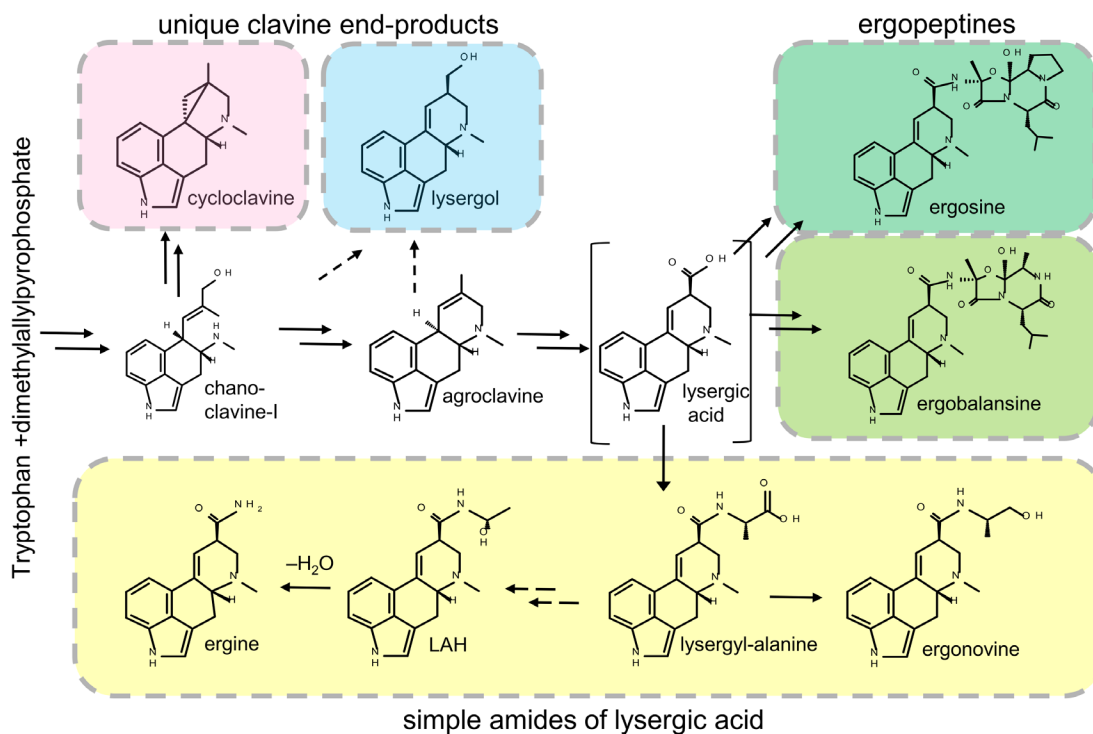


1 **Supplementary Materials for: Diversification of ergot alkaloids and heritable fungal**  
2 **symbionts in morning glories**

