



# NEWSLETTER

50TH ANNIVERSARY EDITION

A Publication of the Entomological Society of Nigeria



## HUMAN INTERFERENCE

(Urbanization and Industrialization):

### Consequences on Insects and Human Health

Rapid development activities have been associated with more and more exploitation of various natural resources as technological advancement has resulted in fast depletion of non-renewable energy resources, mainly coal and petroleum, and also various minerals. Urbanization and industrialization have interfered with the ecological balance of nature due to large scale impact. The species of environment is it plants or animals have an influence on the environment they live in and in turn get influenced by the same. A proper balance has to be maintained between the magnitude of influences and it is being maintained too by the plant and animal species, except for MAN. In simple terms there are over interference of humans on the environment. The main cause for this interference can be blamed on the ever increasing scientific knowledge of man. With this knowledge he is able to modify the environment to suit his needs. Firstly, the misconception we all have is that this over interference by humans is a phenomenon dated back to maybe only a few decades but very few of us realize that this has been happening from the very beginning of human civilization; for instance, early man killing animals few for food, few for safety (fierce animals). Now, what we see is man destroying forests because of increased demand for land for various other purposes like industrialization, urbanization and agriculture.

Destruction of forests not only decreases the number of trees from the earth's surface but it also destroys the habitat of thousands of insects and other arthropods. Industrialization though benefits man by increasing his standard of living it is having a negative impact on the environment. Industries and factories are known to release hazardous chemicals and wastes into rivers which in turn is leading to pollution. Here it can be clearly noticed how this interference of humans is affecting various parts of the

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## FROM ESN PRESIDENT

The 46<sup>th</sup> Annual Conference of the Society holding in the University of Lagos (6-9 October, 2015) coincides with the 50<sup>th</sup> anniversary of Entomological Society of Nigeria (ESN). From 1965 when the Society was established, only four conferences were omitted till date. These years of its existence have been



characterized with steady growth and development.

In all the conferences, a theme is normally chosen that emphasizes at various times, the importance of insects in all aspects of human endeavor including climate change.

This year, the conference "Eko 2015" has the theme "Urbanization and Industrialization: The interfering influence on insects, public health and environment". The keynote address speaker is Mr. Olumide Onakoya, a former executive chairman of Mobil Oil Nigeria Plc.

Insects are found everywhere even in petroleum. They affect public health and changing climatic conditions modify their behavior. Today in northern Uganda, entomologists are trying to solve the problem of Tsetse flies which cause sleeping sickness among the residents and communities along the river banks. The host, an insect like mosquitoes, is the target of entomologists like us who have the knowledge of their control and management.

Our Society today is legally registered with the Corporate Affairs Commission of the Federal Republic of Nigeria. The Society has well over five hundred members with twenty active branches, fifty three fellows, thirty nine honorary fellows and eleven presidents from inception. These entomologists specialize in various aspects of insect studies: Morphology, Taxonomy, Systematics, Physiology, Toxicology, Ecology, Bionomics, Behaviour, Crop protection, Entomology/Economic Entomology/Pest Management, Extension and Regulatory Entomology, Medical/Veterinary Entomology, Storage Entomology and Forensic Entomology.

It is gratifying to note today that the Society has retired N4m of the TETFund grant for publication of our journal.

In marking our fifty years of existence, it is our desire now to have a high impact journal with open access.

Let me welcome everyone with joy to this unique conference in which we shall share reminiscences of our Society which we revere.

**Professor Dan A. Enobakhare, FESN, KSM**  
National President

Inside Issues:



# EDITORIAL



## Urbanization and Industrialization: The interfering influence on insects, public health and environment

Humans alone have the potential to gather resources from beyond their immediate surroundings and process them into different and more versatile forms. This has made humans to thrive and flourish beyond natural constraints. Primitive humans used natural resources to satisfy their basic needs of air, water, food and shelter. These natural and unprocessed resources were readily available in the biosphere, and the residues produced by the use of these resources were generally compatible with or easily assimilated by the environment.

Improvement over the traditional practice in terms of the various activities by man have led to urbanization and industrialization which produces anthropogenic (man-induced) pollutants that overloaded the system, and interferes with the well being of flora and fauna. The resultant effects of this is the distortion of natural equilibrium of the ecosystems in terms of emergence of different kinds of pests and disease causing organism, resurgence of pests and diseases of public health interest and climate change.

With the dawn of the industrial revolution, humans were better able than ever to satisfy their needs for air, water, food and shelter. So, humans turned their attention to other needs beyond those associated with survival. The industrial production, distribution and use of different forms of products usually results in more complex residuals and/or wastes, many of which are not compatible with or readily assimilated by the environment. As the acquired needs (or luxuries) increase so will the complexity of the production chain, and mass and complexity of the pollutants generated.

Urbanization entails development of infrastructures such as housing, good roads, parks, dams and a host of others that alters the natural environmental factors and result to negative impact on the health of the residents. The physical and chemical properties of particulates are associated with health risks such as respiratory problems, skin irritations, eyes inflammations, blood clotting and various types of allergies.

In addition, the impact of mankind on biodiversity has clearly been detrimental to many fauna (insect and other arthropods) and human health, but the story is more complex and subtle than has been appreciated. Urbanization provides ready-made laboratories for studying evolution and adaptive processes, and examining the influence of humans on flora and fauna creates the potential to mitigate any negative effects. Entomologists should be more positive about our relationship with the natural world: We should celebrate the creative aspects of our impact on insects and other arthropods in addition to concerning ourselves with the negative effects by proffering empirical researches that can produce results which will be adopted to mitigate problems caused by urbanization and industrialization.

Of note is the fact that, it is not all bad news as many animal (insect and other arthropods) and plant species have adapted to the new stresses, food sources, predators and threats in urban and suburban environments, where they thrive in close proximity to humans. Their success provides researchers with valuable and sometimes unexpected insights into evolutionary and selective processes.

By **Dr A.A. Oyerinde**  
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**PRESIDENTIAL ADDRESS DELIVERED AT THE  
45th ANNUAL CONFERENCE OF THE ENTOMOLOGICAL  
SOCIETY OF NIGERIA AT UNIVERSITY OF ABUJA 7-10 OCTOBER 2014**

**Professor Dan A. Enobakhare, FESN, KSM  
Department of Crop Science  
Faculty of Agriculture University of Benin, Benin City**

Protocol  
Distinguished Ladies and Gentlemen  
Fellow Entomologists

I am delighted to welcome you all on behalf of Council and the esteemed members of the Entomological Society of Nigeria to the 45th Annual Conference of the Society holding in Abuja, the City of Unity. This conference marks the 49th anniversary of the Society which precedes the golden jubilee celebration in Lagos next year. The tenure of one term of two years in office for some executive members of the Society you elected in October 2012 in Benin, will expire before the close of this conference. Consequently, there will be an election for the posts of President, Vice President, Secretary, Asst. Secretary/PRO and Treasurer. We thank you immensely for your cooperation and understanding.

**Golden Jubilee Celebration of ESN, October 2015**

A proposal, considered and approved by Council, has been made for the Golden jubilee celebration of our Society in 2015. It will be recalled that in my 2013 Presidential address gave a chronology of the Foundation of ESN.

Entomologically speaking, our highly esteemed professional Society (ESN), with the broad objective to "further the study of insects in Nigeria" started with the "egg-phase" in a holo /hemimetabolic setting in October 1965. Its inaugural meeting was held in the Department of Zoology at the University of Ibadan (Balogun, 1995 Presidential address). It is on record that one Dr A.D, Pickott, Head of International Capsid Research Team, Cocoa Research Institute, Ghana delivered an inaugural address titled "the Ecological Approach to the Solution of Pest Problems in Agriculture".

The proposed celebration shall feature

1. Publication and Launching of ESN (Anniversary edition) journal.
2. Past Presidential addresses at annual conference
3. Historical profile of ESN
4. Launching of permanent site of ESN Secretariat
5. ESN commemorative stamp
6. Specialized fora
7. Awards, among others.

Over the years, the Society has grown astronomically and in 2015, would have conducted forty-six (46) annual conferences having missed only four (4) since its existence. As at today, ESN has seventeen (17) active branches and three (3) moribund nationwide with four hundred and ninety-one (491) registered members, twenty four (24) life members, fifty-three (53) Fellows (FESN), thirty-nine (39) honorary Fellows and eleven (12) presidents. **ESN Fellows (FESN)**

The FESN award is given to deserving members of the Society every 2 years. There was none in 2012 and 2013 conferences in Benin and Yenagoa respectively,

In this conference, two eminent entomologists will be awarded Fellowship having been screened using approved criteria and recommended to Council for approval by FESN Award committee after ratification by the Board of ESN Fellows as provided by our Constitution in Article XVI P.13.

