Table S1. Site, year, number of flowering plants, total number of flowers produced, duration of population flowering, synchrony of flowering within population, and mean ± SE flower production per flowering plant.

Site	Year	Plants Flowering	Flowers Produced	Duration of Flowering (Dates, Days)	Synchrony	Flowers/Flowering Plant (Mean ± SE)
LL	2024	20	335	15 May–4 Aug (82 days)	0.650	16.75 ± 3.54
PERL	2024	7	35	7–27 Jun (20 days)	0.375	5.00 ± 1.27
PERL	2025	5	150	3 Jun–23 Jul (50 days)	0.419	30.0 ± 20.34

Table S2. Floral visitation data for *Hibiscus dasycalyx* at the LL site during the 2024 flowering season. Observations summarize flower abundance, visitation frequency, and pollinator composition across four census dates. *Ptilothrix bombiformis* dominated the floral visitor community.

Date	Flowers Observed	Observation Time (min)	Total Visits	% Visits by *Ptilothrix bombiformis*	Visitor Species Richness
15 Jun	73	435	145	95.2%	8
29 Jun	62	423	313	99.7%	2
13 Jul	22	187	31	100%	1
5 Aug	4	240	20	85.0%	4
Total	151	1285	509	97.8%	

Table S3. Behavioral observations of *Ptilothrix bombiformis* visitors to *Hibiscus dasycalyx* flowers at the LL site during the 2024 flowering season. Values represent the percentage of individuals engaged in flyby, nectaring, or pollen-gathering behaviors during each census date.

Date	Flyby (%)	Nectaring (%)	Pollen Gathering (%)
15 Jun	37.0	62.3	0.7
29 Jun	54.8	26.6	18.6
13 Jul	9.7	12.9	77.4
5 Aug	0.0	11.8	88.2

Table S4. Floral visitation observations for *Hibiscus dasycalyx* at PERL in June 2024. Flowers were observed on multiple dates for a total of 515 minutes. Only two visits, both by *Melissodes bimaculatus*, were recorded on 13 June.

Date	Observation Time	# Flowers	Total Visits
7 Jun 2024	14:00–14:30	2	0
10 Jun 2024	14:50–15:30	2	0
12 Jun 2024	14:45–15:30	2	0
13 Jun 2024	09:00–10:40	7	2
14 Jun 2024	15:00–15:30	2	0
17 Jun 2024	15:15–15:45	4	0
Total	515 min	12	2

Table S5. Floral visitation observations for *Hibiscus dasycalyx* at PERL from 10–27 June 2025. Counts represent the number of visits per taxon during timed floral observation periods. The specialist bee *Ptilothrix bombiformis* dominated early in the season, while skipper butterflies were the primary visitors later in June.

Date	*Ptilothrix bombiformis*	*Melissodes communis*	*Agapostemon splendens*	Skippers	Total Visits	% Bees
10 Jun	110	2	5	0	117	100
11 Jun	11	6	3	5	25	80.0
14 Jun	107	0	0	4	111	96.4
16 Jun	0	0	0	1	1	0
17 Jun	0	0	0	1	1	0
19 Jun	0	0	0	13	13	0
20 Jun	0	0	0	3	3	0
27 Jun	0	0	0	0	0	0
Totals	228	8	8	26	271	0.90

Table S6. Results of pollination treatments in *Hibiscus dasycalyx* at LL, 2024–2025. Values are number of flowers, fruits, and percentage fruit set.

Year	Plants Used (Tag ID)*	Treatment	Flowers (N)	Fruits	Fruit Set (%)
2024	1, 2, 3, 4, 5, 7, 9	Autogamy	11	0	0
		Open (Control)	37	2	3.5
		Selfed	6	3	50
		Crossed	5	4	80
2025	2, 3, 5, 6, 9	Autogamy	22	0	0
		Open (Control)	108	41	38
		Selfed	41	28	68
		Crossed	39	34	87

*Tag IDs indicate individual plants used in hand-pollination experiments.



Figure S1. View of the natural population near Lovelady Texas (Houston County, Texas).
General habitat at the LL site where *Hibiscus dasycalyx* occurs. Soils are saturated or inundated throughout much of the year, supporting a wetland plant community with variable canopy cover and dense herbaceous and shrub vegetation. Flowering individual of *H. dasycalyx* at the edge of standing water. Photographs taken 15 June 2024.



