

OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA

CURRICULUM VITAE OF DR. O.J. SOYELU

A. PERSONAL DATA

1. Full Name: SOYELU Olalekan Joseph
2. Date and Place of Birth: 7th January, 1970; Abeokuta
3. Nationality: Nigerian
4. Marital Status: Married
5. Present Position: Senior Lecturer
6. Contact Address
 - (a) Physical Details: House 11C, Line 2B, Aladanla Layout, Ile-Ife
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B. ACADEMIC AND PROFESSIONAL QUALIFICATIONS

- (a) B.Agric. (Hons.) (Second Class Upper) Plant Science, Ile-Ife 1998
- (b) M.Phil. Plant Science (Entomology), Ile-Ife 2005
- (c) Ph.D. (Entomology), Alice 2010

C. AWARDS/GRANTS

(a) Scholarship:

MASHAV Scholarship to attend Research and Development Division course on '*Integrated Pest Management (IPM)*' at CINADCO's Training Centre, Volcani Agricultural Complex, Bet Dagan, Israel 2012

(b) Fellowships:

- (i) Govan Mbeki Fellowship for doctoral studies at University of Fort Hare, Alice, South Africa 2007
- (ii) OAU-Carnegie Travel Grant of \$1500 to participate at the 17th Congress of the Entomological Society of Southern Africa, University of the Free State, Bloemfontein, South Africa 2011
- (iii) The NFP Fellowship to attend a short course on '*Integrated Pest Management (IPM) and Food Safety*' at the Wageningen UR Centre for Development Innovation, Wageningen, The Netherlands 2013
- (iv) Learned Conferences Fund of ₦150,000 to attend the 10th European Congress of Entomology and International Branch Meeting of the Entomological Society of America, University of York, Heslington, United Kingdom 2014
- (v) Host-linked research grant for a 12-month visit to Auburn University, Alabama, USA as a Visiting Research Scholar 2016

(c) **Research Grant:**

AGNES Grant for Junior Researchers 2013: awarded by the African-German Network of Excellence in Science (AGNES) with the support of Alexander von Humboldt Foundation (AvH) and The World Academy of Sciences (TWAS) 2014

(d) **International Award:**

2013 Junior Researchers Award: in acknowledgement of individual academic prowess and as an encouragement to seek further opportunities in research. Award presented by the German Ambassador to the Federal Republic of Kenya at the Humboldt Colloquium in Nairobi, March 6, 2014.

D. LIST OF PUBLICATIONS

1. **Thesis/Dissertation:**

- (a) Soyelu O. J. (2005). Comparative assessment of the feeding damage of pod-sucking bugs (Hemiptera: Heteroptera) on cowpea, *Vigna unguiculata* s. sp. *unguiculata* (L.) Walp. Unpublished M.Phil. Thesis submitted to the Department of Crop Production and Protection, Faculty of Agriculture, Obafemi Awolowo University, Ile-Ife, Nigeria, 94 pp.
- (b) Soyelu O. J. (2010). Effect of nutrition on *Cotesia plutellae* (Hymenoptera: Braconidae) and its parasitism on the diamondback moth, *Plutella xylostella* (Lepidoptera: Plutellidae). Unpublished Ph.D. Thesis submitted to the Department of Zoology and Entomology, Faculty of Science and Agriculture, University of Fort Hare, Alice, South Africa, 207 pp.

2. **Published Journal Articles:**

- (i) Gbolade, A. A., Oyedele, A. O., Sosan, M. B., Adewoyin, F. B. and **Soyelu, O. L.** (2000). Mosquito repellent activities of essential oils from two Nigerian *Ocimum* species. *Journal of Tropical Medicinal Plants* 1(1): 146-148 (**Malaysia**).
- (ii) **Soyelu, O. L.**, Ajayi, S. A., Aluko, O. B. and Fakorede, M. A. B. (2001). Varietal differences in development of maize (*Zea mays* L.) seedlings on compacted soils. *Journal of Agronomy and Crop Science* 186: 157-166 (**Germany**).
- (iii) Oyedele, A. O., Gbolade, A. A., Sosan, M. B., Adewoyin, F. B., **Soyelu, O. L.** and Orafidiya, O. O. (2002). Formulation of an effective mosquito-repellent topical product from lemongrass oil. *Phytomedicine* 9(3): 259-262 (**Germany**).
- (iv) **Soyelu, O. L.** and Akinghohungbe, A. E. (2006). Histological studies of damage by pod-sucking bugs (Heteroptera: Coreoidea) associated with cowpea, *Vigna unguiculata* s. sp. *unguiculata*, in Nigeria. *Bulletin of Entomological Research* 96(4): 439-444 (**United Kingdom**).
- (v) **Soyelu, O. L.** and Akinghohungbe, A. E. (2007). Comparative assessment of feeding damage by pod-sucking bugs (Heteroptera: Coreoidea) associated with cowpea, *Vigna unguiculata* s. sp. *unguiculata*, in Nigeria. *Bulletin of Entomological Research* 97(1): 1-7 (**United Kingdom**).

