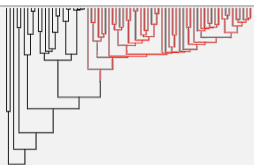
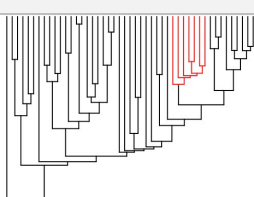
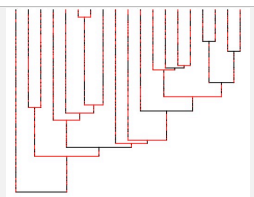
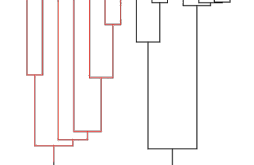


**Supplemental Table 10.** OUwie weighted AICc scores. Tests conducted are specified below as selection regime ~ modelled phenotype. BM1; single-rate Brownian motion, BMS; Brownian motion with different rate parameters for each state on a tree, OU1; Ornstein-Uhlenbeck model with a single optimum for all species, OUM; Ornstein-Uhlenbeck model with different state means and a single  $\alpha$  and  $\sigma^2$  acting all selective regimes, OUMV; Ornstein-Uhlenbeck model that assumes different state means as well as multiple  $\sigma^2$ , OUMA; Ornstein-Uhlenbeck model that assumes different state means as well as multiple  $\alpha$ , OUMVA; Ornstein-Uhlenbeck model that assumes different state means as well as multiple  $\alpha$  and  $\sigma^2$  per selective regime. The best models, as determined with AICc, are bolded and italicized. Asterisk (\*) indicated analyses which returned the warning, “You might not have enough data to fit this model well.”

| Simmap  | Test Conducted                       | BM1                          | BMS                     | OU1                          | OUM             | OUMV            | OUMA            | OUMVA           |
|---|--------------------------------------|------------------------------|-------------------------|------------------------------|-----------------|-----------------|-----------------|-----------------|
|    | AtAlpha/All ~ Total TE               | 0.059294                     | <b><i>0.4075957</i></b> | 0.1026477                    | 0.03478328      | 0.05291083      | 0.10698661      | 0.23578184      |
|   | AtAlpha/All ~ Gypsy                  | 0.00295855                   | 0.00190546              | <b><i>0.3186865</i></b>      | 0.23758937      | 0.14597727      | 0.20500947      | 0.08787339      |
|   | AtAlpha/All ~ Copia                  | 0.00001552                   | 0.000009                | <b><i>0.3509629</i></b>      | 0.29076304      | 0.15800576      | 0.15221466      | 0.0480291       |
|    | Brassicaceae/Brassicaceae ~ Total TE | 0.0795574                    | 0.08170141              | <b><i>0.2741048</i></b>      | 0.09524774      | 0.21402713<br>* | 0.15597822<br>* | 0.09938331<br>* |
|   | Brassicaceae/Brassicaceae ~ Gypsy    | 0.32010442                   | 0.10217491              | <b><i>0.3679953</i></b>      | 0.11124287      | 0.04138997<br>* | 0.03731004<br>* | 0.0197825*<br>* |
|   | Brassicaceae/Brassicaceae ~ Copia    | 0.01588842                   | 0.00555477              | <b><i>0.5635547</i></b>      | 0.18430769      | 0.10066517<br>* | 0.09134368<br>* | 0.03868553<br>* |
|   | Neo/BMAP ~ Total RE                  | <b><i>0.4870293</i></b><br>* | 0.16334972<br>*         | 0.1752389<br>*               | 0.09177786<br>* | 0.01504765<br>* | 0.05696647<br>* | 0.01059003<br>* |
|   | Neo/BMAP ~ Gypsy                     | <b><i>0.4304128</i></b><br>* | 0.15543752<br>*         | 0.1438035<br>*               | 0.10288377<br>* | 0.01833382<br>* | 0.14525589<br>* | 0.00387266<br>* |
|   | Neo/BMAP ~ Copia                     | 0.01666794<br>*              | 0.00857456<br>*         | <b><i>0.4134385</i></b><br>* | 0.37400051<br>* | 0.11452479<br>* | 0.06447625<br>* | 0.00831744<br>* |
|  | ThAlpha/Cleomaceae ~ Total RE        | <b><i>0.5775217</i></b><br>* | 0.19361534<br>*         | 0.1104097<br>*               | 0.09367094<br>* | 0.01500279<br>* | 0.00897249<br>* | 0.00080708<br>* |
|   | ThAlpha/Cleomaceae ~ Gypsy           | 0.12686794<br>*              | 0.11919859<br>*         | <b><i>0.3576261</i></b><br>* | 0.27132915<br>* | 0.05904368<br>* | 0.06326126<br>* | 0.00267328<br>* |
|   | ThAlpha/Cleomaceae ~ Copia           | 0.17259922<br>*              | 0.36403269<br>*         | <b><i>0.3893679</i></b><br>* | 0.05613062<br>* | 0.00970944<br>* | 0.00778289<br>* | 0.00037727<br>* |