Nigerian. J. of Ent. (1991), 12, 13-24 DOI:10.36108/NJE/1991/21.0120

The Zoogeographical Distribution of *Atherigona species* (Diptera: Muscidae) in Nigeria

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ABSTRACT

Distributional records of *Atherigona* species in Nigeria were made. *Atherigona lineata* (Adams) and *A. tomentigera* van Emden were the most widely distributed as they were found in all the major ecological zones of Nigeria except the Sahel Savanna Zone. Many species were, however, not found outside their place of description. In the Owerri area of the Forest Zone, there are no records of *Atherigona*, possibly because of the scarcity of grasslands, the only suitable habitat for the insect. In other parts of the Forest Zone, limited records were made only in the derived grassland areas. Most of the species occurred in the Northern and Southern Guinea Savanna Zones with the least record from the Sahel Savanna Zone. Several species were obtained from the mountainous areas of Mambilla Plateau and Obudu.

INTRODUCTION

The genus *Atherigona* Rondani comprises two subgenera, *Atherigona* (*sensu stricto*) and *Acritochaeta* Grimshaw, based on a combination of characters of both adults and larvae.

Members of *Atherigona* (*sensu stricto*) are pests of Gramineae while members of *Acritochaeta* are mainly facultative predators breeding mostly on organic matter (Deeming, 1971; Mathur, 1969; Pont, 1973). However, *A. yorki* Deeming has recently been found to be a parasitoid, developing in the larva of *Sesamia nonagriodes* Lef. (Lepidoptera: Noctuidae) on sugarcane (Hesse & Mohammed, pers, comm.). The importance of the sorghum shootfly, *Atherigona soccata* Rondani as a serious pest of sorghum has since been recognised in several countries. Most of the detailed studies have thus been done on the biology and ecology of *A. soccata*. However, several other species of *Atherigona* have been found to attack mainly cereal crops and

a wide range of wild Gramineae. For example, *A. oryzae* Malloch has been known to attack rice, wheat and corn (Litsinger, 1979; Young, 1981; Srivastava and Pandey, 1968; Alam, 1964). *A. naqvii* Steyskal and *A. exigua* Stein attack wheat, etc. (Steyskal, 1966).

There are 186 known species and five subspecies of *Atherigona* worldwide (Dike, 1990). A few members of the genus such as *A. soccata, A. laevigata* (Loew), A. naqvii, A. pulla (Wiedr) and *A. orientalis* Schiner are very widely distributed and are found in the Palaerctic, Oriental and Afrotropical regions (Linder, 1964; Pont, 1977). The majority of the species are, however, limited in their geographial distribution A. *lineata* and *A. serecauda* for instance, are widespread over the mainland Afrotropical region while others such as *A. mirabilis* Deeming are found mainly in the East and West African subregions. There are some species such as *A. maculipennis* Stein and *A. immaculata* Stein which are only known from the islands from which they have been described.

Within the past two decades, several new species of *Atherigona* have been described from Nigeria by Deeming (1971), 1975) and Dike (1989 and 1990). The distributional record of the genus in Nigeria has not yet been compiled although about two-fifths of the known species worldwide have been recorded in the country, This paper, therefore, seeks to give the zoogeographical distributional records of all known *Atherigona* species in Nigeria.

MATERIAL AND METHODS

Between 1980 and 1985, *Atherigona* species were collected from various sites in Nigeria indicated in Figure 1. Two methods of collection were used. These include, the sweep net and the malaise trap. With the sweet net, collections were made in the late mornings and in the evenings when the crop was dry to prevent wetting the net and consequently ruining the insects collected. Only males were used for the identification of the insects since it has been reported (Deeming, 1971; Clearwater, 1981) that variability of structure and colour pattern make specific identification of females very difficult. The trifoliate process of all specimens identified was dissected out after maceration of the abdomen for five minutes in 10% potassium hydroxide (KOH) solution. The abdomen was placed in alcoholic acetic acid for two minutes to arrest the action of the KOH. Specimens were compared with collections held at the Institute for Agricultural Research (IAR), Ahmadu Bello University, Zaria, Insect museum.

