THE ENDOMORPHISM RINGS OF JACOBIANS OF CYCLIC COVERS OF THE PROJECTIVE LINE

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Suppose K is a field of characteristic 0, K_a is its algebraic closure, p is an odd prime. Suppose, $f(x) \in K[x]$ is a polynomial of degree $n \geq 5$ without multiple roots. Let us consider a curve $C : y^p = f(x)$ and its jacobian $J(C)$. It is known that the ring $\mathrm{End}(J(C))$ of all K_a-endomorphisms of $J(C)$ contains the ring $\mathbf{Z}[\zeta_p]$ of integers in the pth cyclotomic field (generated by obvious automorphisms of C). We prove that

$$\mathrm{End}(J(C)) = \mathbf{Z}[\zeta_p]$$

if the Galois group of f over K is either the symmetric group S_n or the alternating group A_n.

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