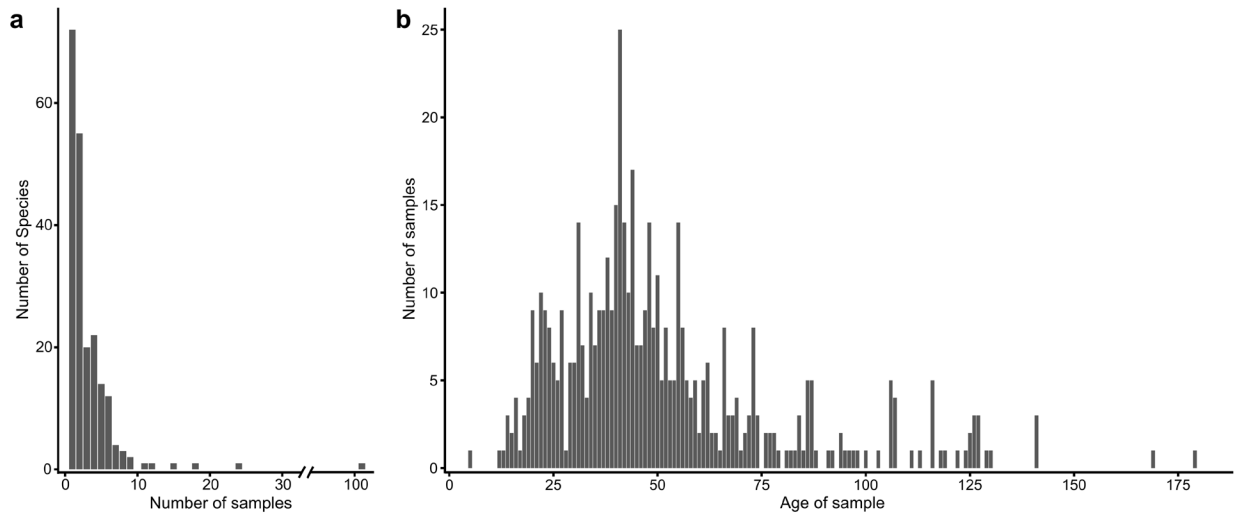
3 Wesley T. Beaulieu, Daniel G. Panaccione, Quynh N. Quach, Katy L. Smoot, Keith Clay