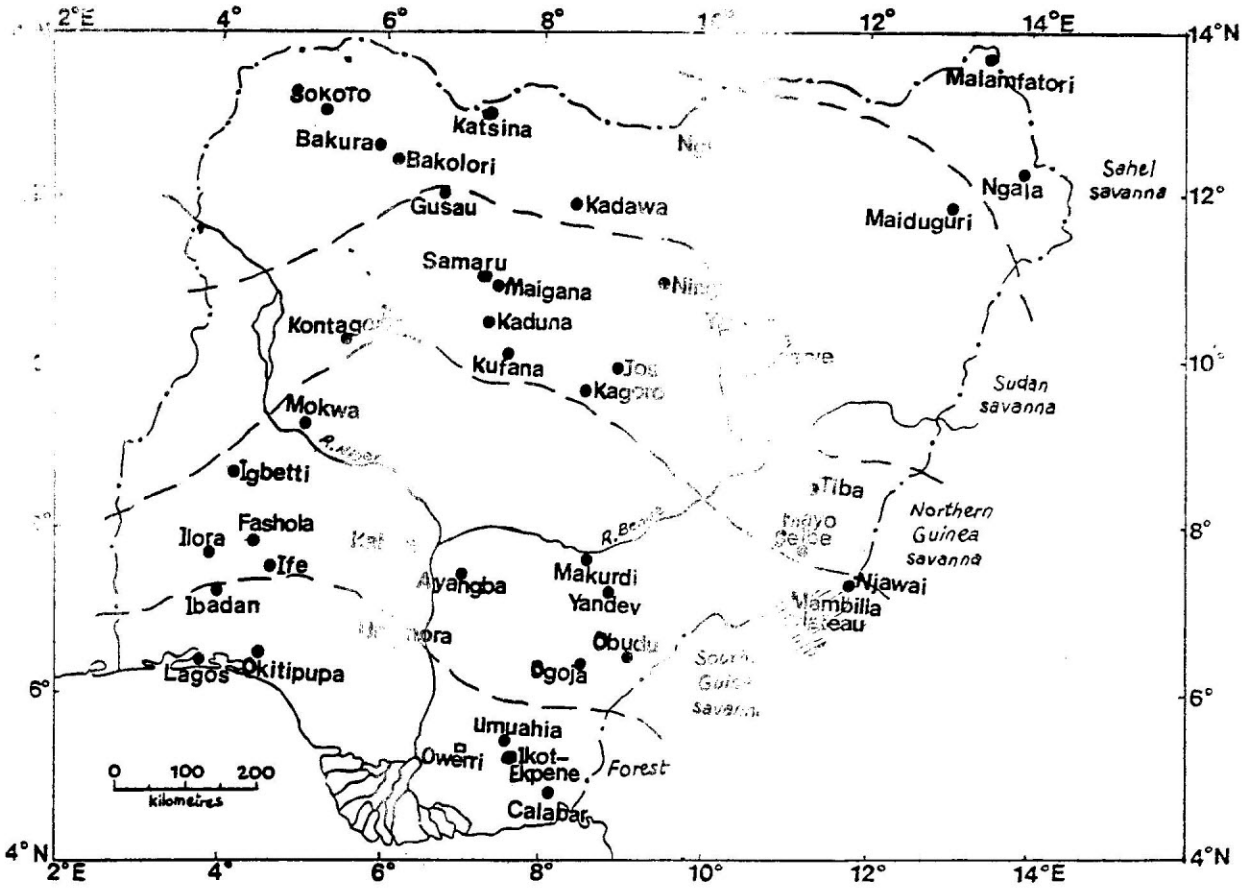

Fig. 1: Map of Nigeria showing localities of record of Atherigona species.

