Plant Pathology Abstracts

1.3.1 Evolution in virulence and pathogenicity of plant pathogens

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Plant diseases are caused by populations of pathogens. One pathogen lesion on one leaf does not have a significant economic or ecological impact. Significant crop loss involves thousands or millions of infection events involving an entire population of pathogens and their host plants. To control the disease, a plant pathologist must develop methods to control the entire pathogen population. Thus it is important to understand the population genetics and virulence of plant pathogens in order to develop rational control strategies. In agro ecosystem evolution of plant pathogens is directed by plant breeders as they control the plant part and determine which plant genotype to be grown in farmer's fields. This attitude forces pathogens to evolve in response to the resistant alleles present in the plants but the plants do not have similar opportunity to respond to changes in the virulence alleles in the pathogen population. When a resistant gene is overcome, plant breeders replace it with another resistant gene imposing unrelieved pathogens evolution.In phytopathology we are concerned with how developed control measures (resistant varieties, chemical, control, rotation and others) affect the population genetics or evolution of the targeted pathogen(s). In general, there are five evolutionary forces that interact to determine evolution and genetic structure of pathogens populations. These forces are mutation, genetic drift, reproduction and mating, gene flow and selection. In this paper each force will be discussed to convey our experience in relation to evolution in plant pathogens population.

Key words: Plant pathogens, evolution, virulence, mutation, genetic drift

1.3.2 RAPD analysis of *Radopholus similis* populations

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The diversity of 19 populations of banana nematodes (*Radopholus similis*) collected worldwide was studied using Random amplified Polymorphic DNA (RAPD). RAPD analysis resulted in 179 bands from 10 decamer primers. OPA3 distinguished five populations, sequencing of the Internal Transcribed Spacer (ITS) region and clustered separately for all combinations of alignments and tree construction methods. This confirmed the findings from previous studies when using Restriction Fragment Length Polymorphism (RFLP).
The dendrogram constructed on the basis of the RAPD results, placed the five populations in one main cluster**.**

Key words: Banana, nematodes, RAPD, RFLP, ITS

1.3.3 Molecular Characterization of *Xanthomonas campestris* pv *malvacearum* Isolates Based on RAPD Markers in Sudan

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Xanthomonas campestris pv *malvacearum* is the causal agent of cotton bacterial blight which originally identified in Sudan into two, pre- and post- Barakat races. The commercial cultivated cotton varieties are virtually resistant to pre- Barakat race. The disease usually exhibited small angular necrotic leaf spots and small vein blight. Development of new symptoms like large water soaked, extended water soaked small and main vein blight and very small necrotic spots were reported to be associated with new emerging mutants of the bacterium (Ahmed et al. 2006).
Sixteen isolates representing different geographical zones of the main cotton growing scheme in Sudan, Gezira scheme, were subjected to Random Amplification Polymorphic DNA (RAPD) markers to assess genetic diversity among isolates showing different disease symptoms. A total of 18 random primers were used in which polymorphic bands were produced and accordingly they were analyzed. Phylogenetic analysis based on the band patterns of the isolates resulted from repetitive PCR, showed variation and similarities among isolates and six distinct genotypic groups were detected.

Keywords: *Gossypium sp*, Bacterial blight, *Xanthomonas campestris* pv *malvacearum*

1.3.4 Influence of *VdNEP6* gene on *Verticilium dahliae* (Kleb) Cotton Isolates Divergence

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Wilt disease in cotton caused by *Verticilium dahliae* (Kleb) known to be economically destructive worldwide. Functional character-ization of fungal virulence genes and then breeding for resistance programs require a comprehensive understanding about the ecology and fungal population genetics. Fungus secretes elicitors triggering defense responses in its host plants. Necrosis and ethylene inducing proteins (NEP) genes encoding secreted proteins

were well studied in recent years. Eight genes, namely, *VdNEP1* to *VdNEP8*, were computationally predicted using bioinformatics techniques based on the *V. dahliae* VdLs17 genome sequence. *VdNEP6* gene, (VDAG_4550.1), showed 39 SNPs (Single Nucleotide Polymorphism) among its overall nucleotides sequence when studied on the two virulently diverged *V. dahliae* strains, the defoliating VdG1 and nondefoliating VdG2, compared to their database counterpart. Subsequently, 20 different *V. dahliae* isolates belong to the two groups and from geographically diverse cotton growing niches in China were included. Study among isolates revealed that, the overall gene structure was conserved with 74 nucleotides polymorphism. 21.6% of these sites were fall in the coding region. Accordingly, the amino acid residues were also conserved with a 4% replacement from the whole peptide encoded. The heptapeptide motif GHRHDWE is common in all aligned peptides with high levels of equal Cystine residue. New isolates groups revealed based on Phylogenetic analysis of amino acids residues regardless of the relatively different virulent strains reported. These findings indicated that divergence in *VdNEP6* gene among fungus isolates should be considered in virulence classification which essentially leads to functional characterization of the gene.

Keywords: Cotton, *Verticilium dahliae*, Necrosis an Ethylene- inducing Proteins, Phylogenetic Analysis

1.3.5 Genetic variability of Fusarium oxysporum f sp ciceris the causal agent of Fusarium wilt of chickpea in Sudan

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Fusarium wilt caused by *Fusarium oxysporum*. f. sp. *ciceris* (Foc), is one of the most important vascular wilt diseases of the chickpea in Sudan and many other countries. To find out the genetic diversity of Sudanese *Foc* isolates of chickpea, a total of 90 distinct isolates of Fusarium which includes 76 *Foc* isolates obtained from different chickpea growing regions of Sudan and 14 *Foc* isolates obtained from Syria. All the samples were isolated and purified from single spores' cultures in the Lab. The DNA of all the isolates were then extracted and subjected to molecular characterization by three types of molecular markers. The PCR analysis were carried out using four randomly amplified polymorphic DNA (RAPD) primers, three simple sequence repeats (SSR) primer pairs, 5 Sequence Characterized Amplified Region primers (SCAR) and 2 specific *Foc* identification primer sets. Based on the coefficient of similarity, the isolates grouped into two different major clusters and six sub clusters in the dendrogram. These clusters differentiated the *Foc* isolates of Sudan based on

the races nomenclature to race 0,2 and unknown race, the cluster analysis clearly distinguished the freshly emerged *Foc* strain obtained from central Gezira state from the other *Foc* isolates. The Syrian Foc isolates, with known genetic map, which have been included for comparison purpose also sub clustered separately and coincide with their already known races, 6 and 1B/C. These findings indicate the discriminatory supremacy of molecular techniques used to clearly distinguish and separate the *Foc* isolates according to its race. This study would be useful not only to design and develop effective management strategies for chickpea wilt disease but also helpful to breeders to design effective resistance breeding programs in chickpea.

