UNIVERSITI PUTRA MALAYSIA

NANOEMULSION FORMULATION OF Vernonia amygdalina Delile AGAINST Botrytis cinerea CAUSING GRAY MOLD DISEASE IN TOMATO AND THEIR EFFECTS ON POSTHARVEST QUALITY

SITI FAIRUZ BINTI YUSOFF

FP 2022 43

NANOEMULSION FORMULATION OF *Vernonia amygdalina* Delile AGAINST *Botrytis cinerea* CAUSING GRAY MOLD DISEASE IN TOMATO AND THEIR EFFECTS ON POSTHARVEST QUALITY

By

SITI FAIRUZ BINTI YUSOFF

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

April 2022

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

NANOEMULSION FORMULATION OF *Vernonia amygdalina* Delile AGAINST *Botrytis cinerea* CAUSING GRAY MOLD DISEASE IN TOMATO AND THEIR EFFECTS ON POSTHARVEST QUALITY

By

SITI FAIRUZ BINTI YUSOFF

April 2022

Chair : Siti Izera Ismail, PhD
Faculty : Agriculture

Gray mold disease caused by *Botrytis cinerea* is one of the significant postharvest losses mostly observed during tomato storage and transportation. Synthetic fungicide is currently used to control this disease, but it poses adverse effects to human health, environment, and development of resistance to synthetic fungicides. *V. amygdalina* extract showed antifungal activity which could be a sustainable tool as biofungicide for plant disease management. The present study aimed to screen phytochemical compounds in *V. amygdalina* leaf extract, develop nanoemulsion formulations containing *V. amygdalina* crude extract, evaluate antifungal activities of nanoemulsions against *B. cinerea* and preserve postharvest quality. Ten fungal isolates were obtained from symptomatic tomato fruits sampled from Cameron Highlands, Pahang, Malaysia. Fungal colonies on PDA appeared cottony and white to gray color. Conidia were ovoid in shape, hyaline, and measured 10.03-16.08 × 7.37-11.15 µm. To confirm molecular identification, the primer pair ITS4/ITS5 of rDNA was used for amplification and sequencing of isolates. The sequences with GenBank accession MT012053-MT012062 were the closest match to *Botrytis cinerea* with query coverage was 98-99%. Based on pathogenicity assay, the isolates indicated highly pathogenic with the maximum disease severity was 90% (Isolate MT012058). *In vitro* test showed leaf extracts of aqueous, hexane, dichloromethane (DCM) and methanol at 100-500 mg/mL were significantly inhibited mycelial growth of *B. cinerea*. DCM was the most effective, which inhibited up to 75.74% of the mycelial growth of *B. cinerea*. The top major chemical compounds identified in DCM extract using GC-MS analysis were squalene, phytol, triacontane, heptacosane, and neophytadiene. For *in vivo* bioassay, the fruits treated with dichloromethane extract at 400 and 500 mg/mL showed the lowest disease incidence with mild severity of infection. The SEM observation proved that the treatment altered the fungal morphology, which leads to fungal growth inhibition. The nanoemulsion system containing oil, water and surfactant was obtained using spontaneous emulsification technique by employing four surfactants. From eight selected formulations, two formulations, F5 and F7 showed stability in storage, remarkable thermodynamic stability, small-sized droplet (66.44 and 139.63 nm), highly stable in zeta potential (−32.70 and −31.70 mV), low in polydispersity index (0.41 and 0.40 PdI), low in viscosity (4.20 and 4.37 cP) and low in surface tension (27.62 and 26.41 mN/m) compared to other formulations. *In vivo* efficacy on tomato fruits showed F5 formulation had a fungicidal activity against *B. cinerea* with zero disease incidence and severity, whereas F7 formulation reduced 62.5% disease incidence compared to a positive control with scale 1. F5 and F7 nanoemulsions exhibited higher enzyme activities of PAL, POD, and SOD compared to benomyl and control fruits. Meanwhile, F5 nanoemulsion triggered significantly higher PPO and CAT activities compared to F7 nanoemulsion. F5 nanoemulsion showed delays in fruit maturity, minimal weight loss, slower changes in firmness, TA, SSC and pH, retained the vitamin C content, fair in phenolic content and execute high antioxidant activities. In conclusion, F5 nanoemulsion has a fungicidal effect on *B. cinerea*, induces higher defense-enzymes activities, and gives optimum postharvest quality in tomato. Thus, F5 nanoemulsion containing *V. amygdalina* leaf extract could be useful for inhibiting gray mold disease on tomato fruit and has the potential as a natural antifungal agent.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

FORMULASI NANOEMULSI *Vernonia amygdalina* Delile TERHADAP *Botrytis cinerea* YANG MENYEBABKAN PENYAKIT KULAT KELABU DALAM TOMATO DAN KESANNYA KE ATAS KUALITI LEPAS TUAI

Oleh

SITI FAIRUZ BINTI YUSOFF

April 2022

Pengerusi : Siti Izera Ismail, PhD
Fakulti : Pertanian

Penyakit kulat kelabu yang disebabkan oleh *Botrytis cinerea* adalah satu kehilangan lepas tuai ketara yang sering diperhatikan semasa penyimpanan dan pengangkutan tomato. Racun kulat sintetik sering digunakan untuk mengawal penyakit ini tetapi ia menimbulkan kesan buruk terhadap kesihatan manusia, persekitaran, dan meningkatkan kerintangan terhadap racun sintetik. Ekstrak *V. amygdalina* menunjukkan aktiviti antikulat yang boleh menjadi alat mampan sebagai biofungisida untuk pengurusan penyakit tumbuhan. Kajian ini bertujuan untuk menyaring sebatian fitokimia dalam ekstrak daun *V. amygdalina*, membangunkan formulasi nanoemulsi yang mengandungi ekstrak mentah *V. amygdalina*, menilai aktiviti antikulat nanoemulsi terhadap *B. cinerea* dan memelihara kualiti lepas tuai. Sepuluh pencilan kulat telah diperolehi daripada buah tomato bergejala yang diambil dari Cameron Highlands, Pahang, Malaysia. Koloni kulat pada PDA kelihatan seperti kapas dan berwarna putih ke kelabu. Konidia berbentuk ovoid, hialin, dan berukuran 10.03-16.08 × 7.37-11.15 µm. Untuk mengesahkan identifikasi molekular, pasangan primer ITS4/ITS5 dari rDNA digunakan untuk amplifikasi dan penjujukan pencilan. Jujukan dengan GenBank aksesi MT012053-MT012062 adalah berpadanan paling hampir dengan *Botrytis cinerea* dengan liputan kuiri adalah 98-99%. Berdasarkan ujian patogenik, pencilan menunjukkan patogenik sangat tinggi dengan keparahan penyakit maksimum iaitu 90% (Pencilan MT012058). Ujian *in vitro* menunjukkan ekstrak daun akueus, heksana, diklorometana (DCM) dan metanol pada 100-500 mg/mL telah menghalang pertumbuhan miselia *B. cinerea* dengan ketara. DCM adalah yang paling berkesan menghalang pertumbuhan miselia *B. cinerea* sehingga 75.74%. Sebatian kimia utama teratas yang dikenal pasti dalam ekstrak DCM menggunakan analisis GC-MS ialah squalena, fitol, triakontana, heptakosana, dan neofitadina. Untuk ujian bio *in vivo*, buah yang dirawat dengan ekstrak diklorometana pada 400 dan 500 mg/mL menunjukkan kejadian penyakit yang paling rendah dengan keterukan jangkitan yang ringan. Pemerhatian SEM membuktikan bahawa rawatan telah mengubah morfologi kulat, yang membawa kepada perencatan pertumbuhan kulat. Sistem nanoemulsi yang mengandungi minyak, air dan surfaktan diperoleh menggunakan teknik pengemulsi spontan dengan menggunakan empat surfaktan. Daripada lapan formulasi terpilih, dua formulasi, F5 dan F7 menunjukkan stabil dalam simpanan, kestabilan termodinamik yang luar biasa, titisan bersaiz kecil (66.44 dan 139.63 nm), sangat stabil dalam potensi zeta (-32.70 dan -31.70 mV), rendah dalam indeks polidispersiti (0.41 dan 0.40 PdI), kelikatan rendah (4.20 dan 4.37 cP) dan tegangan permukaan rendah (27.62 dan 26.41 mN/m) berbanding formulasi lain. Keberkesanan *in vivo* pada buah tomato menunjukkan formulasi F5 mempunyai aktiviti racun kulat terhadap *B. cinerea* dengan sifar kejadian dan keterukan penyakit, manakala formulasi F7 mengurangkan 62.5% kejadian penyakit berbanding kawalan positif dengan skala 1. Nano-emulsi F5 dan F7 menunjukkan lebih tinggi aktiviti enzim PAL, POD, dan SOD berbanding dengan buah benomil dan kawalan. Sementara itu, nanoemulsi F5 mencetuskan aktiviti PPO dan CAT yang lebih tinggi berbanding nanoemulsi F7. Nanoemulsi F5 menunjukkan kelewatan dalam kematangan buah, penurunan berat minimum, perubahan keanjalan, TA, SSC dan pH yang lebih lambat, mengekalkan kandungan vitamin C, kandungan fenolik yang baik dan menunjukkan aktiviti antioksida yang tinggi. Kesimpulannya, nanoemulsi F5 mempunyai kesan fungisida ke atas *B. cinerea*, mendorong aktiviti enzim pertahanan yang lebih tinggi dan memberikan kualiti lepas tuai yang optimum tomato. Oleh itu, nanoemulsi F5 yang mengandungi ekstrak daun *V. amygdalina* berguna untuk menghalang penyakit kulat kelabu pada buah tomato dan berpotensi sebagai agen antikulat semulajadi.

ACKNOWLEDGEMENTS

Alhamdulillah, I am very grateful for this wonderful journey. I am indebted and grateful especially to Dr. Siti Izera Ismail, Dr. Farah Farhanah Harun and Prof. Dr. Mahmud Tengku Muda Mohamed for their great supervision and support, invaluable guidance, tireless advice, constructive comments, and patience throughout my study. All of you are really inspired me to be a successful lecturer, proactive researcher and good academic writer. Then, I would like to acknowledge SLAB, Ministry of Higher Education Malaysia, for awarding scholarship sponsor to complete this study. My sincere gratitude goes to the Human Resource and Faculty of Technical and Vocational, UPSI to give me a full-time study leave with allowance. It is an utmost pleasure to thank my laboratory colleagues (Safari, Indah, Mazumder, Sirah, Rohasmizah, Ainnur, Shahara and Waziri) and PG roommates for their friendship, support and ideas that make my PhD journey very enjoyable. I am delighted and grateful to know all of you. To my lovely circles (Cik Mai, Pika Conco and Jimah), thank you for always being there for me, especially during my late pregnancy, giving me endless support, and those beautiful moments that we have spent together. Last but not least, my most profound appreciation to my husband (Zulkefli Abdullah) for his sacrifice, care, love and ongoing support. Also, I am blessed to have a little princess (Zara Aisyah) in May 2021 after 12 years of waiting. This success would not have been realized without my Happy Family Members (Father: Hj. Yusoff; Siblings: Dr. Zabri, Zanariah, Zainura, Zakiah, Shahrum Nizam, and Siti Noor Adila; In-laws and also my lovely nephews and nieces). Million thanks for your trust, sincere love, continuous encouragement and financial support.
Al-fatihah to my late mother, Hajah Remlah Derahman.

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

Siti Izera binti Ismail, PhD
Senior Lecturer
Faculty of Agriculture
Universiti Putra Malaysia
(Chairman)

Norhayu binti Asib, PhD
Senior lecturer, Ts.
Faculty of Agriculture
Universiti Putra Malaysia
(Member)

Siti Zaharah binti Sakimin, PhD
Associate Professor
Faculty of Agriculture
Universiti Putra Malaysia
(Member)

Farah Farhanah binti Haron, PhD
Deputy Director
Biological Control Programme
Agrobiodiversity & Environment Research Centre
Malaysian Agricultural Research and Development Institute (MARDI)
(Member)

ZALILAH MOHD SHARIFF, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 11 August 2022

Declaration by Members of Supervisory Committee

This is to confirm that:

- the research and the writing of this thesis were done under our supervision;
- supervisory responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2015-2016) are adhered to.

Signature: ______________________________
Name of Chairman of Supervisory Committee: Siti Izera binti Ismail,

Signature: ______________________________
Name of Member of Supervisory Committee: Norhayu binti Asib

Signature: ______________________________
Name of Member of Supervisory Committee: Siti Zaharah binti Sakimin

Signature: ______________________________
Name of Member of Supervisory Committee: Farah Farhanah binti Haron

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

%	percent
<	less than
>	greater than
≤	less than equal
°C	degree celcius
µM TE/g FW	micromolar Trolox Equivalent per gram fresh weight
a.i	active ingredient
ABTS	2, 2-azino-bis (3-ethylbenzthiazoline- 6-sulfonic acid
ACQ	acquisition
ANOVA	analysis of variance
ATP	adenosine triphosphate
BCA	biological control agent
BLAST	basic local alignment search tool
bp	base pair
BSA	bovine serum albumin
$C_2H_3NaO_2 . 3H_2O$	sodium acetate anhydrous
$C_2H_4O_2$	acetic acid
CA	control atmosphere
CAT	catalase
CE	crude extract
CFB	corrugated fiber board
CL	concentration levels
cm	centimeter
CO_2	carbon dioxide
cP	centipoise
CRD	completely randomized design
CS	capsule suspension
DCM	dichloromethane
DNA	deoxyribonucleic acid
dNTPs	deoxyribonucleotide triphosphate
DOA	Department of Agriculture

DP	dust powder
DPPH	2,2-diphenyl-1-picrylhydrazyl
DS	dressing seed
DSI	disease severity index
DVLE	DCM *V. amygdalina* leaf extract
EDTA	ethylenediaminetetraacetic acid
EIP	emulsion inversion point
ESI	electrospray ionization
FAO	Food Agriculture Organization
FDA	Food and Drug Administration
$FeCl_3.6H_2O$	iron trichloride hexahydrate
FRAP	ferric reducing antioxidant power
FT	formulation types
g	gram
g/kg	gram per kilogram
g/L	gram per liter
GCMS	Gas Chromatography-Mass Spectrometry
GR	granule
GRAS	generally recognized as safe
h	hour
H_2O	water
H_2O_2	hydrogen peroxide
hai	hour after inoculation
HCl	hydrochloric acid
HLB	hydrophilic-lipophilic balance
HPLC	High Performance Liquid Chromatography
HR	hypersensitive response
ITS	Internal Transcribed Spacer
IUPAC	International Union of Pure and Applied Chemistry
JA	jasmonic acid
K+	potassium ion
kb	kilobyte
kg	kilogram

KJ m^{-2}	kilojoule per square meter
kPa	kilopascal
kV	kilovolt
L	Liter
LC	liquid Chromatography
LCMS	Liquid Chromatography-Mass Spectrometry
LSD	Least significant difference
M	Molar
m/s	meter per second
m/z	mass-to-charge ratio
MA	modified atmosphere
MAE	microwave-assisted extraction
MeJA	methyl jasmonic acid
mg	milligram
MG	micro granules
mg/kg	milligram per kilogram
mg/kg/day	milligram per kilogram per day
mg/mL	milligram per mililiter
$MgCl_2$	magnesium chloride
MgSO4	magnesium sulphate
MI	maturity index
min	minute
mL	mililiter
mL/min	mililiter per minute
mm	milimeter
mM	millimolar
mN/m	millinewton per meter
mPa.S	millipascal per second
MPWL	maximum permissible weight loss
MS	mass spectrometer
mV	millivolt
MΩ.cm	megohm centimeter
N	newton

NADPH	nicotinamide adenine dinucleotide phosphate
NaOH	sodium hydroxide
NCBI	National Center for Biotechnology Information
nm	nanometer
O/W	oil-in-water
O_2	oxygen
OD	oil dispersion
p	probability
PAL	phenylalanine ammonia-lyase
PCR	polymerase chain reaction
PDA	potato dextrose agar
pdI	polydispersity index
PIC	phase inversion composition
PIRG	percentage inhibition of radial growth
PIT	phase inversion temperature
POD	peroxidase
PPO	polyphenol oxidase
psi	pound per square inch
PVPP	polyvinylpolypyrrolidone
QTOF	Quadrupole time-of-flight
R^2	R square
rDNA	ribosomal DNA
RH	relative humidity
ROS	reactive oxygen species
rpm	revolutions per minute
s	second
SA	salicylic acid
SAS	statistical analysis system
SC	suspension concentrate
SD	storage duration
SE	suspo-emulsion
SEM	scanning electron microscopy
SOD	superoxide dismutase

sp.	species
SSC	soluble solids concentration
TA	titratable acidity
TBE	tris-borate-EDTA
TPC	total phenolic content
TPTZ	2, 4, 6- tripyridyl-s-triazine
u/mg	unit per milligram
U/µL	unit per microliter
UV	ultraviolet
UV-C	ultraviolet-C
UV-VIS	UV–visible spectrophotometry
v/v	volume per volume
v/v/v	volume per volume per volume
w/kg	watt per kilogram
W/O	water-in-oil
w/v	weight per volume
w/w	weight per weight
WG	water-dispersible granules
WP	wettable powder
µg/mL	microgram per milliliter
µL	microliter
µm	micrometer
µM	micromolar

CHAPTER 1

INTRODUCTION

Tomato is a Solanaceae family member and is extensively cultivated as an annual vegetable crop worldwide, either in the greenhouse or in the open-field system. The global tomato industry for both fresh and processed has sharply increased in the past five decades (Heuvelink, 2018). FAO (2021) revealed that in 2019, Asia dominates world tomato production up to 62.02%, followed by the Americas (13.16%), Europe (12.62%), Africa (11.98%), and Oceania (0.23%). Tomatoes in Malaysia are the second highest vegetable production value after brassica and the largest planted area is in Cameron Highland (DOA, 2019). Among the tomato type, the classic round is the most popular variety that is consumed in salad, soup, grilling, baking and sauces (Heuvelink, 2018). Besides that, the tomato provides significant antioxidants such as lycopene, carotenoid, vitamins and phenolic compounds that are beneficial to human health (Salehi et al., 2019).

Botrytis cinerea is an air-borne plant pathogenic fungus with a necrotrophic lifestyle that can infect dicotyledonous plant species, including tomato. Subjected to scientific and economic importance, *B. cinerea* was ranked as the second top plant pathogen in the world (Dean et al., 2012). *B. cinerea* infection is considered the primary pathogen of harvested tomatoes. *B. cinerea* causes gray mold in fruit, affects vegetative tissues, postharvest decay, or remains latent until storage.

Spore germination of this pathogen grows vigorously in higher relative humidity and low temperature (Leyronas et al., 2015). Thus, in cold storage, it leads to the development of gray mold symptoms, and this disease spreads rapidly among fruits in the same packaging. Multiple applications of chemical fungicides are made per season to control gray mold on tomato fruits, but the repeated used of synthetic fungicide can develop fungal resistance and be harmful to consumer health. *Botrytis* species can develop resistance to multiple modes of action. A few modes of action from a new fungicide provide adequate protection for fresh tomatoes (Siviero et al., 2003). However, the residue and toxicity concerns may limit their use.

Among the postharvest strategies in controlling plant diseases, natural products offer a promising treatment to reduce the disease incidence of postharvest diseases. Natural products from plant-based contain advanced chemical novelty compared to chemically synthesized products, and for this reason, researchers try to discover new bioactive compounds in plants (Ma et al., 2015). Plant extracts also contain beneficial secondary metabolites such as phenolics, tannins, coumarins, quinones, flavonoids, saponins, terpenoids, and alkaloids. These compounds have been proven to be potentially significant in plant protection as antimicrobial agents (Compean and Ynalvez, 2014). Many studies have been conducted using plant extracts to control *B. cinerea* pathogen causing gray mold disease. Soylu et al. (2010) reported that essential oils extracted from rosemary and lavender could cause hyphae shriveled, protoplast leakage, conidia loss, and cytoplasmic coagulated on the morphology of *B. cinerea*. The extracted essential oil of fennel, cinnamon, and anis also showed fungicidal effects on *B. cinerea* during *in vitro* and *in vivo* tests (Mohammadi et al., 2012). Moreover, the extraction of oregano and lemon effectively lowered the disease severity of gray mold disease in tomatoes, strawberries, and cucumbers (Vitoratos et al., 2013). In recent findings, stilbene extracted from grapevine leaves possessed antifungal activity of *B. cinerea* by inhibiting the mycelium growth and simultaneously reducing the necrotic lesion (De Bona et al., 2019).

Bitter leaf is scientifically known as *Vernonia amygdalina*. In Africa and Asia, it is commonly used as a medicinal plant (Alara et al., 2017). Various parts of *V. amygdalina,* including the leaf, root, and stem, have been used for their antidiabetic, antioxidant, antimicrobial, anticancer, anti-inflammatory, and antiplasmodial effects (Kadiri and Olawoye, 2016). Among the plant parts, researchers identified that the leaf part contains the highest chemical constituents and nutritional compositions (Toyang and Verpoorte, 2013). Detailed investigations in the compound purification of *V. amygdalina* extract discovered many promising active compounds; for example, flavonoids, triterpenoids, saponins, tannins, sesquiterpene lactones, alkaloids, terpenes, phenolics, and steroidal glycosides (Alara et al., 2017). According to Akowuah et al. (2015), the extract from *V. amygdalina* was non-toxic in mice when exposed to up to 2000 mg/kg/day for 28 days.

To date, most researchers have focused on *V. amygdalina* crude extract in order to uncover its potential as an antifungal agent for the management of plant disease. Recent findings found that *V. amygdalina* ethanol extracts showed a good ability to inhibit postharvest fungal pathogens *Rhizopus stolonifer* and *Fusarium moniliforme* (John et al., 2016; Okey et al., 2016). In another study, an *in vitro* test using an ethanol crude extract of *V. amygdalina* at 300 mg/mL were completely inhibited the growth of *Cercosporella persica* and *Curvularia lunatus* obtained from leafspot disease of ground nut (Ilondu, 2013).

The active ingredient in this precious medicinal plant should be innovated and upgraded into an efficient plant-based biopesticide to compete with the synthetic pesticides in the current market. Thus, the formulation should be reliable in terms of handling, storage life, and competency (Asib et al., 2015). Nowadays, nanotechnology in biopesticides is getting attention due to outstanding characteristics, including smaller droplet size that is efficient in delivery target, good in stability in varied storage temperature, low surface tension to allow them to stick better and widely spread on the target (Fakari and Nezamzadeh-Ejhieh, 2017; Mukhopadhyay, 2014). Besides this, technology also could decrease their quantity use and be non-toxic to the ecosystem as well as human health (Khandelwal et al., 2016).

