We present a classification of all simply connected, complete Riemannian 3-manifolds whose Ricci eigenvalues are $\lambda,\lambda,0$ for a constant $\lambda$. This curvature condition is equivalent to assuming that the manifold is curvature homogeneous and has constant vector curvature 0. By a result of Szabó, this gives a classification of curvature homogeneous semi-symmetric 3-manifolds. (Received May 29, 2017)