1.3.6 Finger prints of Some Indigenous Isolates of Sorghum Head Smut Pathogen *Sporisorium reilianum* in Sudan as revealed by RAPD Analysis

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Polymorphism among different 18 isolates of the sorghum head smut pathogen (*Sporisotium reilianum)* was evaluated using 11 random amplified polymorphic DNA (RAPD) markers. The isolates were collected from different cultivated and wild sorghum lines grown at Gedarif, Damazine, AbuNaama and Sinnar. DNA of the teliospores of each of the isolates was amplified with polymerase chain reaction (PCR) using eleven RAPD primers. Amplification products were resolved in 2% agarose gels electrophoresis in 1×TAE running buffer (10mM Tris-HCI, and 1 mM EDTA, pH 8.0) for about 30 min at 10 voltages. Forty-four polymorphic bands were generated by seven of the primers. Each isolate could be finger printed and easily differentiated from others by a single unique band or a combination of bands generated by the same or different primers. Phylogenetic relationship among the isolates was constructed using the unweighted pair group method with arithmetic means analysis (UPGMA) of the generated bands. Group1 consisted of 10 different isolates with genetic similarity ranging between 35% harmony and 79% harmony, whereas group 2 consisted of seven head smut isolates with similarity ranging between 34% and 75%. The study indicated that there is a significant genetic variability among the isolates of the head smut pathogen, irrespective of the host plant or geographical location from which they are collected. This variability suggests different resistance mechanism in sorghum or breeding strategies.

2.3.1 Hyperparasites and Entompathogenic microbes in Integrated Pest Management: opportunities, implication and research needs

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Problems associated with chemical control of agricultural pests whether due to pest resurgence, resistance to pesticides, enormous cost of bringing environmentally safe chemicals on the market, had already begun to dictate, globally, the pace at which the development of effective, economically justifiable and sustainable integrated pest management practices is moving. In this respect microbial agents may provide the most satisfactory technology option to keep the pest organisms beneath the economic damage threshold. Over the years scientists have been able to introduce into the market such disease causing agents' into different available formulations(spray or dust) and these are known as microbial pesticides. The requirement of high humidity levels to support the growth of these agents has meant field-use of fungal bio-control agents has not been successful and has rarely been attempted outside glasshouses. However, recent developments in formulation technology have demonstrated that with oil-based formulations of fungi, infection can be achieved at a relative humidity as low as 30%. This paper outlines the scientific efforts to date to develop microbial pesticides against major pests and tries to discuss the possibilities of success, implication and research needs for small-scale farmers in Sudan.

Key words: IPM, microbial pesticides, environmental hazards

2.3.2 Development of a web- based expert System for the virus and virus-like diseases that affects citrus production in Sudan

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Citruses are very important crops in many tropical and sub-tropical countries. Although , Sudan is situated within the citrus belt and possesses a great potentialities for citrus industry , citruses are subject to various pests and diseases. Virus and virus-like diseases are considered one of the major constrains for citrus production in Sudan, affecting both quality and quantity. The proposed web-based expert system will help growers to rapid expert advice for different locations at the same time and will guide them to take decision and predictions in citrus diseases and their management. Besides, it links together related groups of agriculture scientist, software Engineers, Web developers and designers. This expert system contains

two main parts; the first part constitutes of the citrus information database , where the user can get all the basic information about the different cultivated citruses and their varieties ; the prevalent diseases with their visual symptoms and their possible control measures. The second part , is the advisory system, in which the user can interact with the expert information system online; the user should answer all the questions asked by the expert system. Depends on the response by the user the expert system will decides the disease and displays its control measure(s). MySql and Dreamweaver have been used as backend for developing the proposed system. The system has been tested and ready for use.

Key words: Citrus, web-based expert system, advisory system, expert system

2.3.3 Risk Analysis Of Brown Rot In Potato Seed Caused By Rulstonniu solunucerum Race 3 in Sudan

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This work aimed to study the possible pest risk posed by the introduction of the brown rot disease in potato crop, caused by the bacteria *Ralstonnia solanacerum* Race 3.
The bacterium was found in potato seed variety pelleini consignment imported from France in2006.Zaling local potato variety previously collected from the local market reported to be infected by the bacterium. Brown discoloration of the vascular ring in80Yo of pelleini tuber variety was seen, when the tuber was cut into two halves across the stem end, the tubers showing no brown discoloration of the vascular ring showed typical symptoms when incubated from (2-3)week. When the tubers were slightly squeezed creamy fluid exudates was observed oozing from the vascular ring. The same symptoms were observed on infected Zalinge potato
tubers. Growth of the bacterium for 24 hours on nutrient agar resulted in small, irregular, smooth cream colored, translucent colonies. The bacteria were short rods, motile and negative to gram reaction. When the bacteria were isolated and injected in potato plants, typical symptoms of brown rot appeared in the inoculated plants. The plants ultimately wilted and died. The soil and plant debris mixed with the inoculums of *Ralstonnia solanacerum* Race 3were left under the sun during the summer (Nzlay-Novemb er 2007). Then certified potato seeds were planted in this soil .Neither the potato plants grown on neither infested soil nor the ones grown on non infested soil shown disease symptoms. The average plant height was 12.62 and 1 7.66 cm in infested soil and non infested soil, respectively. No bacterium was re-isolated from the plants .this study revealed that the disease cannot over summer in central Sudan environmental conditions The average maximum temperature reached 46c. A through pest risk analysis was conducted, the probability of introduction was high as the pest can be introduced with plant material intended for planting (seed potato) from Europe or with private individuals carrying infected material from neighboring countries i.e. Egypt, Saudi Arabia, Eritrea and Ethiopia. From this study survival in the soil is rated low risk. Survival of the bacterium in irrigation water is rated high.
The study concludes that *Ralstonnia solanacerum* Race 3 should be classified as a quarantine pest in Sudan. Seed potato has to be imported from the pest free areas only and the ban of ware potato from neighboring countries has to continue

