

AFS 2004002/5307

An ecological survey of Acridoid grasshoppers (Orthoptera) in the Niger-Delta region of Nigeria

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(Received January 8, 2004)

ABSTRACT: An ecological survey of acridoid grasshoppers was conducted in the Niger Delta region of Nigeria from January to November 2001. A total of 34 taxa distributed in 3 families, 12 sub-families and 27 genera were encountered. The family Acrididae had the highest number of species (28), followed by pygomorphidae with 5 species. The family Tetrigidae was represented by only one species. Several species showed ecological plasticity and were found in all the locations while many others showed ecological restriction. Two new species, *Dorunia chloronota* (Acrididae) and *Adeletia aleareca* (Tetrigidae) were recorded in this study. The species composition, diversity and density of the acridoid grasshoppers in this study were fewer than those recorded in the middle belt and Northern Sahel Zones.

Key words: Acridoid, ecology, Nigeria, Niger-Delta, Tropics.

Introduction

The faunal composition of the acridoid grasshoppers in the Niger delta region of Nigeria have not been given adequate study (Oyidi, 1985). The focus generally have been on the middle belt and Northern regions of Nigeria (Uvarov, 1925; Golding, 1934; Oyidi, 1977; 1985). Uvarov (1925) made collections in the Northern part of Nigeria while Golding (1934) studied the ecology of the species near lake Chad. Oyidi (1977) studied the ecological distribution, seasonal incidence and breeding pattern of acridoid species in Zaria area. Oyidi (1985) also made an ecological survey of acridoid grasshoppers in the Middle Belt of Nigeria.

The aim of this investigation therefore was to study the composition and distribution of the acridoid fauna in the Niger Delta region of Nigeria.

Materials and Methods

The Study Area

The study was carried out in the Niger Delta region, Southern Nigeria. The areas studied lie in the tropical belt and fall within three ecological zones. These include the rainforest, the freshwater swamp forest and the mangrove swamp forest.

The rainforest vegetation is high forest with cultivated farm land, fallow forest regrowth and broken forest. The area is dominated by the oil palm tree (*Elaeis guineensis*), timber trees e.g. *Oxystigma manii* and grasses. The locations studied included Benin City (B) and Sapele (S).

The freshwater swamp forest zone were dominated by trees such as *Pandanus* and the Raphia palm as well as large trees such as *Alstoma congensis*. Many of the trees have stilt roots; also found here were freshwater angiosperms, epiphytic mosses and grasses. The locations studied here included Warri (W) and Patani (P).

The mangrove swamp forest zone is covered by a network of channels filled with brackish water. The most common tree here is the red mangrove tree (*Rhizophora* spp.) with stilt roots. The locations studied were Ahoada (A), Calabar (C) and Port Harcourt (PH).

Methodology

A sweep net was used in catching the insects during the day while light traps were used for night collections. Insects collected were killed in a killing bottle containing cotton wool soaked in ethyl ether. Killed insects were pinned with entomological pins and kept in insect boxes containing camphor as preservative and transported to the laboratory for subsequent examination and final identification. Analysis of variance (ANOVA) was employed to test statistical differences in species densities at the locations.

Results

A total of 34 taxa of acridoid grasshoppers encountered in this study comprised three families, twelve sub-families and twenty-seven genera were collected during the survey. The composition and distribution of the species is shown in Table 1. The highest number of species (28) was recorded in the freshwater swamp zone followed by the rainforest zone (22), while the mangrove swamp recorded the lowest number (18).

Several acridoid species exhibited ecological plasticity and were common in all the zones studied (Table 1), while several others exhibited ecological restrictions and were found in only one of the locations. For example, some acrididae such as *Amphecremna scalata* Cantantopinae, Coptacridinae and Eypreopcnemidinae, were found only in the freshwater zone (Table 1). Other restricted species were members of Acrididae such as *Dorunia chloronota* and *Paracromacris stenoptera* which occurred only in the mangrove swamp zone (Table 1).

