**Supplementary information**

**Supplementary Table S1.** Differences in flight morphology among sex

|  |  |  |
| --- | --- | --- |
| **Anatomical structure** |  | **Statistical significance** |
| Wing |  |  |
|  Shape |  | Goodall’s Fdf 92 = 10.99, P = 0 |
|  Centroide size |  | F1, 408= 110.5, P <0 |
| Thorax |  |  |
|  Shape |  | Goodall’s Fdf42 = 30.01, P = 0 |
|  Centroide size |  | F1, 306= 132.5, P <0 |

**Supplementary Table S2.** Number of bug collection, number of insects showing blood ingestion, and number of gravid females. Data are showed by sex and adult total by landscape. The last column indicates the average and standard deviation (SD) of the number of eggs per female per landscape class. Landscape with the same letter did not present significant differences (p < 0.05) according to a generalized linear model (Negative binomial distribution) with Tukey post hoc test (feeding frequency) and Kruskal-Wallis post hoc test with Holm's correction (gravid female frequency).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Landscape class** |  | **Sex** |  |  | **Adults** | **Number of gravid females** |
| Female (%) | Male (%) | Fed bugstotal (%) | Abundance total (%) | 2014 (%) | 2015 (%) | 2016 (%) | 2017 (%) | 2018 (%) | 2019 (%) | By landscape class (%) | Total% | Egg number |
|  | Abundance | Fed bugs | Abundance | Fed bugs |
| **Urban (U)** | 79(17) | 64(81)**a** | 47(37) | 18(38)**a** | 82(65)**a** | 126 (16) | 0 (0) | 4 (36) | 4 (14) | 4 (12) | 4 (67) | 0 (0) | 16(20) | 19 | 10 + 10**a** |
| Merida | 79 (17) | 64(81) | 47 (37) | 18(38) |  | 126 (15) |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Home-garden (Hg)** | 52 (11) | 32(62)**b** | 45(13) | 1(2)**NA** | 33(34)**ab** | 97(12) | 0 (0) | 0 (0) | 13 (36) | 0 (0) | 5(50) | 0(0) | 18(35) | 21 | 11 + 12**a** |
| Emiliano Zapata | 48 (10) | 30(63) | 43 (13) | 0 |  | 91 (11) | 0 (0) | 0 (0) | 13 (36) | 0 (1) | 5 (10) | 0 (1) |  |  |
| Xul | 4 (1) | 2(50) | 2 (1) | 1(50) |  | 6(1) | 0 (1) | 0 (3) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Median sub-deciduous tropical** forest (Msd) | 242(51) | 168(69)**b** | 201(60) | 143(71)**b** | 311(70)**b** | 443(55) | 1(4) | 2(3) | 4(10) | 6(9) | 0(0/0) | 11(24) | 22(9) | 26 | 11 + 12**a** |
| Kaxil Kiuic | 223 (47) | 156(70) | 183 (55) | 132(72) |  | 406(50) | 1 (25) | 1 (35) | 3 (30) | 6 (70) | 0 (0) | 11(63) |  |  |  |
| Yaxhachen | 19 (4) | 12(63) | 18 (5) | 11(61) |  | 37(5) | 0 (0) | 1 (1) | 1 (18) | 0 (0) | 0 (0) | 0 (0) |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Secondary vegetation (Sv)** | 99(21) | 83(84)**b** | 42(13) | 28(67)**b** | 111(79)**b** | 141(17) | 0(0) | 11(31) | 19(33) | 0(0) | 0(0) | 0 (0) | 28(30) | 33 | 11 + 14**a** |
| Xkobehaltun | 84 (19) | 77(92) | 32 (10) | 24(86) |  | 116(84) | 0 (0) | 11(36) | 17 (52) | 0 (0) | 0 (0) | 0 (0) |  |  |  |
| Potoi | 3 (1) | 2(6) | 2 (5) | 0 |  | 6 (4) | 0 (0) | 0 (0) | 1 (4) | 0 (0) | 0 (0) | 0 (0) |  |  |  |
| Bombahaltun | 8 (2) | 4(25) | 8 (19) | 4(14) |  | 16(12) | 0 (0) | 0 (0) | 1(6) | 0 (2) | 0(0) | 0 (0) |  |  |  |
|  TOTAL | 472(58) | 347(74) | 335(42) | 190(57) | 537(67) | 807 | 26 | 86 | 175 | 106 | 16 | 64 | 84 |  |  |
| % of Gravid females |  |  |  |  |  |  | 4 | 20 | 23 | 9 | 56 | 17 | 18 |  |  |