Figure S2. View of the experimental population at the SHSU Piney Woods Lab (Walker County, Texas). General habitat at the PERL (Piney Woods Environmental Research Laboratory) site. The site is more open and exposed than LL, with no woody vegetation within the study plot. This photo taken on 17 June 2024 illustrates the relatively uniform herbaceous vegetation and high light availability.



Figure S3. View of digital cameras recording flower visitors to *Hibiscus dasycalyx* at PERL 17 June 2025.



Figure S4. Behavior of the dominant flower visitor at LL (*Hibiscus Bee, Ptilothrix bombiformis*).
(A) Fly-bys.
(B) Nectaring (pollen collecting shown in Supplemental Figure S5).
(C) American Bumblebees (*Bombus pennsylvanicus*) were also observed nectaring.



Figure S5. Female hibiscus bee (*Ptilothrix bombiformis*) collecting pollen from *Hibiscus dasycalyx* flowers at the LL site. (A) 5 August 2024, 09:07 a.m.; (B) 13 July 2024, 11:00 a.m. In both images, the bees are positioned at the base of the staminal column, exhibiting pollen-gathering behavior. The purple pollen on the hind tibial scopa confirms active foraging on *H. dasycalyx*, distinguishing it from white *H. moscheutos* pollen. Visitation was concentrated in June, aligning with peak flower availability (Figure S6).

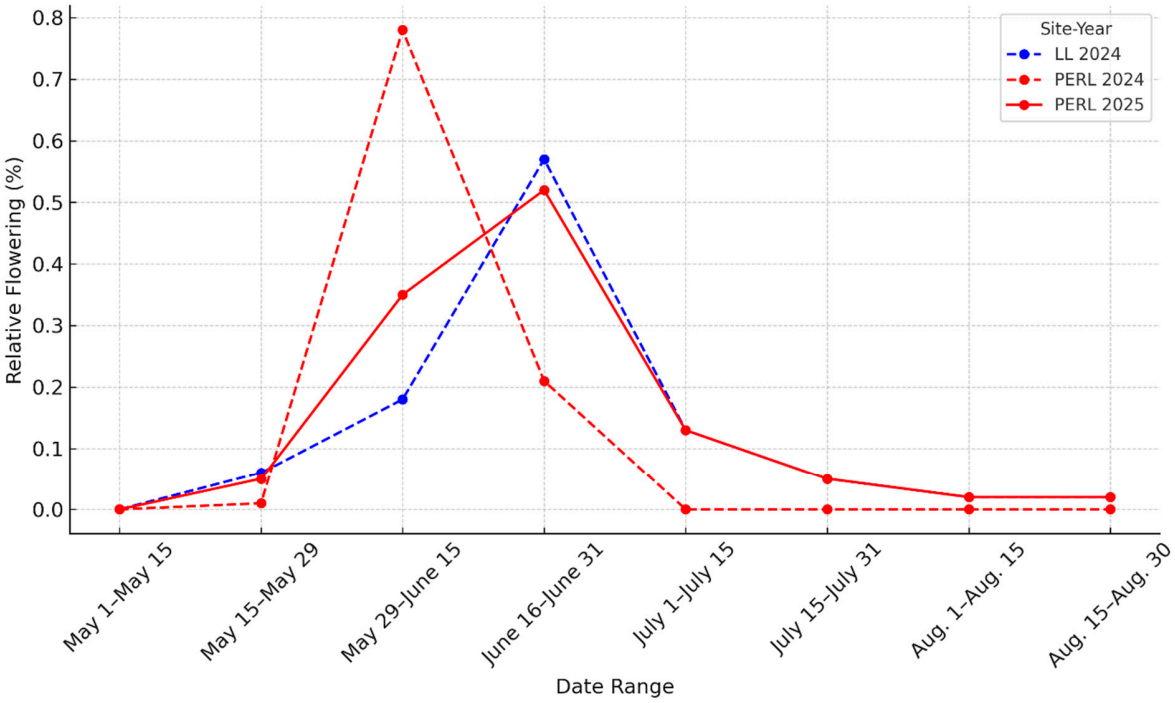


Figure S6. Relative flowering intensity of *Hibiscus dasycalyx* at LL (2024) and PERL (2024, 2025). Flowering is expressed as the proportion of total flowers produced in 14–17 day bins. LL 2024 (blue, solid line) showed a broad distribution of flowering, PERL 2024 (red, dashed line) had a sharp early peak, and PERL 2025 (red, solid line) displayed an intermediate, extended pattern.

