From: "James Salsman" <jsalsman@gmail.com>
To: "Joseph DeCicco" <JXD1@nrc.gov>, <GCP@nrc.gov>
Date: 03/13/2007 2:03:17 PM
Subject: Re: Risk of Birth Defects from 1991 War graph and mutational meltdown reference

Dear Joe:

Also, here is the URL for the JSTOR version, and the abstract is below:

http://links.jstor.org/sici?sici=0014-3820%28199512%2949%3A6%3C1067%3AMMISP%3E2.0.CO%3B2-2&size=LARGE

Please distribute this too.

Sincerely,
James Salsman

Abstract: Although it is widely acknowledged that the gradual accumulation of mildly deleterious mutations is an important source of extinction for asexual populations, it is generally assumed that this process is of little relevance to sexual species. Here we present results, based on computer simulations and supported by analytical approximations, that indicate that mutation accumulation in small, random-mating monoecious populations can lead to mean extinction times less than a few hundred to a few thousand generations. Unlike the situation in obligate asexuals in which the mean time to extinction ($\bar{t}_e$) increases more slowly than linearly with the population carrying capacity (K), $\bar{t}_e$ increases approximately exponentially with K in outcrossing sexual populations. The mean time to extinction for obligately selfing populations is shown to be equivalent to that for asexual populations of the same size, but with half the mutation rate and twice the mutational effect; this suggests that obligate selfing, like obligate asexuality, is inviable as a long-term reproductive strategy. Under all mating systems, the mean time to extinction increases relatively slowly with the logarithm of fecundity, and mutations with intermediate effects (similar to those observed empirically) cause the greatest risk of extinction. Because our analyses ignore sources of demographic and environmental stochasticity, which have synergistic effects that exacerbate the accumulation of deleterious mutations, our results should yield liberal upper bounds to the mean time to extinction caused by mutational degradation. Thus, deleterious mutation accumulation cannot be ruled out generally as a significant source of extinction vulnerability in small sexual populations or as a selective force influencing mating-system evolution.

On 3/13/07, James Salsman <jsalsman@gmail.com> wrote:
> Dear Joe:
>
> Thank you for your help with the teleconference and the PRB.
>
> Here is the additional information as promised:
> http://www.bovik.org/du/gwbd.jpg
> (attached)
>

> This is the most recent citation I have on mutational meltdown:
>
> M. Lynch, J. Conery, and R. Burger (1995) "Mutational meltdowns in
> sexual populations." Evolution 49:1067-1080.
>
> Please distribute this to the PRB and the licensees.
>
> Sincerely,
> James Salsman
>
>

Mail Envelope Properties (45F6E751.C0C : 9 : 27660)

Subject:	Re: Risk of Birth Defects from 1991 War graph and mutational meltdown reference
Creation Date	03/13/2007 2:02:49 PM
From:	"James Salsman" <jsalsman@gmail.com>
Created By:	jsalsman@gmail.com

Recipients

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OWGWPO03.HQGWDO01
JXD1 (Joseph DeCicco)

nrc.gov
TWGWPO03.HQGWDO01
GCP (George Pangburn)

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MESSAGE	2596	3/13/2007 2:02:49 PM
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Options

Expiration Date:	None
Priority:	Standard
ReplyRequested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

Junk Mail Handling Evaluation Results
Message is eligible for Junk Mail handling
This message was not classified as Junk Mail

Junk Mail settings when this message was delivered
Junk Mail handling disabled by User
Junk Mail handling disabled by Administrator
Junk List is not enabled
Junk Mail using personal address books is not enabled
Block List is not enabled