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# Allelopathic Influences in Regeneration of High level Conifers in western Himalayas

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## Abstract

Silver fir (*Abies pindrow*, Spach) and spruce (*Picea smithiana*, Boiss), commonly known as high level conifers, are the important constituents of moist temperate forests of western Himalayas. Natural regeneration in these forests is a long standing problem in these forests. Allelopathy in many instances played a major role in the natural regeneration failure in spite of some limitations. So to investigate the regeneration problems in high level conifer forests, allelopathic research is undertaken to ascertain whether compounds released from litter, humus and under-storey species could negatively affect regeneration of *A. pindrow* and *P. smithiana* at two levels: (1) at the seed level by inhibiting seed germination in laboratory (2) at the plant level by decreasing seedling growth in nursery. The litter, humus and foliages of *Sarcococca saligna*, *Viburnum nervosum* and fern (under-storey plants) at 5, 10, 15, 20% concentrations were used to investigate their effects on seed germination, radicle & plumule growth in laboratory and seedling growth of silver fir and spruce. The various leachate concentrations inhibited the seed germination, radicle & plumule growth, seedling height and seedling basal diameter of both the species with some seedling mortality at higher concentrations. The allelochemicals present in the leachates of litter, humus and under-storey plants were also analyzed using HPLC technique. Allelopathic interactions of litter, humus and under-storey plants may explain the poor seedling establishment and growth of seedlings of *A. pindrow* and *P. smithiana* on the forest floor. The active substances/allelochemicals present in green foliage and decomposing litter are leached out by rainfall and other means and reach the soil underneath the canopy and hamper the regeneration process. Knowing such tree/under-storey interactions can ease the foresters in regenerating the forests by avoiding such situations in site preparations and eradication of ericaceous shrubs in assisted natural regeneration programmes.

**Keywords:** Regeneration, silver fir, spruce, germination, nursery growth, allelopathy, leachates.

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