Cycles of Length 0 Modulo l in Graphs

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Let l be a natural number. A graph G is called a $(0 \bmod l)$-cycle, if the length of each cycle of G is divisible by l. Let G be a graph of order n and size m. In this talk it is shown that if G is a $(0 \bmod l)$-cycle graph $(l \geq 3)$, then $\frac{m}{n} < 2$. We show that if G is a non-planar graph, then G has a cycle of length divisible by 4. G. Chen and A. Saito proved that if G has no cycle of length divisible by 3, then $m \leq 2n - 4$, $(n \geq 3)$. It is proved that if G has no cycle of length divisible by 4 then $m \leq 2n - 3$. We conjecture that if G is a graph with no cycle of length divisible by 4, then $m \leq \frac{3}{2}(n-1)$. Finally, we prove that the conjecture is true for bipartite graphs.