

Review article

Taxa of Diatom group in Iraqi water

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Abstract.

This review aimed to survey diatom composition in Iraqi waters. The facts were taken from surveys of phytoplankton in Iraq, covering freshwater and saline waters in diverse cities. A total of 454 taxa of the diatom group belonging to Bacillophyceae class have been verified in the review. These taxa varied among 107 genera. The genus *Nitzschia* had a higher number of taxa followed via *Navicula*, *Cymbella*, *Fragilaria*, and *Gomphonema*, respectively. This study proposes to present a checklist of diatom composition in Iraq, built on the compilation of preceding investigations.

Keywords: Review, diatom, taxa, Iraqi water.

Introduction

Various investigations have been investigated the taxa of diatom in Iraq in ecosystems such as rivers, lakes, marshes, or reservoirs. [Diatoms](#) belong to an enormous group termed the [heterokonts](#), which embrace [heterotrophs](#) and [autotrophs](#). Twenty thousand existed species of diatom, of which about twelve have been termed to date in accordance with [\[1\]](#). About 1,300 genera have been prescribed, fossil and present [\[2\]\[3\]](#) of which around 300 present solely like fossils [\[4\]](#). The community of diatoms yields a huge amount of the air we breathe because of their capability in CO₂ fixation in processes of photosynthesis. Allotting and activities of diatom depend on various features that have [\[5\]\[6\]](#). Numerous studies described the significance of phytoplankton as bioindicators because of their reaction to the variation in an ecosystem [\[7\]\[8\]](#). The taxa of diatoms adduce a unified and inclusive valuation of the quality of water because they remain for a period of time, thus they signify the type of ambiance of environmental systems [\[9\]](#). Diatoms play as a bespeaking of specific kinds of contaminants like heavy metals or organic, likewise, they play a turn in eutrophication [\[10\]\[11\]](#). In Iraq, numerous efforts have been exercised on diatoms identification. Consequently, this review presented information on the composition of diatom algal taxa in Iraq.

Sources and Methods

Literature review. Data were taken from sixty-nine references (55 research papers, four Ph. D. thesis, and ten M. Sc. thesis, dealing with the phytoplanktons. Data from the references were gathered to make the current list of diatoms. The references are ^[12- 80]: Abdulameer (2014), Al Azawey (2012), Al Fatlawi (2011), Al Zubaidi, *et al.* (2006), Al-Handal (1994), Al Hassany, *et al.*, (2014), Al-Hassany and Hassan (2014), Al- Rawi (2013), Al-Araji(1988), Al-Azawi (2004), Al-Handal, *et al.*, (1991), Ali, *et al.*, (2020), Alkam and Abdullah (2013), Alkam and Abdulmuneem (2012), Al-Khalidi and Al-Asady (2019), Al-Lami (1986), Al-Lami,

et al. (1996), Al-Mayyah (1990), Al-Mosawi, *et al.* (1990), Al-Mousawi, *et al.* (1994), Al-Obaidi, *et al.* (2009), Al-Saadi, *et al.* (2000), Al-Saadi, *et al.* (1996), Al-Saadi, *et al.* (2008), Al-Saadi, *et al.* (1995), Al-Saadi, *et al.* (1995), Al-Saadi, *et al.* (2007), Al-Saadii (1993), Al-Saadii (2001) Al-Saadii and Hadi (1987), Al-Saadii, *et al.* (1976), Al-Shawi (2010), Al-Zubaidi (1985), Azawy (2006), Aziz and Muhammed (2016), Aziz (2011), Aziz and Rasoul (2016), Hassan and Shaawiat (2015), Hadi, *et al.* (1984), Hadi and Al-Saboonchi (1989), Hameed (1977), Hassan, *et al.* (2008), Hassan, *et al.* (2006), Hassan, *et al.* (2014), Hassan, *et al.* (2010), Hassan and Al-Saadi (1995), Hassan, *et al.* (2007 a, b), Hinton and Maulood (1980), Huq, *et al.* (1978), Islam and Hameed (1982), Islam and Hameed (1985), Ismail and Saadallah (2010), Kadhim (2005), Kassim, *et al.* (1999), Kassim, *et al.* (1997), Kassim, *et al.* (2001), Maulood (1991), Merhoon, *et al.* (2017), Merza, *et al.* (2020), Mohammed. (2007), Mohammed (2012), Salman, *et al.* (2013), Salman, *et al.* (2013), Salman, *et al.* (2012), Salman, *et al.* (2013 a, b), Shaban (1980), Slam, *et al.* (2012), Toma (2019), Trifa and Shna (2010).

