Phosphateses (EC 3.1.3.x) are a group of enzymes that hydrolyze phosphoesters. That way they affect the energetic metabolism of a cell and its regulation. Phosphatases that dephosphorylate proteins are an integral part of signaling pathways, stress responses and they modulate enzymatic activity. This thesis deals with the study of phosphatases obtained from tobacco leaves (Nicotiana tabacum, L.). Solution of enzymes was prepared by extraction in both acidic and alkaline buffers. Through the use of the chromogenic substrate pNP-phosphate it was determined that there is a higher phosphatase activity in the glycosylated fraction than in the fraction that did not bind to Con A Sepharose. The research of the ions effect on the phosphatase activity has determined that Mg2+ and Ca2+ show positive effect on the phosphatase activity while the effect of Co2+ and Mn2+ is inhibitory. The Zn2+ ions have shown no effect whatsoever. The glycosylated phosphatases also dephosphorylated low-weight-molecular substrates phosphoserine, ATP and glucose-6-phosphate. The research of protein phosphatase activity discovered the affinity to the substrate phosvitin, although neither to casein nor its tryptic cleaves. Detailed experiments have shown that the pH optima for all the substrates lie from pH 5 to 6. Glycosylated phosphatases also hydrolyze the phosphate in the PEPC molecules from Zea mays seeds.