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SEVERE DAMAGE OF *MORINGA OLEIFERA* LAM. LEAVES BY *ULOPEZA PHAEOTHORACICA* HAMPSON (LEPIDOPTERA: CRAMBIDAE) IN UNGOGO LOCAL GOVERNMENT AREA, KANO STATE, NIGERIA: A SHORT COMMUNICATION

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ABSTRACT
The work was carried out at a location (11^0 58`N and $8^0$ 26`E) in Ungogo Local Government area of Kano State, Nigeria with objective of identifying an unfamiliar larva feeding on Moringa leaves and to describe its nature of damage. The leaf feeding larvae were sampled and reared through to pupation and to adulthood in the Entomology laboratory, Crop Protection Department, Faculty of Agriculture, Bayero University, Kano, Kano State. The adults that emerged were identified to be Ulopeza phaeothoracica Hampson. On the larval feeding, it was observed that damage caused was very severe on a heavily infested young Moringa tree at the study location. In conclusion, the study revealed that U. phaeothoracica is a leaf feeding pest of M. oleifera and that its activity could be of serious concern especially on young trees of Moringa, kept under poor management conditions.
Keywords: Damage, Moringa, Ungogo, Kano

INTRODUCTION

Moringa belongs to the family *Moringaceae,* Genus *Moringa*, species *Oleifera*. It is one of the most widely distributed and naturalized species of the monogeneric family Moringaceae (Ramachandran *et al.* 1980). It includes 13 species of trees and shrubs distributed in sub-himalayan ranges in India, Sri Lanka, North-eastern and South-western Africa, Madagascar and Arabia (Somali *et al*., 1984). Today, it has become naturalized in many locations in the tropics and widely cultivated in Africa, Cylon, Thailand, Burma, Singapore, West Indies, Sri Lanka, India, Mexico, Malabar, Malysia and the Philippines (Fahey, 2005). *Moringa* was probably introduced into Nigeria by Arab traders and as such the plant has names like Zogale, Zogale gandi or Bagaruwar Makka in Hausa, Ewe ile in Yoruba and Ikwe oyinbe in Igbo (Auwal, 2009). At present, *Moringa* grows all over Nigeria more particularly in the northwest and northeast geographical zones where it is widely consumed (Manga, 2001). Among other nations, India is the largest producer of Moringa with an annual yield of 1 to 3 million tons of tender fruits and leaves valued to be over $6 million (USD) (Rajangam *et al*., 2001).

Moringa plays an important role in solving most of the nutritional and general disease situations affecting humans in the world. For instance, some of the important medicinal values of *Moringa* leaf include curing diarrhea, urinary tract infection, scurvy, catarrh and the pods are uses to cure skin cancer, joint pains, hypertension and diabetes, while the roots are used against ulcer, fever and asthma (Fahey, 2005), and also added that all parts of *Moringa* plant are edible and the roots are used as condiment. Auwal (2009) added that the leaf of *Moringa* can be eaten fresh, cooked or stored as dried powder for months without loss of nutritional quality.

According to Loebel (2002), *Moringa* tree could serve as an outstanding indigenous source of highly digestible protein, calcium, iron, vitamin-C and carotenoids suitable for utilization in many of the developing regions of the world where undernourishment is of major concern. Comparatively, *Moringa* leaf contains more beta-carotene than carrot, more protein than pears, more vitamin-C than orange, more calcium than milk, more potassium than bananas and more iron than spinach (Palada and Chang, 2003). Contrary to the belief of most people that *Moringa* tree is rarely attacked by insect pests there has been reports have indicated attack and damage on the tree crop by several insect pests; namely bark eating caterpillar, *indarbela quadrinotata* (Wlk); caterpillar pests, *Eupterote mollifera* (Walker) and *Noorda blitealis* (Walker); bud worm, *Noorda moringae* (Tams); Stem borers *Indarbela tetraonis* (Moore), *Diaxenopsis apomecynoides* (Bruning) and *Batocera rubus* L.; Ash weevil, *Myllocerus viridanus* (Feb.); aphids, *aphis crassivora* Koach; leaf eating caterpillars, *Tetragonia siva* Lef., *Metanastria hyrtaca* (Cramer) and *Helopeltis antonii* (Sign.); bud midges, *Stictodiplosis Moringae* Mani; scale insects, *Diaspidiotus sp.,*and *Ceroplastodes cajani* (Mask) (Kareem *et al*., 1974; Verma and Khurana, 1974; Pillai *et al,* 1979; Ramachandran *et al*., 1980; Morton, 1991; Parrota, 2009).

Recently, Mahesh *et al*. (2014) reported first time from India drumstick pod fly, *Gitona distigma* (Meigen) as a pest of *Moringa*, which has became one of the most serious pests of the crop with infestation starting from fruit initiation and persisting till harvests causing very heavy losses especially under poor management conditions.

Similarly, Ojiako *et al* (2012) identified several nursery insect pests of *M. oleifera* Lam. in Owerri, Nigeria, but however, added that such attacks were of non-significant nature. It was in view of these recent negative developments and the importance of *Moringa* tree to the Nigerian society this investigation was designed with an objective of identifying the adult form of an unfamiliar *Moringa* leaf feeding caterpillar at the study location and to describe its nature of damage.

