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BOOK OF ABSTRACTS

1st international olive center conference

διεθνές συνέδριο κέντρου ελιάς

24-26 ΜΑΪΟΥ 2018
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PERROTIS COLLEGE
ΚΕΝΤΡΟ ΕΛΙΑΣ KRINOS

Επιτραπέζια Ελιά

ΑΝΑΖΗΤΩΝΤΑΣ ΤΗΝ ΚΑΙΝΟΤΟΜΙΑ
ΑΝΑΚΑΛΥΠΤΟΝΤΑΣ ΝΕΕΣ ΤΑΣΕΙΣ

1ο Διεθνές Συνέδριο ‘Κέντρου Ελιάς Κρίνος’:

Βιβλίο Περιλήψεων

Επιμέλεια έκδοσης: Αθανάσιος Γκέρτσης

1st International Conference ‘Krinos Olive Center’:

Book of Abstracts

Editor: Athanasios Gertsis

Όμιλος Μεταλυκειακής Εκπαίδευσης και Κατάρτισης Αμερικανικής Γεωργικής Σχολής, Perrotis College

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P.O.BOX. 60097, 57001 Thermi, Thessaloniki

Editor: Athanasios Gertsis

INVITATION & CALL FOR PAPERS

Dear Friends and Colleagues,

The first annual International Olive Conference will take place **May 24 – 26, 2018, at** the **Krinos® Olive Center** located on the campus of **Perrotis College / American Farm School, Thessaloniki**, Greece. This year's conference will focus on the table olive.

Keynote speakers from around the world will include experts from both academic and business sectors. They will provide a holistic overview that includes recent innovations and future trends in the world of table olives. Farmers, scientists, and businessmen, representing every stage of **table olive production,** will have the opportunity to meet, discuss, and learn from these experts and each other.

We invite you to join us,

Dr. Panos Kanellis,
President, American Farm School and Perrotis College

ΠΡΟΣΚΛΗΣΗ ΚΑΙ ΥΠΟΒΟΛΗ ΕΙΣΗΓΗΣΕΩΝ

Αξιότιμοι φίλοι και συνάδελφοι,

Το πρώτο Διεθνές συνέδριο ελιάς θα πραγματοποιηθεί στις **24-26 Μαΐου 2018** στο **Κέντρο Ελιάς Κρίνος**, του **Perrotis College** εντός των εγκαταστάσεων της **Αμερικανικής Γεωργικής Σχολής** στη Θεσσαλονίκη. Στο επίκεντρο του φετινού συνεδρίου βρίσκεται η επιτραπέζια ελιά.

Μεταξύ των προσκεκλημένων ομιλητών του συνεδρίου συγκαταλέγονται ειδικοί του κλάδου από όλο τον κόσμο, τόσο από τον ακαδημαϊκό όσο και από τον επιχειρηματικό τομέα. Οι ομιλητές θα παράσχουν μία ολιστική επισκόπηση που περιλαμβάνει πρόσφατες καινοτομίες και νέες τάσεις στον κόσμο της επιτραπέζιας ελιάς. Αγρότες, επιστήμονες και επιχειρηματίες, που αντιπροσωπεύουν κάθε στάδιο στην παραγωγή επιτραπέζιας ελιάς, θα έχουν την ευκαιρία να συναντηθούν, να συζητήσουν, να ανταλλάξουν απόψεις και να μάθουν από τους ειδήμονες.

Σας προσκαλούμε να συμμετάσχετε,

Δρ. Πάνος Κανέλλης,
Πρόεδρος, Αμερικάνικη Γεωργική Σχολή και Perrotis College

Panel/Session A
Table olives production and management practices

Panel/Session B
Table olives: Processing, packaging sensory analysis and waste management

Panel/Session C
Table olives: Nutrition – Health & medical issues – Olive Genomics & metabolomics

Panel/Session D
Table olives: Global markets – Marketing – Innovative products

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Climate change mitigation and adaptation practices in cultivation of table olives – a case study in 'Kalamon'

Dr. Georgios Koubouris, Researcher, Head Olive Cultivation Lab, Institute of Olive Tree, Subtropical Crops & Viticulture, Hellenic Agricultural Organization DEMETER, (NAGREF)
Agrokipio, 73100, Chania – GREECE
E-mail: koubouris@nagref-cha.gr

Abstract
The use of biomass is among the priority actions of European Union to develop a sustainable rural economy. Olive growing may play a very important role taking into consideration the huge amounts of biomass byproducts during production –on field- and during processing –in the olive factories. Results of a 5-year field trial are presented towards sustainable table olive orchard management for climate change mitigation and adaptation. Perspectives for the environmental certification of olive products are also discussed.

Foliar application of Silicon Rich Biostimulant is effective for Silicon accumulation in leaves and Olive tree benefit

Jean-Claude Yvin
GrouppeRoulier, FRANCE

Abstract
Facing with agronomic and environmental issues, the development of new generation of biostimulants is one of a privileged way to sustain crop growth while improving the internal quality of produce. In this context, the development of **Silicon (Si)-Rich Biostimulant**, element that confers many beneficial effects to plants, especially in plants subjected to stress conditions, constitute an innovative search pathway of particular interest.

Studies conducted within the CMI-Roullier on plants known as silicon accumulators (rice, *Oryza sativa* ; maize, *Zea mays*) or non Si-accumulators (soybean, *Glycine max* ;

rapeseed, *Brassica napus*) clearly demonstrate the effectiveness of Root or Foliar application of Silicon Rich Biostimulants on growth, photosynthetic activity and nitrogen uptake by up-regulating genes involved for N-transport.

Exploring those finding on olives tree (*Olea europaea*) seems to be a promising way to improve its physiological and agronomic performance. Thus, effect of Silicon Rich Biostimulant was studied on olives tree in order to better understand the mechanism of action of this type of Biostimulants.

Key words: biostimulants, silicon accumulation

Αξιολόγηση εφαρμογής τηλεμετρικής και ηλεκτρονικής εντομοπαγίδας

Ταχόπουλος Νίκος και Αθανάσιος Γκέρτσης
Perrotis College, GREECE
E-mails: nic.tac@gmail.com and agerts@afs.edu.gr

Περίληψη

Στην εργασία αυτή εξετάζεται η λειτουργία και ανάπτυξη μιας νέας πειραματικής εφαρμογής τηλεμετρικής παγίδας (τύπου Funnel trap) παρακολούθησης εντομών, με σκοπό την εξ αποστάσεως παρακολούθηση και αξιολόγηση των πληθυσμών διαφόρων ειδών εντόμων και την εξαγωγή δεδομένων. Η παγίδα αυτή θα εξυπηρετεί την ολοκληρωμένη αντιμετώπιση του εντόμου στόχου στα πλαίσια εφαρμογών Γεωργίας Ακριβείας και προγραμμάτων ολοκληρωμένης διαχείρισης εντομοπροστασίας. Για τον σκοπό αυτό χρησιμοποιήθηκαν παγίδες τύπου Funnel trap, τροποποιημένες με κατάλληλους αισθητήρες, έτσι ώστε να είναι δυνατή η καταγραφή τους από στην τηλεμετρική μονάδα καταγραφής(data logger) και η αυτόματη σε πραγματικό χρόνο (real-time) μεταφορά των δεδομένων σε ασφαλή server της εταιρίας Scientact AE, η οποία μας παραχώρησε δωρεάν χώρο στον server της καθώς και την μονάδα τηλεμετρίας (Data logger and telemetry). Τα αποτελέσματα των δοκιμών και επιβεβαιώσεων έδειξαν ότι η αρχή λειτουργίας είναι σωστή και οι ηλεκτρονικές καταγραφές επιβεβαιώθηκαν με επιτόπια καταμέτρηση των εντομών. Περαιτέρω αξιολόγηση της παγίδας είναι σε εξέλιξη , περιλαμβανόμενης εφαρμογής στον Πειραματικό ελαιώνα του Perrotis College
Λέξεις κλειδιά: τηλεμετρία, ηλεκτρονική εντομοπαγίδα

Evaluation of a telemetric application and electronic insect trap.

Tachopoulos, N. and Gertsis, A.
Perrotis College, GREECE
E-mails: nic.tac@gmail.com and agerts@afs.edu.gr

Abstract

This study presents the development and function of a new experimental application of a telemetric insect trap (funnel trap type) for the monitoring of insects, with the

goal to remotely monitor and evaluate various insect populations and collect data. Tis trap will serve the integrated pest management of the target insect, in the framework of Precision agriculture and integrated insect management programs. For this purpose, we used Funnel trap type, modified to include appropriate sensors, in order to be possible to record in real-time from the telemetric unit (data logger) and automated the data transfer in a safe server of the SCIENTACT Company, which provided free space in their server kai also the telemetry unit. The results from initial tests verified the principle of operation and the recorded number of insects was verified by manual counting. Further development of this trap is under way, including the experimental olive grove at Perrotis College.
Key words: telemetry, electronic insect trap

Novel methods for integrated management of table olive processing waste water.

