**Appendix I. Information about seed germination, plant growth, and measures taken in greenhouses at Indiana University, South Bend.**

**(A) Seed germination -** For greenhouse experiments, we collected open-pollinated fruits from Mpala Research Centre in June 2007 and established a population of 13 *H. aponeurus* and 15 *H. flavifolius* plants based on a random selection from 50 seedlings / species (10 maternal plants / species and 5 seeds from 1 - 3 fruits / plant). The germination protocol comprised overnight treatment in 3% H2O2, nicking the seed coat near the hilum, soaking the nicked seeds overnight in sterile H2O, and then transferring the soaked seeds to moistened cotton balls in 6-well plastic plates with lids, which were maintained at room temperature under fluorescent lights. Once seedlings had established a strong root system and a small number of leaves, they were transplanted (without disturbing the roots growing through the cotton ball) into small pots containing a 50:50 mix of standard potting soil and vermiculite.

**(B) Growing conditions -** From November 2007 to February 2008, plants were given supplemental lighting for eight hours each day using high-pressure sodium lamps. As the plants increased in size, they were transferred to larger pots, until a final selection of 13 *H. aponeurus* and 15 *H. flavifolius* mature plants were transplanted a final time to 1.9-gallon plastic pots in standard potting soil. Plants were rotated, watered as needed, and fertilized occasionally using a standard fertilizer (Scotts Miracle-Gro, Marysville, Ohio, USA). We used these plants for outcrossing, manual selfing, autonomous selfing, and apomixis treatments. Because the greenhouse was free of pollinating insects, flowers were not covered after manipulations or emasculated following each treatment. Fruits were harvested on the day of dehiscence to collect data on seed number. Sample sizes for *H. flavifolius* tended to be lower because plants of this species had slower maturation and lower flowering rates than *H. aponeurus* plants.

**Appendix II. Significance of the differences in floral rewards produced by the two plant species during each time interval and year of observation.**