Results and Discussion

This checklist had 454 taxa of diatom group (427 recognized to species level) which varied among 107 genera (Table 1). This variation of diatom denoted to the diverse limnological features of Iraqi waters. The genus *Nitzschia* had a higher number of the taxa followed via *Navicula*, *Cymbella*, *Fragilaria* and *Gomphonema*, respectively (Table 2). The dominant genus was *Nitzschia*, one of the most common genera, because it is frequently found in organically polluted water and is known to favor relatively alkaline and slow-flowing water^[81,82].

Comparing with a review of non-diatom phytoplanktons was done in 2020 via^[83], the number of the taxa of the diatom was more than the number of the taxa of other phytoplanktons which reached 342 taxa. The diatoms' domination in aquatic environments of Iraq is exactly known in all investigations to their capability to reproduce and develop in the common modification in the environment^[84]. Other phytoplankton were less dominant, this may be as they have lesser numbers of species, likewise, they need various nutrients^[85,86].

The factors affect on qualitative of plankton. Uncontaminated ecosystems are known via high values of diversity. The existence, succession, number, or quality of phytoplankton were affected via grazing via zooplankton and via features of a system in waters^[87, 88, 89].

As an outcome, this review included 107 genera, among these genera, *Nitzschia* was dominant, representing about 11.46% of the detected species, followed via *Navicula* (11%). *Cymbella* (6.6%), while some genera as *Aneumastus*, *Bacillaria*, *Balmella*, *Climacodium*, *Dinobryo*, *Eucampia*, *Gloeotheca*, *Hantzschia*, *Licmophora*, *Mallomonas*, *Paralia*, *Rhabdonema*, *Skeletonema*, and *Tryblionella* were represented by one species as represented in table (2). This review listed 427 species only because of relatively insufficient surveys on diatom groups from Iraqi waters.

Table 1. List of diatoms that found in Iraq

Class	Taxon
Bacillariophyceae	<i>Achnanthes affinis</i>
	<i>Achnanthes biasoletiana</i>
	<i>Achnanthes clevis</i>
	<i>Achnanthes conspicua</i>
	<i>Achnanthes delicatula</i>
	<i>Achnanthes exigua</i>
	<i>Achnanthes flexella</i>
	<i>Achnanthes hungarica</i>
	<i>Achnanthes lanceolata</i>
	<i>Achnanthes linearis</i>
	<i>Achnanthes longipes</i>
	<i>Achnanthes microcephala</i>
	<i>Achnanthes minutissima</i>
	<i>Achnanthidium affine</i>
	<i>Achnanthidium conspicua</i>
	<i>Achnanthidium delicatula</i>
	<i>Achnanthidium minutissima</i>
	<i>Actinocyclus octonarius</i>
	<i>Actinocyclus Microcephala</i>
	<i>Actinocyclus minutissima</i>
	<i>Amphipleura pellucida</i>
	<i>Amphipleura sp.</i>
	<i>Amphiprora alata</i>
	<i>Amphiprora coffeaeformis</i>
	<i>Amphora coffeaeformis</i>
	<i>Amphora vitrea</i>
	<i>Amphora Commutata</i>
	<i>Amphora normanii</i>
	<i>Amphora ocellata</i>
	<i>Amphora ovalis</i>
	<i>Amphora perpusilla</i>
	<i>Amphora veneta</i>
	<i>Aneumastus tusculus</i>
	<i>Anomoeneis exilis</i>
	<i>Anomoeneis sp.</i>
	<i>Anomoeneis sphaerophora</i>
	<i>Asterionella formosa</i>
	<i>Asterionella japonica</i>
	<i>Asteromphalus sp.</i>
	<i>Asterolampra sp.</i>
	<i>Aulacoseira ambigua</i>
	<i>Aulacoseira distans</i>
	<i>Aulacoseira granulata</i>
	<i>Aulacoseira italica</i>
	<i>Aulacoseira roeseana</i>
	<i>Aulacoseira Varian</i>
	<i>Bacillaria paxillifer</i> (also known as <i>Bacillaria paradoxa</i>)
	<i>Bacteriastrium comosum</i>
	<i>Bacteriastrium delicatulum</i>
	<i>Bacteriastrium elegans</i>
	<i>Bacteriastrium furcatum</i>

