**Supplementary Table – Response to Questions**

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| **Name of the radiation you are describing here** | | **I. How did your lineage gain access to the (novel/ under-utilised) eco-evolutionary space into which it radiated?** | **II. How does the ancestral niche compare to what you know of the pattern of establishment?** | **III. Which factor best describes initial establishment in your group?** | **IV. Which factor best describes initial reproductive isolation (i.e. initial divergence between populations) in your group?** | **V. Do species species have long-term persistence or are they ephemeral in your group?** | **VI. Which factor best describes how co-occurrence is achieved in your group?** | **VII. What are the underlying genetic and demographic conditions that lead to selection for ecological disparity in your group?** |
| *Anolis* – Response 1 |  | 1 | 1 | 1 | 2 | 1 | 2 | 3 |
| *Anolis* – Response 2 |  | 2 | ? | 4 | 2 | 2 | 2 | 3 |
| *Anolis* – Response 3 |  | 2 | ? | 1? | 2 | 2 | 2 | 3 |
| *Anolis* (subclade Draconura) | | 2 | ? | 1 | 1&2 | 1 | ? | 3&5 |
| Eastern Plethodontid Salamanders (glutinosus group) | | 1 | 1 | 2 | 2 | 3 | 4 | 5 |
| Hawaiian *Hyposmocoma* moths | | 1 | 2 | ? | 2 | 1 | 1 | 3 |
| Hawaiian *Tetragnatha* spiders | | 1 | 3 | 4 | 2 | 2 | 2 | 6 |
| Hawaiian *Ariamnes* | | 1 | 3 | 4 | 2 | 2 | 2 | 6 |
| Hawaiian *Mecaphesa* spiders | | 1 | ? | ? | 2 | ? | 2 | 6 |
| Hawaiian *Laupala* crickets |  | 1 | ? | 2 | 2 | 1 | 3 | 5 |
| Hawaiian *Drosophila* flies | | 1&5 | 1? | 1 | 1&2 | 1 | 1&2 | 5&6 |
| *Heliconius* butterflies |  | 3 | 2 | 4 | 1 | 2 | ? | 1,3&5 |
| Hawaiian *Metrosideros* trees | | 1 | 1&2 | 1 | 1 | 3 | 5 | 1&2 |
| Hawaiian *Bidens* | | 1 | 1 | 5 | 1 | 1 | 1 | ? |
| Galapagos *Naesiotus* land snails | | 1 | 2 | ? | 2 | ? | 1 | 5 |
| Galapagos finches – Response 1 | | 1 | ? | 1 | 1 | ? | 2 | 3 |
| Darwin's finches – Response 2 | | 1 | 1 | ? | 1 | 3 | 2 | 5 |
| Threespine stickleback (mainly freshwater, early stages) – Response 1 | | 1 | 2 | 1 | 1 | 2 | 1 | 3 |
| Threespine stickleback – Response 1 | | 1 | 1 | 5 | 1 | 1 | 3 | 3 |
| East African cichlids | | 2 | 1 | 1 | 1&2 | ? | 1&2 | 1,2,3,4 |
| Lake Victoria region superflock of cichlid fish | | 1 | 1 | 3 | 1 | 4 | 2 | 1,2,3 |
| Pre-Alpine whitefish radiation | |  | 4 | 1 | 1 | 4 | 1&2 | 3 |
| Mediterranean labrine wrasses | | 1 | ? | 3 | ? | ? | ? | 5 |
| Alpine charr |  | 1 | 2 | 3 | 1&2 | 4 | 2 | 2 |
| San Salvador Island pupfishes | | 2 | 1 | 6 | 1 | 4 | 2 | 1 |
| Barombi Mbo, Cameroon crater lake cichlids | | 1 | 1 | 1 | 1 | ? | 5 | 1 |
| Laguna Chichancanab, Mexico pupfishes | | 1 | 1 | 1 | 1 | 2 | 2 | ? |
| Lake Ejagham, Cameroon cichlids | | 1 | 1 | 7 | 1 | 2 | 2 | 1 |
|  |  | 1. Geographic colonization of a new environment  2. Key innovation AND colonization of a new environment  3. Key innovation without any environmental shift  4. Mass extinction of another lineage  5. Appearance of new resources in situ | 1. Ancestor was generalist (subsequent diversification has led to multiple specialist species).  2. Ancestor was specialized; experienced ecological release at outset of radiation, spreading out from ancestral niche  3. Ancestor was specialized; experienced ecological release at outset of radiation, but no evidence of occupation of their ancestral niche  4. Ancestor was "modal" phenotype  ?. No idea! | 1. Initial establishment in preferred niche; subsequent colonists excluded. Ensuing radiation by expansion from this niche into many other niches  2. Initial establishment in preferred niche; subsequent colonists excluded. Ensuing radiation limited to this niche  3. Initial establishment in niche resembling ancestral niche; subsequent colonists NOT excluded. Ensuing radiation by rapid but gradual "cladistic expansion" from this niche into many other niches  4. Exclusion from ancestral niche (perhaps by earlier colonists) leading to establishment in novel niches and associated radiation  5. Initial establishment in novel niche (relative to mainland sister group), then expansion in novel niches and associated radiation  6. No clear waves of colonization. Likely generalist and multiple specialist niches colonized simultaneously. | 1. Ecological speciation - divergent selection between different environments  2. Initial divergence happens in the same environment, though in allopatry ("mutation–order" speciation) | 1. Most entities persist once they have been formed  2. Many genetic entities are formed but most are ephemeral - eliminated by ecological processes of exclusion etc  3. Many genetic entities are formed but most tend to be ephemeral - eliminated by introgression  4. Most entities persist at least for thousands of years (which is long in a 15'000 years young radiation), but some get eliminated by speciation reversal or because of the finite life of the environment | 1.Entities are ecologically distinct before they come into secondary contact  2. Entities are ecologically similar when they come into secondary contact, and appear to undergo ecological character displacement when they start to interact  3. Entities never precisely co-occur - they exclude each other at the habitat scale  4. Entities never co-occur - they are found only in different environments  5. Entities diverge in sympatry (or close allopatry) | 1. Admixture (adaptive or not)  2. Developmental plasticity  3. Evolvability  4. Gene or genome duplication  5. Lineage Priority - first to get there is the one to radiate  6. Lineage Priority - radiation only after primary niche is filled; first to get there does not radiate |
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