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Title:	Evolution of complex reproductive investment strategies in response to ageing under different intensities of sperm competition in Drosophila melanogaster
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Abstract:	Sexual traits, including post-copulatory traits, can respond differently to different intensities of sperm competition. Ejaculation performance decline with age and affect fertility and lifetime fitness of an individual. Furthermore, ejaculation components can be rapidly depleted in a higher level of sperm competition. In contrast, the depletion is relatively slower across consecutive mating in a lower degree of sperm competition, due to the evolution of reproductive ejaculation investment strategy. The sperm competition theory predicts that with increasing level of sperm competition, male investment is more in reproductive organs or reproductive traits, including ejaculation investment and sperm competition ability. Yet, little is known about different intensities of sperm competition response with Ageing in post-copulatory traits such as sperm competition and ejaculation allocation, how they respond to ejaculation investment with Ageing in response to different intensities of sperm competition. Here, we are using Drosophila melanogaster laboratory maintained three replicates population of MCF population that evolved under different intensities sperm competition via altering operational sex-ratios (i.e. male and female-biased regimes) that have been maintained for more than 250 generations resulting in evolution in populations. Male-biased (M) regimes males have high sperm competitive abilities, as well as less mating opportunities, compare to female-biased (F) regimes males have relatively low sperm competitiveness and relatively more opportunities. Therefore, we predicted that both M and F males evolved different reproductive investment strategies concerning regimes. To investigate this, males were generated from both regimes, i.e. M and F, and maintained at three different ages classes (i.e. young, middle and old age). Whereas, in all cases, young females were collected from common ancestral LHst population. As a part of our 12experiment, we performed four consecutive matings of M and F males of different ages along with common young virgin LHst females. Additionally, we also measured the reproductive tissue such as testis and accessory gland size from the M and F regimes. Our study indicates that high levels of sperm competition (M males) produce more progenies as compared to low-intensity sperm competition (F males). Our research proves that mating number and Ageing play an essential role in reproductive performance such as investment strategies, and it also reflected in reproductive tissues, i.e. testis and accessory gland size. Interestingly, from this study, we suggested that ejaculation performance is not similar throughout life.
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