Title: Congruences for Catalan–Larcombe–French numbers

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Let \( P_n \) be the Catalan–Larcombe–French numbers given by \( P_0 = 1 \), \( P_1 = 8 \) and \( n^2 P_n = 8(3n^2 - 3n + 1)P_{n-1} - 128(n - 1)^2 P_{n-2} \) \((n \geq 2)\), and let \( S_n = P_n/2^n \).

In this paper, we deduce congruences for \( S_{mp^r}, S_{mp^r+1} \pmod{p^3} \), \( S_{mp^r-1} \pmod{p^r} \) and \( S_{mp^r+1} \pmod{p^{2r}} \), where \( p \) is an odd prime and \( m, n, r \) are positive integers.

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