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Identification of the alternate host plants of the groundnut sucking bug (*Rhyparochromus littoralis* Dist.) in the Sudan savannah agro-ecological zone of Nigeria

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To identify the alternate host plants of the groundnut sucking bug (*Rhyparochromus littoralis* Dist.) an emerging field insect pest of groundnut in the Sudan Savannah Agro-ecological zone of Nigeria, field experiment was carried out over a period of five (5) years (2011 to 2016) in order to investigate the behavior of *R. littoralis* with the aim of developing a strategic control method for this insect pest. The study established *R. littoralis* to be a seasonal pest of groundnut that manifests in high density during the months of September to November causing significant loss to cultivated groundnuts in the field and thereafter, disappears until another harvest period. It was observed that, apart from groundnut, *R. littoralis* depended on other plants over-season for the sustenance of its life cycle, where it sucks sap from the plant, pods or fruits. Prominent crops found to be a haven for the over-seasoning for this insect pest included, cowpea, maize, guinea corn and sesame, while a significant percentage were found under the bark-shelves of live-shea tree. This study therefore recommended serious sanitation measures and good cultural practices of field maintenance to curb the rapid multiplication of this insect pest.

Key words: Alternate host, strategy, over-seasoning, sucking bug, insects, population.

INTRODUCTION

Insects are vital to the immense cycle of life, furnishing food for other creatures and breaking down natural materials to chemicals and nutrients for recycling into new life. Whirling, buzzing, singing, chewing, vibrating

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with energy, they are all around us (Youdewei, 2002). It is only through careful observations that one would be able to understand the behavior of insects. Insects belong to a group of organisms called arthropods, a word that means "jointed feet." Insect bodies are quite variable, but generally adult insects have a few things in common: A head with two antennae, a thorax with six legs and up to two pairs of wings, and an abdomen. In their immature stage, insects are called larvae (caterpillars or grubs) or nymphs (Blay et al., 2000).

Other arthropods, such as spiders, sow bugs, centipedes, ticks and mites may superficially look like insects, but they belong to other animal groups. There are many reasons why insects are so successful at surviving. Their amazing ability to adapt permits them to live in extreme ranges of temperatures and environments (Kalaiyarasan and Palanisamy, 2002). The one place they have not yet been found to any major extent is in the open oceans. Insects can survive on a wide range of natural and artificial foods, pepper, glue, books, grain, cotton, other insects, plants and animals. Because they are -small, they can hide in tiny spaces. A strong, hard but flexible shell called an exoskeleton covers their soft organs and is resistant to chemicals, water and physical impact. Their wings give them the option of flying away from dangerous situations or toward food or mates (Lale, 2002). Also, insects have an enormous reproductive capacity: A honey bee queen lays as many as 4,000 eggs a day, and an African termite queen can lay as many as 43,000 eggs a day. Another reason for their success is the strategy of protective coloration. An insect may be right before our eyes, but nearly invisible because it is cleverly camouflaged like a green leaf, lump of brown soil, gray lichen, a seed or some other natural object. Some insects use bright, bold colors to send warning signals that they taste bad, sting or squirt out poison. Others have wing patterns that look like the eyes of a huge predator, confusing their enemies. Some insects also mimic bitter-tasting insects; hungry foes are fooled into avoiding them (Kalaiyarasan and Palanisamy, 2002).

A remarkable variety of insects inhabit this planet. More species of insects exist than all other animal species together. Insects have survived on earth for more than 300 million years, and may possess the ability to survive for millions more. Insects can be found almost everywhere on the highest mountains and on the bottom of rushing streams, in the cold South Pole and in bubbling hot springs. They burrow through the ground, hop and sing in the trees and dart and dance in the air (Lale, 2002; Wightman et al., 1990). They come in many different colors and various shapes. Insects are extremely useful to humans, pollinating our crops as well as flowers in meadows, forests, deserts and other areas. But ticks and some insects, such as mosquitoes and fleas, can transmit diseases. However, the major field insect pest of groundnut can be grouped as soil inhibiting insects' foliar feeding insect (those that transmit virus diseases) and insects that damage flowers and growing parts (Wightman et al., 1990).

Rhyparochromus littoralis commonly known as Lygaeid bug, or groundnut pod sucking bug, which belongs to the order Heteroptera and family Lygaeidae is found in all groundnut growing areas in Sudan Savannah of Nigeria, where it is known to cause serious damage to groundnut during harvest, but detailed record on history of its over-seasoning strategy remains unknown (Samaila and Malgwi, 2010 and Malgwi and Onu, 2004).

MATERIALS AND METHODS

The study areas

Field observations and experiment were carried out in seven (7) major groundnut producing communities in Adamawa State (Song, Girei, Hong, Ganye, Fufore, Gombi, and Yola South), which lies between the coordinates: 9°20′N 12°30′E; 9.333°N 12.500°E; 9.333; 9° 21.263′; 9° 21.252′; 12°30.234′ and 12°30.251′ East of the Equator in the Northern Guinea Savannah agro-ecological zone of North Eastern Nigeria.

Determination of alternate host plants

To identify the alternate host of the *R. littoralis,* observations were made around the experimental plots to observe the prevalence of the pest on, maize, cowpea and sorghum based, weeds, and sesame plants planted all within 10 to 30 m away from the field experiments. Physical observations were also made on the other possible alternate host like trees, plant debris etc.

RESULTS

Alternate hosts of *R. littoralis*

Alternate host plants of R. littoralis are given in Table 1.

