1. ABOUT THE DATASET

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Title: Data used in the PhD thesis ‘SeaCoat - Marine based edible

coatings for minimally processed fruit’.

Creators: Ana Augusto

Organisation: University of Reading

Rights-holders: Ana Augusto

Publication Year: 2022

Description: This dataset contains data obtained from experimental work on the physical and chemical properties and bioactivities of fresh-cut apples and pears coated with an edible coating containing extract ofthe seaweed *Codium tomentosum*. The data was obtained using a spectrophotometer microplate reader, a homogenizer, a Chroma Meter, a centrifuge, a gas analyser (Oxybaby), a digital refractometer, a texture analyser (TA.XTplus), and a thermocycling CFX ConnectTM Real-Time PCR System (Bio-Rad).

Cite as: Augusto, Ana (2022): Data used in the PhD thesis ‘SeaCoat - Marine based edible coatings for minimally processed fruit’. University of Reading. Dataset. https://doi.org/10.17864/1947.000380

Related publications:

(Chapter III) - Augusto, A., Miranda, A., Costa, L., Pinheiro, J., Campos, M.J., Raimundo, D., Pedrosa, R., Mitchell, G., Niranjan, K., Silva, S.F.J. (2022). A pilot plant scale testing of the application of seaweed‐based natural coating and modified atmosphere packaging for shelf‐life extension of fresh‐cut apple. Journal of Food Processing and Preservation. 00, e16630. https://doi.org/10.1111/jfpp.16630

(Chapter II) - Augusto, A., Miranda, A., Crespo, D., Campos, M.J., Raimundo, D., Pedrosa, R., Mitchell, G., Niranjan, K., Silva, S.F.J. (2022). Preservation of fresh-cut Rocha pear using *Codium tomentosum* extract. LWT - Food Science and Technology. 155, 112938. https://doi.org/10.1016/j.lwt.2021.112938

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2. TERMS OF USE

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3. PROJECT AND FUNDING INFORMATION

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Funding was received funding from the following.

Fundação para a Ciência e Tecnologia. Grant number: SFRH/BD/131465/2017.

COMPETE - Operational Competitiveness Programme: Algaecoat project. Grant number: POCI-01-0247-FEDER-006392.

European Union: EASME Blue Labs project AMALIA, Algae-to-MArket Lab IdeAs. Grant number: EASME/EMFF/2016/1.2.1.4/03/SI2.750419.

FEDER - European Regional Development Fund (Portugal 2020 Programme) and Fundação para a Ciência e Tecnologia: ORCHESTRA project- add-value to ORCHards through thE full valoriSaTion of macRoalgAe. Grant number: POCI-01-0247-FEDER-070155.

4. CONTENTS

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Data processing and preparation activities

Data was collected in Excel files. Different tabs have been assigned for different measurements. For data presentation an index tab at the beginning of each Excel file was created with the sample nomenclature, an explanation of the content of the file and a description of each of the variables studied.

File listing

1. ’Chapter2’: this file contains data of the physicochemical analyses done to fresh-cut pears in terms of:
   1. Figure 2.2: Firmness, colour parameters and respiration rates.
   2. Figure 2.3: Enzymatic activities such as polyphenol oxidase (PPO), peroxidase (POD) and pectin methylesterase (PME).
   3. Table 2.2: Microbiological counts.
   4. Figure 2.4: Biplot from principal component analysis.
2. ‘Chapter3’: this file contains data of the physicochemical analysis done to fresh-cut apples in terms of:
   1. Table 3.1: Moisture, water activity, pH and soluble solids content.
   2. Table 3.2: Colour parameters.
   3. Table 3.3: Total microbiological counts.
   4. Figure 3.2. Enzymatic activities such as polyphenol oxidase (PPO), peroxidase (POD) and pectin methylesterase (PME).
3. ‘Chapter4’: this file contains data of the physicochemical analyses and gene expression analysis done in fresh-cut apples in terms of:
   1. Figure 4.1: Browning compounds absorbance and colour parameters.
   2. Figure 4.2: Gene expression of phenylalanine ammonialyse (mdPAL), polyphenol oxidase (mdPPO) and peroxidase (mdPOD) genes.
   3. Figure 4.3: Gene expression of superoxidase dismutase (mdSOD), dehydroascorbate reductase (mdDHAR) and α-arabinofuranosidase (mdα-Af) genes.
   4. Figure 4.4: Enzymatic activities such as polyphenol oxidase (PPO), peroxidase (POD), pectin methylesterase (PME) and superoxidase dismutase (SOD).
   5. Figure 4.5: Principal component analysis.
4. ’Chapter5’: this file contains all the data of the physicochemical analyses done in the produced extracts and in fresh-cut apples in terms of:
   1. Figure 5.2: Extraction yield.
   2. Figure 5.3: Browning compounds absorbance.
   3. Figure 5.4: Peroxidase activity.
   4. Figure S5.1: Extracts absorbance at 260 nm.
   5. Figure S5.2: Extracts solubility.
   6. Table S5.3 and S54: Colour parameters.
   7. Table S5.5, S5.6 and S5.7: Enzymatic activities.

Variables explanation:

CTR: Control

SE: Seaweed extract

CS: Commercial solution

Air: Air packaging

MAP: Modified ambient packaging

6. METHODS

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Detailed information about methods is available in the PhD thesis as well in articles that have been published or are due to be published.

The methodology of Chapter 2 is described in: Augusto, A., Miranda, A., Crespo, D., Campos, M.J., Raimundo, D., Pedrosa, R., Mitchell, G., Niranjan, K., Silva, S.F.J. (2022). Preservation of fresh-cut Rocha pear using *Codium tomentosum* extract. LWT - Food Science and Technology. 155, 112938. https://doi.org/10.1016/j.lwt.2021.112938

The methodology of Chapter 3 is described in: Augusto, A., Miranda, A., Costa, L., Pinheiro, J., Campos, M.J., Raimundo, D., Pedrosa, R., Mitchell, G., Niranjan, K., Silva, S.F.J. (2022). A pilot plant scale testing of the application of seaweed‐based natural coating and modified atmosphere packaging for shelf‐life extension of fresh‐cut apple. Journal of Food Processing and Preservation. 00, e16630. https://doi.org/10.1111/jfpp.16630

The methodology of Chapters 4 and 5 will be soon published and is described in the PhD thesis: Ana Augusto (2022) ‘SeaCoat - Marine based edible coatings for minimally processed fruit’. University of Reading.

The following also contributed to the data collection:

* K. Niranjan (University of Reading; PhD supervisor)
* Susana F. J. Silva (MARE - Centro de Ciências do Mar e do Ambiente, ESTM, Politécnico de Leiria, 2520-641 Peniche, Portugal; PhD supervisor)
* Geoffrey Mitchell (Centre for Rapid and Sustainable Product Development (CDRsp), Portugal; PhD supervisor)