

# A Check-list of Some Elements of the Vegetation in three river basins in the Okyeman Area, Southern Ghana

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## Abstract

The composition of some elements of the aquatic flora was determined in three river basins namely Ayensu, Birim and Densu, in the Okyeman area in Southern Ghana. Samples of these vegetation types, namely bryophytes, podostemonads and rhodophytes, in the three river basins were taken at 16 sites as follows: 4 sampling sites from the Ayensu basin, 7 sampling sites within the Birim and 5 sites were sampled in the Densu basin. Two species of rhodophytes were identified inconclusively. However no bryophyte species and podostemonads were encountered due to stated factors. Issues concerning detailed update of these members of the aquatic flora in Ghana are discussed.

## Introduction

Aquatic flora including the bryophytes, podostemonads, rhodophytes and macrophytes are important in freshwater ecosystems. This is because they are productive (Cooper & Knight, 1985), provide food for birds (Batzer *et al.*, 1993) and fish (Crowder & Cooper, 1982), as well as play other important roles in ecological processes such as decomposition and energy transfer (McQueen, *et al.*, 1986; Dvorak, 1996). The flora of some catchment and sub catchments in Ghana has been studied. For example two members of the Rhodophyta, *Nemastoma* and *Predaea*, belonging to the family Nemastomataceae were described from subtidal habitats in Ghana (Kraft & John, 1976). For one of the species, *Predaea*, this was the first record from Africa. In another study, Swaine *et al.* (2006) recorded 62 plant species in river samples in 28 catchments. However, only nine species out of the lot were related to fast flowing rivers, thus were recognized as rheophytes. The rest were terrestrial, yet strongly influenced by the riverine ecosystem. It is generally known that the

composition of these vegetation elements indicates the ecological state, as well as the environmental conditions of that habitat. For example, plants attached to rocks, provide useful indicators of quality water in head waters of catchments. Their abundance will be low in nutrient concentrations, low with species variation, their diversity high in undisturbed sites and abundance numbers at disturbed sites. Unfortunately there are few records on studies on these elements of the vegetation in Ghana. This study is, therefore, useful as it serves as the launch pad for subsequent investigations into enumeration of flora like the red algae (rhodophytes), bryophytes (mosses and liverworts) as well as the podostemonads occurring on rocks in fast flowing water.

This paper reports an investigation carried out in 3 river basins namely the Ayensu, Birim and Densu, in the Okyeman area in Southern Ghana, to study the composition of some elements of the aquatic flora. Samples of these vegetation types, namely bryophytes, podostemonads and rhodophytes, were studied as part of a project to study and generate useful and

accurate information on the state of water bodies in the Okyeman area, through land use and ecological observations, using the ecosystem approach.

### Study area

Location and Description of the study area (Table 1)