**Supplementary Table S3**. Mean and standard deviation of the wing size (Cs), wing aspect ratio (WAR) and thorax size of *Triatoma dimidiata* by landscape class Urban (U), Home-garden (Hg), Secondary vegetation (Sv) and Median sub-deciduous tropical forest (Msd).

|  |  |  |
| --- | --- | --- |
| **Landscape class** | **Female** | **Male** |
| Wing size | WAR | Thorax size | Wing size | WAR | Thorax size |
| U | 4.016 + 023 | 6.003 + 041 | 2.10 + 017 | 3.796 + 0218 | 6.026 + 0327 | 1.48 + 017 |
| Hg | 4.020 *+* 017 | 6.013 + 013 | 2.25 + 016 | 3.773 + 0180 | 5.962 + 0259 | 2.36 + 026 |
| Sv | 3.966 + 022 | 6.035 + 024 | 2.33 + 022 | 3.663 + 0230 | 5.900 + 0221  | 2.30 + 020 |
| Msd | 4.007 + 019 | 6.038 + 050 | 2.20 + 029 | 3.757 + 0200 | 6.002 + 0342 | 1.92 + 0 25 |

**Supplementary Table S4.** Results of ANOVA statistic for a lineal mixed model for the wing and thorax shape of *Triatoma dimidiata.* Z and p are based on 2500 random permutation according RRPP approach.

|  |  |  |  |
| --- | --- | --- | --- |
| Component | **Female** |  | **Male** |
| DF | SS | MS | R2 | F value | Z | P value |  | DF | SS | MS | R2 | F value | Z | P value |
| Wing |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cs | 1 | 0.0019 | 0.0019 | 0.0062 | 1.556 | 1.070 | 0.152 |  | 1 | 0.0015 | 0.0015 | **0.0019** | 2.9891 | 2.259 | ***0.003*** |
| Body size | 1 | 0.0032 | 0.0032 | 0.0107 | 2.671 | 1.718 | 0.059 |  | 1 | 0.0003 | 0.0033 | 0.0041 | 0.6389 | -0.753 | 0.788 |
| WAR | 1 | 0.0013 | 0.0013 | 0.0045 | 1.116 | 0.653 | 0.214 |  | 1 | 0.0033 | 0.0033 | 0.0453 | 7.4189 | 4.5528 | 0.364 |
| Landscape | 3 | 0.0044 | 0.0011 | 0.0145 | 1.063 | -0.071 | 0.446 |  | 3 | 0.0019 | 0.0019 | 0.0244 | 1.6206 | 0.269 | 0.400 |
| Landscape:Year | 8 | 0.0083 | 0.0010 | 0.0273 | 0.847 | 0.092 | 0.423 |  | 7 | 0.0012 | 0.0012 | 0.0150 | 0.5767 | -0.589 | 0.797 |
| Residuals | 222 | 0.2853 | 0.0012 | 0.9364 |  |  |  |  | 139 | 0.0036 | 0.0036 | 0.0457 |  |  |  |
| Total | 236 | 0.3047 |  |  |  |  |  |  | 152 | 0.0803 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Thorax |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cs | 1 | 0.0032 | 0.0032 | 0.0179 | 2.2740 | 1.6830 | 0.048 |  | 1 | 0.0025 | 0.0025 | **0.0155** | 2.5572 | 1.9169 | ***0.033*** |
| Body size | 14 | 0.0202 | 0.0014 | 0.1110 | 1.0033 | 0.1553 | 0.333 |  | 1 | 0.0118 | 0.0029 | 0.0729 | 0.7952 | -0.7251 | 0.786 |
| Landscape | 3 | 0.0078 | 0.0026 | 0.0433 | 1.5304 | 0.9148 | 0.174 |  | 4 | 0.0051 | 0.0005 | 0.0031 | 0.5163 | -0.7708 | 0.767 |
| Landscape:Year | 9 | 0.0153 | 0.0017 | 0.0849 | 1.1938 | 0.6902 | 0.163 |  | 8 | 0.0297 | 0.0037 | **0.1833** | 3.7622 | 5.5376 | ***0.001*** |
| Residuals | 94 | 0.1323 | 0.0014 | 0.7428 |  |  |  |  | 119 | 0.1175 | 0.0009 | 0.7250 |  |  |  |
| Total | 121 | 0.1992 |  |  |  |  |  |  | 133 | 0.1620 |  |  |  |  |  |

