Acrididea diversity in degraded areas of higher mountains in West Cameroon

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This article highlights the impact of anthropogenic disturbance on Acrididea community in Kouoptamo (Cameroon). Sampling was done in 70 quadrats per site. In total, 27 Acrididea species were recorded on 210 quadrats; 25 species in the mixed food crop field, 19 and 13 in 3- and 10-year fallow respectively. Specific richness, abundance and Shannon index increased when vegetation age decreased. The Acrididea community was similar between vegetation of similar age. The distribution of species abundance in each vegetation fits the Lognormal model and Gymnobothris temporalis, Catantops spissus and Roduniella insipida were the most abundant species.

Acrididea are crop pests (Kumar 1991) and a central taxon in food chains. Due to their importance in the food chain, especially as food resources for a large number of animal species, they constitute a subject of increasing attention by ecologists and environmental managers doing conservation studies to quantify their populations (Badenhauser 2012). Acrididea are also among the most destructive insects on the African continent where research strategies for sustainable control are a global priority. In the natural areas, most of them live in grassy vegetation (Mestre 1988; Badenhauser 2012) from which they attack crops.

The Cameroon highlands are subjected to strong ecological disturbances due to intensive agricultural activities and the use of pesticides. The Acridofauna of Kouoptamo has not been studied and the knowledge of the specific richness and diversity of Acrididea in degraded upland areas of Cameroon is important to update the list of pests, to identify factors that affect the pest status and in the definition of new strategies for pest management and wildlife conservation (Joshi et al. 1999).

In this study, we evaluated the effect of landscape degradation on: (1) Acrididea species richness, (2) species occurrence, and (3) relative abundance of Acrididea and community structure and diversity. This study was conducted in order to determine the consequences of environmental degradation on Acrididea diversity and ultimately help to define long-term research programmes on the subject.

The present study was carried out from July to October 2011 (14 weeks) in the degraded areas of higher mountains of Kouoptamo (5°39’17”N 10°37’1”E, altitude 1100 m) in Cameroon. The primary forest vegetation of Kouoptamo (Olivery 1986) has been gradually degraded due to human activities, that is, marked by vast coffee plantations and other food crops. Kouoptamo has an equatorial climate, characterised by a rainy season of nine months (March to November) and a dry season of three months (December to February) (Loung & Laclavere 1973). The average rainfall from 1997 to 2006 was 1717.7 mm. Acrididea were captured in three vegetation types: a mixed food crop field, a 3- and 10-year falls of almost 2 ha each.

The mixed food crop field is occupied by Zea mays L. (Poaceae), Xanthosoma mafaffa Schott. (Araceae), Ipomoea batatas (L.) Lam. (Convolvulaceae), and Musa paradisiaca L. (Musaceae). Three years of fallow is dominated by Asystasia gangetica T. Anderson (Acanthaceae), Colocasia esculenta (L.) Schott. (Araceae), Crossocephalum sp. and Synedrella nodiflora (L.) Gaertn. (Asteraceae), Bridelia sp. (Euphorbiaceae), Centrostephium pubescens Benth. (Fabaceae), Sida alba L., Sida sp. (Malvaceae), Paspalum polystachyum R. Br., Setaria barbata (Lam.) Kunth., Oplismenus burmannii (Retz.) P. Beauv. (Poaceae), Pteris sp. (Polypodiaceae), Coffea canephora Pierre ex A. Froehner (Rubiaceae), Physalis micrantha Link, Capsicum frutescens L. (Solanaceae) and Cyphostemminia vogelli (Hook. f.) Desc. (Vitaceae). Ten years of fallow is characterised by the presence of Pteris togoensis (Polypodiaceae), C. canephora, P. micrant (Solanaceae), Cyphostemma vogelli (Hook. f.) Desc. and Cyphostemma sp. (Vitaceae), Dacryodes edulis (G. Don.) H.J. Lam (Burseraceae), Leucaena leucocephala (Lam.) de Wit and Desmodium repandum (Vahl.) DC. (Fabaceae), M. parasidiaca (Musaceae) and Oplismenus burmannii (Poaceae).

In each vegetation type, sampling was conducted once a week from 07:00 to 12:00, in five