4 Correspondence to: [clay@tulane.edu](mailto:clay@tulane.edu)

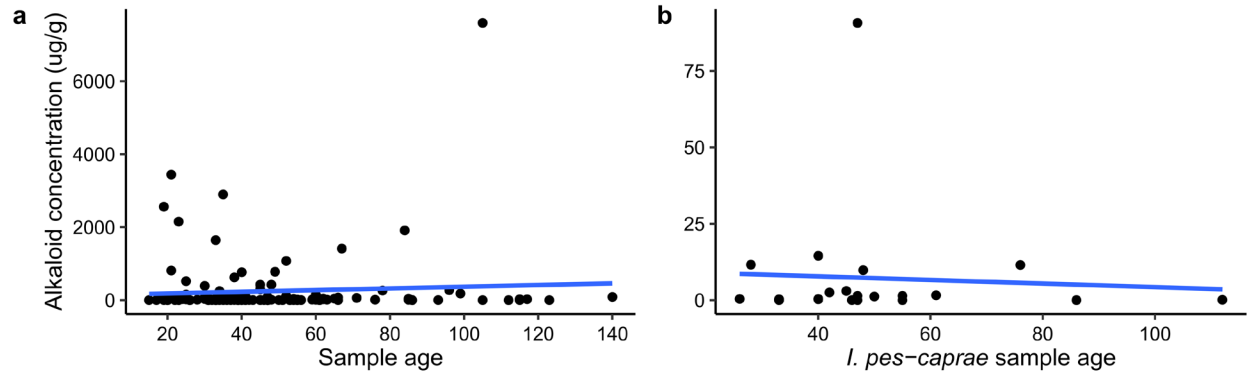
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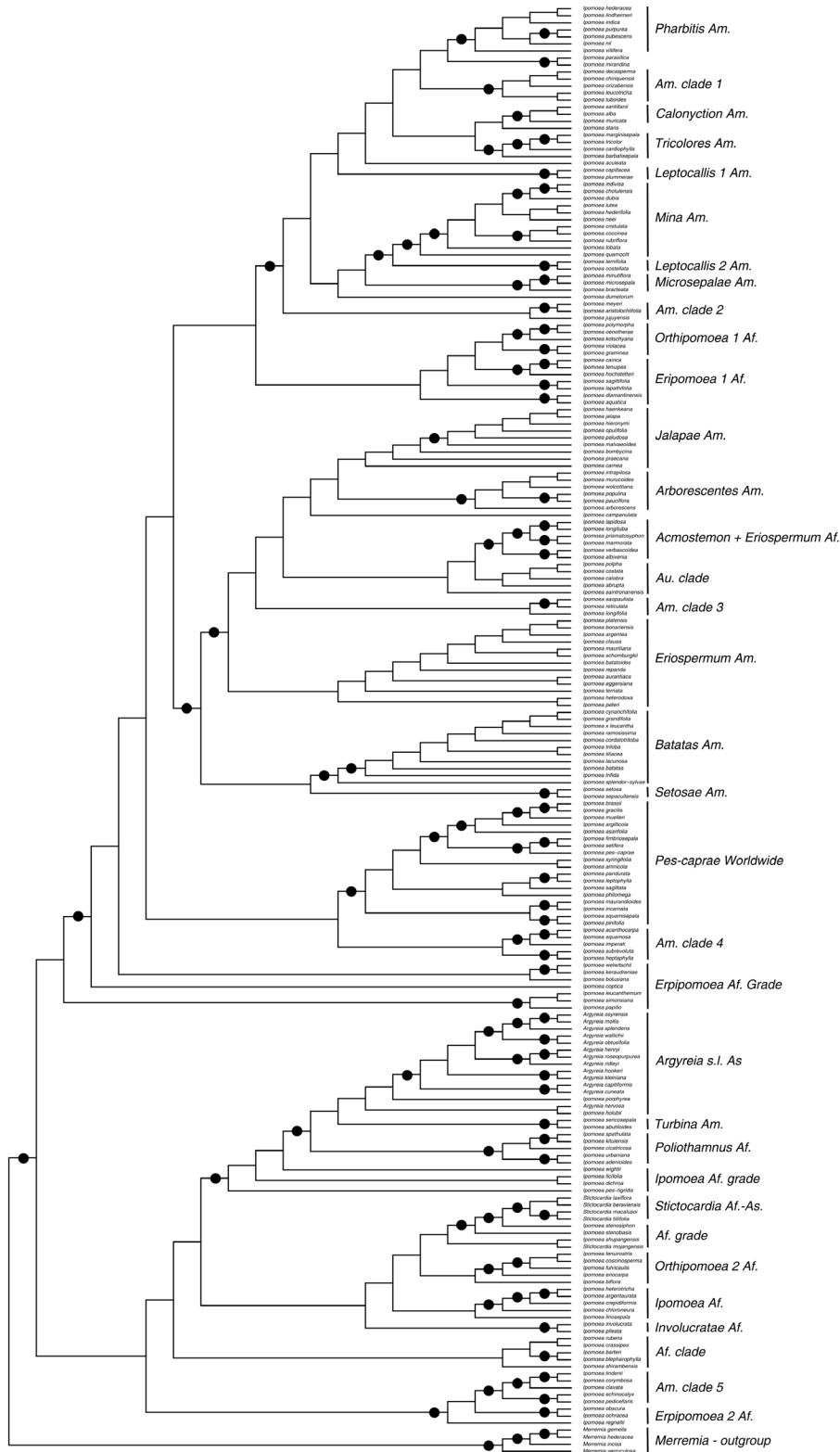
7 **Supplementary Figure 1.** Diversification of EAs produced in *Convolvulaceae-Periglandula*  
8 symbioses. Double arrows indicate one or more omitted intermediates. Dashed arrows indicate  
9 uncharacterized steps. Lysergic acid is bracketed to indicate that it is not typically considered a  
10 clavine and, as a transient intermediate, typically is not detected in analyses. Colored boxes  
11 represent the six distinct EA chemotypes used in PCAs (See Materials and Methods).