Key words: Brown Rot, bacterium, *Ralstonnia solanacerum*

4.3.4 Occurrence and Chemical Control of Grapevine Downy Mildew (*Plasmopara viticola*) in Khartoum Area

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A study was undertaken to assess the occurrence of downy mildew disease on grapevine caused by the fungus (*Plasmopara viticola*) which is a fruit crop that has recently assumed an important status in Khartoum area. The efficacy of the fungicides, Trimiltox 41 WP(copper compound +mancozeb), Ridomil MZ 48 WP (metalaxyl - M + mancozeb) and Ortiva 250 WG(Azoxystrobin 250g/L) was evaluated. Incidence and severity of the disease were surveyed on grape varieties ('Cardinal' and 'Crimson') at two locations, north (Zadna farm at Kadaru) and south Khartoum city (Taiba farm at Jebel Awlia). The Subsequent effect of fungicides spray on disease development was assessed by analysis of the disease progress curves and their correlations with growth and yield parameters of the treated vines. A high disease incidence was detected in the surveyed grapevine yards in both Kharifi and winter seasons and a significantly higher disease developed during the latter. The variety Crimson was significantly more prone to infection than Cardinal. Application of both fungicides was highly effective on controlling downy mildew disease, positively correlated with the number of leaves maintained on vine and increase in berries yield. Two applications of either Ridomil or Ortiva after the copper – based basal spray suppressed the disease significantly and were thus recommended, particularly under favorable conditions to control downy mildew disease.
Key words: grape vine, Downy mildew, Ridomil MZ, Ortiva, chemical control

2.3.5 Characterization and biocontrol of *Neofusicoccum mangiferae* (Syd. & P.Syd.) the causal agent of trees branch wilt in Sudan

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Branch wilt disease is one of the most hazardous diseases which has a wide host range, that includes all tree types. A survey carried throughout North Kordofan State, Khartoum, and Gezira States showed that branch wilt disease is widely distributed to epidemic levels .Thus more than 29 plant species with in 15 families were affected . family Moraceae have the highest frequency of infection. The tree speices *Adansonia digitata*,*Eugenia jambolana* and *Cordia africana* were found free of infection. Isolation of the fungus ,*N.mangiferae* was consistently associated with infected bark from all of the different plant species studied. Five

affected isolates of the fungus were identified according to the culture characteristics , growth rate differences and spores size. Invitro experimental results revealed three streptomyces isolates S3,S4,S5 which significantly inhibited the mycelia growth of *N. mangiferae* isolates. Mycorrhizae showed great tendency and ability to antagonize *N. mangiferae* isolates and to provide greater degree of protection to the host plants, seedlings which were treated with mycorrhizae and later inoculated with *N. mangiferae* isolates showed good growth and did not develop the characteristic wilt as compared to those inoculated with *N. mangiferae* alone. This is the first record of mycorrhizae as biocontrol agent of *N. mangiferae* in Sudan.

Key words: *Neofusicoccum mangiferae,,* branch wilt, streptomyces, Mycorrhizae

2.3.6 Evaluation of chitosan efficacy on tomato growth and control of early blight disease

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Tomato (*Solanum lycopersicon* L.) is one of the world's most widely grown crops. Among the destructive diseases, early blight caused by *Alternaria alternata* is a major yield-limiting factor. Management of the disease has been hampered by the use of ineffective fungicides. Chitosan is a natural nontoxic biopolymer derived by deacetylation of chitin. The objectives of this study were to evaluate the efficacy of chitosan compared to common fungicides at different concentrations against the early blight pathogen *A. alternata* and to evaluate growth promotion of tomatoes *in vitro* and under field conditions. Chitosan at 5mg/mL applied as foliar spray alone, or in combination with seed treatment or seed treatment alone, reduced disease severity by 46.70%, 46.27% and 45.97%, respectively. The chemical fungicide reduced severity by 46.56% compared to untreated control. In general, regardless of the application method, tomato growth parameters were significantly increased by chitosan treatments compared to the control. Application of chitosan at 5mg/mL alone or combined with5mg/ml as seed treatment increased plant height, plant fresh and dry weights by16.88%, 35.95% and 23.14%; respectively. These findings suggest that, chitosan could be used to plant growth and control of *A. alternata* in tomato when applied at 5mg/mL.

Key words: *Alternaria alternata*, chitosan, ortiva, tomato growth promotion.

3.3.1 Determining plant Growth Promoting and biocontrol Factor of Bacterial Culture Media

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The purpose of the present study was to investigate protease producing microorganisms isolated from Banana rhizosphere soil obtained from different localities in Malaysia. Soil micro-organisms were screened for their effects on plant growth and for biocontrol activity. Different media were used to culture these microorganisms. Our results showed that growth media of six bacterial isolates, viz. *pseudomonas* spp., *Serratia* spp., and *providential* spp. had direct influence on promoting banana growth and inhibiting fungal growth. Different culture media had variable effects on growth promotion or mycelia growth inhibition. Four out of six isolates inhibited fungal growth in vitro and the degree of inhibition was affected by growth rate of the fungal pathogen. Proteolytic activity was conducted in the supernatants of these four isolates. The highest proteolytic activity was detected in organic based media, Tryptic Soy Agar and SNB nutrient Agar. In contrast ,in King's B Agar medium proteolytic activity was undetectable

3.3.2 Evaluation of some chickpea cultivars for resistance to Fusarium wilt caused by *Fusarium oxysporum* f sp *ciceris*

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The study was conducted under the conditions of the well-established wilt plot at Hudeiba Research Station (HRS), River Nile State, Sudan for five consecutive winter seasons (2007-08, 2008-09, 2009-10, 2010-11 and 2011-12) to evaluate the resistance of 8 chickpea cultivars *viz*. Burgeig, Salwa, ICCV2, Hawatta, Atmour, Mattama, Gebel Marra and Shandi to Fusarium wilt disease. A highly susceptible cultivar Shendi was included after every two test cultivars to map the uniformity of infestation in the infected plot. Since the cultivars Burgeig and ICCV2 were showed less than 10% disease incidence, they were identified as highly resistant to the disease in the 5 test seasons. The cultivars Atmour, Salwa and Hawatta

were found resistant to the disease as they exhibted less than 20% disease incidence. The cultivars (Mattama, Jebel Marra and Shendi) were observed Highly susceptible with 75% disease incidence in all tested seasons. Low disease incidences of 6.6, 3.8, 2.4, 4.2 and 6.7 % was observed in the cultivars Burgeig (season 2007-08), ICCV2 (season 2008-09) and Burgeig in seasons (2009-10, 2010-11 and 2011-12) respectively. In season 2011-12 the cultivar Hawatta significantly ($p \leq 0.0001$) out yielded other cultivars and obtained 603.8 kg/ha. The cultivar Salwa significantly ($P \leq 0.01$) exceeded other cultivars in the100seed weight and gave 26.9 grams. Reaction of the above mentioned cultivar to Fusarium wilt, were confirmed with artificial inoculation trial conducted at the greenhouse in season 2011-12. The lowest (5%) and the highest (93.3%) disease incidences were observed in the cultivars ICCV2 and Shend,i respectively.