Patsios* S.I., Kontogiannopoulos K.N., Karabelas A.J.
Laboratory of Natural Resources and Renewable Energies (NRRE), Chemical Process and Energy Resources Institute (CPERI), Centre for Research and Technology Hellas (CERTH)
P.O Box 6036, 6th km Charilaou-Thermi Road, Thermi-Thessaloniki, GR 57001, GREECE.
E-mails: patsios@cperi.certh.gr, kkontogiannopoulos@cperi.certh.gr, karabaj@cperi.certh.gr
*corresponding author

Abstract
Table Olive Processing Wastewater (TOPW) is a seriously polluting and difficult to treat effluent, characterized by widely fluctuating pH and salinity, as well as high concentration of organic matter and polyphenols. Various methods, including physico-chemical, biological, thermal, and advanced oxidation processes have been proposed for the treatment of TOPW with uncertain results. A systematic study on TOPW management takes place in the Laboratory of Natural Resources and Renewable Energies of CERTH during the last eight years. The study comprises:

a. systematic collection and analytical characterization of TOPW streams from the main table olive processing methods;
b. development of a technology based on Membrane Bioreactor (MBR) as the primary TOPW treatment step;
c. post-treatment of MBR effluent to render it appropriate for irrigation or discharge.

Long term, laboratory-scale pilot experiments have demonstrated that MBR technology, after appropriate acclimatization of the active biomass, is effective in substantially bio-degrading TOPW, achieving very high removal efficiencies of both organic matter (approx. 90%) and polyphenolic substances (more than 80%). The membrane-based process exhibits stable performance at moderate biomass concentration, whereas membrane fouling (the MBR technology's "Achilles heel") can be successfully controlled through specific operating and cleaning protocols.

Various MBR effluent post-treatment options have been evaluated including ozone treatment, coagulation, and nanofiltration. MBR effluent post-treatment with nanofiltration exhibits the best performance in technical as well as economic terms, yielding a clear and transparent effluent that meets the requirements of the Greek legislation (Joint Ministerial Decree - JMD 145116/2011) for restricted irrigation and/or groundwater recharge. A relevant patent application has been filed and a full-scale demonstration plant based on this integrated TOPW management process is under construction in a table olive processing facility in Chalkidiki (northern Greece). Further R&D efforts are in progress to valorize TOPW through polyphenols recovery.

Key words: wastewater, Table Olive Processing Wastewater (TOPW)

Toward the sustainable bioremediation of table olive processing wastewaters coupled with the generation of value-added products

E. Papadaki[1] and F. Th. Mantzouridou[1]
[1] Department of Chemistry, Aristotle University of Thessaloniki, Thessaloniki, GREECE
Emails: epapadaki@chem.auth.gr and fmantz@chem.auth.gr

Abstract
Table olive processing wastewaters (TOPWs), including lye, washing waters and brine, are generated through the various table olive manufacturing processes. TOPWs constitute a major environmental problem, mainly in Mediterranean countries, due to their extreme pH values, high salinity, high organic load and the presence of antimicrobial and toxic compounds. Moreover, large volumes of the streams, up to 6 m^3/ton of olive, are generated in a short period of time, reflecting the magnitude of the problem. Currently, there are no specific regulations regarding TOPW management and the practices applied include storage in evaporation ponds or disposal into the environmental compartments. However, several studies have been carried out dealing with the effective treatment of the streams. Among the proposed approaches toward TOPW detoxification and/or valorization, biological treatment turns out as the most ecologically and economically sustainable solution. In this study, the relevant state-of-the-art methods and applications within the biotechnological research using different microorganisms, operational conditions and bioreactor design modifications is presented. In particular, the effectiveness of TOPW detoxification by using activated-sludge, fungi or microalgae is evaluated with regard to chemical oxygen demand (COD) and toxic phenolic compound content. Regarding TOPW valorization, special focus is given to the production of methane-rich biogas by anaerobic sludge digestion and the isolation of potential microorganisms that can be used as starter cultures in olive fermentation. Also, the proposed scheme for the simultaneous lactic acid and hydroxytyrosol production through the treatment of TOPWs with lactic acid bacteria is discussed. Further considerations are needed for the implementation of the proposed wastewater remediation and valorization strategies in industrial scale.

Keywords: table olive processing wastewaters, detoxification, valorization, biogas production, starter cultures, lactic acid, hydoxytyrosol

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Προτάσεις για τη βιώσιμη διαχείριση των αποβλήτων επεξεργασίας επιτραπέζιας ελιάς μέσω βιοτεχνολογικών μεθόδων και την παραγωγή προϊόντων υψηλής προστιθέμενης αξίας

Ε. Παπαδάκη[1] και Φ. Μαντζουρίδου[1]
[1] Τμήμα Χημείας, Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης, Θεσσαλονίκη, ΕΛΛΑΔΑ
E-mails: epapadaki@chem.auth.gr και fmantz@chem.auth.gr

Περίληψη

Τα διάφορα στάδια παραγωγής επιτραπέζιας ελιάς, οδηγούν στο σχηματισμό υγρών αποβλήτων επεξεργασίας επιτραπέζιας ελιάς (άλμη, απόνερα εκπίκρανσης και έκπλυσης). Αυτά τα απόβλητα χαρακτηρίζονται από ακραίες τιμές pH, υψηλή περιεκτικότητα αλάτων, υψηλό οργανικό φορτίο και περιέχουν ενώσεις με αντιμικροβιακή και τοξική δράση, με αποτέλεσμα να συνιστούν μεγάλο περιβαλλοντολογικό κίνδυνο, κυρίως για τις χώρες τις Μεσογείου. Το γεγονός ότι τα εν λόγω απόβλητα παράγονται σε μεγάλους όγκους (έως 6 m^3 ανά τόνο ελιάς) μέσα σε μικρό χρονικό διάστημα, αυξάνει την κρισιμότητα που έχει η διαχείρισή τους. Αυτή τη στιγμή, δεν υπάρχει συγκεκριμένη νομοθεσία ως προς τη διαχείρισή τους και οι πρακτικές που εφαρμόζονται περιλαμβάνουν την τοποθέτηση σε λίμνες εξάτμισης ή την απευθείας απόρριψη στο περιβάλλον. Παρόλα αυτά, διάφορες μελέτες έχουν πραγματοποιηθεί για την αποτελεσματική επεξεργασία των αποβλήτων. Μεταξύ των προτεινόμενων μεθόδων για τη μείωση της τοξικότητας ή/και την αξιοποίηση τους, οι βιολογικές διεργασίες αποτελούν την πιο οικολογικά και οικονομικά βιώσιμη προσέγγιση. Στην παρούσα εργασία, παρουσιάζονται οι πιο σύγχρονες βιοτεχνολογικές μέθοδοι για τη διαχείριση των αποβλήτων επεξεργασίας επιτραπέζιας ελιάς, μέσω της αξιοποίησης διαφορετικών μικροοργανισμών, συνθηκών διεργασίας και τύπων βιοαντιδραστήρων. Συγκεκριμένα, αξιολογήθηκε η αποτελεσματικότητα μείωσης της τοξικότητας των αποβλήτων χρησιμοποιώντας ενεργοποιημένη ιλύ, μύκητες ή μικροάλγη και έχοντας ως δείκτες το χημικά απαιτούμενο οξυγόνο και την περιεκτικότητα σε τοξικές φαινολικές ενώσεις. Στην κατεύθυνση της αξιοποίησης των αποβλήτων, ειδική έμφαση δίνεται στην παραγωγή βιοαερίου πλούσιου σε μεθάνιο μέσω αναερόβιας χώνευσης και στην απομόνωση μικροοργανισμών που μπορούν να χρησιμοποιηθούν ως καλλιέργειες εκκίνησης στη ζύμωση της ελιάς. Επιπλέον, συζητήθηκε η δυνατότητα παράλληλης παραγωγή γαλακτικού οξέος και υδροξυτυροσόλης μέσω της ζύμωσης των αποβλήτων με γαλακτικά βακτήρια. Επιπλέον, συζητούνται οι κρίσιμες παράμετροι την κλιμάκωση των προτεινόμενων βιοδιεργασιών σε βιομηχανική κλίμακα.