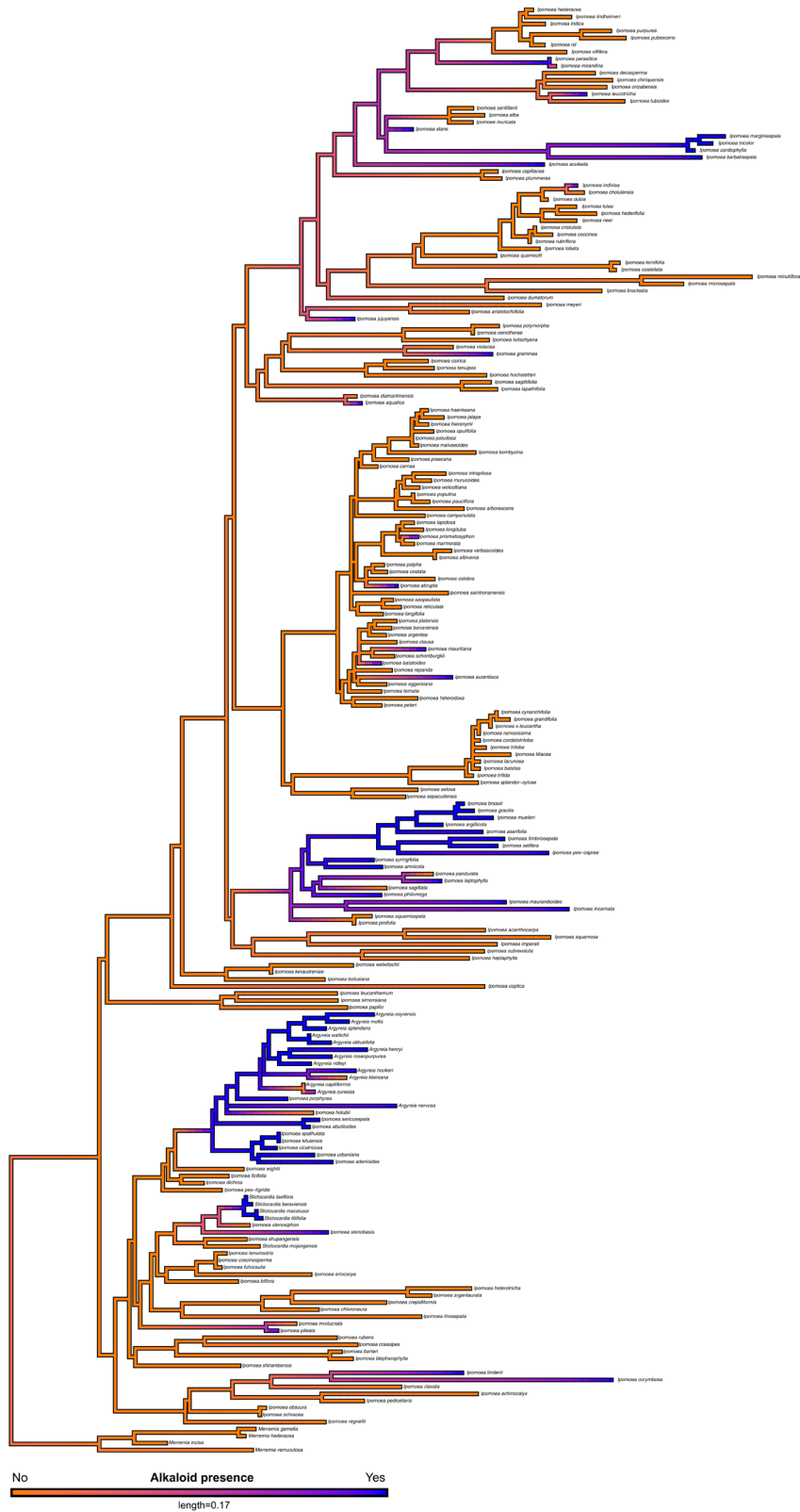
14 **Supplementary Figure 2. Sample and sample age distribution. a)** Sample distribution among  
15 surveyed species; **b)** Sample age distribution among samples with an available year of collection.