Up to now, there is no comprehensive study on the effects of fungicide formulation from *V. amygdalina* extract on gray mold disease control in tomato at postharvest and their application effects on postharvest quality, antioxidants and changes of resistance mechanism of the fruits. Therefore, the general research aimed was to develop nanoemulsion formulation of *V. amygdalina* crude extract on gray mold disease control in tomato and their effects on the changes of postharvest physicochemical quality of fruits during storage. The specific objectives were:

1. to isolate and identify *Botrytis cinerea* isolates causing gray mold disease on tomato based on morphological and molecular characteristics;
2. to evaluate antifungal activities of *V. amygdalina* leaf extracts against *B. cinerea* and to screen the phytochemical compounds in the crude extracts;
3. to formulate and characterize nanoemulsion formulation of *V. amygdalina* leaf extract;
4. to evaluate the *in vivo* efficacy of *V. amygdalina* nanoemulsion formulation in controlling gray mold disease on tomato fruits and their effects on host defense-related enzymes activities; and
5. to determine the effect of *V. amygdalina* nanoemulsion formulation on the postharvest quality and antioxidants of tomato during storage.

REFERENCES

Aadesariya, M. K., Ram, V. R., & Dave, P. N. (2017). Evaluation of antioxidant activities by use of various extracts from *Abutilon pannosum* and *Grewia tenax* in the Kachchh Region. *MOJ Food Process and Technology*, *5*(1), 216-230. https://doi.org/10.15406/mojfpt.2017.05.00116

Abbey, J. A., Percival, D., Abbey, L., Asiedu, S. K., Prithiviraj, B., & Schilder, A. (2018). Biofungicides as alternative to synthetic fungicide control of grey mould (*Botrytis cinerea*) – Prospects and challenges. *Biocontrol Science and Technology*, *29*(3), 207-228. https://doi.org/10.1080/09583157.2018.1548574

Abdelhai, M. H., Zhang, Q., Zhao, L., Komla Mahunu, G., Musa, A., Yang, Q., Adwoa Serwah, N., & Zhang, H. (2019). Effects of baobab (*Adansonia digitata* L.) in combination with *Sporidiobolus pararoseus* Y16 on the activities of the defense-related enzymes and the expression levels of defense-related genes of apples. *Biological Control*, *139*(Article No. 104094). https://doi.org/10.1016/j.biocontrol.2019.104094

Abdel-Rahim, I. R., & Abo-Elyousr, K. A. (2017). Using of endophytic *Saccharomycopsis fibuligera* and thyme oil for management of gray mold rot of guava fruits. *Biological Control*, *110*, 124-131. https://doi.org/10.1016/j.biocontrol.2017.04.014

Aboofazeli, R. (2010). Nanometric-scaled emulsions (nanoemulsions). *Iranian Journal of Pharmaceutical Research,* *9*(4), 325–326. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3870055/

Abu Bakar, A.I., Nur Ain Izzati, M.Z., & Umi Kalsom, Y. (2013). Diversity of *Fusarium* species associated with post-harvest fruit rot disease of tomato. *Sains Malaysiana* *42*(7), 911–920. http://journalarticle.ukm.my/6297/1/04_A.I._Abu_Bakar.pdf

AbuQamar, S. F., Moustafa, K., & Tran, L. S. P. (2016). 'Omics' and plant responses to *Botrytis cinerea*. *Frontiers in Plant Science*, *7*, 1658. https://doi.org/10.3389/fpls.2016.01658

Acevedo-Fani, A., Soliva-Fortuny, R., & Martín-Belloso, O. (2017). Nanoemulsions as edible coatings. *Current Opinion in Food Science*, *15*, 43-49. https://doi.org/10.1016/j.cofs.2017.06.002

Adeoye, I. B., Odeleye, O. M. O., Babalola, S. O., & Afolayan, S. O. (2009). Economic analysis of tomato losses in Ibadan metropolis, Oyo State, Nigeria. *African Journal of Basic and Applied Sciences*, *1*(5-6), 87-92. http://www.idosi.org/ajbas/ajbas1(5-6)09/1.pdf

Adiukwu, P. C., Amon, A., Nambatya, G., Adzu, B., Imanirampa, L., Twinomujuni, S., Twikirize, O., Amanya, M., Ezeonwumelu, J.O., Oloro, J., Okoruwa, G.A & Katusiime, B. (2012). Acute toxicity, antipyretic and antinociceptive study of the crude saponin from an edible vegetable: *Vernonia amygdalina* leaf. *International Journal of Biological and Chemical Sciences*, *6*(3), 1019-1028. https://doi.org/10.4314/ijbcs.v6i3.9

Afroz, T., Aktaruzzaman, M., & Kim, B. S. (2019). First Report of Gray Mold on Okra Caused by *Botrytis cinerea* in Korea. *Plant Disease*, *103*(5), 1038-1038. https://doi.org/10.1094/PDIS-10-18-1884-PDN

Agarwal Rajesh Khanna, S. P. (2007). *Physical Pharmacy* (2nd ed., pp. 177-186). CBS Publisher.

Agbodeka, K., Gbekley, H.E., Karou, S.D., Anani, K., Agbonon, A., Tchacondo, T., Batawila, K., Simpore, J., & Gbeassor, J. (2016). Ethnobotanical study of medicinal plants used for the treatment of malaria in the Plateau region, Togo. *Pharmacognosy Research, 8*(5), 12-18. https://doi.org/10.4103/0974-8490.178646

Agrios G.N. (2005). *Plant Pathology* (5th ed.). CA: Academic.

Aguilar, M., Farran, A., Serra, C., Sepaniak, M. J., & Whitaker, K. W. (1997). Use of different surfactants (sodium dodecyl sulfate, bile salts and ionic polymers) in micellar electrokinetic capillary chromatography application of the separation organophosphorus pesticides. *Journal of Chromatography A*, *778*(1-2), 201-205. https://doi.org/10.1016/S0021-9673(97)00220-3

Ahmad, P., Jaleel, C. A., Salem, M. A., Nabi, G., & Sharma, S. (2010). Roles of enzymatic and nonenzymatic antioxidants in plants during abiotic stress. *Critical Reviews in Biotechnology*, *30*(3), 161-175. https://doi.org/10.3109/07388550903524243

Ahmed, F. A., Sipes, B. S., & Alvarez, A. M. (2016a). Natural products to control postharvest gray mold of tomato fruit-possible mechanisms. *Journal of Plant Pathology & Microbiology*, *7*(7), 1-7. https://doi.org/10.4172/2157-7471.1000367

Ahmed, K., Li, Y., McClements, D. J., & Xiao, H. (2012). Nanoemulsion- and emulsion-based delivery systems for curcumin: Encapsulation and release properties. *Food Chemistry*, *132*(2), 799–807. https://doi.org/10.1016/j.foodchem.2011.11.039

Ahmed, S. I., Hayat, M. Q., Tahir, M., Mansoor, Q., Ismail, M., Keck, K., & Bates, R. B. (2016). Pharmacologically active flavonoids from the anticancer, antioxidant and antimicrobial extracts of *Cassia angustifolia* Vahl. *BMC Complementary and Alternative Medicine*, *16*(460), 1-9. https://doi.org/10.1186/s12906-016-1443-z

Ahmed, S. M., & Abdelgaleil, S. A. M. (2005). Antifungal activity of extracts and sesquiterpene lactones from *Magnolia grandiflora* L. (Magnoliaceae). *International Journal of Agriculture & Biology*, *7*(4), 638–642. http://www.fspublishers.org/published_papers/71798_..pdf

Ahmet, I., Çevik, M. Y., & Vursavuş, K. K. (2016). Effects of maturity stages on textural mechanical properties of tomato. *International Journal of Agricultural and*

Biological Engineering, *9*(6), 200-206. https://ijabe.org/index.php/ijabe/article/view/1999

Akinseye, O. F., & Ataga, A. E. (2014). Aqueous and ethanolic extracts of *Vernonia amygdalina* L. in the control of fungi associated with *Arachis hypogeae* L. *Scientia Africana*, *13*(2), 281-289. https://www.ajol.info/index.php/sa/article/view/156970

Akowuah, G. A., May, L. L. Y., & Chin, J. H. (2015). Toxicological evaluation of *Vernonia amygdalina* methanol leaves extracts in rats. *Oriental Pharmacy and Experimental Medicine, 15*, 365-369. https://doi.org/10.1007/s13596-015-0194-6

Aktaruzzaman, M., Afroz, T., Hong, S. J., & Kim, B. S. (2017). Identification of *Botrytis cinerea*, the cause of post-harvest gray mold on Broccoli in Korea. *Research in Plant Disease*, *23*(4), 372-378. https://doi.org/10.5423/RPD.2017.23.4.372

Aktaruzzaman, M., Afroz, T., Kim, B. S., & Shin, H. D. (2016). First report of gray mold disease of sponge gourd (*Luffa cylindrica*) caused by *Botrytis cinerea* in Korea. *Research in Plant Disease*, *22*(2), 107-110. https://doi.org/10.5423/RPD.2016.22.2.107

Aktaruzzaman, M., Kim, J. Y., Xu, S. J., & Kim, B. S. (2014). First report of postharvest gray mold rot on carrot caused by *Botrytis cinerea* in Korea. *Research in Plant Disease*, *20*(2), 129-131. https://doi.org/10.5423/RPD.2014.20.2.129

Alaoui, F. T., Askarne, L., Boubaker, H., Boudyach, E. H., & Aoumar, A. A. B. (2017). Control of gray mold disease of tomato by postharvest application of organic acids and salts. *Plant Pathology Journal, 16*(2), 62-72. https://doi.org/10.3923/ppj.2017.62.72

Alara, O. R., Abdurahman, N. H., Mudalip, S. A., & Olalere, O. A. (2018). Microwave-assisted.extraction of *Vernonia amygdalina* leaf for optimal recovery of total phenolic content. *Journal of Applied Research on Medicinal and Aromatic Plants*, *10*, 16-24. https://doi.org/10.1016/j.jarmap.2018.04.004

Alara, O. R., Abdurahman, N. H., Ukaegbu, C. I., & Kabbashi, N. A. (2019). Extraction and characterization of bioactive compounds in *Vernonia amygdalina* leaf ethanolic extract comparing Soxhlet and microwave-assisted extraction techniques. *Journal of Taibah University for Science*, *13*(1), 414-422. https://doi.org/10.1080/16583655.2019.1582460

Alara, O. R., Abdurahmana, N. H., Mudalipa, S. K. A., & Olalerea, O. A. (2017). Phytochemical and pharmacological properties of *Vernonia amygdalina*: a review. *Journal of Chemical Engineering and Industrial Biotechnology*, *2*(1), 80-96. https://doi.org/10.15282/jceib.v2i1.3871

Alegbeleye, O. O., Singleton, I., & Sant'Ana, A. S. (2018). Sources and contamination routes of microbial pathogens to fresh produce during field cultivation: a review. *Food microbiology*, *73*, 177-208. https://doi.org/10.1016/j.fm.2018.01.003

Alemu, K., Ayalew, A., & Woldetsadik, K. (2014). Antifungal activity of plant extracts and their applicability in extending the shelf life of mango fruits. *Journal of Food Science and Quality Management*, *33,* 47-53. https://www.iiste.org/Journals/index.php/FSQM/article/view/17612

Al-Eryani, A. R. A. A. (2004). *Effects of salinity on yield and postharvest quality of tomato (Lycopersicone esculentum* Mill*.)* [Doctoral dissertation]. Universiti Putra Malaysia, Malaysia.

Alexandre, E. M. C., Lourenço, R. V., Bittante, A. M. Q. B., Moraes, I. C. F., & do Amaral Sobral, P. J. (2016). Gelatin-based films reinforced with montmorillonite and activated with nanoemulsion of ginger essential oil for food packaging applications. *Food Packaging and Shelf Life*, *10*, 87-96. https://doi.org/10.1016/j.fpsl.2016.10.004

Ali, A., Maqbool, M., Ramachandran, S., & Alderson, P. G. (2010). Gum arabic as a novel edible coating for enhancing shelf-life and improving postharvest quality of tomato (*Solanum lycopersicum* L.) fruit. *Postharvest Biology and Technology*, *58*(1), 42-47. https://doi.org/10.1016/j.postharvbio.2010.05.005

Ali, A., Mekhloufi, G., Huang, N., & Agnely, F. (2016). β-lactoglobulin stabilized nanemulsions-Formulation and process factors affecting droplet size and nanoemulsion stability. *International Journal of Pharmaceutics*, *500*(1-2), 291-304. https://doi.org/10.1016/j.ijpharm.2016.01.035

Alkan, N., & Fortes, A. M. (2015a). Insights into molecular and metabolic events associated with fruit response to post-harvest fungal pathogens. *Frontiers in Plant Science*, *6*(889), 1-14. https://doi.org/10.3389/fpls.2015.00889

Allen, L., & Ansel, H. C. (2013). *Ansel's pharmaceutical dosage forms and drug delivery systems*. Lippincott Williams & Wilkins.

Alscher, R. G., Erturk, N., & Heath, L. S. (2002). Role of superoxide dismutases (SODs) in controlling oxidative stress in plants. *Journal of Experimental Botany*, *53*(372), 1331-1341. https://doi.org/10.1093/jexbot/53.372.1331

Amiri, A., Zuniga, A. I., & Peres, N. A. (2018). Potential impact of populations drift on *Botrytis* occurrence and resistance to multi-and single-site fungicides in Florida Southern highbush blueberry fields. *Plant Disease*, *102*(11), 2142-2148. https://doi.org/10.1094/PDIS-11-17-1810-RE

Amit, S. K., Uddin, M. M., Rahman, R., Islam, S. R., & Khan, M. S. (2017). A review on mechanisms and commercial aspects of food preservation and processing. *Agriculture & Food Security*, *6*(51), 1-22. https://doi.org/10.1186/s40066-017-0130-8

An, B., Li, B. Q., Qin, G. Z., Tian, S. P. (2012). Exogenous calcium improves viability of biocontrol yeasts under heat stress by reducing ROS accumulation and oxidative damage of cellular protein. *Current Microbiology*, *65*(2), 122–127. https://doi.org/10.1007/s00284-012-0133-4

Angelini, R. M. D. M., Pollastro, S., & Faretra, F. (2016). Genetics of *Botrytis cinerea*. In S. Fillinger & Y. Elad (Eds.), *Botrytis–the Fungus, the Pathogen and its Management in Agricultural Systems* (pp. 35-53). Springer. https://doi.org/10.1007/978-3-319-23371-0_3

Anthon, G. E., LeStrange, M., & Barrett, D. M. (2011). Changes in pH, acids, sugars and other quality parameters during extended vine holding of ripe processing tomatoes. *Journal of the Science of Food and Agriculture*, *91*(7), 1175-1181. https://doi.org/10.1002/jsfa.4312

Anton, N., & Vandamme, T. F. (2011). Nanoemulsions and micro-emulsions: Clarifications of the critical differences. *Pharmaceutical research*, *28*(5), 978-985. https://doi.org/10.1007/s11095-010-0309-1

Anwar, H., Hussain, G., Mustafa, I. (2018) Antioxidants from natural sources. In E. Shalaby & G. M. Azzam (Eds.) *Antioxidants in foods and its applications* (pp. 3-28). IntechOpen. https://doi.org/ 10.5772/intechopen.75961

Aranega-Bou, P., de la O Leyva, M., Finiti, I., García-Agustín, P., & González-Bosch, C. (2014). Priming of plant resistance by natural compounds. Hexanoic acid as a model. *Frontiers in Plant Science*, *5*(488), 1-12. https://doi.org/10.3389/fpls.2014.00488

Armijo, G., Schlechter, R., Agurto, M., Muñoz, D., Nuñez, C., & Arce-Johnson, P. (2016). Grapevine pathogenic microorganisms: understanding infection strategies and host response scenarios. *Frontiers in Plant Science*, *7*(382), 1-18. https://doi.org/10.3389/fpls.2016.00382

Arnnok, P., Ruangviriyachai, C., Mahachai, R., Techawongstien, S., & Chanthai, S. (2010). Optimization and determination of polyphenol oxidase and peroxidase activities in hot pepper (*Capsicum annuum* L.) pericarb. *International Food Research Journal*, *17*, 385-392. http://www.ifrj.upm.edu.my/17%20(02)%202010/IFRJ-2010-385-392_Chantai_Thailand[1].pdf

Asante, D., Effah-Yeboah, E., Barnes, P., Abban, H. A., Ameyaw, E. O., Boampong, J. N., Ofori, E. G., & Dadzie, J. B. (2016). Antidiabetic effect of young and old ethanolic leaf extracts of *Vernonia Amygdalina*: a comparative study. *Journal of Diabetes Research*, Article ID 8252741, 1-13. https://doi.org/10.1155/2016/8252741

Asib, N., Omar, D., Awang, R. M., Ashikin, N., & Abdullah, P. (2015). Preparation, characterization and toxicity of nanoemulsion formulations of rotenone extract of *Derris Elliptica*. *Journal of Chemical, Biological and Physical Sciences*, *5*(4), 3989-3997. https://www.researchgate.net/publication/325158630

Asnake, S., Teklehaymanot, T., Hymete, A., Erko, B., & Giday, M. (2015). Survey of medicinal plants used to treat malaria by Sidama people of Boricha District, Sidama zone, South region of Ethiopia. *BMC Complementary Alternative Medicine*, *15*(448), 1-12. https://doi.org/10.1155/2016/9690164

Asselbergh, B., Curvers, K., França, S. C., Audenaert, K., Vuylsteke, M., Van Breusegem, F., & Höfte, M. (2007). Resistance to *Botrytis cinerea* in sitiens, an abscisic acid-deficient tomato mutant, involves timely production of hydrogen peroxide and cell wall modifications in the epidermis. *Plant Physiology*, *144*(4), 1863-1877. https://doi.org/10.1104/pp.107.099226

Athayde, A. J. A. A., De Oliveira, P. D. L., Guerra, I. C. D., Da Conceição, M. L., De Lima, M. A. B., Arcanjo, N. M. O., & de Souza, E. L. (2016). A coating composed of chitosan and *Cymbopogon citratus* (Dc. Ex Nees) essential oil to control Rhizopus soft rot and quality in tomato fruit stored at room temperature. *The Journal of Horticultural Science and Biotechnology*, *91*(6), 582-591. https://doi.org/10.1080/14620316.2016.1193428

Awad, H. M., & Al-Shennawy, M. Z. (2015). Efficacy of some plant extracts on Botrytis cinerea, the causal of gray mould rot of strawberry fruits. *Egyptian Journal of Crop Protection*, *10*(1), 35-45.

Ayranci, E., & Tunc, S. (2004). The effect of edible coatings on water and vitamin C loss of apricots (*Armeniaca vulgaris* Lam.) and green peppers (*Capsicum annuum* L.). *Food Chemistry*, *87*(3), 339-342. https://doi.org/10.1016/j.foodchem.2003.12.003

Azwanida, N. N. (2015). A review on the extraction methods use in medicinal plants, principle, strength and limitation. *Medicine & Aromatic Plants*, *4*(3), 1-7 https://doi.org/10.4172/2167-0412.1000196

Baboota, S., Shakeel, F., Ahuja, A., Ali, J., & Shafiq, S. (2007). Design, development and evaluation of novel nanoemulsion formulations for transdermal potential of celecoxib. *Acta Pharmaceutica*, *57*(3), 315-332. https://doi.org/10.2478/v10007-007-0025-5

Babosha, A. V. (2004). Changes in lecitin activity in plants treated with resistance inducers. *Biology Bulletin Russia Acedemy of Science*, *31*(1), 51–55. https://doi.org/10.1023/B:BIBU.0000014355.12982.ce

Bakeer, A. R. T., El-Mohamedy, R. S., Saied, N. M., & Abd-El-Kareem, F. (2016). Field suppression of *Fusarium* soil borne diseases of tomato plants by the combined application of bio agents and chitosan. *British Biotechnology Journal, 13*(3), 1-10. https://doi.org/10.9734/BBJ/2016/24985

Balint-Kurti, P. (2019). The plant hypersensitive response: concepts, control and consequences. *Molecular Plant Pathology*, *20*(8), 1163-1178. https://doi.org/10.1111/mpp.12821

Banks, N. H., Dadzie, B. K., & Cleland, D. J. (1993). Reducing gas exchange of fruits with surface coatings. *Postharvest Biology and Technology*, *3*(3), 269-284. https://doi.org/10.1016/0925-5214(93)90062-8

Barakat, R. M., & Al-Masri, M. I. (2017). Effect of *Trichoderma harzianum* in Combination with Fungicides in Controlling Gray Mould Disease (*Botrytis* *cinerea*) of Strawberry. *American Journal of Plant Sciences*, *8*(4), 651-665. https://doi.org/10.4236/ajps.2017.84045

Barkai-Golan, R. (2001). *Postharvest Diseases of Fruits and Vegetables Development and Control*. Elsevier.

Barksdale, T. H. (1972). Resistance in tomato to six anthracnose fungi. *Phytopathology*, *62*, 660-663. https://doi.org/10.1094/Phyto-62-660

Bartz, J. A., S. A. Sargent, & Mahovic, M (2013). Guide to identifying and controlling postharvest tomato diseases in Florida. *University of Florida IFAS Extension, EDIS, Publication #HS866*. https://edis.ifas.ufl.edu/hs131

Barzegar, A., & Moosavi-Movahedi, A. A. (2011). Intracellular ROS protection efficiency and free radical-scavenging activity of curcumin. *PLoS One*, *6*(10), 1-7. https://doi.org/10.1371/journal.pone.0026012

Bautista-Baños, S. (Ed.). (2014b). *Postharvest Decay: Control Strategies*. Elsevier. https://doi.org/10.1016/C2012-0-07916-1

Bautista-Baños, S.B., Molina, E.B., & Barrera-Necha, L.L. (2014a). *Rhizopus stolonifer* (soft rot). In S. Bautista-Baños (Ed.), *Postharvest decay* (1st ed., pp. 1–37). Academic Press. https://doi.org/10.1016/C2012-0-07916-1

Bazie, S., Ayalew, A., & Woldetsadik, K. (2014). Antifungal activity of some plant extracts against (*Colletotrichum musae*) the cause of postharvest banana anthracnose. *Journal of Plant Pathology and Microbiology*, *5*(2), 1-4. https://doi.org/10.4172/2157-7471.1000226

Beckers, G. J., & Conrath, U. (2007). Priming for stress resistance: From the lab to the field. *Current Opinion in Plant Biology*, *10*(4), 425-431. https://doi.org/10.1016/j.pbi.2007.06.002

Benelli, G., Pavela, R., Maggi, F., Petrelli, R., & Nicoletti, M. (2017). Commentary: Making green pesticides greener? The potential of plant products for nanosynthesis and pest control. *Journal of Cluster Science*, *28*(1), 3-10. https://doi.org/10.1007/s10876-016-1131-7

Benita, S. (2005). *Microencapsulation: Methods and Industrial Applications*. (2nd ed., pp. 355). CRC Press.

