QUICK AUTUMNAL VIEW OF ALGAE, WATER QUALITY AND NATURE CONSERVATION OF THE VJOSA AREA, TEPELENA, ALBANIA

ANISA TOSKA[1], HENRI BORDE[2], ERISA SEITI[3], ALEKO MIHO[4]

[1]*Graduated in MSc. Environmental Biology, Department of Biology, Faculty of Natural Sciences, University of Tirana, Albania*

[2]*Environmental Monitoring (B.Sc.), Dresden University of Applied Sciences (HTWD), Germany*

[3]*MSc. Environmental Biology, Department of Biology, Faculty of Natural Sciences, University of Tirana, Albania*

[4]*Department of Biology, Faculty of Natural Sciences, University of Tirana, Albania*

Contact: aleko.miho@fshn.edu.al

Abstract

A joint Summer School was organized by the Dresden University of Applied Sciences (HTWD) and the University of Tirana (UT), in September 2025, with the focus Vjosa River, Monitoring and Conservation. Algal findings (Team 4) are reported here. Sampling was in representative habitats of Vjosa and Drino Rivers in Tepelena and some other freshwater habitats nearby. 48 aquatic plant species are reported, where 35 are algae. Cladophora, Spirogyra, Zygnema species were the most common and relatively abundant. The yellow-green algae Vaucheria was abundant in Hotel waterfall, Cold Water, Tepelena, noted for the first time in Vjosa waters. Chara species were relatively abundant and in reproductive stage in Lekli, Drino River and Spring Canal, Tepelena. Cyanobacteria species of Oscillatoria or Phormidium, known as toxic, were scarcely to moderately observed, too. The waters seem to be of the first quality (I), unpolluted, in the most upstream part of the Cold Water spring; the quality drops to II immediately downstream, from the Hotel waterfall, the Spring Canal and the Lekli, Drino; even to III at the Dragoti, Vjosa; it corresponds to moderate to

relatively high pollution. Moreover, high erosion was evidenced there, showing poor land use in the Vjosa watershed. Taking care of nature conservation must be a permanent challenge for all municipalities and other relevant stakeholders to preserve the water quality of the Vjosa NP, but also human health within the Vjosa valley Biosphere Reserve, and its attractiveness.

Keywords: *Algalogy, Vjosa Wild River NP, water quality, ecological state, nature conservation.*

Përmbledhje

Një Shkollë Verore e përbashkët u organizua nga Universiteti i Shkencave të Aplikuara të Dresdenit (HTWD) dhe Universiteti i Tiranës (UT), në shtator 2025, me fokus në Lumin Vjosë, Monitorimin dhe Ruajtjen. Këtu sillen gjetjet për algat (Grupi 4). Mostrat u morën në habitate përfaqësuese të lumenjve Vjosë dhe Drino në Tepelenë dhe disa habitate të tjera të ujërave të ëmbla aty pranë. Këtu sillen 48 bimë ujore, prej të cilave 35 lloje janë alga. Llojet Cladophora, Spirogyra, Zygnema ishin më të zakonshmet dhe relativisht të bollshme. Alga e verdhë-jeshile Vaucheria ishte e bollshme në ujëvarën e Hotelit, Uji i Ftohtë, Tepelenë, e vërejtur për herë të parë në ujërat e Vjosës. Llojet e gjinisë Chara ishin relativisht të bollshme dhe në fazë riprodhimi në Lekli, Lumin Drino dhe Kanalin e Burimit, Tepelenë. U vunë re gjithashtu cianobakteret e gjinive Oscillatoria ose Phormidium, të njohura si helmuese. Ujërat duket se janë të cilësisë së parë (I), të pandotura, në pjesën më të sipërme të burimit të Ujit të Ftohtë; cilësia bie në II menjëherë poshtë rrjedhës, nga ujëvara e Hotelit, Kanali i Burimit dhe Lekli, Drino; madje në III te Dragoti, Vjosë; kjo i përket ndotjes mesatare deri të lartë. Në ujëra vihet re gjithashtu edhe erozion i lartë, si dëshmi e përdorimit të keq të tokës brenda hapësirës së pellgut të Vjosës. Kujdesi për ruajtjen e natyrës duhet të jetë një sfidë e përhershme për të gjitha bashkitë dhe gjithë palët e tjera të interesuara për të ruajtur cilësinë e ujit të PK Vjosës, por edhe shëndetin e njeriut brenda Rezervës së Biosferës së luginës së Vjosës dhe fuqinë e saj tërheqëse.