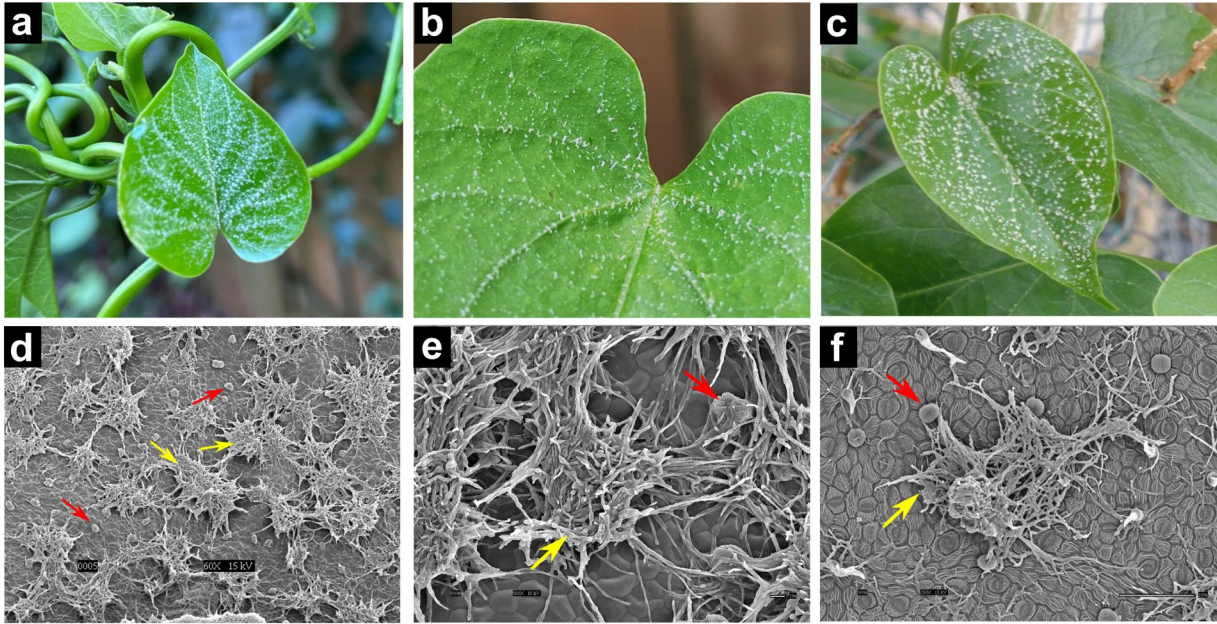
17 **Supplementary Figure 3.** Ergot alkaloid concentration variation based on sample age in **a)** all  
18 EA+ samples, and **b)** *Ipomoea pes-caprae*.



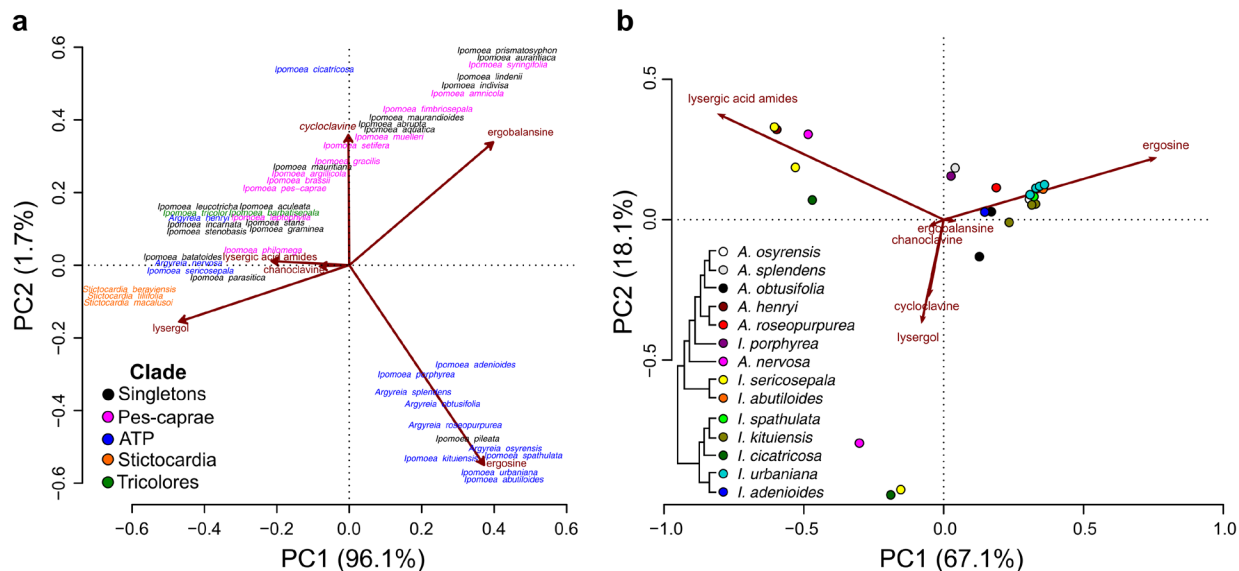
20 **Supplementary Figure 4.** Maximum likelihood ITS phylogeny with clade denotation. Nodes  
 21 with bootstrap support >75 are represented by a black circle. Af, African; Am, American; As,  
 22 Asian; Au, Australian.