**Supplementary Table S5.** Number of sensilla by segment and Landscape class. Letters show the paired significance differences (p<005) among landscapes (a-d) Landscapes: Median sub-deciduous tropical dry forest (Msd); Secondary forest (Sf); Home-garden (Hg); Urban (U) Pedicel (P), Flagellomere I (FI); Flagellomere II (FII) Sensillae: Basiconic (Ba), Bristles (Br), Thin walled trichoid (TH) and Thick walled trichoid (TK) Average abundance by segment (Total), Average abundance in all the three segments (TOTAL) Mechanoreceptor (MR), Chemoreceptor (CR) Sensillum region nomenclature according to Catalá (1997).

|  |  |  |
| --- | --- | --- |
| Sensilla | Female | Male |
| Msd **(a)** |  | Sv **(b)** |  | Hg **(c)** |  | U **(d)** |  | Msd **(a)** |  | Sv **(b)** |  | Hg **(c)** |  | U **(d)** |
| Meann | + SD | Mean | + SD  | Mean | + SD | Mean | + SD | Mean | + SD | Meann | + SD | Meann | + SD | Mean | + SD |
| **P** | MR  | Br | 47 | 8 |  | 46 | 6 |  | 43 | 9 |  | 40 | 6 |  | 41 | 6 |  | 37 | 4 |  | 41 | 7 |  | 38 | 4 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | CR | Ba | 13 | 6 |  | 15 | 6 |  | 12 | 6 |  | 14 | 5 |  | 12 | 7 |  | 15 | 4 |  | 12 | 6 |  | 11 | 4 |
|  |  |  |  |  |  |  |  |  |  |  |  |  | **d** |  |  |  | **b** |
|  | TH | 165 | 41 |  | 160 | 32 |  | 155 | 59 |  | 151 | 39 |  | 195 | 42 |  | 189 | 36 |  | 187 | 26 |  | 169 | 54 |
|  |  | **d, d** |  | **a** |  | **d** |  | **a, c** |  | **d** |  | **d** |  | **d** |  | **a, b, c** |
|  | TK | 57 | 29 |  | 54 | 24 |  | 46 | 31 |  | 52 | 27 |  | 45 | 23 |  | 43 | 9 |  | 56 | 36 |  | 48 | 22 |
|  |  |  | **b, d** |  | **a, c** |  | **a, b, d** |  | **a, c** |  | **c** |  | **c** |  | **a, b** |  |  |
|  |  | **Total** | 282 | 67 |  | 277 | 44 |  | 256 | 94 |  | 257 | 58 |  | 294 | 50 |  | 283 | 41 |  | 296 | 45 |  | 265 | 57 |
|  |  |  | **c, d** |  |  |  | **a** |  | **a** |  | **d** |  | **c** |  | **b** |  | **a** |
| **FI** | MR  | Br | 14 | 3 |  | 12 | 3 |  | 12 | 2 |  | 12 | 2 |  | 13 | 3 |  | 14 | 3 |  | 11 | 2 |  | 14 | 3 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | CR | Ba | 22 | 8 |  | 23 | 5 |  | 20 | 7 |  | 18 | 9 |  | 28 | 10 |  | 22 | 6 |  | 20 | 8 |  | 18 | 10 |