Discussion

The acridoid grasshoppers encountered in this study comprised three families, twelve sub-families, twenty-seven genera and thirty-four species. The species here were however fewer than the numbers encountered by Oyidi (1977) in the Zaria area of Northern Nigeria, and the Middle Belt area (Oyidi, 1985). In his first study, Oyidi recorded 11 sub-families, 82 genera and 112 species; and 13 sub-families, 83 genera and 114 species in the second study.

Oyidi (1985) asserted that acridoid grasshopper populations in the more wetter savannah zone were higher than those encountered by Golding (1948) in the Northern drier sahel zone and concluded that the wetter the zone, the higher the density and species of acrididae. The results of this study was contrary to

this view expressed by Oyidi since the numbers encountered in the Niger Delta which is wetter than the Middle Belt and Northern Sahel was lower.

Table 1 The Composition and Distribution of Acridoid Species in the Niger Delta (Jan. – Dec., 2003).

| Species | Rain | | Forest | Freshwater | Swamp | Mangrove | PH |
|---|------|---|--------|------------|-------|----------|----|
| | B | S | W | P | A | C | |
| Family ACRIDIDAE | | | | | | | |
| Subfamily Acridinae | | | | | | | |
| <i>Acrida bicolor</i> (Thumb) | + | + | + | + | + | + | + |
| <i>Amphecremna scalata</i> (Kasch) | | | | + | | | |
| <i>Dorunia chloronota</i> (Stal) | | | | | + | | |
| <i>Gymnbothrus temporalis</i> (Stal) | | | | + | | | |
| <i>Paracromacris stenoptera</i> | | | | | + | | |
| Subfamily Cantantopinae | | | | | | | |
| <i>Acacantantops notatus</i> (Kasch) | | | | + | | | |
| <i>Cantantops melanasticus</i> (Schaum) | | | | + | | | |
| <i>Cantantops spissus spissus</i> (Walk) | | | | + | | | |
| <i>Cantantops stylefer</i> (Krauss) | | | + | | | | |
| <i>Cantantopsis basalis</i> (Walk) | + | | | | | | |
| Subfamily Calliptaminae | | | | | | | |
| <i>Acorypha modesta</i> (Uvar) | + | + | + | | | | |
| <i>Acorypha unicarinata</i> (Krauss) | | + | + | + | | | |
| <i>Stobbea riggenbachi</i> (Ramme) | + | + | + | + | | | |
| Subfamily Coptacridinae | | | | | | | |
| <i>Epistaurus succinens</i> (Krauss) | | | | + | | | |
| <i>Eucoptacra anguiliflava</i> (Karsch) | | | | + | | | |
| Subfamily Cyrtacanthacridinae | | | | | | | |
| <i>Cyrtacanthacris sp.</i> | + | + | + | + | + | + | + |
| Subfamily Eyprepocnemidinae | | | | | | | |
| <i>Eyprepocnemis plorans ibadana</i> (G.T.) | | | | + | | | |
| <i>Tylotropidius didymus</i> (Thunb) | | | + | + | | | |
| <i>Tylotropidius gracilipes</i> (Branc) | | + | | + | | | |
| Subfamily Hemicridinae | | | | | | | |
| <i>Spathosternum nigrotaemiatum</i> (Stal) | + | + | + | + | + | + | + |
| <i>Spathosternum pygmacum</i> (Krauss) | + | + | | + | + | | |
| Subfamily Oedipodinae | | | | | | | |
| <i>Acrotylus patruelis</i> (H.S) | + | + | | + | | | |
| <i>Oedaleus senegalensis</i> (Krauss) | + | + | | | + | | + |
| <i>Trilophidia conturbata</i> (Walk) | + | | + | | | | + |
| <i>Trilophidia sp.</i> | + | | | | + | | + |
| Subfamily Oxynae | | | | | | | |
| <i>Oxyla hyla</i> (Serv) | + | + | + | + | + | + | + |
| Subfamily Gomphocerinae | | | | | | | |
| <i>Dnopherula invenusta</i> (Krauss) | + | + | + | + | + | + | + |
| <i>Dnopherula rotundifrons</i> (I. Bol.) | + | | + | + | + | | |
| Family PYGOMORPHIDAE | | | | | | | |
| <i>Chrotognus senegalensis</i> (Krauss) | + | + | | + | + | | |
| <i>Pygomorpha cognate</i> (Krauss) | + | + | | | | + | |
| <i>Pygomorpha dispar</i> (Bol) | | | | + | + | + | |
| <i>Taphronota sp.</i> | | | + | + | | | |
| <i>Zonocerus variegates</i> (Linn) | + | + | + | + | + | | |
| Family TETRIGIDAE | | | | | | | |
| Subfamily Tetriginae | | | | | | | |
| <i>Adeletia aleareca</i> (Oyidi) | + | | | | + | | |