Key words:Chickpea, Fusarium wilt, *Fusarium oxysporum* f sp *ciceris*

3.3.3 Evaluation of Some Sorghum Genotypes for Resistance to Covered Kernel Smut Disease

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Field experiments were conducted at the Gezira and Gedarif research farms to evaluate 8 sorghum cultivars and land races and 2 hhybrids to covered kernel smut disease (*Sporisorium sorghi)* in season 2001 – 2004. at both locations and in all seasons, the tested genotypes varied greatly in their susceptibility to the disease and the land race Arfa Gadamack was consistently disease free. At Gezira, in seasons 2001/02 and 2002/03, the highest disease incidence was exhibited by the improved variety Wad Ahmed (54% and 27%, respectively), followed by the hybrid Panar 606 and the improved variety Tabat (45% and 34%, respectively) in season 2001/02 and by fodder variety Abu Sabein and Hageen Dura - 1(22% and 16% , respectively). in season 2002/03. At Gedarif, in both seasons, the highest disease incidence was recorded in abu Sabein (47% and 26%, respectively). Wad Ahmed and Hageen Dura-1 displayed disease incidence of 37% and 33% in season 2002/03 and 12% and 24% in season 2003/04, respectively. Disease severity on the tested genotypes also varied. Variety Tabat was the least affected (2.1) compared to Korakola and Zahrat Gadamblia which showed the highest disease severity (rated 3.6 and 3.5, respectively).The Landrace Arfa

Gadamak gave higher yield than the improved cultivars in Gezira in season 2002/03 and in Gedarif in season 2003/04.

3.3.4 Pearl Millet genotypes resistant to Downy mildew

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In this study, twenty pearl millet genotypes obtained from gene bank at Agricultural Research Corporation, Wad Medani (Sudan) and from ICRISAT (India) were evaluated for their reaction to downy mildew disease caused by (*Sclerospora graminicola*) at Gezira, Rahad and Gedarif in seasons of 2004/05 – 2007/08. The seeds were artificially inoculated with the fungus at sowing (one gram dry powder /hole). Variability of disease occurrence within seasons and through genotypes was evident. The local land races of the crop (Herehir, Umgarfa, Dahabaya and Dimbi) consistently exhibited high susceptibility to the disease (up to 61%). Some of the exotics genotypes showed erratic reaction to the disease, while genotypes MCNELC, ICMV-white, and MCSRC were disease resistant. (0.0 – 9.4%) and showed disease levels statistically similar to or better than the resistant released check Ashana.

3.3.5 Field assessment of wheat leaf rust major genes to prevailing wheat leaf rust disease In Sudan

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Leaf rust caused by *Puccinia recondita* f. sp. *tritici*. is the most common disease of wheat in New Halfa, Sudan where favourable conditions prevail. Losses due to leaf rust diseases varies from trace to over 40%. Eighty five near isogonics lines of wheat with 38 major genes and one entry with minor genes were assessed for their resistance to prevailing leaf rust races in New Halfa during season 2010/2011 and 2011/2012. The results showed that the genes Lr1,Lr9,Lr10,Lr11,Lr18,Lr19,Lr26 and the combination of Lr10+Lr27+Lr31 are resistant to leaf rust in the Sudan during the two seasons. However, lines possing others genes, such as Lr24,Lr24, Lr21, Lr20, Lr17, Lr16, Lr15, Lr14, Lr3Bg, Lr2a, Lr22b exhibited susceptible reaction to leaf rust disease.

Key words: leaf rust, wheat, resistance

3. 3. 6 Reaction of Some Cotton (*Gossypium barbadense*) lines to Fusarium Wilt Disease

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Abstract

Fusarium wilt of cotton caused by *Fusarium oxysporum* f.sp *vasinfectum* is a soil inhibiting organism that can survive for long periods in soils, even in the absence of its host. Disease management is only possible by use of resistant varieties. To keep pace with cotton improvement programs identification of source of resistance is important. In this respect, ten new long staple cotton (*Gossypium barbadense*) lines namely, Barakat S, SPA-9, IMY1, IM14, SP-7, IMB-9, SP-21, IS-10, IS10-1 and IS3 and their F_1 and F_2 progenies were assessed for resistance to the disease under field and green house conditions. The long staple cotton varieties, Domain Sakel, Huda, Barakat and Barakat 90 with known reaction to fusarium wilt were included for comparison. The results confirmed that the varieties Domain Sakel, Huda, Barakat were the most susceptible genotypes, while the standard Barakat 90, IS-10, IMB-9 and F_2 generations of IM14 and IMY1showed a high level of resistance. The cotton lines SP-21, IS3, SPA-9and IS10-1 and the F_1 generations of Barakat S, SPA-9, IMY1, IM14, SP-7, IMB-9 and SP-21 showed intermediate resistance to the disease. IM14 and IMY1 had better resistance and could be considered a source of resistance to fusarium wilt disease.

Key words: Fusarium wilt, fusarium oxysporum, resistance, cotton. *Gossypium barbadense*

4.3.1 A new Aggressive Bacterial Disease on 'Baladi' Lime in Gadarif Area

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During a routine survey to monitor appearance of citrus bacterial canker(CBC) in the humid area of the eastern region of Sudan starting from Kassala in the north to Damazin in the Blue Nile State, an apparently high contagious bacterial disease flared up on "Baladi" Lime in August 2013. The disease became even more severe in the later months of the rainy season in Gedarif area. The visual symptoms consisted of corky lesions that develop on the leaves, fruits, twigs and shoots. The lesions on fruits and leaves were surrounded by chlorotic haloes and might appear atypical if found in association with a wound site or leaf miner feeding damage. Shoot die- back, defoliation and early fruit abscission were evident as the disease progressed. Besides its severe symptoms, the disease had a serious impact on the fruit marketability in Gedarif this season. A serious economic consequence seems inevitable with such a conducive environment, in addition to the severe, high incidence and rapid spread in commercial orchards and nurseries as well as in backyard lime trees in Gedarif city and suburb areas. Based on symptoms consistent with canker and host range, biochemical characteristics of *Xanthomonas citri*, and pathogenic response of lime species, the disease can tentatively be identified as type C of citrus bacterial canker(C CBC). Currently, more accurate and reliable detection and diagnostic methods such as antibodies and polymerase chain reaction are seriously considered for early and correct identification of the causal bacterial.

