This study presents a monthly distribution of the main Saharan dust outbreaks registered in the period 2003-2005 at seven Italian locations. The identification has been carried out by looking at several sources of information such as monitoring network observations, satellite images, ground measurements of aerosol optical properties, dust model simulations and air mass backward trajectory analysis. Dust intrusions are mainly focused in spring (40%-45%) and summer (35%-55%). In winter and autumn the sites in Northern Italy registered a significant number of episodes in January and February (between 7% and 10%) whereas the stations in Central Italy and in the islands were not affected by any dust intrusion. The highest number of episodes was identified at the Mediterranean island of Lampedusa in summer (57% of the total). A specific dust event in 2005 (17th-26th July) identified by using this methodology is also described.

Three particle pathways originating at the same site by different heights above ground: 500m (red), 1500 m (green), and 2000 m (blue). The computation of the trajectories at 1000 m and 1500 m supports the North African origin of the dust, whereas the stations in Central Italy and in the islands were not affected by any dust intrusion. The highest number of episodes was identified at the Mediterranean island of Lampedusa in summer (57% of the total). A specific dust event in 2005 (17th-26th July) identified by using this methodology is also described.

The Saharan dust event is predicted by the SKIRON/Eta model (Kallos et al., 1997). The daily evolution of surface PM10 concentration over the Mediterranean area predicted by SKIRON is qualitatively similar to the AOD evolution by MODIS.