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DISTRIBUTION OF LEPIDOPTEROUS STEMBORERS OF MAIZE *(ZEA mays L.)* IN ECOLOGICAL ZONES OF CROSS RIVER STATE OF NIGERIA

A. A. OBHIOKHENAN, E. J. USUA and S. B. A. UMOETOK

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ABSTRACT

A survey of the distribution of maize stemborers in the three ecological zones of Cross River State was undertaken between March to December, 1998 and 1999 respectively. Results of the survey revealed higher stemborer populations in the mangrove zone followed by rainforest and derived Savannah zones of Cross River State. The survey also showed that *Sesamia calamistis* was more abundant than any other stemborers in all the vegetational zones of Cross River State. This was followed by *Chilo orichalcociliella*, while *Busseola fusca* (Fuller) was absent.

KeyWords: Survey, Distribution, Stemborers, Ecological Zones, Cross River State.

INTRODUCTION

Cereal occupies an important position in the agricultural economy of most countries of the world not only are they the most outstanding sources of carbohydrates for world human and livestock population, but they also serve as sources of income.

Maize (*Zea mays L.*) is essentially a crop of warm countries with adequate soil moisture (Adeyemi, 1969). It is one of the most important cereal crops in sub-Saharan Africa and is widely cultivated in Southern Nigeria. Cross River State has three main vegetational zones; mangrove, rainforest and derived Savannah zones (Avery, 1982). The mangrove zone is made up of creeks and swamps with no true dry season and with heavy rainfall over 2000mm annually. The rainforest zone however has a mixture of tall and small trees with short dry season of less than 3 months, moderate rainfall of (1500 - 2000mm) annually while the derived Savannah zone has thorny bushes, scattered trees and low grasses with light rainfall (500 - 1000mm) annually.

Maize production is however threatened by pests and diseases (Adeyemi, 1969). Nwosu and Ogunwolu (1986) and Hill (1975) observed that pest related losses in the field and storage play a contributory role in keeping cereal production below quantities demanded for utilisation by rapidly expanding livestock industries and increasing human population in Nigeria. In the field, maize is damaged principally by lepidopterous stemborers which belong to two lepidoptera families: Noctuidae and Pyralidae, Basque-Petrez and Mareck (1990a) and Usua (1997).

Harris (1962), Usua (1966) and Van Rensburg *et al* (1987) carried out detailed investigation on the distribution of major stemborers as *Busseola fusca* (Fuller) *Sesamia calamistis* (Hampson) and *Chilo sp.* (Swinhoe) in Northern and South Western Nigeria respectively and observed that *S. calamistis* was the dominant stemborer in the two zones. Phiri (1955) reported that *Chilo partellus* (Lepidoptera: Pyralidae) was dominant at altitude below 1200m while *B. fusca* (Lepidoptera: Nuctuidae) was dominant at higher altitudes. Usua (1997) observed that *S. calamistis* was more abundant than both *B. fusca* and *Chilo sp.* in Eastern States of Nigeria. Despite these, there is no information of the

A. A. OBHIOKHENAN, National Productivity Centre, Calabar Zonal Office, Calabar, Nigeria
E. J. USUA, Department of Zoology, Department of Zoology, University of Calabar, Nigeria
S. B. A. UMOETOK, Department of Crop Science, University of Calabar, Calabar, Nigeria

