

## Mineralogy of soils and differentiation of hydroxy interlayer smectite from vermiculite on Sefidrud river terraces in central Gilan province

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**Abstract:** Adsorption, storage and release of nutrient elements are related to clay minerals in agriculture and environmental activities. In this study, mineralogy of soils in a chronosequence of Sefidrud river terraces in Gilan province was investigated. After removing organic matters, carbonates and iron and aluminum oxides, fractionation of soil particles was performed by centrifuge. Soil minerals were identified using X-ray diffraction. Primary minerals were also identified in thin sections using micro-morphological techniques. Quartz, micas, feldspars, chlorite and epidote were the primary minerals observed in sand and coarse silt fraction. Chlorite was transformed to smectite, hydroxy interlayer smectite and other mixed minerals. In the middle terrace (T2) soil, chlorite is completely disappeared but the relative amount of smectite is increased. With time smectite becomes dominant in clay particles, specially fine clay size. Smectite was increased with depth in Bt horizon on middle and upper terraces. Three different methods were tested to remove hydroxy interlayers from 2:1 clays, but only one of these methods which consisted of washing coarse clay fraction by 0.05 M HCl, heating to 400°C and finally boiling it in 0.5 M NaOH was able to remove hydroxy interlayer. The results showed this mineral is primarily hydroxy interlayer smectite (HIS).

**Keywords:** *clay minerals, terraces of Sefid-rud River, hydroxy interlayer smectite, Gilan.*