**Table S1.** Nested ANOVAs testing for differences between *H. aponeurus* and *H. flavifolius* in standing crop nectar volume (μL / flower), nectar sugar concentration (% sucrose / mg), and pollen availability (scores). Pollen scores ranged from 4 (> 75% of total pollen remaining) to 0 (all pollen removed). Day of observation was treated as a random variable nested within species. Flowers were sampled three times daily: 0800 - 0900, 1200 - 1300, and 1600 – 1700 hrs. In 2005 *H. flavifolius* flowers were sampled 3 different days, and *H. aponeurus* 2 days, and in 2006 both species were sampled 2 days.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **2005** | **Sum of squares** | **df** | **Mean square** | **F** | ***P*** | **Variance (%) component** |
| **Nectar Volume** |  |  |  |  |  |  |
| **0800 - 0900 hrs** |  |  |  |  |  |  |
| between species | 0.071 | 1 | 0.071 | 1.742 | 0.279 | 2.9 |
| days within species | 0.123 | 3 | 0.041 | 0.880 | 0.459 | 0.0 |
| within days | 2.061 | 44 | 0.046 |  |  | 97.1 |
| Total | 2.257 | 48 |  |  |  | 100.0 |
| **1200 - 1300 hrs** |  |  |  |  |  |  |
| between species | 14.037 | 1 | 14.037 | 633.646 | 0.000 | 92.7 |
| days within species | 0.066 | 3 | 0.022 | 0.428 | 0.734 | 0.0 |
| within days | 2.223 | 43 | 0.051 |  |  | 7.3 |
| Total | 16.327 | 47 |  |  |  | 100.0 |
| **1600 - 1700 hrs** |  |  |  |  |  |  |
| between species | 2.558 | 1 | 2.557 | 5.410 | 0.102 | 58.0 |
| days within species | 1.418 | 3 | 0.472 | 17.974 | 0.000 | 26.7 |
| within days | 1.130 | 43 | 0.026 |  |  | 15.3 |
| Total | 5.107 | 47 |  |  |  | 100.0 |
| **Sugar concentration** |  |  |  |  |  |  |
| **0800 - 0900 hrs** |  |  |  |  |  |  |
| between species | 677.344 | 1 | 677.343 | 4.271 | 0.130 | 25.0 |
| days within species | 475.702 | 3 | 158.567 | 2.453 | 0.076 | 9.7 |
| within days | 2779.267 | 43 | 64.634 |  |  | 65.3 |
| Total | 3932.312 | 47 |  |  |  | 100.0 |
| **1200 - 1300 hrs** |  |  |  |  |  |  |
| between species | 27.097 | 1 | 27.096 | 0.008 | 0.933 | 0.0 |
| days within species | 9740.212 | 3 | 3246.738 | 57.911 | 0.000 | 90.5 |
| within days | 1457.658 | 26 | 56.063 |  |  | 9.5 |
| Total | 11224.968 | 30 |  |  |  | 100.0 |
| **1600 - 1700 hrs** |  |  |  |  |  |  |
| between species | 216.000 | 1 | 216.000 | 3.360 | 0.208 | 15.5 |
| days within species | 128.569 | 2 | 64.285 | 0.903 | 0.420 | 0.0 |
| within days | 1493.430 | 21 | 71.116 |  |  | 84.5 |
| Total | 1838.000 | 24 |  |  |  | 100.0 |
| **Pollen availability** |  |  |  |  |  |  |
| **0800 - 0900 hrs** |  |  |  |  |  |  |
| between species | 0.667 | 1 | 0.667 | 1.428 | 0.318 | 3.7 |
| days within species | 1.400 | 3 | 0.467 | 1.893 | 0.145 | 8.1 |
| within days | 10.600 | 43 | 0.247 |  |  | 88.2 |
| Total | 12.667 | 47 |  |  |  | 100.0 |
| **1200 - 1300 hrs** |  |  |  |  |  |  |
| between species | 4.594 | 1 | 4.594 | 0.488 | 0.535 | 0.0 |
| days within species | 28.219 | 3 | 9.406 | 21.863 | 0.000 | 68.2 |
| within days | 18.500 | 43 | 0.430 |  |  | 31.8 |
| Total | 51.312 | 47 |  |  |  | 100.0 |
| **1600 - 1700 hrs** |  |  |  |  |  |  |
| between species | 133.010 | 1 | 133.010 | 202.683 | 0.000 | 95.4 |
| days within species | 1.969 | 3 | 0.656 | 2.565 | 0.067 | 0.6 |
| within days | 11.000 | 43 | 0.256 |  |  | 3.9 |
| Total | 145.979 | 47 |  |  |  | 100.0 |
| **2006** | **Sum of squares** | **df** | **Mean square** | **F** | ***P*** | **Variance (%) component** |
| **Nectar Volume** |  |  |  |  |  |  |
| **0800 - 0900 hrs** |  |  |  |  |  |  |
| between species | 1.683 | 1 | 1.682 | 7.552 | 0.025 | 31.1 |
| days within species | 1.783 | 8 | 0.222 | 3.172 | 0.005 | 17.2 |
| within days | 4.074 | 58 | 0.070 |  |  | 51.7 |
| Total | 7.539 | 67 |  |  |  | 100.0 |
| **1200 - 1300 hrs** |  |  |  |  |  |  |
| between species | 0.125 | 1 | 0.125 | 1.250 | 0.296 | 0.8 |
| days within species | 0.802 | 8 | 0.100 | 1.718 | 0.106 | 7.3 |
| within days | 4.728 | 81 | 0.058 |  |  | 91.9 |
| Total | 5.655 | 90 |  |  |  | 100.0 |
| **1600 - 1700 hrs** |  |  |  |  |  |  |
| between species | 0.041 | 1 | 0.041 | 1.011 | 0.344 | 0.0 |
| days within species | 0.325 | 8 | 0.040 | 3.056 | 0.005 | 20.6 |
| within days | 0.944 | 71 | 0.013 |  |  | 79.4 |
| Total | 1.310 | 80 |  |  |  | 100.0 |
| **Sugar concentration** |  |  |  |  |  |  |
| **0800 - 0900 hrs** |  |  |  |  |  |  |
| between species | 605.788 | 1 | 605.788 | 1.308 | 0.286 | 0.7 |
| days within species | 3703.353 | 8 | 462.919 | 6.829 | 0.000 | 48.3 |
| within days | 3727.998 | 55 | 67.781 |  |  | 50.9 |
| Total | 8037.138 | 64 |  |  |  | 100.0 |
| **1200 - 1300 hrs** |  |  |  |  |  |  |
| between species | 3.204 | 1 | 3.204 | 0.005 | 0.945 | 0.0 |
| days within species | 5056.043 | 8 | 632.005 | 17.262 | 0.000 | 69.6 |
| within days | 2306.588 | 63 | 36.612 |  |  | 30.4 |
| Total | 7365.836 | 72 |  |  |  | 100.0 |
| **1600 - 1700 hrs** |  |  |  |  |  |  |
| between species | 22.523 | 1 | 22.523 | 0.020 | 0.890 | 0.0 |
| days within species | 7671.206 | 7 | 1095.887 | 35.499 | 0.000 | 87.4 |
| within days | 1142.206 | 37 | 30.870 |  |  | 12.6 |
| Total | 8835.935 | 45 |  |  |  | 100.0 |
| **Pollen availability** |  |  |  |  |  |  |
| **0800 - 0900 hrs** |  |  |  |  |  |  |
| between species | 0.998 | 1 | 0.998 | 14.176 | 0.005 | 13.7 |
| days within species | 0.563 | 8 | 0.070 | 0.398 | 0.917 | 0.0 |
| within days | 10.248 | 58 | 0.176 |  |  | 86.3 |
| Total | 11.809 | 67 |  |  |  | 100.0 |
| **1200 - 1300 hrs** |  |  |  |  |  |  |
| between species | 118.534 | 1 | 118.534 | 23.918 | 0.001 | 70.0 |
| days within species | 39.647 | 8 | 4.955 | 8.464 | 0.000 | 13.6 |
| within days | 47.424 | 81 | 0.585 |  |  | 16.4 |
| Total | 205.604 | 90 |  |  |  | 100.0 |
| **1600 - 1700 hrs** |  |  |  |  |  |  |
| between species | 220.501 | 1 | 220.501 | 144.012 | 0.000 | 91.4 |
| days within species | 12.249 | 8 | 1.531 | 4.180 | 0.000 | 2.5 |
| within days | 25.637 | 70 | 0.366 |  |  | 6.1 |
| Total | 258.388 | 79 |  |  |  | 100.0 |