Table 1: Distribution list of *Atherigona sp.* in Nigeria

1. FOREST ZONE

	Species	Where Found	State
	Atherigona (Acritochaeta)		
1.	*Atherigona furculisterna* Deeming	Umuahia	Imo
2.	*A. orientalis* Schiner	Umuahia	Imo
3.	*A tedderi* Deeming	Okitipupa	Ondo
4.	*A. yorki* Deeming	Ibadan	Oyo
	Atherigona sensu stricto		
5.	*A binubila* van Emden	Ikot-Ekpene	Akwa-Ibom
6.	*A fililoba* Deeming	Unomora	Bendel
7.	*A gilvifolia* van Emden	Ibadan	Oyo
8.	*A. hyalinipennis* van Emden	Ikot-Ekpene	Akwa-Ibom
9.	*A laevigata* (Loew)	Ibadan	Oyo
10.	*A lineata* (Adams)	Umuahia; Ikot-Ekpene	Imo and Akwa-Ibom
11.	*A. marginifolia* van Emden	Unomora	Bendel
12.	*A. nigeriensis* Deeming	Ikot-Ekpene	Akwa-Ibom
13.	*A. pulla* (Wiedemann)	Lagos	Lagos
14.	*A rubricornis* Stein	Calabar	Cross-River
15.	*A. ruficornis* Stein	Ibadan	Oyo
16.	*A secrecauda* Seguy	Ikot-Ekpene	Akwa-Ibom
17	*A. steelease* van Emden	Umuahia	Imo
18.	*A. tomentigera* van Emden	Ikot-Ekpene	Akwa-Ibom

II. SOUTHERN GUINEA SAVANNA ZONE

	Species	Where Found	State
	Atherigona (Acritochaeta)		
1.	*Atherigona furculisterna* Deeming	Ile-Ife	Oyo
2.	*A. fuscicephala* Dike	Ile-Ife	Oyo
3.	*A. orientalis* Schiner	Ilora	Oyo
4.	*A. gracilipalpis* Deeming	Ayangba	Benue
	Atherigona sensu stricto		
5.	*A. albistyla* Deeming	Ilora	Oyo
6.	*A. aurifacies* van Emden	Ogoja	Cross-River
7.	*A. bimaculata* Stein	Ilora	Oyo
8.	*A bedrodi* van Emden	Yandev	Benue
9.	*A budongoana* van Emden	Mokwa; Kabba	Niger/Kwarra
10.	*A fililoba* Deeming	Ilora; Fashola	Oyo
11.	*A. hargreavesi* Deeming	Ilora	Oyo
12.	*A longifolia* van Emden	Ilora	Oyo
13.	*A. marginifolia* van Emden	Ilora; Kabba	Oyo/Kwara
14.	*A mirabilis* Deeming	Ile-Ife; Kabba	Oyo/Kwara
15.	*A. pallidipleura* Deeming	Igbetti, Njawali	Oyo/Gongola
16.	*A. palpalis* Dike	Igbetti	Oyo
17.	*A. rubricornis* Stein	Ile-Ife	Oyo
18.	*A soccata* Rondani	Makurdi, Ilorin	Benue/Kwara
19.	*A tomentigera* van Emden	Ilora	Oyo
20.	*A truncata* van Emmden	Mokwa; Kabba	Niger/Kwara
21.	*A. tumidistipes* Deeming	Ile-Ife	Oyo