	<i>Bacteriastrum hyalinum</i>
	<i>Balmella asterlionella</i>
	<i>Bellerochea</i> sp.
	<i>Biddulphia</i> sp.
	<i>Biddulphia mobiliensis</i>
	<i>Biddulphia sinensis</i>
	<i>Brachysira exilis</i>
	<i>Caloneis amphisbaena</i>
	<i>Caloneis bacillum</i>
	<i>Caloneis permagna</i>
	<i>Caloneis silicula</i>
	<i>Caloneis ventricosa</i>
	<i>Campylodiscus clypeus</i>
	<i>Campylodiscus Daemelinus</i>
	<i>Campylodiscus echeneis</i>
	<i>Campylodiscus ralfsii</i>
	<i>Campylodiscus noricus</i>
	<i>Cerataulina bargonii</i>
	<i>Cerataulina pelagioa</i>
	<i>Chaetoceros affinis</i>
	<i>Chaetoceros brevis</i>
	<i>Chaetoceros cervisetum</i>
	<i>Chaetoceros crinitus</i>
	<i>Chaetoceros curvisetus</i>
	<i>Chaetoceros decipience</i>
	<i>Chaetoceros densus</i>
	<i>Chaetoceros diversus</i>
	<i>Chaetoceros excentricus</i>
	<i>Chaetoceros lorenzianus</i>
	<i>Chaetoceros Peruvianus</i>
	<i>Chaetoceros politana</i>
	<i>Chrysococcus</i> sp.
	<i>Climacaudium fruenfeldianum</i>
	<i>Cocconeis diminuta</i>
	<i>Cocconeis disculus</i>
	<i>Cocconeis pediculus</i>
	<i>Cocconeis placentula</i>
	<i>Cocconeis scutellum</i>
	<i>Corethron cryophilum</i>
	<i>Coscinodiscus asteromphalus</i>
	<i>Coscinodiscus centralis</i>
	<i>Coscinodiscus concinnus</i>
	<i>Coscinodiscus gigas</i>
	<i>Coscinodiscus granii</i>
	<i>Coscinodiscus kuetzingii</i>
	<i>Coscinodiscus lacustris</i>
	<i>Coscinodiscus oculus</i>
	<i>Coscinodiscus perforatus</i>
	<i>Coscinodiscus radiatus</i>
	<i>Coscinodiscus rothii</i>
	<i>Cyclotella atomus</i>
	<i>Cyclotella comta</i>
	<i>Cyclotella crassa</i>
	<i>Cyclotella glomerata</i>
	<i>Cyclotella katzingiana</i>
	<i>Cyclotella meneghiniana</i>