Species tend to be more abundant in the North and Middle Belt zones of Nigeria probably due to diversity and abundance of grasshoppers. This finding is similar to that of Oyidi (1985). This writer ascribed higher abundance of grasshoppers in the savannah zones to rich grass vegetation which provided adequate food and shelter for grassland grasshoppers. This type of environment is lacking in the Niger delta region which on the other hand is dominated by extensive forest with prospective food isolated, scattered and punctuated by forest trees. Differences in topography which meet the ecological requirements of different grasshoppers species.

All the genera encountered in this study except *Acrotylus*, *Oedaleus*, *paracromacris*, *Trilophidae* and *Cryptacanthacris* are represented in the North and Middle Belt of Nigeria (Uvarov, 1925; Oyidi, 1977; 1985).

Some species appear to show regional isolation; for example *A. scalata* and *G. temporalis* (Acridinae) and *E. anguli flava* (Coptacridinae), as well as *E. plorans ibadana* (Eyprepocnemidae). These species were found only in the freshwater swamp zone; while *D. chloronota* and *Paracromacris spp* (Acridinae) occurred only at the mangrove swamp zone.

Acrida bicolor (Acridinae), *Spathosternum migrotaemiatum* (Hemicridinae), and *Dnopherula invenusta* (Gomphocerinae) showed extreme plasticity and were seen in all the locations visited. These species were also encountered in the Northern Sahel and Middle belt of Nigeria (Golding, 1948, Oyidi, 1977; 1985).

Oyidi (1985) observed some wingless and brachypterous species such as *Pododula ancisa*, *Rhabdoplea klaptoczi* and *Pseudogmothela foveolata* in areas north and south of the River Niger. He therefore suggested that the wingless and brachypterous morphologies are recent evolutionary developments or that the Niger is a young river in Nigeria. It is expected that the association of these forms with the upper Niger river would also be reflected in the lower Niger where the river became detritic, branching off as the Niger-Delta. Surprisingly, none of these insect forms was encountered in this survey.

A new species *Dorunia chloronota* was recorded for the first time in the Niger delta. This species was not included in the checklist of grasshoppers in the Niger Delta (Ogedegbe, unpublished). This species was known to occur only in the Middle belt of Nigeria (Oyidi, 1985).

One species of Tetrigidae, *Adeletia aleareca*, which was first encountered by Oyidi (1985) in the Middle Belt was also found in this study. This is suggestive that this species occur in zones that are wet or moderately wet. This could be plausible since none of these species have been recorded in the Northern drier zones (Golding, 1948; Dirsh, 1965; Oyidi, 1977).

Generally, it does appear that the composition, diversity and density of acridoidae are fewer in the Niger delta region than the Middle Belt and Northern Sahel zones. Further intensive survey is however required to determine the overall acridoid fauna in the Niger Delta region of Nigeria.

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