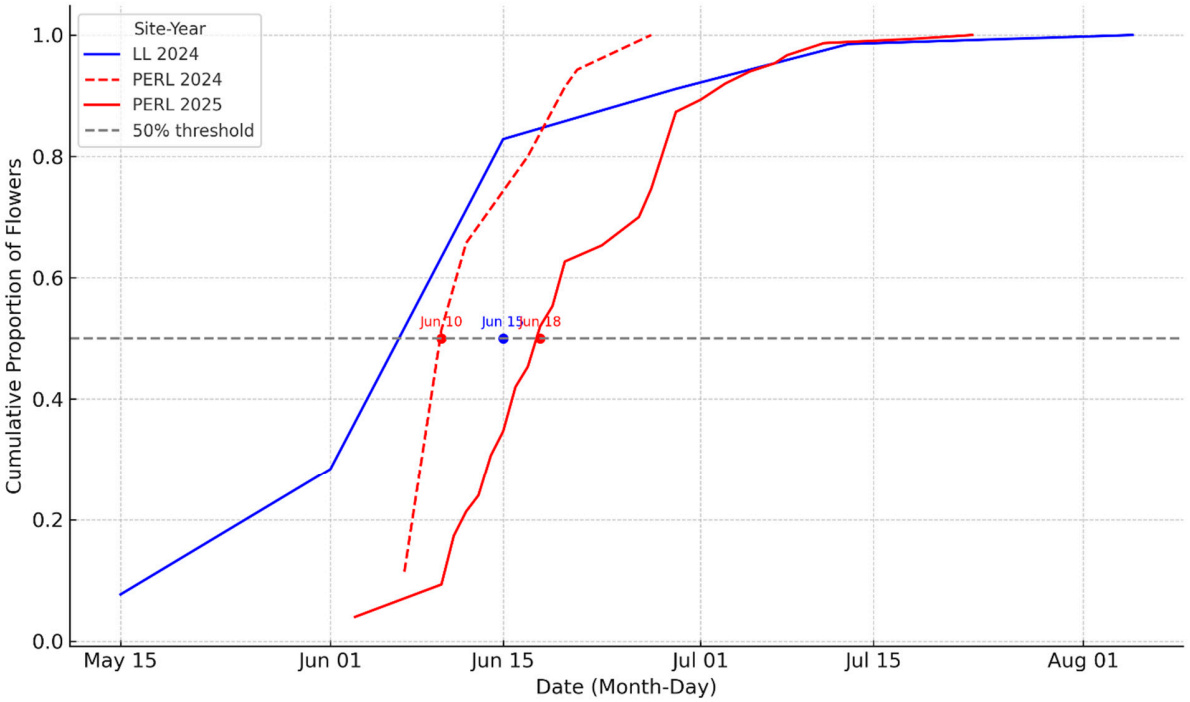


Figure S7. Cumulative proportion of flowering of *Hibiscus dasycalyx* at LL (2024) and PERL (2024, 2025). Cumulative flowering curves for *Hibiscus dasycalyx* across three site-years (LL 2024, PERL 2024, PERL 2025), showing the proportion of flowers produced from May 15 to August 1. The 50% flowering threshold (grey dashed line) was reached on June 10 (PERL 2024), June 13 (LL 2024), and June 18 (PERL 2025). These patterns reflect temporal variation in phenology across sites and years, with implications for pollinator interactions, seed production, and conservation planning.

