



**Suez Canal University
Faculty of Science
Ismailia**

**Potency of actinomycete metabolites as biocontrol agents
against cotton leafworm, *Spodoptera littoralis* (Boisduval)**

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Abstract

The present study aims to investigate the potency of certain endophytic actinomycete secondary metabolites in controlling *Spodoptera littoralis*. Under laboratory conditions, the efficiency of ethyl acetate extracts of seventy endophytic actinomycete strains against laboratory and field cultures of *S. littoralis* larvae (4th instar) were tested. The studied endophytic strains reflected the biochemical diversity of these strains in biocontrol aspect against *S. littoralis* larvae. The results indicated high potency for the crude metabolites of seven strains at a concentration of 100 mg/ml. The seven strains belonged to *Streptomyces* (2 strains), *Nocardioides* (2 strains), *Kitasatospora* (2 strains), *Pseudonocardia* (1 strain); and were originally recovered from the *Asteraceae* host plants *Seriphidium herba-album* and *Artemisia judaica* L. against *S. littoralis*. Bioactivity of the metabolic extracts ranged between direct toxicity on the 2nd day of feeding against the laboratory *S. littoralis* strain; to latent effects that appeared from the 6th day in the field *S. littoralis* strain. The molecular studies of the most potent endophytic strain have directly contributed to drawing the way to complete the evaluations of this strain. The assessment of volatile organic compounds of the most potent endophytic actinomycete strain, which belonged to the genus *Kitasatospora*, has shown the short-time effectiveness of controlling *S. littoralis* larvae. This promising result leads us in the future to the extensive

study of this technology and its application as an environmentally friendly. *Kitasatospora* ES2 crude metabolite resulted in significant histopathological impacts which explained a part of the biological activity. The biochemical assessments revealed significant deficiencies to α esterase, protease, and lactate dehydrogenase enzymatic activities of *S. littoralis* differ from the commercial product, Radiant 12 % SC. The thin layer chromatographically analysis was a separator point for distinguishing between *Kitasatospora* ES2 crude metabolite and the commercial product, Radiant 12 % SC.

Contents

Subject	Page
Acknowledgement	i
Abstract	ii
Contents	iii
List of Figures	vii
List of Tables	viii
List of Abbreviations	ix
<u>1. Introduction</u>	1
1.1. Statement of problem	2
1.2. Aim of work	3
<u>2. Literature Review</u>	5
2.1. Actinomycetes	5
2.2. Endophytic actinomycetes	8
2.3. Importance of endophytic actinomycete metabolites	10
2.4. Importance of <i>Streptomyces</i>' metabolites	12
2.5. Microbial consortia as a source of active metabolites	14
2.6. History of biocontrol and contribution of actinomycetes in that field	14

2.7. Spinosad, a commercial insecticide from actinomycetes, (CAS Number: 168316-95-8)...	17
2.8. The Egyptian cotton leafworm, <i>Spodoptera littoralis</i> (Boisd.).....	19
2.9. Microbial volatile compounds (mVOCs) and its role(s) in pests' control.....	22
2.10. Histological aspects in insecticides assays.....	25
2.11. Biochemical aspects in insecticides assays.....	27
2.11.1. Esterase (EST) enzymes.....	27
i. Specific esterase enzymes.....	27
ii. Non-Specific esterase enzymes.....	30
a. Alpha esterase [α -esterase (EC 3.1.1.1)].....	30
b. Beta esterase [β -esterase (EC 3.1.1.2)].....	31
2.11.2. Peptidases family enzymes; Protease (EC 3.4.21.112).....	31
2.11.3. Oxidoreductases family enzymes; LDH- Lactate Dehydrogenase (EC 1.1.1.27)....	32
<u>3. Materials and Methods</u>	33
3.1. Chemicals, reagents and tools.....	33
3.2. Cultures.....	33
3.2.1. Source of endophytic actinomycete strains.....	33