4.3.2 The prevalence and occurrence of some pests and diseases on the cultivated sunflower in Gezira area Sudan

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The Study was conducted in Gezira University farm during 2011-2013 winter and autumn seasons, revealed the presence of different types of virus disease suggestive symptoms such as mottling, general chlorosis, systemic ring spot followed by complete wilting and drying. Forty eight percent of the total samples tested serologically were positive for Tobacco streak virus and Tomato ring spot viruses. However, there is a number of samples that showed the presence of unknown poty and luteoviruses. Seed health testing confirm that most of the tested samples were free from seed borne viruses despite occurrence of very low incidence (2%) of seed transmitted viruses such as TAWV. Three of the nine sunflower varieties showed partial resistance to the detected viruses. Of the insect pest complex, whitefly (*Bamisia tabaci*) is the most dominant followed by aphid (*Myzus persicae*). Jassid and leaf minor are at low incidence in addition to viruses. Alternaria leaf spot (*Alternaria helianthi*) and powdery mildew (*Erisiphe cichoracearum* f sp *helianthi)* were noticed to attack the crop at different stages. Powdery mildew has a noticeable effect in reducing the head size especially when infection takes place early in the season. An outbreak of the beetle

(*Bachnoda interrupta*) was observed only just before harvesting in autumn, 2013 and results in more than 60% head damage.

Key words: Chlorosis, luteoviruses, poty, *Bamisia tabaci, Myzus persicae, Alternaria helianthi, Erisiphe cichoracearum* f sp *helianthi, Bachnoda interrupta*

4.3.3 Immerging of criniviruses in tomato and cucumber grown in greenhouses in Sudan

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Growing tomato and cucumber in greenhouses in summer is a technology currently adopted in Sudan to overcome off seasons heat stresses. The major constraints for tomato and cucumber production in greenhouses are virus diseases. Here we report for the first time the detection of three *crinivirus* diseases ; tomato chorosis disease (ToCD) in tomato, cucurbit chlorotic yellows disease (CCYD) and cucurbit yellows stunting disorder disease (CYSDD) in cucumber. We report also here the detection of large cotton leaf curl gezira alphasatellite molecules associated with an isolate of novel strain of tomato leaf curl Sudan virus (ToLCSDV) in infected tomato plants. All these viruses are transmitted by Whitefly (*Bemicia tabaci*) which was noticed to occur in high population in all greenhouses cultivation in Sudan

Key words: Criniviruses, Tomatoes, Whitefly, Cucumber

4.3.4 Spatial and Temporal Spread of Chickpea Chlorotic Dwarf Virus (CpCDV) in Chickpea in the River Nile State, North of Sudan

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Chickpea chlorotic dwarf gemininvirus (CpCDV) (family, *Geminiviridae*, genus, *mastrevirus*) is in chickpea fields in northern Sudan since early 90s causing great losses to chickpea production. As the epidemiology of this virus is unknown, seasonal, spatial and temporal spreads of the chickpea chlorotic dwarf (CpCD) disease were investigated. Field trials were conducted at Hudeiba Research Station Farm, northern Sudan during 2004- 2006 seasons. High levels of disease incidence were found to occur in plots that were grown during summer in year 2004 and 2005, while low incidence was noticed during winter. The low spread of the disease was consistently associated with low numbers of leafhopper vector, *Orosius orientalis*, and vice versa. Ordinary runs analysis indicated that the arrangement of infected chickpea plants within rows was random throughout the life cycle of the crop regardless of sowing dates. Disease progress and rate curves (*dy/dt*) indicated that logistic,

monomolecular, logistic and monomolecular growth models would best describe disease progress in chickpea crop grown in May, June, November and December 2005, respectively. Logistic was the best model to describe the disease in May 2006, while monomolecular was the best for describing disease spread in June, November and December 2006. Accordingly the monomolecular model was chosen for the purpose of comparing the disease epidemics. Estimated rates of infection were 0.214, 0.081, 0.012 and 0.001 with respect to chickpea that grown in May, June, November and December 2005, respectively. For the year 2005 the rates of disease progress were 0.122, 0.083, 0.006 and 0.001 in the crop that grown in May, June, November and December 2006, respectively. The highest rates of virus progress was clearly shown to be during summer, where the key to disease management in the River Nile State is choosing the third week of November as the optimum sowing date.

Key words: Chickpea, chloratic dwarf geminivirus, epidemiology

4.3.6 Mango seedlings wilt causal agent, symptoms, seed transmission and the effect of some seed treatments on its incidence.

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Abstract

Mango (*Mangifera indica* L.) is one of the most important fruit crops in the Sudan and it suffers from several diseases at all growth stages. Some of these diseases are of great economic importance as they cause heavy losses in mango production. The aim of this study is to determine the causal agent of wilt disease, symptoms development, seed transmission and control measures. Random samples of mango fruits were collected from different areas (Hwata region and Wad medani fruit market). The collected fruits were mixed thoroughly and divided into two groups as hulled and dehulled seeds. Seeds were treated with Clorox 2.5%, the fungicides Sharpen 0.5%, and Tilt 0.2%, and compared to untreated control. The study indicated that the disease was caused by the fungus *Nattrassia mangiferae* contaminating seeds of fruits obtained from infected trees. The symptoms of the disease appeared as yellowing in newly emerged young leaves followed by browning of the whole flush. Infected seedlings dried out and withered. The study indicated that mango propagation by dehulled seeds significantly increased germination and reduced disease incidence compared to hulled seeds. Tested fungicides were effective in reducing the disease incidence and significantly resulted in better control compared to other treatments.
Keywords: mango, wilt, *Mangifera indica, Nattrassia mangiferae*

4.3.7 Synergistic interaction in cucumber plants caused by dual infection of cucumber vein yellowing Virus (*Ipomovirus)* and zucchini yellow mosaic virus (*potyvirus)*

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A recently survey for cucurbit viruses conducted in seasons 2009/2010 showed that *Cucumber vein yellowing virus* (CVYV, Ipomovirus)*, and Zucchini yellow mosaic virus* (ZYMV, Potyvirus), are predominant cucurbit viruses in Sudan. In addition, two Crinivirus namely a *Cucurbit chlorotic yellows virus* and *cucurbit yellow stunt disorder virus* have been recently reported infecting cucurbit in Sudan *(Hamed, et al. 2011).* Cucumber plants susceptible to CVYV and ZYMV were grown under greenhouse conditions at 25˚C and mechanically inoculated with Sudanese isolates of CVYV and ZYMV. Co- infections were done by pre-inoculating plants with CVYV two days before inoculation with ZYMV. Virus accumulation in systemically infected plants was determined by ELISA at 15 dpi. Cucumber plants singly infected with either CVYV or ZYMV showed a significant reduction of growth and total fresh weight was reduced by about 35% compared to mock inoculated plants. Mixed infections with CVYV and ZYMV resulted in a strong synergistic response and more severe symptoms reducing plant height and fresh weight by about 75%. The accumulation of ZYMV (DAS-ELISA) and CVYV (TAS-ELISA) was significantly higher in mixed infections. This increase of virus concentration was more pronounced for ZYMV than for CVYV.

