Plant extract with bioactive potential against SARS-CoV-2

Adma N. F. Melo[1], Tiago B. Afonso[1], Marta Carvalho[1], Cláudia Rodrigues[3], Tânia Ribeiro[1], Márcio Carocho[2], Miguel Marques Pinto[4], Freni Tavaria[1], Paula Teixeira[1], J. Pedro Simas[3], Lillian Barros[2], Manuela Pintado[1]

[1]Centre for Biotechnology and Fine Chemistry, Universidade Católica Portuguesa, Porto, Portugal
[2] Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, Bragança, Portugal
[3]Institute of Molecular Medicine, Faculty of Medicine, University of Lisbon, Lisboa, Portugal
[4] Next Generation Chemistry, Unipessoal Lda, Porto, Portugal

Background: The novel disease caused by SARS-CoV-2 has been causing chaos worldwide due to its high mortality, morbidity and contagiousness nature, and therefore forced the scientific world to develop new alternatives to combat and assist the fight against this virus. Plant extracts have bioactive molecules that might provide a starting point for the research on the use of plants as an excellent source of new antiviral agents able to inhibit or neutralize COVID-19. Therefore, the objective of this study was to obtain an extract from a Plant cultivated under controlled conditions in Portugal to be used as an antiviral substance to be applied against COVID-19.

Materials/Methods: The plant extract obtained from plant cultivated under controlled conditions in Portugal was extracted by maceration in a hydroethanolic solution under optimized conditions and submitted to freeze drying. The extracts were evaluated for their phenolic profile by high performance liquid chromatography coupled to a diode array detector and a mass spectrometer detector (HPLC-DAD-MS). Antioxidant activity was also measured, and antiviral properties were measured for SARS-CoV-2 in Vero cells.

Results. HPLC analysis revealed the presence of different phenolic compounds in the extracts with relevance for caftaric acid, cis-chicoric acid and trans-chychoric acid. The extract showed a good antioxidant capacity demonstrated by the high value found for ORAC of 3202,82 ± 32,52 Trolox/mg extract. Regarding the antiviral activity, the results achieved for the viral titer was 20 PFU/mL, and the antiviral activity for SARS-CoV-2 was 4.02 ± 0.00 Mv and the percentage of reduction was > 99.99%.

Conclusion: The results showed that the obtained extract demonstrated consistent results of antiviral activity presenting a potential for applications against the SARS-CoV-2. Further studies are required for validation and application of this extract.

Acknowledgments: Project was financed by the European Fund for Regional Development (Fundo Europeu de Desenvolvimento Regional (FEDER)) through the Programa Operacional Regional Norte 2020, within the "PlantCovid" project, NORTE-01-02B7-FEDER-054870.