- (vi) **Soyelu, O. L.**, Akinghohungbe, A. E. and Okonji, R. E. (2007). Salivary glands and their digestive enzymes in pod-sucking bugs (Hemiptera: Coreoidea) associated with cowpea, *Vigna unguiculata* s. sp. *unguiculata*, in Nigeria. *International Journal of Tropical Insect Science* 27(1): 40-47 (**United Kingdom**).
- (vii) **Soyelu, O. J.** (2012). Electroantennographic responses of *Plutella xylostella* and its parasitoid, *Cotesia vestalis* to cues from honey-based diets. *Canadian Journal on Computing in Mathematics, Natural Sciences, Engineering and Medicine* 3(6): 220-224 (**Canada**).
- (viii) **Soyelu, O. J.** and Waladde, S. M. (2013). Effect of beebread on the reproductive performance of *Cotesia vestalis*. *New Zealand Journal of Crop and Horticultural Science* 41(2): 78-85 (**New Zealand**).
- (ix) Ajayi, O. M. and **Soyelu, O. J.** (2013). Relative susceptibility of nine maize varieties to the maize weevil, *Sitophilus zeamais* (Motschulsky). *Canadian Journal on Computing in Mathematics, Natural Sciences, Engineering and Medicine* 4(4): 315-319 (**Canada**).
- (x) **Soyelu, O. J.** (2013). Suitability of a novel diet for a parasitic wasp, *Cotesia plutellae*. *Journal of Insect Science* 13(1): 86 (**USA**). Available online: <http://www.insectscience.org/13.86>
- (xi) Oyebanji, O., **Soyelu, O. J.**, Bamigbade, A. and Okonji, R. (2014). Distribution of digestive enzymes in the gut of American cockroach, *Periplaneta americana* (L.). *International Journal of Scientific and Research Publications* 4:1 (**USA**). Available online: <http://www.ijsrp.org/research-paper-0114/ijsrp-p2515.pdf>
- (xii) **Soyelu, O. J.** (2014). Behavioral responses of *Cotesia vestalis* (Haliday) (Hymenoptera: Braconidae) to honey-based diets. *American Journal of Experimental Agriculture* 4(6): 703-712 (**USA**).
- (xiii) Okonji, R. E., Ehigie, L. O. and **Soyelu, O. J.** (2014). Properties of arginase from gut of adult cockroach (*Periplaneta americana*). *African Journal of Biochemistry Research* 8(4): 88-94 (**South Africa**).
- (xiv) Akinmosun, R. S., **Soyelu, O. J.**, Bamigbade, A. T. and Okonji, R. E. (2015). Properties of amyloglucosidase in the digestive tract of *Periplaneta americana* L. (Blattodea: Blattidae). *International Journal of Biochemistry Research and Review* 5(2): 107-115 (**United Kingdom**).
- (xv) Onayemi, S. O., **Soyelu, O. J.** and Amujoyegbe, B. J. (2016). Effects of cropping patterns on the flea beetles, *Podagrica* spp. (Coleoptera: Chrysomelidae), in okra-kenaf intercrop system. *Journal of Agriculture and Crops* 2(4): 41-45 (**Germany**).

- (xvi) Raifu, I. T. and **Soyelu, O. J.** (2016). Physicochemical basis for relative susceptibility of two jute mallow morphotypes to *Acraea eponina* Cramer. *Ife Journal of Agriculture* 28(1): 96-105 (**Nigeria**).
- (xvii) Taiwo, A. E., **Soyelu, O. J.** and Okonji, R. E. (2016). Protease inhibition in cowpea pod-sucking bug species (Hemiptera: Heteroptera) using cereal and legume grain extracts. *African Journal of Biochemistry Research* 10(6): 38-46 (**South Africa**).
- (xviii) Dairo, O. S. and **Soyelu O. J.** (2017). Consequences of prolonged agronomic practices: faunal composition and abundance in cultivated and fallowed soils. *International Journal of Conservation Science* 8(3): 509-518 (**Romania**).
- (xix) Alade, O. T. and **Soyelu, O. J.** (2017): Bioactivity of four plant materials against the maize weevil, *Sitophilus zeamais* Motschulsky. *American Journal of Chemical Research* 1:2. DOI:10.28933/ajcr-2017-03-2501 (**USA**).

