EVOLUTION ALGEBRA

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Recently a new type of genetic algebras, denominated *evolution algebras*, has emerged to enlighten the study of non-Mendelian genetics, which is the basic language of the molecular Biology. We study evolution algebras of arbitrary dimension. We analyze in deep the notions of evolution subalgebras, ideals and non-degeneracy and describe the ideals generated by one element and characterize the simple evolution algebras. We also prove the existence and unicity of a direct sum decomposition into irreducible components for every non-degenerate evolution algebra . When the algebra is degenerate, the uniqueness cannot be assured.

The graph associated to an evolution algebra (relative to a natural basis) will play a fundamental role to describe the structure of the algebra. Moreover, we classify three dimensional evolution algebras over a field having characteristic different from 2 and in which there are roots of orders 2, 3 and 7.

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