MATERIALS AND METHODS

Study site and sample collection

The unfamiliar larvae were sampled from five infested *Moringa* trees at a location (11^0 58`N and $8^0$26`E) in Ungogo Local Government area, Kano, Kano State situated in Sudan savanna ecological zone of Nigeria between the months of June to July, 2013. Kano State is characterized by distinct dry and wet season. The rainy season start in may/June and terminates in September/October, while the dry season starts from November to April. The larval specimen were obtained using forceps and placed on a piece of small paper, then transferred into a bottle with perforated cover for respiration and thereafter fresh *Moringa* leaves were used for the larval feeding in the laboratory (Plate I).

The specimen were reared to adulthood under room temperature and relative humidity in the Entomology laboratory of the Crop Protection Department, Faculty of Agriculture, Bayero University, Kano during which the larval developmental stages were observed on daily basis under a binocular microscope up to pupation and adult emergence. Such records were taken by counting and removing all head capsules shed after larval molting.

Specimen identification

A total of five (5) adults were neatly parceled and on the 6th of January, 2014 taken to the Insect Museum of the Department of Crop Protection, Ahmadu Bello University, Zaria, in Kaduna State for possible identification and naming.

Plate I: Developed larva in a Petri dish being fed with fresh *Moring* leaves

Plate II: Late instar larva forming a silk cocoon for pupation

RESULTS AND DISCUSSION

Larval development to adulthood

All the sampled larvae were observed to through 5 to 6 instars, which is a phase between two molting periods. In all, the larval period ranged between 8 to 10 days then followed by about 24 hours of inactivity before going into pupation. Early larval instars appeared dull white with small hairs and brown to black dots on the dorsal surface of each segment, while the late instar larvae changed to light red in colour.

Pupation takes place inside a silken cocoon that was formed by the late instar larva and lasted for about 8 days (Plate II). Fully formed pupa appeared brownish in colour and all appendages were hidden inside the cocoon as shown in Plate III, while Plate IV indicates the appearance of the adult insect.

The adult moth measured about 8 mm in length (Plate IV), 1 mm in width, a body colour that appeared black to brown dorsally and a wing span of about 20.5 mm. The fore wings are dark brown in colour with white patterns at the middle. The emerged adult was identified to be *Ulopeza phaeothoracica* Hampson; belonging to Phylum - Arthropoda, Class – Insecta, Order – Lepidoptera and Family – Crambidae.

Similarly, Satti *et al* (2013) have reported a sudden outbreak of an unfamiliar caterpillar on *M. oleifera* in Sudan, identified to be *Noorda blitealis* Walker. In addition to this, drumstick pod fly *Gitona distigma* (Meigen) was reported to be an important pest of on *Moringa* in India (Mahesh *et al*., 2014).

Nature of leaf damage by *U. phaeothoracica* on *M. oleifera*

The larvae feed on leaf lamina, turning them into transparent parchment structures as or in some cases a creating a window like opening on the leaf shown in Plate V. Heavy larval infestation that occurred between July to September resulted to a severe leaf damage on *Moringa* as shown in Plate VI or in some cases led to a complete defoliation of a young *Moringa* tree (Plate VII). Satti *et al*. (2013) reported that *N. blitealis* has become an important leaf defoliator of *Moringa* species in Sudan. In India, the larvae of *N. moringae* bore into flower buds of Moringa causing shedding of up to 75% of the buds (TNAU Agritech, 2014), while the *E. mollifera* feed gregariously by scrapping and gnawing foliage resulting in complete defoliation of the tree during severe infestation.

Plate III: Fully formed pupa

Plate IV: Adult form of *Ulopeza phaeothoracica* Hampson

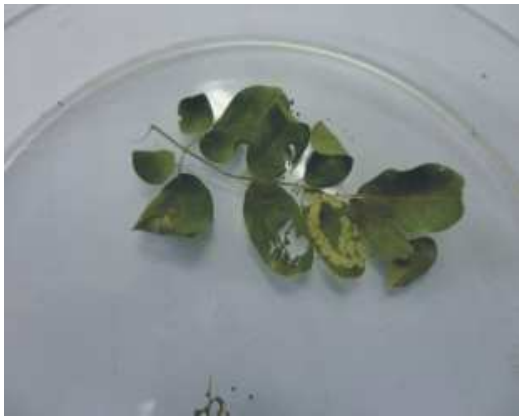

Plate V: Nature of the larval feeding on the *Moringa* leaf

Plate VI: Severely damaged young *Moringa* tree as a result of the larval feeding activity

Plate VII: Completely defoliated of a young *Moringa* tree

CONCLUSION

Present investigation revealed that *M. oleifera* is attacked and severely damaged by the larva of *Ulopeza phaeothoracica* Hampson at the study location and could be a pest of serious concern under poor management conditions. There is therefore, the need for a well coordinated study involving large area survey and bio-ecology of this *Moringa* leaf feeding moth to be used for the development of an effective, safe, sustainable and environmentally friendly management approach in affected areas cultivating *Moringa* as a crop.

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