1067-12-1117 **Zev Chonoles*** (zevchonoles@gmail.com), 69 Brown Street, Box 7240, Providence, RI 02912, **John Cullinan** (cullinan@bard.edu), John Cullinan, Bard College, 30 Campus Road, Annandale-on-Hudson, NY 12504, **Hannah Hausman** (Hannah.E.Hausman@williams.edu), Bronfman Science Center, Williams College, Williamstown, MA 01267, **Allison Pacelli**, Bronfman Science Center, Williams College, Williamstown, MA 01267, **Sean Pegado**, Bronfman Science Center, Williams College, Williamstown, MA 01267, and **Fan Wei*** (fan_wei@mit.edu), 6-301, 471 Memorial Drive, Cambridge, MA 02139. *The Splitting Fields of Generalized Rikuna Polynomials.*

Fix a positive integer ℓ, and let K be any field containing $\zeta_\ell + \zeta_\ell^{-1}$ but not ζ_ℓ. Rikuna discovered a polynomial F_ℓ over the function field $K(T)$ whose Galois group is $\mathbb{Z}/\ell\mathbb{Z}$. Komatsu recently generalized classical Kummer theory to cover cyclic extensions arising from F_ℓ.

In our work, for each $m \geq 1$, we introduce the *m-th generalized Rikuna polynomial* r_m, which roughly is formed from the m-th iteration of a rational function related to F_ℓ. Let K_m be the splitting field of r_m over $K(T)$. It is known that the tower of K_m's ramifies at finitely many primes of $K(T)$.

We study the tower of K_m's. For any odd $\ell \geq 3$, we show that the Galois group $\mathrm{Gal}(K_m/K(T))$ is a semi-direct product $\mathbb{Z}/\ell^m\mathbb{Z} \rtimes \mathbb{Z}/(\ell^m/b_m)\mathbb{Z}$, where b_m is the order of a certain group of roots of unity in K_m. For even ℓ, the Galois group is one of four possibilities, depending on the field K. We also show that only one prime of $K(T)$ ramifies in the tower of K_m's, and determine this prime explicitly. Then, using the Riemann-Hurwitz formula, we prove that K_m is of genus 0, and therefore has class number 1, for all $m \geq 1$. (Received September 19, 2010)