Toughness and forbidden subgraphs for hamiltonicity of graphs

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A graph G is t-tough if for each vertex cut S, the number of components of G - S does not exceed $\frac{|S|}{t}$. In 1973, Chvátal conjectured that there exists a constant t_0 such that every t_0 -tough graph is hamiltonian. In this talk, we discuss some results on Chvátal's conjecture on R-free graphs for some graphs R. In particular, we will present hamiltonicity of $2K_2$ -free graphs, the existence of 2-factors of $(P_4 \cup P_{10})$ -free graphs and hamiltonicity of $(K_2 \cup kK_1)$ -free graphs.