STRUCTURAL CHARACTERIZATION AND LOW RESOLUTION MODEL OF NECROSIS FACTOR 2 (NEP2) FROM *MONILIOPHTHORA PERNICIOSA* USING SAXS

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Moniliophthora perniciosa is the causal agent of witches' broom in *Theobroma cacao*. This hemibiotrophic fungus has, at least, three genes that codes for necrosis proteins. NEP2 is present in the biotrophic phase and disappears in the necrotrophic phase. Using SAXS we have characterized the oligomerization state of the protein and generated a low resolution model of the protein. The protein is a monomer at low concentration and becomes a dimer as the concentration increases. The radius of gyration (Rg) of NEP2 obtained with dynamic light scattering (DLS), at concentrations below 1 mg/ml, is 24 nm. This corresponds to a molecular weight of 24 kDa, which correspond to a monomer. SAXS data showed that NEP2 is a monomer at low concentration but as it increases (over 2 mg/ml) it begins to dimerize and at concentrations above 2.5 mg/ml the protein is a dimer. This results show a difference between NEP2 and NEP1, another necrosis factor from *M. perniciosa* present mainly in the necrotrophic phase of the disease. NEP1 that is always a dimer, as shown by DLS and SAXS, as well as the necrosis factor NPP1 from *Phytophtora parasitica*. The model calculated for NEP2 up to 10 Å presents an elongated shape with a long axis of 115 Å and a short axis of 35 Å. This dimerization process might be related to the change of phase of the fungus, from biotrophic to necrotrophic. In this case this protein might become the target for the design of drugs aimed to control this devastating disease.