



Botanical diversity of Hyrcanian forests; a case study of a transect in the Kheyroud protected lowland mountain forests in northern Iran

SOUDEH SIADATI**¹, HALIMEH MORADI**¹, FARIDEH ATTAR*¹, VAHID ETEMAD², BEHNAM HAMZEH'EE³, ALIREZA NAQINEZHAD⁴

¹Department of Plant Biology, School of Biology, College of Science, University of Tehran, PO Box 14155-6455, Teheran, Iran

²Department of forestry, Faculty of Natural Resources, University of Tehran, PO Box 31585-3314, Karaj, Iran.

³Research Institute of Forests and Rangelands, PO Box 13185-16, Teheran, Iran

⁴Department of Biology, Faculty of Basic Science, University of Mazandaran, Babolsar, P.O. Box 47416-95447, Mazandaran, Iran

*Corresponding author. E-mail: Fattar@khayam.ut.ac.ir

** These authors contributed equally to this publication

Abstract

Hyrcanian or Caspian forests follow a profile along the northern slopes of the Alborz mountain range, located in the provinces of Gilan, Mazandaran and Golestan in northern Iran. The area is approximately 800 km long and 110 km wide and covers ca 1.84 million hectare. There are few protected forest patches across this extended area in northern Iran, but Kheyroud forest is one of these reserves, which has been under the direct supervision and protection by the University of Tehran for an extended period of time. The area includes three elevational classes, lowland (50–500 m), submountain (501–1000 m) and mountain (1001–2200 m). It lies seven km east of Now-Shahr and covers an area of 10,000 hectare. Based on floristic collecting during spring, summer and autumn of 2008 and 2009, three plots were made, each with a 100 m elevational interval. Floristic data were collected in 234 plots. Data related to elevation, slope and direction were also noted. A total of 295 plant taxa were encountered, out of which 29 taxa (10%) are endemic to Iran and 16 taxa (5.5%) are only found in the Hyrcanian provinces. Classification based on life form indicates that geophytes (with 110 taxa, 37.5%) constitute the largest proportion. Chorologically, the largest proportion of the flora is constituted of Euro-Siberian elements (72 taxa, 24.7%). In addition to general assessments, variation of life forms between the study area and other similar areas are discussed. A comparison was made between the floristic data of the three elevational belts. The result of this investigation indicates that the species diversity increases with the increase of elevation. Likewise, the proportion of hemicryptophytes and geophytes are more prominent in the montane belt above 1000 m.

Introduction

The Hyrcanian (Caspian) province on the northern slopes of Alborz Mountains, Northern Iran, unlike the arid and semiarid landscape throughout most of Central and Southern Iran (Naqinezhad *et al.* 2008), is one of the remnants of natural closed-canopy deciduous forests in the world. The south Caspian forests, which form a long and narrow vegetation belt on the northward slopes of the Alborz Mountains, are characterized by a Euro-Siberian flora unique to Iran. These forests are dominated by temperate broad-leaved deciduous trees, of which some are thermophilous Tertiary relicts i.e. *Zelkova carpinifolia*, *Parrotia persica*, *Pterocarya fraxinifolia*, *Quercus castaneifolia* and some others are Asian subtropical trees such as *Gleditsia caspica* and *Albizia julibrissin* (Djamali *et al.* 2008). These forests are characterized by three elevational vegetation belts (i.e. lowland, submontane and montane) ranging from sea level to 2500 m.

The Hyrcanian forests are climatically very different from other areas in Iran by having a high annual precipitation (600–2000 mm), a considerable part of which falls in summer. The high air humidity and the higher winter temperatures at the lower elevations make most of this area suitable for mesic forest.