III. NORTHERN GUINEA SAVANNA

	Species	Where Found	State
	Atherigona (Acitochaeta)		
1.	*Atherigona aberrans* Malloch	Samaru	Kandua
2.	*A. gracilipalpis* Deeming	Samaru	Kaduna
3.	*A. orientalis* Schiner	Samaru; Jos	Kaduna/Plateau
4.	*A. yorki* Deeming	Samaru; Kufana	Kaduna/Sokoto
	Atherigona sensu stricto		
5.	*Atherigona africana* Deeming	Samaru	Kaduna
6.	*A. albistyla* Deeming	Samaru	Kaduna
7.	*A. ancora* Deeming	Samaru	Kaduna
8.	*A. angulata* Deeming	Samaru	Kaduna
9.	*A befordi* van Emden	Samaru	Kaduna
10.	*A. bimaculata* Stein	Samaru	Kaduna
11.	*A. binubila* van Emden	Samaru	Kaduna
12.	*A. budongoana* Deeming	Samaru	Kaduna
13.	*A. campestris* Deeming	Samaru	Kaduna
14.	*A. cinarina* Seguy	Samaru	Kaduna
15.	*A. corrugata* Deeming	Samaru	Kaduna
16.	*A. facilis* Deeming	Samaru	Kaduna
16.	*A. facilis* Deeming	Samaru	Kaduna
17.	*A. gilvifolia* van Emden	Samaru; Kufana	Kaduna
18.	*A. griseiventris* van Emden	Samaru	Kaduna
19.	*A humeralis* (Wiedemann)	Samaru	Kaduna
20.	*A hyalinipennis* van Emden	Samaru; Maigane	Wusasa; Kaduna
21.	*A. insignis* Deeming	Samaru	Kaduna

	Species	Where Found	
	na sensu stricto (continued)		
	laevigata (Loev)	Samaru, Kadun	
	latiloba Deeming	Samaru, Kadun	
	lineata (Adams)	Samaru, Konta	
	longifolia van Emden	Samaru, Kadun; Kufana	
	marginifolia van Emden	Samaru, Kagor	
	mirabilis Deeming	Samaru	
	mitrata Seguy	Samaru; Kajela nr. Ningi	chi
	naqvii Steyskal	Samaru Kadun	
	nigeriensis Deeming	Samaru; Mu	
	nigrapicalis Deeming	Samaru	
	occidentalis Deeming	Samaru	
	pallidipleura Deeming	Samaru	
	ponti Deeming		
	prosternalis Deeming		
	pulla (Wiedemann)	Sam	a
	robertsi Deeming		ola
38.	*rubricornis* Stein		Kaduna
39.	*samaruensis* Deeming		Kaduna
40.	*secrecauda* Seguy		Kaduna
41.	*soccata* Rondani		Kaduna
42.	*steelease* van Emden		Kaduna
43.	*tomentigera* van Emden		Kaduna

	Species	Where Found	State
	Atherigona sensu stricto (continued)		
44.	*A. tridentata* Malloch	Samaru	Kaduna
45.	*A. truncata* van Emden	Samaruu; Lihonmora	Kaduna/Gongola
46.	*A. valida* (Adams)	Samaru	Kaduna
47.	*A. zariaensis* Deeming	Samaru	Kaduna
	IV. SUDAN SAVANNA ZONE		
	Atherigona sensu stricto		
1.	*Atherigona bedfordi*	Maiduguri; Yankari	Bornu/Bauchi
2.	*A. bimaculata* Stein	Sokoto	Sokoto
3.	*A. budongoana* van Emden	Yankari	Bauchi
4.	*A. humeralis* (Wiedemann	Yankari	Bauchi
5.	*A. hyalnipennis* van Emden	Kadawa	Kano
6.	*A. lineata* (Adams) Bakolori;	Nguru; Kaduna; Katsina; Yankari	Sokoto/Kano Katsina/Bauchi
7.	*A. marginifolia* van Emden	Yankari	Bauchi
8.	*A mitrata* Séguy	Lake Ala near Maiduguri	Bornu
9.	*A. secrecauda* Séguy	Katsina	Katsina
10.	*A. soccata* Rondani	Bakura Sokoto	
11.	*A. tomentigera* van Emden	Kadawa; Katsina	Kano/Katsina
	V. SAHEL SAVANNA ZONE		
	Atherigona sensu stricto		
1.	*Atherigona corrugata* Deeming	Ngala	Bornu
2.	*A. humeralis* (Wiedemann)	Malamfactori (Shore of Lake Chad)	Bornu

