Suitable Methods in Spatial Pattern Analysis of Heterogeneous Wild Pistachio (*Pistacia atlantica* Desf.) Woodlands in Zagros, Iran

Y. Erfanifard*, F. Rezayan[1]

(Received Aug. 25-2014 ; Accepted: Nov. 30-2014)

Abstract

Spatial pattern of trees in forests reveals how trees interact with each other and their environment. Spatial structure of trees in forest ecosystems is affected by environmental heterogeneity that leads to their heterogeneous distribution. This study was aimed to investigate the appropriate methods to analyze spatial pattern of heterogeneous wild pistachio woodlands in Zagros, Iran. A 40-ha pure stand of wild pistachio trees (*Pistacia atlantica* Desf.) was selected in Wild Pistachio Research Forest in Fars Province for this purpose. The Kolmogrov-Smirnov test of goodness-of-fit of inhomogeneous Poisson point process showed that the distribution of wild pistachio trees was significantly heterogeneous (α=0.05). Inhomogeneous Ripley's *K*-, *L*-, and *G*-functions were applied beside their homogeneous forms. Inhomogeneous Ripley's *K*- and *L*-functions showed that wild pistachio trees were primarily clumped and dispersedly distributed thereafter, while g(r) not only showed these results but also well expressed the detailed changes in spatial scale. The results of inappropriate homogeneous functions in the study area showed that all three functions expressed the primary clumping of the trees more than it was and their dispersed pattern as clumped. In general, it was concluded that inhomogeneous functions should be applied to analyze the spatial pattern of heterogeneous wild pistachio trees in the study area and it is recommended to develop g(r) applications due to its more detailed information.

Keywords: Spatial pattern, Wild pistachio, Inhomogeneous functions, Zagros, Heterogeneity.

[Downloaded from ijae.iut.ac.ir on 2026-11-15]

[DOR: 20.1001.1.24763128.1393.3.9.7.9]

1. Dept. of Natur. Resour. and Environ., College of Agric., Shiraz Univ., Shiraz, Iran.
*: Corresponding Author, Email: erfanifard@shirazu.ac.ir