Behaviour, movement and survival strategy of *R. littoralis*

It was difficult to monitor the activity of the bug on groundnut during the day; however, it was observed that at night, the bug is very active; this proved that the insect is nocturnal in nature, since most of its activities were done at night time. It was very difficult to catch the insect both in the daytime and at night at a sound or disturbance, *R. littoralis* will pause just within some seconds, probably to note the direction of disturbance and continuous disturbance makes them crawl quickly or hide under groundnut haulms or fly away.

However, the heavy presence of this bug on under the bark of shea tree suggests that *R. littoralis* might have

Table 1. Alternate host plants of *Rhyparochromus littoralis* Dist discovered between 2011 and 2016.

S/N	Family	Scientific name	Where the bug is found
1	Acanthaceae	*Asystasia gangetica* (Linn.) T. Anders	Debris of the cultivated crops, road sides and waste areas
2	Asteraceae	*Hyposestes cancellata* Nees	Debris of the cultivated fields and bush fallows
3	Asteraceae	*Justicia flava (*Forsk) Vahl	Compound farms usually growing on moist soils
4	Asteraceae	*Tridax procumbens* Linn	Abundant on lands with debris of this plant on waste areas and road sides
5	Pedaliaceae	*Sesamum orientale* L (*S.indicum* L)	Debris on cultivated oil seed crop.
6	Gramineae	*Zea mays* L	Debris of stalks and leaves of harvested maize especially when harvested green
7	Leguminoseae	*Unguiculata esculentum*	Late maturing varieties and other wild species
8	Sapotaceae	*Vitellaria paradoxa*	Underneath the bark of live shea tree, where it sucks sap, lay eggs and multiply in very large numbers especially on bigger trunks (for over seasoning strategy)

Source: Field Survey, 2011 - 2016.

been in existence in these areas for a very long time, but was not given attention as a threatening pest. Although no work has been carried out on *R. littoralist* alternate feeding sources, findings in this study could serve as an eye opener on its possible alternate hosts. There is also the need to thoroughly investigate this insect pest which will help in developing a comprehensive control of *R. littoralis*, because the pest appears to survive for longer periods under the bark of the shea tree than any of the identified alternate host plants in all the locations investigated.

The families of the weeds that could serve as alternate host plants has to be put into consideration as most of them other than those found, could be potential host plants or alternate host plants where *R. littoralis* is a dormant pest. Care should be taken that such weeds and crop plants are not planted or rotated on the same field, mix farming or inter cropping where *R. littoralis* is a major pest as stated previously.

Conclusion

The present study confirmed *R. littoralis* as a serious threat to groundnut farming in the study areas and by extension other groundnut producing areas in Nigeria, which is in conformity with the survey conducted by Samaila and Malgwi (2010). This threat should be taken seriously and adequate measures should be taken by the groundnut farmers, researchers, major stakeholders and policy makers to ensure a gradual elimination of this insect pest that appears to hibernate and survive. It is therefore, opined that, the present study has increased greatly the basic knowledge on the over-seasoning strategy of the groundnut sucking bug “Sha mai” or “offa” (*R. littoralis)* thus paving way for a concerted effort in the formation of a strategic management principles for its control and which will, in turn help in controlling other pests of groundnut, as well. The identification of alternate host plants, which serve as source of over seasoning strategy, and the behaviour, and other knowledge of its possible habitat or niches of *R. littoralis* are major steps towards understanding and planning an effective management and control programme for its control and probably eradication. Given the findings of this study, the following are suggestions or recommendations that could be utilized in planning an effective management of *R. littoralis* control and future research:

1. All thrash and debris on the farm should be collected and burnt after harvest. This will assist in breaking the life cycle of *R. littoralis* and that of other insect pests.
2. Groundnut seeds should be obtained from reliable sources treated or dressed before planting.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Blay E, Cudjoe AR, Braun M (2000). Cereals and pulses. Handbook of crop protection Recommendations in Ghana: An IPM approach. Volume. 1. plant protection and regulatory services Directorate and integrated crop protection project (ICP) Gasman Development Co-operation (GTZ/PPRSD). 25 p.

Kalaiyarasan S, Palanisamy S (2002) Screening Sesame Germplasm against Sesame Pod bugs (Elasmolomus sordidus Fabricius) for resistance. Madras Agric. J. 89(7-9):407-409.

Lale NES (2002). Stored Product Entomology and Acarology in Tropical

Africa. Mole Publications Nigeria Ltd. P 73.
Malgwi AM , Onu JI (2004). Insect pest of cowpea and groundnut in Girei Local Government Area, Adamawa State. Nigeria J. Entomol. 21:137-151.
Samaila AE (2010). Effects of Cropping Systems and Insecticides on the Abundance of Groundnut Sucking Bug (Rhyparochromus littoralis Dist.) in Song Local Government Area of Adamawa State: A paper presented during the 41st Annual Conference of the Entomological Society of Nigeria, (E S.N) held at the Wesley University of Science and Technology, Ondo Town, Ondo State. October 2010.
Samaila AE, Malgwi AM (2010). Survey of the Abundance of the Groundnut Sucking Bug (Rhyparochromus littoralis Dist): A Field and Storage Pest of Groundnut in Adamawa Central Senatorial District being a paper presented during the 41st Annual Conference of the Entomological Society of Nigeria, (E S.N) held at the Wesley University of Science and technology, Ondo Town, Ondo State. October 2010.
Wightman JA, Dick KM, Bold D (1990). Pests of groundnut in the Semi Arid Tropics. In: Singh, S.R. (ed) Insect Pests of Tropical Legumes. John Willey and Sons, Chichester 245 p.
Youdewei A (2002). Integrated pest management practices for the production of cereals and pulses. Integrated pest management extension guide 2. Ministry of Food and Agriculture (MOFA) Plant Protection and Regulatory Services Directorate (PPRSD), Ghana and Gasman development cooperation (GTZ) 126 p.