Members of the Committee of FESN Award chaired by the veteran Dr Olupomi Ajayi, independently scored nominated candidates from branches using the approved criteria. Scores were collated by the Committee with Professors Emmanuel O. Ogunwolu, Thomas Ofuya, Adeyinka Adesiyun as members.

numbers temporarily, unexpected toxic effects beyond target species may be produced. This is the logical expectation of pesticide use where most pesticides are applied. Resurgence/resistance to pesticides, rise of secondary pests and environmental pollution arise from indiscriminate use of pesticides. Pesticides are harmful and there is an awareness in government industry and agriculture that pesticide chemicals are potentially so. The question remains whether this awareness is great enough and whether it is focused sufficiently on hazards to species other than the pest species, yet this fact is lightly regarded unless complaints are made. The Entomological society of Nigeria (ESN) has successfully provided answers to these problems by reviewing and publishing a "Handbook of Insecticides Available in Nigeria". The recent edition edited by C.I. Amatobi, A.O. Omoloye, R.S. Adamu and M.B. Sosan was a mandate of ESN and is now available to government, members of the Society and everybody for information and necessary action.

There is no doubt that misplaced emphasis on chemicals modifies assessment to the nature and values of advantages brought about by pest control. Our government should henceforth be able to legislate on the proper use of pesticides on food crops, determine safe levels and publicize the hazards resulting from overuse and abuse.

#### **Recognition, Promotion and bereavement**

Communique of 2013 conference was published in The Nation and The Guardian Newspapers. Press conference was granted to President and the Vice President from about eleven (11) media

houses with an interview by Channels TV. This was aired many times with emphasis on Insect Taxonomy and the need to establish Insect Museum of Natural History in Nigeria.

Since the last conference, we have had recognitions, promotions and losses.

1. Prof E.O. Ogunwolu (Makurdi branch) was given an award for distinguished long service to the University of Agriculture, Makurdi during the University's last convocation ceremony,
2. Prof R.I. Egwatu (Awka branch) appointed Emeritus professor of Unizik since 2011.
3. Prof A.E. Akingbohunbe, FESN (Ile-Ife branch) appointed Emeritus Professor at OAU, Ile-Ife.
4. Prof I.E. Nwana FESN (Awka branch) appointed chairman of planning & Implementation Committee of a proposed University in Achina, Anambra State,
5. Prof B.A. Matanmi FESN (Ile-Ife branch) celebrated his 70<sup>th</sup> birthday anniversary.
6. ESN commends Dr. J.O. Williams, past Executive Director of NSPRI, Ilorin who retired from service.
7. Prof. W.A. Muse FESN elected chairman Committee of Dean of OAU, Ile-Ife.
8. Prof. S. Asala (Abuja branch) appointed Provost College of Health Sciences.

Many members were promoted to various positions in their Institutions. To the rank of professor we have:

Dr A. Omoloye (Ibadan branch),

Dr F.I. Aigbodion (Benin branch), Dr M.U. Ukwela (Makurdi /Yandev/Lafia branch), Dr N.D. Ibrahim (Sokoto branch), Dr M.O. Ashamo (National Secretary, Akure branch), Dr AT, Ande (Ilorin/Ogbomoso branch., Drs A.B.O. Ogedegbe and J. Rotimi (Benin branch) were promoted to the rank of Associate professor while Dr J.O. Akinneye (Chairman, Akure branch) was elevated to the post of Senior lecturer. A.O. Omoregie (Benin branch) was upgraded to the rank of Assistant Lecturer.

The following members successfully defended their Ph.D thesis and awarded degree of Doctor of Philosophy in Entomology. They are Aneni (Benin branch), Mrs S.W. Asala (Abuja branch) defended Ph.D and appointed Deputy Dean, Faculty of Agriculture; and K.D. Ileke (Akure branch).

We rejoice with Professors Edward Agbo Omudu (Makurdi branch) and Timothy Eidi (PH/Yenagoa branch) who delivered their inaugural lectures this year.

We are pleased with the appointments of Dr Yahaya M. Abdullah! (Sokoto branch) as Ag Head of Zoology Unit, P.N. Idachaba (Abuja branch) Ag Head of Crop Science Laboratory, Prof Sylvester Ogbogu (Ile-Ife branch & National Treasurer) Head of Department in OAU, Ile-Ife for 3 years w.e.f July 2014. In Yola/Jalingo/Mubi branch, we have many appointments as Heads of Department viz: Dr (Mrs) Rabecah S. Naphtali - HOD Zoology; Sunday C.



Samuel, HOD Crop Sci.; Oaya C. Samuel, HOD Agric Technology; Dr. M.M. Degri, HOD Agronomy and their branch chairman Dr (Mrs) A.M. Malgwi Associate professor, elected internal member of the Governing Council of MAUTECH.

I congratulate you all on behalf of Council and members of ESN. It is heart-warming to learn that Dr Samson Oladipo Okunade of Kano branch relocated to NSPRI headquarters in Ilorin.

On a sad note, however the Society lost some eminent members. First is Professor Oba Oyidi of IA &R Zaria. He was a founding member of the Society and he specialized in grasshoppers and Locusts. He was buried 15 July, 2014 at Ogiri in Kogi State. ESN was represented and condolences sent. Mr S.O. Dina (Ibadan branch) a foremost entomologist and former secretary of Ibadan branch passed on 12 Dec. 2013 buried 24 Jan. 2013 at IAR &T Moor Plantation, Ibadan. ESN sent condolences and was adequately represented at the burial. Donald Ukeh (Calabar/Uyo branch) on sabbatical leave at University of Agriculture Makurdi died in an accident 16 Jan 2014. Condolences were sent and ESN represented in the burial. A. J. Akpan, a curator from PH/Yenagoa branch died 3 July 2013 and was buried 22 March 2014. Condolences sent to the family. Prof Banjo (Abeokuta branch) died 3 November 2013 and buried 15 November, Condolences sent.

The following members lost their dear ones and we share your grief Prof S. N. Okiwelu

(PH/Yenagoa branch) lost the younger brother (Felix O. Okiwelu) on Friday 23 May 2014. He was buried 2nd August 2014. Condolences were sent. Mother of Prof W. Makanjuola (Chairman Lagos branch) died and was buried Friday 31 Jan 2014. ESN sent condolences. Prof. F.A. Ajayi buried his mother-in-law and ESN was represented by the National Secretary, N.E.S. Lale, CO. Adedire and two branch members from Akure were in the burial ceremony.

May their souls rest in peace.

### Conclusion

Finally, permit me to inform you that since the last Conference, Council has met four (4) times at Yenagoa (7 Oct. 2013) Bida/Badeggi (22 March 2014), Awka (19 July 2014) and Abuja (7/10/14). I would like to thank the elders and fellow entomologists of the Society for your encouragement and cooperation and for tolerating my shortcomings.

In all I have done, I consulted widely. I am wiser now because whoever walks with the wise becomes wiser. Without deliberation, plans come to nothing and where counsellors are many, plans succeed. If you want to know the road ahead, ask those coming back.

Let me appreciate the chief host of this conference i.e. the Vice-Chancellor of University of Abuja, Prof M. U. Adikwu FSTAN, FPSN; the special guests of honour - the Hon. Minister Federal Ministry of Agriculture and Rural Development (Dr Akinwumi Ayo Adesina); the honourable Minister Federal Ministry of Science and Technology (Dr Bulama); the keynote address presenter, Prof

Hayward B. Mafuyai, Vice-Chancellor University of Jos. I thank the presenters of symposium and Special papers.

The LOC members of this Conference (led by Dr Oyerinde) have my profound regard for all the efforts they have made to bring us to Abuja notwithstanding EVD and insecurity threats. However good or bad a situation is, it will change.

Thank you fellow entomologists and participants for coming to this conference.

