Supplementary Materials: Role of Clay Mineralogy in the Stabilization of Soil Organic Carbon in Olive Groves under Contrasted Soil Management

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Table S1. Pearson's correlation coefficients between SOC functional fractions (%), soil properties of the fine earth (>2 mm) and mineral phases in the <2 μm fraction (%).

	Non Protected (NPP)			**Chemically Protected**	**Biohemically Protected**	**Physically Protected (PPP)**			
	cPOM	**LF**	**Total NPP**	**H**	**NH**	**μNH**	**μH**	**iPOM**	**Total (PPP)**
SOC (%)	**0.759***	**0.756***	**0.909****	**−0.892****	−0.476	0.510	**−0.728***	0.067	**−0.903****
pH	0.276	−0.346	0.077	0.334	−0.692	0.620	**0.708***	0.244	0.010
Sand (%)	−0.099	0.458	0.101	−0.510	0.498	−0.434	**−0.797***	−0.011	−0.152
Clay (%)	−0.092	−0.426	−0.227	0.591	−0.220	0.196	0.702	−0.258	0.171
Silt (%)	0.438	−0.255	0.232	−0.002	**−0.753***	0.648	0.466	0.573	0.010
CEC (cmol + kg^{-1})	0.571	0.046	0.487	−0.282	−0.521	0.477	−0.065	0.099	−0.477
Sm	−0.132	−0.248	−0.159	0.395	−0.199	0.163	0.529	0.057	0.224
V	0.399	0.736	0.606	−.656	−0.070	0.027	0.166	−0.545	−0.713
Illite	0.247	−0.053	0.206	−0.258	−0.128	0.075	−0.244	0.384	−0.193
ML (%)	**−0.727***	−0.473	**−0.728***	0.443	**0.810***	**−0.794***	0.088	−0.229	0.695
MLV	−0.233	−0.021	−0.316	0.300	0.271	−0.316	0.248	−0.375	0.303
MLS	0.497	−0.699	0.495	−0.161	−0.620	0.707	0.197	0.219	−0.414
Chl	0.470	0.668	0.643	−0.627	−0.287	0.300	−0.579	−0.189	**−0.743***
K	−0.174	0.201	−0.130	−0.168	0.455	−0.410	−0.360	−0.249	0.104
FdK	0.039	−0.170	0.012	0.295	−0.309	0.267	0.425	0.036	−0.021
FdCa-Na	0.390	0.274	0.395	−0.306	−0.456	0.354	−0.099	0.607	−0.296
Q.	−0.340	−0.147	−0.321	0.116	0.199	−0.282	0.096	0.625	0.506
Calcite	−0.004	−0.410	−0.168	0.562	−0.510	0.463	**0.885****	0.097	0.261

CEC: Cation Exchange Capacity; Sm: Smectite; V: Vermiculite; ML: mixed layers; Chl: Chlorite; K: Kaolinite; FdK: Potassium Feldspar; FdCa-Na: Calcium-Sodium Feldspar; Q: Quartz; NH: Non-hydrolysable organic carbon, biochemically protected; μNH: Non-hydrolysable organic carbon, physically protected; H: Hydrolysable organic carbon, chemically protected; μNH: Hydrolysable organic carbon, physically protected; LF: light fraction, non-protected; iPOM: occluded particulate organic matter, physically protected; cPOM: coarse particulate organic matter, non-protected; P-P: protected pool. Significance: *< 0.05. **< 0.01.

Table S2. Pearson's correlation coefficients between SOC functional fractions (%) and some properties of the <2 μm fraction (%).

	Non Protected (NPP)			Chemically Protected	Biohemically Protected	Physically Protected (PPP)			
	cPOM	**LF**	**Total NPP**	**H**	**NH**	**μNH**	**μH**	**iPOM**	**Total (PPP)**
SSA_{clay} (m^2 g^{-1})	0.226	−0.229	0.132	0.079	−0.371	0.358	0.199	0.176	−0.176
Fe_2O_{3clay} (%)	0.188	0.638	0.355	−0.632	0.323	−0.216	**−0.851****	−0.429	−0.463

SSA: specific surface area (N_2 adsorption method); CEC: Cation Exchange Capacity. NH: Non-hydrolysable organic carbon, biochemically protected; μNH: Non-hydrolysable organic carbon, physically protected; H: Hydrolysable organic carbon, chemically protected; μNH: Hydrolysable organic carbon, physically protected; LF: light fraction, non-protected; iPOM: occluded particulate organic matter, physically protected; cPOM: coarse particulate organic matter, non-protected; P-P: protected pool. Significance: *< 0.05. **< 0.01. ***< 0.001.

Table S3. Pearson's correlation coefficients between mineral phases in <2 μm fraction (%) and some properties of the fine earth and <2 μm fraction (%).

	Phyllosilicates							Tectosilicates				Calcite
	Sm	**V**	**Illite**	**ML**	**MLV**	**MLS**	**Chl**	**K**	**FdK**	**FdCa-Na**	**Q**	
SOC (%)	−0.310	0.659	0.318	**−0.705***	−0.412	0.152	**0.747***	−0.052	−0.081	0.502	−0.237	−0.438
pH	0.358	−0.545	0.284	−0.553	−0.047	0.527	−0.327	−0.684	0.603	0.467	−0.214	**0.768***
Sand (%)	−0.548	0.509	−0.086	0.275	−0.159	−0.640	0.565	0.672	**−0.721***	−0.248	0.214	**−0.828***
Clay (%)	0.557	−0.360	0.090	−0.081	0.193	0.615	−0.621	−0.674	**0.800***	0.131	−0.327	0.651
Silt (%)	0.163	−0.413	0.019	−0.502	−0.010	0.255	−0.070	−0.219	0.071	0.331	0.167	0.651
CEC (cmol + kg^{-1})	−0.164	−0.102	**0.798***	**−0.735***	−0.214	0.194	−0.011	−0.569	0.456	**0.726***	−0.615	−0.014
SSA_{clay} (m^2 g^{-1})	−0.156	−0.500	**0.832***	−0.584	−0.455	0.361	−0.036	−0.631	0.431	0.615	−0.488	0.094
Fe_2O_{3clay} (%)	−0.620	**0.872***	−0.117	0.162	0.065	−0.440	0.638	0.701	−0.677	−0.384	−0.253	**−0.818***

Sm: Smectite; V: Vermiculite; ML: mixed layers; Chl: Chlorite; K: Kaolinite; FdK: Potassium Feldspar; FdCa-Na: Calcium-Sodium Feldspar; Q: Quartz; SSA: specific surface area (N_2 adsorption method). CEC: Cation Exchange Capacity. Significance: *< 0.05.

Table S4. Pearson's correlation coefficients between properties of the fine earth and the <2 μm fraction (%).

	Surface Properties of the Clay Fraction	
	SSA (m^2 g^{-1})	**Fe_2O_3 (%)**
SOC (%)	0.109	0.480
pH	0.656	**−0.831***
Sand (%)	−0.486	**0.834***
Clay (%)	0.466	−0.694
Silt (%)	0.203	−0.573
CEC (cmol + kg^{-1})	**0.820***	−0.226

SSA: specific surface area (N_2 adsorption method); CEC: Cation Exchange Capacity. Significance: *< 0.05.