

New alien invasive pest identified in West and Central Africa!

A new pest—**southern armyworm**, *Spodoptera eridania* (Stoll)—has been discovered in four countries in Africa

The presence of an introduced second armyworm species from the Americas was recently confirmed by DNA barcode analysis at the International Institute of Tropical Agriculture (IITA). The pest was first found in cassava fields in south-eastern Nigeria in December 2016 and then in southern Bénin in 2017.

The recent introduction of the fall armyworm (FAW) into the African continent and its growing threat to agriculture and food security have caused much concern in many of the 44 countries of tropical Africa invaded by this pest. Originating from the tropical regions of the Americas the FAW adult has a remarkable capacity for long distance migration and high female fertility. Its crop-destroying caterpillars can cause serious damage to maize but also to other important crops such as sorghum, rice, and vegetables. These attributes have made the control of FAW a challenging task. The development of management options adapted to Africa has mobilized international experts and the national capacities of affected countries and raised general attention to caterpillar attacks on various crops.

Discovery and identification

Farmers in Edo State experienced an outbreak of caterpillars that caused severe defoliation on cassava in a 450-hectare field near Ubiaja in south-eastern Nigeria in mid-December 2016. Alcohol-preserved samples of immatures (larvae) were sent for diagnosis to the Biodiversity Center at the IITA Station in Bénin. They did not match the morphological characteristics of FAW caterpillars. The species appeared to have related origins



Southern armyworm - *Spodoptera eridania* eggs. Photo by G. Goergen, IITA.

and closely resembled the African cotton leafworm (*S. littoralis* [Boisduval]). In the absence of adult moths it was concluded that the latter species, widespread in tropical Africa and known to feed on various kinds of food, must have attacked some sweet varieties of cassava that are less toxic to potential insect pests. Similar observations were made in early 2017 when farmers submitted alcohol-stored samples of immatures for identification following complaints about dense caterpillar colonies in their cassava fields in the areas surrounding Dasso, southern Bénin.

Moths were finally obtained from tomato fields attacked in Yaoundé, Cameroon, and samples of adults from the University of Masuku in Franceville, Gabon. The examination of the outer features of the moths together with the genitalia of both sexes allowed an unambiguous identification of the southern armyworm (SAW) *S. eridania* (Stoll). As a further means of control, larval and adult samples collected from all present sites were sent to the Germplasm Health, Virology, and Diagnostics Unit at the IITA headquarters in Ibadan for DNA barcode analysis. Results confirmed the findings.



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Southern armyworm - *Spodoptera eridania* larva. Photo by G Goergen, IITA.

Genus

The southern armyworm belongs to the cosmopolitan genus *Spodoptera* that encompasses 31 species worldwide including many of the most important agricultural armyworm caterpillars such as FAW. The detection of the new pest adds to the eight species already known to occur on the African continent. Caterpillars, particularly mature instars of the SAW, are extremely variable in their general appearance and can therefore hardly be identified based on morphological characters alone. Thus, in Africa, forms that bear a row of dark triangles on each side of the back along the length of the body can easily be mistaken for *S. littoralis* or the beet armyworm (*S. exigua* [Hübner]).

Accurate identification of adults is not less challenging since *S. eridania* belongs to the category of *Spodoptera* moths lacking strong contrasting patterns on the forewings. They measure 33-38 mm in length, are commonly cream or gray in ground color, bear a faint kidney-shaped spot, and look identical in both sexes. The only constant feature is a dark brown streak at the inner margin of the forewing. Some forms exhibit a large bar extending from the center to the margin of the forewing (see photo below). The high variability and difficult identification of the species are evidenced by its 20 Latin synonyms.

Life cycle and distribution

The southern armyworm is native to the Americas, occurring widely from southern USA to Argentina. With records of more than 200 host plants belonging to 58 plant families including many important crops, the species is probably the most polyphagous species within the genus *Spodoptera*. Depending on the host plant and temperature, the SAW can complete its life cycle within 30-40 days and is able to produce 1500-3000 eggs over its lifetime.



Southern armyworm attack on cassava in Nigeria. Photo by Andrew Ajetola.

Although the species has been known only sporadically until now as a serious pest in southern USA, in recent years it has emerged as an important pest of soybean in the cotton growing areas of South America. In addition, recurrent interceptions on internationally traded goods by quarantine authorities at entry points in Europe have led to a new risk assessment for the species. In 2015, *S. eridania* was newly ranked as an A1 quarantine pest recommended for regulation on the list of the European and Mediterranean Plant Protection Organization (EPPO). In Africa, spectacular outbreaks comparable to those caused by FAW have not been observed; however preliminary data show that the species is present in at least four countries in West and Central Africa, where it can be found on cassava, tomato, amaranth, and maize.

Concluding note

It is uncertain how long the southern armyworm has been present in West and Central Africa and its possible pathways of introduction into the continent are also unclear. Since their identification is difficult, populations may have remained latent in the field and only been sporadically noticed, especially when young caterpillars aggregate on individual host plants before they disperse upon maturation. The fact that adult males react on pheromones of other *Spodoptera* species calls for a more thorough assessment of pheromone trapping when FAW populations are monitored. An interesting circumstance is that the SAW and FAW share many important natural enemy species in South America. While this trait may become a significant stabilizing factor for common natural enemy populations, more research is urgently needed to assess its effective pest status in tropical Africa.



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Southern armyworm - *Spodoptera eridania* moths, M&F. Photo by G Goergen, IITA.