**Professor Dan A. Enobakhare, FESN, KSM**  
National President 2012 - date





## *Helicoverpa armigera* HUBNER [LEPIDOPTERA: NOCTUIDAE]: A COSMOPOLITAN AND POLYPHAGOUS PESTS OF MANY TROPICAL AND SUB- TROPICAL CROPS

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National ESN Treasurer And Pioneer  
Chairperson ESN (Yola/Jalingo/Mubi Branch)



MATURED LARVAE

### Scientific classification

Kingdom: [Animalia](#)  
Phylum: [Arthropoda](#)  
Class: [Insecta](#)  
Order: [Lepidoptera](#)  
Family: [Noctuidae](#)  
Genus: [Helicoverpa](#)  
Species: *H. armigera*

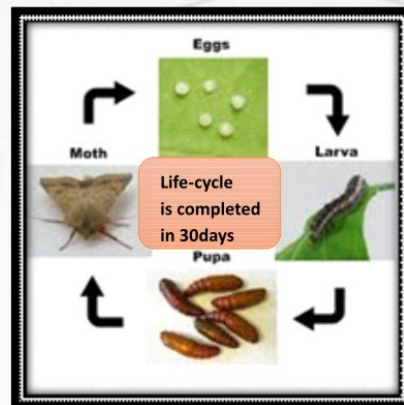
### Binomial name

*Helicoverpa armigera*  
([Hübner](#), [1809])



MATURED ADULT AND COMPLETE LIFE CIRCLE *H. Armigera*  
SYNONYMS

- *Chloridea armigera* Hübner,
- *Chloridea obsoleta* Duncan & Westwood, 1841
- *Helicoverpa communi* Hardwick, 1965
- *Helicoverpa obsoleta* Auctorum,
- *Heliothis armigera* Hübner, 1805
- *Heliothis conferta* Walker, 1857
- *Heliothis fusca* Cockerell, 1889
- *Heliothis pulverosa* Walker, 1857
- *Heliothis rama* Bhattacharjee & Gupta, 1972
- *Heliothis uniformis* Wallengren, 1860
- *Noctua armigera* Hübner, [1805]
- *Noctuabarbara* Fabricius, 1794



**Distribution:** This species is widespread in central and southern Europe, temperate Asia, Africa, Australia and Oceania, and has also recently been confirmed to have successfully invaded Brazil. It is a migrant species, able to reach Scandinavia and other northern territories. The **cotton bollworm**, **corn earworm** or **Old World (African) bollworm**, *Helicoverpa armigera*, (also known as the **scarce**

**bordered straw** in the UK, where it is an immigrant) is a moth, the larvae of which feed on a wide range of plants, including many important cultivated crops. It is a major pest in cotton and one of the most polyphagous and cosmopolitan pest species. It should not be confused with the similarly named, related species *Helicoverpa zea*.

### Life History

**THE EGGS** are spherical, 0.4 to 0.6 mm in diameter and have a costate surface. They are white, later becoming greenish.

**THE LARVAE** takes 13 to 22 days to develop, reaching up to 40 mm long in the sixth instar. Their colouring is variable but mostly greenish and yellow to red-brown. The head is yellow with several spots. Three dark



stripes extend along the dorsal side and one yellow light stripe is situated under the spiracles on the lateral side. The ventral parts of the larvae are pale. They are rather aggressive, occasionally carnivorous and may even cannibalise each other. If disturbed, they fall from the plant and curl up on the ground.

**THE PUPAE** develop inside a silken cocoon over 10 to 15 days in soil at a depth of 410 centimetres (1.63.9 in), or in cotton bolls or maize ears.

**THE ADULT** moth body length varies between 12 millimetres (0.47 in) and 20 millimetres (0.79 in) with a wingspan of 3040 millimetres (1.21.6 in). The forewings are yellowish to orange in females and greenish-gray in males, with a slightly darker transversal band in the distal third. The external transversal and submarginal lines and the reniform spot are diffused. The hind wings

are a pale yellow with a narrow brown band at the external edge and a dark round spot in the middle. It takes about 30days from egg to adulthood.

## E c o n o m i c importance:

The greatest damage is caused to cotton, tomatoes, maize, chick peas, sorghum, millet, wheat/ barley, alfalfa, soy beans, okra, garden eggs, sorrel/roselle, pepper, sunflower and tobacco. The economic threshold of harmfulness in central Asia is three to five larvae per hundred plants of long-staple cotton and eight to 12 larvae per hundred plants on medium-staple cotton. In cotton crops, blooms that have been attacked may open prematurely and stay fruitless. When the bolls are damaged, some will fall off and others

will fail to produce lint or produce lint of an inferior quality. Secondary infections by fungi and bacteria are common and may lead to rotting of fruits. Injury to the growing tips of plants may disturb their development, maturity may be delayed and the fruits may be dropped.

**Host plants:** *H.armigera* is a highly polyphagous species. The most important crop hosts are tomato, cotton, pigeon pea, chickpea, sorghum and cowpea. Other hosts include groundnut, okra, peas, field beans, cowpea, soybeans, lucerne, *Phaseolus* spp., other *Leguminosae*, tobacco, potatoes, maize, flax, *Dianthus*, *Rosa*, *Pelargonium*, *Chrysanthemum*, *Lavandula angustifolia*, a number of fruit trees, forest trees and a range of vegetable crops. In Russia and adjacent countries, the larvae populate more than 120 plant species, favouring *Solanum*, *Datura*, *Hyoscyamus*, *Atriplex* and *Amaranthus* genera.

*H. armigera* *H. Armigera*

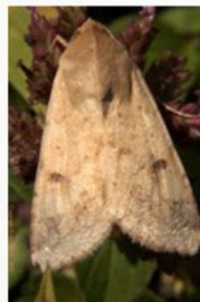


Plate 1a -c: *H. armigera* on sorghum, known as sorghum headworm

Plate 2 : *H. armigera* on pearl millet, known as millet headworm



Plate 3 : *H. armigera* on wheat, known as wheat earworm

Plate 4a-c: *H. armigera* on maize cobs, known as maize ear worm/silkworm





**Plate 5a-e:** *H. armigera* on tomato fruits, known as tomato fruit worm



**Plate 6a-b:** *H. armigera* on pepper, known as pepper fruitworm



**Plate 7a-b:** *H. armigera* on cotton bolls, known as red cotton bollworm /African bollworm



**Plate 8a -b:** *H. armigera* on green beans pods, known as pod/budworm



**Plate 11 :** *H. armigera* on sunflower, known as oil seed worm



**Plate 12a-b:** *H. armigera* on safflower capsules, known as oil seed worm







**Plate 13 :** *H. armigera* on Tobacco, known as tobacco fruit/leave worm

## BENEFICIAL IMPORTANCE OF *H. armigera*

The adult moth is a pollinator of flowers/ornamental and crop plants, while the larvae can be a pest on same plants or other crop plants after laying its eggs and hatched to larval stage which is the most destructive stage.



**Plate 15a-c:** *H. armigera* on as pollinator of flowers on different crop/ornamental plants

## DAMAGE CAUSED BY *H. armigera* ON IT'S HOST PLANTS

Damage on **cereals** it infests the inflorescences of the productive parts (panicles and Cobs) from flowering to maturity causing premature flower drop which results

**Plate 14:** *H. armigera* on redgram pods, known as pod/budwormfruit/lea

to abortion of flowers and the larvae feeds on the developing grains and the faeces in addition causes qualitative damage with combination of puncturing the seeds which eventually makes the grain unfit for human consumption and devaluing the market prize as shown in Plates 1-4. Similar damage is caused on tomatoes and peppers, which makes the fruits unattractive and unfit for human consumption and open entries for secondary infections by bacteria and fungi, Plates 5&6. On **cotton** crops, blooms that have been attacked may open prematurely and stay fruitless. When the bolls are damaged, some will fall off and others will fail to produce lint or produce lint of an inferior quality. Secondary infections by fungi and bacteria are common and may lead to rotting of fruits. Injury to the growing tips of plants may disturb their development, maturity may be delayed and the fruits may be dropped



(Plate 7).

The African bollworm feeds on leaves, flowers and pods of **okra**. The main damage occurs on flowers and pods. Attack on flowers results in flower abortion. The caterpillar usually bore clean, circular holes in pods, causing extensive damage and promoting decay from secondary infection by diseases (Plate 9). Similarly on **pulses and oil seeds**, the flower and buds and pods are bored by the larvae, which

**Plate 15a-b:** *H. armigera* on chickpea, known as chickpea podworm

eventually leads to premature shedding of flowers and pod drop. The pulses also becomes unfit for human consumption (Plates 8, 10, 11, 14 & 15). *H. armigera* attack it's host plants fruiting bodies, which opens up wounds for secondary infections by pathogenic organisms causing severe disease damage on most Malvaceas family most especially **sorrel/roselle and kenaf**; Salanaceous crops such as **garden eggs** etc.

