This study aimed to evaluate the maturity stage effects on the bioactive metabolites content, the antioxidant activity and color variation of Algerian *Pistacia lentiscus* L. fruit. For this propose, both red and black fruits of the selected species representing two different maturation stages immature and mature, respectively are chosen. Our experimental study was initiated by a GC/MS analysis in order to determinate the fixed oils chemical composition. An AAS for macroelements and ICP-MS for microelements was carried out to evaluate the mineral composition. Furthermore, phenolic, anthocyanins and total sugars compounds level were determinate. Also, a chromameter was used to detect the color changes of fruits powders. At last, antioxidant activities were evaluated by DPPH and FRAP assays. As a result, the fixed oil qualitative evaluation, revealed new molecules were synthesized in the mature fruit oil which gives it a higher quality than one of the immature stage, we also noted that the accumulation of the oils increases with the fruits maturation while the sugar content decreases significantly. In addition, the results obtained showed that the bioactive molecules were found to be significantly high at the mature stage and its affects positively the *P. lentiscus* antioxidant activity. High levels of minerals (Ca, Mg, Mn, Cu and Zn) observed in mature fruits ensure a high nutritional quality compared to immature ones. To conclude, the phytocomponents of *P. lentiscus* fruit are accumulated during maturation, which provides it with an important qualitative and quantitative value in terms of both curative and/ or nutritional fields