Λέξεις-κλειδιά: απόβλητα επεξεργασίας επιτραπέζιας ελιάς, μείωση τοξικότητας, αξιοποίηση, βιοαέριο, καλλιέργειες εκκίνησης, γαλακτικό οξύ, υδροξυτυροσόλη

Insights into the processing of Spanish natural olives

Brenes, M., Romero, C. García, P., De Castro, A. and Medina, E.
Instituto de la Grasa (IG-CSIC), Buiding 46, Ctra.Utrera km 1, 41013-Seville, SPAIN
E-mails: brenes@cica.es, crb@cica.es, pedrog@cica.es, amillan@cica.es, emedina@ig.csic.es

Abstract

According to the "Trade Standards Applying to Table Olives" (International Olive Council, 2004), natural olives are those harvested with green, turning colour or black surface colour which are placed directly in brine without any alkali treatment. In Spain, this trade preparation represents less than 5% of total production although consumer´s demand is increasing, particularly for organic olives. Empeltre, Aloreña, Verdial, Manzanilla, Gordal, Cornezuelo, Cacereña and Arbequina are the main olive cultivars processed as natural olives. Green and turning colour olives are currently fermented in acidified brine to avoid microbial spoilage whereas black olives are put directly in brine where lactic acid fermentation is not wanted. Many changes occurs during fermentation of natural olives, in particular colour of green olives darken due to chemical and enzymatic oxidation of the phenolic compounds, and their firmness is also affected mainly at low pH and high ambient temperature. One of the main drawbacks of this type of olives is the slow debittering process needed to make palatable the product. Debittering is carried out first by an enzymatic hydrolysis of the oleuropein followed by the chemical hydrolysis of this substance and its derivatives under the acidic environment of the fermentation brine. The whole debittering process may last for months although it depends on many factors. Nevertheless, this process can be accelerated favouring the oxidation of the oleuropein present in the olive flesh. Despite the colour variability, destoning problems and high sodium content in natural olives, this product is increasingly appreciated by consumers because of their high content in bioactive substances, such as phenolic compounds and triterpenic acids.

Keywords: table olives, debittering, fermentation, phenolic, valorization

Full paper attached

Insights into the processing of Spanish natural olives

Brenes, M., Romero, C. García, P., De Castro, A. and Medina, E.

Instituto de la Grasa (IG-CSIC), Buiding 46, Ctra. Utrera km 1, 41013-Seville, Spain

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Abstract

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Keywords: table olives, debittering, fermentation, phenolic, valorization

Introduction

Spain is the main producer country of table olives with an annual production of approximately 550000 tons a year, the Spanish-style green olives and the black ripe olives being the two main types of table olives elaborated in the Spanish factories. These two alkali debittered olives account for around 95 % of the total production thereby the elaboration of natural olives, which are not debittered with sodium hydroxide, is negligible. However, these natural olives are very appreciated for home consumption and local markets as well as by organic consumers.

The main Spanish natural olives are those prepared with the Empeltre (3000-6000 tons/year), Aloreña (2000-4000 tons/year), Verdial, Manzanilla, Gordal, Cornezuelo, Cacereña and Arbequina cultivars, among others. Most of these olives are harvested with green/yellow or turning color except the Empeltre olives that are picked overripe with black color.

These natural olives are rich in bioactive substances and are wanted by traditional consumers but they are not generally accepted by worldwide consumers due to their color variability, soft texture and high sodium content. In addition, the debittering of these olives is a very slow process that lasts for months or even years that limits their processing in factories.

Fermentation of natural olives

After harvesting, green and turning color olives are washed and put into the fermentation tanks or alternatively they are directly introduced into small drums for low scale production. In both cases the fruits are covered with a brine of 6-9 % NaCl content whose strength is continuously increased for months up to 6-8 % at equilibrium. At the first stages of the fermentation, putrid, butyric and vinegar malodorous spoilage may occur, mainly if the hygienic conditions are bad, so that the initial acidification of the brine is recommended with either acetic or lactic acids to maintain the pH below 4.3.

A rare spoilage defect may also appear in the flesh of green and turning color olives which is characterized by areas of soft tissue due to pectin degradation caused by yeast strains (Golomb et al., 2013) although the participation of lactic acid bacteria must not be ruled out. Less common is the formation of gas pocket in the flesh of these olives unlike to black olives that are very prone to this spoilage defect. Consequently, the latter olives are currently fermented under aerobic conditions that also favor darkening of the fruit and debittering process due to recirculation of brine (García et al., 1984). By contrast, green olives are maintained under anaerobic conditions to avoid color fading due to polyphenols oxidation (Ramírez et al., 2015).

Yeasts are the prevailing microorganisms during the fermentation stage of natural green and turning color olives due the presence of anti-lactic acid compounds in the brines (Medina et al., 2009). Among these compounds, the dialdehydic form of decarboxymethyl elenolic acid linked to hydroxytyrosol (HyEDA) that results from the enzymatic hydrolysis of oleuropein and demethyl oleuropein (Figure 1) shows a very high antimicrobial activity. However, growth of lactic acid bacteria can be detected in fermentation tanks, particularly in those containing sweet olive cultivars with low content in the HyEDA precursors, when the ambient temperature is warmer at the beginning of the fermentation process, and if the strength of the brine is low (Medina et al., 2010).

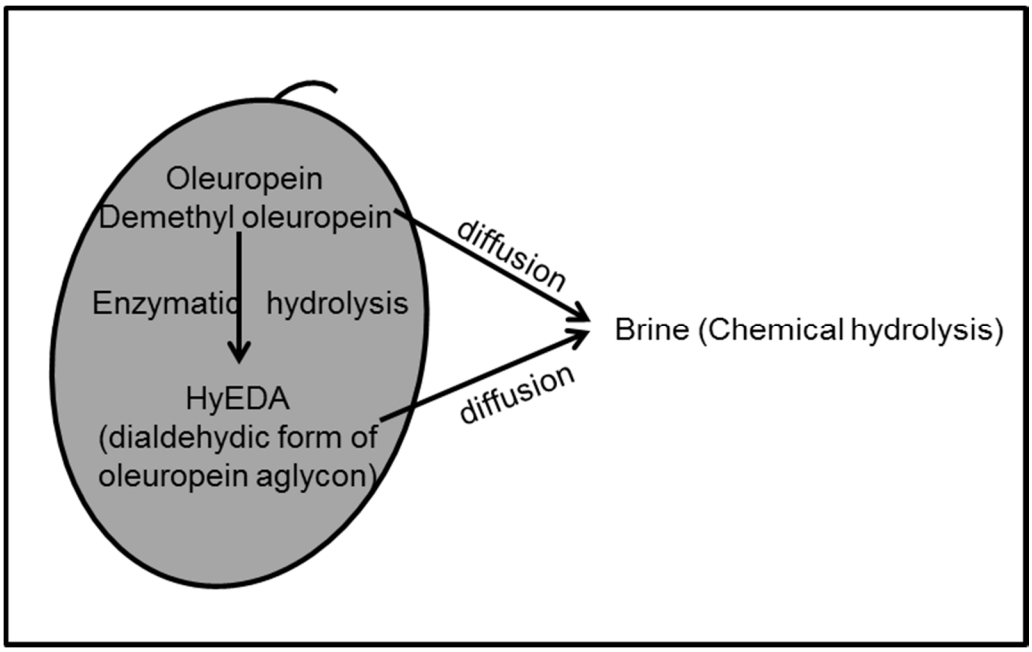

Figure 1.- Hydrolysis of oleuropein during processing of natural olives.

On the other hand, natural black olives of the Empeltre cultivar are fermented in brines without any initial acidification, and therefore the final pH can range between 4.2 to 4.5 units (Figure 2). In addition, lactic acid fermentation is not desirable so that pathogenic microorganism could grow.

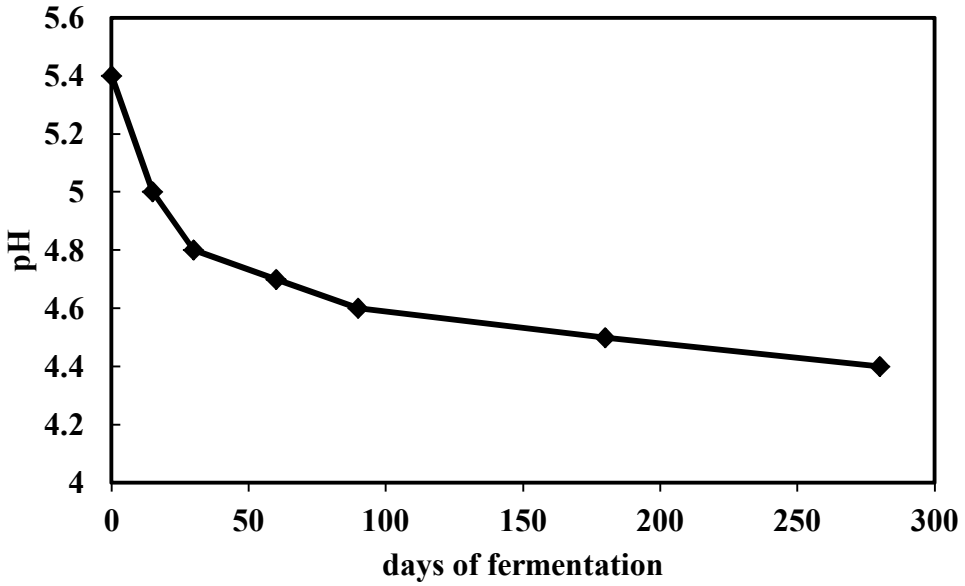

Figure 2.- Evolution of pH in brine during fermentation of Empeltre black olives in industrial tanks.