## MANAGEMENT AND CONTROL MEASURES

At the early rains, *H. armigera* move to sprouting ratoon cotton, weeds, thrash and debris and survive also Okra, roselle, Kenaf, maize, sorghum etc which usually matures earlier than cotton one of its major host plant. They will feed on them, multiply until cotton bolls starts forming then they will



migrate to cotton. Therefore, management and control of *H. armigera* could be divided into three sub-topics: cultural, insecticidal, biological and integrating any of the three has been successful especially in Americas and developed countries in Agriculture.

**a). Cultural measures** include:

i). Regular weeding to remove



alternative hosts and shelter for pest or otherwise clean farm sanitation.

ii). A rotation of different crops should be used on soils previously used for growing host plants. This is to reduce the effects of soil pests by breaking their reproductive cycle. Plants should be uprooted and destroyed or ploughed under the soil after harvesting.

iii). A 'closed season' should be operated that is when sowing of a new crop is delayed for at least two months after the harvest of the previous crop.

iv). Synchronizing planting dates within one area. Crops such as okra, pepper which are also preferred hosts of pests, should only be planted at the same time. When this is applied in conjunction with the closed season, it will break the pest life cycle.

v). Manipulation of planting dates reduces cotton pests.

vi). Deep and early ploughing of cotton field, which was previously used for cotton, exposes the larvae, soil pests to desiccation and predators.

vii). Inspect plants regularly; once or twice a week after plants begin to bloom. Early detection of eggs and/or caterpillars before they bore into the pods is important.

viii). Hand pick and destroy eggs and caterpillars. This helps when their numbers are low and in small fields.

#### b). Insecticides.

i) Polythrin C (Cypermethrine + Profenofos 16 g + 150 g/l) and

Sherpa plus (Cypermethrine + Dimethoate 12g + 100g/l) has been effective.

ii). Sherpa plus (cypermethrine 12g + dimethoate 100g/l) was very effective particularly on most insect pests especially on cereals and malvaceous plants.

iii). Spraying with quinalphos 25 EC (2 ml/litre of water) or carbaryl (4 g/litre of water) or carbaryl 50WP 2 g/lit or profenophos 0.05 per cent effectively controls the pest. Before spraying all the affected plant parts should be removed.

#### BIOLOGICAL CONTROL

i. Conserve natural enemies. The African bollworm has a wide variety of natural enemies. Parasitic wasps and predators such as ants, lacewings, assassin bugs (Figure 2 below) and ladybird beetles are important in natural control of this pest which has been successful.

ii. Mixtures of bioagents such as vivux (applied as nuclear polyhedrosis virus (HaNPV) @250-500 larval equivalent/ha), dipel, xentari, *Bacillus thuringiensis* var. kurstaki 2 g/lit. Collect and destroy the infected fruits and grown up larvae. Do not spray insecticides after maturity of fruits. Spray with botanicals or neem extracts has been successful with good spray coverage and targeting small caterpillars before they bore into the flowers, bolls and pods is very important (Figures 1 & 3 below). <http://www.infonhttp://www.w.i.n.f.o.n.e.t.-iovision.org/res/res/files/1530.280x185.clip.jpeg-t-biovisio>



Figure 1: Bioagent used for the control of *H. armigera*



Figure 2: Natural enemy used for the control of *H. armigera*



Figure 3: Bioagent used for the control of *H. armigera*

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## THE VISITORS OF THE DEAD: THE ROLE OF ENTOMOLOGY IN FORENSIC PRACTICE

Forensic Scientist uses in forensic investigation. This contribution of entomology to forensic science is Forensic Entomology which should work in cooperation with others especially in the greater part of the world where newer methods such as the use of DNA for human identification are either not available or are still far too expensive for general application.

During the Annual Conference of the Entomology Society of Nigeria tagged ABUJA 2014, a comment by Professor Samuel Asala, representing the Vice Chancellor, brought to light the generally unrecognised relationship between entomology and forensic medicine. For example, careful insect data analysis can assist in forensic investigations such as the determination of time since death (post-mortem index) and site of crime. At a subsequent College of Health Sciences lecture titled "Dead Bones Speak Too: The Role of Bones in Human Identification", Professor Asala alluded to the fact that forensic practice is in a rudimentary stage in Nigeria. He encouraged scientists and practitioners in different areas of the discipline (Pathology, Biological Anthropology, Pharmacology, Law, Chemistry/Biochemistry, Entomology etc.) to come together to enhance forensic practice and interdisciplinary research in Nigeria.



# ESN NEWS



## ESN Elect New EXCOs

The Society at his 45<sup>th</sup> Annual Conference elected New Excos as follow:

Prof D.A. Enobakhare FESN, KSM President  
Dr K.A. Kemabonta Vice President  
Prof M.O. Ashamo FESN National Secretary  
Dr A.A. Oyerinde Asst. Sec/PRO  
Dr A.M. Malgwi Treasurer

### ESN National Secretariat in Abuja

The University of Abuja Governing Council approved the request for land for the construction of the Entomological Society of Nigeria Secretariat at the Main Campus of the University.

#### ESN at National Science Summit

The President Professor D.A. Enobakhare FESN, KSM was ably represented by the Assistant Secretary/PRO at the Nigerian Academy of Science National Science Summit held at the Royalton Hotels Abuja, on the 12th and 13th of May 2015. The meeting discussed and formulate strategies for improving scientific research and innovation among science institutions and tertiary institutions in Nigeria, strengthen and build the capacity of science based associations in Nigeria, and foster collaboration among national science associations and other key stakeholders for national development. The Entomological Society of Nigeria representative presented the Society's reviewed Curriculum for Entomology studies in Nigeria at the forum.

## Loss of Immediate Past President

The Society lost the Immediate Past President and trustee, Prof Dike FESN on 7<sup>th</sup> January 2015 and was buried on 6<sup>th</sup> February 2015. The Society was adequately represented at the burial. The ESN delegation was led by the President, Prof Enobakhare FESN; others included Prof Ashamo FESN, Prof Ogbogu FESN and Dr Oyerinde. Prof Badejo FESN, Prof Okiwelu FESN and members from Umuahia/Umudike branch led by Dr Echendu also attended the funeral. Letter of condolence was written to the family. Letters of condolences were also written to Profs Epidi and Adamu who lost their father and mother respectively.

#### Promotions/Elevations/Appointments

##### PhD Defense

Mr M.M. Manyi, Stanley Dimkpa, Azawei Alamene

#### Msc Defense

Yakubu Appollm Iliya; Bitrus Eli; Eyitayo E. Oshegbemi, M. O. Adeyeye

#### Promotions

Dr. Y.T. Maina (Maiduguri Branch) & Dr. B Matur (Abuja Branch) were promoted to the rank of Professor  
Dr N.J. Okonkwo (Awka Branch) has been promoted to the rank of Reader.  
Drs A.A. Oyerinde and Mrs S.W. Asala (Abuja Branch) have been promoted to the rank of Senior Lecturer

#### Appointments

Prof. L.E. Lale has been appointed as Vice Chancellor University of Port Harcourt  
Prof Asala has been re-elected as Provost of College of Health Sciences, University of Abuja  
Prof T. T. Epidi has been appointed Deputy Vice Chancellor (Administration) of the Niger Delta University  
Prof. E. B. Alo got an appointment as a member of the Board of Council with the Estate Investment Company Limited.  
Dr. Kabe, C.S. Oaya; Dr. M. M. Degri; Dr. H. Nahunnaro and Dunuwel D. M. have been appointed as HODs  
Dr A. A. Oyerinde has been appointed Faculty of Agriculture, University of Abuja Examination Officer and member of the University's Research Grant and Ceremonials Committees.

#### Award

Prof. Anthony Youdeowei was given an award for his meritorious service in pest management at the International Plant Protection Congress (IPPC 2015) at Berlin, Germany held 24-27<sup>th</sup> August 2015. The duo of Profs Adedire and Ashamo (ESN National Secretary) were at the event to felicitate with him for his laudable achievement.