24 **Supplementary Figure 5.** Density map of Bayesian stochastic character probabilities of alkaloid  
 25 positive (blue) and alkaloid negative (orange) character states. Legend length equals units of  
 26 substitution per site.



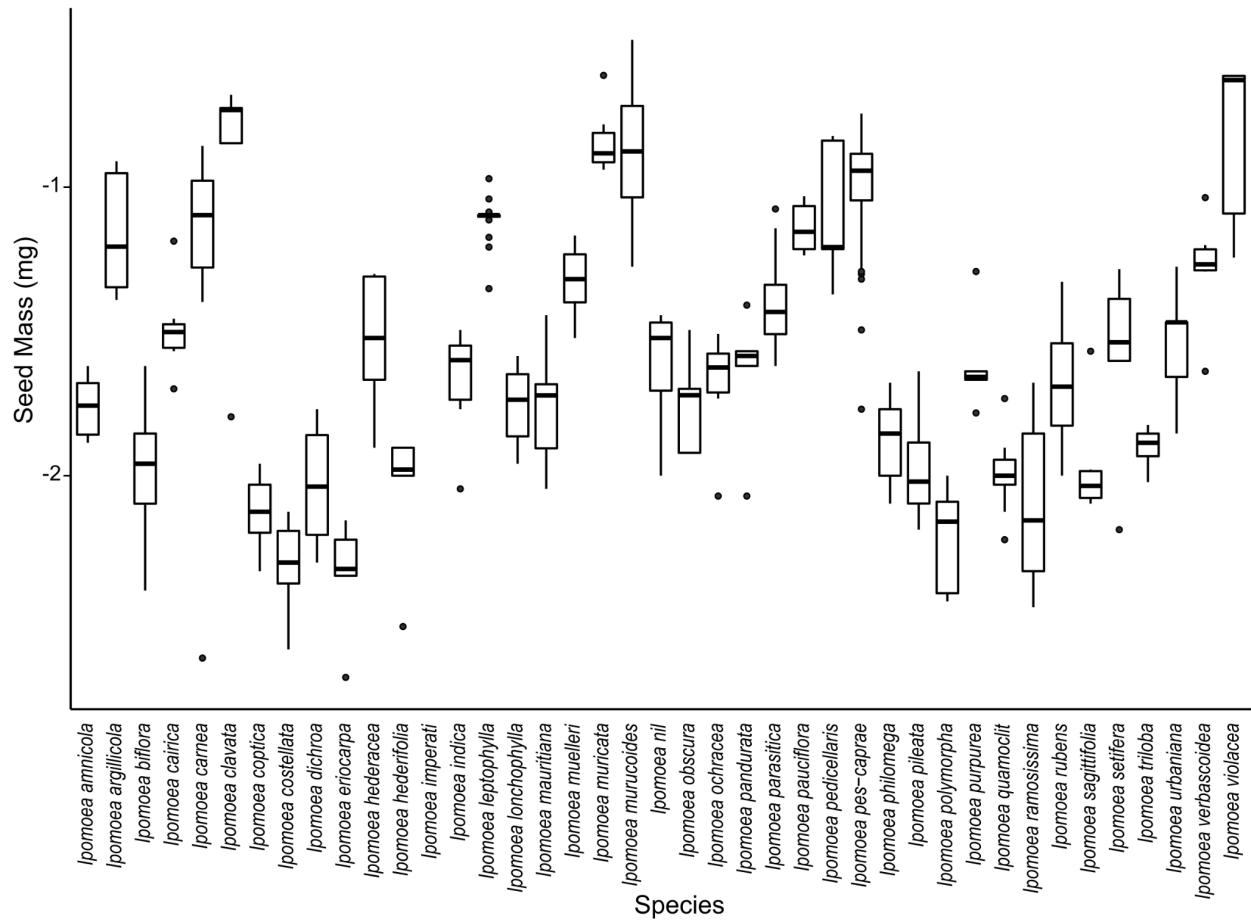
28 **Supplementary Figure 6. Epiphytic fungal colonies.** a,b,c) Colonies growing along the leaf  
29 veins of *Ipomoea corymbosa*. d,e,f) Scanning electron microscope images of fungal colonies  
30 (indicated by yellow arrows) closely associated with oil glands (indicated by red arrows).



