On some classes of graphs whose second largest eigenvalue does not exceed $\frac{\sqrt{5}-1}{2}$

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Let λ_2 be the second largest eigenvalue of the adjacency matrix of a graph. We determine all trees and all bicyclic graphs for which λ_2 does not exceed $\frac{\sqrt{5}-1}{2}$. In description of these classes we use mappings that preserve sgn $\left(\lambda_2 - \frac{\sqrt{5}-1}{2}\right)$.