

Full Length Research Paper

A checklist of desmids of Lekki lagoon, Nigeria

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This paper presents a pioneer investigation of the desmids of Lekki lagoon, located in Epe Local Government area of Lagos State. Samples were collected monthly for two years (June, 2003 - May, 2005) using standard plankton net of 55 µm mesh size. Seventy three taxa were observed, the genera *Closterium* (16), *Gonatozygon* (5), *Penium* (2), *Cosmarium* (8), *Desmidium* (3), *Docidium* (2), *Hyalotheca* (2), *Pleurotaenium* (2), *Spondylosium* (4) and *Staurastrum* (29). Thirty-three of these taxa have not been documented for Nigeria as compared with other relevant work while they all represented the first list for the Lekki lagoon.

Key words: Tropical lagoon, freshwater, desmids, checklist, diversity.

INTRODUCTION

Lagoon environments are usually fertile; they provide shelter, food and nursery grounds for numerous aquatic biota and in many countries attract large fishing industries (Hickling, 1975). Desmids, according to Rawson (1956) and Brook (1965) are recognized to constitute an important group of organisms in the trophic classification of freshwater while Coesel (1975) reported their importance in the typology of lakes generally in various parts of Africa. Available literature on desmids included those of Gronblad and Croasdale (1971); Rich (1935, 1939) and Claassen (1961) all of South Africa; Gronblad et al. (1958) and Gronblad (1962) on desmids from Sudan in North Africa. Nayal, (1932) gave an indepth account of the desmids in Egypt. Gronblad et al. (1968) studied Sierra Leone desmids while Sandra et al. (1990) also in Sierra Leone studied desmids from Guma valley. Gerrath and John (1988, 1991) made their investigations on Ghana desmids while Lind (1967, 1971) concentrated on the desmids of Uganda and other East African countries. Elsewhere, desmids of selected areas in Bagladesh were studied by Islam (1970), Islam and Zaman (1975), and most recently Islam and Akter (2004a, 2006) and Islam and Begum (2004b). In U.S.A., Prescott et al., (1977, 1981), Poland (Tomaszewicz and Kowalski (1993). In Nigeria early works on desmids

include Khan (1984) which listed 48 taxa in 12 genera. Other records are 40 taxa of *Closterium* (Kadiri 1988); 21 taxa of *Micrasterias* (Kadiri and Opute 1989, Kadiri 1999a); 28 taxa of *Cosmarium* (Kadiri 1993a); 24 taxa of some desmids including *Pleurotaenium* and *Gonatozygon* (Kadiri 1993b, 1996), 31 taxa including *Actinotaenium* and *Desmidium* (Kadiri 1999), 20 taxa of contrasting spring desmids including *Cosmarium* and *Euastrum* (Kadiri 2000). Opute (1992, 2000) reported ninety taxa belonging to seventeen genera while Nwankwo (1996) reported 106 taxa belonging to twenty genera and most recently Kadiri (2002) reported desmids in Nigeria while Onyema (2008) reported only 3 taxa, *Closterium*, *Gonatozygon*, and *Staurastrum* from Iyagbe lagoon. There is a need for the compilation of clear records of desmids and taxonomic guides for use in regions where hydrobiology and its applications are still in relative infancy like Nigeria (Kadiri and Opute 1989). Presently, there is no published work on the checklist of desmids of Lekki lagoon. The description of this lagoon was reported by Adesalu and Nwankwo (2009).

MATERIALS AND METHODS

The desmids samples were collected monthly for two years, (June 2003 - May 2005) from Lekki lagoon using standard plankton net of 55µm mesh size towed steadily for ten minutes at low speed and preserved in 4% unbuffered formalin. Investigations were made using Olympus BX51 photomicroscope, relevant texts used for

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Table 1. A check-list of desmids from Lekki lagoon, Nigeria.

