

Botany (H) CBCS Syllabus WBSU

Semester IV

Core Course IX: Plant Ecology and Phytogeography

Course Code: BOTACOR09T THEORY

Unit 10: Phytogeography

Endemism

Endemism is the condition of being *endemic*, or restricted in geographical distribution to an area or region. The area or region can vary in size, and is defined or identified in different ways. Endemism is an ecological classification in that it describes the range or distribution of a **species**, or group of species. For instance, entire families of different species of birds are endemic to the island of Madagascar. The term endemism can be applied to many things, including diseases and natural phenomena. Endemism in these cases refers to the "normal" or standard level of some measured observation within a specific geographic region or area.

The term 'endemism' was coined by A.P. de Candolle (1855) for the distribution of an organism in a limited geographical area. According to Engler (1882) there are two kinds of endemism, one based on the preservation of ancient forms, which may have originated in entirely different regions and the other based on the development of new, entirely autochthonous forms. Based on the theory of age and area, Willis (1922) quantified the youthful endemics with his J-shaped or "hollow" (hyperbolic) curves. Cain's (1944) put forth the following three dicta on endemics: a) "Endemism includes two types of plants that are confined to single regions—endemics, *sensu stricto*, which are relatively youthful species, and epibiotics which are relatively old relict species", b) "Youthful endemics may or may not have attained their complete areas by having migrated to their natural barriers. Epibiotics may, but frequently do not contain the biotype richness that will allow or has allowed them an expansion of area, following their historical contraction of area" and c) "a high degree of endemism is usually correlated with age and isolation of an area, and with the diversification of its habitats, as these factors influence both evolution and survival".¹¹ Stebbins and Major (1965) modified Cain's observations and renamed two types of endemics as Paleoendemics and Neoendemics. Wherry (1944) classified endemic plants into Primary and Secondary endemics. The latter has been further classified into a) environmentally repressed, b)

genetically repressed and c) senescent, based on the reasons for their restricted distribution. According to Stebbins and Major (1965) some species might have lost aggressiveness because, the changing environment restricts them only to a specialised niche. Moreover, the genetic knowledge lends support to the idea that a small population could have lost its genetic variability (Stebbins 1942) leading to genetically suppressed endemics (Wherry 1944). Stebbins (1965) observed that the mode of origin of relicts and newly formed had remained mostly unclarified. He also noted that the use of cytological data might determine the direction and relative ages of origin of taxa. Favarger and Contandriopoulos (1961) proposed a classification of endemics based on cytological data. They are 1) Paleoendemics, which are isolated systematically, old, with little variation and not necessarily having arisen in their area of present survival, 2) Schizoendemics, produced by gradual speciation having a common origin and identical chromosome numbers, 3) Patroendemics, which are narrow diploids and have given rise to widely distributed polyploids and 4) Apoendemics, 12 which are narrow polyploids arisen from widely distributed diploids. They also discussed the historical and phytogeographical significance of the various kinds of endemics they have differentiated. However, Drury (1974; 1980) argued that neither genetics, ecology nor history alone would suffice to explain the origin of endemic taxa. Richardson (1978) concluded that the nature of plant distribution varied with time and all species start as neoendemics and end as paleoendemics. Between these events some species will lose their endemic status and occupy larger areas and some remain as endemics. He called this intermediate form of endemics as Holoendemics.

<https://biologydictionary.net/endemism/>

https://shodhganga.inflibnet.ac.in/bitstream/10603/32092/8/08_chapter%203.pdf

*Used for Study Purpose only.

Prepared By Dr. Tamal Mondal
Assistant Professor
Department of Botany
H.M.M.College for Women
Dakshineswar, Kol-35