Key words: ZYMV, CVYV, Potyvirus, Ipomovirus, synergism, Cucumber

5.3.1 Current Status Of Aflatoxin Contamination of Groundnut (*Arachis hypogea L*) in Sandy Belt of Southern Kordofan State

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Abstract

Groundnut (*Arachis hypogea*) is regularly consumed as a major component of the daily meals. Despite its importance as food, aflatoxin contamination has the potential to limit its use in human diet and reduce its economical impact in the well fare of the region. The results of this study clearly indicate relation between fungal infection and aflatoxin contamination in stored groundnut. The highest infection was always found in the millers stores (47 – 61 %) followed by traders stores (37 – 40 %) and the market place (26 – 46 %). Insect and mechanical damage was in the range of (2.1 – 7.2 %) and (1.0 – 12 %), respectively. The combination damage of fungal/insect and fungal/mechanical was found to be in the range of (1.8 – 7.8 %) and (2.1 – 10.8 %). The discolored kernels percentage (0.3 – 0.5 %) was almost similar in all storage types and locations with minor variability.

Aflatoxin analysis by High Performance Liquid Chromatogram (HPLC) revealed that (52 %) of the samples were contaminated by aflatoxin. Aflatoxin B_1 is the predominant followed by B_2. However, G_1 was only detected in low levels in 4 samples while G_2 was not found in any of the samples. Concentration of Aflatoxin B_1 and B_2 were respectively higher in ELdaleng (53.6 – and 6.6 µg/ kg), followed by Eldebabat (18.6 and 4 µg/ kg) and ELhamadi (0.5 and 0.1 µg/ kg). Groundnut cake was highly contaminated with B_1 in all locations with the highest contamination in ELdaleng (88 µg/ kg) followed by ELhamadi (33.3 µg/ kg) and Eldebabat (21.7 µg/ kg). Aflatoxin B_2 is again higher in ELdaleng (13.3 µg/ kg), followed by Eldebabat (9.5 µg / kg) and ELhamadi (5 µg/ kg). Aflatoxin G_1 was only detected in groundnut samples from the market place at ELdaleng (1.4 µg/ kg). However, it was detected in all groundnut cake samples and the level of contamination was 5.9, 3.4 and 2.3 µg/ kg in ELdaleng, ELdebabat and ELhamadi, respectively.

Key words: Aflatoxin, Groundnut, *Arachis hypogea,* HPLC

5.3.2 Potentialities of some *Penicillium spp.* indigenous to Sudanese soil for antibiotic production

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Abstract

This study aimed to monitor the potentialities of five species of *Penicillium* indigenous to Sudanese soils for antibiotic production. Six localities were chosen to represent different crops and different agricultural practices. Isolates of *Penicillium spp.* were screened for their capabilities to suppress the growth of some important agricultural and medical bacteria. The selected isolates were grown on different liquid media and their metabolites were extracted with ethyl acetate, methanol, chloroform, methanol/chloroform (1:2) and water. Aqueous metabolites of these species were found suppressive to the growth of *Xanthomonas campestris* pv *malvacearum*, *X. c.* pv *vesicatoria* and *Staphylococcus aureus* and *Escherichia coli.* Aqueous metabolites of all penicillia were more suppressive to *Staphylococcus aureus* and *Escherichia coli* than the synthetic antibiotics, Penicillin G and Ampicillin.

Based on thin layer chromatography R_f values, colures of these suppressive metabolites and infra red spectrum, they are suggested to be Penicillin derivatives.

The DNA of *Penicillium* isolates showed clear differentiation between the species.

Key words: *Xanthomonas campestris, Staphylococcus aureus, Escherichia coli, Penicillium,* antibiotics

5.3.3 Effects of the Nematophagous Fungi *Arthrobotrys oligospora* Fresen on Nematodes infecting Lime Plants

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Nematophagous fungi are the fungi which attack nematodes, many of them are plant pathogens. These fungi worldwide in distribution and have been reported from many countries including Sudan. This study has been carried out to search for nematophagous fungi in Gezira soil and their capability to attack nematodes. Random samples collected from Gezira soil grown with lime crops were placed on Corn Meal Agar media (CMA) for the growth of the fungi and nematodes. Using Digital Microscope many types of trapping nematodes had been seen, such as those with adhesive nets, adhesive knob and presence of fungal spores inside the dead body of the nematode. The samples labeled, and kept in laboratory for further glass house studies. The fungus has been identified as *Arthrobotrys oligospora.* The study investigated the capability of this fungus to attack and destroy nematodes. The nematophagous fungus *A. oligospora* was found to attack the nematode *Xiphenema sp.* It was also observed that, the nematode had been captured by adhesive knops and after that the nematode struggled until death. Also the same fungus had been seen capturing the nematode *Xiphenema sp*. by adhesive net and had been held at two points and sometimes at several points. Growing of lemon plants on soil artificially infested with *Xephenema sp*. nematodes and treated with different concentrations (10^5, 10^4 and 10^3) of the fungus *A. oligospora* significantly increased the number of lime plant leaves, stem length, root length and also increased the fresh and dry root weight compared to untreated soil. So, Nematophagous fungi, if given more attention may be useful as biological control which can decrease cost of nematicides and conserve the ecosystem.