**Appendix III. Visitor taxa recorded on each plant species for each year of observation.**

**Table S2**. Checklist of insect visitors recorded in *Hibiscus aponeurus* and *H. flavifolius* during the four years of observations at Mpala Research Centre in Kenya. An X indicates at least one recorded visit by that taxon in that given year.

| **Order/Family/Species** | ***Hibiscus aponeurus*** | | | |  | ***Hibiscus flavifolius*** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2004** | **2005** | **2006** | **2008** |  | **2004** | **2005** | **2006** | **2008** |
| **HYMENOPTERA** |  |  |  |  |  |  |  |  |  |
| **Apidae** |  |  |  |  |  |  |  |  |  |
| *Apis mellifera* |  |  |  | X |  |  |  |  | X |
| *Braunsapis* sp*.* |  | X | X |  |  |  | X |  |  |
| *Ceratina* sp. |  |  | X |  |  |  |  |  |  |
| *Macrogalea candida* |  |  |  |  |  |  | X | X |  |
| *Tetralonia boharti* |  |  |  |  |  | X |  |  |  |
| *Tetralonia* spp. |  |  |  | X |  |  | X | X | X |
| **Halictidae** |  |  |  |  |  |  |  |  |  |
| *Lasioglossum* spp. |  |  | X |  |  | X | X | X |  |
| *Lipotriches* spp. |  |  |  |  |  |  | X | X |  |
| Unidentified sp. |  |  |  | X |  |  |  |  |  |
| **Vespidae** |  |  |  |  |  |  |  |  |  |
| Unidentified sp. |  |  | X |  |  |  |  |  |  |
| **LEPIDOPTERA** |  |  |  |  |  |  |  |  |  |
| **Hesperiidae** |  |  |  |  |  |  |  |  |  |
| *Saragnesa phidyle* | X |  |  |  |  |  |  |  |  |
| **Lycaenidae** |  |  |  |  |  |  |  |  |  |
| *Deudorix* sp. |  |  | X |  |  |  |  |  |  |
| *Lepthotes pirithous* |  |  | X |  |  |  |  |  |  |
| *Zizula hylax* |  |  | X |  |  |  |  |  |  |
| **Pieridae** |  |  |  |  |  |  |  |  |  |
| *Belenois aurota* |  |  |  |  |  |  |  | X |  |
| *Belenois gidieae* |  |  | X |  |  |  |  |  |  |
| *Borbo ?borbonica* |  |  | X |  |  |  |  |  |  |
| *Colotis aurigeneus* |  | X | X |  |  |  |  |  |  |
| *Colotis eris eris* |  |  | X |  |  |  |  |  |  |
| *Colotis euipe* |  | X | X |  |  |  |  |  |  |
| *Colotis* spp. |  |  | X |  |  |  |  | X |  |
| *Dixeia* sp. |  |  | X |  |  |  |  |  |  |
| *Eurema brigitta* |  |  | X |  |  |  |  |  |  |
| Unidentified spp. | X |  |  |  |  | X |  |  |  |
| **Sphingidae** |  |  |  |  |  |  |  |  |  |
| *Cephanodes hylas* |  |  |  |  |  | X |  |  |  |
| **DIPTERA** |  |  |  |  |  |  |  |  |  |
| **Bombyliidae** |  |  |  |  |  |  |  |  |  |
| Unidentified sp. |  |  |  |  |  |  |  | X |  |
| **Muscidae** |  |  |  |  |  |  |  |  |  |
| Unidentified spp. |  |  |  |  |  |  | X | X |  |
| **Syrphidae** |  |  |  |  |  |  |  |  |  |
| *Phytomia incisa* |  |  |  |  |  |  |  | X |  |
| Unidentified sp. |  |  |  |  |  |  | X |  |  |
| **COLEOPTERA** |  |  |  |  |  |  |  |  |  |
| **Chrysomelidae** |  |  |  |  |  |  |  |  |  |
| Unidentified sp. |  |  |  |  |  | X |  |  |  |
| **Meloidae** |  |  |  |  |  |  |  |  |  |
| *Coryna* spp. | X | X |  |  |  | X |  |  |  |
| *Meloidea* spp. |  |  | X |  |  |  |  | X |  |
| Unidentified sp. |  |  |  |  |  |  |  |  | X |
| **Scarabaeidae** |  |  |  |  |  |  |  |  |  |
| *Scarabus* sp. |  |  | X |  |  |  |  |  |  |
| **HEMIPTERA** |  |  |  |  |  |  |  |  |  |
| Unidentified spp. |  |  | X |  |  |  | X | X |  |