3.2.2. Production of actinomycetes inocula from the stock source	35
i. Culture refreshment on starch casein (SC) agar	35
ii. Maintenance in 20% glycerol.....	35
iii. Maintenance as lyophilized cultures.....	36
3.3. Fermentation and extraction.....	37
3.3.1. Secondary metabolites production...	37
3.3.2. Extraction of organic metabolites...	37
3.4. Reared insects, laboratory and field <i>Spodoptera littoralis</i> strains	47
3.4.1. Rearing protocol of the laboratory <i>S. littoralis</i> strain, and offspring.....	47
3.4.2. Rearing technique of the field <i>S. littoralis</i> strain	49
3.5. Commercial insecticide product, Radiant 12 % SC.....	50
3.6. Screening of bioactivity.....	50
3.6.1. Bioactivity of the crude metabolites against the 4th larval instar of the laboratory <i>S. littoralis</i> strain	51
3.6.2. Toxicity impacts of the crude metabolites on the field <i>S. littoralis</i> strain.....	52
3.7. Molecular confirmation of the most promising endophytic actinomycete strain	54

3.7.1. Taxonomic affiliation and phylogenetic analysis based on partial 16S rRNA gene sequence	55
i. PCR amplification.....	56
ii. PCR product purification and DNA sequencing.....	56
3.7.2. Computational analysis.....	57
3.7.3. Screening of the active biosynthetic PKS-I (EC 2.3.1.233) and NRPS (EC 6.3.2.1-49 group) genes of <i>Kitasatospora</i> ES2.....	58
3.8. Detailed investigations of <i>Kitasatospora</i> ES2 secondary crude metabolites on <i>S. littoralis</i>	59
3.8.1. Toxic effects of <i>Kitasatospora</i> ES2 secondary crude metabolites	59
3.8.2. Biological effects of <i>Kitasatospora</i> ES2 secondary crude metabolites	60
3.8.3. Evaluation of 1 st , 2 nd and 3 rd extract of <i>Kitasatospora</i> ES2 extracts	60
3.8.4. Effect of the crude volatile organic compounds (VOCs) of <i>Kitasatospora</i> ES2 on <i>S. littoralis</i>	61
3.8.5. Histopathological investigations of <i>Kitasatospora</i> ES2.....	63
3.8.6. Biochemical effects of <i>Kitasatospora</i> ES2 (Biochemical assay) on <i>S. littoralis</i>	64
3.8.6.1. Samples preparation	64
3.8.6.2. Total soluble protein assessment	66

3.8.6.3. Acetylcholinesterase (EC	
3.1.1.7) determination	67
3.8.6.4. Non-specific esterases	
determination	68
3.8.6.5. Determination of proteolytic	
activity, protease enzyme (EC 3.4.21.112).....	69
3.8.6.6. Lactate Dehydrogenase (LDH,	
EC 1.1.1.27) determination	70
3.9. Thin layer chromatography (TLC) for the	
bioactive fraction(s) of <i>Kitasatospora</i> ES2	
crude metabolite	71
3.10. Statistical analysis	73
<u>4. Results</u>	74
4.1. Screening of bioactivity	74
4.1.1. Bioactivity of the crude metabolic	
extracts against the 4 th larval instar of the	
laboratory <i>S. littoralis</i> strain	74
4.1.2. Toxicity impacts of the crude	
metabolites on the field <i>S. littoralis</i> strain	78
4.2. Molecular analysis for confirming the	
taxonomic affiliation of <i>Kitasatospora</i>	
ES2.....	79
4.2.1. Phylogenetic analysis established on	
partial 16S rRNA gene sequence	79
4.2.2. Phylogenetic analysis of	
<i>Kitasatospora</i> ES2 (EMCC2291) strain	84

4.2.3. Screening for active biosynthetic PKS-I (EC 2.3.1.233) and NRPS (EC 6.3.2.1-49 group) genes for <i>Kitasatospora</i> ES2 EMCC2291.....	86
4.3. Detailed investigations of <i>Kitasatospora</i> ES2 (EMCC2291) secondary crude metabolites on <i>S. littoralis</i>	86
4.3.1. Toxic effects of <i>Kitasatospora</i> ES2 (EMCC2291) secondary crude metabolites....	86
4.3.2. Biological effects of <i>Kitasatospora</i> ES2 (EMCC2291) secondary crude metabolites	88
4.3.3. Evaluation of 1 st , 2 nd and 3 rd extract of <i>Kitasatospora</i> ES2 (EMCC2291).....	90
4.3.4. Effect of the volatile organic compounds (VOCs) of <i>Kitasatospora</i> ES2 (EMCC2291).....	92
4.3.5. Histopathological investigations of <i>Kitasatospora</i> ES2 (EMCC2291).....	93
i. Deformities in the cuticle layer and muscles of the treated <i>S. littoralis</i>	93
ii. Deformities in the midgut tissues of the treated <i>S. littoralis</i>	96
4.3.6 Biochemical effects of <i>Kitasatospora</i> ES2 (EMCC2291) (Biochemical assay).....	100
4.3.6.1. Acetylcholinesterase (EC 3.1.1.7) determination	100
4.3.6.2. Non-specific esterases determination	100