Fjalë kyçe: *Algalogji, Parku Kombëtar i Lumit të Egër Vjosa, cilësia e ujit, gjendja ekologjike, ruajtja e natyrës.*

Introduction

A joint Summer School was organized by the Dresden University of Applied Sciences (HTWD) and the University of Tirana (UT), from 22-27 September 2025. The special focus was on '*River Monitoring and Conservation – the Vjosa River as a Case Study of a Unique Wild River in Europe*'. It followed an interdisciplinary approach with 6 Working Teams (WT): 1 & 2, Plastic pollution (macro- & microplastics); 3, Vegetation; **4, Phytobenthos (algae);** 5, Zoobenthos; and 6, UAV photogrammetry.

In the first day the students attended lectures at the FNS, UT, by the supervisors from both universities, dealing with Biodiversity/Ecology, Water Quality, Macro-/Microplastics, with particular focus on the Vjosa. The rest was on the field: 2-3 days in the Vjosa middle and upper parts, and after the Vjosa lower part and its Delta; the seminar for the data presentation was on the last day at the University of Vlora '*Ismail Qemali*'. The most important findings of the Algal team (WT 4) will be summarized here.

The aim of our team was to acquire preliminary skills in: sampling methodology for algae (periphyton); microscope use and species identification; photographing microscopic species; processing photos and presenting data; etc. As result a representative aquatic plant checklist and related quantity was prepared, and a set of microscopic photos and other field photos, worth to be presented also here. Beside algae, other submersed macrophytes (not algae) were considered too. Some considerations on algal diversity, water quality and nature conservation are emphasized. Worth mentioning that **macrophytes and periphyton (mainly diatoms) are two key bioindicators of the Water Framework Directive (WFD 2000/60/EC)** for assessing the ecological status of surface water bodies. Our study is still in process, but as such this paper may help ecologists for a quickly approach of the surface water bioquality and human impact; it can also serve **as a tool for local stakeholders to assist in concrete measures to preserve water and life quality in the area**.

Material and methods

Sampling was in representative habitats of Vjosa and Drino Rivers in Tepelena and some other interesting freshwater habitats nearby: 1) Dragoti/Vjosa river, few kilometers downstream Dragoti bridge, ca. 1 km before joining Drino River; 2) Cold Water/Spring, the untouched upstream part; 2/1) Cold Water/Hotel, the nearby artificial waterfall; 3) Lekli/Drino river, downstram Lekli bridge, ca. 1 km before joining Vjosa; 4) Tepelena/Spring canal, its downstream part, before joining Vjosa, nearby Vjosa Research Center (VRC), Tepelena (Fig. 1).