Benito, E. P., Ten Have, A., van't Klooster, J. W., & van Kan, J. A. (1998). Fungal and plant gene expression during synchronized infection of tomato leaves by *Botrytis cinerea*. *European Journal of Plant Pathology*, *104*(2), 207-220. https://link.springer.com/article/10.1023/A:1008698116106

Ben-Jabeur, M., Ghabri, E., Myriam, M., & Hamada, W. (2015). Thyme essential oil as a defense inducer of tomato against gray mold and *Fusarium* wilt. *Plant Physiology and Biochemistry*, *94*, 35-40. https://doi.org/10.1016/j.plaphy.2015.05.006

Bera, B. (Ed.). (2015, July 11-12). *Nanoporous silicon prepared by vapour phase strain etch and sacrificial technique*. International Conference on Microelectronic Circuit and System (Micro), Kolkata, India. https://www.ijcaonline.org/proceedings/micro2015/number1/23705-1742

Bhandari, S. R., & Lee, J. G. (2016). Ripening-dependent changes in antioxidants, color attributes, and antioxidant activity of seven tomato (*Solanum lycopersicum* L.) cultivars. *Journal of Analytical Methods in Chemistry*, *Article ID 5498618*. https://doi.org/10.1155/2016/5498618

Bhattacharjee, I., Ghosh, A., Chowdhury, N., Chatterjee, S. K., Chandra, G., & Laskar, S. (2010). n-Alkane profile of *Argemone mexicana* leaves. *Verlag der Zeitschrift für Naturforschung*, 65(9-10), 533-536. https://doi.org/10.1515/znc-2010-9-1001

Bhattacharjee, S. (2006). DLS and zeta potential-What they are and what they are not? *Journal of. Controlled Release*, *235*, 337-351. https://doi.org/10.1016/j.jconrel.2016.06.017

Bhattarai, K., Sharma, S., & Panthee, D. R. (2018). Diversity among modern tomato genotypes at different levels in fresh-market breeding. *International Journal of Agronomy*, *Article ID 4170432*, 1-15. https://doi.org/10.1155/2018/4170432

Bhowmik, D., Kumar, K. S., Paswan, S., & Srivastava, S. (2012). Tomato-a natural medicine and its health benefits. *Journal of Pharmacognosy and Phytochemistry*, *1*(1), 33-43. https://www.phytojournal.com/vol1Issue1/3.html

Bhutia, D. D., Zhimo, Y., Kole, R., & Saha, J. (2016). Antifungal activity of plant extracts against *Colletotrichum musae*, the postharvest anthracnose pathogen of banana cv. Martaman. *Nutrition & Food Science*, *46*(1), 2-15. https://doi.org/10.1108/NFS-06-2015-0068

Bi, J. L., & Felton, G. W. (1995). Foliar oxidative stress and insect herbivory: Primary compounds, secondary metabolites, and reactive oxygen species as components of induced resistance. *Journal of Chemical Ecology*, *21*(10), 1511-1530. https://doi.org/10.1007/BF02035149

Bill, M., Sivakumar, D., Korsten, L., & Thompson, A. K. (2014). The efficacy of combined application of edible coatings and thyme oil in inducing resistance components in avocado (*Persea americana* Mill.) against anthracnose during post-harvest storage. *Crop Protection*, *64*, 159-167. https://doi.org/10.1016/j.cropro.2014.06.015

Bin Rohin, M. A. K., Ridzwan, N., Jumli, M. N., Hadi, N. A., Johari, S. A. T. T., & Latif, A. Z. A. (2017). Cytotoxicity study and morphological changes of different extraction for Bismillah leaf (*Vernonia amygdalina*) in human glioblastoma multiforme cell line (U-87). *Biomedical Research, 28*(4), 1472-1478. https://www.alliedacademies.org/

Blanco-Ulate, B., Labavitch, J. M., Vincenti, E., Powell, A. L. T., & Cantu, D. (2016b). Hitting the wall: plant cell walls during *Botrytis cinerea* infections. In S. Fillinger & Y. Elad (Eds.), *Botrytis – The Fungus, the Pathogen and Its Management in Agricultural Systems* (pp. 362-386). Springer International Publishing. https://doi.org/10.1007/978-3-319-23371-0_18/s10327-013-0492-0

Blanco-Ulate, B., Morales-Cruz, A., Amrine, K. C., Labavitch, J. M., Powell, A. L., & Cantu, D. (2014). Genome-wide transcriptional profiling of *Botrytis cinerea* genes targeting plant cell walls during infections of different hosts. *Frontiers in Plant Science*, *5*(Article 435), 1-16. https://doi.org/10.3389/fpls.2014.00435

Blanco-Ulate, B., Vincenti, E., Cantu, D., & Powell, A. L. (2016a). Ripening of tomato fruit and susceptibility to *Botrytis cinerea*. In S. Fillinger & Y. Elad (Eds.), *Botrytis–The Fungus, the Pathogen and Its Management in Agricultural Systems* (pp. 387-412). Springer. https://doi.org/10.1007/978-3-319-23371-0_19

Blanco-Ulate, B., Vincenti, E., Powell, A. L. T., & Cantu, D. (2013). Tomato transcriptome and mutant analyses suggest a role for plant stress hormones in the interaction between fruit and *Botrytis cinerea*. *Frontiers in Plant Science, 4*(Article 142), 1-16. https://doi.org/10.3389/fpls.2013.00142

Blau, S., & Burak, K. (2009). *Writing In The Works*. Wadsworth: Cengage Learning.

Bojkov, G., Mitrev, S., & Arsov, E. (2019). Impact of ampelotechnical measures in the grapevine protection from occurrence of grey mould (*Botrytis cinerea*). *Journal of Agriculture and Plant Sciences*, *17*(1), 29-41. https://js.ugd.edu.mk/index.php/YFA/article/view/2643

Bollen, G., & Scholten, G. (1971). Acquired resistance to benomyl and some other systemic fungicides in a strain of *Botrytis cinerea* in cyclamen. *Netherlands Journal of Plant Pathology, 77*, 83-90. https://doi.org/10.1007/BF01981496

Boller, T. (1995). Chemoperception of microbial signals in plant cells. *Annual Review of Plant Physiology and Plant Molecular Biology*, *46*(1), 189-214. https://doi.org/10.1146/annurev.pp.46.060195.001201

Bonaterra, A., Mari, M., Casalini, L., & Montesinos, E. (2003). Biological control of *Monilinia laxa* and *Rhizopus stolonifer* in postharvest of stone fruit by *Pantoea agglomerans* EPS125 and putative mechanisms of antagonism. *International Journal of Food Microbiology*, *84*(1), 93-104. https://doi.org/10.1016/s0168-1605(02)00403-8

Borges, Á. V., Saraiva, R. M., & Maffia, L. A. (2014). Key factors to inoculate *Botrytis cinerea* in tomato plants. *Summa Phytopathologica*, *40*(3), 221-225. https://doi.org/10.1590/0100-5405/1929

Borges, D. F., Lopes, E. A., Moraes, A. R. F., Soares, M. S., Visôtto, L. E., Oliveira, C. R., & Valente, V. M. M. (2018). Formulation of botanicals for the control of plant-pathogens: A review. *Crop Protection*, *110*, 135-140. https://doi.org/10.1016/j.cropro.2018.04.003

Boyetchko, S., Pedersen, E., Punja, Z., & Reddy, M. (1999). Formulations of Biopesticides. In F. R. Hall & J. J. Menn (Eds.), *Biopesticides: Use and Delivery. Methods in Biotechnology*, (5th ed., pp. 487-508). Humana Press. https://doi.org/10.1385/0-89603-515-8:487

Boyetchko, S. M., Rosskopf, E. N., Caesar, A. J., & Charudattan, R. (2002). Biological weed control with pathogens: Search for candidates to applications. In G. G. Khachatourians & D. K. Arora (Eds.), *Applied Mycology and Biotechnology*: *Agriculture and Food Production* (2nd ed., pp. 239-274). Elsevier Science. https://doi.org/10.1016/S1874-5334(02)80013-2

Bradford, M. M. (1976). A rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding. *Analytical Biochemistry*, *72*(1-2), 248-254. https://doi.org/10.1006/abio.1976.9999

Brandhoff, B., Simon, A., Dornieden, A., & Schumacher, J. (2017). Regulation of conidiation in *Botrytis cinerea* involves the light-responsive transcriptional regulators BcLTF3 and BcREG1. *Current genetics*, *63*(5), 931-949. https://doi.org/10.1007/s00294-017-0692-9

Brand-Williams, W., Cuvelier, M. E., & Berset, C. L. W. T. (1995). Use of a free radical method to evaluate antioxidant activity. *LWT-Food science and Technology*, *28*(1), 25-30. https://doi.org/10.1016/S0023-6438(95)80008-5

Bravo, K., & Osorio, E. (2016). Characterization of polyphenol oxidase from Cape gooseberry (*Physalis peruviana* L.) fruit. *Food chemistry*, *197*(Part A), 185-190. https://doi.org/10.1016/j.foodchem.2015.10.126

Cainelli, N., & Ruperti, B. (2019). Biochemistry and Molecular Biology in Fruits during Cold Storage. *Annual Plant Reviews Online*, *2*(3), 1-29. https://doi.org/10.1002/9781119312994.apr0694

Caires, N. P., Rodrigues, F. A., & Furtado, G. Q. (2015). Infection process of *Botrytis cinerea* on *Eucalypt* leaves. *Journal of Phytopathology*, *163*(7-8), 604-611. https://doi.org/10.1111/jph.12360

Campos, E. V., Proença, P. L., Oliveira, J. L., Bakshi, M., Abhilash, P. C., & Fraceto, L. F. (2019). Use of botanical insecticides for sustainable agriculture: Future perspectives. *Ecological Indicators*, *105*, 483-495. https://doi.org/10.1016/j.ecolind.2018.04.038

Cano, A., Acosta, M., & Arnao, M. B. (2003). Hydrophilic and lipophilic antioxidant activity changes during on-vine ripening of tomatoes (*Lycopersicon esculentum* Mill.). *Postharvest Biology and Technology*, *28*(1), 59-65. https://doi.org/10.1016/S0925-5214(02)00141-2

Cantoral, J. M., Collado, I. G., (2011). Filamentous fungi (*Botrytis cinerea*). *Molecular Wine Microbiology*, 263-264. https://doi.org/10.1016/B978-0-12-375021-1.10010-4

Cantu, D., Blanco-Ulate, B., Yang, L., Labavitch, J. M., Bennett, A. B., & Powell, A. L. T. (2009). Ripening-regulated susceptibility of tomato fruit to *Botrytis cinerea* requires NOR but not RIN or ethylene. *Plant Physiology, 150*(3), 1434–1449. https://doi.org/10.1104/pp.109.138701

Cantu, D., Vicente, A. R., Greve, L. C., Dewey, F. M., Bennett, A. B., Labavitch, J. M., & Powell, A. L. T. (2008). The intersection between cell wall disassembly, ripening, and fruit susceptibility to *Botrytis cinerea. Proceeding of the National Academy of Sciences of the United States of America*, *105*(3), 859-864. https://doi.org/10.1073/pnas.0709813105

Carocho, M., & Ferreira, I. C. (2013). A review on antioxidants, prooxidants and related controversy: Natural and synthetic compounds, screening and analysis methodologies and future perspectives. *Food and Chemical Toxicology*, *51*, 15-25. https://doi.org/10.1016/j.fct.2012.09.021

Chai-Ming, L., & Chun-Nan, L. (1993). Two 2′, 4′, 6′-trioxygenated flavanones from *Artocarpus heterophyllus*. *Phytochemistry*, *33*(4), 909-911. https://doi.org/10.1016/0031-9422(93)85302-8

Chanamai, R.., & McClements, D. J. (2000). Impact of weighting agents and sucrose on gravitational separation of beverage emulsions. *Journal of Agricultural and Food Chemistry, 48*(11), 5561–5565. https://doi.org/10.1021/jf0002903

Chen, C., Peng, X., Zeng, R., Chen, M., Wan, C., & Chen, J. (2016). *Ficus hirta* fruits extract incorporated into an alginate-based edible coating for Nanfeng mandarin preservation. *Scientia Horticulturae*, *202*, 41-48. https://doi.org/10.1016/j.scienta.2015.12.046

Chen, H., Cheng, Z., Wisniewski, M., Liu, Y., & Liu, J. (2015). Ecofriendly hot water treatment reduces postharvest decay and elicits defense response in kiwifruit. *Environmental Science and Pollution Research, 22*(19), 15037-15045. https://doi.org/10.1007/s11356-015-4714-1

Chen, P. H., Chen, R. Y., & Chou, J. Y. (2018). Screening and evaluation of yeast antagonists for biological control of *Botrytis cinerea* on strawberry fruits. *Mycobiology*, *46*(1), 33-46. https://doi.org/10.1080/12298093.2018.1454013

Choupanian, M., Omar, D., Basri, M., & Asib, N. (2017). Preparation and characterization of neem oil nanoemulsion formulations against *Sitophilus oryzae* and *Tribolium castaneum* adults. *Journal of Pesticide Science*, *42*(2), 158-165. https://doi.org/10.1584/jpestics.D17-032

Chrysargyris, A., Nikou, A., & Tzortzakis, N. (2016). Effectiveness of *Aloe vera* gel coating for maintaining tomato fruit quality. *New Zealand Journal of Crop and*

Horticultural Science, *44*(3), 203-217. https://doi.org/10.1080/01140671.2016.1181661

Chu, E. H., Shin, E. J., Park, H. J., & Jeong, R. D. (2015). Effect of gamma irradiation on *Botrytis cinerea* causing gray mold and cut chrysanthemum flowers. *Research in Plant Disease*, *21*(3), 193-200. https://doi.org/10.5423/RPD.2015.21.3.193

Chuacharoen, T., Prasongsuk, S., Sabliov, C. M. (2019). Effect of surfactant concentrations on physicochemical properties and functionality of curcumin nanoemulsions under conditions relevant to commercial utilization. *Molecules, 24*(15), 1-12. https://doi.org/10.3390/molecules24152744

Chylińska, M., Szymańska-Chargot, M., Deryło, K., Tchórzewska, D., & Zdunek, A. (2017). Changing of biochemical parameters and cell wall polysaccharides distribution during physiological development of tomato fruit. *Plant Physiology and Biochemistry*, *119*, 328-337. https://doi.org/10.1016/j.plaphy.2017.09.010

Compean, K. L., & Ynalvez, R. A. (2014). Antimicrobial activity of plant secondary metabolites: A review. *Research Journal of Medicinal Plant*, *8*(5), 204-213. https://doi.org/10.3923/rjmp.2014.204.213

Costa, C., Medronho, B., Filipe, A., Mira, I., Lindman, B., Edlund, H., & Norgren, M. (2019). Emulsion formation and stabilization by biomolecules: The leading role of cellulose. *Polymers*, *11*(10), 1-19. https://doi.org/10.3390/polym11101570

Cotoras, M., & Silva, E. (2005). Differences in the initial events of infection of *Botrytis cinerea* strains isolated from tomato and grape. *Mycologia*, *97*(2), 485-492. https://doi.org/10.3852/mycologia.97.2.485

Cotoras, M., Mendoza, L., Muñoz, A., Yáñez, K., Castro, P., & Aguirre, M. (2011). Fungitoxicity against *Botrytis cinerea* of a flavonoid isolated from *Pseudognaphalium robustum*. *Molecules*, *16*(5), 3885–3895. https://doi.org/10.3390/molecules16053885

Cramer, R. A., & Perfect, J. R. (2009). Recent advances in understanding human opportunistic fungal pethogenesis mechanisms. In E. J. Anaissie, M. R. McGinnis & M. A. Pfaller (Eds.), *Clinical Mycology* (2nd ed., pp.15-28). Elsevier. https://doi.org/10.1016/B978-1-4160-5680-5.00002-5

Crisosto, C. H., Garner, D., & Crisosto, G. (2002). Carbon dioxide-enriched atmospheres during cold storage limit losses from *Botrytis* but accelerate rachis browning of ‘Redglobe’table grapes. *Postharvest Biology and Technology*, *26*(2), 181-189. https://doi.org/10.1016/S0925-5214(02)00013-3

Cristescu, S. M., De Martinis, D., Te Lintel, Hekkert, S., Parker, D. H., & Harren, F. J. M. (2002). Ethylene production by *Botrytis cinerea in vitro* and in tomatoes. *Applied and Environmental Microbiology, 68*(11), 5342–5350. http://doi.org/10.1128/AEM.68.11.5342-5350.2002

Cruz, M. E. S., Schwan-Estrada, K. R. F., Clemente, E., Itako, A. T., Stangarlin, J. R., & Cruz, M. J. S. (2013). Plant extracts for controlling the post-harvest anthracnose of banana fruit. *Revista Brasileira de Plantas Medicinais*, *15*(4), 727-733. https://doi.org/10.1590/S1516-05722013000500013

Czarnocka, W., & Karpiński, S. (2018). Friend or foe? Reactive oxygen species production, scavenging and signaling in plant response to environmental stresses. *Free Radical Biology and Medicine*, *122*, 4-20. https://doi.org/10.1016/j.freeradbiomed.2018.01.011

Da Costa, S., Basri, M., Shamsudin, N., & Basri, H. (2014). Stability of positively charged nanoemulsion formulation containing steroidal drug for effective transdermal application. *Journal of Chemistry*, Article ID 748680. https://doi.org/10.1155/2014/748680

da Silva, D. J. H., Abreu, F. B., Caliman, F. R. B., Antonio, A. C., & Patel, V. B. (2008). Tomatoes: Origin, cultivation techniques and germplasm resources. In V.R. Preedy & R. R. Watson (Eds.), *Tomatoes and tomato products-Nutritional, medicinal and therapeutic properties* (pp. 3-25). CRC Press.

Dalmais, B., Schumacher, J., Moraga, J., Le Pêcheur, P., Tudzynski, B., Gonzalez Collado, I., & Viaud, M. (2011). The *Botrytis cinerea* phytotoxin botcinic acid requires two polyketide synthases for production and has a redundant role in virulence with botrydial. *Molucelar Plant Pathology, 12(*6), 564–579. https://doi.org/10.1111/j.1364-3703.2010.00692.x

Damialis, A., Mohammad, A. B., Halley, J. M., & Gange, A. C. (2015). Fungi in a changing world: Growth rates will be elevated, but spore production may decrease in future climates. *International Journal of Biometeorology*, *59*(9), 1157-1167. https://doi.org/10.1007/s00484-014-0927-0

Daniel, C. K., Lennox, C. L., & Vries, F.A. (2015). *In vivo* application of garlic extracts in combination with clove oil to prevent postharvest decay caused by *Botrytis cinerea, Penicillium expansum* and *Neofabraea alba* on apples. *Postharvest Biology and Technology, 99*, 88–92. https://doi.org/10.1016/j.postharvbio.2014.08.006

Das, K., & Roychoudhury, A. (2014). Reactive oxygen species (ROS) and response of antioxidants as ROS-scavengers during environmental stress in plants. *Frontiers in Environmental Science*, *2*(Article 53), 1-13. https://doi.org/10.3389/fenvs.2014.00053

Dasgupta, N., & Ranjan, S. (2018). Nanoemulsion in Food. In N. Dasgupta & S. Ranjan (Eds.), *An Introduction to Food Grade Nanoemulsions* (13th ed., pp. 35). Springer.

De Bona, G. S., Adrian, M., Negrel, J., Chiltz, A., Klinguer, A., Poinssot, B., Héloir, M., Angelini, E., Vincenzi, S., & Bertazzon, N. (2019). Dual mode of action of grape cane extracts against Botrytis cinerea. *Journal of Agricultural and Food Chemistry, 67*(19), 5512–5520. https://doi.org/10.1021/acs.jafc.8b07098 de Jesús Salas-Méndez, E., Vicente, A., Pinheiro, A. C., Ballesteros, L. F., Silva, P., Rodríguez-García, R., & Peña-Ramos, F. M. (2019). Application of edible nanolaminate coatings with antimicrobial extract of *Flourensia cernua* to extend the shelf-life of tomato (*Solanum lycopersicum* L.) fruit. *Postharvest Biology and Technology*, *150*, 19-27. https://doi.org/10.1016/j.postharvbio.2018.12.008

Dean, R., Van Kan, J. A., Pretorius, Z. A., Hammond-Kosack, K. E., Di Pietro, A., Spanu, P.D., & Foster, G. D. (2012). The Top10 fungal pathogens in molecular plant pathology. *Molecular Plant Pathology, 13(*4), 414-430. https://doi.org/10.1111/j.1364-3703.2011.00783.x

Dehgahi, R., Subramaniam, S., Zakaria, L., Joniyas, A., Firouzjahi, F. B., Haghnama, K., & Razinataj, M. (2015). Review of research on fungal pathogen attack and plant defense mechanism against pathogen. *International Journal of Science Research and Agriculture Science*, *2*(8), 197-208. http://doi.org/10.12983/ijsras-2015-p0197-0208

Department of Agriculture (DOA). (2019). *Vegetables and cash crops statistic* (pp. 10-68).

Derckel, J. P., Baillieul, F., Manteau, S., Audran, J. C., Haye, B., Lambert, B., & Legendre, L. (1999). Differential induction of grapevine defenses by two strains of *Botrytis cinerea*. *Phytopathology*, *89*(3), 197-203. https://doi.org/10.1094/PHYTO.1999.89.3.197

Dhall, R. K. (2013). Advances in edible coatings for fresh fruits and vegetables: A review. *Critical Reviews in Food Science and Nutrition*, *53*(5), 435-450. https://doi.org/10.1080/10408398.2010.541568

Dias, D. D. O., Colombo, M., Kelmann, R. G., Kaiser, S., Lucca, L. G., Teixeira, H. F., & Koester, L. S. (2014). Optimization of Copaiba oil-based nanoemulsions obtained by different preparation methods. *Industrial Crops and Products*, *59*, 154-162. https://doi.org/10.1016/j.indcrop.2014.05.007

Droby, A. and Lichter, A. (2004) Post-harvest *Botrytis* infection: etiology, development and management. In Y. Elad; B. Williamson; P. Tudzynski & N. Delen (Eds.), *Botrytis: Biology, Pathology and Control* (pp. 349–367). Kluwer Academic Press.

