinene | 5027 | 3996 |
| | Reduced β-pinene | 5595 | 3828 |
| | Reduced 3-carene | 5054 | 3758 |
| | Reduced limonene | 5268 | 3778 |
| | Reduced sulcatone | 5260 | 3969 |
| | Reduced nonanal | 4335 | 5107 |
| | Reduced decanal | 5296 | 3807 |
| | Reduced β-caryophyllene | 5210 | 3872 |
| | Only nonanal | 4667 | 3869 |