	<i>Cyclotella ocellata</i>
	<i>Cyclotella radiosia</i>
	<i>Cyclotella stelligera</i>
	<i>Cyclotella striata</i>
	<i>Cyclotella Stylorum</i>
	<i>Cymatopleura elliptica</i>
	<i>Cymatopleura solea</i>
	<i>Cymbella affinis</i>
	<i>Cymbella amphicephala</i>
	<i>Cymbella angustata</i>
	<i>Cymbella aspera</i>
	<i>Cymbella caepitosa</i>
	<i>Cymbella cesutii</i>
	<i>Cymbella cistula</i>
	<i>Cymbella creptocyphala</i>
	<i>Cymbella cymbiformis</i>
	<i>Cymbella differta</i>
	<i>Cymbella gracilis</i>
	<i>Cymbella helvetica</i>
	<i>Cymbella Hustedtii</i>
	<i>Cymbella lanceolata</i>
	<i>Cymbella leptoceros</i>
	<i>Cymbella leptoris</i>
	<i>Cymbella microcephala</i>
	<i>Cymbella obtusiuscula</i>
	<i>Cymbella parva</i>
	<i>Cymbella perpusilla</i>
	<i>Cymbella prostrata</i>
	<i>Cymbella pusilla</i>
	<i>Cymbella sinuate</i>
	<i>Cymbella sinuta</i>
	<i>Cymbella tumida</i>
	<i>Cymbella tumidula</i>
	<i>Cymbella turgida</i>
	<i>Cymbella ventricosa</i>
	<i>Cylindrotheca closterium</i>
	<i>Cylindrotheca gracilis</i>
	<i>Dandorina</i> sp.
	<i>Denticula degens</i>
	<i>Denticula elegans</i>
	<i>Denticula rainierensis</i>
	<i>Denticula</i> sp.
	<i>Diatoma dongatum</i>
	<i>Diatoma elongatum</i>
	<i>Diatoma elongtoma</i>
	<i>Diatoma hiemale</i>
	<i>Diatoma tenue</i>
	<i>Diatoma vulgare</i>
	<i>Diatomella</i> sp.
	<i>Dinobryo gomphosphaerla</i>
	<i>Diploneis bombuus</i>
	<i>Diploneis elliptica</i>
	<i>Diploneis interrupta</i>
	<i>Diploneis ovalis</i>
	<i>Diploneis pseudovalis</i>
	<i>Diploneis smithii</i>

	<i>Ditylum brightweellii</i>
	<i>Ditylum sol Grun</i>
	<i>Duodenarium bailey</i>
	<i>Epithema zebra</i>
	<i>Epithemia sorex</i>
	<i>Epithemia turgida</i>
	<i>Eucampia zodiacus</i>
	<i>Eunotia arcus</i>
	<i>Eunotia formica</i>
	<i>Eunotia lunaris</i>
	<i>Eunotia pectinalis</i>
	<i>Eunotia pectinas</i>
	<i>Eunotia valida</i>
	<i>Fragilaria acus</i>
	<i>Fragilaria affinis</i>
	<i>Fragilaria brevistriata</i>
	<i>Fragilaria capitata</i>
	<i>Fragilaria capucina</i>
	<i>Fragilaria constrems</i>
	<i>Fragilaria Construens</i>
	<i>Fragilaria crotonensis</i>
	<i>Fragilaria fasciculata</i>
	<i>Fragilaria intermedia</i>
	<i>Fragilaria minuscula</i>
	<i>Fragilaria pinnata</i>
	<i>Fragilaria pulchella</i>
	<i>Fragilaria tabulata</i>
	<i>Fragilaria ulna</i>
	<i>Fragilaria vaucheriae</i>
	<i>Fragilaria virescens</i>
	<i>Gomphonema abbreviatum</i>
	<i>Gomphonema acuminatum</i>
	<i>Gomphonema angustatum</i>
	<i>Gomphonema attenuatum</i>
	<i>Gomphonema augur</i>
	<i>Gomphonema constrictum</i>
	<i>Gomphonema gracile</i>
	<i>Gomphonema intracatum</i>
	<i>Gomphonema intricatum</i>
	<i>Gomphonema lanceolatum</i>
	<i>Gomphonema montanum</i>
	<i>Gomphonema olivacea</i>
	<i>Gomphonema olivaceum</i>
	<i>Gomphonema parvulum</i>
	<i>Gomphonema sphaerophorum</i>
	<i>Gomphonema tergestinum</i>
	<i>Gomphonema turris</i>
	<i>Geminella crenulato</i>
	<i>Geminella interrupta</i>
	<i>Geminella sp.</i>
	<i>Gloeotheca rupestris</i>
	<i>Gomphoneis olivacea</i>
	<i>Gomphotheca sinensis</i>
	<i>Gloeothichia sp.</i>
	<i>Gomplosphaeria lacustris</i>
	<i>Gonatozygon sp.</i>

