

Re: Applying TDF (was understanding y)

Source: <http://sci.tech-archive.net/Archive/sci.bio.evolution/2005-11/msg00030.html>

- *From:* "Perplexed in Peoria" <jimmenegay@xxxxxxxxxxxxxxx>
 - *Date:* Wed, 2 Nov 2005 13:37:57 -0500 (EST)
-

"John Edser" <edser@xxxxxxxxxx> wrote in message [news:dk8c4g\\$2u2k\\$1@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:dk8c4g$2u2k$1@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)

>>> JE:-

>>> The value r^e reduces geometrically as e increases arithmetically so
>>> that r^e represents "Edser's index of credibility for inclusive fitness"
>>> (EICIF).

>

>>> As e increases EICIF becomes reduced to an effective zero meaning that
>>> inclusive fitness is simply not credible.

>

>> JM:-

>> Not true at all. If there is no sexual selection (what you called the
>> non-definitive case), your only objection to my analysis was that
>> there is a difficulty (almost an impossibility) at "getting started".
>> I know many ways around this "getting started" problem.

>

> JE:-

> Really, how?

Ok. Here is a "just so story" for the evolution of bee stings – an epistatic altruistic trait. I have no idea whether this is the way bees' stinging behavior evolved, but it demonstrates my point that complex behaviors which now seem to require a lot of epistatic genes to work might evolve.

Step 1. Originally, fertile female bees develop a penetrating ovipositor for use in a parasitic lifestyle – they inject their eggs into caterpillars. Seven genes are eventually involved in controlling the development of the ovipositor and the egg-laying behavior. But none of this involves altruism.

Step 2. A toxin is deposited with the eggs because the eggs develop better in necrotic tissue in the caterpillar. Two more genes – still no altruism.

Step 3. The bee learns how to inject toxin without eggs. This behavior is directed against lizards which eat caterpillars. Three more genes, making twelve, now. But still not altruism by your accounting – you would call it parental care.

Step 4. This is a haplodiploid species that can lay fertilized eggs –

Re: Applying TDF (was understanding y)

producing females – or unfertilized eggs – producing males. A change takes place such that only the male eggs are deposited in caterpillars with a toxin. The female eggs are deposited in a nest and tended. Three more genes – fifteen now.

Step 5. The bees begin nesting socially, and collaborate on egg tending. Mutualism, not altruism. Five more genes for various mutualistic social behaviors.

Step 6. An age-graded caste system develops. Young females tend eggs and rarely leave the nest. Hence they rarely meet males, and rarely encounter caterpillars. But there are occasionally opportunities for using their toxic ovipositors to stun other insects that blunder into the nest. Not really altruistic, since they eat the intruders, though they do share the food. No barbs yet on the ovipositors, so stinging is not harmful to your health. Five more genes – twenty five now.

Step 7. Our first "Hamilton" gene! A gene delays the onset of nest-leaving and sexual intercourse. Also delayed is the opportunity to lay male eggs in caterpillars. Some individuals even die before leaving the nest. There is certainly a cost c , but there is a benefit b to the other sisters, whose eggs are well tended. We now have a complex altruistic trait requiring twenty-six genes, but the Hamilton gene didn't have difficulty "getting started" since the other twenty five were already common in the population.

Steps 8–20. Several more changes, each caused by a single gene modifying the whole epistatic complex of behaviors. Bees develop even stronger toxins, and begin dragging caterpillars back to the nest to lay their eggs. Males and females both develop in the nest now – but behaviors are developed to discourage inbreeding. A new food – royal jelly – is developed which overrides some of the age-structured caste system. The new caste system distinguishes the fully fertile females from those who are forever incapable of being fertilized (though they can still produce males).

Steps 20–30. The habit of laying the male eggs in caterpillars is gradually lost. Ovipositors become barbed – more effective in defense against lizards, etc. but fatal to the wielder. In the non-royal caste, the ability to lay male eggs is gradually lost, under the guidance of Hamilton's rule, as one gene after another provides an rb benefit to the nest which outweighs the c cost to the unfortunate donor. (I call the donor unfortunate, because she was unfortunate that she wasn't fed royal jelly in her youth. Queens also have the same Hamilton genes, but they are only the recipients of altruism – never the donors.)

>>> A similar error is the deletion of p (the number of
>>> recipients) [snip remainder about " p " – someone else can deal with this
>> new delusion of John's]
>>>
>>> Amazingly, none of the above represents the worst errors within HR! This
>>> error is and remains the deletion of the total fitness of the actor (K)
>> from

Re: Applying TDF (was understanding y)

Re: Applying TDF (was understanding y)

>>> the rule [And snip more about K for the same reason]

>

> JE:–

> Why do you keep ignoring p?

Two reasons:

1. Your choice of the letter 'p' as a count of the number of recipients is a horrible choice. If you actually read some of that "oversimplified model" literature, rather than simply talking about it, you would have picked up a bit of the "culture" and would have used a different letter. The letter "p" usually represents a probability. Use a letter like "n" for a count of individuals.
2. You wrote your formula " $(r^e)b/p > K-c$ " without a hint of justification, other than that it has all the letters in it that you think should be there. I see no reason for dividing rb or $(r^e)b$ by p . If anything, you should multiply. Surely, if helping one relative is good (according to Hamilton), then helping more than one should be better.

And don't tell me that your formula is refutable, and hence scientific even if it turns out to be empirically refuted. You know as well as I do that your real purpose is to come up with a formula that is laughably INCORRECT, and then to laugh at it. Why are you doing this, John???

It doesn't damage Hamilton's case at all.

.

• **References:**

◆ ***Re: Applying TDF (was understanding y)***

◇ *From:* John Edser

- Prev by Date: ***Re: First Mutation Was Biggish***
- Next by Date: ***Re: Sergey Gavrilets and the adaptive landscape***
- Previous by thread: ***Re: Applying TDF (was understanding y)***
- Next by thread: ***Re: Applying TDF (was understanding y)***
- Index(es):
 - ◆ ***Date***
 - ◆ ***Thread***