

# A CLASS OF MULTIVARIABLE POLYNOMIALS ASSOCIATED WITH HUMBERT POLYNOMIALS

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## Abstract

In this paper, we present a generalization (and unification) of a class of Humbert polynomials which include well known families of Chan-Chyan-Srivastava, Lagrange-Hermite and Erkus-Srivastava multivariable polynomials. We derive various families of multilateral and multilinear generating functions for these polynomials. We also obtain other miscellaneous properties of these polynomials. Furthermore, for some special cases of these polynomials, we present hypergeometric representations and give expansions of these polynomials in series of some orthogonal polynomials.

**Keywords:** Humbert polynomials; Chan-Chyan-Srivastava multivariable polynomials; Lagrange-Hermite multivariable polynomials; Erkus-Srivastava multivariable polynomials; Multilinear and multilateral generating function; Recurrence relation; Hypergeometric function

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## 1. Introduction

An interesting generalization of Humbert, Gegenbauer, Legendre, Tchebycheff, Pincherle and Kinney polynomials, which is called generalized Humbert polynomials, was presented by Gould [10] and it is generated by

$$(1.1) \quad (c - mx + yt^m)^p = \sum_{n=0}^{\infty} P_n(m, x, y, p, c) t^n$$

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