The viable microbial community that exists in cloud water sampled from the summit of the puy de Dôme Mountain (1465 m.a.s.l; France) is described, along with its qualitative and quantitative variability, based on 41 independent cloud water samples. The total microbial counts determined by microscopy reached about ~ $10^5$ cells per mL of cloud water, of which less than 1 % were cultivable under aerobic conditions and in the absence of light. However, the global ADP/ATP concentrations and ratios measured in cloud water samples were compatible with the existence of a metabolic activity in the cloud droplets. More than 500 bacterial and yeast strains were isolated and identified by 16s or 26s rRNA gene sequencing; Most frequent genera included *Pseudomonas*, *Sphingomonas* and *Frigoribacterium* for bacteria and *Udeniomyces*, *Dioszegia* and *Cryptococcus* for yeasts. They presented high similarities with those originating from vegetation, soil and aquatic environments. Interestingly, most of *Sphingomonas* strains isolated from clouds were phylogenetically located in a small and specific cluster that gathered a few species found in the atmosphere. The ability of cloudborne bacteria to produce bio-surfactants and induce freezing were determined in order to estimate their potential role as cloud condensation nuclei (CCN); *Pseudomonadaceae* and *Microbacteriaceae* were generally able to produce bio-surfactant. These results suggest a potential impact of the living microorganisms of clouds on the microphysical and chemical processes occurring in the atmosphere.