Coloring problems for planar graphs

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In 1975 Steinberg asked whether every planar graph without 4- and 5-cycles is 3-colorable. The answer to this question is still unknown. It seems to be natural to investigate an analogous problem for choosability. Additionally it is interesting to consider defective choosability of these graphs.

A graph G is $(k, d)^*$-*choosable* if for every list assignment $\mathcal{L} := \{L(v) \; ; \; |L(v)| = k \; \forall \; v \in V(G)\}$ there exists a coloring c of the vertices $v \in V$ such that $c(v) \in L(v)$ and every monochromatic subgraph has maximum degree at most d.

In the talk some results for defective choosability and choosability of planar graphs with forbidden cycle lengths are discussed. An example is presented giving a negative answer to the choosability version of Steinberg's question.