

Table S2: Initial parameter values of the Genetic Algorithm

| Floret-generator parameters         | Parameter description  | Values of the initial population            |
|-------------------------------------|--|---|
| Growth parameters                   | Elongation lengths [ $l_{\text{growth}}$ ] are drawn from a gamma distribution with optimized shape and scale parameters in [0,100].           | [ $g_{Sh}, g_{Sc}$ ]                        |
|                                     |  | [43.4, 1.6]                                 |
| Retraction parameters               | Retraction lengths [ $l_{\text{retract}}$ ] are drawn from a gamma distribution with optimized shape and scale parameters in [0,100].          | [ $r_{Sh}, r_{Sc}$ ]                        |
|                                     |  | [43.9, 2.2]                                 |
| Resource parameters                 | For every floret, the amount of available resource $r$ is drawn from a gamma distribution with optimized shape and scale parameters in [0,20]. | [ $rs_{Sh}, rs_{Sc}$ ]                      |
|                                     |  | [10.8, 15.7]                                |
| Growth and retraction probabilities | The probability of growth and retraction are both sampled uniformly from [0,1].  | [ $p_{\text{growth}}, p_{\text{retract}}$ ] |
|                                     |  | [0.8, 0.2]                                  |
| The bias parameter                  | The bias parameter is optimized in the range of [0.5,1]. It determines the allocation of resource after bifurcation.                           | [b]   |
|                                     |  | [0.9]                                       |
| The offset parameter                | The offset parameter determines the initial length grown and is optimized within [1,2].  | [os]  |
|                                     |  | [1.6]                                       |

The initial parameter values of the floret-generator of an initial population of the Genetic Algorithm. Parameter values are selected for the initial populations probabilistically within their individual ranges (for the ranges see main text Table S1). Over the following iterations, the genetic algorithm seeks an optimum of its search process by minimizing the divergence of segment-length and length-weighted asymmetry distributions between biological and generated data.