Hudai geothermal waters are located in southwestern Sandıklı, Afyon, in Aegean Region. In the study area, the basement rocks are quartzite, schist, limestone and dolomite of Precambrian and Paleozoic age. The basement rocks are overlain by sedimentary and volcanic rocks ranging from Mesozoic to Quaternary in age. The primary aquifers for the geothermal waters in the region are the quartzites, dolomites and limestones, while tuffs and other impermeable units form the cap rocks. Hydrochemical and isotopic samples were collected from cold and thermal waters for evaluation of the origin of the geothermal waters in dry and rainy seasons. The geothermal waters have Na-Ca-SO$_4$-HCO$_3$ hydrochemical facies. All the waters are of meteoric origin based on $\delta^{18}$O and $\delta^2$H isotopes. The geothermal waters have long residence times, deep circulation and mixing features; whereas the cold waters have short residence times and shallow circulation. $\delta^{13}$C (%DB) values of the waters indicate dissolved inorganic carbon, freshwater carbonate, marine limestone CO$_2$ input. The very high $^{14}$C apparent ages of the geothermal waters (31 and 48 ka) may imply modern biogenic carbon contributions. The sulfur-34 isotopes values denote coal, limestone, and volcanic sulfur contributions to the waters. The highest reservoir temperature of the geothermal waters is estimated at 107°C for silica geothermometers. Heat sources for the geothermal waters may be geothermal gradients, volcanism and deep-sealed plutonic rocks. The Hudai geothermal field has 18 thermal productivity wells, whereas it has one reinjection well for geothermal waste waters. Overexploitation from the productivity wells may negatively affect the sustainability of the geothermal waters in the future. The geothermal waters have been used for several purposes such as balneotherapy, heating and thermal tourism in recent years.