#### Bereavements

Lost the Immediate Past President and trustee, Prof Dike FESN

James Edache (Abuja Branch)

Umar Yunus Fatimo (Kano Branch)

Profs Epidi and Adamu who lost their father and mother respectively

Prof R.I. Egwuatu lost his very dear mother

Mr Samuel Cheron from Akperan Orshi.

Mrs Stephanie Adelusi lost her mother.

## Continue from Page 1

### Human Interference (Urbanization and Industrialization): Consequences on Insects and Human Health

ecosystem. The ever increasing population can also be blamed for the deterioration of the environment. More number of people indicates increased demand for food, clothing and shelter. This demand is leading to deforestation for the purpose of industrialization and urbanization which in turn is affecting the ecological balance. Many people might feel that urbanization and industrialization is the need of the hour, and can't be stopped but it needs to be reduced because the effects of over interference will not stop with our generation.

The harmful consequences will be carried forward to further generations and the magnitude of the ill effects will be ever increasing. Let us take the example of the development and large scale use of insecticides. Insecticides have definitely helped in the immediate eradication of pests and insects that damage crops and increased the yield. But these insecticides have also poisoned the birds which feed on these insects. Temporary results are noticed by all but the long term effects are being ignored as the resultant death of the birds will rapidly increase the number of insects as their direct predators are fewer in number. This leads to an imbalance in the natural cycle which further has many negative consequences. Thus, the bottom line here is that the interference of humans with the environment has been increasing over the years and the ill effects, though might not be visible immediately, will start appearing in future and will pose a great risk to

the pest and disease management in agriculture, public health and the environment.

The influence of the interference of urbanization and industrialization on arthropods and other organisms, public health and environment can be ascribed to be as a result of human civilization in terms of de-vegetation or deforestation, Groundwater Contamination, Surface Water Pollution, Air Pollution, Climate Change viz a viz agricultural activities such as the use of pesticides and herbicides, and the release of other toxic compounds into the environment have all taken their toll, particularly on vertebrates and also lead to Defacing of Landscape and destruction of natural habitat of insects and other arthropods on air, soil, and water.

The World Conservation Union (IUCN; Gland, Switzerland) now includes more than 16,000 entries in its Red List of Threatened Species: 5,624 vertebrates, 2,101 invertebrates and 8,390 plants (IUCN, 2006). The number of documented extinctions since 1500 AD is now 784 species and the IUCN estimates that extinction rates are now 50 to 500 times higher than previous rates calculated from the fossil record (Baillie *et al*, 2004).

Resultantly for survival, many animal and plant species have adapted to the new stresses, food sources, predators and threats in urban and suburban environments, where they thrive in close proximity to humans. Their success provides researchers with valuable and sometimes unexpected insights into evolutionary and selective processes. Because these

## Continue from page:

### ASPECTS OF ENTREPRENEURSHIP IN ENTOMOLOGY

3. Business ideas in Agriculture for Young Entrepreneurs

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# Reports from Branches



The following branches submitted written reports even though the reports were not taken:

**1. AWKA:** The branch met three informal meetings since the last Council meeting at Abuja. Sixteen new members have joined the branch and membership drive has been extended to other institutions in Anambra State including Anambra State University, Igbariam Campus, College of Education, Nsugbe, Federal College of Education, Umuze and Paul University, Awka. Members were encouraged to pay the annual dues of N3,000.00 for full members and N1,000.00 for student members. Dr N.J. Okonkwo has been promoted to the rank of Reader. Prof R.I. Egwuatu lost his very dear mother on 17<sup>th</sup> February 2015.

**2. MAKURDI/YANDEV/LAFIA:** Membership strength was 29. Branch meetings held as scheduled and rotated among three locations and last meeting was on 24<sup>th</sup> February 2015 at Benue State University, Makurdi with 17 members in attendance. A proposal to celebrate 50<sup>th</sup> anniversary was presented and 17<sup>th</sup> September 2015 was chosen. Prof F.A. Ajayi has completed his tenure as Dean and currently at UAM on sabbatical leave. Prof E.A. Omudu has also completed his term as Head of Biological Sciences. Mr M.M. Manyi

successfully defended his PhD thesis at Benue State University, Makurdi. The branch lost a member, Mr Samuel Cheron from Akperan Orshi College of Agriculture, Yandev. Mrs Stephanie Adelusi lost her mother in December 2014. Prof M.U. Ukwela's daughter would get marry on 21<sup>st</sup> March 2015. Members were encouraged to fulfil their financial obligations to the branch and an amount of N5,000.00 was agreed to be released to any institution hosting branch meeting. Two new members joined.

## **3. PORTHARCOURT /YENAGOA:**

Branch has not been able to meet since last Council meeting. Members were encouraged to pay their annual dues. Five postgraduate students indicated willingness to join the Society. Stanley Dimkpa and Azawei Alamene have bagged PhD degree. Chairman of the branch, Prof Epiidi appointed Deputy Vice Chancellor (Administration) of the Niger Delta University, Wilberforce Island, Bayelsa State. Some members were still expecting their ESN registration numbers.

## **4. ABUJA:**

The branch was able to meet twice since the hosting of 2014 annual conference. Members were reminded to pay annual due of N4,000.00 and all outstanding dues. The branch had new members from Raw Materials

Research Council, Veritas and Baze University, Abuja. Dr Oyerinde has been appointed Faculty of Agriculture, University of Abuja Examination Officer and member of the University's Research Grant and Ceremonials Committees. Prof Asala has been re-elected as Provost of College of Health Sciences, University of Abuja.

## **5. LAGOS:**

The branch had met four times since the last conference and meetings have been scheduled on a monthly basis. Student's membership has increased and seminar presentation had been incorporated into the meetings. Dr Denloye gave a presentation titled "Biosafety imperatives for genetically modified insects". All hands were on deck towards the successful hosting of the ESN conference tagged "Eko 2015". Local Organizing Committee has been constituted and Vice Chancellor of Unilag had approved the use of the multipurpose halls A and C. Members have made voluntary contributions as take-off grant for the conference and the programme of events was presented to Council.

**6. Owerri branch** presented a letter of reactivation which was approved by Council.





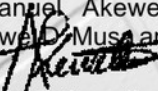
7. The Acting Chairperson of Calabar/Uyo branch, Prof S.B.A. Umeotok presented a written report of the branch. The branch has 12 members and was told by Council to re-apply after electing their officials. Election of executives was scheduled for April 2015.

#### **8. ESNYOLA /JALINGO/MUBI BRANCH'S OUTSTANDING ACHIEVEMENT 2012 2015**

ESN gave birth to Yola/Jalingo/Mubi chapter during the July Meeting of 2013 following the formal application submitted by the branch at the Benin Annual Conference of 2012. To the glory of God Almighty, the branch which started with just 6 members has today risen to membership strength of 22 all of whom have registered with the national council and have ESN numbers.

Since inception, the branch has recorded tremendous achievements in terms of growth professional within the ranks of her members. The following are some noticeable achievements in the branch:

1. We have members that completed their Masters' Degree; Emmanuel Akeweta, Clement, Dunuwa Musa and Minta Musa

  
A.E. Samaila  
Secretary

in 2012. Yakubu Appollm Iliya; Bitrus Eli; Eyitayo E. Oshegbemi and M. O. Adeyeye completed their Master's Degrees in July, 2015.

2. Prof. E. B. Alo got an appointment as a member of the Board of Council with the Estate Investment Company Limited.

3. Dr. (Mrs.) A.M. Malgwi got her promotion positively assessed to the rank of Associate Professor in and at the same time cloaked 50 and she celebrated her golden jubilee birthday and silver jubilee marriage ceremony, in December, 2012.


4. Alex Wahedi Jasini got married on 6/4/2013.

5. Samaila, E. A. got appointment with Federal University, Kashere in 2012.

6. Jacob H. Yusuf got appointment with Federal University, Lokoja.

7. The branch Chairman was elevated to the National EXCO as National Treasurer during the Abuja 2014 Conference.

8. 2 of her members have

  
Dr. A. M. Malgwi  
Chairperson

been favourably assessed and confirmed Associate Professors within 2015 (R. S. Naphtali and H. Nahunnaro).

9. A. M. Malgwi is awaiting external assessors result to be confirmed a Professor, 2014; while Dr. H. Nahunnaro and Dr. M. M. Degri awaiting assessment to Professor and Associate Professor, 2015 respectively.

10. The branch has always been to all conferences since inception and was inaugurated in 2012.

11. The branch has reached out to Gombe State where some of the tertiary Institutions have entomologist (Federal University Kashere and Gombe State University).

