

Abstract. Generalized Jacobians are natural candidates to use in discrete logarithm (DL) based cryptography since they include the multiplicative group of finite fields, algebraic tori, elliptic curves as well as all Jacobians of curves. This observation therefore raised the possibility that other families of generalized Jacobians may be of cryptographic interest. This exploration began with the study of the simplest nontrivial generalized Jacobians of an elliptic curve, for which an efficient group law algorithm was recently obtained. With these explicit equations at hand, it is now possible to concretely study the corresponding discrete logarithm problem (DLP); this is what we undertake in this paper. In short, our results highlight the close links between the DLP in these generalized Jacobians and the ones in the underlying elliptic curve and finite field.