



**Ke d :**

## Materials and Methods

### Experiment

In 2015, we were given approval by the Lixian Forestry Bureau to gather the testing soil in a nearby forest. Because only a small number of soil samples were used in this study's microcosm experiment, our work had little impact on how the larger ecosystem functioned. The laws of the People's Republic of China were also followed in the conduct of this investigation. No measurements of people or animals were used in the research, and no endangered or protected plant species were used [8].

### Experiment site

At the Long-term Research Station of Alpine Forest Ecosystems (31°18' E, 3023 m a.s.l., Southwest China), 20 kg or so of tested soil was collected in October 2015. Using a soil auger with a 15 cm depth and 5 cm diameter, earth was extracted from five forest plots (2 m × 2 m in size) and combined after being cleared of all visible trash and new litter. According to the IUSS Working Group WRB, the soil type was a Cambic Umbrisol, and the basic soil chemical characteristics (0–15 cm depth) were as follows: pH 6.5–0.3, bulk density of the soil 1.04–0.11 g kg<sup>-1</sup>, total organic carbon 153.9–27.4 g kg<sup>-1</sup>, total nitrogen 7.8–1.3 g kg<sup>-1</sup>, and phosphorus 0.9–0.1 g kg<sup>-1</sup> are all acceptable values. After being sieved (2 mm), the collected soil was combined. To prepare the samples for the soil microcosm experiment, stones, obvious animal

**Ac c e e e**

None

**C c I e e**

None

1. Jobbágy EG, Jackson RB (2015) The vertical distribution of soil organic carbon and its relation to climate and vegetation. *Ecological Applications* 2000 10:423-436.
2. Waldchen J, Schulze ED, Schoning I, Schrumpf M, Sierra C (2013) The influence of changes in forest management over the past 200 years on present soil organic carbon stocks. *Forest Ecology and Management* 289:243-254.
3. Nabuurs GJ, Lindner M, Verkerk PJ, Gunia K, Deda P, et al. (2013) First signs of carbon sink saturation in European forest biomass. *Nature Clim Change* 3:792-796.
4. Buchholz T, Friedland AJ, Hornig CE, Keeton WS, Zanchi G, et al. (2014) Mineral soil carbon fluxes in forests and implications for carbon balance assessments. *GCB Bioenergy* 6:305-311.
5. Johnson CE, Driscoll CT, Fahey TJ, Siccama TG, Hughes JW (1995) Carbon Dynamics Following Clear-Cutting of a Northern Hardwood Forest. In: W MW, K JM, editors. *Carbon Forms and Functions in Forest Soils*. Madison, WI: Soil Science Society of America 463-488.
6. Kreuzweiser DPKP, Hazlett PWHW, Gunn JMGM (2008) Logging impacts on the biogeochemistry of boreal forest soils and nutrient export to aquatic systems: A review. *Environmental Reviews* 16:157-179.
7. Moore JC, Berlow EL, Coleman DC, de Ruiter PC, Dong Q, et al. (2004) Detritus, trophic dynamics and biodiversity. *Ecol Lett* 7: 584-600.
8. Brussaard LB, Pulleman MM, Ouedraogo E, Mando A, Six J (2007) Soil fauna and soil function in the fabric of the soil food web. *Pedobiologia* 50: 447-462.
9. Liu YW, Yang F, Yang WQ, Wu FZ, Xu ZF, et al. (2019) Effects of naphthalene on soil fauna abundance and enzyme activity in the subalpine forest of western Sichuan, China. *Sci Rep* 9: 2849.
10. Gonzalez G, Seastedt TR (2001) Soil fauna and plant litter decomposition in tropical and subalpine forests. *Ecology* 82: 955-964.
11. Diaz S, Symstad AJ, Chapin FS III, Wardle DA, Huenneke LF (2003) Functional diversity revealed by removal experiments. *Trends Ecol Evol* 18: 140-146.
12. Wang SJ, Ruan HH, Wang B (2009) Effects of soil microarthropods on plant litter decomposition across an elevation gradient in the Wuyi Mountains. *Soil Biol Biochem* 41: 891-897.
13. Seastedt TR, Crossley Jr DA (1983) Nutrients in forest litter treated with naphthalene and simulated throughfall: a field microcosm study. *Soil Biol Biochem* 15: 159-165.
14. Blair JM, Crossley DA Jr, Rider S (1989) Effects of naphthalene on microbial activity and nitrogen pools in soil-litter microcosms. *Soil Biol Biochem* 21: 507-510.