Droby, S., Wisniewski, M., Macarisin, D., & Wilson, C. (2009). Twenty years of postharvest biocontrol research: is it time for a new paradigm? *Postharvest Biology and Technology,* *52*(2), 137–145. https://doi.org/10.1016/j.postharvbio.2008.11.009

Droby, S., Wisniewski, M., Teixidó, N., Spadaro, D., & Jijakli, M. H. (2016). The science, development, and commercialization of postharvest biocontrol products. *Postharvest Biology and Technology*, *122*, 22-29. https://doi.org/10.1016/j.postharvbio.2016.04.006

Duan, Y. B., Ge, C. Y., Zhang, X. K., Wang, J. X., & Zhou, M. G. (2014). Development and evaluation of a novel and rapid detection assay for *Botrytis cinerea* based on loop-mediated isothermal amplification. *PLoS One*, *9*(10), 1-9. https://doi.org/10.1371/journal.pone.0111094

Ebrahim, S., Usha, K., & Singh, B. (2011). Pathogenesis related (PR) proteins in plant defense mechanism. In A. Méndez-Vilas (Eds.), *Science against Microbial Pathogen: Communicating Current Research and Technological Advances* (3rd ed., pp.1043-1054). Badajoz: Formatex Research Center.

Ecobichon, D. J. (2001). Pesticide use in developing countries. *Toxicology*, *160*(1-3), 27-33. https://doi.org/10.1016/s0300-483x(00)00452-2

Ekwere, E. O., Ihunwaeze, O. M., & Odoemelam, V. K. (2015). The efficacy of some plant extracts on the postharvest control of fruit rot on plantain (*Musa paradisiaca*) fruit in Southeastern Nigeria. *Journal of Global Biosciences, 4*(3), 1647-1654. http://www.mutagens.co.in/jgb/vol.04/3/04.pdf

Elad, Y., Pertot, I., Cotes Prado, A.M., & Stewart, A. (2016). Plant hosts of *Botrytis* spp. In S. Fillinger & Y. Elad (Eds.), *Botrytis – The Fungus, the Pathogen and its Management in Agricultural Systems* (pp. 413–486). Springer.

Elfar, K., Riquelme, D., Zoffoli, J. P., & Latorre, B. A. (2017). First report of *Botrytis prunorum* causing fruit rot on kiwifruit in Chile. *Plant Disease, 101*(2), 1-388. https://doi.org/10.1094/PDIS-05-16-0775-PDN

Eltahir, A. S., & AbuEReish, B. I. (2011). Microscopical Studies on the leaf and petiole of *Vernonia amygadlina* Del. *Advances in Applied Science Research*, 2(2), 398-406. https://www.imedpub.com/articles/microscopical-studies-on-the-leaf-and-petiole-of-vernonia-amygadlina-del.pdf

Emana, B., Afari-Sefa, V., Nenguwo, N., Ayana, A., Kebede, D., & Mohammed, H. (2017). Characterization of pre-and postharvest losses of tomato supply chain in Ethiopia. *Agriculture & Food Security*, *6*(3), 1-11. https://doi.org/10.1186/s40066-016-0085-1

Emanuele, M., & Balasubramaniam, B. (2014). Differential effects of commercial-grade and purified poloxamer 188 on renal function. *Drugs in R&D*, *14*(2), 73-83. https://doi.org/10.1007/s40268-014-0041-0

Ene, A.C., & Atawodi, S. E. (2012). Ethnomedicinal survey of plants used by the Kanuris of North-eastern Nigeria. *Indian Journal of Traditional Knowledge 11*(4), 640–645. http://nopr.niscair.res.in/bitstream/123456789/14960/1/IJTK 11(4) 640-645.pdf?utm_source=The_Journal_Database&trk=right_banner&id=1403990728&ref=15287a5c3573434d689ffffdafa0590a

Erper, I., Celik, H., Turkkan, M., & Kilicoglu, M. C. (2015). First report of *Botrytis cinerea* on golden berry. *Australasian Plant Disease Notes, 10*(25), 1-2. https://doi.org/10.1007/s13314-015-0175-0

Evans, E. (1971). Systemic fungicides in practice. *Pesticide Science, 2*(5), 192-196. https://doi.org/10.1002/ps.2780020503

Fagundes, C., Moraes, K., Pérez-Gago, M. B., Palou, L., Maraschin, M., & Monteiro, A. R. (2015). Effect of active modified atmosphere and cold storage on the postharvest quality of cherry tomatoes. *Postharvest Biology and Technology*, *109*, 73-81. https://doi.org/10.1016/j.postharvbio.2015.05.017

Fagundes, C., Palou, L., Monteiro, A. R., Pérez-Gago, M. B. (2014). Effect of antifungal hydroxypropyl methylcellulose-beeswax edible coatings on gray mold development and quality attributes of cold-stored cherry tomato fruit. *Postharvest Biology and Technology, 92*, 1–8. https://doi.org/10.1016/j.postharvbio.2014.01.006

Fakari, S., & Nezamzadeh-Ejhieh, A. (2017). Synergistic effects of ion exchange and complexation processes in cysteine-modified clinoptilolite nanoparticles for removal of Cu (II) from aqueous solutions in batch and continuous flow systems. *New Journal of Chemistry*, *41*(10), 3811-3820. https://doi.org/10.1039/C7NJ00075H

Fallik, E., Temkin-Gorodeiski, N., Grinberg, S., Rosenberger, I., Shapiro, B., & Apelbaum, A. (1994). Bulk packaging for the maintenance of eggplant quality in storage. *Journal of Horticulture Science, 69*(1), 131-135. https://doi.org/10.1080/14620316.1994.11515258

Fan, X. J., Zhang, B., Yan, H., Feng, J. T., Ma, Z. Q., & Zhang, X. (2019). Effect of lotus leaf extract incorporated composite coating on the postharvest quality of fresh goji (*Lycium barbarum* L.) fruit. *Postharvest Biology and Technology*, *148*, 132-140. https://doi.org/10.1016/j.postharvbio.2018.10.020

FDA. (n.d.). *US Food and Drug Administration*. U.S. Food & Drugs Administration. Accessed on March, 2014 from, http://www. accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch. cfm?fr¼182.20

Feng, W., Zheng, X., & Chen, J. (2008). Combination of cassia oil with magnesium sulphate for control of postharvest storage rots of cherry tomatoes. *Crop Protection*, *27*(1), 112-117. https://doi.org/10.1016/j.cropro.2007.04.014

Fernández, J. G., Fernández Baldo, M. A., Sansone, G., Calvente, V., Benuzzi, D. A., Salinas, E., Raba, J. & Sanz Ferramola, M. I. (2014). Effect of temperature on the morphological characteristics of *Botrytis cinerea* and its correlated with the genetic variability. *Journal of Coastal Life Medicine*, *2*(7): 541-546. https://doi:10.12980/JCLM.2.2014JCLM-2014-0039

Ferrada, E. E., Latorre, B. A., Zoffoli, J. P., & Castillo, A. (2016). Identification and characterization of *Botrytis* blossom blight of Japanese plums caused by *Botrytis* cinerea and *B. prunorum* sp. nov. in Chile. *Phytopathology*, *106*(2), 155-165. https://doi.org/10.1094/PHYTO-06-15-0143-R

Fielding, B., Knowles, C. L., Vries, F., & Klaasen, J. (2015). Testing of eight medicinal plant extracts in combination with Kresoxim-Methyl for integrated control of *Botrytis cinerea* in apples. *Agriculture*, *5*(3), 400-411. https://doi.org/10.3390/agriculture5030400

Figueiredo-González, M., Valentão, P., Pereira, D. M., & Andrade, P. B. (2017). Further insights on tomato plant: Cytotoxic and antioxidant activity of leaf extracts in human gastric cells. *Food and Chemical Toxicology*, 109, 386-392. https://doi.org/10.1016/j.fct.2017.09.018

Fillinger, S., & Walker, A. S. (2016). Chemical control and resistance management of Botrytis diseases. In S. Fillinger & Y. Elad (Eds.), *Botrytis–The fungus, the pathogen and its management in agricultural systems* (pp. 189-216). Springer.

Flores-López, M. L., Cerqueira, M. A., de Rodríguez, D. J., & Vicente, A. A. (2016). Perspectives on utilization of edible coatings and nano-laminate coatings for extension of postharvest storage of fruits and vegetables. *Food Engineering Reviews*, *8*(3), 292-305. https://doi.org/10.1007/s12393-015-9135-x

Floury, J., Legrand, J., & Desrumaux, A. (2004). Analysis of a new type of high pressure homogeniser. Part B. study of droplet break-up and recoalescence phenomena. *Chemical Engineering Science*, *59*(6), 1285-1294. https://doi.org/10.1016/j.ces.2003.11.025

Food and Agriculture Organization of the United Nations (FAO). (2020). Tomatoes production quantity. Accessed on March 20, 2021 from, http://www.fao.org/faostat/en/#data/QC

Food and Agriculture Organization of the United Nations (FAO). (2021). Tomatoes Production Quantity. Accessed on September 20, 2021, from http://www.fao.org/faostat/en/#data/QC

Food and Agriculture Organization of the United Nations (FAO). (2018). Food loss analysis: Causes and solutions case study on the tomato value chain in the Republic of Guyana. FAO.

Forgiarini, A., Esquena, J., Gonzalez, C., & Solans, C. (2001). Formation of nanoemulsions by low-energy emulsification methods at constant temperature. *Langmuir*, *17*(7), 2076-2083. https://doi.org/10.1021/la001362n

Francl LJ. 2001. The disease triangle: A plant pathological paradigm revisited. *Plant Health Instructor*. https://doi.org/10.1094/PHI-T-2001-0517-01

Frankel, E. N., & Meyer, A. S. (2000). The problems of using one-dimensional methods to evaluate multifunctional food and biological antioxidants. *Journal of the Science of Food and Agriculture*, *80*(13), 1925-1941. https://doi.org/10.1002/1097-0010(200010)80:13<1925::AID-JSFA714>3.0.CO;2-4

Freiesleben, S., & Jäger, A. (2014). Correlation between plant secondary metabolites and their antifungal mechanisms–a review. *Medicinal and Aromatic Plants*, *3*(2), 1-6. https://doi.org/10.4172/2167-0412.1000154

Fuentes, E. J., Astudillo, L. A., Gutierrez, M. I., Contreras, S. O., Bustamante, L. O., Rubio, P. I., Moore-Carrasco, R., Alarcon, M. A., Fuentes, J. A., Gonzalez, D. E., & Palomo, I. F. (2012). Fractions of aqueous and methanolic extracts from tomato (*Solanum lycopersicum* L.) present platelet antiaggregant activity. *Blood Coagulation & Fibrinolysis,* *23*(2), 109–117. https://doi.org/10.1097/MBC.0b013e32834d78dd

Fukumori, Y., Nakajima, M., & Akutsu, K. (2004). Microconidia act the role as spermatia in the sexual reproduction of *Botrytis cinerea*. *Journal of General Plant Pathology*, *70*(5), 256-260. https://doi.org/10.1007/s10327-004-0124-9

Gaber, M. A., Wagih, E. E., Shehata, M. R., Fahmy, M. M., & Wahab, H. A. (2020). Detection and Characterization of *Botrytis cinerea* isolates from vegetable Crops in Egypt. *International Journal of Phytopathology*, *8*(3), 77-85. http://doi.org/10.33687/phytopath.008.03.2945

Galani, J. H., Patel, J. S., Patel, N. J., & Talati, J. G. (2017). Storage of fruits and vegetables in refrigerator increases their phenolic acids but decreases the total phenolics, anthocyanins and vitamin C with subsequent loss of their antioxidant capacity. *Antioxidants*, *6*(3), 59. https://doi.org/10.3390/antiox6030059

Gallo, A., Giuberti, G., Frisvad, J. C., Bertuzzi, T., & Nielsen, K. F. (2015). Review on mycotoxin issues in ruminants: Occurrence in forages, effects of mycotoxin ingestion on health status and animal performance and practical strategies to counteract their negative effects. *Toxins*, *7*(8), 3057-3111. https://doi.org/10.3390/toxins7083057

Gašić, S., & Tanović, B. (2013). Biopesticide formulations, possibility of application and future trends. *Pesticidi I Fitomedicina*, *28*(2), 97-102. https://doi.org/10.2298/PIF1302097G

Genescope. (2002). *Botrytis cinerea* estimated losses to vineyards in France [Annual Report]. UIPP.

Ghayour, N., Hosseini, S. M. H., Eskandari, M. H., Esteghlal, S., Nekoei, A. R., Gahruie, H. H., & Naghibalhossaini, F. (2019). Nanoencapsulation of quercetin and curcumin in casein-based delivery systems. *Food Hydrocolloids*, *87*, 394-403. https://doi.org/10.1016/j.foodhyd.2018.08.031

Gholamnezhad, J. (2019). Effect of plant extracts on activity of some defense enzymes of apple fruit in interaction with *Botrytis cinerea*. *Journal of Integrative Agriculture*, *18*(1), 115-123. https://doi.org/10.1016/S2095-3119(18)62104-5

Glare, T., Caradus, J., Gelernter, W., Jackson, T., Keyhani, N., Kohl, J., Marrone, P., Morin, L., & Stewart, A. (2012). Have biopesticides come of age? *Trends in Biotechnology, 30*(5), 250-258. https://doi.org/10.1016/j.tibtech.2012.01.003

Gnamusch, E., Ryder, N. S., & Paltauf, F. (1992). Effect of squalene on the structure and function of fungal membranes. *Journal of Dermatological Treatment*, *3*(sup1), 9-13. https://doi.org/10.3109/09546639209088694

Gong, C., Liu, Y., Liu, S. Y., Cheng, M. Z., Zhang, Y., Wang, R. H., & Wang, A. X. (2017). Analysis of *Clonostachys rosea*-induced resistance to grey mould disease and identification of the key proteins induced in tomato fruit. *Postharvest Biology and Technology*, *123*, 83-93. https://doi.org/10.1016/j.postharvbio.2016.08.004

Govrin, E. M., & Levine, A. (2000). The hypersensitive response facilitates plant infection by the necrotrophic pathogen *Botrytis cinerea*. *Current biology*, *10*(13), 751-757. https://doi.org/10.1016/s0960-9822(00)00560-1

Grządka, E., & Matusiak, J. (2017). The effect of ionic and non-ionic surfactants and pH on the stability, adsorption and electrokinetic properties of the alginic acid/alumina system. *Carbohydrate Polymers*, *175*, 192-198. https://doi.org/10.1016/j.carbpol.2017.07.066

Gupta, A., Eral, H. B., Hatton, T. A., & Doyle, P. S. (2016). Nanoemulsions: Formation, properties and applications. *Soft Matter*, *12*(11), 2826-2841. https://doi.org/10.1039/c5sm02958a

Gur, L., Reuveni, M., & Cohen, Y. (2017). Occurrence and etiology of *Alternaria* leaf blotch and fruit spot of apple caused by *Alternaria alternata* f. sp. mali on cv. pink lady in Israel. *European Journal of Plant Pathology*, *147*(3), 695-708. https://doi.org/10.1007/s10658-016-1037-0

Gurpreet, K., & Singh, S. K. (2018). Review of nanoemulsion formulation and characterization techniques. *Indian Journal of Pharmaceutical Sciences*, *80*(5), 781-789. https://doi.org/0.4172/pharmaceutical-sciences.1000422

Hall, T. J., Blair, J. M., Moakes, R. J., Pelan, E. G., Grover, L. M., & Cox, S. C. (2019). Antimicrobial emulsions: Formulation of a triggered release reactive oxygen delivery system. *Materials Science and Engineering C*, *103*, Article 109735. https://doi.org/10.1016/j.msec.2019.05.020

Hammerschlag, R. S., & Sisler, H. D. (1973). Benomyl and methyl-2-benzimidazolecarbamate (MBC): Biochemical, cytological and chemical aspects of toxicity to Ustilago maydis and Saccharomyces cerevesiae. *Pesticide Biochemistry and Physiology*, *3*(1), 42-54. https://doi.org/10.1016/0048-3575(73)90007-2

Hammond-Kosack, K. E., & Jones, J. D. (1996). Resistance gene-dependent plant defense responses. *Plant Cell 8*, 1773–1791. https://doi.org/10.2307/3870229

Hang, N. T. T., Oh, S. O., Kim, G. H., Hur, J. S., & Koh, Y. J. (2005). *Bacillus subtilis* S1-0210 as a biocontrol agent against *Botrytis cinerea* in strawberries. *The Plant Pathology Journal*, *21*(1), 59-63. https://doi.org/10.5423/PPJ.2005.21.1.059

Hapon, M. V., Boiteux, J. J., Fernández, M. A., Lucero, G., Silva, M. F., & Pizzuolo, P. H. (2017). Effect of phenolic compounds present in Argentinian plant extracts on mycelial growth of the plant pathogen *Botrytis cinerea* Pers. *Phyton-International Journal of Experimental Botany*, *86*, 270-277. https://doi.org/10.32604/phyton.2017.86.270

Haque, E., Irfan, S., Kamil, M., Sheikh, S., Hasan, A., Ahmad, A., Lakshmi, V., Nazir, A., & Mir, S. S. (2016). Terpenoids with antifungal activity trigger mitochondrial dysfunction in *Saccharomyces cerevisiae. Microbiology*, *85*(4), 436-443. https://doi.org/10.1134/S0026261716040093

Haron, F. F., Sijam, K., Omar, D., & Rahmani, M. (2013). Bioassay-guided isolation of antifungal plumericin from *Allamanda* species (*Apocynaceae*). *Journal of Biological Sciences*, *13*(3), 158-162. https://doi.org/10.3923/jbs.2013.158.162

Haron, F. F. (2012). *Antifungal activity of Allamanda spp. extracts and their microemulsion formulations against anthracnose (Colletotrichum gloeosporioides) disease of papaya.* [Unpublished doctoral dissertation]. Universiti Putra Malaysia, Malaysia.

Hassan, H. (2017). *Antagonist yeast for biocontrol of postharvest anthracnose disease on papaya (Carica papaya L.)*. [Unpublished doctoral dissertation]. Universiti Putra Malaysia, Malaysia.

Hassanpour, H. (2015). Effect of *Aloe vera* gel coating on antioxidant capacity, antioxidant enzyme activities and decay in raspberry fruit. *LWT-Food Science and Technology*, *60*(1), 495-501. https://doi.org/10.1016/j.lwt.2014.07.049

Hayat, S., Ahmad, H., Ali, M., Ren, K., & Cheng, Z. (2018). Aqueous garlic extract stimulates growth and antioxidant enzymes activity of tomato (*Solanum lycopersicum*). *Scientia Horticulturae*, *240*, 139-146. https://doi.org/10.1016/j.scienta.2018.06.011

Hegyi-Kaló, J., Holb, I. J., Lengyel, S., Juhász, Á., & Váczy, K. Z. (2019). Effect of year, sampling month and grape cultivar on noble rot incidence, mycelial growth rate and morphological type of *Botrytis cinerea* during noble rot development. *European Journal of Plant Pathology*, *155*, 339-348. https://doi.org/10.1007/s10658-019-01745-8

Heuvelink, E. (2018). *Tomatoes* (2nd ed.). CABI.

Hodges, D. M. (2003). *Postharvest oxidative stress in horticultural crops*. CRC Press.

Holz, G., Coertze, S., & Williamson, B. (2007). The ecology of *Botrytis* on plant surface. In Y. Elad; B. Williamson; P. Tudzynski & N. Delen (Eds.), *Botrytis: Biology, Pathology and Control* (pp.9-27). Springer.

Howard, C. B., Johnson, W. K., Pervin, S., & Izevbigie, E. B. (2015). Recent perspectives on the anticancer properties of aqueous extracts of Nigerian *Vernonia amygdalina*. *Botanics,* 5, 65-76. https://doi.org/10.2147/BTAT.S62984

Hsiang, T., & Chastagner, G. A. (1992). Production and viability of sclerotia from fungicide-resistant and fungicide-sensitive isolates of *Botrytis cinerea, B. elliptica* and *B. tulipae*. *Plant Pathology*, *41*(5), 600-605. https://doi.org/10.1111/j.1365-3059.1992.tb02459.x

Hu, H., Wisniewski, M. E., Abdelfattah, A., & Zheng, X. (2017). Biocontrol activity of a cold-adapted yeast from Tibet against gray mold in cherry tomato and its action mechanism. *Extremophiles*, *21*(4), 789-803. https://doi.org/10.1007/s00792-017-0943-1

Hua, C., Li, Y., Wang, X., Kai, K., Su, M., Zhang, D., & Liu, Y. (2019). The effect of low and high molecular weight chitosan on the control of gray mold (*Botrytis cinerea*) on kiwifruit and host response. *Scientia Horticulturae*, 246, 700-709. https://doi.org/10.1016/j.scienta.2018.11.038

Hua, L., Yong, C., Zhanquan, Z., Boqiang, L., Guozheng, Q., & Shiping, T. (2018). Pathogenic mechanisms and control strategies of *Botrytis cinerea* causing post-harvest decay in fruits and vegetables. *Food Quality and Safety*, *2*(3), 111-119. https://doi.org/10.1093/fqsafe/fyy016

Huang, Y. X., Yin, Y. G., Sanuki, A., Fukuda, N., Ezura, H., & Matsukura, C. (2015). Phosphoenolpyruvate carboxykinase (PEPCK) deficiency affects the germination, growth and fruit sugar content in tomato (*Solanum lycopersicum* L.). *Plant Physiology and Biochemistry*, *96*, 417-425. https://doi.org/10.1016/j.plaphy.2015.08.021

Hyder, S., Naseem, S., Azhar, S., Ashfaq, M., Ali, Z., Khalid, A., & Inam-ul-Haq, M. (2018). Disease incidence and severity of *Pythium* spp. and *Phytophthora* spp. affecting chili pepper and tomato crops in Punjab, Pakistan. *Philippine Agricultural Scientist*, *101*(1), 36-44.