|  |  |  |  |  |  |  |  |  |  | **d** |  | **d** |  | **a** |  | **a, b** |
|  | TH | 48 | 20 |  | 62 | 23 |  | 50 | 20 |  | 53 | 17 |  | 66 | 21 |  | 64 | 18 |  | 59 | 20 |  | 54 | 23 |
|  |  | **c, d** |  | **a, c, d** |  | **b** |  | **a, b** |  | **d** |  | **d** |  | **a** |  | **a** |
|  | TK | 69 | 21 |  | 58 | 17 |  | 49 | 14 |  | 55 | 14 |  | 53 | 22 |  | 45 | 11 |  | 41 | 13 |  | 49 | 19 |
|  |  |  | **b, c, d** |  | **a, c** |  | **a, b** |  | **a** |  | **d** |  | **d** |  |  |  | **a, b** |
|  |  | **Total** | 153 | 34 |  | 156 | 33 |  | 132 | 29 |  | 138 | 31 |  | 159 | 30 |  | 146 | 23 |  | 131 | 27 |  | 136 | 38 |
|  |  |  | **c, d** |  | **c, d** |  | **a, b** |  | **a, b** |  | **c, d** |  | **c, d** |  | **a, b** |  | **a, b** |
| **FII** | MR  | Br | 7 | 2 |  | 6 | 1 |  | 9 | 3 |  | 8 | 2 |  | 8 | 2 |  | 7 | 3 |  | 6 | 1 |  | 7 | 3 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | CR | Ba | 17 | 6 |  | 15 | 5 |  | 14 | 10 |  | 17 | 6 |  | 19 | 4 |  | 16 | 3 |  | 15 | 5 |  | 15 | 6 |
|  |  |  |  |  |  |  |  |  |  | **d** |  |  |  |  |  | **a** |
|  | TH | 20 | 9 |  | 24 | 9 |  | 24 | 13 |  | 33 | 11 |  | 24 | 9 |  | 26 | 11 |  | 21 | 10 |  | 22 | 9 |
|  |  | **d** |  | **d** |  |  |  | **a, b** |  |  |  |  |  |  |  |  |
|  | TK | 58 | 16 |  | 51 | 10 |  | 48 | 17 |  | 52 | 15 |  | 59 | 15 |  | 49 | 11 |  | 45 | 8 |  | 39 | 17 |
|  |  |  | **c, d** |  |  |  | **a** |  | **a** |  | **a, b, d** |  | **a, b** |  | **c** |  | **a, b** |
|  |  | **Total** | 102 | 22 |  | 97 | 19 |  | 94 | 26 |  | 110 | 20 |  | 110 | 16 |  | 97 | 15 |  | 87 | 18 |  | 82 | 26 |
|  |  |  | **d** |  | **d** |  |  |  | **a, b** |  | **d** |  | **d** |  |  |  | **a, b** |
|  |  | **TOTAL** | 537 | 97 |  | 530 | 72 |  | 482 | 131 |  | 505 | 81 |  | 563 | 67 |  | 526 | 51 |  | 515 | 53 |  | 483 | 73 |
|  |  |  | **c, d** |  | **c, d** |  | **a, b** |  | **a, b** |  | **d** |  | **d** |  |  |  | **a, b** |