Key words: Nematophagous fungi, *Arthrobotrys oligospora*, *Xiphenema sp,*

5.3.4 Morphological Characteristic Of Dagger Nematode (*Xiphinema spp.*)

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Soil samples were collected from citrus plants. Nematode was isolated and identified according to their body measurements. The measurement of the nematode under study done by using drawing tube attach to calibrated microscope. Females: (n= 24); L = 3.0 mm ± 3.2 (2.7-3.4), a = 63 ± 5.8 (53-73), b = 6 .5 ± 0.2 (3.5-8.5), c = 71 ± 9 (59-73), v %= 51±1 (49-53); tail = 45 µm ± 6 (38-51), odontostyle = 129 µm ± 7 (132-144), odontophore= 65 µm ±

4 (55-74), stylet= 193 µm ± 7 (183-204). Males: Not found. Body shape straight to slightly curve after fixation. Lips region varying from well offset and knob-like to continuous with body contour. Amphids usually with wide stir up-shaped, sometimes globlet-shaped fovea and large, slit-like opening. Base of odontostyle forked. Odontophore with sclerotized basal flanges. Female reproductive system variable, typically amphidelphic-didelphic, but some species with reduced or completely lacking anterior branch. Uterus from very short to long and differentiated in several parts; in Tails of females usually similar from bluntly round, digitate or elongate conoid to filiform The author found that in his measurement of *X. basiri* body length was 3.15mm, vulva position was 50% ±1 and tail 45 µm ± 5, while in our population the body length is 3.0 mm ± 3.2, vulva position 51% ±1 and tail 45 µm ± 6. However, despite the variations in our measurements compared to Zeidan (1990) still we considered our population as *X. basiri*. This is the third report for *X. basiri* in Sudan from citrus.

5.3.5 Bioefficacy of Plant Extracts to Control *Nattrassia mangiferae* in date palm

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Sooty canker disease is an important disease of date palm In the Northern State of the Sudan causing severe damage of off-shoots ,date palm trees and reduction in yield. In present study, the pathogenic fungus was isolated from infected plant parts and identified based on morphological and cultural characters as*Nattrassia mangiferae* The *in vitro* efficacy of different plant extracts Neem (*Azadirachtai ndica*), Mint (*Mentha spicata*), Ryhan (*Ocimum basilicum*), and Maharab (*Cymbopogonschoenanthus* Poximus).were tested to control sooty canker pathogen. Different concentrations 5, 10, 15 and 20% of plant extracts were tested for their effect on the inhibition of mycialial germination . All the plant extracts showed significant inhibition of fungal mycelial growth.Among the different extracts, complete inhibition of fungal mycelia l growth was exhibited at 20% of *Ocimumb asilicum*was found most effective followed by Mint (*Mentha spicata*) with only retardation of mycelial growth while, Neem (*Azadirachta indica*), and Maharab (*Cymbopogon schoenanthus* Poximus was the least effective. Application of plant extract which are easily available for controlling plant diseases are non-pollutive, cost effective nonhazardous and do not disturb ecological balance. Investigations are in progress to test the bioefficacy of these extracts in field applications.Four chemical fungicides namely ,Tilt, Benlate, Bayfidan, and Bayliton, at different conc. (10 ppm , 20ppm,30ppm, 40ppm,50ppm) were also used for their effect on the mycialial germination , all of them inhibited the germination the most effective one was Tilt at 30-50 ppm, followed by Benlate while Bayleton and Bayfidan at high concentration 50 ppm inhibited the growth of the fungus. The effects of plant extract are more effective for controlling the fungus as compare to the fungicides.

Key words: date palm, sooty canker, fungicides, *Nattrassia mangiferae.* Plant extract

5.3.6 Seed priming in Hargal shoot powder aqueous extract (*Solenostemma argel* (Del) Hayne) to control downy mildew disease on millet under traditional rain-fed conditions in North Kordofan, Sudan

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In North Kordofan, Sudan, millet (Pennisetum glaucum) is cultivated under rain-fed conditions in sandy soil. Downy mildew disease caused by Sclerospora graminicola (Sacc.) Schroet. is the most economically important fungal disease associates with the crop. A field

trial was conducted for two consecutive seasons 2009-2010 in North Kordofan State to study the effect of seed priming in Hargal (Solenostemma argel (Del) Hayne) shoot powder aqueous extract to control downy mildew on millet. Hargal shoot powder aqueous extract was used at 10, 20 and 30g/ litre of water and compared to the seed dressing fungicide Apron Star 42% WS. One kilogram seeds of the susceptible land race millet "Um garfa" were soaked in each concentration. The data on the percentage of seedling emergence, percentage of disease incidence and grain yield were evaluated. Hargal shoot powder aqueous extract at 30 g/ L H2O and the Apron Star 42% WS recorded 55% seedling emergence and 5.2% disease incidence. The control recorded 14.2% and 32.4% for seedling emergence and disease incidence respectively. Hargal shoot powder aqueous extract at 30 g/ litre of water and the standard seed dresser significantly increased millet grain yield compared to the untreated control.

Key words: Millet, Pennisetum glaucum, Solenostemma argel, Downy mildew

6.3.1 Chemical composition and antimould activities of essential oils from selected aromatic plants

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The essential oils of the seven aromatic plants from Kenya have been chemically characterized and their activity against mycotoxigenic fungi isolated from maize and groundnuts evaluated. The lowest MIC of the oil of *Tarchonanthus camphoratus* (59 mg/ml) was on *A. parasiticus*, *A. fumigatus, A. nidulans* and *A. sparsus,* whereas *A. flavus* was the most resistant with MIC of 470 mg/ml. For the *Fusarium* species oil *T. camphoratus* was more active than nystain on all the species tested except *F. scirpi*, *F. graminearum* and *F. crookwellence.* The lowest MIC (30 mg/ml) was on *F. proliferatum, F. scirpi* and *F. moniliforme* while the highest at 118 mg/ml was on *F. sporotrichoides* and *F. crookwellence.* The twelve species of *Penicillium* tested were more resistant as compared to nystatin. The oil of *Cymbopogon citratus* was found to be active against all the fungal strains tested. The minimum inhibition concentration (MIC) of the oil ranged from 15 to 118 mg/ml. Oil of *Rosemarinus officinalis* was more active on *Fusarium* species and induced inhibitions zones

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higher than nystatin. It was less active on all the eight *Aspergillus* species tested, inducing inhibitions zones of less than 10 mm. *Aspergillus parasiticus* was the most sensitive with an MIC of 56.3 mg/ml while the highest MIC was 225 mg/ml. Oil of *F. vulgare* had good activity with more than 10mm inhibition zone against *Aspergillus* and *Penicillium* species. For *Piper capense* oil, the highest antifungal activities of the oil were observed against *Aspergillus* species with the highest inhibition zone of 28.3 mm for *A. niger* and a corresponding MIC of 33.1 mg/ml. Oil of *Afromomum angustifolium* had higher activity than

6.3.2 Antibacterial Activity Of Chemical Constituents Of *Datura metel* Against Phytopathogenic *Xanthomonas campestris* pv. *malvacearum*