However, it must be noted that a 5-log population reduction of foodborne pathogenic bacteria (*Escherichia coli*, *Salmonella enterica*, *Listeria monocytogenes*

and *Staphylococcus aureus*) is reached between 5 and 10 min in natural olive brines (Medina et al., 2013).

Debittering

Figure 1 shows the degradation of oleuropein during fermentation of natural olives. A rapid enzymatic hydrolysis of this glucoside is firstly carried out followed by a slow chemical degradation. The enzymatic hydrolysis of both oleuropein and demethyloleuropein gives rise to the bitter substance HyEDA that is chemically hydrolyzed into the non-bitter hydroxytyrosol (Figure 3).

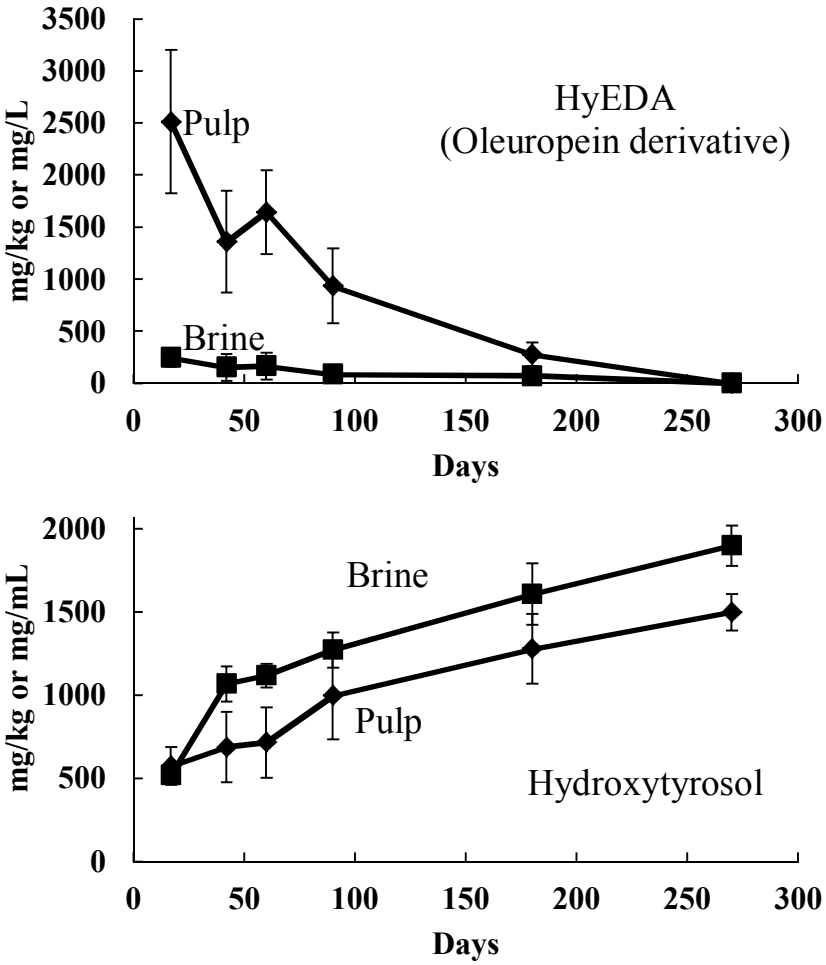

Figure 3.- Evolution of HyEDA and hydroxytyrosol in the pulp and brine of olives of the Empeltre cultivar during their fermentation process.

Therefore, the debittering of natural olives is a very slow process that may be influenced by many variables such as the olive cultivar, chemical conditions of the brine and ambient temperature, among others. A soft heat shock (60 ºC, 15 min) on olives can inactivate the β-glucosidase activity and, consequently, formation of HyEDA but a very high concentration of the bitter oleuropein remains in the brine and the olive flesh for months (Ramírez et al., 2017). By contrast, olives submitted to an

overpressure of oxygen can rapidly lose their bitterness due to oxidation of both oleuropein and HyEDA (Ramírez et al., 2016).

Nutritional valorization

Table olives constitute an important component of the Mediterranean diet, and their world consumption has steadily increased during the last decades. Besides their content in olive oil, fiber, vitamins, minerals and proteins, table olives are rich in bioactive substances such as phenolic compounds and triterpenic acids. In fact, these substances have been attributed with many beneficial properties for human health (EC 2012; Lozano-Mena et al., 2014). There are many factors that influence the concentration of these bioactive substances in table olives, among which the cultivar and the alkali treatment are very determinant (Romero et al., 2004; 2010; Alexandraki et al., 2014). An example of this can be observed in Table 1. The concentration of phenolic compounds, particularly hydroxytyrosol, and triterpenic acids in Spanish natural olives is much higher than in alkali treated olives (Romero et al., 2004) , which must contribute to the nutritional valorization of this product.

Table 1.- Phenolic compounds (mg/kg) and triterpenic acids (mg/kg) in commercial Spanish natural olives.

Cultivar	Hydroxytyrosol	Total phenolics	Maslinic acid	Oleanolic acid	Total triterpenics
Gordal	389	563	488	131	619
Manzanilla	514	680	1303	417	1720
Hojiblanca	676	836	1785	862	2647
Aloreña[a]	60	241	938	180	1118
Cuquillo	836	1290	1496	615	2111
Empeltre	739	1003	1841	897	2739
Empeltre[b]	974	1396	1852	829	2681

[a]Cracked olives. [b]Packed without cover brine.

Acknowledgements

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Recent developments in genomics fields and their application in olive tree

Dr. Tsaftaris Athanasios
Emer. Professor, Aristotle University of Thessaloniki,
Dean of Graduate Studies, Graduate School, Perrotis College, American Farm School, Thessaloniki, GREECE
E-mail: atsaftaris@afs.edu.gr

Abstract

The rapidly advancing discipline of genomics fields, propelled by a veritable explosion in sequencing efforts and allied technologies, is enabling exquisitely detailed insights into almost all genomes, including plants. The current developments in the different fields of plant -omics, including genomics, transcriptomics, epigenomics, and metagenomics will be mentioned. The main results concerning *Olea* genome, architecture, structure and function, its origin and domestication will be presented. Like all plant lineages *Olea'*s evolutionary histories include several whole genome doubling events proving that *Olea* is a polyploid species too. Most non-genic DNA (~63 % of the wild genome and ~53% of the cultivated genome) consist of active, epigenetically silenced and dead-decaying Transposable Elements. The opportunities offered by application of this knowledge to *Olea* genetic material and germplasm resources, to *Olea* breeding, production and certification of propagations material, as well as different cultivation schemes will be discussed. The suit of epigenetic regulatory mechanisms (DNA methylations, Histone modifications and of small RNAs) involved in regulating genes for olive oil biosynthesis will also be mentioned. Emphasis will be given to table olives production and processing, traceability and accuration quantitative of adulterations of *Olea* products (table olives and olive oil, among others).

Lastly, time will be devoted to results of metagenomics analysis reviewing of probiotic Bacteria (~60%) as well as probiotic Archaea (~40%) microorganisms associated with olive trees, as well as with fermented table olives. Their nutritional values for human nutrition and human health will be presented.

Mapping the quality characteristics of Greek table olives

Elena Utevska, Styliani Tsipeli, Tamara Kichukova, Tryfon Adamidis, Maria Gougouli, Kyriaki G. Zinoviadou
Perrotis College, American Farm School, Thessaloniki, GREECE (all authors)
E-mail of corresponding author: kzinov@afs.edu.gr

Abstract

Table olives is the most important fermented vegetable product in the western world and of great economic importance for Greece where out of the 200.000 tones that are produced annually more than 50% are exported. A great number of studies

have demonstrated that consumption of table olives can be beneficial for our health due to the high levels of functional compounds. Interestingly table olives are one of the few fermented products of plant origin that can also be carriers of probiotic bacteria. However, the nutritional value, the physicochemical characteristics as well as the probiotic potential are highly affected by the variety, the degree of ripeness of the olive fruit as well as the processing and preservation method applied. The aim of this study was to evaluate the variability in the physicochemical characteristics such as colorimetric parameters, hardness, salinity and water activity as well the probiotic potential of several table olives found in the Greek market. It was found that all the parameters varied greatly among the samples.

