This study examines the wave disturbances on the submonthly-scales over the tropical Indian Ocean using the JRA-25 products and NOAA outgoing long wave radiation data. The analysis period is December—February 1979/80—2007/08. A well-organized wave train pattern is detected as a dominant mode of variability over the Indian Ocean by performing extended EOF (EEOF) analysis on daily 850-hPa meridional wind anomalies. Composite analysis for various elements based on the EEOF results reveals the structure and evolution of the wave train along the ITCZ in the tropical Indian Ocean. The waves with zonal wavelengths of 3000—5000 km exhibit westward and southwestward phase propagation. Troughs and ridges of the wave train move westward and southwestward from the west of Sumatra into Madagascar. On the other hand, eastward and northeastward amplification of the wave train occurs associated with the successive growth of new troughs and ridges over the eastern Indian Ocean. This could be induced by wave energy dispersion along the mean monsoon westerly flow. The waves have convectively coupled wave characteristics and play a vital role in modulating the ITCZ convection. Correlation statistics manifest average behavior of the wave disturbances. Teleconnectivity, temporal coherence, and other measures characterize the propagating wave activity and determine the waveguide along the mean westerly flow over the tropical Indian Ocean. Eddy vorticity budget analysis demonstrates the dynamical role of the background condition produced by the mean westerly flow in maintaining the waves. The origin and initiation of the waves are also explored.