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Assessing and ranking the flammability of some ornamental plant species to select firewise plants for landscaping in WUI (SE France).

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The increasing urbanization of Wildland-Urban Interfaces (WUI) as well as the high fire occurrence in these areas requires the assessment and the ranking of the flammability of the ornamental vegetation surrounding houses especially that planted in hedges. Thus, the flammability of seven species, among those most frequently planted in hedges in Provence (South-Eastern France), were studied at particle level and at dead surface fuel level (litters) under laboratory conditions.
The flammability parameters (ignition frequency, time-to-ignition, flaming duration) of the very fine particles (live leaves and particles <2 mm in diameter) were measured using an epiradiator as burning device. The flammability parameters (ignition frequency, time-to-ignition, flaming duration and initial flame propagation) of the undisturbed litter samples were recorded during burning experiments performed on fire bench.
Burning experiments using the epiradiator showed that live leaves of Phyllostachys sp., Photinia frasei and Prunus laurocerasus had the shortest time-to-ignition and the highest ignition frequency and flaming duration whereas Pittosporum tobira and Nerium oleander were the longest to ignite with a low frequency.
Phyllostachys sp. and Nerium oleander litters were the shortest to ignite while Prunus laurocerasus litter had the lowest bulk density and long time-to-ignition, but high flame propagation. Photinia fraseri litter ignited frequently and had a high flame spread while Pittosporum tobira litter ignited the least frequently and for the shortest duration. Cupressus sempervirens litter had the highest bulk density and the longest flaming duration but the lowest flame propagation. Pyracantha coccinea litter was the longest to ignite and flame propagation was low but lasted a long time.
Hierarchical cluster analysis performed on the flammability parameters of live leaves and of litters ranked the seven species in four distinct clusters from the most flammable (Prunus laurocerasus and Pyracantha coccinea) to the least flammable (Pittosporum tobira and Nerium oleander); the other species displaying two groups of intermediate flammabilities (Phyllostachys sp.- Photinia fraseri and Cupressus sempervirens).
The species with highly flammable characteristics should not be used in hedges planted in WUIs in South-Eastern France.