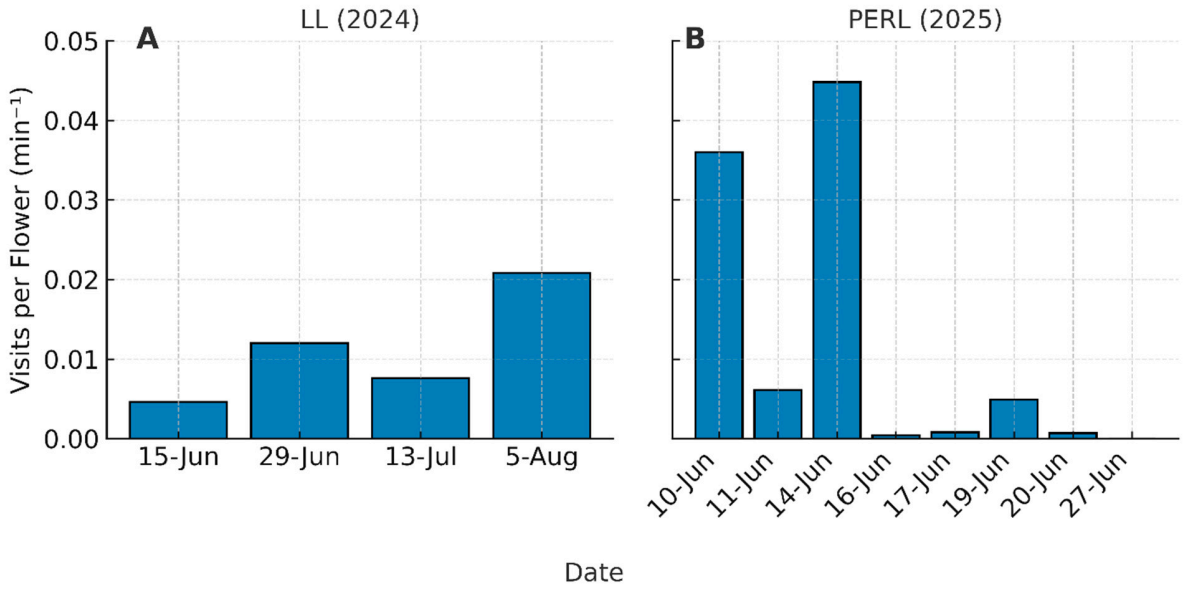


Figure S8. Comparison of floral visitation rates between (A) LL (2024) and (B) PERL (2025). Bars show visitation rate (visits per flower min^{-1}) per census date. Dates for PERL (2025) are angled for clarity. Each bar represents a single day of multiple observation periods across multiple flowers.

