In this work, an attempt was made to study the interactions between heavy metal and humic acid (HA). Two humic acids were isolated from two Inceptisols, one from “Buxa reserve forest” area in Alipurduar and another from “Nagrakata tea estate” region in Jalpaiguri district, West Bengal, India. Humic acids were purified by HF-HCl mixture and treated with eight heavy metals viz. zinc (Zn), copper (Cu), lead (Pb), nickel (Ni), cadmium (Cd), chromium (Cr), mercury (Hg) and arsenic (As). Pure humic acids and metal-humate complexes formed were characterized by means of total acidity, $E_4/E_6$ ratio, viscometric measurements, potentiometric and conductometric titration, stability constant determination, infrared spectroscopy, scanning electron microscopy and petrographic techniques. Pot and field experiments were done on two different crops for assessing the effects of humic acid on toxic heavy metals in soil as well as plants. Results of all experiments inferred the formation of strong metal-humate complexes between heavy metals and humic acid. Total acidity and cation exchange capacity reduces on metal complexation. Decrease in $E_4/E_6$ ratio after metal complexation may be indicative of high degree of condensation. In viscometric measurements, molecular weight increases after complex formation which reflect symmetry with $E_4/E_6$ ratio, clearly indicate that heavy metals form bridge like bonds between humic molecules. Stability constant determination suggested competition of binding of metal ions to humate ligand and stabilities of the complexes at pH 4 follow the order: Cr > As > Pb > Cu > Ni > Zn > Cd > Hg. Results of infrared spectroscopy indicated the disappearance of C=O adsorption band for COOH group around 1720 cm$^{-1}$ and band for phenolic –OH (1200 cm$^{-1}$) upon reaction with metal ions and formation of new band for asymmetric and symmetric stretching vibrations of carboxylate ion near 1630 and 1380 cm$^{-1}$, respectively. Scanning electron microscopy and petrographic images revealed the structural differences and inclusion of particle grains. Results of both pot and field experiments suggested that availability and mobility of most heavy metals in soils and plants were greatly reduced on application of humic acid to the soil. The results further suggested that application of HA (@ 0.05 % on soil weight basis per hectare) can be considered as an effective ameliorant in remediation of heavy metal polluted soils.