12. We had appointments of HODs: Sunday Hamman and Dr. R.S. Naphthali who had finished their terms; Dr. Kabe, C.S. Oaya; Dr. M. M. Degri; Dr. H. Nahunnaro and Dunuwel D. M. are still serving up to date and Dr. A. M. Malgwi Internal member of Governing Council MAUTECH, Yola (2013 up to date).





### CONTRIBUTIONS AND PROSPECTS FROM INSECT BIRD RELATIONSHIPS.

**Georgina S. Mwansat & Samson A. Da'an**

Department of Zoology,  
University of Jos, P.M.B 2083, JOS, NIGERIA.



The environment has never been challenged in the history of man like now; this is evidenced in the overall global environmental degradation and biodiversity decline resultant almost completely from humans often from their activities and or lifestyles. Human activities such as deforestation, firewood collection, land clearing for agricultural and structural development purposes and pollution have been particularly high within the past five decades with attendant deleterious impacts on the environment. High extinction vortices are glaring consequences, climate change which is also an easily identifiable footprint of human activities over the years promises to further erode the genetic diversity of species on earth. Astronomical rate of increase in human populations and technological developments have been widely blamed as the main driver of the negative impacts on the environment.

Conservation biology was hatched about three decades ago as a practical response to curb these challenges; this science operates on the concept of sustainability in the management of the environment and biodiversity generally. The concept of sustainable environment seeks to provide environmental benefits needed at present not jeopardizing future needs. Accepted and

implemented protected area networks on global and local bases have contributed significantly to the global convention of sustaining the environment, thus, have proven a very effective conservation tool.

The environment thrives on diverse naturally occurring relationships between different components of ecosystems. These wide range of relationships are very important in different ecosystem processes, a key example is insect-bird relationships. These species are important players in the environment with numerous contributions to the environment when considered as single species plus several prospects when relationships between the two species are considered.

Apart from being major pests of several agricultural products with consequent economic importance, insects and birds have contributed to the environment as good pollination agents. Insects and birds have served as important vectors of vector-borne human diseases, these are known to cause human morbidity and mortality more than all other causes of diseases put together.

For example, mosquitoes transmit malaria fever, yellow fever and dengue fever. It is known that Malaria accounts for the highest human deaths more than any human vector-borne disease, malaria fever which is caused by *Plasmodium*

*spp.*, is known to cause between 1 to 3 million deaths per year and largely in sub-Saharan Africa. Swamps, ditches and wet environments are the key requirements for mosquitoes to breed, hence, a critical factor in the epidemiology of the disease. Interestingly, birds and several other animal taxa are known to be infected by malaria.

H5N1 highly pathogenic Avian influenza (HPAI) is a disease of bird origin. Though known over two decades, it is currently a common daily parlance due to the enormous impact of outbreaks in poultry across Asia, Africa and Europe since 2003, such as deaths of over 200 human, 230 million poultry and thousands of wildbirds. Presently, H5N1 HPAI is still being contained globally and particularly in Nigeria. Common Avian influenza strains and their wild host populations have developed an evolutionary equilibrium over time whereby the virus does not cause serious disease or mortality. Periodically, wild birds, particularly ducks and geese, have been identified as the source of virus introductions to domestic poultry.

Our research experiences over the years have shown that insect and birds respond in similar ways to environmental factors and disturbances. We have found that the diversity and abundance of insects and birds responded in



similar ways to rainfall, humidity, temperature and fire. The results are consistent with reports from other authors. Living organisms will generally integrate the effect of environmental changes over a period of time and their reactions may reveal quiet novel and unexpected changes in the environment. Insects and birds are therefore, good biomonitors of the environment. Our findings have also shown that relationships between insects and birds have direct consequences to the transference of fitness to future generations of both species.

The most important and prospective insect-bird relationships we have learned so far are the symbiotic and predatory relationships between the

two groups because of the crucial role these play in the recruitment of populations into the environment. Wasps of the family Cynipidae have demonstrated a symbiotic relationship with

diverse bird species during breeding seasons. For example Gall wasps have offered defense to the nest of Red Cheeked Cordon blue *Uraeginthus bengalus* while it uses food remains and materials from the bird to service its own nearby nest. Bird nests' guarding by wasps enhances nest success for both species suggesting that synchronized breeding seasons have been selected as nest success behaviour. Predatory relationship is probably the most important relationship between insects and birds, especially where the former is the prey while the latter is the predator. This is because food has been identified as the most important factor in the breeding

success of living organisms. It is known that all birds regardless of their feeding guilds require a good proportion of animal protein in the diet of their young which is chiefly from insect sources. Insectivory have also been identified as the most common dietary strategy in birds. We have evidence substantiating the food availability-breeding time hypothesis between insects and insectivorous birds, hence, predicting breeding seasons of the bird species. Evidence also abounds on how environmental pollution has been deciphered through the feeding of insectivorous birds on insects in polluted areas.



Insect-bird relationships promises to be a novel tool for ensuring a sustainable environment especially now that emphasis is on using environmentally friendly measures of mitigation. Relationships between organisms which borders on critical aspects of their ecologies are key in pest and or vector management. Therefore, we believe that insect-bird relationships research offers greater prospects than already explored, for example as a Biological Control component of Integrated Pest Management (IPM) and or Integrated Vector Management (IVM).

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## ASPECTS OF ENTREPRENEURSHIP IN ENTOMOLOGY

The green areas of investment in entomology begging for attention in Nigeria include:

- i. Entomophagy (rearing of edible insects);
- ii. Mulberry sericulture;
- iii. Apiculture;
- iv. Maggot Production and;
- v. Pest control and Fumigation

### Entomophagy

Entomophagy is simply defined as the consumption of insects as food by man. It is sometimes referred to as mini-livestock which has become an emerging ecological concept in animal husbandry. The prospects of edible insects (e.g. African Silkworm, *Anaphe venata*) to the national food security as food and feed cannot be overemphasized. Promoting edible insects as alternative candidate to conventional production of meat may mitigate crises such as land pressure, deforestation and environmental degradation. About 1900 species of insects are eating worldwide, mainly in developing countries. In Africa, especially in Nigeria, over 470 insects are eating. The insects mostly eaten in the continent are dominated by the orders Lepidoptera, Orthoptera and Coleoptera. These edible insects constitute high quality food for humans, livestock, poultry and fish. Since insects are cold blooded, they have a high quality food conversion rate than conventional livestock and emit less green house gases. However, edible insects are important alternative for other animal based protein sources either for direct human consumption, or indirectly as feedstock. They also provide environmental friendly source of dietary protein because they produce much lower amounts of ammonia than conventional livestock. Eating nutritious insects could help fight obesity, reduce protein deficiency and end national hunger. The roles of entomologists in this business involves rearing edible insects for food and feed, identification and differentiation of edible species, studying biology of edible insects, sexing of edible insects and; mass rearing of edible insects.

### Mulberry sericulture

Mulberry sericulture is the rearing of insect called silkworms on mulberry plant to produce silk. This method of silk production is found in the temperate countries but with the advancement in research, it is

now possible to grow different species of mulberry in different agro-ecological zones of the tropical countries thereby making mulberry sericulture possible in Nigeria. In mulberry sericulture, farmer produces mulberry leaf and sells both the leaf and the eggs of cotton silkworm (*Bombyx mori*) to the cocoon producer. The eggs hatch into larvae which are fed with the mulberry leaf. The cocoon is then sold to the final producer to produce yarn which could be exported directly or reeled to produce silk. The most interesting thing in mulberry sericulture is that, at every stage of the production, chain employment opportunities and incomes are generated. In addition to silk production, the cotton silkworm insects are also edible, hence serving dual purposes.

### Apiculture

Apiculture is defined as the artificial rearing and management of honey bee for commercial production of honey and other products of the beehive. Bees may travel as far as 55,000 miles and visit more than two million flowers to gather enough nectar to make just a pound of honey. Honey bee produces up to six different products of lucrative potentials and high demand (in the market) in a range of industries from food processing to medicine. These products are honey, bee wax, propolis (bee glue), pollen, royal jelly (bee's milk) and honey bee venom (apitoxin). It is interesting to know that a litre of pure honey now goes for between N1000 to N2000. In the recent time, pollination service is gaining ground especially in the western world where farmers are demanding for bumpy harvest. Pollination service involves location of bee hives within orchards, plantation and farms and the bee activities are monitored by an expert (beekeeper) especially entomologist. However, during flowering, the expert releases bees to the farmer's field to encourage pollination which brings about higher yield and the beekeeper are paid in return.

