Do the (Callosobruchus maculatus) bean beetles prefer their native bean species over others bean species?

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Intro:

Bean beetles, Callosobruchus maculatus inseminated adult females lay many single fertilized eggs on the surface of a bean that is firmly glued to the surface. The eggs develops into a larva that hatches from the egg and burrows into the bean and feeds on its endosperm. The larva will undergo a series of molts prior to pupation and then become imago (fully develiped individual) inside the bean that chews it self out of the bean.

We tested two experiment: first the behavior of female bean beetles, how often they stayed on each bean type in a period of time. And the second experiment, on which bean type do the females beetles prefer to lay theyr'e eggs. Three different beans species where use, Brown (Azuki), Black eyed peas and green (Mung) wich is theyre nativ bean for 2-3 generations.

Hypotese:

Do the bean beetles prefer the nativ (Green bean) over the other bean species (Brown and Black eyed beans)?

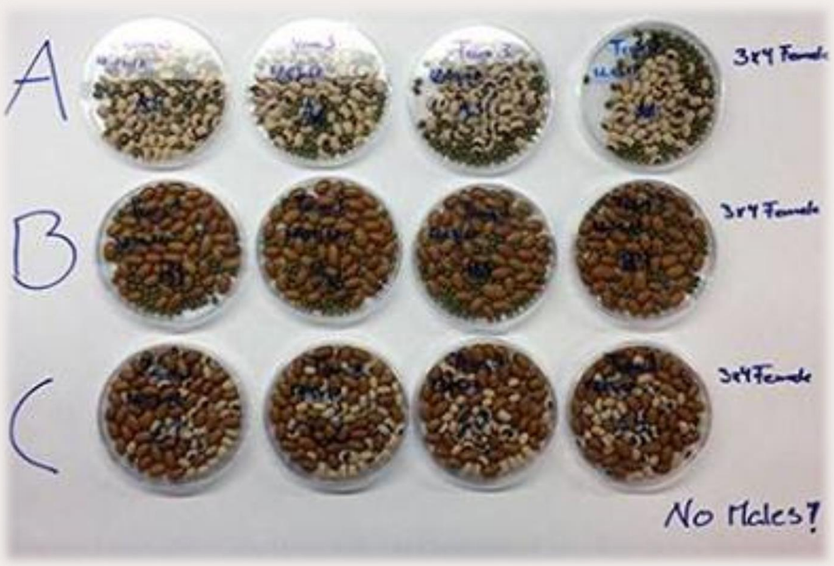
Methode:

Three groups where made with combination of two types of beans, each combination repeated four times.

Group A: Green bean (Mung) (Gb) and the Black eyed beans (BE), (70:70).
Group B: Green bean (Mung) (Gb) and Brown bean (Azuki) (Bb), (54:54).
Group C: Brown bean (Azuki) (Bb) and Black eyed beans (BE), (45:45).

For the first experiment, three female beetles where placed to all petri dishes in every group, 30 minutes let pass by and then position of the beetles where noted. It was noted every second minutes during a period of 20 minutes.

