# ABSTRACT

In the present research work determination of the ethnoecological significance of the indicator species (I.S) in Tehsil Taunsa Sharif, Dera Ghazi Khan was conducted. Indigenous ethnobotanical knowledge along with the data on density and frequency of the indicator plant species, soil, and water samples were collected from four locations viz. (Mangrotha, Basti buzdar, Sokar and Vahova). The information gathered from the questionnaire and field visits revealed that 87 plant species from 42 different families were common and abundant in the study area. The dominant family was Poaceae (10 species), while Rhamnaceae family showing the least number of plants (1). Soil samples from four locations were analyzed for moisture, texture, pH, and electrical conductivity (EC). Mangrotha exhibited the highest %age moisture (37.45 ± 1.6), while Vahova had the lowest %age moisture (3.47 ± 0.2). In terms of soil texture, Mangrotha had the highest %age sand (81 ± 3.2), and Basti Buzdar had the lowest %age sand (23 ± 1). Similarly, Sokar had the highest %age silt (63 ± 2.3%), while Mangrotha had the lowest %age silt (17 ± 0.6). Regarding the %age clay, Basti Buzdar had the highest with (26 ± 1). For pH and EC, Sokar had the highest values (8.6 ± 0.4) and (11.9 ± 0.3) respectively, whereas Mangrotha had the lowest pH (6.8 ± 0.2), and Basti Buzdar had the lowest EC (0.5 ± 0.05). Water analysis showed the highest pH in Mangrotha (8.2 ± 0.3) and the highest EC in Sokar (1.7 ± 0.017 dS $m^{-1}$). Soils in Tehsil Taunsa Sharif vary by location: Sokar (silty/loamy), Basti Buzdar (clay loam), Mangrotha (loamy sand), and Vahova (loam). Five indicator species were identified on the basis of density and % cover such as *Salvadora oleoides* Decne., *Salvadora persica* L., *Albizia lebbeck* (L.) Benth, *Calotropis procera* (Aiton) W.T. Aiton, and *Tamarix aphylla* (L.), Karst. Among I.S, *Calotropis procera* (Aiton) W.T. Aiton had the highest %frequency (262.5 ± 10.5%) and stomatal length (5.1 ± 0.5 µm), while *Salvadora persica* L. showed the lowest %frequency (116.6 ± 3.7%) and *Salvadora oleoides* Decne. had the lowest stomatal length (3.9 ± 0.39 µm). *Salvadora oleoides* Decne also had the largest %Cover (3.8 ± 0.38%) and largest xylem vessel diameter (275 ± 11 µm). In contrast, *Albizia lebbeck* (L.) Benth had the lowest %Cover (1.38 ± 0.13%) and *Tamarix aphylla* (L.), Karst. The smallest xylem diameter (150 ± 6 µm). Phytochemical analysis of the indicator species confirmed their medicinal potential used by the local communities in different areas. Phytochemical analysis revealed high levels of alkaloids, proteins, tannins, and flavonoids in polar solvents, with no amino acids detected. The five indicator species studied are rich in secondary metabolites and minerals, commonly used in traditional medicines. Their phytochemical profiles indicate their potential for developing new therapeutic drugs.