SARS-CoV-2 variant from India to Marseille: the still active role of ports in the introduction of epidemics

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A recent variant of SARS-CoV-2 named B.1.617 has recently spread to several countries from India (Cherian et al., 2021). The mutations found in the Indian variant in its spike are identified as E484Q, L452R, E154K and P681R. They involve amino acid 484 that is changed in the South African variant B.1.351 and in the Brazilian variant P1. Another mutation, L452R, was already detected in a Californian variant. It is therefore the association in a single variant of these mutations supposed to reduce recognition by antibodies and impact on attachment to the ACE2 receptor that has caused this strain to be classified as a variant of interest by the WHO due to a strong potential to cause epidemics and escape antibodies, especially those generated by vaccination (Starr et al., 2021; Zhou et al., 2021).

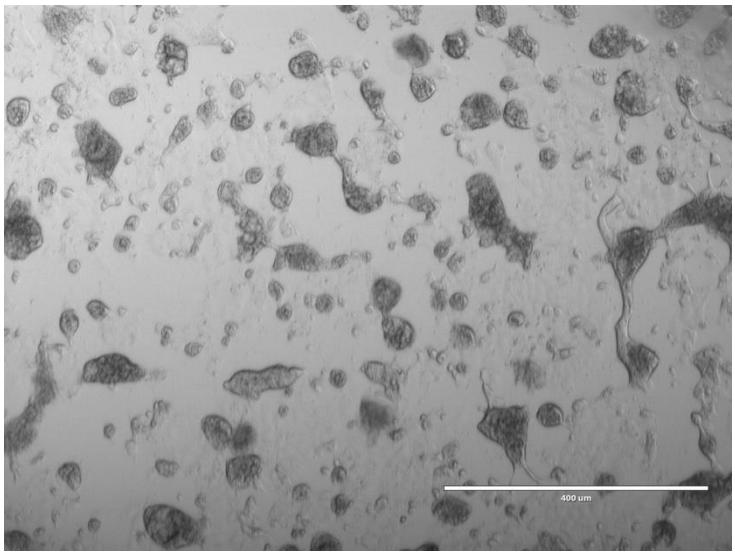
The case we report here is that of an Indian sailor coming to Marseille to embark on a ship as a crew member who illustrates the role of ports like that of Marseille in the historical introduction of epidemics. This patient from Goa, India, embarked at New Delhi airport,

passed through Amsterdam airport and landed at Marseille airport on April 26, 2021. Tested SARS-CoV-2-negative 72 hours before boarding, he was detected positive when he left the plane by an antigen test carried out by the civil security firefighters. The patient was quarantined in a city hotel. A new nasopharyngeal swab was performed for confirmation of the diagnosis and isolation of virus on April 27 and sent to our institute (Amrane et al., 2020). qRT-PCR was positive at Ct 17 and direct sequencing (Colson et al., 2021) confirmed the "Indian Variant" nature of this strain. The genomic sequence has been deposited in GISAID (No. XXXXX). On April 28, characteristic CPEs were seen in culture (Figure 1a) and the strain sub-cultured for subsequent sero-neutralization analysis on the sera of local patients carrying antibodies (vaccinated and convalescent).

This case perfectly illustrates the role played by ports such as Marseille in the entry of epidemics of distant origin. Indeed, for 2000 years this port has faced the arrival of epidemic agents, in particular plague, cholera, yellow fever. The history of these epidemics and the strategies put in place to fight them, including creation of our institute, have been recently reviewed (Barbieri et al., 2021). For many years, merchant navy crews have mainly come from countries with low labor costs, in particular the Indian subcontinent, and the case of this sailor continues to illustrate this historical characteristic by the fact that it is an area of mixing of populations. It also raises the question of the lack of real control over transfers of people from areas where variants of concern are circulating. This patient had been tested before boarding and was able to transit unchecked to Marseille where, fortunately, civil security checks as many travelers as possible but without being exhaustive. It is very probable that similar situations will occur, illustrating the extreme difficulty of controlling the introduction of new epidemic variants in countries or regions which are traditionally areas of intense transit. Ensuring effective detection of these cases is however critical, especially for crew

members destined, as was the case with this sailor, to embark on cruise ships in order to avoid a repetition of the Diamond Princess episode (Yamagishi et al., 2020).

Figure 1. Indian variant isolated in Marseille at IHU Méditerranée Infection. Cytopathic effect observed on Vero E6 cells after 24 hours of incubation.



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