4.3.6.3. Determination of proteolytic activity, protease enzyme (EC 3.4.21.112).....	100
4.3.6.4. Lactate Dehydrogenase (LDH, EC 1.1.1.27) determination	101
4.4. Thin layer chromatography (TLC) for the bioactive fraction(s) of <i>Kitasatospora</i> ES2 (EMCC2291) crude metabolite	108
<u>5. Discussion</u>	110
Summary	118
Conclusion and recommendations	121
References	123
Appendices	167
Arabic Summary	

List of Figures

	Title	Page
Figure (1):	Crop damage caused by <i>S. littoralis</i> in Egypt.	3
Figure (2):	Phylogenetic tree of Actinobacteria based on 1,500 nucleotides of 16S rRNA (Gao and Gupta, 2012).	7
Figure (3):	Growth of actinomycetes on solid agar media (Qinyuan et al., 2016).	8
Figure (4):	Plant-endophyte symbiosis and ecological perspectives (Wani et al., 2015).	9
Figure (5):	Graphical representation of natural product(s) discovery approach from endophytes (Alvin et al., 2014).	9
Figure (6):	<i>Streptomyces</i> spp. role in production of metabolites and enzymes for supporting crop protection (Rey and Dumas, 2017).	13
Figure (7):	Molecular structure of the commercial product Spinosad (Cas no.: 168316-95-8). Spinosyn A, R=H & Spinosyn D, R=CH ₃ (Crouse, et al., 2007).	18
Figure (8):	Graphical representation focusing on the role of volatile compounds released by bacteria and their biocontrol potential impacts and applications (Audrain et al., 2015).	25
Figure (9):	Structure of acetylcholinesterase (AChE, EC 3.1.1.7) (Heide, 2012).	29

Figure (10):	Mode of action of acetylcholinesterase (AChE, EC 3.1.1.7) in neurotransmission (Čolović <i>et al.</i> , 2013).	30
Figure (11):	Relation between the studied endophytic actinomycete strains.	34
Figure (12):	Preparation of actinomycetes crude metabolites.	39
Figure (13):	Schematic flowchart showing the steps of experimental design.	40
Figure (14):	Cotton leafworm, <i>S. littoralis</i> , life cycle.	49
Figure (15):	Flowchart illustrating the treatment of laboratory and field <i>S. littoralis</i> with crude actinomycete metabolites under constant laboratory conditions.	53
Figure (16):	Experimental design to evaluate the crude volatile organic compounds effect of <i>Kitasatospora</i> ES2.	62
Figure (17):	Histological wax blocks and slides for the 4 th treated larval instar of <i>S. littoralis</i> .	64
Figure (18):	TLC chromatography for preliminary fractionation of <i>Kitasatospora</i> ES2 crude metabolite.	72
Figure (19):	Lethality and developmental defects of the <i>Kitasatospora</i> ES2 crude metabolite on 4 th instar laboratory <i>S. littoralis</i> larvae.	76
Figure (20):	Toxicity and latent effects of actinomycetes' metabolic extracts on the field <i>S. littoralis</i> strain.	78