	<i>Guinardia blavyana</i>
	<i>Guinardia flaccida</i>
	<i>Gyrodinium</i> sp.
	<i>Gyrosigma acuminatum</i>
	<i>Gyrosigma attenuatum</i>
	<i>Gyrosigma balticam</i>
	<i>Gyrosigma fasciola</i>
	<i>Gyrosigma macrum</i>
	<i>Gyrosigma peisonis</i>
	<i>Gyrosigma scalproides</i>
	<i>Gyrosigma sinensis</i>
	<i>Gyrosigma spenceri</i>
	<i>Gyrosigma stregilii</i>
	<i>Gyrosigma tenuirostrum</i>
	<i>Hantzschia amphioxys</i>
	<i>Hemiaulus membranaceus</i>
	<i>Hemiaulus hauckii</i>
	<i>Hemidiscus cuneiformis</i>
	<i>Hemidiscus sinensis</i>
	<i>Holopedium irregulare</i>
	<i>Hyalodiscus</i> sp.
	<i>Lauderia annulata</i>
	<i>Lauderia borealis</i>
	<i>Leptocylindrus danicus</i>
	<i>Leptocylindrus</i> sp.
	<i>Limnophora enrenborgii</i>
	<i>Lithodesmium undulatum</i>
	<i>Mallomonas</i> sp.
	<i>Mastogloia braunii</i>
	<i>Mastogloia ellipti</i>
	<i>Mastogloia elliptica</i>
	<i>Mastogloia jurgensii</i>
	<i>Mastogloia smithii</i>
	<i>Melosira ambigua</i>
	<i>Melosira distance</i>
	<i>Melosira granulata</i>
	<i>Melosira italica</i>
	<i>Melosira moniliformis</i>
	<i>Melosira spaerica</i>
	<i>Melosira variance</i>
	<i>Melosira varians</i>
	<i>Meridion circulare</i>
	<i>Navicula acuta</i>
	<i>Navicula americana</i>
	<i>Navicula anglica</i>
	<i>Navicula apiculata apiculate</i>
	<i>Navicula atomus</i>
	<i>Navicula bacillum</i>
	<i>Navicula bryophila</i>
	<i>Navicula buccella</i>
	<i>Navicula cincta</i>
	<i>Navicula crucicula</i>
	<i>Navicula cryptocephala</i>
	<i>Navicula cuspidata</i>
	<i>Navicula decussis</i>
	<i>Navicula dicephala</i>

