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A remark on rank varieties for a class of local algebras.  

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Rank varieties were originally introduced by Carlson for finite-dimensional modules over group algebras of finite elementary abelian groups and it was shown later by Avrunin and Scott that these are equivalent to certain cohomological support varieties. A little later, rank varieties were used to describe cohomological support varieties of finite-dimensional modules of restricted Lie algebras by Jantzen and by Friedlander and Parshall. Recently, both theories were unified in the framework of finite group schemes by Friedlander and Pevtsova, and moreover, rank varieties were also introduced for other classes of algebras. One of these classes consists of quantum complete intersection algebras which include the truncated polynomial algebras $\Lambda^n_m := k[X_1, \ldots, X_m]/(X_1^n, \ldots, X_m^n)$ over an algebraically closed field $k$ of characteristic $p \geq 0$. If $p$ does not divide $n$, then there are two definitions of a rank variety for a finite-dimensional $\Lambda^n_m$-module available, one due to D. J. Benson, K. Erdmann, and the author [J. Pure Appl. Algebra 211, No. 2, 497-510 (2007; Zbl. 1184.16012)] and another due to J. Pevtsova and S. Witherspoon [Algebr. Represent. Theory 12, No. 6, 567-595 (2009; Zbl. pre05659701)]. In the latter paper the authors prove that for $n = 2$ both definitions give rise to the same varieties and in the paper under review it is proved by establishing an isomorphism between the algebras used in defining the rank varieties that both definitions agree in general.