Division: Chlorophyta
Class: Chlorophyceae
Order : Desmiales
Family 1: Closteriaceae
Closterium acerosum (Schrank)
**C acutum* Breb.
C. archerianum Cleve
**C archrianum f.major* Irene-Marie
C. ehrenberg Menegh.ex Ralfs
C. gracile Breb
C. gracile var elongata W&G.S.West
**C. juncidum var elongatum* Roy and Biss
**C. lineatum var costatum* Cush
C. parvulum Nag.
**C. pusillum* Hanzsch
C. setaceum Ehr. ex Ralfs
**C. setaceum var.sigmoideum* Irene-Marie
C. venus Kutz.
Closterium sp.I
Closterium sp II.
**Pleurotaenium ehrenbergii var elongatum* West and West
Pleurotaenium sp.
Family 2: Peniaceae
Gonatozygon aculeatum (Hastings)
G. kinahani (Arch.) Rabenhorst.
**G. kinahani var majus* Taylor
G. pilosum Wolle
Gonatozygon sp
Penium libellula (Foche) Nordstedt
Penium sp
Family3: Desmidiaceae
Cosmarium granatum Breb.
**C. lunatum var depressum* W & G West
**C obtusatum* Schmidle
**C turpinii var eximium* W.West
**C. tenue* Arch
Cosmarium sp 1
Cosmarium sp 2
Cosmarium sp 3
Desmidium quadratum Nordst
Desmidium swartzii Agardii
Desmidium sp
Docidium undulatum Bailey
Docidium sp.
Hyalotheca mucosa var minor Roy & Biss
Hyalotheca sp 1
Spondylosium planum (Wolle) W.& G.S. West
S .pulchrum (Bail) Arch. ex Smith
**S. pygaeum* Rab
Spondylosium sp
**Staurastrum arachne var curvatum* W & G.S.West
**S. aspinosum var annulatum* W & G.S.West

Table 1. Contd.

* <i>S. bieneanum</i> Rabenhorst
<i>S. chaetoceras</i> (Shrod.)G.M.Smith
* <i>S. cingulum var floridense</i> Scott & Groubald
* <i>S. curvatum</i> W.West
* <i>S. dickiei var rhomboideum</i> W &G.S. West
* <i>S. elongatum var quadratum</i> Irene-Marie
* <i>S. excavatum var planctonicum</i> Krieg
* <i>S. glabrum</i> Ehr. Ralfs
* <i>S. haxacerum</i> (Ehr.)Wittr
<i>S. leptocladum</i> Nordst
<i>S. leptocladum var cornutum</i> Wille
<i>S. leptocladum var insignis</i> W and G.S.West
* <i>S. leptocladum var sinuatum</i> Wolle
* <i>S. manfeldtii var fluminense</i> Schumacher
<i>S. paradoxum</i> Meyen.
* <i>S. paradoxum var cingulum</i> W&G.S West
* <i>S. paradoxum var parvulum</i> W.West
<i>S. paradoxum var paradoxum f. paradoxum</i> Ralfs
* <i>S. pentacerum</i> (Wolle) G. M. Smith
* <i>S. pingue morpha</i> Thomasson
* <i>S. pingue var pingue</i> Tail
* <i>S. quadricuspidatum</i> Turner
* <i>S. staurogeniaeforme</i>
* <i>S. subcruciatum</i> Cooke & Wille
<i>S. tetracerum</i> Ralfs
<i>Staurastrum</i> sp 1
<i>Staurastrum</i> sp 2

*= New records for Nigeria

identification include Gronblad et al. (1958, 1968); Gronblad and Crosdale (1971); Whitford and Schumacher, 1973).

RESULTS

A total of seventy three taxa were identified belonging to ten genera; *Closterium* (21.92%), *Cosmarium* (10.96%), *Desmidium* (6.85%), *Docidium* (2.74%), *Gonatozygon* (6.85%), *Hyalotheca* (2.74%), *Penium* (2.74%), *Pleurotaenium* (2.74%), *Spondylosium* (5.48%) and *Staurastrum* which is the most frequently encountered of all genera throughout the two years sampling period making up twenty nine species (39.73%). In this study, the taxa are arranged alphabetically within families and genera (Table 1).

DISCUSSION

The genus *Staurastrum* recorded the highest number of taxa (29) followed by *Closterium* (16) and *Cosmarium* (8). This is in conformity with often reported dominance by these genera especially *Staurastrum* and *Cosmarium*

which have been implicated by other authors as constituting about half the population occurring in equal or nearly equal numbers (Lind, 1971; Kadiri 1999, 2002). The abundance of *Staurastrum* over other species is also in agreement with Thomasson (1972) who stated that it is usually attributed to its polymorphic nature. The high diversity of desmids in West Africa and *Closterium* in particular has been connected with high rainfall (Lind 1968, John 1986).

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