	<i>Navicula fusca</i>
	<i>Navicula gastrum</i>
	<i>Navicula gibbula</i>
	<i>Navicula gracilis</i>
	<i>Navicula graciloides</i>
	<i>Navicula gregaria</i>
	<i>Navicula griseum</i>
	<i>Navicula halophila</i>
	<i>Navicula hungarica</i>
	<i>Navicula hustdtii</i>
	<i>Navicula inflata</i>
	<i>Navicula lanceolata</i>
	<i>Navicula mutica</i>
	<i>Navicula oblonga</i>
	<i>Navicula parva</i>
	<i>Navicula perrotettii</i>
	<i>Navicula phyllepta</i>
	<i>Navicula placentula</i>
	<i>Navicula pseudohalophila</i>
	<i>Navicula pseudotuscula</i>
	<i>Navicula pupula</i>
	<i>Navicula pygmaea</i>
	<i>Navicula radiosa</i>
	<i>Navicula radiosa</i>
	<i>Navicula rhynchocephala</i>
	<i>Navicula salinarum</i>
	<i>Navicula schroeteri</i>
	<i>Navicula similis</i>
	<i>Navicula simplex</i>
	<i>Navicula spicula</i>
	<i>Navicula tenera</i>
	<i>Navicula trivialis</i>
	<i>Navicula viridula</i>
	<i>Neidium affine</i>
	<i>Neidium iridis</i>
	<i>Neidium productum</i>
	<i>Nitzschia acicularis</i>
	<i>Nitzschia amphibia</i>
	<i>Nitzschia amphicephala</i>
	<i>Nitzschia angustata</i>
	<i>Nitzschia bilobata</i>
	<i>Nitzschia circumscuta</i>
	<i>Nitzschia closterium</i>
	<i>Nitzschia cluassii</i>
	<i>Nitzschia communis</i>
	<i>Nitzschia commutata</i>
	<i>Nitzschia dissipata</i>
	<i>Nitzschia dubia</i>
	<i>Nitzschia fasciculata</i>
	<i>Nitzschia filiformis</i>
	<i>Nitzschia fonticola</i>
	<i>Nitzschia frustulum</i>
	<i>Nitzschia fruticosa</i>
	<i>Nitzschia gracilis</i>
	<i>Nitzschia granulata</i>
	<i>Nitzschia hantzschiana</i>

	<i>Nitzschia hungarica</i>
	<i>Nitzschia hustediana</i>
	<i>Nitzschia hybrida</i>
	<i>Nitzschia ignorata</i>
	<i>Nitzschia inconspicue</i>
	<i>Nitzschia incurva</i>
	<i>Nitzschia intermedia</i>
	<i>Nitzschia kuetzingiana</i>
	<i>Nitzschia linearis</i>
	<i>Nitzschia littoralis</i>
	<i>Nitzschia longissima</i>
	<i>Nitzschia lorenziana</i>
	<i>Nitzschia microcephala</i>
	<i>Nitzschia obtusa</i>
	<i>Nitzschia palea</i>
	<i>Nitzschia paleacea</i>
	<i>Nitzschia pandurifomis</i>
	<i>Nitzschia punctata</i>
	<i>Nitzschia pusilla</i>
	<i>Nitzschia romana</i>
	<i>Nitzschia scalaris</i>
	<i>Nitzschia seriati</i>
	<i>Nitzschia sigma</i>
	<i>Nitzschia sigmoidea</i>
	<i>Nitzschia spectabilis</i>
	<i>Nitzschia stagnorum</i>
	<i>Nitzschia tryblionella</i>
	<i>Nitzschia umbonata</i>
	<i>Nitzschia vermicularis</i>
	<i>Odontella mobiliensis</i>
	<i>Odontella sinensis</i>
	<i>Ophiocutium</i> sp.
	<i>Palmella</i> sp.
	<i>Paralia sulcata</i>
	<i>Peridinium</i> sp.
	<i>Petrodictyon gemma</i>
	<i>Petroneis</i> sp.
	<i>Picutosigma</i> sp.
	<i>Pimmularia aleptosoma</i>
	<i>Pimmularia alpine</i>
	<i>Pimmularia appendiculata</i>
	<i>Pimmularia borealis</i>
	<i>Pimmularia brebissonii</i>
	<i>Pimmularia gentilis</i>
	<i>Pimmularia globiceps</i>
	<i>Pimmularia piagrame</i>
	<i>Pinuclearia tatar</i>
	<i>Plagiotropis lepidoptera</i>
	<i>Planktoniella</i> sp.
	<i>Planktoniella sol</i>
	<i>Pleurosigma aestuari</i>
	<i>Pleurosigma angulatum</i>
	<i>Pleurosigma capense</i>
	<i>Pleurosigma delicatulum</i>
	<i>Pleurosigma directum</i>
	<i>Pleurosigma elongatum</i>

