



Effect of Habitat Type on Soil Organic Carbon Content in Central Spain

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Soil organic carbon content at two different soil depths has been assessed in four riparian systems: three forested ones and another with herbaceous vegetation. The goal was to assess the effect of the different habitat types and their features on the accumulation of organic matter and carbon in the soil.

The experimental area was located in Henares River (Central Spain). Four riparian habitats with different floristic composition and history management practices were evaluated: Zone A, Native gallery forest, quite homogenous regarding its composition and structure; Zone B, Riparian plantation, as a result of a restoration process during 1994; Zone C, Riparian plantation in 1999 and Zone D, riparian deforested area, with herbaceous vegetation. Soil were sampled at two depths: 10 and 20 cm. The samples were collected in autumn 2006. Soils were characterized according to Official Spanish Soil Methodology. Soil organic carbon content was determined by Walkey-Black method.

Soil organic carbon content, at 0-10 cm and at 10-20 cm, showed significant differences among studied habitats. There were significant differences among the four studied zones in organic carbon content at the first 10 cm of soil ($F=3.63$, $P<0.023$). Post hoc tests showed that mean values were significantly different in all comparisons except for that between the Zone C (the more recent plantation) and the deforested zone (Zone D). The soil organic carbon content was very similar between them and much lower than values for the natural forest and the older plantation. The analyses of soil

organic carbon content between 10 and 20 cm of soil depth showed significant differences among the four riparian zones ($F=12,41$, $P < 0.0000015$). Nevertheless, post hoc comparisons of means showed that just the organic carbon content of the natural forest was different from the other zones.

Results are interesting because data from the first 10 cm of topsoil did reflect the effect of the forest especially in the natural forest, but also in the area that were afforested 14 years ago. Nevertheless, in the more recent plantation (8 years) and in the deforested one, the effect of the litter and consequently the organic matter content was more relevant. On the contrary, at deeper soil layers (10-20 cm), the higher content of soil organic carbon was reflected mainly in the natural forest and, in a low order in the older plantation. Therefore, the maturity of the forest along with other linked features such as litter production and woody vegetation cover, which favoured decomposition processes, showed a positive effect on soil organic carbon content.