

COVID-19 and Evolutionary Selection Pressure

· bbnath · Yesterday at 3:13 AM

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Movement of human population, in terms of exploration, pilgrimage, politics, business and pleasure impacted global dispersal of microbes. During the entire span of 200,000 years of human history, movement of hominins across the continents finds antecedents in modern international tourism. Recent headlines such as, Ebola, Zika, SARS and the last but not the least the COVID-19 repeat the human history buried in the classical antiquity when human ancestors began acquisition of microbial pathogens from the animals as hunters-gatherers. Globalization has rewarded us to travel geographic distances far greater than what we could do in the past. Incidentally, the emergence of at least 40 new infectious diseases in the last 50 years has interplayed with the ever-increasing density of touring human population. So far, the COVID-19 transmission tends to be horizontal and the viral fitness is trading off with the host fitness as a function of mobility and population density. Here comes the persistence of COVID-19 life strategy which is critically dependent on temporal and spatial nature of the infected cluster of human population. On the other hand, the preventive measures through social, cultural, political and clinical management have been impacting a negative selection pressure on COVID-19. Moreover, persistence or decline of widely dispersed viral population might exhibit 'Allee effect'. The possibility of either stabilization or decline of COVID-19 will depend on the size and density of the infected 'floating' population of humans who are yet to reach to their base from the site of infection. Alternatively, disease-driven mutual selective pressures and disease-modified fitness can lead to modular evolutionary consequences, such as, *de novo* gene acquisition, one of the frequent events in the past history of viral evolution. In this context, there is an urgency to call upon policy makers for formulating a sustainable strategy to tackle COVID-19 like future pandemic disasters.

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Moderator

Lutfij

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