	<i>Pleurosigma normanni</i>
	<i>Pleurosigma obscurum</i>
	<i>Pleurosigma salinarum</i>
	<i>Pseudostaurosira brevistriata</i>
	<i>Podosira stelliger</i>
	<i>Rhabdonema adriaticum</i>
	<i>Rhizoclonium artitspira</i>
	<i>Rhizoclonium hieroglyphicus</i>
	<i>Rhizosolenia alata</i>
	<i>Rhizosolenia calcar</i>
	<i>Rhizosolenia calearavis</i>
	<i>Rhizosolenia imricata</i>
	<i>Rhizosolenia robusta</i>
	<i>Rhizosolenia setigera</i>
	<i>Rhizosolenia shrubslei</i>
	<i>Rhoicosphenia curvata</i>
	<i>Rhoicosphenia marina</i>
	<i>Rhopalodia gibba</i>
	<i>Rhopalodia gibberula</i>
	<i>Rhopalodia musculus</i>
	<i>Rhopalodia parallela</i>
	<i>Scoliopleura</i> sp.
	<i>Skeletonema costatum</i>
	<i>Spirotaenia</i> sp.
	<i>Surirella angusta</i>
	<i>Surirella angustata</i>
	<i>Surirella biseriata</i>
	<i>Surirella capronii</i>
	<i>Surirella gemma</i>
	<i>Surirella ovalis</i>
	<i>Surirella ovata</i>
	<i>Surirella ovatis</i>
	<i>Surirella recedens</i>
	<i>Surirella robusta</i>
	<i>Surirella striatula</i>
	<i>Stauroneis phenicenteron</i>
	<i>Stauroneis smithii</i>
	<i>Stauroneis</i> sp.
	<i>Stephanodiscus astrea</i>
	<i>Stephanediscus dubius</i>
	<i>Stephanodiscus hantzschii</i>
	<i>Stephanediscus tenuis</i>
	<i>Streptotheca tamesis</i>
	<i>Striata anipunctat</i>
	<i>Striatella unipunctata</i>
	<i>Synedra acus</i>
	<i>Synedra affinis</i>
	<i>Synedra capitata</i>
	<i>Synedra fasciculata</i>
	<i>Synedra pulchella</i>
	<i>Synedra rumpens</i>
	<i>Synedra tabulate</i>
	<i>Synedra ulna</i>
	<i>Synedra vaucheria</i>
	<i>Tabellaria dinobryon</i>
	<i>Tabellaria flocculosa</i>

<i>Tabellaria</i> sp.
<i>Thalassiosira anguster</i>
<i>Thalassiosira decipiens</i>
<i>Thalassiosira fluyiatilis</i>
<i>Thalassiosira hyalina</i>
<i>Thalassiosira leptopa</i>
<i>Thalassiosira weissflogii</i>
<i>Thalassionema nitzschioides</i>
<i>Thalassiothrix fruenfeldii</i>
<i>Tropidoneis lepidoptera</i>
<i>Tryblionella debilis</i>