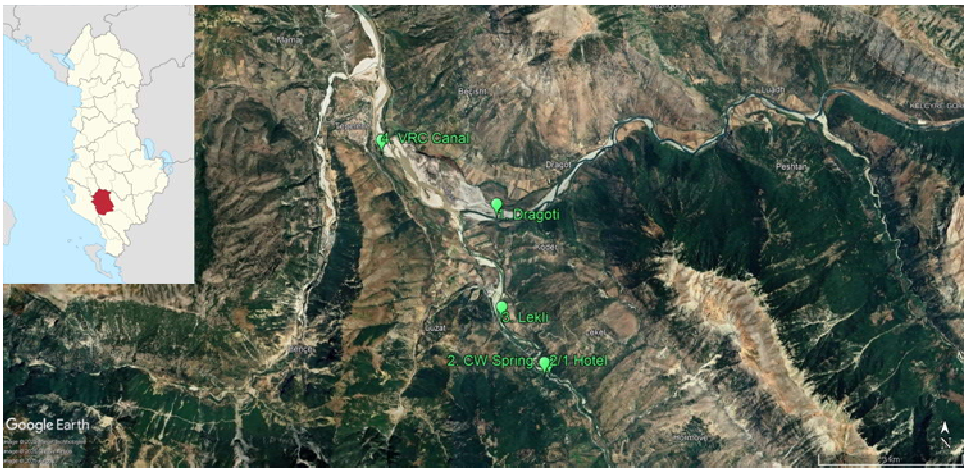


Figure 1. Satellite map of the visited stations in Tepelena, September 2025.

A toothbrush and/or a knife were used to scratch the algae from the submersed stones, mostly based on the standard EN13946:2003. Samples were observed fresh using a microscope REICHERT-JUNG NEOVAR 2 at the VRC, Tepelena; ocular pictures were taken directly using iPhone12. The samples were preserved with Lugol's solution and examined further in Tirana using a Leica DM4B microscope, and a Leica M205C stereomicroscope, both equipped with digital cameras.

A representative checklist of algae was prepared, noting their relative abundance: +++++ (very abundant); +++ (moderately present); + (scarcely present). For the taxonomic and ecologic aid were mostly used: Bellinger & Sigee (2010), Kadlubowska (1984), Rieth (1980), Streble *et al.* (2018), etc., a collection of microscopic photos from Vjosa and the web data.

The table on page 354 of Streble *et al.* (2018) combines several ways of assessing water quality: 4 nutrient classes (oligotrophic, mesotrophic, eutrophic and polytrophic); 4 water quality classes (I, oligosaprobe - os; II, ß-mesosaprobe - bms; III, α-mesosaprobe - ams; IV, polysaprobe - ps); the ecological value, saproby and other quality classes are given for each species and also discussed here.

Results

After a quick assessment in Tepelena, and then in Tirana by A. Miho, all the species found are reported in table 1, grouped after the main systematic groups, with the presence and relative quantity for each species in each habitat. The second column provides with the ecological data (saproby). In figures 2 -4 microscopic photos of the most important algae are reported. Significant views from the visited habitats are given in figure 5, too.

A total of 48 aquatic species were recorded, including 35 algal species and 13 macrophytes. Of 13 macrophytes, 11 species are flowering plants (5 eudicots and 6 monocots), one fern, and one aquatic moss. It was possible to give the saproby values for 37 plant species, where 29 are algae, based mainly on Streble *et al*. (2018; *p*. 354). For some species we have uncertainty on the right scientific name, reported as *cf*.; it is due to scarce information (e.g. absence of reproductive stages), or scarce experience and literature.

More algal species were in Dragoti, Vjosa, 15 species; in the Cold Water spring, 10 species; in the Hotel waterfall, 13 species; in Lekli, Drino, 11 species; and in the spring Canal near VRC, 8 species. Seven species are marked in red because they were found for the first time in the Vjosa waters, according to the latest data of Miho (*in preparation*). Worth emphasizing that in periphyton, but also in general, diatoms are numerous; but with our quick approach it was not possible to have a complete species list. The work

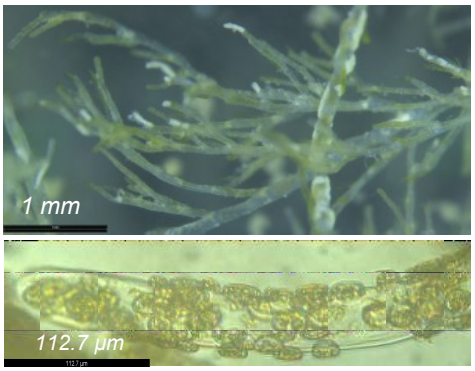
is in process; based on the diatom's community, the Index of Pollution Sensitivity, IPS (Coste in Cemagref, 1982), can be calculated; IPS helps better for a more accurate estimation of the habitat bioquality.