Figure (21):	Nucleotide sequence of the partial sequencing 16S rRNA gene of <i>Kitasatospora</i> ES2 (EMCC2291) strain.	82
Figure (22):	G + C content plotting of <i>Kitasatospora</i> ES2 (EMCC2291) sequence.	82
Figure (23):	16S rRNA partial sequencing of <i>Kitasatospora</i> ES2 (EMCC2291).	83
Figure (24):	Microphotograph of <i>Kitasatospora</i> ES.	84
Figure (25):	Neighbor-joining phylogenetic position of <i>Kitasatospora</i> ES2 and related taxa based on 16S rRNA partial gene sequences.	85
Figure (26):	Toxic effects of <i>Kitasatospora</i> ES2 (EMCC2291).	87
Figure (27):	Biological effects of <i>Kitasatospora</i> ES2 (EMCC2291).	89
Figure (28):	Biological effects of 1 st , 2 nd and 3 rd extract of <i>Kitasatospora</i> ES2 (EMCC2291).	90
Figure (29):	Comparison of 1 st , 2 nd and 3 rd extract effects of <i>Kitasatospora</i> ES2 (EMCC2291).	91
Figure (30):	Effect of volatile fraction(s) of <i>Kitasatospora</i> ES2 (EMCC2291).	92
Figure (31):	Light micrographs of longitudinal sections of histopathological deformities on the <i>S. littoralis</i> larval cuticle layer after 3 days posttreatment, Showing muscles deformities, (100× H&E).	94

Figure (32):	Light micrographs of longitudinal sections of histopathological deformities on the <i>S. littoralis</i> larval cuticle layer after 3 days posttreatment, (400× H&E).	95
Figure (33):	Light micrographs of transverse sections of histopathological deformities in <i>S. littoralis</i> larval midgut tissue after 3 days posttreatment, (100× H&E).	98
Figure (34):	Light micrographs of transverse sections of histopathological deformities in <i>S. littoralis</i> larval midgut tissue after 3 days post treatment, (400× H&E).	99
Figure (35):	Showing Acetylcholinesterase (EC 3.1.1.7) determination.	102
Figure (36):	Showing α -esterase (EC 3.1.1.1) determination.	103
Figure (37):	Showing β -esterase (EC 3.1.1.2) determination.	104
Figure (38):	Showing Protease (EC 3.4.21.112) determination.	105
Figure (39):	Showing Lactate Dehydrogenase (LDH, EC 1.1.1.27) determination.	106
Figure (40):	Biochemical assessment of the enzymatic activities of the laboratory <i>S. littoralis</i> treated with <i>Kitasatospora</i> ES2 extract.	108
Figure (41):	Preliminary separation and detection for the fraction(s) of <i>Kitasatospora</i> ES2 (EMCC2291) crude metabolite.	109

List of Tables

	Title	Page
Table (1):	Selected actinomycete strains and their respective host plants (El-Shatoury <i>et al.</i> 2006).	41
Table (2):	The 70 studied actinobacterial strains, their host plants, physiological activities, and bioactivities (El-Shatoury <i>et al.</i> 2006).	43
Table (3):	Bioactivity of the crude metabolic extracts against the 4 th laboratory <i>S. littoralis</i> larvae at concentration 100 mg/mL .	77
Table (4):	Bioactivity of the crude metabolic extracts against the 4 th field <i>S. littoralis</i> larvae at concentration 100 mg/mL .	79
Table (5):	Sequence similarity showing the query and identity of <i>Kitasatospora</i> ES2 and its closest type strains based on the partial 16S rRNA gene sequence.	81
Table (6):	Biological effects of <i>Kitasatospora</i> ES2 (EMCC2291) crude extract.	89
Table (7):	Biological effects of 1 st , 2 nd and 3 rd extract of <i>Kitasatospora</i> ES2 (EMCC2291).	91

- Table (8):** Biochemical analysis for **102**
Acetylcholinesterase (AChE, EC
3.1.1.7) enzyme activity.
- Table (9):** Biochemical analysis for α - **103**
esterase (EC 3.1.1.1) enzyme
activity.
- Table (10):** Biochemical analysis for β - **104**
esterase (EC 3.1.1.2) enzyme
activity.
- Table (11):** Biochemical analysis for protease **105**
(EC 3.4.21.112) enzyme activity.
- Table (12):** Biochemical analysis for Lactate **106**
Dehydrogenase (LDH, EC
1.1.1.27) enzyme activity.
- Table (13):** Statistical and biochemical analysis **107**
for some enzymatic activities
which might be responsible for the
phenotype potency.



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فعالية نواتج أيض الأكتينوميسيتات في المكافحة الحيوية لدودة ورق القطن

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