Banana fruit and its associated residual biomass are amylaceous and lignocellulosic resources that can be considered an appropriate raw material for bioethanol production. Peel banana is a suitable material for hydrolysis since it shows high starch and cellulose contents. Because of high water content (88 – 92 %, w/w), peel banana is highly susceptible to degradation by biochemical and microbiological reactions. Drying brings about product conservation as well as substantial reduction in weight and volume whereby a decrease in packaging, storage and transportation costs can be achieved. The aim of this work was the modeling of drying kinetics of peel banana (Musa acuminata AAA cv. Dwarf Cavendish) during convective drying. A mathematical model for infinite-plate geometry was formulated considering moisture transport by liquid diffusion inside the material and forced convection mass transfer as boundary condition. Constant, temperature dependent and both temperature and moisture dependent effective diffusivities were evaluated. The model was validated with drying curves from experiments carried out at temperatures of 40, 50, 60 and 70 °C and air velocities of 0.9, 1.5 and 2.1 m/s. Model considering the effective diffusion coefficient as function of local moisture and temperature showed the best fitted results with a mean relative error lower than 1.5 % and an explained variation higher than 99 %. The computational algorithm developed to the modeling allowed the simultaneous calculation of parameters of effective diffusivity for all temperature and velocity ranges. Results of effective diffusivity were comparable with those reported for other agrofood materials.