	Species	Where Found	State
	Sahel Savanna Zone (Contd.)		
3.	*A. rubricornis* Stein	Ngala	Bornu
4.	*A. ruficornis* Stein	Malamfatori	Bornu
	VI. MONTANE FAUNA		
	Atherigona (Acritochaeta)		
1.	*A. montana* Deeming	Mambilla Plateau	Gongola
2.	*A. obudua* Dike	Obudu	Cross-River
3.	*A. orientalis* Schiner	Obudu	Cross-River
	Atherigona sensu stricto		
4.	*A. alticola* Deeming	Obudu	Cross-River
5.	*A. aurificacies* van Emden	Mambilla Plateau; Obudu	Gongola; Cross-River
6.	*A. bifida* Deeming	Mambilla Plateau	Gongola
7.	*A bimaculata* Stein	Obudu	Cross-River
8.	*A. budongoana* van Emden	Mambilla Plateau	Gongola
9.	*A. fililoba* Deeming	Mambilla Plateau	Gongola
10.	*A. latiloba* Deeming	Obudu	Cross-River
11.	*A. lineata* (Adams)	Obudu	Cross-River
12.	*A. longifolia* van Emden	Obudu	Cross-River
13.	*A. mambillaensis* Deeming	Mambilla Plateau	Gongola
14.	*A. marginifolia* van Emden	Obudu	Cross-River

	Species	Where Found	State
	Atherigona sensu stricto		
15.	*A. matilei* Deeming	Obudu	Cross-River
16.	*A. melderi* Deeming	Obudu	Cross-River
17.	*A. mirabilis* Deeming	Obudu	Cross-River
18.	*A. nitidifrons* endeni Deeming	Obudu	Cross-River
19.	*A. perfida* Stein	Obudu	Cross-River
20.	*A. robertsi* Deeming	Obudu	
21.	*A secrecauda* Seguy	Obudu	Cross-River
22.	*A setiterga* Deeming	Mambilla Plateau	Gongola
23.	*A steeleae* van Emden	Mambilla Plateau	Gongola
24.	*A. trapezia* van Emden	Mambilla Plateau;	Gongola
		Obudu	Cross-River
25.	*A. vibrissana* Deeming	Mambilla Plateau	Gongola

RESULTS AND DISCUSSION

The malaise trap consisted basically of an open-fronted tent, the roof of which slopes down to the innermost corner. At this innermost corner, there is an aperture leading to a trap. This trap cannot be used in windy weather. The studies of Juillet (1963) showed that the malaise trap gives unbiased catches for Diptera and larger Hymenoptera.

The possibilities of record of *Anterigona* spp. in Nigeria are shown in Figure 1 while the distribution list is shown in Table 1. The taxonomic status of *A. humeralis* and *A. bedfordi* is reflected in this compilation, that is, *A. humeralis* (Wiedemann) Pont 1986, Skidmore 1985 non Henning 1964 nec auctt. (Syn. A. *ferruginea* van Emden).

A. bedfordi van Emden = *A. humeralis* (Wiedemann) sensu Hennig, 1964 et auctt. non Skidmore, 1985 nec Pont, 1986.

Some species such as *Atherigona lineata* and *A. tomentigera* are predominant and more widely distributed as they were found in all the major ecological zones except the Sahel Savanna zone. Many species are, however, not yet known beyond their place of description. In Owerri area of the rain

Zone, there were no records of *Atherigona*, possibly because of the scarcity of grasslands which constitute the only suitable habitat for the insect. In other parts of the Forest zone, limited records were made from the derived grassland areas. Most of the species occurred in the Northern and Southern Guinea Savanna Zones with the least record from the Sahel Savanna Zone. The harsh weather condition (temperature extremes and long dry season) might be responsible for the small population and range of *Atherigona spp.* found in the Sahel Savanna zone.

ACKNOWLEDGEMENTS

I am grateful to Mr. M. Chori for technical assistance. My thanks also go to Prof. I.D. Erinle and Dr. I. Onu for reviewing this manuscript and offering useful suggestions. I thank the Director, Institute for Agricultural Research, Ahmadu Bello University, Zaria for permission to publish the work.

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