Table 1. Checklist of plant species (macrophytes and algae) found in the Tepelena waters, September 2025, distribution by stations, their ecological value (saproby) and relative abundance; WF, waterfall; VRC, Vjosa Research Center, Tepelena.

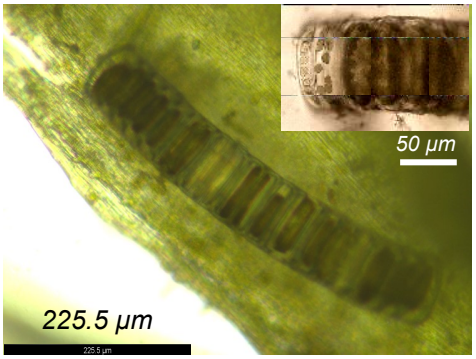
River name		**1. Vjosa**	**2. Spring**	**2/1. Spring**	**3. Drino**	**4. Spring**
Place name		**Dragoti**	**Cold Water**	**Hotel WF**	**Lekli**	**VRC Canal**
Coordinates		40°16'46.33"N 20° 3'11.28"E	40°15'0.53"N 20°3'52.88"E	40°15'0.59"N 20°3'56.98"E	40°15'37.75"N 20° 3'15.64"E	40°17'28.93"N 20° 1'30.78"E
Species list/ Saproby/Date		**23.09.2025**	**24.09.2025**			
Tracheophyta - Eudicots						
Berula erecta (Huds.)Coville	os-bms/ams (I-II/III)					+++
Lactuca muralis (L.)Gaertn.				+		
Mentha aquatica L.	os-bms (I-II)				+	
Myriophyllum cf. *heterophyllum* Michx.*	os-bms (I-II)				+	
Petasites hybridus (L.) G.Gaertn., B.Mey. & Scherb.				+++		
**See comments given in figure 6.*						
Tracheophyta - Monocots						
Alisma cf. *lanceolatum* With.					+	
Lemna minor L.	bms-ams (II-III)					+++++
Paspalum cf. *paspaloides* (Michx.) Scribn.					+	
Potamogeton crispus L.	ams (III)				+	
Potamogeton nodosus Poir	os-bms (I-II)				+++	
Typha spp.	bms-ams (II-III)				+++	+++
Tracheophyta - Polypodiophyta						
Cystopteris cf. *fragilis* (L.) Bernh.			+			

River name		**1. Vjosa**	**2. Spring**	**2/1. Spring**	**3. Drino**	**4. Spring**
Place name		**Dragoti**	**Cold Water**	**Hotel WF**	**Lekli**	**VRC Canal**
Briophyta						
Cratoneuron filicinum (Hedw.)Spruce	os (I)		+++++			
Charophyta						
Chara gymnophylla (A.Braun) A.Braun	os/bms (I/II)					+++
Chara vulgaris var. *longibracteata* (Kütz.)Kütz.	os/bms (I/II)	+			+++	
Closterium cf. *lunula* (O.F. Müller) Nitzsch ex Ralfs	os/bms (I/II)					+
Mugeotia sp.	os-bms (I-II)	+				
Spirogyra porticalis (O.F.Müller)Dumortier	bms (II)	+++	+	+	+++++	+++
Spirogyra spp.	os/bms-bms (I/II-II)				+++	+
Spirogyra cf. *infalata* (Vaucher)Kützing	os-bms (I-II)	+				
Zygnema cf. *decussatum* (Vauch.)Agarth	os-bms (I-II)				+++++	
Zygnema cf. *kashmiriense* J.N.Misra	os-bms (I-II)	+		+++++		+++++
Clorophyta						
Cladophora glomerata (Linnaeus) Kützing	os/bms-ams (I-III)	+++++		+++		
Cosmarium formosulum Hoff	os-bms (I-II)	+				
Cosmarium sp.	os-bms (I-II)				+++	
Oedogoinium sp.	bms (II)	+				+
Pseudopediastrum integrum (Nägeli) M.Jena & C.Bock	bms (II)	+				
Stigeoclonium cf. *tenue (Agardh) Kützing*	ams (III)					
Ulothrix cf. *aequalis* Kützing	bms (II)			+		

