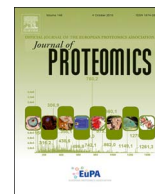


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Of mice and men: Traces of life in the death registries of the 1630 plague in Milano

Alfonsina D'Amato^a, Gleb Zilberstein^b, Svetlana Zilberstein^b, Benedetto Luigi Compagnoni^c, Pier Giorgio Righetti^{d,*}

^a Quadram Institute Bioscience, Norwich Research Park, NR4 7UA, England, United Kingdom

^b Spectrophon Ltd., Pekeris 4, Rehovot 76702, Israel

^c Archivio di Stato di Milano, Via Senato 10, Milano 20121, Italy

^d Department of Chemistry, Materials and Chemical Engineering "Giulio Natta", Politecnico di Milano, Via Mancinelli 7, Milano 20131, Italy

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ABSTRACT

The death registries of the plague epidemic of 1630, stored at the Archivio di Stato of Milano, have been interrogated via the EVA film technology (ethyl vinyl acetate film studded with crushed strong anion and cation exchangers as well as C₈ resins). The EVA diskettes have been left in contact with the lower right margins of 11 different pages pertaining to the peak months of the raging disease (June through end of September) for 60–90 min and then the captured material, after elution and digestion, analysed by mass spectrometry. The main findings: 17 *Yersiniaceae family proteins*, 31 different human keratins, 22 unique mouse keratins, about 400 peptides from different bacterial strains, 58 human tissue proteins and 130 additional mouse and rat tissue proteins. In addition, > 60 plant proteins (notably potato, corn, rice, carrot and chickpeas), likely representing the meagre meals of the scribes, contaminating the pages, were detected. The significance of these unique findings is amply illustrated in the body of the article.

Significance: Archivists, historians, librarians usually explore the texts of ancient and modern manuscript in order to extract the meaning of the writing and understand the mood, feelings, political, philosophical and/or religious ideas therein expressed by the authors. With the present EVA methodology (the only one, at present, able to access our Cultural Heritage without damaging or contaminating it) we interrogate, instead, the support, be it paper, parchment, wood panel, cloth, canvas and the like, in order to extract invisible data, such as the presence of drugs, medicaments, infectious pathogens, human and environmental contaminants. Metabolites, proteins and peptides thus captured are then analysed via mass spectrometry. The unique data mined by this technology should considerably enlarge the (so far) restricted horizon of the writing exploration and add new insight on the environmental conditions in which such documents were produced as well as, importantly, on the health/pathological conditions of the authors. It is believed that the present technology, as here reported, will become the officially accepted one for exploring the world Cultural Heritage.

1. Introduction

Barrages of epidemics, typhus with his brothers and sisters, such as plague, cholera, typhoid and dysentery, have scourged humanity for millennia and have decided more military campaigns than Caesar, Hannibal, Napoleon, to mention just a few. Perhaps, over the centuries, the most devastating one has been plague [1–4]. The first literary citation on this disease can be found in the Iliad of Homer (I, 43–61) and later on in Sophocles, Thucydides, Lucretius, Virgil, Ovid and Seneca, to name just some classic authors.

Bouts of plague kept spreading around Europe at regular intervals,

till the end of the XVIII century. In Milano, there were two such episodes that drastically altered the population of the town as well as of the surrounding region of Lombardy. The first one occurred during 1578, at the time of cardinal Carlo Borromeo (later declared a saint). The cardinal daily visited the affected people and organized processions and public masses not in churches but in open squares, so as to avoid strict contact among the believers. Notwithstanding the daily contacts, the cardinal was spared by the disease. A most devastating epidemic occurred in 1630 at the time of cardinal Federico Borromeo, Carlo's cousin. Early episodes were registered around mid-March, the peak being reached in the summer months, June through September, the

* Corresponding author at: Department of Chemistry, Materials and Chemical Engineering "Giulio Natta", Politecnico di Milano, 20131 Milan, Italy.
E-mail address: piergiorgio.righetti@polimi.it (P.G. Righetti).

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