### Maggot Production

Maggot production as a business, deals with the breeding of maggot. A maggot is the larva of a fly (order Diptera); it is applied in particular to the larvae of Brachyceran flies such as houseflies, cheese flies and blowflies rather than larvae of the Numatocera such as mosquitoes and crane flies. Maggot farming is a viable and profitable business as it has several uses such as feed for fish and poultry, bait for fishes, therapy for treating small wound, and estimation of time elapsed since death

among others.

### Pest control and Fumigation

Pest control and fumigation is the act of controlling and eradicating harmful insect/pests in our surroundings using chemicals and machines. The importance of pest control and fumigation in our environment cannot be over-emphasized. Pest and insects are deadly and can cause severe harm to humans and properties. Most sickness today is as a result of deadly pest/insects that inhabits our environment. Mosquitoes, cockroaches, snakes, rats, termites, bedbugs, tick etc are very harmful and could cause severe damage to our health and properties if they are not controlled. Therefore, it is recommended that our environment should be fumigated once in every three months in order to get rid of these deadly pests. In the past, farmers and agricultural fumigators relied on the use of gases such methyl bromide as fumigant for controlling insects and diseases affecting harvested crop. But these products have broad spectrum effect and as a result pose numerous environmental and health hazards. For instance, methyl bromide which was used primarily for soil fumigation and as a fumigant in the control of insects, nematodes, pathogens, and rodents and weeds is being phased out due to its high ozone-depletion potential. However, carbon dioxide (CO<sub>2</sub>) and nitrogen (N<sub>2</sub>), which are natural products, have been found incredibly effective against pest and insect infestation in dry ingredients.

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## THE VISITORS OF THE DEAD:

### **THE ROLE OF ENTOMOLOGY IN FORENSIC PRACTICE**

For most people, old and young, and particularly the latter, insects/arthropods cannot be anything but unwanted friends who often complicate their lives by causing physical harm to their skin and leading to illnesses such as malaria. For adults who are more enlightened, they may appreciate the benefits that insects can bring to man. For example, insects pollinate flowers and give rise to the development of fruits such as pawpaw. Some insects such as bees, give rise to honey. In these examples and several others, the insects are either harmful or beneficial visitors to man in the living state and his environment.

However, when insects visit man after death, it is for good. They assist the dead body to decompose particularly when the body is lying free on the surface of the earth where decomposition would have normally taken much longer to occur. But beyond that, the visit of insects to a dead body can become a useful tool in Forensic practice. The type of insects that visit the body and the order in which they do so, the time it takes them to dissect the body can assist the forensic practitioner to estimate time since death. Time since death is one of the parameters that the

# A Gift to Professor M.C. Dike: What Should He be Remembered for?

## **Professor M.C. Dike: A Giant Entomologist Is Lost!**

### **The Lost of a Gem among Beneficial Insects!**

#### **This tribute is written in loving memory of Professor Mike Dike**

Nigeria lost a great Entomologist, Professor Dike. I knew him since 2009 when he was saddled with the responsibility of paddling ESN to the promise land as the president of the association. Death is a robber, and as the Holy Bible says, "If the head of a household knew what time the robber would break his house, he would never allow him to accomplish his mission". Certainly had there been anything we could do to prevent Professor Dike's death, we would have done just that. The biting pangs of death caused by motor accidents last year have claimed one of our most renowned Entomologists, Professor M.C Dike. He is said to have died in a car accident in Suleja on his way to Abuja. Certainly, one of the few things that mortals have yet failed to unravel is death and how, when and where it comes. But more painful reality is that death is a destiny for us all, and we can only pray that the good Lord rests his soul in eternal peace. To the widow, children, relatives and friends, please receive my most sincere commiserations during this difficult moment. Be comforted by the fact that the life Professor Dike has gone to is the very magnificent one. Let's continue to pray for Professor Dike's safe rest in eternity. Our dead are never dead to us, until we have forgotten them. Professor Dike is dead but his unprecedented and unparalleled impact in the life of people, his students and Entomological Society of Nigeria (ESN) lingers forever. For us living, the loss of Dike was a shock that we have continued to make do with till our death come knocking. As character had it, he was born in humility, he lived a life of service, died on the line of duty and was buried victoriously - reminiscent of how great kings cherished and loved by their people are sent off. For M.C. Dike, it was a life well spent. May God forgive his sins and reward him with everlasting peace. Adieu Dike, till we meet to part no more. In spite of his teaching schedule, Professor Dike acted in various capacities in the upliftment of ESN. He was the editor-in-chief for several years and the president of the society for two terms. As a president of ESN, he was able to single-handedly attract fund from ETF to the society. His immense contribution in the

society is immeasurable and incomparable. There was hardly ESN initiative that took place without Professor Dike's unique presence, inspirational ideas, support, humour and insightful political views. Truly he was a fine person, with a finer mission and the finest vision for ESN. However, it is no exaggeration to state that Professor Dike was a pivot around whom a lot of ESN entities and activities were organized and perfected. His landmark and sense of organization will forever be remembered. You could always rely on Professor Dike to draw our attention to the most significant aspects of the ESN event in Nigeria - just as you could rely on him to provide guidance and encouragement during hard times. It was quite surprising and remained mystery to us how he managed to combine all of these with his role as a lecturer in ABU Zaria. Every man dies, not every man really lives. Professor Dike lived, made an impactful remark and passed on. The legacy left by him will continue to be a point of reference. His wealth of knowledge of insects' taxonomy was **unparallel**. He was a jewel of unparallel and unquantifiable worth. 'A man who won't die for something is not fit to live'. Throughout his life, he spoke for the voiceless and aided the oppressed among his students but he never tolerated mediocrity. He will forever be remembered, forever missed. His memory will reside forever in our hearts. His departure leaves a massive vacuum in all our lives. We all need to grieve the loss of this giant Entomologist. May his gentle soul, rest in perfect peace, amen. I feel it is a lot too early to bestow the title of "the late" on Dike as his inspirational activities at ESN still ring bells of freshness in our minds.

#### **Professor Dike**

To hear about him was to thirst to see him

To meet him was to respect him  
To know him was to love him

To entrust him was to be rest assured and go to sleep

To give him responsibility was to see him delivering

To work with him was to admire him

To believe him was to encourage him

**Dr. Aderolu, I.A.**



# ENTOMOLOGICAL SOCIETY OF NIGERIA



Website: [www.esn.org.ng](http://www.esn.org.ng)

## **COMMUNIQUE OF THE 45<sup>TH</sup> ANNUAL CONFERENCE OF ENTOMOLOGICAL SOCIETY OF NIGERIA HELD AT UNIVERSITY OF ABUJA FROM 7-10 OCTOBER, 2014**

The 45<sup>th</sup> Annual Conference of the Entomological Society of Nigeria held at Faculty of Veterinary Medicine, University of Abuja, Abuja FCT on the theme "Insect Resurgence: Implication for Agriculture, Health and Sustainable Environment.

Keynote address on the theme was given by Professor Hayward Babale Mafuyai, the Vice-Chancellor, University of Jos after the Conference was declared open by Professor M. U. Adikwu, the Vice Chancellor, University of Abuja. The Conference also attracted other dignitaries such as the Minister of National Planning – Dr. Abubakar Olanrewaju Suleiman; Dr. Chioma Amajo – Chief Executive Officer, Community Vision Initiative and Alhaji Abubakar Haruna Tanko – the Conservator General, Nigeria National Park.

Two hundred and forty (240) participants from within and outside the country including scientists from the Academia, Research Institutes and industries attended the conference in which a total of 173 scientific papers were delivered.

### **Three symposia papers were presented namely:**

- a. Integrated Vector Management: The Strategy for Vector Control in Public Health
- b. An Emerging Trend for Insect Pest Management in Nigeria
- c. The Role of Insects in Heritability Conservation in the Nigeria National Park

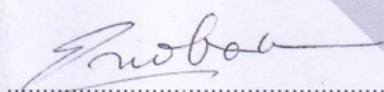
### **The Conference highlighted the following challenges:**

- i. Insecticide usage treadmill birthed by indiscriminate, non judicious usage of pesticides with consequent adverse impact on non-target beneficial organisms.
- ii. Weak pedestal to grow synergy of management of pests of agricultural and public health importance.
- iii. Inadequate funding of research on the management of pests of agricultural and public health importance.