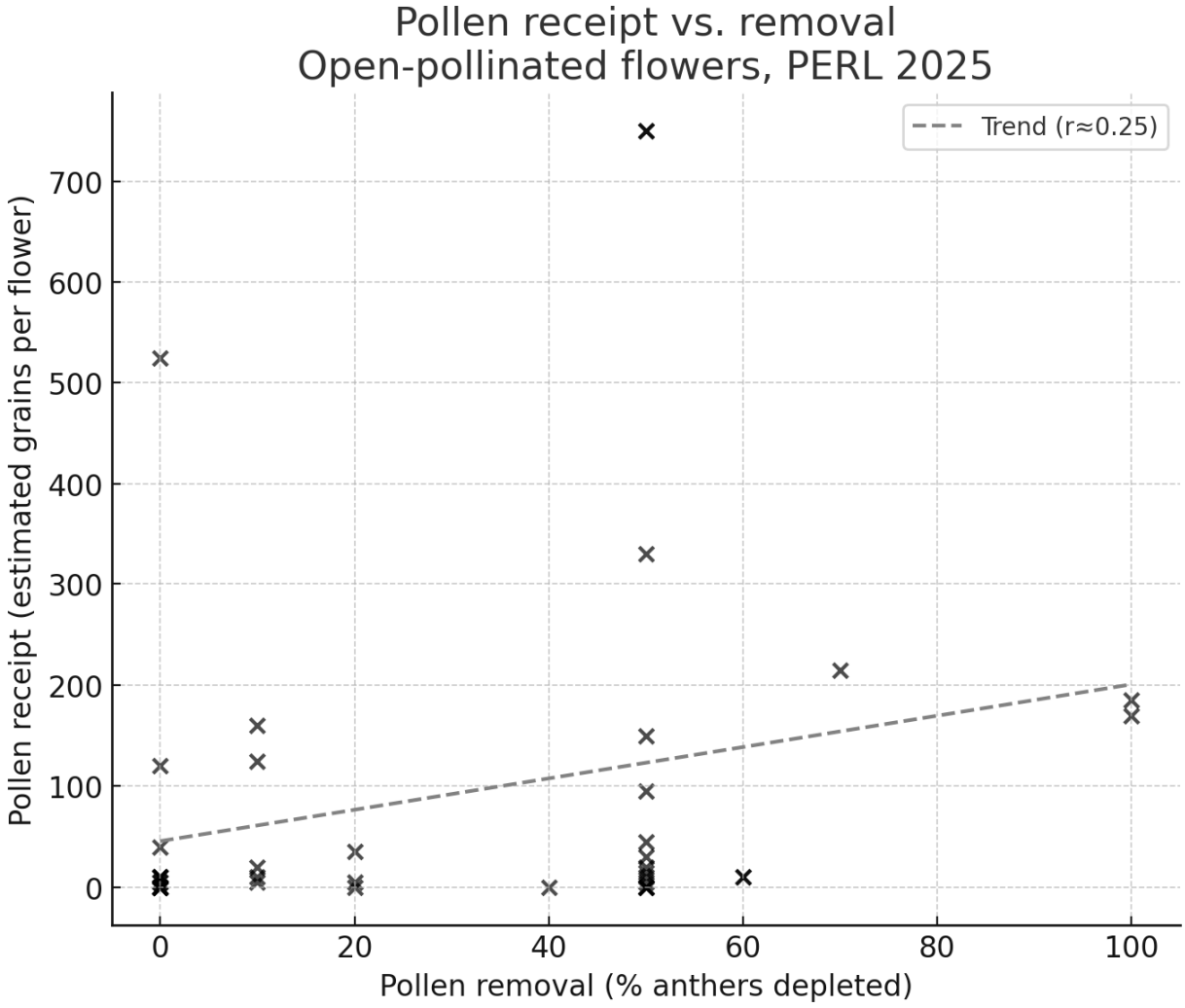


Figure S9. Relationship between pollen removal and pollen receipt in open-pollinated flowers of *Hibiscus dasycalyx* at the PERL experimental population in 2025. Pollen removal is expressed as the percentage of anthers depleted (1 = full, 2 = sparse, 3 = empty, converted to 0, 50, and 100% respectively), while pollen receipt is estimated from stigma lobe scores (0–4) converted to grain count midpoints (0, 5, 30, 75, 150) and summed across five lobes. Each point represents a single flower ($n = 43$). The dashed line indicates the fitted linear trend ($r \approx 0.25$), showing a weak positive association between pollen removal and stigma deposition. Despite pollen remaining abundant in many anthers, stigmatic pollen receipt was frequently low, indicating that pollinator limitation rather than pollen supply constrained reproduction in this experimental stand.

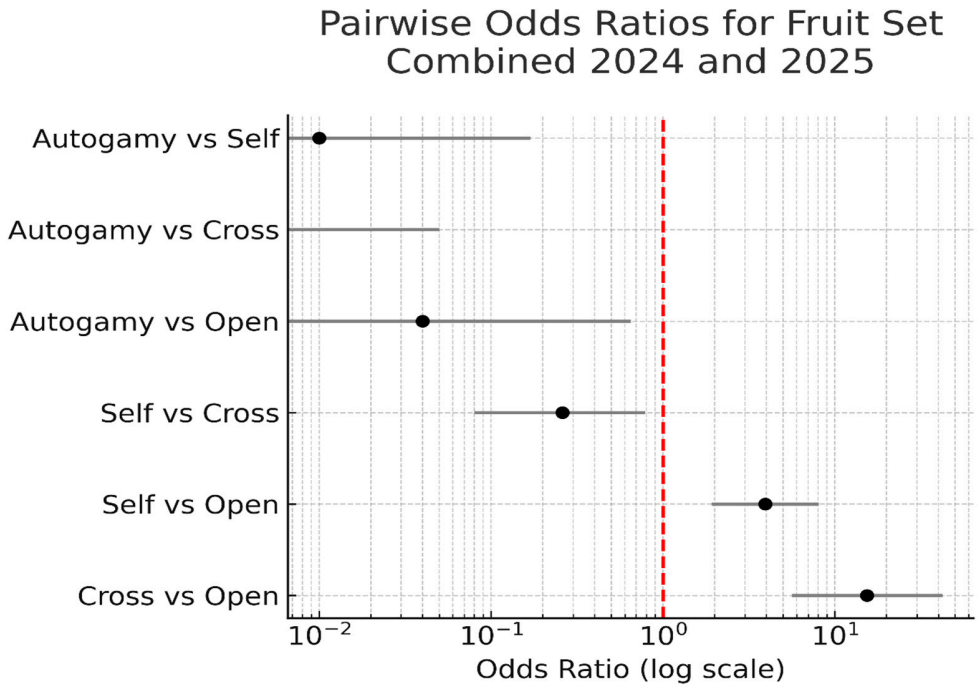


Figure S10. Pairwise odds ratios comparing fruit set success among pollination treatments using combined data from 2024 and 2025. Odds ratios were calculated using two × two contingency tables with Wilson 95% confidence intervals. Values greater than 1 indicate that the first treatment listed had higher odds of fruit set than the second. A red dashed line at odds ratio = 1 denotes no difference between treatments. Autogamy consistently underperformed all other treatments, while hand cross-pollination showed significantly greater odds of fruit set compared to both open and self-pollination.

Video S1. Video of female *Ptilothrix bombiformis* harvesting pollen in ritualized behavior.