Keywords: quality mapping

Θρεπτική και εδαφολογική επισκόπηση ελαιώνων επιτραπέζιας ελιάς (ποικιλία Χαλκιδικής) στους νομούς Θεσσαλονίκης και Χαλκιδικής

Θ. Χατζηστάθης*, Ε. Μεταξά, Π. Ψωμά, Α. Μπούντλα, Γ. Στρίκος, Φ. Παπαδόπουλος
Ινστιτούτο Εδαφοϋδατικών Πόρων Θεσσαλονίκης (Θέρμη), 57001, Θεσσαλονίκη
*E-mail: chchatzista@gmail.com

Περίληψη

Στην παρούσα μελέτη παρουσιάζονται τα αποτελέσματα ενός μεγάλου αριθμού δειγμάτων εδαφών και φύλλων ελαιώνων βρώσιμης ελιάς, που διαχειρίστηκε το Ινστιτούτο Εδαφοϋδατικών Πόρων Θεσσαλονίκης, κατά την τριετία 2015-2017. Από τα αποτελέσματα αυτά προέκυψε ανεπάρκεια Ν στα φύλλα σε ποσοστά από 49-70%, για αρδευόμενους και ξερικούς ελαιώνες, αντίστοιχα, ενώ ανεπάρκεια σε Κ εμφανίστηκε περίπου στο 30% των ελαιώνων. Η θρεπτική κατάσταση των φύλλων σε Ρ ήταν γενικά καλή, ενώ τα μακροθρεπτικάCa και Mg μετρήθηκαν σε επαρκείς συγκεντρώσεις, με την ανεπάρκεια να περιορίζεται σε ποσοστά <10% των δειγμάτων. Από τα ιχνοστοιχεία, έλλειψη παρουσίασε το Β, σε ποσοστά από 48-80% για αρδευόμενους και ξερικούς ελαιώνες, αντίστοιχα, ενώ σοβαρή έως ήπια ανεπάρκεια Mn εμφάνισαν τα φύλλα, σε ποσοστό 80% των δειγμάτων, και στις δύο κατηγορίες ελαιώνων. Έλλειψη Zn παρουσίασαν τα φύλλα στο 14-21% των δειγμάτων, με το μεγαλύτερο ποσοστό να παρατηρείται στους ξερικούς ελαιώνες. Ο Cu είχε έως και 3,5 φορές υψηλότερη συγκέντρωση στα φύλλα των αρδευόμενων ελαιώνων. Αναφορικά με τις εδαφικές συνθήκες των ελαιώνων βρώσιμης ελιάς, τα εδάφη σε ποσοστό 42% είναι αλκαλικής αντίδρασης (pH> 7,8), ενώ πτωχή είναι η περιεκτικότητα των εδαφών σε οργανική ουσία, αφού περίπου το 60% αυτών έχει ανεπαρκή έως πολύ χαμηλά επίπεδα (<2%). Επίσης, το 62% των εδαφών βρώσιμης ελιάς παρουσιάζει ανεπάρκεια Ρ, ενώ για το εναλλακτικό Κ το αντίστοιχο ποσοστό ελαιώνων που εμφανίζουν έλλειψη είναι περίπου 30%. Από τα ιχνοστοιχεία, μεγαλύτερη ανεπάρκεια παρουσιάζουν τα εδάφη σε Β και Mn, με ποσοστά που κυμαίνονται από 75 έως 85%, αντίστοιχα. Σημαντική ανεπάρκεια παρουσιάζουν ο Zn, ο Fe και ο Cu, σε ποσοστά 52%, 16% και 17% των εδαφών, αντίστοιχα. Τέλος, τα εδάφη είναι (σε ποσοστό 94%) μέσης μηχανικής σύστασης. Το Ινστιτούτο Εδαφοϋδατικών Πόρων Θεσσαλονίκης, αξιοποιώντας την πολυετή εμπειρία του,

ανέπτυξε και εφαρμόζει λογισμικά συμβουλευτικής λίπανσης σε δεδομένα εδάφους και φύλλων, καθώς και σε συνδυασμό των δύο.

Table olives texture in relation to the different processing technologies: relationship between ultrastructural, rheological and sensory analyses

Lanza B.
Council for agricultural research and economics (CREA)
Research center for engineering and agro-food processing (CREA-IT)
Via Nazionale 38, I-65012 Cepagatti (PE), ITALY

Abstract
A series of transformations occur in olive fruit both during ripening and processing. In particular, significant changes of the microstructural composition affect the flavour, texture, nutrients and overall quality of the end product. Texture is one of the sensory quality attributes of greatest importance to the consumer acceptance. Information provided by sensory and rheological measurements of olive tissues were compared with those provided by ultrastructure of fracture surface by scanning electron microscopy (SEM) to better understand the complex relationships that contribute to create the texture profile of table olives and to be helpful in the screening and training the assessors of a sensory panel.

The Table Olives as Functional Food and their Role in Preventing Oxidative Stress

A. Kiritsakis[1*], S. Kailis[2], E.L. Iorio[3], D. Gerasopoulos[4],
K. Kiritsakis[5] and N. Sakellaropoylos[6]
[1] Greek Observatory of Oxidative Stress, Thessaloniki, GREECE
[2] Australian Mediterranean Olive Research Centre, Perth Western AUSTRALIA
[3] International Observatory of Oxidative Stress, Salerno, ITALY
[4] Department of Agriculture,Aristotle University of Thessaloniki, GREECE
[5] Ph.D. Candidate, Aristotle University of Thessaloniki, GREECE
[6] Sakelaropoylos Organic Olives, Sparti, GREECE
*E-mail: kyritsak@gmail.com

Abstract
Oxidative stress (OS) is an abnormal response to exogenous and/or endogenous stressors, including, among others, cigarette smoke and infectious diseases, causing a dysfunction of the redox system. Due to this dysfunction, reactive oxidizing species (ROS) get partially or totally out of the antioxidant control, thus causing an impairment of cell signaling and defense with potential physical and chemical changes in the whole body, finally leading to the oxidative stress syndrome (OSS). Thus, the latter is caused from the unbalance between the antioxidant constituents of the diet and the presence of free radicals in our body. OSS may lead to more than one hundred diseases including stroke, myocardial infarction, diabetes, colitis, neurodegenerative disorders, cancer and early aging. Table olives as well as other

olive tree products contain phenolic compounds acting as functional compounds in our body, protecting it from different diseases related to oxidative stress. It is interesting to note that polyphenols, found in olives, may protect inflammation and can even exert antimicrobial and antiviral activity. The benefits of table olives as functional foods have been predominantly based on evidence from studies on its minor components, especially polyphenols and often in the context of the Mediterranean diet. Table olive consumption tends to portray a worldwide increase, due to the beneficial impacts on health of the so called functional products of high added value. On this base the aim of this paper is to provide the available evidence why table olives are considered as an important functional product, which may protect our body from oxidative stress and its related diseases, thus potentially prolonging our life.

Key words: functional food, oxidative stress

Development of a Sweet Olive Snack

Evi Psounou-Prodromou, Yannis Prodromou
Yanni's Olive Grove, Nea Tenedos 63200, Chalkidiki, GREECE
Kyriaki Zinoviadou, Nikos Chatzilias
Perrotis College kzinov@afs.edu.gr

Abstract

Table olives are the products prepared from sound fruits of the cultivated olive tree (*Olea europaea* L.) and are a common and well-known food commodity in the whole Mediterranean area. Interestingly, there is an increasing trend regarding the consumption of table olives and just in the EU approximately 600.000 tonnes are consumed annually. However, despite the presence of various bioactive compounds in table olives they have not been considered as an alternative health snack due to the relatively high salt content. The aim of this work was to develop a convenient ready to eat and totally liquid free olive snack with low salt content. For his reason naturally fermented Chalkidiki olives were used and were dehydrated after the salt reduction. The final olive product was mixed with various dried fruits and packed into convenient and light stand-up pouches. The preservative free final product has a shelf-life of 12 months and the most important is that it has a deliciously sweet and savory taste, giving the Chalkidiki table olives a different and new market perspective. The development of this one-of-a-kind product was done at the premises of the company Yanni's Olive Grove, under the care of the Perrotis College, Krinos Olive Center, AFS.