Hynes, R. K., & Boyetchko, S. M. (2006). Research initiatives in the art and science of biopesticide formulations. *Soil Biology and Biochemistry*, *38*(4), 845-849. https://doi.org/10.1016/j.soilbio.2005.07.003

Ighodaro, O. M., & Akinloye, O. A. (2018). First line defence antioxidants-superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPX): Their fundamental role in the entire antioxidant defence grid. *Alexandria Journal of Medicine*, *54*(4), 287-293. https://doi.org/10.1016/j.ajme.2017.09.001

Ignjatov, M., Milosevic, D., Nikolic, Z., Gvozdanovic-Varga, J., Jovicic, D., & Zdjelar, G. (2015). *Fusarium oxysporum* as causal agent of tomato wilt and fruit rot. *Pesticidi i Fitomedicine*, *27*(1), 25–31. https://doi.org/10.2298/PIF1201025I

Igwe, K. K., Okafor, I. I. I. P. N., & Anika, S. M. (2015). Phytochemical characterization of *Vernonia amygdalina*. del ethanolic extract fraction and contractile response on isolated uterine tissue in female albino wistar rats. *International Journal of Scientific Research and Management*, *3*(11), 3684-3693. https://www.ijsrm.in/index.php/ijsrm/article/view/240

Ilahy, R., Hdider, C., Lenucci, M. S., Tlili, I., & Dalessandro, G. (2011). Antioxidant activity and bioactive compound changes during fruit ripening of high-lycopene tomato cultivars. *Journal of Food Composition and Analysis*, *24*(4-5), 588-595. https://doi.org/10.1016/j.jfca.2010.11.003

Ilondu, E. M. (2013). Phytochemical composition and efficacy of ethanolic leaf extracts of some *Vernonia* species against two phytopathogenic fungi*. Journal Biopesticides*, *6*(2), 165-172. http://www.jbiopest.com/users/lw8/efiles/vol_6_2_165-172.pdf

Ilondu, E. M., Ojeifo, I. M., & Egho, E. O. (2014). Field evaluation of leaf extract of some *Asteraceae* for the management of leafspot disease of sweet potatoes in Abraka, Delta State, Nigeria. *Academia Journal of Agricultural Research*, *2*(3), 080-086. http://doi.org/10.15413/ajar.2013.0175

Ivanescu, B., Miron, A., & Corciova, A. (2015). Sesquiterpene lactones from *Artemisia* genus: Biological activities and methods of analysis. *Journal of Analytical Methods in Chemistry*, Article ID 247685. https://doi.org/10.1155/2015/247685

Jaiswal, M., Dudhe, R., & Sharma, P. K. (2015). Nanoemulsion: An advanced mode of drug delivery system. *3 Biotech*, *5*(2), 123-127. https://doi.org/10.1007/s13205-014-0214-0

Jardak, K., Drogui, P., & Daghrir, R. (2016). Surfactants in aquatic and terrestrial environment: Occurrence, behavior, and treatment processes. *Environmental Science and Pollution Research*, *23*(4), 3195-3216. https://doi.org/10.1007/s11356-015-5803-x

Javed, S., Javaid, A., Anwar, W., Majeed, R. A., Akhtar, R., & Naqvi, S. F. (2017). First report of *Botrytis* bunch rot of grapes caused by *Botrytis cinerea* in Pakistan. *Plant Disease, 101*(6), 1036. https://doi.org/10.1094/PDIS-05-16-0762-PDN

Jermini, M., Jelmini, G., & Gessler, C. (1986). Control of *Botrytis cinerea* on Merlot grapevine in Ticino. Role of latent infections. *Rev. Suisse Vitic. Arboric. Hortic*, *18*, 161-166

Ji, X., Li, J., Meng, Z., Zhang, S., Dong, B., & Qiao, K. (2019). Synergistic effect of combined application of a new fungicide fluopimomide with a biocontrol agent *Bacillus methylotrophicus* TA-1 for management of gray mold in tomato. *Plant Disease*, *103*(8), 1991-1997. https://doi.org/10.1094/PDIS-01-19-0143-RE

Jiang, L. C., Basri, M., Omar, D., Rahman, M. B. A., Salleh, A. B., Rahman, R. N. Z. R. A., & Selamat, A. (2012). Green nanoemulsion intervention for water-soluble glyphosate isopropylamine (IPA) formulations in controlling *Eleusine indica* (*E. indica*). *Pesticide Biochemistry and Physiology*, *102*(1), 19-29. https://doi.org/10.1016/j.pestbp.2011.10.004

Jiao, J., & Burgess, D. J. (2003). Ostwald ripening of water-in-hydrocarbon emulsions. *Journal of Colloid and Interface Science*, *264*(2), 509–516. https://doi.org/10.1016/S0021-9797(03)00276-5

Jimenez, A., Creissen, G., Kular, B., Firmin, J., Robinson, S., Verhoeyen, M., & Mullineaux, P. (2002). Changes in oxidative processes and components of the antioxidant system during tomato fruit ripening. *Planta*, *214*(5), 751-758. https://doi.org/10.1007/s004250100667

Jin, P., Wang, H., Zhang, Y., Huang, Y., Wang, L., & Zheng, Y. (2017). UV-C enhances resistance against gray mold decay caused by *Botrytis cinerea* in strawberry fruit. *Scientia Horticulturae*, *225*, 106-111. https://doi.org/10.1016/j.scienta.2017.06.062

John, W. C., Anyanwu, N. C. J., & Ayisa, T. (2016). Evaluation of the effects of the extract of *Vernonia amygdalina* on fungi associated with infected tomatoes (*Lycopersicon esculentum*) in Jos North Local Government Area, Plateau State, Nigeria. *Annual Research & Review in Biology*, *9*(4), 1-8. https://doi.org/10.9734/ARRB/2016/23698

Jones, C. G., Hare, J. D., & Compton, S. J. (1989). Measuring plant protein with the Bradford assay. *Journal of Chemical Ecology*, *15*(3), 979-992. https://doi.org/10.1007/BF01015193

Jones, K. A., & Burges, H. D. (1998). Formulation of bacterial, viruses and protozoa to control insects. In H. D. Burges (Eds.), *Formulation of Microbial Biopesticides: Beneficial Micro-organisms, Nematodes and Seed Treatments* (pp. 32-127). Kluwer Academic Publishers.

Judet-Correia, D., Bollaert, S., Duquenne, A., Charpentier, C., Bensoussan, M., & Dantigny, P. (2010). Validation of a predictive model for the growth of *Botrytis cinerea* and *Penicillium expansum* on grape berries. *International Journal of Food Microbiology*, *142*(1-2), 106-113. https://doi.org/10.1016/j.ijfoodmicro.2010.06.009

Kadiri, O., & Olawoye, B. (2016). *Vernonia amygdalina*: An underutilized vegetable with nutraceutical potentials–A review. *Turkish Journal of Agriculture-Food Science and Technology*, *4*(9), 763-768. https://doi.org/10.24925/turjaf.v4i9.763-768.570

Kaewseejan, N., & Siriamornpun, S. (2015). Bioactive components and properties of ethanolic extract and its fractions from *Gynura procumbens* leaves. *Industrial Crops and Products*, *74*, 271-278. https://doi.org/10.1016/j.indcrop.2015.05.019

Kah, M., & Hofmann, T. (2014). Nanopesticide research: Current trends and future priorities. *Environment International,* *63*, 224–235. https://doi.org/10.1016/j.envint.2013.11.015

Kale, S. N., & Deore, S. L. (2017). Emulsion micro emulsion and nano emulsion: A review. *Systematic Reviews in Pharmacy*, *8*(1), 39-47. https://doi.org/10.5530/srp.2017.1.8

Kamarudin, N. (2013). *Oil Nanoemulsion Formulation of Azadirachtin for Control of Bemisia Tabaci Gennadius* [Doctoral dissertation]. Universiti Putra Malaysia, Malaysia.

Kanetis, L., Exarchou, V., Charalambous, Z., & Goulas, V. (2017). Edible coating composed of chitosan and *Salvia fruticosa* Mill. extract for the control of grey mould of table grapes. *Journal of the Science of Food and Agriculture*, *97*(2), 452-460. https://doi.org/10.1002/jsfa.7745

Kankara, S. S., Ibrahim, M. H., Mustafa, M., & Go, R. (2015). Ethnobotanical survey of medicinal plants used for traditional maternal healthcare in Katsina state, Nigeria. *South African Journal of Botany, 97,* 165–175. https://doi.org/10.1016/j.sajb.2015.01.007

Kapoor, S., & Dharmesh, S. M. (2017). Pectic oligosaccharide from tomato exhibiting anticancer potential on a gastric cancer cell line: Structure-function relationship. *Carbohydrate Polymers*, *160*, 52-61. https://doi.org/10.1016/j.carbpol.2016.12.046

Katan, T. (1982). Resistance to 3, 5-dichlorophenyl-N-cyclic imide ('dicarboximide') fungicides in the grey mould pathogen *Botrytis cinerea* on protected crops. *Plant Pathology*, *31*(2), 133-141. https://doi.org/10.1111/j.1365-3059.1982.tb02821.x

Kekuda, T. R., Vinayaka, K. S., Swathi, D., Suchitha, Y., Venugopal, T. M., & Mallikarjun, N. (2011). Mineral composition, total phenol content and antioxidant activity of a macrolichen *Everniastrum cirrhatum* (Fr.) Hale (Parmeliaceae). *Journal of Chemistry*, *8*(Article ID 420673). https://doi.org/10.1155/2011/420673

Khachik, F., Carvalho, L., Bernstein, P. S., Muir, G. J., Zhao, D., & Katz, N. B. (2002). Chemistry, distribution, and metabolism of tomato carotenoids and their impact on human health. *Experimental Biology and Medicine, 227*(10), 845–851. https://doi.org/10.1177/153537020222701002

Khaliq, G., Abbas, H. T., Ali, I., & Waseem, M. (2019). *Aloe vera* gel enriched with garlic essential oil effectively controls anthracnose disease and maintains postharvest quality of banana fruit during storage. *Horticulture, Environment, and Biotechnology*, *60*(5), 659-669. https://doi.org/10.1007/s13580-019-00159-z

Khaliq, G., Nisa, M., Ramzan, M., & Koondhar, N. (2017). Textural properties and enzyme activity of mango (*Mangifera indica* L.) fruit coated with chitosan during storage. *Journal of Agricultural Studies*, *5*(2), 32-50. https://doi.org/10.5296/jas.v5i2.10946

Khandelwal, N., Barbole, R. S., Banerjee, S. S., Chate, G. P., Biradar, A. V., Khandare, J. J., & Giri, A. P. (2016). Budding trends in integrated pest management using advanced micro-and nano-materials: Challenges and perspectives. *Journal of Environmental Management*, *184*(2), 157-169. https://doi.org/10.1016/j.jenvman.2016.09.071

Khatri, D., Panigrahi, J., Prajapati, A., & Bariya, H. (2020). Attributes of *Aloe vera* gel and chitosan treatments on the quality and biochemical traits of post-harvest tomatoes. *Scientia Horticulturae*, *259*, 1-8. https://doi.org/10.1016/j.scienta.2019.108837

Khazaeli, P., Zamanizadeh, H., Morid, B., & Bayat, H. (2010). Morphological and molecular identification of *Botrytis cinerea* causal agent of gray mold in rose greenhouses in centeral regions of Iran. *International Journal of Agricultural Science and Research,* *1*(1), 19-24. https://www.sid.ir/en/journal/ViewPaper.aspx?id=205777

Khokhar, I., Wang, J., Jia, Y., & Yan, Y. (2019). First report of *Rhizopus* soft rot on tomato (*Lycopersicon esculentum*) caused by *Rhizopus oryzae* in China. *Plant Disease*, *103*(5), 1041-1041. https://doi.org/10.1094/PDIS-10-18-1848-PDN

Kim, J. Y., Aktaruzzaman, M., Afroz, T., Kim, B. S., & Shin, H. D. (2016). First report of gray mold caused by *Botrytis cinerea* on red raspberry (*Rubus idaeus*) in Korea. *Plant Disease*, *100*(2), 533. https://doi.org/10.1094/PDIS-08-15-0869-PDN

Knapp, S., & Peralta, I. E. (2016). The tomato (*Solanum lycopersicum* L., Solanaceae) and its botanical relatives. In M. Causse; J. Giovannoni; M. Bouzayen & M. Zouine (Eds.), *The tomato genome* (pp. 7-21). Springer, Berlin, Heidelberg.

Knowles, A. (Ed.). (2012). *Chemistry and technology of agrochemical formulations*. Springer Science & Business Media.

Konstantinou, S., Veloukas, T., Leroch, M., Menexes, G., Hahn, M., & Karaoglanidis, G. (2015). Population structure, fungicide resistance profile, and sdhB mutation frequency of *Botrytis cinerea* from strawberry and greenhouse-grown tomato in Greece. *Plant Disease*, *99*(2), 240-248. https://doi.org/10.1094/PDIS-04-14-0373-RE

Kookana, R. S., Boxall, A. B., Reeves, P. T., Ashauer, R., Beulke, S., Chaudhry, Q., & Lynch, I. (2014). Nanopesticides: Guiding principles for regulatory evaluation of environmental risks. *Journal of Agricultural and Food Chemistry*, *62*(19), 4227-4240. https://doi.org/10.1021/jf500232f

Koubé, J., Dongmo, S. S., Guiama, V. D., & Bum, E. N. (2016). Ethnomedicinal survey of Gavdé (*Acacia nilotica*): A medicinal plant used in sahelian zone of Cameroon, Central Africa. *International Journal of Innovation and Applied Studies, 16* (4), 820–827. http://www.ijias.issr-journals.org/abstract.php?article=IJIAS-16-051-01

Koul, O. (2011). Microbial biopesticides: Opportunities and challenges. *CAB Reviews Perspectives in Agriculture Veterinary Science Nutrition and Natural Resources, 6*(No.056), 1–26. https://doi.org/10.1079/PAVSNNR20116056

Köhl, J., Molhoek, W. M. L., Van der Plas, C. H., Kessel, G. J. T., & Fokkema, N. J. (1992). Biological control of Botrytis leaf blight of onions: significance of sporulation suppression. *Recent Advances in Botrytis Research*, 192-196.

Krzyśko-Łupicka, T., Walkowiak, W., & Białoń, M. (2019). Comparison of the fungistatic activity of selected essential oils relative to *Fusarium graminearum* isolates. *Molecules*, *24*(2), 1-14. https://doi.org/10.3390/molecules24020311

Kumar, G. V., Kumar, A., Raghu, K., Patel, G., & Manjappa, S. (2013). Determination of vitamin C in some fruits and vegetables in Davanagere city (Karanataka)–India. *International Journal of Pharmacy & Life Sciences*, *4*(3), 2489-2491. http://www.ijplsjournal.com/issues%20PDF%20files/march-2013/12.pdf

Kumar, P., & Mittal, K. L. (Eds.). (1999). *Handbook of microemulsion science and technology*. CRC press.

Kumar, S. P., & Babu, A. S. K. R. (2018). Symptomology of major fungal diseases on tomato and its management. *Journal of Pharmacognosy and Phytochemistry*, *7*(6), 1817-1821.

Kumar, S., Nehra, M., Dilbaghi, N., Marrazza, G., Hassan, A. A., & Kim, K. H. (2019). Nano-based smart pesticide formulations: Emerging opportunities for agriculture. *Journal of Controlled Release*, *294*, 131–153, https://doi.org/10.1016/j.jconrel.2018.12.012

Kumari, S., Tayal, P., Sharma, E., & Kapoor, R. (2014). Analyses of genetic and pathogenic variability among *Botrytis cinerea* isolates. *Microbiological Research*, *169*(11), 862-872. https://doi.org/10.1016/j.micres.2014.02.012

Kumbum, S., & Sivarao, S. (2012). Antibacterial, antioxidant activity and GC-MS analysis of *Eupatorium odoratum*. *Asian Journal of Pharmaceutical and Clinical Research*, *5*(suppl. 2), 99-106.

Kurniawan, O., Wilson, K., Mohamed, R., & Avis, T. J. (2018). *Bacillus* and *Pseudomonas* spp. provide antifungal activity against gray mold and *Alternaria* rot on blueberry fruit. *Biological Control*, *126*, 136-141. https://doi.org/10.1016/j.biocontrol.2018.08.001

Lafuente, M. T., Ballester, A. R., & González-Candelas, L. (2019). Involvement of abscisic acid in the resistance of citrus fruit to *Penicillium digitatum* infection. *Postharvest Biology and Technology*, *154*, 31-40. https://doi.org/10.1016/j.postharvbio.2019.04.004

Lalève, A., Fillinger, S., & Walker, A. S. (2014). Fitness measurement reveals contrasting costs in homologous recombinant mutants of *Botrytis cinerea* resistant to succinate dehydrogenase inhibitors. *Fungal Genetics and Biology,* 67, 24-36. https://doi.org/10.1016/j.fgb.2014.03.006

Lattanzio, V., Lattanzio, V. M., & Cardinali, A. (2006). Role of phenolics in the resistance mechanisms of plants against fungal pathogens and insects. In F. Imperato (Ed.), *Phytochemistry: Advances in research* (pp. 23-67). Research Signpost.

Łaźniewska, J., Macioszek, V. K., Lawrence, C. B., & Kononowicz, A. K. (2010). Fight to the death: *Arabidopsis thaliana* defense response to fungal necrotrophic pathogens. *Acta Physiologiae Plantarum*, *32*(1), 1-10. https://doi.org/10.1007/s11738-009-0372-6

Lebov, J. F., Engel, L. S., Richardson, D., Hogan, S. L., Hoppin, J. A., & Sandler, D. P. (2016). Pesticide use and risk of end-stage renal disease among licensed pesticide applicators in the Agricultural Health Study. *Occupational Environmental Medicine*, *73*(1), 3-12. https://doi.org/10.1136/oemed-2014-102615

Lechuga, M., Fernández-Serrano, M., Jurado, E., Núñez-Olea, J., & Ríos, F. (2016). Acute toxicity of anionic and non-ionic surfactants to aquatic organisms. *Ecotoxicology and Environmental Safety*, *125*, 1-8. https://doi.org/10.1016/j.ecoenv.2015.11.027

Lee, S. K., & Kader, A. A. (2000). Preharvest and postharvest factors influencing vitamin C content of horticultural crops. *Postharvest Biology and Technology*, *20*(3), 207-220. https://doi.org/10.1016/S0925-5214(00)00133-2

Legard, D. E., Xiao, C. L., Mertely, J. C., & Chandler, C. K. (2000). Effects of plant spacing and cultivar on incidence of *Botrytis* fruit rot in annual strawberry. *Plant Disease*, *84*(5), 531-538

Leroux, P. (2004) Chemical control of Botrytis and its resistance to chemical fungicides. In Y. Elad; B. Williamson; P. Tudzynski & N. Delen (Eds.), *Botrytis: Biology, Pathology and Control* (pp. 195–222). Springer.

Leyronas, C., Duffaud, M., Parès, L., Jeannequin, B., & Nicot, P. C. (2015). Flow of *Botrytis cinerea* inoculum between lettuce crop and soil. *Plant Pathology*, *64*(3), 701-708. https://doi.org/10.1111/ppa.12284

Li, B., Peng, H., & Tian, S. (2016). Attachment capability of antagonistic yeast *Rhodotorula glutinis* to *Botrytis cinerea* contributes to biocontrol efficacy. *Frontiers in Microbiology*, *7*(Article 601), 1-9. https://doi.org/10.3389/fmicb.2016.00601

Li, L., & Steffens, J. C. (2002). Overexpression of polyphenol oxidase in transgenic tomato plants results in enhanced bacterial disease resistance. *Planta*, *215*(2), 239-247. https://doi.org/10.1007/s00425-002-0750-4

Li, X., Long, Q., Gao, F., Han, C., Jin, P., & Zheng, Y. (2017). Effect of cutting styles on quality and antioxidant activity in fresh-cut pitaya fruit. *Postharvest Biology and Technology*, *124*, 1-7. https://doi.org/10.1016/j.postharvbio.2016.09.009

Li, Y., Sun, S., Du, C., Xu, C., Zhang, J., Duan, C., & Zhu, Z. (2016a). A new disease of mung bean caused by *Botrytis cinerea*. *Crop Protection*, *85*, 52-56. https://doi.org/10.1016/j.cropro.2016.03.020

Liu, C. H., Cai, L. Y., Lu, X. Y., Han, X. X., & Ying, T. J. (2012). Effect of postharvest UV-C irradiation on phenolic compound content and antioxidant activity of tomato fruit during storage. *Journal of Integrative Agriculture*, *11*(1), 159-165. https://doi.org/10.1016/S1671-2927(12)60794-9

Liu, C., Chen, L., Zhao, R., Li, R., Zhang, S., Yu, W., & Shen, L. (2019). Melatonin induces disease resistance to *Botrytis cinerea* in tomato fruit by activating jasmonic acid signaling pathway. *Journal of Agricultural and Food Chemistry, 67*(22), 6116-6124. https://doi.org/10.1021/acs.jafc.9b00058

Lozano-Grande, M. A., Gorinstein, S., Espitia-Rangel, E., Dávila-Ortiz, G., & Martínez-Ayala, A. L. (2018). Plant sources, extraction methods, and uses of squalene. *International Journal of Agronomy*, *2018*(Article ID 1829160), 1-13. https://doi.org/10.1155/2018/1829160

Ma, S., Hu, Y., Liu, S., Sun, J., Irfan, M., Chen, L. J., & Zhang, L. (2018). Isolation, identification and the biological characterization of *Botrytis cinerea*. *International Journal of Agriculture and Biology*, *20*(5), 1033-1040. https://doi.org/10.17957/IJAB/15.0600

Ma, T., Luo, J., Tian, C., Sun, X., Quan, M., Zheng, C., Kang, L., & Zhan, J. (2015). Influence of technical processing units on chemical composition and antimicrobial activity of carrot (*Daucus carrot* L.) juice essential oil. *Food Chemistry*, *170*, 394-400. https://doi.org/10.1016/j.foodchem.2014.08.018

Mahmud, T. M. M. (2017). *Postharvest: An Unsung Solutions for Food Security*. UPM Press.