**Supplementary Table S6.** Results of the multivariate analysis base on canonical variate analysis (CVA) of the sensorial phenotypic of *T. dimidiata* sensilla: Basiconic (Ba), bristles (Br), thin walled trichoid (TH) and thick walled trichoid (TK)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** |  | **Female** |  | **Male** |
|  |  | CV1 (73%) |  | CV1 (69%) |
| Pedicel |  |  |  |  |
| Ba |  | - |  | **-0.055** |
| TBF |  | **-0.015** |  | 0.006 |
| TBG |  | 0.003 |  | 0.002 |
| Flagellomere I |  |  |  |  |
| Ba |  | **-0.038** |  | **0.066** |
| TH |  | 0.010 |  | 0.013 |
| TK |  | -0.018 |  | -0.008 |
| Flagellomere II |  |  |  |  |
| TH |  | **0.088** |  | - |
| TK |  | -0.002 |  | **0.053** |
|  |  |  |  |  |

**Supplementary Table S7.** Landscape class assignment according to the canonical discriminate analysis (CVA) and Kappa statistical (value and significance) Landscape class: Urban (U), Home-garden (Hg), Secondary vegetation (Sv), Median sub-deciduous tropical forest (Msd).

|  |  |  |  |
| --- | --- | --- | --- |
| **A priori group** | **Female** |  | **Male** |
| Assignment group | Assignment group |
| n | U | Hg | Sv | Msd | n | U | Hg | Sv | Msd |
| U | 24 | **13 (54%)** | 1 (4%) | 7 (29 %) | 3 (13%) | 18 | **8****(44%)** | 3(17%) | 3(17%) | 4(22 %) |
| Hg | 12 | 2 (17%) | 4 (33%) | 4 (33%) | 2 (17%) | 8 | 1(14%) | 3(43 %) | 1(14%) | 2(29%) |
| Sv | 13 | 2 (15%) | 5 (38%) | 4 (31%) | 2 (15%) | 14 | 5(33%) | 2(13%) | 6(40%) | 2 (13%) |
| Msd | 34 | 4 (12%) | 4 (12%) | 8 (24%) | **18** **(53%)** | 27 | 5(19%) | 6(22%) | 1(4%) | **15****(56%)** |
|  |  |  |  |

**Supplementary Table S8.** Results of ANOVA statistic for a lineal mixed model for differences in the proboscis length of *Triatoma dimidiata.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Component** | **DF** | **SS** | **M Sq** | **R2** | **F** | **Z** | **P value** |
|  |  |  |  |  |  |  |  |
| Body size | 1 | 0.714 | 0.714 | 0.020 | 5653 | 1.395 | 0.056 |
| Sex | 1 | 0.002 | 0.002 | 0.000 | 0017 | -1.221 | 0.894 |
| Landscape class | 3 | 0.955 | 0.318 | 0.027 | 2521 | 1.239 | 0.069 |
| Landscape class:Year | 10 | 1.544 | 0.154 | 0.044 | 1222 | 0.588 | 0.285 |
| Residuals | 230 | 2.9051 | 0.126 | 0.845 |  |  |  |
| Total | 245 | 3.4341 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

