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Abstract

Understanding species richness and diversity in a forested area is crucial for the future conservation of forests. The objectives of this study were to investigate woody species diversity, species richness, and to identify endangered plant species. Three churches were selected based on major agro-ecological zonation. Hence, church 1, church 2 and church 3 were highland, mixed midland and lowland, and midland, respectively. Transect lines and plots were established for woody species inventory. All woody species with a diameter at breast height ≥ 5 cm were measured. Species richness, α diversity, β-diversity, and Sørensen similarity were calculated. The results revealed the presence of 34, 17 and 27 woody species in church 1 (Assela Teklehymanot), church 2 (Etisa Teklehymanot) and church 3 (Saramba Kidanemhret), respectively. The importance value (IV) indicated native tree species *Podocarpus falcatus* (IV=164.59), *Croton macrostachyus* (IV=80.28), and the exotic *Eucalyptus globulus* (IV=199.06) as important in church 1, church 2, and church 3, respectively. There were 5 woody species common to the study churches. Sørensen similarity indicated church 1 and church 2 had 26.1%, church 1 and church 3 had 29.9% and church 2 and church 3 had 26.7% similarities. Similarly, β-diversity indicated similarities of 18.22%, 27% and 22.22% between (church 1 and church 2), (church 1 and church 3), and, (church 2 and church 3), respectively. The total tree

density was 1058, 304 and 569 stems ha^{-1} in church 1, church 2 and church3 correspondingly. The woody species richness and abundance were significantly higher in church 1(12.55; 106.55) than in church 2 (4.71; 17.29) and in church 3 (10.67; 71.79) than in church 2. There are a number of uses of the woody species including traditional medicine, food, fodder and for fencing. The result also indicated the presence of 9 IUCN Red List of Threatened Species. The conservation and additional enrichment planting with the indigenous woody species found in the respective church forests and from similar other areas by performing species-site matching are recommended.

Key words: conservation, diversity index, endangered species, species richness