Maioli, A., Gianoglio, S., Moglia, A., Acquadro, A., Valentino, D., Milani, A. M., & Comino, C. (2020). Simultaneous CRISPR/Cas9 editing of three PPO genes reduces fruit flesh browning in *Solanum melongena* L. *Frontiers in Plant Science*, *11*(Article 607161), 1-13. https://doi.org/10.3389/fpls.2020.607161

Mao, L., & Miao, S. (2015). Structuring food emulsions to improve nutrient delivery during digestion. *Food Engineering Reviews*, *7*(4), 439-451. https://doi.org/ 10.1007/s12393-015-9108-0

Maphosa, Y., Jideani, V. A., & Adeyi, O. (2017). Effect of soluble dietary fibres from Bambara groundnut varieties on the stability of orange oil beverage emulsion. *African Journal of Science, Technology, Innovation and Development*, *9*(1), 69-76. https://doi.org/10.1080/20421338.2016.1263436

Marinho, G. J. P., Klein, D. E., & César Luis Junior, S. (2018). Evaluation of soapberry (*Sapindus saponaria* L.) leaf extract against papaya anthracnose. *Summa Phytopathologica*, *44*(2), 127-131. https://doi.org/10.1590/0100-5405/175605

Martin, F. L., Martinez, E. Z., Stopper, H., Garcia, S. B., Uyemura, S. A., & Kannen, V. (2018). Increased exposure to pesticides and colon cancer: Early evidence in Brazil. *Chemosphere*, *209*, 623-631. https://doi.org/10.1016/j.chemosphere.2018.06.118

Martins, N., Barros, L., Henriques, M., Silva, S., & Ferreira, I. C. (2015). Activity of phenolic compounds from plant origin against *Candida* species. *Industrial Crops and Products*, *74*, 648-670. https://doi.org/10.1016/j.indcrop.2015.05.067

McClements, D. J. (2012). Nanoemulsions versus microemulsions: Terminology, differences, and similarities. *Soft Matter*, *8*(6), 1719-1729. https://doi.org/10.1039/C2SM06903B

McClements, D. J. (2015). *Food Emulsions: Principles, Practices, and Techniques* (3rd ed., pp. 289-373). CRC Press.

Mekoya, A., Oosting, S.J., Fernandez-Rivera, S., & Van der Zijpp, A. J. (2008). Multipurpose fodder trees in the Ethiopian highlands: Farmers' preference and relationship of indigenous knowledge of feed value with laboratory indicators. *Agriculture System, 96*(1-3), 184–194. https://doi.org/10.1016/j.agsy.2007.08.001

Mendy, T. K., Misran, A., Mahmud, T. M. M., & Ismail, S. I. (2019). Application of *Aloe vera* coating delays ripening and extend the shelf life of papaya fruit. *Scientia Horticulturae*, *246*, 769-776. https://doi.org/10.1016/j.scienta.2018.11.054

Mercier, A., Carpentier, F., Duplaix, C., Auger, A., Pradier, J. M., Viaud, M., & Walker, A. S. (2019). The polyphagous plant pathogenic fungus *Botrytis cinerea* encompasses host-specialized and generalist populations. *Environmental Microbiology*, *21*(12), 4808-4821. https://doi.org/10.1111/1462-2920.14829

Michailides, T. J., & Elmer, P. A. (2000). Botrytis gray mold of kiwifruit caused by Botrytis cinerea in the United States and New Zealand. *Plant Disease*, *84*(3), 208-223.

Mirdehghan, S. H., & Valero, D. (2017). Bioactive compounds in tomato fruit and its antioxidant activity as affected by incorporation of *Aloe*, eugenol, and thymol in fruit package during storage. *International Journal of Food Properties*, *20*(sup2), 1798-1806. https://doi.org/10.1080/10942912.2016.1223128

Miresmailli, S., & Isman, M. B. (2014). Botanical insecticides inspired by plant–herbivore chemical interactions. *Trends in Plant Science*, *19*(1), 29-35. https://doi.org/10.1016/j.tplants.2013.10.002

Mirzaei, S., Goltapeh, E.M., & Shams-bakhsh, M. (2007). Taxonomical studies on the genus *Botrytis* in Iran. *Journal of Agricultural Technology 3*(1), 65-76. http://www.ijat-aatsea.com/pdf/JUN_V3_07/7-IJAT2007_01-R.pdf

Mirzaei, S., Mohammadi Goltapeh, E., Shams-Bakhsh, M., Safaie, N., & Chaichi, M. (2009). Genetic and phenotypic diversity among *Botrytis cinerea* isolates in Iran. *Journal of Phytopathology*, *157*(7-8), 474-482. https://doi.org/10.1111/j.14390434.2008.01518.x

Mishra, J., Tewari, S., Singh, S., & Arora, N. K. (2015). Biopesticides: Where we stand? In N. K. Arora (Ed.), *Plant microbes symbiosis: Applied facets* (pp. 37-75). Springer. https://doi.org/10.1007/978-81-322-2068-8_2

Mittler, R. (2002). Oxidative stress, antioxidants and stress tolerance. *Trends in Plant Science*, *7*(9), 405-410. https://doi.org/10.1016/s1360-1385(02)02312-9

Modi, J. D., & Patel, J. K. (2011). Nanoemulsion-based gel formulation of aceclofenac for topical delivery. *International Journal of Pharmacy and Pharmaceutical Science Research, 1*(1), 6-12.

Mohamed, N. T. S., Ding, P., Ghazali, H. M., & Kadir, J. (2017). Biochemical and cell wall ultrastructural changes in crown tissue of banana (Musa AAA 'Berangan') fruit as mediated by UVC irradiation against crown rot fungal infection. *Postharvest Biology and Technology*, *128*, 144-152. https://doi.org/10.1016/j.postharvbio.2017.02.004

Mohammadi, S., Aroiee, H., Aminifard, M. H., & Jahanbakhsh, V. (2012). *In vitro* and *in vivo* antifungal activates of the essential oils of various plants against strawberry grey mould disease agent *Botrytis cinerea*. *Archives of Phytopathology and Plant Protection*, *45*(20), 2474-2484. https://doi.org/10.1080/03235408.2012.729422

Moon, K. M., Kwon, E. B., Lee, B., & Kim, C. Y. (2020). Recent trends in controlling the enzymatic browning of fruit and vegetable products. *Molecules*, *25*(12), 1-15. https://doi.org/10.3390/molecules25122754

Moorman, G. W. (2014). *Botrytis* or gray mold. [Fact Sheet]. Home & Garden Information Centre. Retrieved from https://hgic.clemson.edu/factsheet/gray-mold-botrytis-blight

Moosa, A., Sahi, S. T., Khan, S. A., & Malik, A. U. (2019). Salicylic acid and jasmonic acid can suppress green and blue moulds of citrus fruit and induce the activity of polyphenol oxidase and peroxidase. *Folia Horticulturae*, *31*(1), 195-204. https://doi.org/10.2478/fhort-2019-0014

Moparthi, S., Peluola, C., Agindotan, B., McPhee, K., & Burrows, M. (2020). First report of gray mold of chickpea caused by *Botrytis euroamericana* in the USA. *Crop Protection*, *137*, 105297. https://doi.org/10.1016/j.cropro.2020.105297

Morris, P. F., Connolly, M. S., & St Clair, D. A. (2000). Genetic diversity of *Alternaria alternata* isolated from tomato in California assessed using RAPDs. *Mycological Research*, *104*(3), 286-292. https://doi.org/10.1017/S0953756299008758

Moshi, M.J., Otieno, D.F., Mbabazi, P.K., Weisheit, A., (2010). Ethnomedicine of the Kagera Region, North western Tanzania. Part 2: The medicinal plants used in Katoro Ward, Bukoba District. *Journal of Ethnobiology and Ethnomedicine, 6*(19), 1-5. https://doi.org/10.1186/1746-4269-6-19

Mukhopadhyay, S. S. (2014). Nanotechnology in agriculture: Prospects and constraints. *Nanotechnology, Science and Applications*, *7*, 63-71. https://doi.org/10.2147/NSA.S39409

Müller, L., Caris-Veyrat, C., Lowe, G., & Böhm, V. (2016). Lycopene and its antioxidant role in the prevention of cardiovascular diseases—A critical review. *Critical Reviews in Food Science and Nutrition*, *56*(11), 1868-1879. http://doi.org/10.1080/10408398.2013.801827

Muñoz, M., Faust, J. E., & Schnabel, G. (2019). Characterization of *Botrytis cinerea* from commercial cut flower roses. *Plant Disease*, *103*(7), 1577-1583. https://doi.org/10.1094/PDIS-09-18-1623-RE

Murad, N. B. A., & Zainudin, N. A. I. M. (2017). Review of fruit rot diseases of important tropical and some temperate fruit crops. *Pertanika Journal of Scholarly Research Reviews*, *3*(1), 138-156. http://psasir.upm.edu.my/id/eprint/58287/

Mustapha, A. A., Owuna, G., & Uthman, H. I. (2013). Plant remedies practiced by Keffi people in the management of dermatosis. *Journal Medicinal and Plants Studied, 1* (5), 112–118. https://www.plantsjournal.com/archives/?year=2013

Nagi, A., Iqbal, B., Kumar, S., Sharma, S., Ali, J., & Baboota, S. (2017). Quality by design based silymarin nanoemulsion for enhancement of oral bioavailability. *Journal of Drug Delivery Science and Technology*, *40*, 35-44. https://doi.org/10.1016/j.jddst.2017.05.019

Nakajima, M., & Akutsu, K. (2014). Virulence factors of *Botrytis cinerea*. *Journal of General Plant Pathology. 80*, 15–23. https://doi.org/10.1007/s10327-013-0492-0

Narasimhan, B., Belsare, D., Pharande, D., Mourya, V., & Dhake, A. (2004). Esters, amides and substituted derivatives of cinnamic acid: Synthesis, antimicrobial activity and QSAR investigations. *European Journal of Medicinal Chemistry*, *39*(10), 827-834. https://doi.org/10.1016/j.ejmech.2004.06.013

Narayan, S., Liew, Z., Bronstein, J. M., & Ritz, B. (2017). Occupational pesticide use and Parkinson's disease in the Parkinson Environment Gene (PEG) study. *Environment International*, *107*, 266-273. https://doi.org/10.1016/j.envint.2017.04.010

Nawab, A., Alam, F., & Hasnain, A. (2017). Mango kernel starch as a novel edible coating for enhancing shelf-life of tomato (*Solanum lycopersicum*) fruit. *International Journal of Biological Macromolecules*, *103*, 581-586. https://doi.org/10.1016/j.ijbiomac.2017.05.057

NCBI Taxonomy. (n.d.). *Botrytis cinerea*. Retrieved October 16, 2019 from https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?mode=Info&id=40559&lvl=3&lin=f&keep=1&srchmode=5&unlock

Ndaeyo, N. U. (2007). Assessing the contributions of homestead farming to food security in a developing economy: A case study of Southeastern Nigeria. *Journal of Agriculture and Social Science, 3*(1), 11–16. http://www.fspublishers.org/published_papers/39829_..pdf

Ngadze, E., Icishahayo, D., Coutinho, T. A., & Van der Waals, J. E. (2012). Role of polyphenol oxidase, peroxidase, phenylalanine ammonia lyase, chlorogenic acid, and total soluble phenols in resistance of potatoes to soft rot. *Plant disease*, *96*(2), 186-192. https://doi.org/10.1094/PDIS-02-11-0149

Nicholson, R. L., & Hammerschmidt, R. (1992). Phenolic compounds and their role in disease resistance. *Annual Review of Phytopathology*, *30*(1), 369-389. https://doi.org/10.1146/annurev.py.30.090192.002101

Ninkuu, V., Adetunde, L. A., Sackey, I., Opoku, N., & Diedong, P. (2019). Antifungal efficacy of crude extracts of *Azadirachta indica* and *Vernonia amygdalina* against pathogenic *Aspergillus niger* (ATCC 16404). *Journal of Medicinal Plants Research, 13*(17), 408-412. https://doi.org/10.5897/JMPR2018.6609

Njan, A. A., Adzu, B., Agaba, A. G., Byarugaba, D., Díaz-Llera, S., & Bangsberg, D. R. (2008). The analgesic and antiplasmodial activities and toxicology of *Vernonia amygdalina*. *Journal of Medicine Food, 11*(3), 574–581. https://doi.org/10.1089/jmf.2007.0511

Nobbmann, U. L. (2020, November 18). Polydispersity–What Does It Mean for DLS and Chromatography. http://www.materials-talks.com/blog/2014/10/23/polydispersity-what-does-it-mean-for-dls-and-chromatography

Nowicki, M., Foolad, M. R., Nowakowska, M., & Kozik, E. U. (2012). Potato and tomato late blight caused by *Phytophthora infestans*: An overview of pathology and resistance breeding. *Plant Disease*, *96*(1), 4-17. https://doi.org/10.1094/PDIS-05-11-0458

Nursuhaili, A.B., Nur Afiqah Syahirah, P., Martini, M.Y., Azizah, M., & Mahmud, T. M. M. (2019). A review: Medicinal values, agronomic practices and postharvest handlings of *Vernonia amygdalina*. *Food Research*, *3*(5), 380-390. https://doi.org/10.26656/fr.2017.3(5).306

Nwosu, S. I., Stanley, H. O., & Okerentugba, P. O. (2013). Occurrence, types and location of calcium oxalate crystals in *Vernonia amydalina* Del (Asteraceae).

International Journal of Science and Nature, 4(3), 533–537. https://doi.org/10.1186/1999-3110-55-32

O'Kennedy, N., Crosbie, L., van Lieshout, M., Broom, J. I., Webb, D. J., & Duttaroy, A. K. (2006). Effects of antiplatelet components of tomato extract on platelet function *in vitro* and ex vivo: A time-course cannulation study in healthy humans. *American Journal of Clinical Nutrition, 84*(3), 570–579. https://doi.org/10.1093/ajcn/84.3.570

O'Neill, T. (2014). Tomato and Pepper. In R. A. George & R. T. Fox (Eds.), *Diseases of temperate horticultural plants* (pp. 299-302). CABI.

Ogo-Oluwa, A., & Liamngee, K. (2016). Evaluation of bitter leaf (*Vernonia amygdalina*) extract in the inhibition of fungi causing post-harvest rot of tomato fruits in Makurdi, Benue State, Nigeria. *Der Pharmacia Lettre*, *3*(11), 69-73. https://www.scholarsresearchlibrary.com/

Okey, E. N., Akwaji, P. I., Akpan, J. B., Umana, E. J., & Bassey, G. A. (2016). *In vitro* control of tomato (*Solanum lycopersicon* L.) fruit rot caused by fungi using two plant extracts. *International Letters of Natural Sciences*, *52*, 19-27. https://doi.org/10.18052/www.scipress.com/ILNS.52.19

Omosun, G., Okoro, I. A., Ekundayo, E., Ojimelukwe, P. C., & Ibe, O. (2013). Ethnobotanical study of medicinal plants useful for malaria therapy in eight local government areas of Abia State, Southeast Nigeria. *Advancement in Medicinal Plant Research 1*(2), 39–44. http://www.netjournals.org/z_AMPR_13_021.html

Oms-Oliu, G., Soliva-Fortuny, R., & Martín-Belloso, O. (2008). Edible coatings with antibrowning agents to maintain sensory quality and antioxidant properties of fresh-cut pears. *Postharvest Biology and Technology*, *50*(1), 87-94. https://doi.org/10.1016/j.postharvbio.2008.03.005

Oyeyemi, I. T., Akinlabi, A. A., Adewumi, A., Aleshinloye, A. O., & Oyeyemi, O. T. (2018). *Vernonia amygdalina*: A folkloric herb with anthelminthic properties. *Beni-Suef University Journal of Basic and Applied Sciences*, *7*(1), 43-49. https://doi.org/10.1016/j.bjbas.2017.07.007

Özden, S., Atabey, D., Yıldız, S., & Göker, H. (2005). Synthesis and potent antimicrobial activity of some novel methyl or ethyl 1H-benzimidazole-5-carboxylates derivatives carrying amide or amidine groups. *Bioorganic & Medicinal Chemistry*, *13*(5), 1587-1597. https://doi.org/10.1016/j.bmc.2004.12.025

Palou, L., Rosales, R., Montesinos-Herrero, C., & Taberner, V. (2016). Short-term exposure to high CO2 and O2 atmospheres to inhibit postharvest gray mold of pomegranate fruit. *Plant Disease*, *100*(2), 424-430. https://doi.org/10.1094/PDIS-06-15-0637-RE

Pan, T. T., Pu, H., & Sun, D. W. (2017). Insights into the changes in chemical compositions of the cell wall of pear fruit infected by *Alternaria alternata* with confocal Raman microspectroscopy. *Postharvest Biology and Technology*, *132*, 119-129. https://doi.org/10.1016/j.postharvbio.2017.05.012

Pande, S., Galloway, J., Gaur, P. M., Siddique, K. H. M., Tripathi, H. S., Taylor, P., MacLeod, M. W. J., Basadrai, A. K., Bakr, M. A., Joshi, S., Kishore, K. G., Isenegger, D. A., Narayana, J., & Sharma, M. (2006). *Botrytis* gray mold of chickpea: A review of biology, epidemiology and disease management. *Australian Journal of Agricultural Research, 57*, 1137-1150. http://doi.org/10.1071/AR06120

Pane, C., Fratianni, F., Parisi, M., Nazzaro, F., & Zaccardelli, M. (2016). Control of *Alternaria* post-harvest infections on cherry tomato fruits by wild pepper phenolic-rich extracts. *Crop Protection*, *84*, 81-87. https://doi.org/10.1016/j.cropro.2016.02.015

Pant, M., Dubey, S., & Patanjali, P. K. (2016). Recent advancements in bio-botanical pesticide formulation technology development. In V. Veer & R. Gopalakrishnan (Eds.), *Herbal insecticides, repellents and biomedicines: Effectiveness and commercialization* (pp. 117-126). Springer. https://doi.org/10.1007/978-81-322-2704-5_7

Pantelic, I. (Ed.). (2014). *Alkyl Polyglucosides: From natural-origin surfactants to prospective delivery systems*. Woodhead Publishing.

Pareek, S. (Ed.). (2016). *Postharvest ripening physiology of crops* (Vol. 1). CRC Press.

Parveen, R., Baboota, S., Ali, J., Ahuja, A., & Ahmad, S. (2015). Stability studies of silymarin nanoemulsion containing Tween 80 as a surfactant. *Journal of Pharmacy & Bioallied Sciences*, *7*(4), 321. https://doi.org/10.4103/0975-7406.168037

Paul, T. T., & Onwoke, A. D. (2017). Biological control of tomato wilt fungi using leaf extracts of bitter leaf (*Vernonia amygdalina*). *World Academy of Science, Engineering and Technology, International Journal of Biological, Biomolecular, Agricultural, Food and Biotechnological Engineering*, *11*(8), 638-641. https://publications.waset.org/10008291

Payet, L., & Terentjev, E. M. (2008). Emulsification and stabilization mechanisms of O/W emulsions in the presence of chitosan. *Langmuir*, *24*(21), 12247-12252. https://doi.org/10.1021/la8019217

Perveen, R., Suleria, H. A. R., Anjum, F. M., Butt, M. S., Pasha, I., & Ahmad, S. (2015). Tomato (*Solanum lycopersicum*) carotenoids and lycopenes chemistry; metabolism, absorption, nutrition, and allied health claims—A comprehensive review. *Critical Reviews in Food Science and Nutrition*, 55(7), 919-929. https://doi.org/10.1080/10408398.2012.657809

Pesticide Board Malaysia. (2016). *Guidelines for biopesticide registration*. DOA, Malaysia.

Petsikos-Panayotarou, N., Markellou, E., Kalamarakis, A. E., Kyriakopoulou, D., & Malathrakis, N. E. (2003). *In vitro* and *in vivo* activity of cyprodinil and pyrimethanil on *Botrytis cinerea* isolates resistant to other botryticides and selection for resistance to pyrimethanil in a greenhouse population in Greece. *European Journal of Plant Pathology*, *109*(2), 173-182. https://doi.org/10.1023/A:1022522420919

Polat, İ., Görkem, S. Ü. L. Ü., Kitapci, A., Gümrükcü, E., & Baysal, Ö. (2018). Molecular fingerprinting of *Botrytis cinerea* population structure from different hosts. *Derim*, *35*(2), 121-134. https://doi.org/10.16882/derim.2018.410051

Posocco, P., Perazzo, A., Preziosi, V., Laurini, E., Pricl, S., & Guido, S. J. R. A. (2016). Interfacial tension of oil/water emulsions with mixed non-ionic surfactants: Comparison between experiments and molecular simulations. *RSC Advances*, *6*(6), 4723-4729. https://doi.org/10.1039/C5RA24262B

Prakash, A., & Rao, J. (2018). *Botanical pesticides in agriculture*. CRC Press.

Prasanna, V., Prabha, T. N., & Tharanathan, R. N. (2007). Fruit ripening phenomena–An overview. *Critical Reviews in Food Science and Nutrition*, *47*(1), 1-19. https://doi.org/10.1080/10408390600976841

Prasannath, K. 2017. Plant defense-related enzymes against pathogens: A review. *Agrieast: Journal of Agricultural Sciences, 11*(1), 38-48. http://doi.org/10.4038/agrieast.v11i1.33

Preedy, V. R., & Watson, R. R. (Ed.). (2008). *Tomato and tomato products—Nutritional, medicinal and therapeutic properties*. CRC Press.

Prusky, D. (2011). Reduction of the incidence of postharvest quality losses, and future prospects. *Food Security*, *3*(4), 463-474. https://doi.org/10.1007/s12571-011-0147-y

Prusky, D., Alkan, N., Mengiste, T., & Fluhr, R. (2013). Quiescent and necrotrophic lifestyle choice during postharvest disease development. *Annual Review of Phytopathology, 51*, 155–176. https://doi.org/10.1146/annurev-phyto-082712-102349

Pusztahelyi, T., Holb, I. J., & Pócsi, I. (2015). Secondary metabolites in fungus-plant interactions. *Frontiers in Plant Science*, *6*, 573. https://doi.org/10.3389/fpls.2015.00573

Rahim, H., Wahab, M. A. M. A., Amin, M. Z. M., Harun, A., & Haimid, M. T. (2017). Technological adoption evaluation of agricultural and food sectors towards modern agriculture: Tomato. *Economic and Technology Management Review*, *12*, 41-53. http://etmr.mardi.gov.my/Content/ETMR%20Vol.12(2017)/Vol12_5.pdf

Ramezani, Y., Taheri, P., & Mamarabadi, M. (2019). Identification of *Alternaria* spp. associated with tomato early blight in Iran and investigating some of their virulence factors. *Journal of Plant Pathology*, *101*, 647-659. https://doi.org/10.1007/s42161-019-00259-w

Ranganna, S. (1977). *Manual of analysis of fruits and vegetables products* (pp. 135-141, 484-572). Tata McGraw Hill.

