Drying of sultana grape fruits was studied using a microwave dryer under the laboratory environment at the Department of Agricultural Machinery and Technologies Engineering at Suleyman Demirel University. In this study, the effects of microwave drying and fan assisted microwave drying on drying time, drying ratio of grape samples were examined. Sultana grape fruits were dried by using microwave, microwave-convective combination and convective drying, respectively. The effects of microwave drying (180, 540 and 720 W); combined convective and microwave drying (180W-100ºC, 360W-100ºC and 540 W-100ºC), convective drying (100, 150, 200ºC) on drying time, drying rate of grape samples have been investigated. The drying data were applied to four different mathematical models, namely, Midilli-Kucuk, Weibull distribution, logistic and Alibas Equation Models. The performances of these models were compared according to the coefficient of determination (R2), standard error of estimate (SEE) and residual sum of squares (RSS), between the observed and predicted moisture ratios. The drying characteristic curves were estimated against four mathematical models and the Weibull distribution was found to be the best descriptive model for all the drying experiments of thin layer grape fruit samples except for 540W-100ºC. Alibas model equation was also found to be the best descriptive model for combined microwave and convective drying (540W-100ºC)