Table S1. Tree species tagged for phenological observation in the El Triunfo Biosphere Reserve (Polygon 1) during 2019-2021. Species listed are in order of number of trees tagged. Species with asterisk were also observed in 1991-1993 by Solórzano et al. (2000). Abbreviations of species names are in parenthesis.

|  |  |  |  |
| --- | --- | --- | --- |
| **Family** | **Scientific name** | **Local common name** | **No. of trees tagged** |
| *Species producing feeding resources for quetzals* | | | |
| Chloranthaceae | *Hedyosmum mexicanum* (*H mex*) | Muñeco | 16 |
| Lauraceae | *\*Nectandra rudis* (*N rud*) | Aguacatillo | 15 |
| Lauraceae | *\*Ocotea chiapensis* (*O chi*) | Tepeaguacate | 15 |
| Moraceae | *\*Trophis cuspidata* (*T cus*) | Aretillo | 15 |
| Myrtaceae | *\*Eugenia capuli* (*E cap*) | Escobillo | 15 |
| Rosaceae | *\*Prunus brachybotrya* (*P bra*) | Cacho de carnero | 13 |
| Melastomataceae | *\*Conostegia volcanalis* (*C vol*) | Uva | 8 |
| Moraceae | *\*Morus insignis* (*M ins*) | Mora | 8 |
| Lauraceae | *\*Licaria excelsa* (*L exc*) | Canelillo | 7 |
| Verbenaceae | *\*Citharexylum mocinnii* (*C moc*) | Perla | 7 |
| Mysinaceae | *\*Ardisia compressa* (*A com*) | Chime | 6 |
| Lauraceae | *\*Ocotea acuminatissima* (*O acu*) | Canelillo | 5 |
| Mysinaceae | *Ardisia verapazensis* (*A ver*) | Chime | 5 |
| Actinidiaceae | *\*Saurauia madrensis* (*S mad*) | Moquillo rojo | 5 |
| Rhamnaceae | *\*Frangula capreifolia* (*F cap*) | Canzucar | 4 |
| Theaceae | *\*Symplococarpun purpusii* (*S pur*) | Palo Colorado | 3 |
| Lauraceae | *\*Cinnamomum zapatae* (*C zap*) | Canelillo | 3 |
| Clusiaceae | *Clusia salvinii* (*C sal*) | Palo de agua | 2 |
| Araliaceae | *Dendropanax arboreus* (*D arb*) | Cerillo | 2 |
| Rosaceae | *\*Prunus tetradenia* (*P tet*) | Cochoc | 1 |
| *Species producing fruits which quetzals could potentially consume (without observation)* | | | |
| Actinidiaceae | *Saurauia yasicae* (*S yas*) | Moquillo blanco | 3 |

Table S2. Ecology and phenology of the more common fleshy-fruit trees in the cloud forest of El Triunfo, Mexico.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Species** | **Ecology** | **Location in the canopy** | **Fruiting peak** | **Duration of peak** | **Fruiting pattern** | **Consistent production between years** |
| *Eugenia capuli* | slopes & ravines | understory | Dec | short | distinct peak & same timing between years | no |
| *Conostegia volcanalis* | slopes & ravines | understory | Feb/May | long | distinct peak but not consistent between years | yes |
| *Hedyosmum mexicanum* | wet & disturbed areas | understory | Mar-May | long | distinct peak & same timing between years | yes |
| *Trophis cuspidata* | Slopes | understory & codominant | Sept | short | distinct peak & same timing between years | no |
| *Ardisia compressa* | slopes & ravines | understory & codominant | Throughout Apr-Oct | long | unripe fruits all year, various peaks in ripe fruits in different times of the year & between years | yes |
| *Symplococarpun purpusii* | slopes & secondary | understory or codominant | Feb or none | short | distinct peak but not consistent between years | no |
| *Saurauia madrensis* | slopes & ravines | understory or codominant | May | long | distinct peak & same timing between years | yes |
| *Prunus brachybotrya* | slopes & ravines | codominant | Jan | long | distinct peak & same timing between years | yes |
| *Citharexylum mocinnii* | slopes | codominant | Feb-Apr | long | distinct peak but not consistent between years | no |
| *Frangula capreifolia* | secondary | codominant | Jun | short | distinct peak & same timing between years | yes |
| *Morus insignis* | slopes & ravines | codominant | Feb-Mar | short | distinct peak & same timing between years | no |
| *Licaria excelsa* | slopes & ravines | codominant | Dec-Jan | long | peaks throughout the year, but not same timing between years | no |
| *Cinnamomum zapatae* | Slopes | codominant | Mar | short | distinct peak & same timing between years | no |
| *Ocotea chiapensis* | slopes and valley bottom | dominant | Throughout year | long | peaks throughout the year, but not same timing between years | no |
| *Nectandra rudis* | slopes and valley bottom | dominant | Dec | long | distinct peak but not consistent between years | no |