**Supplementary Table S9.** Total number of chemoreceptors sensilla documented in the antennae of adults of *T. dimidiata* according to previous studies in the region Haplogroup 1 (Hg1).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Segment** | **Sensilla** | **In this work** | **Catalá (2005)**  | **Concha-May et al 2016, Hg1** | **Concha-May et al 2018, Hg1** |
|  |  | Land | ♀ | ♂ | Rural | Rural ♀ | Rural ♂ | Rural ♀ | Rural ♂ |
| P | TK | Msd | 57 | 45 | 70 | 106 | 827 | 7703 | 6505 |
|  |  | Sv | 54 | 43 |  |  |  |  |  |
|  |  | Hg | 46 | 56 |  |  |  |  |  |
|  |  | U | 52 | 48 |  |  |  |  |  |
|  | TH | Msd | 165 | 195 | 282 | 1842 | 3423 | 13695 | 25935 |
|  |  | Sv | 160 | 189 |  |  |  |  |  |
|  |  | Hg | 155 | 187 |  |  |  |  |  |
|  |  | U | 151 | 169 |  |  |  |  |  |
|  | Ba | Msd | 13 | 12 | 1779 | 197 | 24 | 1690 | 2055 |
|  |  | Sv | 15 | 15 |  |  |  |  |  |
|  |  | Hg | 12 | 12 |  |  |  |  |  |
|  |  | U | 14 | 11 |  |  |  |  |  |
| FI | TK | Msd | 69 | 53 | 91 | 1036 | 792 | 7645 | 6590 |
|  |  | Sv | 58 | 45 |  |  |  |  |  |
|  |  | Hg | 55 | 41 |  |  |  |  |  |
|  |  | U | 53 | 49 |  |  |  |  |  |
|  | TH | Msd | 48 | 66 | 9424 | 931 | 1708 | 6755 | 12407 |
|  |  | Sv | 62 | 64 |  |  |  |  |  |
|  |  | Hg | 49 | 59 |  |  |  |  |  |
|  |  | U | 53 | 54 |  |  |  |  |  |
|  | Ba | Msd | 22 | 28 | 3264 | 41 | 68 | 3170 | 4865 |
|  |  | Sv | 23 | 23 |  |  |  |  |  |
|  |  | Hg | 20 | 20 |  |  |  |  |  |
|  |  | U | 18 | 18 |  |  |  |  |  |
| FII  | TK | Msd | 58 | 59 | 83 | 1036 | 79 | 8255 | 10395 |
|  |  | Sv | 54 | 49 |  |  |  |  |  |
|  |  | Hg | 48 | 45 |  |  |  |  |  |
|  |  | U | 52 | 39 |  |  |  |  |  |
|  | TH | Msd | 20 | 24 | 4593 | 389 | 713 | 2910 | 5280 |
|  |  | Sv | 24 | 26 |  |  |  |  |  |
|  |  | Hg | 24 | 21 |  |  |  |  |  |
|  |  | U | 33 | 22 |  |  |  |  |  |
|  | Ba | Msd | 17 | 19 | 2771 | 338 | 479 | 27 | 3560 |
|  |  | Sv | 24 | 16 |  |  |  |  |  |
|  |  | Hg | 24 | 15 |  |  |  |  |  |
|  |  | U | 33 | 15 |  |  |  |  |  |



**Supplementary Figure S1.** Average and standard deviation of the number of sensilla in females by landscape class. Segment, Pedicel (P), Flagellomere I (FI) and II (FII) Sensilla: Basiconic (Ba), bristles (Br), thin walled trichoid (TH) and thick walled trichoid (TK) Landscape class: Urban (U), Hummangarden (Hg), Secondary vegetation (Sv) and Median subdeciduous tropical forest (Msd).



**Supplementary Figure S2.** Average and standard deviation of the number of sensilla in males by landscape class. Segment, Pedicel (P), Flagellomere I (FI) and II (FII) Sensilla: Basiconic (Ba), bristles (Br), thin walled trichoid (TH) and thick walled trichoid (TK). Landscape class: Urban (U), Hummangarden (Hg), Secondary vegetation (Sv) and Median subdeciduous tropical forest (Msd).



**Supplementary Figure S3.** Average and standard deviation of the number of sensilla by segment in females **(A)** and males **(B)** by landscape class Segment, Pedicel (P), Flagellomere I (FI) and II (FII) Landscape class: Urban (U), Hummangarden (Hg), Secondary vegetation (Sv) and Median subdeciduous tropical forest (Msd).



**Supplementary Figure S4.** Average and standard deviation of the number of sensors considering all the antenna segments in females **(A)** and males **(B)** by landscape class Segment: Pedicel (P), Flagellomere I (FI) and II (FII) Landscape class: Urban (U), Hummangarden (Hg), Secondary vegetation (Sv) and Median subdeciduous tropical forest (Msd).