E. PAPERS AND WORK IN PROGRESS

- (a) Associative learning of food and host cues by *Cotesia vestalis* (Haliday) (Hymenoptera: Braconidae). Proposed Journal: *Communications in Applied Sciences*.
- (b) Partial purification and characterization of arginase in flight muscles of the coreid bug, *Anoplocnemis curvipes*. Proposed Journal: *Proteins*.
- (c) Pathogenicity of selected *Beauveria* and *Metarhizium* isolates against the common house fly, *Musca domestica* L. (Diptera: Muscidae). Proposed Journal: *Nigerian Journal of Entomology*.
- (d) Assessment of nutritional qualities of six cowpea varieties infested with the cowpea weevil, *Callosobruchus maculatus* (F.). Proposed Journal: *Journal of Agricultural and Food Chemistry*.

F. CURRENT RESEARCH ACTIVITY

- (i) Chemical ecology of *Cotesia marginiventris* (Hymenoptera: Braconidae), an important parasitoid of lepidopterous pests.
- (ii) Entomopathogenic fungi as biological agents for controlling selected insect pests.
- (iii) Formulation of a suitable artificial diet for the exotic fall armyworm, *Spodoptera frugiperda* (Lepidoptera: Noctuidae).

G. TRAINING/CONFERENCES/WORKSHOPS ATTENDED WITHIN THE LAST FIVE YEARS

- (i) Advanced Digital Appreciation Programme for Tertiary Institutions (ADAPTI), 10-14 February, 2014. Computer Buildings, Obafemi Awolowo University, Ile-Ife.
- (ii) Humboldt Colloquium, The Power of Excellence in Science – Enhancing Academic Capacities in Africa, 6-8 March, 2014. Safari Park Hotel, Nairobi, Kenya.

Paper presented:

Over-dependence on synthetic insecticides: Botanical sources to the rescue of Nigerian farmers.

- (iii) 10th European Congress of Entomology and International Branch Meeting of the Entomological Society of America, 3-8 August, 2014. University of York, Heslington, United Kingdom.

Paper presented:

Bioactivity of four plants against the maize weevil, *Sitophilus zeamais* (Motschulsky)

- (iv) ACE (Africa Centre of Excellence) Research Workshop, April 14, 2015. Centre of Excellence in Software Engineering, New ICT Centre. Obafemi Awolowo University, Ile-Ife.
- (v) Humboldt Conference, Impacting Lives and Livelihoods through Research: A New Mission (Vision) For Humboldt Research Fellows in Nigeria, 2-7 August, 2015. Osun State University, Osogbo.

Paper presented:

The efficacy of intercropping in the control of the flea beetle, *Podagrica* spp.

- (vi) 46th Annual Conference and Golden Jubilee Anniversary of the Entomological Society of Nigeria (ESN), 6-9 October, 2015. University of Lagos, Akoka, Lagos.

Papers presented:

- (a) Protease inhibition in cowpea pod-sucking bug species using plant extracts.
- (b) Effect of okra-kenaf intercrop on incidence of the flea beetle, *Podagrica* spp.
- (vii) 25th International Congress of Entomology (ICE 2016) and Annual Conference of the Entomological Society of America (Entomology 2016), 25-30 September, 2016. Orange County Convention Centre, Orlando, Florida, USA.

Paper presented:

Insecticidal activities of *Beauveria bassiana* and *Metarhizium* spp. against larval and adult housefly, *Musca domestica* L.

- (viii) USAID-PBS Hands-on Training in Molecular Techniques. Obafemi Awolowo University, Ile-Ife, 18-20 September, 2017.
- (ix) Southwest Agroecological Biosafety Awareness Workshop. Obafemi Awolowo University, Ile-Ife, 20-22 September, 2017.

- (x) Training Workshop on Breeding Management System by Integrated Breeding Platform. Faculty of Agriculture, Obafemi Awolowo University, Ile-Ife, 29 November – 01 December, 2017.