Raseetha, S., Heenan, S. P., Oey, I., Burritt, D. J., & Hamid, N. (2011). A new strategy to assess the quality of broccoli (*Brassica oleracea* L. italica) based on enzymatic changes and volatile mass ion profile using Proton Transfer Reaction Mass Spectrometry (PTR-MS). *Innovative Food Science & Emerging Technologies*, *12*(2), 197-205. https://doi.org/10.1016/j.ifset.2010.12.005

Rashid, T. S., Awla, H. K., & Sijam, K. (2018). Antifungal effects of *Rhus coriaria* L. fruit extracts against tomato anthracnose caused by *Colletotrichum acutatum*. *Industrial Crops and Products*, *113*, 391-397. https://doi.org/10.1016/j.indcrop.2018.01.066

Rashid, T. S., Sijam, K., Kadir, J., Saud, H. M., Awla, H. K., & Hata, E. M. (2015). First report of tomato anthracnose caused by *Colletotrichum boninense* in Malaysia. *Journal of Plant Pathology*, *97*(1), 219-220. http://doi.org/10.4454/JPP.V97I1.021

Rashid, T. S. (2016). *Antimicrobial activity of Rhus coriaria L. fruit extracts against selected bacterial and fungal pathogens on tomato*. [Unpublished doctoral dissertation]. Universiti Putra Malaysia, Malaysia.

Rauha, J. P., Remes, S., Heinonen, M., Hopia, A., Ka¨hko¨nen, M., Kujala, T., Pihlaja, K., Vuorela, H., & Vuorela, P. (2000). Antimicrobial effects of Finnish plant extracts containing flavonoids and other phenolic compounds. *International Journal of Food Microbiology*, *56*(1), 3–12. https://doi.org/10.1016/S0168-1605(00)00218-X

Razak, M. A., Afzan, A., Ali, R., Jalaluddin, N. F., Wasiman, M. I., & Zahari, S. H. (2014). Effect of selected local medicinal plants on the asexual blood stage of chloroquine resistant *Plasmodium falciparum*. *BMC Complementary and Alternative Medicine*, *14*(Article number 492), 1-13. https://doi.org/10.1186/1472-6882-14-492

Reboredo-Rodríguez, P., Varela-López, A., Forbes-Hernández, T. Y., Gasparrini, M., Afrin, S., Cianciosi, D., & Battino, M. (2018). Phenolic compounds isolated from olive oil as nutraceutical tools for the prevention and management of cancer and cardiovascular diseases. *International Journal of Molecular Sciences*, *19*(8), 1-21. https://doi.org/10.3390/ijms19082305

Reddy, L. H., & Couvreur, P. (2009). Squalene: A natural triterpene for use in disease management and therapy. *Advanced Drug Delivery Reviews*, *61*(15), 1412-1426. https://doi.org/10.1016/j.addr.2009.09.005

Rees, D., Farrell, G., & Orchard, J. (Eds.). (2012). *Crop Post-Harvest: Science and Technology Perishables*. Wiley-Blackwell.

Remington, J. P. (2006). *Remington: The science and practice of pharmacy*. Lippincott Williams & Wilkins.

Righini, H., Baraldi, E., García Fernández, Y., Martel Quintana, A., & Roberti, R. (2019). Different antifungal activity of *Anabaena* sp., *Ecklonia* sp., and *Jania* sp. against *Botrytis cinerea*. *Marine Drugs*, *17*(5), 1-12. https://doi.org/10.3390/md17050299

Rigotti, S., Gindro, K., & Viret, O. (2006). Two New Primers Highly Specific for the Detection of" Botrytis cinerea" Pers. Fr. *Phytopathologia Mediterranea, 45*(3), 253-260. https://doi.org/10.14601/Phytopathol_Mediterr-1833

Rodenburg, S. Y., Terhem, R. B., Veloso, J., Stassen, J. H., & van Kan, J. A. (2018). Functional analysis of mating type genes and transcriptome analysis during fruiting body development of *Botrytis cinerea*. *MBio*, *9*(1), 1-19. https://doi.org/10.1128/mBio.01939-17

Rodriguez, M. H., Bandte, M., Gaskin, T., Fischer, G., & Büttner, C. (2018). Efficacy of electrolytically-derived disinfectant against dispersal of *Fusarium oxysporum* and *Rhizoctonia solani* in hydroponic tomatoes. *Scientia Horticulturae*, *234*, 116-125. https://doi.org/10.1016/j.scienta.2018.02.027

Romanazzi, G., & Feliziani, E. (2014). *Botrytis cinerea* (Gray mold). In S. Bautista-Baños (Ed.), *Postharvest decay* (pp. 131-146). Academic Press. https://doi.org/10.1016/B978-0-12-411552-1.00004-1

Romanazzi, G., Sanzani, S. M., Bi, Y., Tian, S. P., Gutierrez-Martinez, P., & Alkan, N. (2016). Induced resistance to control postharvest decay of fruit and vegetables. *Postharvest Biology and Technology*, *122*, 82–94. https://doi.org/10.1016/j.postharvbio.2016.08.003

Romeo, F., Ballistreri, G., Fabroni, S., Pangallo, S., Nicosia, M., Schena, L., & Rapisarda, P. (2015). Chemical characterization of different sumac and pomegranate extracts effective against *Botrytis cinerea* rots. *Molecules*, *20*(7), 11941-11958. https://doi.org/10.3390/molecules200711941

Rosero-Hernández, E. D., Moraga, J., Collado, I. G., & Echeverri, F. (2019). Natural Compounds That Modulate the Development of the Fungus Botrytis cinerea and Protect Solanum lycopersicum. *Plants*, *8*(5), 111. https://doi.org/10.3390/plants8050111

Rossi, F. R., Krapp, A. R., Bisaro, F., Maiale, S. J., Pieckenstain, F. L., & Carrillo, N. (2017). Reactive oxygen species generated in chloroplasts contribute to tobacco leaf infection by the necrotrophic fungus *Botrytis cinerea*. *The Plant Journal*, *92*(5), 761-773. https://doi.org/10.1111/tpj.13718

Saalu, L. C., Akunna, G. G., & Oyewopo, A. O. (2013). The Histo-morphometric evidences of *Vernonia amygdalina* leaf extract-induced testicular toxicity. *International Journal of Morphology, 31*(2), 662–667. http://dx.doi.org/10.4067/S0717-95022013000200052

Safari, Z. S., Ding, P., Juju Nakasha, J., & Yusoff, S. F. (2020). Combining chitosan and vanillin to retain postharvest quality of tomato fruit during ambient temperature storage. *Coatings*, *10* (12), 1-23. https://doi.org/10.3390/coatings10121222

Safari, Z. S., Ding, P., Atif, A., Salari, M. W., & Yusoff, S. F. (2021). Antifungal evaluation of edible coating agent against fusarium oxysporum on tomato. *International Journal of Scientific & Technology Research*, *2*(10), 51-62.

Salehi, B., Sharifi-Rad, R., Sharopov, F., Namiesnik, J., Roointan, A., Kamle, M., Kumar, P., Martins, N., & Sharifi-Rad, J. (2019). Beneficial effects and potential risks of tomatoes consumption for human health: An overview. *Nutrition, 62*, 201-208. https://doi.org/10.1016/j.nut.2019.01.012

Salim, M. M. R., Rashid, M. H., Hossain, M. M., & Zakaria, M. (2018). Morphological characterization of tomato (*Solanum lycopersicum* L.) genotypes. *Journal of the Saudi Society of Agricultural Sciences*, *19*(3), 233-240. https://doi.org/10.1016/j.jssas.2018.11.001

Sambrook, J., Fritsch, E. F., & Maniatis, T. (1989). *Molecular cloning: A laboratory manual* (2nd ed.). Cold Spring Harbor Laboratory Press (CSH Press).

Sanoubar, R., & Barbanti, L. (2017). Fungal diseases on tomato plant under greenhouse condition. *European Journal of Biological Research*, *7*(4), 299-308. http://dx.doi.org/10.5281/zenodo.1011161

Sarkhosh, A., Schaffer, B., Vargas, A. I., Palmateer, A. J., Lopez, P., Soleymani, A., & Farzaneh, M. (2018). Antifungal activity of five plant-extracted essential oils against anthracnose in papaya fruit. *Biological Agriculture & Horticulture*, *34*(1), 18-26. https://doi.org/10.1080/01448765.2017.1358667

Schuh, R. S., Bruxel, F., & Teixeira, H. F. (2014). Physicochemical properties of lecithin-based nanoemulsions obtained by spontaneous emulsification or high-pressure homogenization. *Química Nova*, *37*(7), 1193-1198. https://doi.org/10.5935/0100-4042.20140186

Schumacher, J., & Tudzynski, P. (2012). Morphogenesis and infection in *Botrytis cinerea*. In J. P. Martin & A. Di Pietro (Eds.), *Morphogenesis and pathogenicity in fungi* (pp. 225-241). Springer. https://doi.org/10.1007/978-3-642-22916-9_11

Schumacher, J., Simon, A., Cohrs, K. C., Viaud, M., & Tudzynski, P. (2014). The transcription factor BcLTF1 regulates virulence and light responses in the necrotrophic plant pathogen *Botrytis cinerea*. *PLoS Genet*, *10*(1), 1-21. https://doi.org/10.1371/journal.pgen.1004040

Seetharamulu, J., Umamaheshwari, J., Sreeramulu, A., Goel, A. K., & Raju, P. J. (2012). Effect of medicinal plants and biofungicides on defense enzyme levels and disease control in mulberry. *The Ecoscan*, *6*(1&2), 93-97. http://theecoscan.in/JournalPDF/61&220%20J.%20Seetharamulu.pdf

Sellamuthu, P. S., Sivakumar, D., Soundy, P., & Korsten, L. (2013). Enhancing the defence related and antioxidant enzymes activities in avocado cultivars with essential oil vapours. *Postharvest Biology and Technology*, *81*, 66-72. https://doi.org/10.1016/j.postharvbio.2013.02.007

Sepúlveda-Rivas, S., Fritz, H. F., Valenzuela, C., Santiviago, C. A., & Morales, J. O. (2019). Development of novel EE/alginate polyelectrolyte complex nanoparticles for lysozyme delivery: Physicochemical properties and *in vitro* safety. *Pharmaceutics*, *11*(3), 1-19. https://doi.org/10.3390/pharmaceutics11030103

Šernaitė, L., Rasiukevičiūtė, N., & Valiuškaitė, A. (2020). Application of plant extracts to control postharvest gray mold and susceptibility of apple fruits to *B. cinerea* from different plant hosts. *Foods*, *9*(10), 1-12. https://doi.org/10.3390/foods9101430

Şesan, T. E., Enache, E., Iacomi, B. M., Oprea, M., Oancea, F., & Iacomi, C. (2015). Antifungal activity of some plant extracts against *Botrytis cinerea* Pers. in the blackcurrant crop (*Ribes nigrum* L.). *Acta scientiarum Polonorum. Hortorum cultus*, *14*(1), 29-43. http://www.hortorumcultus.actapol.net/pub/14_1_29.pdf

Shafiq, S., Shakeel, F., Talegaonkar, S., Ahmad, F. J., Khar, R. K., & Ali, M. (2007). Development and bioavailability assessment of ramipril nanoemulsion formulation. *European Journal of Pharmaceutics and Biopharmaceutics*, *66*(2), 227-243. https://doi.org/10.1016/j.ejpb.2006.10.014

Sharma, N., Bansal, M., Visht, S., Sharma, P. K., & Kulkarni, G. T. (2010). Nanoemulsion: A new concept of delivery system. *Chronicles of Young Scientists*, *1*(2), 2-6. http://www.opubs.com/cys

Sharma, R., Kumari, A., Singh, N. S., Singh, M. K., Dubey, S., Iqbal, N., & Patanjali, P. K. (2019). Development and stability enhancement of neem oil based microemulsion formulation using botanical synergist. *Journal of Molecular Liquids*, *296*, 112012. https://doi.org/10.1016/j.molliq.2019.112012

Shirazi, A., & Cameron, A. C. (1993). Measuring transpiration rates of tomato and other detached fruit. *HortScience*, *28*(10), 1035-1038. https://journals.ashs.org/hortsci/downloadpdf/journals/hortsci

Shishiyama, J., Araki, F., & Akai, S. (1970). Studies on cutin-esterase II. Characteristics of cutin-esterase from *Botrytis cinerea* and its activity on tomato-cutin. *Plant and Cell Physiology*, *11*(6), 937-945. https://doi.org/10.1093/oxfordjournals.pcp.a074585

Shridhar, B. P., Sharma, M., & Sharma, A. (2019). Efficacy of aqueous and cow-urine based biopesticides against *Phytophthora nicotianae* var. parasitica causing buckeye rot of tomato. *Journal of Pharmacognosy and Phytochemistry*, *8*(3), 28-31. https://www.phytojournal.com/archives/

Shtienberg, D., Elad, Y., Niv, A., Nitzani, Y., & Kirshner, B. (1998). Significance of leaf infection by Botrytis cinerea in stem rotting of tomatoes grown in non-heated greenhouses. *European Journal of Plant Pathology*, *104*(8), 753-763

Siegmund, U., & Viefhues, A. (2015). Reactive oxygen species in the *botrytis*-host interaction. In S. Fillinger & Y. Elad (Eds.), *Botrytis: The fungus, the pathogen and its management in agricultural systems* (pp. 269–289). Springer International Publishing. https://doi.org/10.1007/978-3-319-23371-0

Silva, H. D., Cerqueira, M., & Vicente, A. A. (2012). Nanoemulsions for food applications: Development and characterization. *Food Bioprocess and Technology*, *5*, 854–867, https://doi.org/10.1007/s11947-011-0683-7

Silva-Beltrán, N. P., Ruiz-Cruz, S., Cira-Chávez, L. A., Estrada-Alvarado, M. I., Ornelas-Paz, J. D. J., López-Mata, M. A., & Márquez-Ríos, E. (2015). Total phenolic, flavonoid, tomatine, and tomatidine contents and antioxidant and antimicrobial activities of extracts of tomato plant. *International Journal of Analytical Chemistry*, Article ID 284071, 1-10. https://doi.org/10.1155/2015/284071

Simbo, D. J. (2010). An ethnobotanical survey of medicinal plants in Babungo, Northwest Region, Cameroon. *Journal of Ethnobiology and Ethnomedicine, 6*(8), 1-7. https://doi.org/10.1186/1746-4269-6-8

Sindhan, G. S., Indira-Hooda, I., & Prashar, R. D. (1999) Effect of some plant extracts on the vegetative growth and storage rot causing fungi. *Journal of Mycology and Plant Pathology, 29*(1)*,* 110-111.

Singh, D., & Thakur R. K. (2003). Effect of pre harvest sprays of fungicides and calcium nitrate on post-harvest rot of kinnow in low temperature storage. *Plant Disease Research, 18*(1), 9-11.

Singh, Y., Meher, J. G., Raval, K., Khan, F. A., Chaurasia, M., Jain, N. K., & Chourasia, M. K. (2017). Nanoemulsion: Concepts, development and applications in drug delivery. *Journal of Controlled Release*, *252*, 28-49. https://doi.org/10.1016/j.jconrel.2017.03.008

Sivakumar, D., & Bautista-Baños, S. (2014). A review on the use of essential oils for postharvest decay control and maintenance of fruit quality during storage. *Crop Protection*, *64*, 27-37. https://doi.org/10.1016/j.cropro.2014.05.012

Siviero, P., Azzaro, A., & Polizzi, G. (2003). Influence of fungicidal protection on preservation of table tomato. *Informatore Agrario*, *59*, 41-43.

Sjöblom, J., Stenius, P., Simon, S., & Grimes, B. A. (2013). Emulsion Stabilization. In T. Tadros (Ed.), *Encyclopedia of Colloid and Interface Science* (1st ed., pp. 415-454). Springer International Publishing. https://doi.org/10.1007/978-3-642-20665-8_83

Smole, M. S., Hribernik, S., Kurečič, M., Krajnc, A. U., Kreže, T., & Kleinschek, K. S. (2019). *Surface Properties of Non-conventional Cellulose Fibres*. Springer International Publishing. https://doi.org/10.1007/978-3-030-10407-8

Sobowale, A. A., Owootomo, P. O., & Agbawodike, C. R. (2019). Inhibitory potentials of *Trichoderma harzianum* and two botanicals against fungi associated with postharvest rots of *Ipomoea batatas* (L.) Lam. *International Journal of Plant & Soil Science*, *28*(2), 1-12. https://doi.org/10.9734/ijpss/2019/v28i230105

Solanský, M., Mikulášek, K., Zapletalová, M., Petřivalský, M., Chiltz, A., Zdráhal, Z., Leborgne-Castel, N., & Lochman, J. (2021). Elicitins' oligomeric states affect the hypersensitive response and resistance in tobacco. *Journal of Experimental Botany*, erab011. https://doi.org/10.1093/jxb/erab011

Song, J. Y., Lim, J. H., Nam, M. H., Kim, H. G., & Kim, B. S. (2008). Development of PCR primers for specific identification and detection of *Botrytis cinerea* on tomato. *The Korean Journal of Mycology*, *36*(2), 138-143. https://doi.org/10.4489/KJM.2008.36.2.138

Soylu, E. M., Kurt, Ş., & Soylu, S. (2010). *In vitro* and *in vivo* antifungal activities of the essential oils of various plants against tomato grey mould disease agent *Botrytis cinerea*. *International Journal of Food Microbiology*, *143*(3), 183-189. https://doi.org/10.1016/j.ijfoodmicro.2010.08.015

Sravanthi, J., & Rao, S. G. (2015). Phytochemical and antioxidant composition in *Lycopersicum esculentum*. *Journal Medicinal Plants Studies*, *3*(4), 107-10. https://www.plantsjournal.com/archives/2015/vol3issue4/PartB/3-3-21.1.pdf

Staats, M., Van Baarlen, P., & vanKan, J. A. L. (2005). Molecular phylogeny of the plant pathogenic genus *Botrytis* and the evolution of host specificity. *Molecular Biology Evolution, 22*(2), 333–346. https://doi.org/10.1093/molbev/msi020

Su, H. (2012). Regalia® bioprotectant in plant disease management. *Outlooks on Pest Management*, *23*(1), 30-34. https://doi.org/10.1564/23feb09

Sugumar, S., Mukherjee, A., & Chandrasekaran, N. (2015). Nanoemulsion formation and characterization by spontaneous emulsification: Investigation of its antibacterial effects on Listeria monocytogenes. *Asian Journal of Pharmaceutics*, *9*(1), 1-6. http://doi.org/10.22377/ajp.v9i1.427

Sun, C., Jin, L., Cai, Y., Huang, Y., Zheng, X., & Yu, T. (2019). l-Glutamate treatment enhances disease resistance of tomato fruit by inducing the expression of glutamate receptors and the accumulation of amino acids. *Food Chemistry*, *293*, 263-270. https://doi.org/10.1016/j.foodchem.2019.04.113

Sun, C., Lin, M., Fu, D., Yang, J., Huang, Y., Zheng, X., & Yu, T. (2018b). Yeast cell wall induces disease resistance against *Penicillium expansum* in pear fruit and the possible mechanisms involved. *Food Chemistry*, *241*, 301-307. https://doi.org/10.1016/j.foodchem.2017.08.092

Sun, G., Yang, Q., Zhang, A., Guo, J., Liu, X., Wang, Y., & Ma, Q. (2018a). Synergistic effect of the combined bio-fungicides ε-poly-l-lysine and chitooligosaccharide in controlling grey mould (*Botrytis cinerea*) in tomatoes. *International Journal of Food Microbiology*, *276*, 46-53. https://doi.org/10.1016/j.ijfoodmicro.2018.04.006

Sun, K., van Tuinen, A., van Kan, J. A., Wolters, A. M. A., Jacobsen, E., Visser, R. G., & Bai, Y. (2017). Silencing of DND1 in potato and tomato impedes conidial germination, attachment and hyphal growth of *Botrytis cinerea*. *BMC Plant Biology*, *17*(Article no. 235), 1-12. https://doi.oeg/10.1186/s12870-017-1184-2

Sunar, S., & Agar, G. (2017). Allelopathic effect of *Convolvulus arvensis* L. extracts on the phytohormones and cytological processes of *Zea mays* L. seeds. *European Journal of Experimental Biology*, *7*(3), 1-6. https://doi.org/10.21767/2248-9215.100015

Sundari, S., Singh, A., & Yadava, P. (2016). Review of current research advances in microbial and phyto-biopesticides. *International Journal Biotechnology and Biomedical Science*, *2*(1), 73-77.