River name		**1. Vjosa**	**2. Spring**	**2/1. Spring**	**3. Drino**	**4. Spring**
Place name		**Dragoti**	**Cold Water**	**Hotel WF**	**Lekli**	**VRC Canal**
Xanthophyta						
Vaucheria cf. *sessilis* (Vaucher)De Candolle	bms (II)			+++++		
Bacillariophyta-Centrales						
Ellerbeckia arenaria (D.Moore ex Ralfs) Dorofeyuk & Kulikovskiy	os (I)		+++++	+++		
*Melosira varians*Agardh	bms (II)			+++		
Bacillariophyta - Pennales						
Cocconeis pediculus Ehrenberg	bms(II)	+++++	+	+++		
Cocconeis spp.	bms (II)	+	+			
Craticula cuspidata (Kützing) D.G.Mann	os (I)				+	
Cymbella lanceolata C.Agardh	bms(II)			+++	+++	
Diatoma vulgaris Bory gr.	bms (II)		+	+++		
Fragilaria spp.	bms (II)	+	+			
Gomphonella olivacea (Hornemann) Rabenhorst	bms (II)					
Gyrosigma sp.	bms (II)	+				
Navicula spp.		+	+		+	
Nitzschia spp.			+	+		
Ulnaria ulna (Nitzsch)Compère	bms-ams (II-III)		+++		+	+
Cyanobacteria						
Oscillatoria princeps Vaucher *ex* Gomont	ams (III)				+++	
Oscillatoria spp.		+	+++	+	+	+
Phormidium spp.				+++++		



***Cladophora glomerata* (Linnaeus) Kützing;** Dragoti, Vjosa river; below, an apex detail of *Cladophora* on MO covered with cells of ***Cocconeis pediculus* Ehrenberg** as periphyton.



Epiphyte colonies (periphyton) of ***Ellerbeckia arenaria* (D.Moore ex Ralfs) Dorofeyuk & Kulikovskiy** *on* ***Cratoneuron filicinum* (Hedw.)Spruce**; Cold Water Spring, Tepelena.

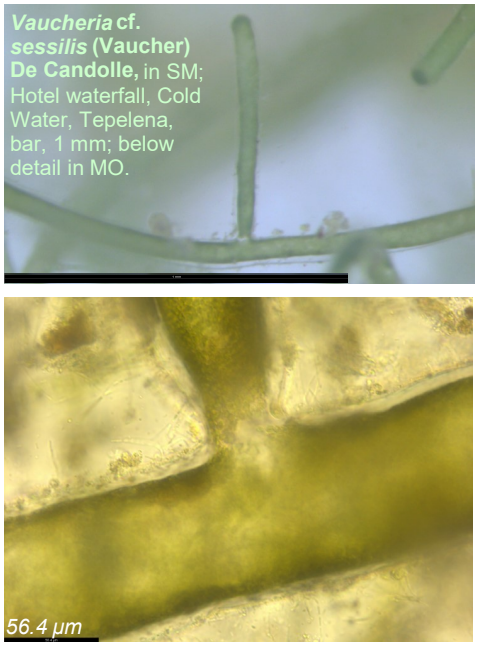
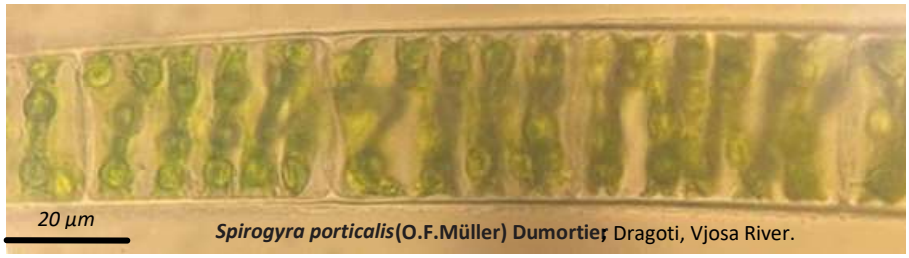
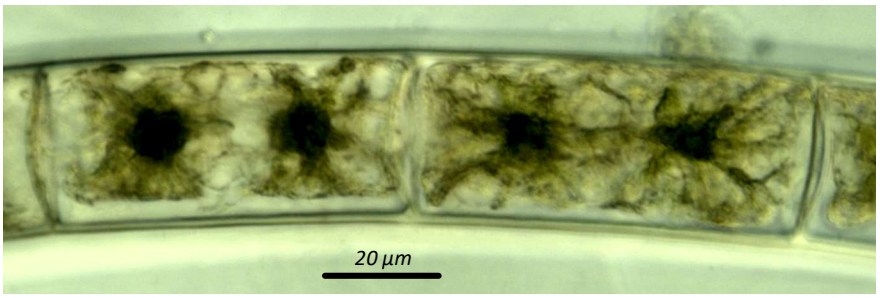