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Ethanol and hexane extracts of different parts of *Datura metel* were tested *in vitro* against the bacterium *Xanthomonas campestries* pv *malvacearum,* the causal agent of bacterial blight in cotton. In vitro growth inhibition of the bacterium was evaluated using different concentrations of *Datura* leaves ethanolic extracts. . The antibacterial activity was detected in both alkaloidal and non alkaloidal fractions of the extract. Growth inhibition of the bacterium ranged from 2.7-7 cm when concentrations of 50-2000µl were extracted. The minimum inhibitory concentrations were found to be <50µl. The extracts were compared to Bronopol, the only antibacterial pesticide in use in Sudan. *Datura* ethanolic extract resulted in better inhibition of the bacterium compared to Bronopol. Stability of antibacterial activity of *Datura* leaves extracts was evaluated under several storage conditions. Antibacterial activity of *Datura* leaves extracts was found stable up to 8, 12 months and 18 months, 5 - 8 weeks and 5 hours when kept outdoor at 40-47 **°C**, at room temp 25-40 **°C**, at 4**°C** , in the soil and under UV radiation, respectively. The active ingredients of ethanolic *Datura metel* leaves extract were characterized using Thin Layer Chromatography. Eleven TLC separated bands were identified , five of them had antibacterial activity against the bacterium.
Key words: *Datura metal*, antibacterium activity, bacterial blight, *Xanthomonas campestries* pv *malvacearum*

6.3.3 Antibacterial activity of *Prosopis juliflora* against *Xanthomans campestris* pv. *vesicatoria* and *Xanthomans axonopdis* pv. *malvecearum*

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Ethanolic extracts of plant species were screened invitro for their antibacterial activity against *Xanthomonas campestris* pv. *vesicatoria* and *Xanthomans axonopdis* pv. *malvecearum*. Extracts of *Physalis angulata* roots, *Aristolochia bracteulata* leaves and stems, *Ipomea helderbranditty* stems and roots, *Argemon Mexicana* seeds, inhibited bacteria growth. All plant parts of *Prosopis juliflora, (*roots, stems, leaves and seeds) had a significant antibacterial activity against the bacterium, however, ethanolic extracts of leaves and pods were the most effective parts. Accordingly *P. juliflora* leaves were used for further studies, extracted with solvents and tested against the *X. c.* pv. *vesicatoria* and *Xanthomans axonopdis* pv. *malvecearum*. Among all organic solvents used only Ethanol inhibited the bacterium growth. Ethanolic extract of *P. juliflora* leaves inhibited the growth of *X. a.* pv. *malvacearum* by 71-74%. In addition, antibacterial activity of the extract was tested against *X. c. pv. translucens, Bacillus. subtilis and E. coli* and it reduced the growth of these bacteria by 54% , 69% , and 53% , respectively. The minimum inhibitory concentration expressed by the extracts against these bacteria ranged from 50-200 µl.

The active component of the crude leaves extract of *P. juliflora* was isolated using Thin Layer Chromatography (TLC) and two active fractions (F1, F2) were identified. Fraction1 was soluble in chloroform and had significantly higher antibacterial activity against phytopathogenic bacteria *X. c. pv. vesicatoria and X. a. pv. malvacearum*. Fraction 2 which was soluble in methanol significantly inhibited the growth of *X. c.* pv *vecicatoria* and *X. a*. pv. *malvecearum*.

According to the infra red, Mass spectra and UV data of the two fractions, and published data on julifloricin, F1 was identified as julifloricin.

Keywords: *Prosopis Juliflora,* Ethanolic extracts, antibacterial activity, *Xanthomonas. axonopdis.* pv. *Malvacearum*, *Physalis angulata*, *Aristolochia bracteulata*, *Ipomea helderbranditty*, *Argemon Mexicana*,

6.3.4 Inhibition of *Rhizoctonia solani* by Seed-Oil and extracts of *Xanthium strumarium*

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Antifungal activity of leaf and root extracts from X*anthium strumarium* prepared in ethanol or dichloromethane and seed oil were studied against *Rhizoctonia solani* using the disc diffusion method. The active plant parts of *Xanthium strumarium* were seeds, extracted with n-hexane , leaves and roots extracted with absolute ethanol (cold defatted) resulting in growth inhibition diameter of 45mm and 47mm respectively. The minimum inhibitory concentration (MIC) of the seed-oil was between 2.5 and 1.25 µl /ml. Gas Liquid Chromatography of *Xanthium* strumarium seed-oil, revealed presence of usual fatty acids, palmitoleic (16:1), oleic (18:1) and linoleic(18:2) which constitute 7.6%, 21.6% and 70.4% of the oil respectively. The oil was fractioned into free fatty acids and unsaponifiable matter fractions. As the antifungal activity resided in the unsaponifiable matter fraction, it was subjected to Thin Layer Chromatography (TLC) analysis. All bands separated and tested for antifungal activity against *Rhizoctonia solani* and the compounds of the two active bands were subjected to IR identification. The infra-red spectrum (FTIR) results suggested the presence of two substances with a long chain hydrocarbons back-bone for both .The most active one, in addition, had an aliphatic alcoholic moiety.

Keywords: *Xanthium strumarium*. *Rhizoctonia solani,* seed- oil, antifungal activity, TLC, FTIR,

6.3.5 *In vitro* evaluation of four plant leaves extracts against growth of *Xanthomonas campestris pathovars (malvacearum, phasoli, and vasicotoria*).

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Bacterial blight is the most distributed and destructive diseases of cotton, tomato and bean. Aqueous extracts from leaves of four plant (*Prosopis juliflora* Swartz, *Lawsonia inermis (L.*), *Lantana camara (L.)* and *Acacia nilotica (L.)* Willd. ex Delile, from Gezira were evaluated in vitro for antibacterial activity using disc diffusion assay. Plant extract from all plant species showed antibacterial activity, based on inhibition zones. Significant antibacterial activity was observed in all teased bacterial pathovars. Aqueous extracts of *Prosopis juliflora* showed relatively high inhibition zone of (28-34)mm, followed by *Acacia nilotica* (20-35)mm, *Lawsonia inermi* (17-33)mm and *Lantana camara* (15-29)mm. Among the tested pathovars grown *X. c*. pv. *malvacearum* was highly inhibited by *Prosopis juliflora* while that of *X. c.* pv. *phasoli* was highly inhibited by all other plant species extracts. Future studies are needed to utilize these findings in bacterial diseases management.

Key Words: Bacterial Blight, *Xanthomonas campestris,* plant leaves extracts, *Prosopis juliflora*, *Lawsonia inermis* , *Lantana camara* and *Acacia nilotica*, inhibition