Table2: Number of species and taxa of diatom group

Genera	Species	Taxa	Genera	Species	Taxa
<i>Achnanthes</i>	13	13	<i>Gyrosigma</i>		1
<i>Achnanthidium</i>	4	4	<i>Hantzschia</i>	1	1
<i>Actinocyclus</i>	3	3	<i>Hemiaulus</i>	2	2
<i>Amphipleura</i>	1	2	<i>Hemidiscus</i>	2	2
<i>Amphipora</i>	2	2	<i>Holopedium</i>	1	1
<i>Amphora</i>	8	8	<i>Hyalodiscus</i>		1
<i>Aneumastus</i>	1	2	<i>Lauderia</i>	2	2
<i>Anomoeneis</i>	2	3	<i>Leptocylindrus</i>	1	2
<i>Asterionella</i>	2	2	<i>Licmophora</i>	1	1
<i>Asteromphalus</i>		1	<i>Lithodesmium</i>	1	1
<i>Asterolampra</i>		1	<i>Mallomonas</i>	1	1
<i>Aulacoseira</i>	6	6	<i>Mastogloia</i>	5	5
<i>Bacillaria</i>	1	1	<i>Melosira</i>	8	8
<i>Bacteriastrium</i>	5	5	<i>Meridion</i>	1	1
<i>Balmella</i>	1	1	<i>Navicula</i>	47	47
<i>Bellerochea</i>		1	<i>Neidium</i>	3	3
<i>Biddulphia</i>	2	3	<i>Nitzschia</i>	49	49
<i>Brachysira</i>	1	1	<i>Odontella</i>	2	2
<i>Caloneis</i>	5	5	<i>Ophiocutium</i>		1
<i>Campylodiscus</i>	5	5	<i>Palmella</i>		1
<i>Cerataulina</i>	2	2	<i>Paralia</i>	1	1
<i>Chaetoceros</i>	12	12	<i>Peridinium</i>		1
<i>Chrysococcus</i>		1	<i>Petrodictyon</i>	1	1
<i>Climacodium</i>	1	1	<i>Petroneis</i>		1
<i>Cocconeis</i>	5	5	<i>Picutosigma</i>		1
<i>Corethron</i>	1	1	<i>Pinnularia</i>	8	8
<i>Coscinodiscus</i>	11	11	<i>Pinuclearia</i>	1	1
<i>Cyclotella</i>	11	11	<i>Plagiotropis</i>	1	1
<i>Cymatopleura</i>	2	2	<i>Planktoniella</i>	1	2
<i>Cymbella</i>	28	28	<i>Pleurosigma</i>	9	9
<i>Cylindrotheca</i>	2	2	<i>Pseudostaurosira</i>	1	1
<i>Dandorina</i>		1	<i>Podosira</i>	1	1
<i>Denticula</i>	3	4	<i>Rhabdonema</i>	1	1
<i>Diatoma</i>	6	6	<i>Rhizoclonium</i>	2	2
<i>Diatomella</i>	1	1	<i>Rhizosolenia</i>	7	7
<i>Dinobryo</i>	1	1	<i>Rhoicosphenia</i>	2	2
<i>Diploneis</i>	6	6	<i>Rhopalodia</i>	4	4
<i>Ditylum</i>	2	2	<i>Scoliopleura</i>		1
<i>Duodenarium</i>	1	1	<i>Skeletonema</i>	1	1
<i>Epithema</i>	3	3	<i>Spirotaenia</i>		1

<i>Eucampia</i>	1	1	<i>Surirella</i>	11	11
<i>Eunotia</i>	6	6	<i>Stauroneis</i>	2	3
<i>Fragilaria</i>	17	17	<i>Stephanodiscus</i>	4	4
<i>Gomphonema</i>	17	17	<i>Streptotheca</i>	1	1
<i>Geminella</i>	2	2	<i>Striata</i>	1	1
<i>Geminella</i>		1	<i>Striatella</i>	1	1
<i>Gloeotheca</i>	1	1	<i>Synedra</i>	9	9
<i>Gomphoneis</i>	1	1	<i>Tabellaria</i>	2	3
<i>Gomphotheca</i>	1	1	<i>Thalassiosira</i>	6	6
<i>Gloeothichia</i>		1	<i>Thalassionema</i>	1	1
<i>Gomplosphaeria</i>	1	1	<i>Thalassiothrix</i>	1	1
<i>Gonatozygon</i>		1	<i>Tropidoneis</i>	1	1
<i>Guinardia</i>	2	2	<i>Tryblionella</i>	1	1
<i>Gyrodinium</i>		1			

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