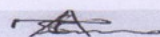


**The following resolutions were reached at the end of the deliberations:**

1. Pest resurgence is a complex phenomenon and there is paucity of coherent database from which researchers can draw because most research work published in this area in which the phenomenon is embedded deals with other aspects such as pest control, ecology and insect-plant interactions. Consequently, scientists should be encouraged to carry out studies relating insect resurgence to population ecology and thus, allowing resurgence to be viewed within a broader ecological context.
2. Pest resurgence has been noticed both in the agricultural and health sectors. Therefore, there is a need for concerted efforts by entomologists and related disciplines and Government agencies in funding collaborative studies to abate this problem.
3. The Nigerian Agricultural production system is characterized by small holder farmers, insect pest resurgence, weeds, diseases, low yields and poor storage systems. It was resolved that biotechnology is capable of improving Nigeria's sustainable agricultural production system by ensuring high yields and reduction in post-harvest losses. It is also capable of dealing with resistance and resurgence of notorious public health insect pests such as mosquitoes, bed bugs, blackflies etc.
4. Government should consciously fund Entomological research in both agriculture and health sectors in order to foster the Transformation Agenda of the Federal Government for its citizenry.
5. Government should legislate on the proper use of pesticides on food crops, animals and environment; determine safety levels and publicize the hazards resulting from over use and abuse. Entomological Society of Nigeria and the Institute of Entomology should play a key role in setting the standards for pesticide handling, application and registration of pest control practitioners.



**Prof. D.A. Enobakhare, fesn**  
**National President**



**Prof. M.O. Ashamo, fesn**  
**National Secretary**



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## Continue from Page 12

### Human Interference (Urbanization and Industrialization):

adaptations have had to be rapid, cities are, in some respects, ideal laboratories for studying natural selection.

Ways to ameliorate the problems of interfering effects of urbanization and industrialization on insect, public health and environment

The very basic step that can be taken to reduce interfering effects of urbanization and industrialization with the

environment is creating awareness among people. The thoughtless exploitation (urbanization and industrialization) is mainly due to ignorance of man about the environment and ecosystem. So the basic step to be taken is to engage man in environmental education and show how important is the diversity of species in an ecosystem. This will entail:

1. Formal Environmental Education which includes teaching and training students at primary, secondary and higher levels and making them aware about the importance of conservation of environment. It also includes training of teachers and environmental professionals to create awareness among various sections of the society.

2. Non-Formal Environmental Education by educating the youth and adults from all sections of the society about environment through adult education programmes, by organizing Eco-development camps for the youth, spreading awareness by celebrating occasions like World Environment Day (5th June), NGOs conducting programmes like environmental education, conservation of nature aimed to reach out to various sections of the society.

The advocacy on the need to urbanize and industrialize our nation should not be at the detriment of the fauna and flora that were important in the conservation of the environment. This can be achieved with some definite actions such as judicious use of available resources, using Eco friendly products, trying to bring down all possible causes of environmental pollution, control of population growth. Although, this feat can't be achieved within a day or two but taking an initiative towards reducing the factors causing environmental degradation will militate the adverse impacts of un managed urbanization and industrialization on insect and other arthropod, public health and the environment.

By

**Dr Akeem A. Oyerinde MESN, MNSPP**

ESN National Assistant Secretary/PRO  
Department of Crop Science  
University of Abuja  
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A cross section of participants at the 49th ESN Annual Conference



From left Prof. A.A. Adesoye, former President, Prof. D.A. Enobakhare, President & Prof. M.C. Odu, Immediate Past President



Arrival of ESN Leaders led by the President Prof. D.A. Enobakhare



Prof. Adigbo (left) & Prof. Ajayi



Dr. Amajuor flanked by ESN President and Prof. Kisu Dean Fac. Agric. Unilag



Prof. Kusu, FESN



Prof. D.A. Enobakhare, FESN, KSM President delivering his address



Dr. Enobakhare (left) flanked by Prof. Kisu Dean Fac. Agric. Unilag



Dr. Nwae-Okeke, a top paper presenter



Prof. Odu



Prof. Odu, FESN



ESN President, Secretary and Treasurer at the ESN Council meeting at OAU, Ile-Ife, 2015



Arrival of Prof. Kisu Dean Fac. Agric. Unilag & Prof. B. Nwae-Okeke, FESN



Prof. M.O. Ashamu, meeting the ESN President



Prof. Makenzie flanking the ESN President at the 49th ESN Annual Conference



Dr. Odu



Prof. A.A. Adesoye, FESN



Prof. B. Nwae-Okeke, FESN, flanked by Prof. A.A. Adesoye, FESN



Prof. Odu, FESN



Dr. K. Karamba, ESN Vice President



Prof. D.A. Enobakhare, FESN, and Hon. Minister for National Planning & Economic Development



Prof. Odu & Prof. Makenzie organizing secretarial activities at the conference



Dr. A.A. Oyerinde, LOC Chairman and Prof. M.O. Ashamu, the National Secretary



Prof. B. Nwae-Okeke, FESN, flanked by Prof. A.A. Adesoye, FESN



Prof. Odu, FESN, flanked by Prof. A.A. Adesoye, FESN



ESN President flanking Prof. Ashamu on his FESN Award



Prof. Odu, FESN, flanked by Prof. A.A. Adesoye, FESN



A cross section of participants at the 49th ESN annual conference



Prof. Makenzie and Dr. K.A. Karamba at the ESN Council meeting in OAU, Ile-Ife



The ESN Council meeting in OAU, Ile-Ife



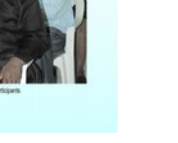
Dr. Oyerinde (left) with the immediate past PRO/Sec. Sec. Dr. Bantye



Prof. Agade and other participants at the conference



Prof. Odu, FESN, flanked by Prof. A.A. Adesoye, FESN



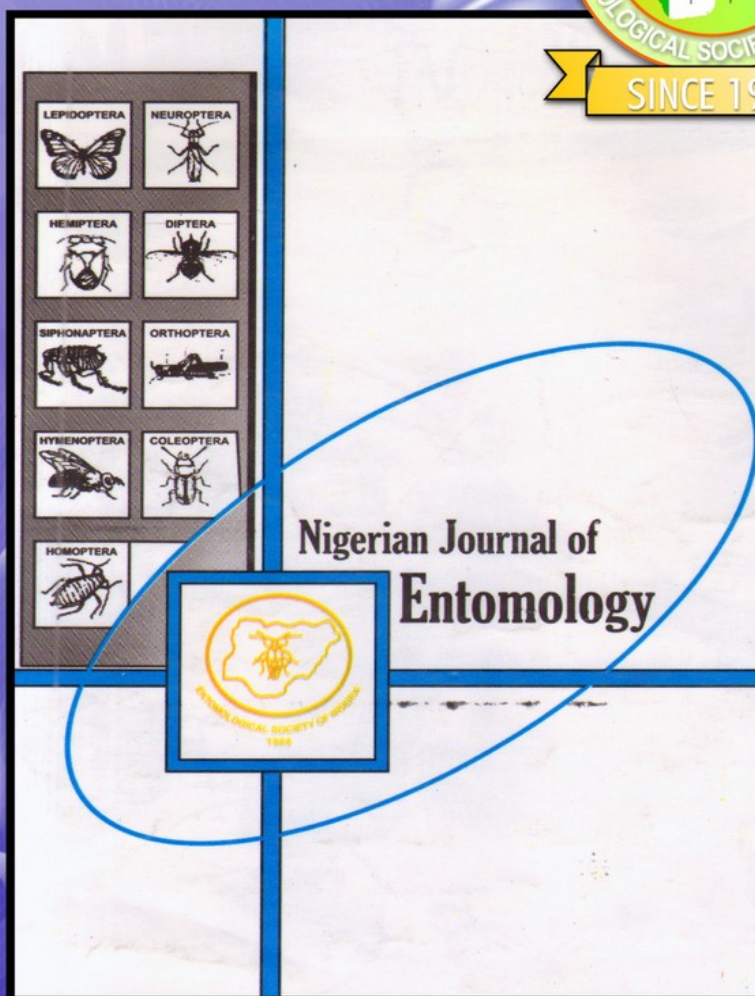
Prof. Odu, FESN, flanked by Prof. A.A. Adesoye, FESN



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