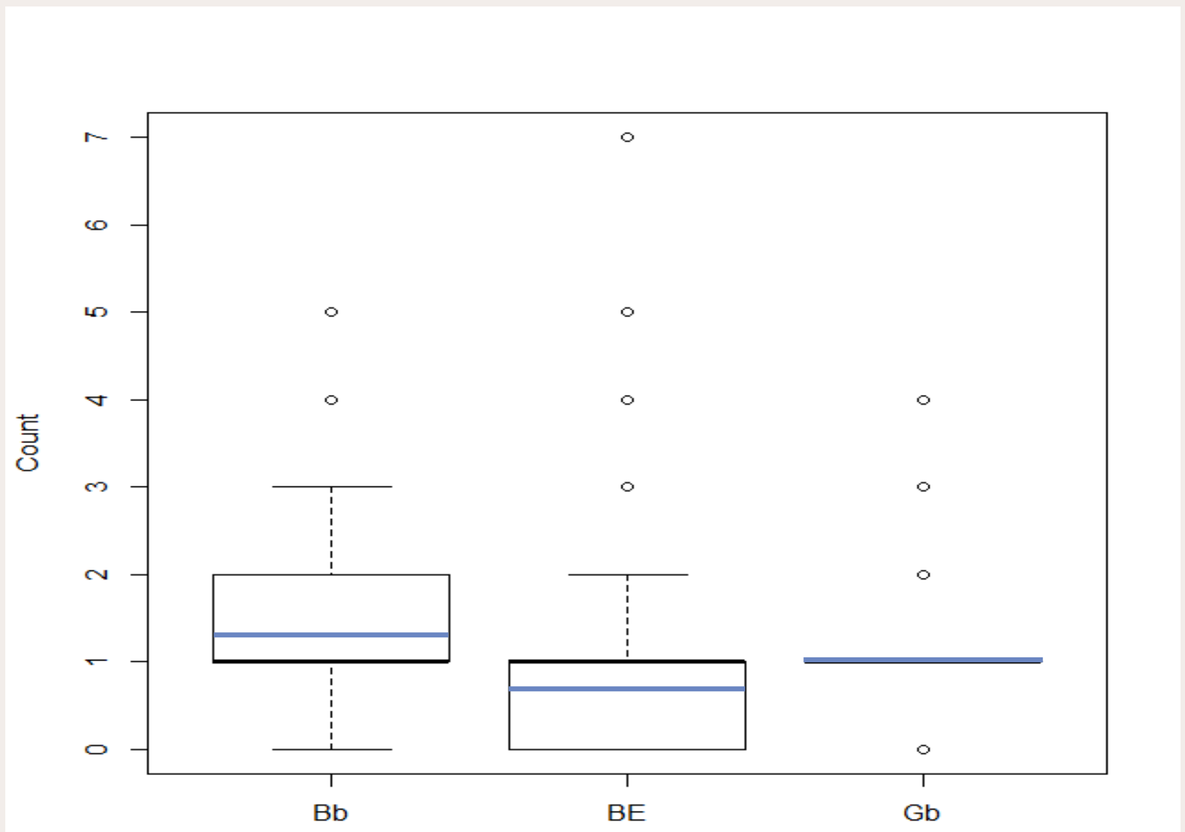
For the second experiment, two days passed by for the removal of the female beetles. Eggs got visible after few weeks and then eggs where counted of each type of bean.



Results:

First experiment: Position of three female beetles noted in all groups A, B and C (petri dish 1 and 2). The numbers indicates how many beetles (1-3) were on the bean species in that given time (every 2 minutes).

Petri dish	A1		A2		B1		B2		C1		C2	
Time (min)	Green bean	Black eyed	Green bean	Black eyed	Green bean	Brown bean	Green bean	Brown bean	Black eyed	Brown bean	Black eyed	Brown bean
2	1	2	1	2	3	0	2	1	1	2	2	1
4	1	2	1	2	3	0	2	1	1	2	2	1
6	1	2	1	2	3	0	3	0	0	3	3	0
8	1	2	1	2	3	0	2	1	0	3	1	1
10	1	2	1	2	2	0	2	1	1	2	1	1
12	1	2	1	2	2	1	1	1	1	2	1	2
14	1	2	1	2	1	1	2	1	1	2	1	2
16	1	2	1	2	1	2	2	1	1	1	1	2
18	1	2	1	2	2	1	1	2	1	2	1	2
20	1	2	0	2	2	1	0	3	0	1	1	2
22					0	0	0	0				
24					1	2	0	3				
26					1	2	0	1				
28					2	0	2	0				
30					2	1	0	1				
32					2	1	0	1				
34					2	1	0	1				



Second experiment: Boxplot of the mean (blue line) of eggs in different beans. Brown: 1.2, Green: 1, Black eyed: 0.7

Discussion:

From the first experiment the behavior of the female beetles, there is no obvius pattern in which bean species they choose to stay on. It looks like they just randomly stands still on topp of one of them. So it looks like there is no conection between the position of the females in this experiment and bean species that had the most eggs.

By looking at the mean of how many eggs where on different beans, the results shows that the beetles prefer the brown one insted of the green, but only by (0.2 egg more). It also shows that the beetles prefer the green bean over the black eyed bean. With this in mind, it looks like it could be choosen by size. But the black eyed bean is bigger than the green bean.

To have a better understanding of the choices of the beetles, the experiment can have be done with more petri dishes, where on of them have a combination of all of the tree beans species.

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