Biological Cultivation of Olive Tree in Fthiotida

Giorgos Doutsias
Chairman of the Board of Directors of D.O.E.P.E.L., Agronomist, former General Manager of "Elaiourgiki", cultivates a variety of organic table olives, mainly

"Konservolia" and "Kalamata" in the region of Agios Konstantinos and Stylida Fthiotida

Abstract
The experience, the difficulties and the prospects of olive cultivation, when cultivated in a biological way, will be shown in the presentation.
The presentation will move around three axes:

1. The factors of fertilization, plant protection and other cultivation care
2. The certification process
3. The added value that the product takes on when certified organic

The presentation will conclude whether the cost and expenses are efficient.

Evaluation of a biological foliar fertilization system, in the production and quality of olives

Gertsis, A. and K. Zoukidis
Perrotis College/ American Farm School, Thessaloniki, GREECE
E-mails: agerts@afs.edu.gr and kzouki@afs.edu.gr

Abstract
Long term studies are needed to evaluate fertility management practices and products in perennial species. Olive represents one of the most important tree species in Greece and the impact to the economy and the culture is of paramount value. Studies were established in the Perrotis College and at a collaborative Olive grove, in Halkidiki, Greece (Yannis olive grove). Both olive oil (var. Arbequina and Koroneiki) and table olives for mixed production (var. Halkidiki), are produced in the specified groves. The management practices compare conventional treatments with trees treated with a special foliar fertilizer system (SANOVITA Concept) The objective of this study, is to evaluate the possible effects of an innovative foliar fertilizer system, composed of three parts: a mineral fertilizer in a micronized formulation, a biostimulant and an amino acid compound. Half of the grove is sprayed with the system at three growth stages (one application before flowering and two applications aftermath), while the growers apply conventional management to the entire grove. Results from the last three years, have shown that the additional application of the foliar system has resulted to statistical significant yield increases and an improvement of the overall quality of the table olives and olive oil, and it has also reduced insect and disease problems. The study will be continued for additional years comparison.

Key words: foliar fertilizer, SANOVITA, table olives, Halkidiki, Arbequina, Koroneiki

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Arthropod Biodiversity in Olive Orchards under Organic and Conventional Agricultural Farming

CHAHINE ISSA (CHAHINE ISSA)
E. Kabourakis, Ecological Production Systems Unit, Hellenic Agricultural Organisation (ELGO), Heraklion, GREECE.
A. Economopoulos, Laboratory of Applied Entomology, Department of Biology, University of Crete, Heraklion, GREECE.
E-mail: economop@uoc.gr

Abstract

Oliviculture is of great socio-cultural and economic significance for Greece, and, for decades, it has been conventionally managed. It was only in the 80s that conversion of olive cultivation to organic farming started to evolve. The olive quality is improved under organic farming, because this agricultural system, aiming to achieve sustainability, relies on ecological processes and biodiversity rather than the use of chemical inputs. For example arthropods provide a variety of ecological services within organic agriculture, such as biological control of olive pests, and nutrient recycling. Arthropods are commonly used in sustainability assessment as bioindicators of the impact of agricultural systems.

In the current study, the impact of different agricultural systems on the arthropod fauna was examined in two regions on Crete island, one of the main producers of olive in Greece: one humid near the sea coast (Kalyves, Apokoronas, Western Crete), and one less humid in Messara plain (Petrokefali). Arthropod Diversity was compared under organic, abandoned and conventional agricultural management systems. Arthropod specimens were sampled from both the soil and the canopy using a novel approach combining three different trap types, over two consecutive years. The region of Kalyves showed a higher diversity in term of species richness, while among studied taxa, Coleoptera and Araneae were identified as promising bioindicator candidates for further testing. Overall, this study provided useful indications on the responses of the major arthropod taxa present in the Cretan olive agroecosystem to organic farming.

Key words: arthropods, diversity, bioindicator
This work was conducted in the framework of a PhD study at the Department of Biology, University of Crete.

Challenges and Opportunities in the Table Olives Sector: The case study of the USA specialty retail sector

Constantinos Constantinidis

Abstract

Within the context of a changing US retail environment, the table olive sector is faced with some particular challenges. The overall consumption of table olives is

declining, though imports are remaining stable. Overall household penetration of table olives is low, which is particularly pronounced across certain demographics. The growing fragmentation of shopper loyalty across channels increases the complexity of distribution and access to market. At the same time, there are significant changes in US eating culture that both drive and result from the before mentioned changes.

Despite these challenges – or perhaps because of them – there are unprecedented opportunities, if we are able to unlock them. Table olives are aligned with many long-term trends, including a growing Specialty Foods sector and continued growing interest in exciting and international foods as well as better-for-you foods. To exploit the opportunities that are arising, the Table Olive Industry needs to focus more on the needs of underpenetrated segments and channels including:

- Millennials: the dominant buyers of Specialty Foods
- Underrepresented demographics
- Growing alternative channels (online, convenience)

Table Olives already have all the characteristics required to attract these consumers. What we need is a change in mindset from producing a commodity to creating a product offering that is engaging, relevant and accessible.

TELEOLIVA: Traceability and Big Data in the smart monitoring of the value chain to improve the overall competitiveness of the Agri-food Table Olive sector

Rafael Pleite Gutierrez, Global Olive Consulting S.L., Seville, SPAIN
E-mail: info@global-olive.es

Abstract

TELEOLIVA is an easy to use, fast and efficient system that is getting to improve quantitatively and qualitatively the process of elaboration of table olives. The system consists of an **interactive online platform and mobile app** that will allow the companies to obtain **objective**, **specific and in real time data about the different steps of their production process**. Moreover, the application of **business intelligence** technologies will result in the parameterization of the different stages, **creating process patterns** throughout the time that will allow implementing **predictive process management**, which will lead to significant economic, operational, environmental and social improvements.

For **green Spanish style olives**, the main benefits are:

- The optimal timing of collection of the fruit and the optimal timing of soda treatment it can be **objectively defined**.
- The companies can monitor the fermentation process,
- The companies **parameterize the most critical aspects** of packaging, such as color and texture and predicted the duration of the process, ahead of in the decision-making.

For **natural black olives**, the main benefits are:

- During ripening on the tree, the system measures the exterior color and interior of the olives, which allows registering the **rate of maturity before reaching the olives factory and along all the collection**.
- During the natural fermentation, the system measures the exterior color of the olives which allows predicting **the final moment of the fermentation process**, and plan for packaging and subsequent sale.
- During the packaging process, TELEOLIVA allows you to **objectively measure the color of the finished product** and define an extra so far non-existent quality parameter.
- Monitoring these parameters allows defining more clearly and objectively, **the standard of particular quality of each company**, compare between different years and places of origin of the olives as well as separating the olives in different batches, according to the requirements of different customers.
- Finally, the information recorded by the system TELEOLIVA, will **bring value to the current system of traceability of each company**, positioning it better with respect to the rest of its competitors.

Key words: TELEOLIVA, big data, traceability

Application of compositional data analysis to table olive fat

Garrido-Fernández, A. and A. López-López
Instituto de la Grasa, Campus Universitario Pablo de Olavide, Building 46, Ctra. Sevilla-Utrera, km 141013. Sevilla, SPAIN.
E-mails: garfer@cica.es and all@cica.es

Abstract

The analysis of foods relates to the determination of a series of components in a certain amount of product (e.g. mg, g, or kg). Besides, not all the compounds present in them are of interest or can be determined. These circumstances provide such data of specific characteristics. Aitchison (1986) in his book "The statistical analysis of compositional data" established that this type of figures belong to the Simplex and requires specific tools for their study. In this case, the interest is focussed not on the individual values but the relationships among them; however, such information has been traditionally, and unproperly, analysed as belonging to the Euclidean space. Over the last decades, numerous exploratory techniques have been developed for the new statistic. Among them, variance arrays, compositional biplot or dendrogram should be mentioned. When studying the transformations during table olive processing, it was evident that the data collected from their fat analyses agree with the Aitchison definition and should be treated using the new methodology. The usefulness of these techniques for the study of the fatty acid and minor component changes in table olives will be illustrated with various examples. The compositional data analysis would be satisfactorily applied to them, at least, with similar results than the conventional statistics. Particularly noteworthy is the *ilr*transformation of compositions, which changes the original data in the Simplex into *coordinates* in the Euclidean space where the new data set can then be submitted and adequately

studied with to the battery of the conventional multivariate techniques, all of them developed for this space. To notice, that the new statistic could also be applied to the diverse categories of olive oil.

Key words: Table olive, olive fat composition, multivariate analysis, compositional data analysis, *Aloreña de Málaga* DOP.

Social Media Strategy in Brand Formation – Case Study: "5"

T. Spyropoulos[1]
[1] Department of International Business, Perrotis College, Thessaloniki, GREECE

Abstract
This paper presents the role of Social Media Strategy in Brand Formation and the case study of "5", a dynamic Olive Oil Startup Brand.

