

Abstract

The negative binomial distribution has been widely used and to a lesser extent the Neyman Type A distribution, whereas the Polya-Aeppli distribution has received no attention in modeling overdispersed (clustered) populations. On the other hand, the Poisson distribution is naturally used to model random populations. The aim of this paper is to carry out a comparative study of the aforementioned distributions based on index of patchiness, correlation, skewness and kurtosis. The study revealed that the negative binomial, the Neyman Type A and the Polya Aeppli distributions are equivalent in describing dispersion and they have Poisson as a limiting distribution. However, the distributions differ in terms of skewness and kurtosis, though the Polya-Aeppli is closer to the negative binomial than the Neyman Type A. Thus, in order to discriminate probability models for over dispersion, an index which incorporates skewness and kurtosis need to be devised