Swartzberg, D., Kirshner, B., Rav-David, D., Elad, Y., & Granot, D. (2008). *Botrytis cinerea* induces senescence and is inhibited by autoregulated expression of the IPT gene. *European Juarnal Plant Pathology 120*, 289–297. https://doi.org/10.1007/s10658-007-9217-6

Syah, Y. M., Juliawaty, L. D., Achmad, S. A., Hakim, E. H., & Ghisalberti, E. L. (2006). Cytotoxic prenylated flavones from *Artocarpus champeden*. *Journal of Natural Medicines*, *60*(4), 308-312. https://doi.org/10.1007/s11418-006-0012-z

Tabet Zatla, A., Dib, M. E. A., Djabou, N., Ilias, F., Costa, J., & Muselli, A. (2017). Antifungal activities of essential oils and hydrosol extracts of *Daucus carota* subsp. sativus for the control of fungal pathogens, in particular gray rot of strawberry during storage. *Journal of Essential Oil Research*, *29*(5), 391-399. https://doi.org/10.1080/10412905.2017.1322008

Tadros, T. (2013). Ostwald Ripening. In T. Tadros (Ed.), *Encyclopedia of Colloid and Interface Science* (1st ed., pp. 1-820). Springer International Publishing. https://doi.org/10.1007/978-3-642-20665-8_124

Tadros, T. F. (2018). Agrochemicals, Paints and Coatings and Food Colloids. In T. F Tadros (Ed.), *Formulation Science and Technology*, (pp. 245-254). De Gruyter. https://doi.org/10.1515/9783110588002

Talegaonkar, S., Azeem, A., Ahmad, F. J., Khar, R. K., Pathan, S. A., & Khan, Z. I. (2008). Microemulsions: A novel approach to enhanced drug delivery. *Recent Patents on Drug Delivery & Formulation*, *2*(3), 238-257. https://doi.org/10.2174/187221108786241679

Tanović, B., Hrustić, J., Mihajlović, M., Grahovac, M., & Delibašić, G. (2014). *Botrytis cinerea* in raspberry in Serbia I: Morphological and molecular characterization. *Pesticidi i Fitomedicina*, *29*(4), 237-247. https://doi.org/10.2298/PIF1404237T

Taranto, F., Pasqualone, A., Mangini, G., Tripodi, P., Miazzi, M. M., Pavan, S., & Montemurro, C. (2017). Polyphenol oxidases in crops: Biochemical, physiological and genetic aspects. *International Journal of Molecular Sciences*, *18*(2), 377. https://doi.org/10.3390/ijms18020377

Tarkowski, Ł. P., Van de Poel, B., Höfte, M., & Van den Ende, W. (2019). Sweet immunity: Inulin boosts resistance of lettuce (*Lactuca sativa*) against grey mold (*Botrytis cinerea*) in an ethylene-dependent manner. *International Journal of Molecular Sciences*, *20*(5), 1052. https://doi.org/10.3390/ijms20051052

Taylor, P. (1998). Ostwald ripening in emulsions. *Advances in Colloid and Interface Science*, *75*(2), 107-163. https://doi.org/10.1016/S0001-8686(98)00035-9

Temme, N., & Tudzynski, P. (2009) Does *Botrytis cinerea* ignore H_2O_2-induced oxidative stress during infection? Characterization of *Botrytis* activator protein 1. *Molecular Plant-Microbe Interaction, 22*, 987–998. https://doi.org/10.1094/MPMI-22-8-0987

Thaipong, K., Boonprakob, U., Crosby, K., Cisneros-Zevallos, L., & Byrne, D. H. (2006). Comparison of ABTS, DPPH, FRAP, and ORAC assays for estimating antioxidant activity from guava fruit extracts. *Journal of Food Composition and Analysis*, *19*(6-7), 669-675. https://doi.org/10.1016/j.jfca.2006.01.003

Thakur, M., & Sohal, B. S. (2013). Role of elicitors in inducing resistance in plants against pathogen infection: A review. *International Scholarly Research Notices*, *2013*. https://doi.org/10.1155/2013/762412

Thipyapong, P., & Steffens, J. C. (1997). Tomato polyphenol oxidase (differential response of the polyphenol oxidase F promoter to injuries and wound signals). *Plant Physiology*, *115*(2), 409-418. https://doi.org/10.1104/pp.115.2.409

Thomidis, T., Pantazis, S., Navrozidis, E., & Karagiannidis, N. (2015). Biological control of fruit rots on strawberry and grape by BOTRY-Zen. *New Zealand Journal of Crop and Horticultural Science, 43*(1), 68–72. https://doi.org/10.1080/01140671.2014.958502

Thomma, B. P., Seidl, M. F., Shi-Kunne, X., Cook, D. E., Bolton, M. D., van Kan, J. A., & Faino, L. (2016). Mind the gap; seven reasons to close fragmented genome assemblies. *Fungal Genetics and Biology*, *90*, 24-30. https://doi.org/10.1016/j.fgb.2015.08.010

Thompson, J. F., Mitchell, F. G., Rumsay, T. R., Kasmire, R. F., & Crisosto, C. H. (2008). *Commercial cooling of fruits, vegetables, and flowers* (Vol. 21567). UCANR Publications.

Tian, S. P. (2006). Microbial control of postharvest diseases of fruits and vegetables: Current concepts and future outlook. In R. C. Ray & O. P. Ward (Eds.), *Microbial Biotechnology in Horticulture* (1st ed., pp. 163-202). CRC Press.

Tijjani, A. (2018). *Control of gray mold rot disease of tomato caused by Botrytis cinerea with emulsion formulated from Moringa oleifera Lam. crude extract*. [Unpublished doctoral dissertation]. Universiti Putra Malaysia, Malaysia.

Tijjani, A., Ismail, S. I., Khairulmazmi, A., & Dzolkhifli, O. (2018). First report of gray mold rot disease on tomato (*Solanum lycopersicum* L.) caused by *Botrytis cinerea* in Malaysia. *Journal of Plant Pathology*, 101(1), 207. https://doi.org/10.1007/s42161-018-0155-2

Tilahun, S., Park, D. S., Taye, A. M., & Jeong, C. S. (2017). Effects of storage duration on physicochemical and antioxidant properties of tomato (*Lycopersicon esculentum* Mill.). *Horticultural Science & Technology*, *35*(1), 88-97. https://doi.org/10.12972/kjhst.20170010

Tiwari, P., Kumar, B., Kaur, M., Kaur, G., & Kaur, H. (2011). Phytochemical screening and extraction: A review. *Internationale Pharmaceutica Sciencia*, *1*(1), 98-106. http://docshare01.docshare.tips/files/9403/94036813.pdf

Tomioka, K., & Sato, T. (2011). Gray mold of yacon and sunflower caused by *Botrytis cinerea*. *Journal of General Plant Pathology*, *77*(3), 217-219. https://doi.org/10.1007/s10327-011-0309-y

Tomlinson, J. A., Dickinson, M. J., & Boonham, N. (2010). Detection of *Botrytis cinerea* by loop‐mediated isothermal amplification. *Letters in Applied Microbiology*, *51*(6), 650-657. https://doi.org/10.1111/j.1472-765X.2010.02949.x

Toor, R. K., & Savage, G. P. (2005). Antioxidant activity in different fractions of tomatoes. *Food Research International*, *38*(5), 487-494. https://doi.org/10.1016/j.foodres.2004.10.016

Toyang, N. J., & Verpoorte, R. (2013). A review of the medicinal potentials of plants of the genus *Vernonia* (Asteraceae). *Journal of Ethnopharmacology*, *146*(3), 681–723. https://doi.org/10.1016/j.jep.2013.01.040

Trolinger, J. C., & Strider, D. L. (1984). *Botrytis* blight of Exacum affine and its control. *Phytopathology*, *74*(10), 1181-1188

Tromba, A. (2019, December 14). *Food emulsifiers: What they are and how they can be multi-functional*. https://foodensity.com/lecithin-in-chocolate/

Troncoso-Rojas, R., & Tiznado-Hernández, M. E. (2014). *Alternaria alternata* (black rot, black spot). In S. Bautista-Baños (Ed.), *Postharvest decay* (pp. 147-187). Academic Press. https://doi.org/10.1016/B978-0-12-411552-1.00005-3

Tugume, P., Kakudidi, E. K., Buyinza, M., Namaalwa, J., Kamatenesi, M., & Mucunguzi, P. (2016). Ethnobotanical survey of medicinal plant species used by communities around Mabira Central Forest Reserve, Uganda. *Journal of Ethnobiology and Ethnomedicine, 12*(5), 1-28. https://doi.org/10.1186/s13002-015-0077-4

Uchendu, I. K. (2018). Effect of aqueous extract of bitterleaf (*Vernonia Amygdalina*) against acetaminophen-induced liver damage in rat. *Bioequivalence and Bioavailability International Journal*, *2*(1), 1-9. https://doi.org/10.23880/BEBA-16000122

Usall, J., Ippolito, A., Sisquella, M., & Neri, F. (2016). Physical treatments to control postharvest diseases of fresh fruits and vegetables. *Postharvest Biology and Technology*, *122*, 30-40. https://doi.org/10.1016/j.postharvbio.2016.05.002

Valero, D., & Serrano, M. (2010). *Postharvest biology and technology for preserving fruit quality*. CRC press.

Valiuškaitė, A., Survilienė, E., & Baniulis, D. (2010). Genetic diversity and pathogenicity traits of Botrytis spp. isolated from horticultural hosts. *Žemdirbystė Agriculture,* *97*(4), 85-90. file:///C:/Users/Dell/Downloads/Botrytis_LT_gnetic_diversity.pdf

Van Kan, J. A., Stassen, J. H., Mosbach, A., Van Der Lee, T. A., Faino, L., Farmer, A. D., Papasotiriou, D. G., Zhou, S., Seidl, M. F., Cottam, E., Edel, D., Hahn, M., Schwartz, D. C., Dietrich, R. A., Widdison, S., & Scalliet, G. (2017). A gapless genome sequence of the fungus *Botrytis cinerea*. *Molecular Plant Pathology*, *18*(1), 75-89. https://doi.org/10.1111/mpp.12384

Vanitha, S. C., Niranjana, S. R., & Umesha, S. (2009). Role of phenylalanine ammonialyase and polyphenol oxidase in host resistance to bacterial wilt of tomato. *Journal of Phytopathology*, *157*(9), 552-557. https://doi.org/10.1111/j.1439-0434.2008.01526.x

Vasilica, M. R., Suciu, L. A., & Puia, C. E. (2012). *In vitro* studies regarding the morphology of *Botrytis cinerea* pers. isolated from geranium plants. *ProEnvironment,* *5,* 60-66. http://journals.usamvcluj.ro/index.php/promediu/article/view/7851

Velásquez, A. C., Castroverde, C. D. M., & He, S. Y. (2018). Plant–pathogen warfare under changing climate conditions. *Current Biology*, *28*(10), R619-R634. https://doi.org/10.1016/j.cub.2018.03.054

Veloso, J., & van Kan, J. A. L. (2018). Many shades of grey in botrytis-host plant interactions. *Trends Plant Science, 23*(7), 613–622. https://doi.org/10.1016/j.tplants.2018.03.016

Violeta, N. O. U. R., Trandafir, I., & Ionica, M. E. (2013). Antioxidant compounds, mineral content and antioxidant activity of several tomato cultivars grown in Southwestern Romania. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca*, *41*(1), 136-142. https://doi.org/10.15835/nbha4119026

Vio-Michaelis, S., Apablaza-Hidalgo, G., Gómez, M., Peña-Vera, R., & Montenegro, G. (2012). Antifungal activity of three Chilean plant extracts on *Botrytis cinerea*. *Botanical Sciences*, *90*(2), 179-183. https://doi.org/10.17129/botsci.482

Vitoratos, A., Bilalis, D., Karkanis, A., & Efthimiadou, A. (2013). Antifungal activity of plant essential oils against *Botrytis cinerea*, *Penicillium italicum* and *Penicillium digitatum*. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca*, *41*(1), 86-92. https://doi.org/10.15835/nbha4118931

Wagih, E. E., Wahab, H. A., Shehata, M. R., Fahmy, M. M., & Gaber, M. A. (2019). Molecular and pathological variability associated with transposable elements of *Botrytis cinerea* isolates infecting grape and strawberry in Egypt. *International Journal of Phytopathology*, *8*(2), 37-51. https://doi.org/10.33687/phytopath.008.02.2943

Wang, C. Y., Wang, S. Y., & Chen, C. (2008). Increasing antioxidant activity and reducing decay of blueberries by essential oils. *Journal of Agricultural and Food Chemistry*, *56*(10), 3587-3592. https://doi.org/10.1021/jf7037696

Wang, K., Liao, Y., Kan, J., Han, L., & Zheng, Y. (2015). Response of direct or priming defense against *Botrytis cinerea* to methyl jasmonate treatment at different concentrations in grape berries. *International Journal of Food Microbiology*, *194*, 32-39. https://doi.org/10.1016/j.ijfoodmicro.2014.11.006

Wang, Y., Yu, T., Xia, J., Yu, D., Wang, J., & Zheng, X. (2010). Biocontrol of postharvest gray mold of cherry tomatoes with the marine yeast *Rhodosporidium paludigenum*. *Biological Control*, *53*(2), 178-182. https://doi.org/10.1016/j.biocontrol.2010.01.002

Wani, A. H. (2011). An overview of the fungal rot of tomato. *Mycopathology, 9*(1), 33-38.

Weiberg, A., Wang, M., Lin, F.-M., Zhao, H., Zhang, Z., & Kaloshian, I. (2013). Fungal small RNAs suppress plant immunity by hijacking host RNA interference pathways. *Science, 342*(6154), 118–123. https://doi.org/10.1126/science.1239705

Williamson, B., Tudzynski, B., Tudzynski, P., & Van Kan, J. A. L. (2007). *Botrytis cinerea*: the cause of grey mould disease. *Molecular Plant Pathology, 8*, 561–580. https://doi.org/10.1111/j.1364-3703.2007.00417.x

Wills, R., McGlasson B., Graham, D., & Joyce, D. (2007). *Postharvest: An introduction to the physiology and handling of fruit, vegetables and ornamentals* (5th ed., pp. 227). UNSW Press.

Wilson, C. L., Solar, J. M., El Ghaouth, A., & Wisniewski, M. E. (1997). Rapid evaluation of plant extracts and essential oils for antifungal activity against *Botrytis cinerea*. *Plant Disease*, *81*(2), 204-210. https://doi.org/10.1094/PDIS.1997.81.2.204

Wojtaszek, P. (1997). The oxidative burst: A plant's early response against infection. *Biochemistry Journal*, *322*, 681-692. https://doi.org/10.1042/bj3220681

World Health Organization and Food Agricultural Organization. (2016). *Manual on Development and Use of FAO and WHO Specifications for Pesticides*. 3rd revision. WHO Press.

Würz, D. A., Rufato, L., Bogo, A., Allebrandt, R., de Bem, B. P., Marcon Filho, J. L., ... & Bonin, B. F. (2020). Effects of leaf removal on grape cluster architecture and control of *Botrytis* bunch rot in Sauvignon Blanc grapevines in Southern Brazil. *Crop Protection*, *131*, 105079.

FAO/WHO Joint Meeting on Pesticide Specifications (JMPS). (2016). *Manual on Development and Use of FAO and WHO Specifications for Pesticides* (1st ed., pp. 1-292). WHO Pesticide Evaulation Scheme (WHOPES).

Xu, D., Deng, Y., Xi, P., Yu, G., Wang, Q., Zeng, Q., & Gao, L. (2019). Fulvic acid-induced disease resistance to *Botrytis cinerea* in table grapes may be mediated by regulating phenylpropanoid metabolism. *Food Chemistry*, *286*, 226-233. https://doi.org/10.1016/j.foodchem.2019.02.015

Yahia, E. M., & Carrillo-Lopez, A. (Ed.). (2018). *Postharvest physiology and biochemistry of fruits and vegetables*. Woodhead Publishing.

Yakhin, O. I., Lubyanov, A. A., Yakhin, I. A., & Brown, P. H. (2017). Biostimulants in plant science: A global perspective. *Frontiers in Plant Science*, *7*, 2049. https://doi.org/10.3389/fpls.2016.02049

Yang, Y., Hu, J., Chen, F., Ding, D., & Zhou, C. (2018). Development of a SCAR marker-based diagnostic method for the detection of the citrus target spot pathogen *Pseudofabraea citricarpa*. *BioMed Research International*, *2018*(Article ID 7128903), 1-5. https://doi.org/10.1155/2018/7128903

Yangui, T., Sayadi, S., Rhouma, A., & Dhouib, A. (2010). Potential use of hydroxytyrosol-rich extract from olive mill wastewater as a biological fungicide against *Botrytis cinerea* in tomato. *Journal of Pest Science*, *83*(4), 437-445. https://doi.org/10.1007/s10340-010-0314-5

Yaqoob Khan, A., Talegaonkar, S., Iqbal, Z., Jalees Ahmed, F., & Krishan Khar, R. (2006). Multiple emulsions: An overview. *Current Drug Delivery*, *3*(4), 429-443. https://doi.org/10.2174/156720106778559056

Ye, J., Coulouris, G., Zaretskaya, I., Cutcutache, I., Rozen, S., & Madden, T. L. (2012). Primer-BLAST: A tool to design target-specific primers for polymerase chain reaction. *BMC Bioinformatics 13*(Article No.134), 1-11. https://doi.org/10.1186/1471-2105-13-134

Yeap, S. K., Liang, W. S., Beh, B. K., Ho, W. Y., Yousr, A. N., & Alitheen, N. B. (2013). *In vivo* antidiabetic and acute toxicity of spray-dried *Vernonia amygdalina* water extract. *International Food Research Journal, 20(*2), 613–616. http://ifrj.upm.edu.my/20%20(02)%202013/15%20IFRJ%2020%20(02)%202013%20Noorjahan.pdf

Yeap, S. W., Ho, W. Y., Beh, B. K., Liang, W. S., Ky, H., Noaman Yousr, A. H., & Alitheen, N. H. (2010). *Vernonia amygdalina*, an ethnoveterinary and ethnomedical used green vegetable with multiple bioactivities. *Journal of Medicinal Plants Research*, *4*(25), 2787-2812. https://doi.org/10.5897/JMPR

Yin, Y., Bi, Y., Chen, S., Li, Y., Wang, Y., Ge, Y., Ding, B., Li, Y., & Zhang, Z. (2011). Chemical composition and antifungal activity of cuticular wax isolated from Asian pear fruit (cv. *Pingguoli*). *Science Horticulture, 129*(4), 577–582. https://doi.org/10.1016/j.scienta.2011.04.028

Yoshihiro, I., Toshiko, H., Shiraishi, A., Hirose, K., Hamashima, H. & Kobayashi, S. (2005). Biphasic effects of geranylgeraniol, teprenone and phytol on the growth of *Staphylococcus aureus. Antimicrobial Agents and Chemotherapy, 49*(5), 1770-1774. https://doi.org/10.1128/AAC.49.5.1770-1774.2005

Yourman, L. F., & Jeffers, S. N. (1999). Resistance to benzimidazole and dicarboximide fungicides in greenhouse isolates of *Botrytis cinerea*. *Plant disease*, *83*(6), 569-575. https://doi.org/10.1094/PDIS.1999.83.6.569

Youssef, K., Roberto, S., Colombo, R., Canteri, M., & Elsalam, K. (2019). Acibenzolar-S-methyl against *Botrytis* mold on table grapes *in vitro* and *in vivo*. *Agronomy Science and Biotechnology*, *5*(1), 52-61. https://doi.org/10.33158/ASB.2019v5i1p52

Zakaria, Y., Azlan, N. Z., Fakhuruddin, N., Hassan, N., & Muhammad, H. (2016). Phytochemicals and acute oral toxicity studies of the aqueous extract of *Vernonia amygdalina* from state of Malaysia. *Journal of Medicinal Plants Studies*, *4*(3), 1-5. https://www.plantsjournal.com/archives/2016/vol4issue3/PartA/4-2-1.pdf

Zaker, M. (2016). Natural plant products as eco-friendly fungicides for plant diseases control-A review. *The Agriculturists*, *14*(1), 134-141. https://doi.org/10.3329/agric.v14i1.29111

Zentmyer, G. A., Nishijima, W. T., Rohrbach, K. G., Ohr, H. D., & Ploetz, R. C. (Eds.). (1994). *Compendium of tropical fruit diseases* (vol. 88., pp. 1-118). APS Press.

Zhang, D., Spadaro, D., Garibaldi, A., & Gullino, M. L. (2010). Selection and evaluation of new antagonists for their efficacy against postharvest brown rot of peaches. *Postharvest Biology and Technology*, *55*(3), 174-181. https://doi.org/10.1016/j.postharvbio.2009.09.007

Zhang, T., Dong, D., Lu, D., Wang, S., & Wu, B. (2016). Cremophor EL-based nanoemulsion enhances transcellular permeation of emodin through glucuronidation reduction in UGT1A1-overexpressing MDCKII cells. *International Journal of Pharmaceutics*, *501*(1-2), 190-198. https://doi.org/10.1016/j.ijpharm.2016.01.067

Zhang, T., Murphy, M. J., Yu, H., Bagaria, H. G., Yoon, K. Y., Nielson, B. M., & Bryant, S. L. (2015). Investigation of nanoparticle adsorption during transport in porous media. *SPE Journal*, *20*(04), 667-677. https://doi.org/10.2118/166346-PA

Zhang, Z., Qin, G., Li, B., & Tian, S. (2014). Knocking out Bcsas1 in *Botrytis cinerea* impacts growth, development, and secretion of extracellular proteins, which decreases virulence. *Molecular Plant-Microbe Interactions*, *27*(6), 590-600. https://doi.org/10.1094/MPMI-10-13-0314-R

Zhang, Z., Qin, G., Li, B., & Tian, S. (2015). Effect of cinnamic acid for controlling gray mold on table grape and its possible mechanisms of action. *Current Microbiology*, *71*(3), 396-402. https://doi.org/10.1007/s00284-015-0863-1

Zhao, J., Bi, Q., Wu, J., Lu, F., Han, X., & Wang, W. (2019). Occurrence and management of fungicide resistance in *Botrytis cinerea* on tomato from greenhouses in Hebei, China. *Journal of Phytopathology*, *167*(7-8), 413-421. https://doi.org/10.1111/jph.12812

Zhao, S., Guo, Y., Wang, Q., Luo, H., He, C., & An, B. (2020). Expression of flagellin at yeast surface increases biocontrol efficiency of yeast cells against postharvest disease of tomato caused by *Botrytis cinerea*. *Postharvest Biology and Technology*, *162*, 1-7. https://doi.org/10.1016/j.postharvbio.2019.111112

Zhao, Y., Tu, K., Shao, X., Jing, W., & Su, Z. (2008). Effects of the yeast *Pichia guilliermondii* against *Rhizopus nigricans* on tomato fruit. *Postharvest Biology and Technology*, *49*(1), 113-120. https://doi.org/10.1016/j.postharvbio.2008.01.001

Zheng, L., Cao, C., Chen, Z., Cao, L., Huang, Q., & Song, B. (2020). Evaluation of emulsion stability by monitoring the interaction between droplets. *LWT*, *132*(ID No. 109804), 1-8. https://doi.org/10.1016/j.lwt.2020.109804

Zhou, Y., Li, N., Yang, J., Yang, L., Wu, M., Chen, W., & Zhang, J. (2018). Contrast between orange-and black-colored sclerotial isolates of *Botrytis cinerea*: Melanogenesis and ecological fitness. *Plant Disease*, *102*(2), 428-436. https://doi.org/10.1094/PDIS-11-16-1663-RE

Zhu, Z., & Tian, S. (2012). Resistant responses of tomato fruit treated with exogenous methyl jasmonate to *Botrytis cinerea* infection. *Scientia Horticulturae*, 142, 38-43. https://doi.org/10.1016/j.scienta.2012.05.002

Zong, Y. Y., Liu, J., Li, B. Q., Qin, G. Z., & Tian, S. P. (2010). Effects of yeast antagonists in combination with hot water treatment on postharvest diseases of tomato fruit. *Biological Control*, 54, 316–321. https://doi.org/10.1016/j.biocontrol.2010.06.003

Zuidema, H., & Waters, G. (1941). Ring method for the determination of interfacial tension. *Industrial & Engineering Chemistry Analytical Edition*, *13*(5), 312-313. https://doi.org/10.1021/i560093a009