TABLE 1  
Description of the study sites and their location

River Basin	Sampling Site	Location	Description
Ayensu	A1	N 05° 59' 17.3" W 000° 34' 33.0"	Site off main road under bridge at Anumapapam
	A2	N 05° 56' 52.2" W 000° 33' 42.5"	Site near bridge off Kofi parry village.
	A3	N 05° 49' 13.9" W 000° 37' 39.9"	Asuoko Site. River 8m wide and 48cm deep. Water collection site and laundry site.
	A4	N 05° 43' 41.8" W 000° 37' 17.1"	Nyanoa site, along road to mankron with 10m wide and 46cm wide.
Birim	B1	N 06° 17' 03.9" W 000° 27' 39.7"	Site near a bridge on way to Bunso Cocoa College.
	B2	N 06° 21' 25.7" W 000° 29' 00.5"	Site under bridge on outskirts of Osino. Site has steep sites.
	B3	N 06° 23' 11.6" W 000° 33' 09.8"	Site on a bridge along main road at Anyinam. Farming activity evident.
	B4Up	N 06° 05' 21.6" W 000° 45' 50.3"	East of Kade town. River bank completely covered by vegetation. Water fetching and swimming site.
	B4D	N 06° 05' 05.6" W 000° 50' 00.0"	Site located near bridge on road through Kade town.
	B5	N 05° 57' 04.5" W 000° 58' 46.9"	Site below a bridge on the Apoli from Akim Oda. Sampling done on left side of bridge.
	B6	N 05° 57' 01.4" W 001° 09' 21.9"	Site at Apoli near Etwereso. River 20m wide and 35 cm deep. Farming, fishing and water collection site for domestic purposes.
Densu	D2	N 06° 14' 14.3" W 000° 23' 43.5"	Site under a bridge at Kukurantumi. Film of oil observed on water surface.
	D3Up	N 00° 07' 00" W 000° 20' 55.2"	Outskirts of Akwadum in a Cocoa farm. Shaded by bamboo. Flow is slow and water collection site.
	D3D	Poor GPS coverage	Site near a bridge in the centre of Akwadum. River bank steep on both sites.
	D4Up	N 00° 04' 00" W 000° 17' 23.5"	Site just behind water reservoir at Koforidua Water works. Vegetation lined the river. Water collection site.
	D4D	N 00° 00' 54.0" W 000° 17' 30.6"	About 1km walk downstream of water works. Channel about 10m wide and clear to bottom. Human activity including farming and fishing observed.

*Methodology and identification of phytoplankton*

Members of the groups encountered, in Rhodophytes, Bryophytes and Podostemonads at the respective sampling sites are listed in Table 2.

the study; rhodophytes, bryophytes and podostemonads, at the respective sampling sites.

*General observation on vegetation elements*

The floral groups were generally very low in numbers at the ten sampling sites. The aquatic flora community observed consisted

TABLE 2  
*Elements of the aquatic flora observed at respective sampling sites*

River Basin	Sampling Site	Genera of Vegetation Groups		
		Rhodophytes,	Bryophytes	Podostemonads
Ayensu	A1	-	-	-
	A2	1	-	-
	A3	2	-	-
	A4	2	-	-
Birim	B1	1	-	-
	B2	-	-	-
	B3	2	-	-
	B4Up	-	-	-
	B4Dn	1	-	-
	B5	1	-	-
Densu	B6	1	-	-
	D2	2	-	-
	D3 Up	1	-	-
	D3 Dn	1	-	-
	D4Up	1	-	-
	D4D	1	-	-

**Methods**

Plant samples along up to 50 m, where necessary were observed and recorded. Species were identified at the Ghana Herbarium in the Department of Botany, University of Ghana, Legon.

**Results and Discussion**

Table 2 shows a list of members of the elements of the aquatic flora encountered in

of 2 genera of the rhodophytes and none of the bryophytes and the podostemonads.

**Floral Groups***Rhodophytes*

Two genera suspected to be earlier ones observed by John *et al.*, *Nemastoma* and *Lemanea*, were the main genera observed during the survey at all sampling sites. *Lemanea* was more consistent and

encountered at 14 out of the 16 sampling sites. The identity of a third bryophyte genus, observed by the author at site B3, could not be matched with any herbarium specimens, apart from photographs from text books. It is the belief of the author that one set back is the apparent lack of keys to the identification of these organisms.

#### *Bryophytes*

No genera belonging to the bryophytes were observed in the aquatic samples. Swaine *et al.* (2006) did not record any bryophytes in 62 plant species in rivers sampled in 28 catchments. The nature of the habitats sampled and lack of technical expertise could be factors responsible for these results.

#### *Podostemonads*

These are floral groups known to inhabit swift flowing river systems. None of the sampling sites visited exhibited any such condition; as such the complete absence of the podostemonads is not strange.

It is the hope of the author that a more detailed study would be commissioned to review and update the presence of these organisms in the other catchments, as well as

augment herbarium specimens of the groups, especially the freshwater specimens.

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