Table S3. Characteristics of seasonality of flowering, unripe fruiting, and ripe fruiting during 1992, 1993, and 2019-2020 in El Triunfo, Mexico.

|  |  |  |  |
| --- | --- | --- | --- |
| **Phenophase** | **Mean angle** | **Date** | **Vector r** |
| *January-December 1992 (Solórzano et al. 2000)* | | | |
| Ripe fruiting | 119 | May 1 | 0.13 |
| *January-December 1993 (Solórzano et al. 2000)* | | | |
| Ripe fruiting | 131 | May 13 | 0.19 |
| *April 2019-March 2020 (only same tree species as Solórzano et al. 2000)* | | | |
| Ripe fruiting | 93 | Apr 4 | 0.24 |
| *April 2019-March 2020 (all tree species in study)* | | | |
| Flowering | 36 | Feb 6 | 0.46 |
| Unripe fruiting | 310 | Nov 10 | 0.11 |
| Ripe fruiting | 67 | Mar 9 | 0.25 |
| Fruit number | 67 | Mar 9 | 0.22 |

Table S4. Phenological circular statistics for the number of ripe fruits estimated on 13 tree species during the yearly cycles: January – December 1992, January – December 1993 (Solórzano et al., 2000), and April 2019 – March 2020 (this study). Variables are number of trees observed in each study (n), degree of seasonality (r), average angle of the distribution of the data (angle) and the day of the year corresponding to this angle (date).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Year** | **n** | **r** | **Angle** | **Date** |
| *Ardisia compressa* | 1992 | 16 | 0.56 | 175 | Jun 26 |
| 1993 | 16 | 0.88 | 72 | Mar 14 |
|  | 2020 | 6 | 0.5 | 197 | Jul 16 |
| *Citharexylum mocinnii* | 1992 | 5 | 0.56 | 167 | Jun 18 |
| 1993 | 5 | 0.56 | 122 | May 4 |
|  | 2020 | 7 | 0.77 | 71 | Mar 13 |
| *Conostegia volcanalis* | 1992 | 11 | 0.48 | 133 | May 15 |
| 1993 | 11 | 0.77 | 135 | May 17 |
|  | 2020 | 8 | 0.63 | 80 | Mar 22 |
| *Eugenia capuli* | 1992 | 5 | 0.76 | 358 | Dec 29 |
|  | 1993 | 5 | 0.76 | 326 | Nov 26 |
|  | 2020 | 15 | 0.85 | 326 | Nov 26 |
| *Frangula capreifolia* | 1992 | 5 | 0.74 | 179 | Jun 30 |
| 1993 | 5 | 0.75 | 156 | Jun 7 |
|  | 2020 | 4 | 0.94 | 167 | Jun 16 |
| *Licaria excelsa* | 1992 | 5 | 0.24 | 336 | Dec 7 |
|  | 1993 | 5 | 0.55 | 157 | Jun 8 |
|  | 2020 | 7 | 0.73 | 7 | Jan 7 |
| *Morus insignis* | 1992 | 11 | 0.88 | 49 | Feb 19 |
|  | 1993 | 11 | 0.96 | 57 | Feb 27 |
|  | 2020 | 8 | 0.99 | 76 | Mar 18 |
| *Nectandra rudis* | 1992 | 9 | 0.79 | 42 | Feb 12 |
|  | 1993 | 9 | 0.21 | 258 | Sep 19 |
|  | 2020 | 15 | 0.72 | 350 | Dec 21 |
| *Ocotea acuminatissima* | 1992 | 5 | 0.53 | 49 | Feb 19 |
| 1993 | 5 | 0.77 | 68 | Mar 10 |
|  | 2020 | 5 | 0.95 | 30 | Jan 30 |
| *Ocotea chiapensis* | 1992 | 40 | 0.75 | 66 | Mar 8 |
| 1993 | 40 | 0.02 | 121 | Apr 29 |
|  | 2020 | 15 | 0.09 | 153 | Jun 4 |
| *Prunus brachybotrya* | 1992 | 6 | 0.62 | 33 | Feb 2 |
| 1993 | 6 | 0.65 | 30 | Jan 30 |
|  | 2020 | 13 | 0.62 | 19 | Jan 19 |
| *Saurauia madrensis* | 1992 | 5 | 0.63 | 186 | Jul 5 |
| 1993 | 5 | 0.92 | 152 | Jun 3 |
|  | 2020 | 5 | 0.75 | 118 | Apr 30 |
| *Trophis cuspidata* | 1993 | 5 | 0.85 | 272 | Oct 3 |
| 2020 | 15 | 0.63 | 259 | Sep 20 |

Figure S1. Study area in the cloud forest of polygon 1, El Triunfo Biosphere Reserve, Chiapas, Mexico.

Figure S2: Average minimum, mean and maximum daily temperatures and monthly rainfall during the 1990-2000 (Solórzano et al., 2010) and 2013-2019 (CONAGUA, 2021) periods in El Triunfo, Mexico.