H. RESEARCH CONTRIBUTIONS TO KNOWLEDGE

As an **Insect Physiologist** with a minor in **Biological Control**, I have contributed to scientific knowledge in the areas of enzymology, nutrition, sensory biology, and usage of botanical insecticides, parasitoids and pathogenic fungi as biological control agents of insect pests. The primary aim of my research is to develop alternative control measures for solving insect pest problems; approving usage of chemical insecticides only as a last resort. This is in line with my strong belief in the ideals of integrated pest management (IPM).

Enzymology: My work on the feeding damage of cowpea pod-sucking bug species (PSBs) has shown that cellular disturbance and subsequent reduction in yield are due to enzymatic activities, especially proteinases. In a follow-up study, I identified grains of a local soybean, *Kishí*, and a cowpea landrace NG/SA/07/0098 as suitable sources of proteinase inhibitors against three important PSBs. Percent inhibition ranged 48-76% when plant extracts were assayed singly against enzyme extracts but rose to 100% (total inhibition) when they were combined in specific soybean-biased ratios. Another study showed that ripe tomato has an excellent inhibitory activity against proteinases of the cowpea weevil, *Callosobruchus maculatus* (F.).

Action: Further studies will be carried out to identify genes that mediate enzyme inhibition in the grains and effort will be made to insert such genes into the genome of elite varieties with a view to developing transgenic cowpea which would be resistant to the PSBs. This way, yield loss would be reduced significantly.

Insect nutrition: It is generally believed that only host-feeding parasitoids need protein sources for optimum reproductive performance but results from my studies have shown that exogenous protein sources also enhance performance in non-host feeding synovigenic parasitoids. Using *Cotesia vestalis* Kurdjumov (Hymenoptera: Braconidae) as a case study, lifetime fecundity and adult longevity were increased by a protein-rich diet while female-biased progenies were also produced. Female-biased sex ratios are clearly the preferred outcome of parasitoid mass-rearing for biocontrol interventions.

Sensory biology: I investigated associative learning in selected insect pests and parasitoids with respect to foraging efficiency and avoidance of superparasitism. It was evident from obtained results that the innate ability to discriminate odours enhanced insects' decision-making process without losing time and energy unnecessarily.

Action: Laboratory studies are ongoing to identify chemical cues that elicited specific behaviours in the insects and any identified attracting or repelling cue would be used accordingly as a pest control tool.

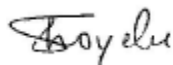
Natural products: Personal protection by the use of repellents is of considerable importance within the integrated disease-vector control endeavour. In collaboration with some colleagues, I have assessed insecticidal properties of different formulations of lemongrass,

Cymbopogon citratus (DC.) Stapf, against *Aedes aegypti* L. The repelling efficacy of the plant extract was comparable to that of a commercial product. A topical application of 25% leaf extract (v/v; oil in liquid paraffin) deterred mosquito bites significantly for 5 h after application. We wish to commercialise the botanical formulation since it has the potential of controlling mosquitoes at no risk to the environment. I also screen plants for insecticidal properties against storage pests of grain and legume crops.

Parasitoid efficacy: As the South African weather warms up in spring, the population of diamond back moth (*Plutella xylostella* (L.)) increases while that of *Cotesia vestalis* remains low and by late spring when the parasitoid population increases to an appreciable level, a measurable damage would have been done on cabbage. In an effort to ensure the presence of adequate parasitoid population in the field during the peak period of pest population, I formulated a protein-rich artificial diet which sustained a significantly higher number of parasitoids, compared to the pest, over the planting seasons. The study was carried out in the laboratory and it was suggested that it should be extended to the field.

Entomopathogenic fungi: I took an interest in entomopathogenic fungi recently and one of my graduate students assessed the efficacy of *Beauveria bassiana*, *Metarhizium anisopliae* and *M. robertsii* against the common housefly, *Musca domestica*. The fungi were found to be effective against the dipteran at temperatures between 15-35°C, a feature that makes them fit for controlling insect pests in different regions of Nigeria. Similarly, I isolated a fungus from the kudzu bug, *Megacopta cribraria* (F.) (Hemiptera: Plataspidae), in Auburn, Alabama, USA and preliminary results showed that the fungus is effective against a range of major heteropteran pests. The fungus is being subjected to molecular techniques for identification.

Signature:



Date: October 10, 2019