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*Rational points on algebraic curves in infinite towers of number fields*

We study a natural question in the Iwasawa theory of algebraic curves of genus  $> 1$ .

Let  $X$  be a smooth, projective, geometrically irreducible curve  $X$  defined over a number field  $K$  of genus  $g > 1$ , such that the Jacobian has good ordinary reduction at the primes above  $p$ . Fix an odd prime  $p$  and for any integer  $n > 1$ , let  $K_n$  denote the degree- $p^n$  extension of  $K$  contained in  $K(\mu_{p^{n+1}})$ . We prove explicit results for the growth of  $\#X(K_n)$  as  $n \rightarrow \infty$ . When the Jacobian of  $X$  has rank zero and the associated adelic Galois representation has big image, we prove an explicit condition under which  $X(K_n) = X(K)$  for all  $n$ . We show that this condition is satisfied for 100% of primes  $p$  at which the Jacobian of  $X$  has good ordinary reduction.