32 **Supplementary Figure 7.** Clustering of alkaloid chemotypes in alkaloid-positive species. **a)**  
 33 Phylogenetic PCA showing differences in EA profile of different clades of morning glory,  
 34 represented by different colors. Alkaloid values are averaged for each species. “Singletons” are  
 35 clades with only one positive taxa each. **b)** PCA showing differences in EA profiles of different  
 36 species in the ATP clade.







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**Supplementary Figure 9.** Seed mass variation in species with five or more samples. Seed mass were log10 transformed.

45 **Supplementary Table 1.** Species in Eich (2008) absent from our sampling but are included in  
 46 the ITS phylogeny.

Species	Authority	Previous Designation (Eich 2008)	Geographical Distribution
<i>A. cuneata</i>	(Willd.) Ker Gawl.	Positive	India
<i>A. hookeri</i>	C.B. Clarke	Positive	Nepal to Thailand, Andaman Is.
<i>A. mollis</i>	(Burm f.) Choisy	Positive	Bangladesh to Hainan and Lesser Sunda Is.
<i>A. ridleyi</i>	(Prain) Ooststr.	Positive	Pen. Malaysia to Sumatera
<i>A. wallichii</i>	Choisy	Positive	Sikkim to SC. China and N. Indo-China
<i>I. asarifolia</i>	(Desr.) Roem. & Schult.	Positive	Tropics
<i>I. batatas</i>	(L.) Lam.	Devoid	
<i>I. bracteata</i>	Cav.	Devoid	
<i>I. cardiophylla</i>	A. Gray	Positive	Arizona to Texas and Mexico
<i>I. chloroneura</i>	Hallier f.	Devoid	
<i>I. corymbosa</i>	(L.) Roth	Positive	Mexico to Trop. America
<i>I. cynanchifolia</i>	Meisn.	Devoid	
<i>I. jujuyensis</i>	O'Donell	Positive	Ecuador to NW. Argentina
<i>I. lobata</i>	(Cerv.) Thell.	Contradictory	
<i>I. marginisepala</i>	O'Donell	Positive	S. Bolivia to NW. Argentina
<i>I. microsepala</i>	Benth.	Devoid	
<i>I. mirandina</i>	(Pittier) O'Donell	Devoid	
<i>I. reticulata</i>	O'Donell	Devoid	
<i>S. laxiflora</i>	(Baker) Hallier f.	Positive	Tanzania to E. South Africa, Madagascar