

ABSTRACT

The present study was aimed to investigate the leaf economic spectrum across herbs and shrubs belonging to taxonomically diverse plant families growing in the Botanic Garden of Government College University Lahore. In total, fifty (50) species were selected for this study including ten (10) species of herbs and forty (40) species of shrubs representing thirty (30) plant families. The following traits representing the leaf economic spectrum were measured i.e., stomata density (SD), stomata length (SL), stomata pore index (SPI), major vein density (MVD), and minor vein density. Apart from the mentioned traits leaf area (LA), leaf mass per area (LMA), petiole diameter and chlorophyll and relative water content were also measured. The water supply and demand ratio was calculated as the ratio of MVD and SD across the studied species. The significant differences in the mean values of leaf area, petiole diameter, minor vein density, and stomata density were found in the herbs and shrubs. While the significant differences were lacking in the mean values of leaf mass per area, chlorophyll content, relative water content, major vein density, stomata density and water supply and demand ratio. A significant and positive relationship was found between major vein density and minor vein density across herbs with $R^2 = 0.98$ and for shrubs with $R^2 = 0.80$. The stomata length and stomata density were significantly and inversely correlated across the herbs with $R^2 = 0.40$, while there was lack of any relationship between stomata density and stomata length across the shrubs. Similarly chlorophyll content and major vein density, relative water content and petiole diameter did not show any relationship across herbs and shrubs. From this study it is concluded that; (1) the major and minor vein density remain strongly linked with each other for both the herbs and shrubs (2) herbs and shrubs follow different pattern for the relationship of stomata length and stomata density (3) both herbs and shrubs do not show the significant difference in their supply and demand ratio. The results of present study highlight the importance of leaf economic spectrum for maintaining the leaf water balance, which can be further used to compare with the other studies or can be strengthened with more relevant studies in future. Based upon the species water supply and demand traits, the results can also be used to select the species for plantation in the urban ecosystems.