Background
A wide number of Olive Oil Brands appeared in Greece the last 10 years. However few of them met long term success in the international market. The most notable examples in have been the establishment of "Ultra Premium" Brands, mainly "λ" and "5". Both brands designed and implemented an effective marketing strategy, and especially in the case of "5", the use of social media & digital marketing was a determining factor for the success of the brand.

Implementation
An analysis of the marketing strategy and the role of social media and digital marketing behind "5" were developed based on the review of the relevant bibliography on e-Commerce, Digital marketing and Startups. Campaign Goals, Results and integration with overall marketing and branding strategy is analyzed.

Outcomes and impact
The comparison between "5" case study and academic frameworks on Digital marketing and social media will be presented and discussed. The results will provide useful and practical guidance to Agricultural and Olive Oil Startup ecosystem, including entrepreneurs, business angels, venture capital companies and government policy planners. The study will highlight key success factors at different areas related to digital marketing and social media planning (targeting, segmentation integration with overall strategy) through different stages of development and provide a better understanding for Olive Oil and Agricultural Startup evaluation. Furthermore, a set of best-practices conclusions will be presented.

Lessons learned
The lessons learned from this analysis will have an impact on various stakeholders involved in Olive Oil and agricultural Startups establishment and development

(producers, business angels, entrepreneurs, venture capital companies, etc). In addition, the study will highlight key factors for further research.

Keywords**:** Social Media, Digital Marketing, Business Model Innovation, Branding, Extra Premium

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Increasing Market Share for Chalkidiki Table Olives in the US Table Olive Market

Alvestegui, A.[1], DeRosier, A.[1], Dale, C.[1], Kounininis, A.[1], Hersh, R.[1] , Elmes, M.[1], and Rotsios, K.[2]
[1] Worcester Polytechnic Institute, Worcester, MA, USA.
[2] Perrotis College, Thessaloniki, GREECE

Abstract
The objectives of this study are to a) identify and understand the factors that influence consumption of table olives in Massachusetts US, b) assist the ability of Chalkidiki olive producers/processors to meet Massachusetts Consumer preferences, and c) identify the challenges faced by Chalkidiki table olive producers/processors both domestically and abroad. To accomplish the above, mixed research methods approach was used. Based on the findings, the ideal taste of table olives is presented and new consumer segments are identified. Furthermore, the product characteristics processors can change in order to better meet the consumers' preferences are discussed. Finally, the challenges currently faced by producers/processors are presented and analyzed.

Keywords: Chalkidiki variety, Consumer purchasing habits

Analysis of fatty acids, phenols and processing residues of California-style ripe olives

Selina Wang

PhD, Research Director, UC Davis Olive Center

E-mail: scwang@ucdavis.edu

California-style ripe table olives are the most common type of table olive produced in the US. However, concentrations of fatty acids, phenolics, processing residues such as sodium benzoate and ferrous gluconate, and potential toxins such as styrene and acrylamide have been poorly studied. Styrene and acrylamide are neurotoxic compounds found in CA-style black olives as by-products of processing, although the mechanisms of formation are unclear. The goal of this project was to quantify fatty acids, antioxidant compounds, residues and toxins in commercial California-style olives and identify strategies to improve the safety and quality of these products.

Fatty acid profile was not affected processing method, as domestic black and green ripe Manzanilla olives showed no difference in their fatty acid profiles. Oleic acid was the primary fatty acid present in all the studies samples. Green ripe olives contained higher phenolics and α-toocpherol than black ripe olives, possibly due to elimination of air bubbling and reduced oxidation during processing. All commercial samples except one imported product were below legal limits for processing aids. Imported products had significantly higher levels of styrene compared with domestic products. Green ripe olives had no detectable styrene and lower acrylamide concentrations compared with black products. The results of this study not only showed the potential health benefits of California-style ripe table olives from fatty acids and phenolics and but guided future research into eliminating mechanisms for these neurotoxins.

Keywords: California-style ripe olives, phenolics, fatty acids

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Poster session

The olive fruit fly microbiome: Advantage or Achilles' heel?

Maria Kalyva[1], Frances Blow[2], Ioannis Iliopoulos[1] and Anastasia Gioti[1,3].
[1] Department of Medicine, University of Crete, Heraklion, GREECE.
[2] Department of Entomology, Cornell University, Ithaca, NY, USA.
[3] Bioinformatics Lab, Perrotis College, American Farm School, Thessaloniki, GREECE.

Abstract

Olives represent the most important Greek agricultural product, accounting for over US$700 million in export value. The fruit fly *Bactrocera oleae* is a major olive pest, infesting up to 40% of Greek olive trees. The insect's larvae feed within the fruit and render it vulnerable to secondary infections, leading to a severe deterioration of the final product. Currently, US$35 million p.a. is spent on pesticides that only temporarily limit the *B. oleae* populations. Most importantly, the insect's larvae have the unique ability to develop within unripe olives, resulting in fully damaged annual crops.

The ability to survive and develop in the hostile environment of the unripe olive, where nutrient availability is poor, can be achieved through adaptations of metabolic behavior. The latter is directly affected by bacteria residing in the insect gut, which can be difficult to study due to our inability to grow them outside of the insect host. Next Generation Sequencing (NGS) technologies now allow studying the metabolic interactions between host and bacteria *in situ*.

In this study, we examine the native gut microbiota of *B. oleae*, focusing on the most abundant bacterium: *Erwiniadacicola*is an unculturable, co-evolved symbiont of the olive fruit fly, without which the pest is unable to develop within the unripe olives. The genome of *E. dacicola* was previously reconstructed from NGS sequencing and

bioinformatic analyses of gut samples. Here, transcriptomic data and phylogenetic analyses were used to study the bacterial pathway of nitrogen breakdown, based on the hypothesis that this pathway may provide *B. oleae* with a selective advantage: Recycling of the pest's waste products into essential amino acids can support larval development. This work will lead to a better understanding of the symbiosis and potentially provide avenues for specific targeting of the olive pest at the early stages of infestation.

Keywords: microbiome, olive fruit fly, NGS, symbiosis, metabolic interactions

Περίληψη

Οι ελιές αντιπροσωπεύουν ένα από τα πιο σημαντικά ελληνικά γεωργικά προϊόντα, με εξαγωγές άνω των $700 εκατομμυρίων. Ο δάκος, ή *Bactrocera oleae*, αποτελεί το πιο επιβλαβές παράσιτο της ελιάς, προσβάλλοντας έως και 40% των ελαιόδεντρων στην Ελλάδα. Οι προνύμφες του εντόμου βλάπτουν άμεσα τον καρπό, καθώς αναπτύσσονται μέσα σε αυτόν, ενώ τον καθιστούν ευάλωτο σε δευτερογενείς μολύνσεις, οδηγώντας έτσι σε σοβαρή υποβάθμιση του τελικού προϊόντος. Μέχρι στιγμής δεν έχει βρεθεί αποτελεσματικός τρόπος καταπολέμησης: $35 εκατομμύρια δαπανούνται ετησίως σε εντομοκτόνα, τα οποία περιορίζουν προσωρινά τους πληθυσμούς του παρασίτου.

Οι προνύμφες του δάκου έχουν τη μοναδική ικανότητα να αναπτύσσονται σε άγουρες ελιές, καταστρέφοντας πρώιμα και πλήρως την παραγωγή. Η επιβίωση στο εχθρικό αυτό περιβάλλον, όπου η διαθεσιμότητα θρεπτικών ουσιών είναι περιορισμένη, μπορεί να επιτευχθεί μέσω προσαρμογών στον μεταβολισμό του εντόμου. Η μικροβιακή κοινότητα του εντέρου συμμετέχει ενεργά στο μεταβολισμό, αλλά γνωρίζουμε ελάχιστα για αυτήν: Η καλλιέργεια των μικροβίων αυτών εκτός του εντόμου-ξενιστή είναι δύσκολη/αδύνατη. Οι τεχνολογίες αλληλούχισης νέας γενιάς (NGS), επιτρέπουν πλέον την *insitu* διερεύνηση των μεταβολικών αλληλεπιδράσεων μικροβίων-εντόμου σε μοριακό επίπεδο.

