### Local Mate Competition

<table>
<thead>
<tr>
<th>k</th>
<th>4</th>
<th>ai</th>
<th>Wi</th>
</tr>
</thead>
<tbody>
<tr>
<td>a(pop)</td>
<td>0.43</td>
<td>0</td>
<td>1.0000</td>
</tr>
<tr>
<td>R = resources</td>
<td>1</td>
<td>0.05</td>
<td>1.0351</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1</td>
<td>1.0640</td>
</tr>
<tr>
<td>ESS</td>
<td>0.42857</td>
<td>0.15</td>
<td>1.0875</td>
</tr>
<tr>
<td>W(ESS)</td>
<td>1.14286</td>
<td>0.2</td>
<td>1.1060</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.25</td>
<td>1.1201</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.3</td>
<td>1.1302</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.35</td>
<td>1.1366</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.4</td>
<td>1.1396</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.45</td>
<td>1.1397</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>1.1369</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.55</td>
<td>1.1315</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.6</td>
<td>1.1238</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.65</td>
<td>1.1139</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.7</td>
<td>1.1020</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.75</td>
<td>1.0882</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8</td>
<td>1.0727</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.85</td>
<td>1.0556</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.9</td>
<td>1.0370</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.95</td>
<td>1.0170</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>0.9956</td>
</tr>
</tbody>
</table>
Variables (you can change these)

- $k = \text{number of mates} \quad 4$
- $a(\text{pop}) \quad 0.25$
- $R = \text{resources} \quad 1$

Notes:

1. Red diamond (the attractor) shows the ESS and popl. mean fitness at the ESS.
2. The blue line shows fitness given $a(i)$
3. Change blue variables, $k$ and $a(\text{pop})$
4. Note that when the population mean male allocation is equal to the ESS, the red diamond is at the top of the curve.
5. The triangle is fitness of the resident genotype
6. Calculations in "calcs" worksheet.

Calculated values (don't change)

- $\text{ESS} \quad 0.429$
- $\text{Pop mean fitness at the ESS} \quad 1.143$

<table>
<thead>
<tr>
<th>$a(\text{pop})$</th>
<th>$\text{fitness(\text{pop})}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Graph:
- Blue line: fitness
- Red diamond: ESS
- Triangle: Resident or population

Axes:
- Y-axis: Fitness
- X-axis: Allocation to male function ($ai$)
Variables (you can change these)

k = number of mates  4

a(pop)  0.35

R = resources  1

Calculated values (don't change)

ESS  0.429

Pop mean fitness at the ESS  1.143

Notes

1. Red diamond (the attractor) shows the ESS and popl. mean fitness at the ESS.
2. The blue line shows fitness given a(i)
3. Change blue variables, k and apop
4. Note that when the population mean male allocation is equal to the ESS, the red diamond is at the top of the curve.
5. The triangle is fitness of the resident genotype
6. Calculations in "calcs" worksheet.
Variables (you can change these)

- \( k \) = number of mates \( 4 \)
- \( a(pop) \) = 0.43
- \( R \) = resources = 1

Calculated values (don't change)

- ESS = 0.429
- Pop mean fitness at the ESS = 1.143

\( a(pop) \) | fitness(pop)
--- | ---
0.429 | 1.142

Notes

1. Red diamond (the attractor) shows the ESS and popl. mean fitness at the ESS.
2. The blue line shows fitness given \( a(i) \)
3. Change blue variables, \( k \) and \( a(pop) \)
4. Note that when the population mean male allocation is equal to the ESS, the red diamond is at the top of the curve.
5. The triangle is fitness of the resident genotype
6. Calculations in "calcs" worksheet.
Variables (you can change these)

- $k =$ number of mates \(100\)
- $a(pop) = 0.25$
- $R =$ resources \(1\)

Calculated values (don't change)

- ESS \(0.497\)
- Pop mean fitness at the ESS \(1.005\)
- $a(pop) =$ fitness(pop) \((0.25 \text{ and } 1.5)\)

Notes

1. Red diamond (the attractor) shows the ESS and popl. mean fitness at the ESS.
2. The blue line shows fitness given $a(i)$
3. Change blue variables, $k$ and $apop$
4. Note that when the population mean male allocation is equal to the ESS, the red diamond is at the top of the curve.
5. The triangle is fitness of the resident genotype
6. Calculations in "calcs" worksheet.
**Variables (you can change these)**
- k = number of mates  100
- a(pop)  0.35
- R = resources  1

**Calculated values (don't change)**
- ESS  0.497
- Pop mean fitness at the ESS  1.005
- a(pop)  fitness(pop)  0.35  1.3

**Notes**
1. Red diamond (the attractor) shows the ESS and popl. mean fitness at the ESS.
2. The blue line shows fitness given a(i)
3. Change blue variables, k and apop
4. Note that when the population mean male allocation is equal to the ESS, the red diamond is at the top of the curve.
5. The triangle is fitness of the resident genotype
6. Calculations in "calcs" worksheet.
### Variables (you can change these)
- \( k \) = number of mates: 100
- \( a_{\text{pop}} \) = 0.5
- \( R \) = resources: 1

### Calculated values (don't change)
- ESS: 0.497
- Pop mean fitness at the ESS: 1.005
- \( a_{\text{pop}} \) = 0.497, \( \text{fitness}_{\text{pop}} \) = 1.006

### Notes
1. Red diamond (the attractor) shows the ESS and popl. mean fitness at the ESS.
2. The blue line shows fitness given \( a(i) \).
3. Change blue variables, \( k \) and \( a_{\text{pop}} \).
4. Note that when the population mean male allocation is equal to the ESS, the red diamond is at the top of the curve.
5. The triangle is fitness of the resident genotype.
6. Calculations in "calcs" worksheet.