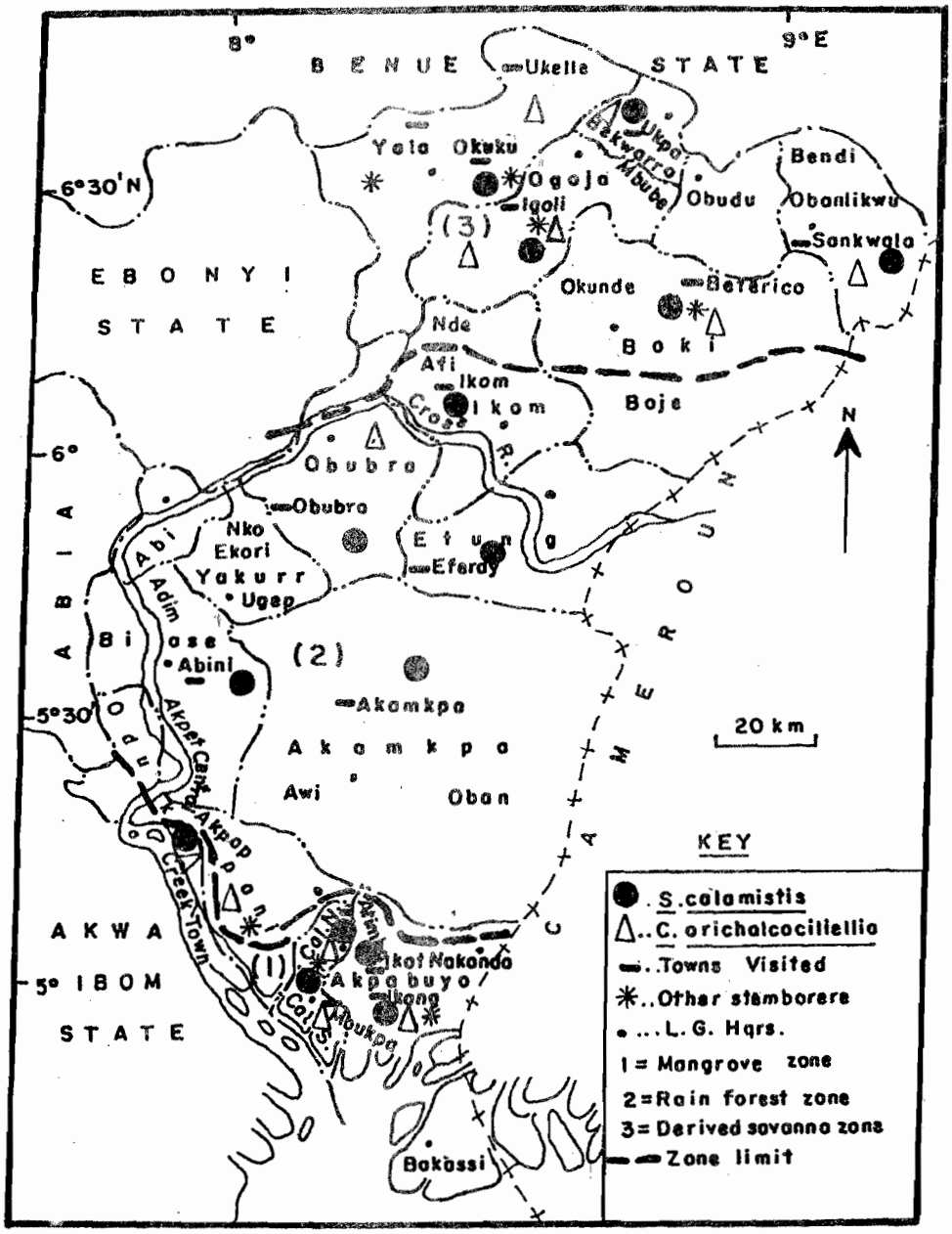

Fig. 1: Map of Cross River State showing distribution of stemborers of maize

occurrence of maize stemborers in Cross River State of Nigeria and hence the need for this study.

MATERIALS AND METHODS

Stemborer Survey in Cross River State.

A survey of the distribution of the major

stemborers of maize in Cross River State was undertaken between March to December, 1998 and 1999 respectively. During the survey, 15 locations in the three main vegetational zones namely, mangrove, rainforest and derived Savannah zones were visited (Fig. 1). Examinations were made at every 15 - 20 km except where maize were not grown. In such cases, the next available and accessible maize farm was surveyed and examined. Affected and damaged maize plants or those that showed the symptoms of 'dead-heart' were cut, dissected, and the larvae and pupae in them collected. The larvae were placed in a netted cage and fed with young maize leaves and stems while the pupae were left in the old maize stems in the greenhouse and kept in the dark cupboard to develop to adult stemborer. The emerged adults were later sorted out and identified in the laboratory into respective species based on British insect museum information for comparison.

RESULTS AND DISCUSSIONS

The distribution of maize stemborers, namely *B. fusca, S. calamistis, Chilo* sp. and other stemborers are shown in Fig.1. A total of 804 stemborers were collected in the three ecological zones visited.

Table 1 shows the distribution of stemborer in the various locations visited in the three ecological zones of Cross River State. The mangrove zone recorded significantly highest stemborer, followed by the rainforest and derived Savanah zones.

Of the total numbers, Table 1: showed that 461 (57.33%) stemborers pupae and larvae were collected in the mangrove zone, the rainforest zone accounts for 259 (32.21%) while the derived Savannah had a total of 84 (10.44%). After laboratory examination and separation, it was observed that of the total 461 stemborers larvae and pupae collected in the Mangrove zone, 283 (61.39%) were *S. calamistis*, 129 (27.98%) were *Chilo* sp. and 49 (10.62%) were other stemborer species, *B. fusca* was absent. In the rainforest zone, out of the 259 stemborers collected, 259 (100%) were *S. calamistis* while other species were absent. In the derived Savannah zone, of the 84 stemborers larvae and pupae collected, 48 (57.14%) were *S. calamistis*, 25 (29.76%) were *Chilo* sp. while 11 (13.09%) were other stemborer larvae and pupae.

The survey also showed that *S. calamistis* was more abundant than both *Chilo* sp. and *B. fusca* in Cross River State of Nigeria. Nye (1960) working in East Africa reported that a pyralid, *Chilo zonellus* was the principal stemborer in the coastal and plateau areas while *B. fusca* was dominant in the highland areas. Usua (1997), observed that *S. calamistis* was more abundant than both *B. fusca* and *Chilo* sp. in Eastern States of Nigeria.

CONCLUSION

The survey of the distribution of the stemborer species in different ecological zones of maize growing areas of Cross River Sate showed that mangrove zone had the highest distribution of stemborers fotllowed by rainforest and derived Savannah zones of Cross River State respectively. The study had confirmed earlier report by Usua (1997) who observed that *S. Calamistis* was the commonest and most widely distributed stemborer species followed by *Chilo sp* in Eastern State of Nigeria.

Table 1: **Distribution of Stemborers Larvae and Pupae of Maize in the three Ecological zones of Cross River State**

Ecological Zones	Total No. of Larvae and Pupae collected	% distribution by species			
		B. fusca	*S. calamistis*	*Chilo sp*	Other sp.
Mangrove	461	0	283(61.39%)	129(27.98%)	49(10.62%)
Rainforest	259	0	259(100%)	0	0
D. Savannah	84	0	48 (57.14%)	25(29.76%)	11(13.09%)

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