A matroid $M$ is called minor-minimally 3-connected if $M$ is 3-connected and, for each $e \in E(M)$, either $M \setminus e$ or $M/e$ is not 3-connected. Wagner proved a chain theorem for minor-minimally 3-connected graphs. He also conjectured that the graph result could be generalized to minor-minimally 3-connected matroids. In this paper, we confirm Wagner’s conjecture for the class of minor-minimally 3-connected binary matroids by proving a chain theorem. (Received February 04, 2008)