Σε αυτή τη μελέτη, εξετάζουμε το μικροβίωμα του εντέρου του δάκου, εστιάζοντας στον υποχρεωτικό συμβιώτη *Erwiniadacicola*: Πρόκειται για το πιο άφθονο βακτήριο του εντέρου, χωρίς το οποίο οι προνύμφες δεν αναπτύσσονται στις άγουρες ελιές. Προηγουμένως, ανασυστήσαμε, με βιοπληροφορικές μεθόδους, το πλήρες γονιδίωμα του βακτηρίου από δείγματα εντέρου που αλληλουχίσαμε με τεχνολογίες NGS. Εδώ, παρουσιάζουμε το χαρακτηρισμό του γονιδιώματος: Χρησιμοποιήσαμε φυλογενετικές αναλύσεις και δεδομένα έκφρασης γονιδίων ώστε να μελετήσουμε το βακτηριακό μονοπάτι διάσπασης του αζώτου. Η υπόθεση εργασίας μας είναι ότι το μονοπάτι αυτό προσδίδει στον δάκο αρμοστικό πλεονέκτημα, επιτρέποντας την ανακύκλωση προϊόντων του καταβολισμού του σε απαραίτητα αμινοξέα για την ανάπτυξη των προνυμφών. Η μελέτη μας θα οδηγήσει στην κατανόηση της συμβίωσης και θα παράσχει εργαλεία για την καταπολέμηση του δάκου από τα πρώτα στάδια της προσβολής.

Are Wastewaters Generated from Table Olive Factories of Agronomic Interest?

Romero, C. [1], B. de los Santos[2] , A. de Castro[1] , E. Medina[1] , A. Aguado[2] , P. García[1], A. Expósito[1] and M. Brenes[1]

[1] Instituto de la Grasa (IG-CSIC), Building 46, Ctra.Utrera km1, 41013 Seville, SPAIN

[2] Centro IFAPA Las Torres-Tomejil (CAP-JA). Apartado de Correos Oficial.41200-Alcalá del Río (Seville), SPAIN

E-mails: c.romero@csic.es, berta.santos@juntadeandalucia.es, amillan@cica.es, emedina@ig.csic.es, ana.aguado@juntadeandalucia.es, pedrog@cica.es, aexposito@ig.csic.es and brenes@cica.es

Abstract

Table olive factories generate a large amount of wastewaters with a very different chemical composition. In the last decades, an enormous economic and technological effort has been employed, but this problem remains unresolved. Among all these solutions, the wash waters from Spanish-style green olive processing and the acidified storage solutions from black ripe olives contain a high organic contamination. However, their use as bactericidal or fungicidal solution against plant pathogens and as growth promoting substance in tomato plants has recently been demonstrated. The objective of this study is the utilization of those table olive solutions for agriculture purposes. It was evaluated the biofortifying and biofungicide capacity of these table olive solutions on four Mediterranean cultivars: strawberry, tomato, cucumber and pepper. The solutions were concentrated by vacuum evaporation and their chemical composition was analyzed. Also, the antimicrobial capacity against “Phytophthora spp., Botrytis cinerea, Fusarium solani and Macrophominaphaseolina” was evaluated “in vitro”. The concentrates were tested in greenhouse and in the field during three years. Results have shown that these solutions contain a high concentration of sugars (17-85 mM), polyphenolic compounds (10-22 mM), antimicrobial compounds (0.29-3.44 mM) and minerals of interest (C, N, K, P). The concentrates have large antimicrobial capacity against Phythophthora and a more limited effect was found against Botrytis cinerea. No phytotoxic effect was detected on any of the tested plants. In addition, there was a large biofortifying effect on tomato plants. Strawberry data indicated that the flowers and fruits per plant and the early production were better in the treated than in the control plants. There were not conclusions with cucumber and pepper results. In resume, the washwater solution of the Spanish-style green olives and the acidified storage liquids of black ripe olives processing could be employed as natural biostimulant and fungicide in substitution of synthetic products.

Keywords: table olives, wastewaters, Mediterranean cultivar, biofertilizer, natural fungicide, chemical stability Acknowledgements: This work was supported by grant P12-AGR-1123 from Junta de Andalucía and the European Union FEDER funds.

"Kothreiki" an underutilized olive tree cultivar with risen nutrition value

Georgios Zakynthinos[1]*and Alexandros Papachatzs[2]

[1] Food Technology Department, Agricultural Technology and Food Technology and Nutrition School, Higher Educational Institute of Peloponnese. Antikalamos Kalamata, 24100 GREECE.
[2] Agricultural Technology Department, Agricultural Technology and Food Technology and Nutrition School, Higher Educational Institute of Thessaly. Larissa, 41110 GREECE.
*correspondence author

Abstract

The olive tree cultivar "Kothreiki" having various names around of olive culturing areas in Greece is grown to produce good quality oil and to produce black canned olives. It is estimated to produce edible black olives in areas where Conservolia cultivar does not thrive. It is a variety resistant to drought, winds and cold, and can be grown at an altitude of 900 m. In a three years study were estimated the oil containing, total phenols and the profile of fatty acids. Fruits samples were received from olive orchards at definite timely periods of fruits growth. According to results were noted the important level of total phenols reaching the 575mgGAE/L at harvest time in the middle of December every year of three years study. Also, we were found a high and unusual level of palmitoleic acid (ω-7). The amount of 3,5% (per 100gr of total fatty acids) of this unsaturated fatty acid is a serious case for production olive oil for health protection aim. In bibliography palmitoleic acid has been shown to have important metabolic activities that improve whole-body glucose homeostasis and insulin sensitivity. Our investigation, of the profile of fatty acids by combination of total phenols level in this variety, where is basically existed as population around of Greece is continuing and we are concerning the production of one olive oil for the diabetes patients.

"Κοθρέϊκη" μια λιγότερο χρησιμοποιούμενη ποικιλία ελιάς με αυξημένη διατροφική αξία

Γεώργιος Ζακυνθινός[1*] και Αλέξανδρος Παπαχατζής[2]
[1] Τμήμα Τεχνολογίας Τροφίμων, Σχολή Τεχνολογίας Γεωπονίας και Τεχνολογίας Τροφίμων και Διατροφής, Ανώτατο Εκπαιδευτικό Ίδρυμα Πελοποννήσου. Αντικαλάμου Καλαμάτας, 24100 ΕΛΛΑΔΑ.
[2] Τμήμα Τεχνολογίας Γεωπονίας, Σχολή Τεχνολογίας Γεωπονίας και Τεχνολογίας Τροφίμων και Διαιτολογίας & Διατροφής, Ανώτατο Εκπαιδευτικό Ίδρυμα Θεσσαλίας. Λάρισα, 41110 ΕΛΛΑΔΑ.
[*]συγγραφέας σε επικοινωνία

Περίληψη

Η ποικιλία «Κοθρέϊκη» που έχει διάφορα ονόματα στις περιοχές ελαιοκαλλιέργειας στην Ελλάδα καλλιεργείται για την παραγωγή ελαιολάδου καλής ποιότητας και για την παραγωγή μαύρων κονσερβοποιημένων ελιών. Η ποικιλία εκτιμάται για το ότι παράγει μαύρες επιτραπέζιες ελιές σε περιοχές όπου η ποικιλία «Κονσερβολιά» δεν ευδοκιμεί. Είναι μια ποικιλία ανθεκτική στην ξηρασία, τους ανέμους και το κρύο, και μπορεί να καλλιεργηθεί σε υψόμετρο 900 μ. Σε μια μελέτη τριών ετών εκτιμήθηκε το έλαιο που περιέχει, οι ολικές φαινόλες και το προφίλ των λιπαρών οξέων. Δείγματα καρπών ελήφθησαν από ελαιώνες σε καθορισμένες χρονικές περιόδους κατά την περίοδο ανάπτυξης των καρπών. Σύμφωνα με τα αποτελέσματα

σημειώθηκε ένα σημαντικό επίπεδο συνολικών φαινολών που έφθασαν στα 575mgGAE / L κατά το χρόνο συγκομιδής στα μέσα Δεκεμβρίου κάθε έτους της τριετούς μελέτης. Επίσης, βρήκαμε ένα υψηλό και ασυνήθιστο επίπεδο παλμιτελαϊκού οξέως (ω-7). Η ποσότητα 3,5% (ανά 100gr ολικών λιπαρών οξέων) αυτού του ακόρεστου λιπαρού οξέος αποτελεί σοβαρή περίπτωση παραγωγής ελαιολάδου για την προστασία της υγείας. Στη βιβλιογραφία, το παλμιτελαϊκό οξύ έχει φανεί ότι έχει σημαντικές μεταβολικές δράσεις που βελτιώνουν την ομοιόσταση της γλυκόζης ολόκληρου του σώματος και την ευαισθησία στην ινσουλίνη Η έρευνά μας για το προφίλ των λιπαρών οξέων σε αυτή την ποικιλία όπου, υπάρχει ουσιαστικά ως πληθυσμός, σε όλη την Ελλάδα και σε συνδυασμό με την περιεκτικότητας της σε ολικές φαινόλες συνεχίζεται και αφορά στην παραγωγή ενός ελαιολάδου για ασθενείς με διαβήτη.

Cases

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