Figure 2. Microscopic photos of the most important and abundant algae found in Tepelena waters, in September 2025.

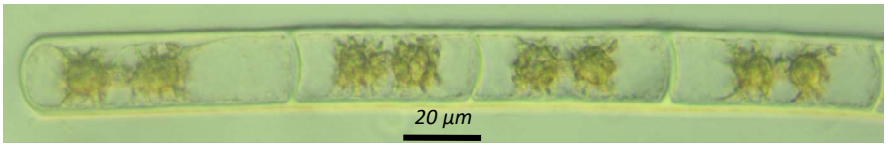
Figure 3. Microscopic photos of the most important and abundant algae found in Tepelena waters, in September 2025 (*continue*…).►



***Spirogyra porticalis*(O.F.Müller) Dumortier**; Dragoti, Vjosa River.



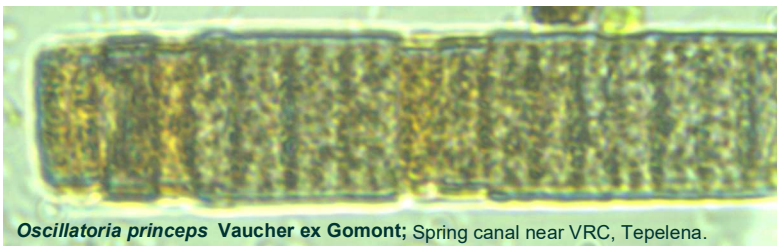
***Zygnema* cf. *kashmiriense* J.N.Misra**; Dragoti, Vjosa river, Tepelena; L, 63-105 µm; B, 39-41 µm



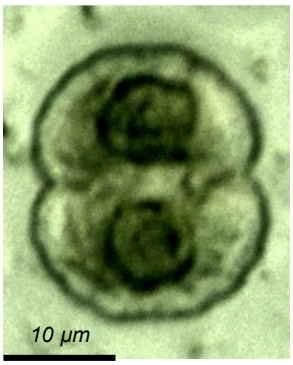
***Zygnema* cf. *decussatum* (Vauch.) Agardh**; Lekli, Drino River, Tepelena, September 2025; L, 36-93 µm; B, 17-19 µm

***Oscillatoria* sp.** 1; Spring, Cold Water, Tepelena

***Oscillatoria* sp. 2;** Hotel waterfall, Cold Water Spring, Tepelena.

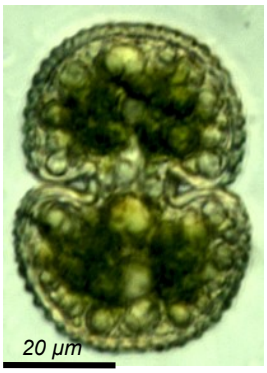


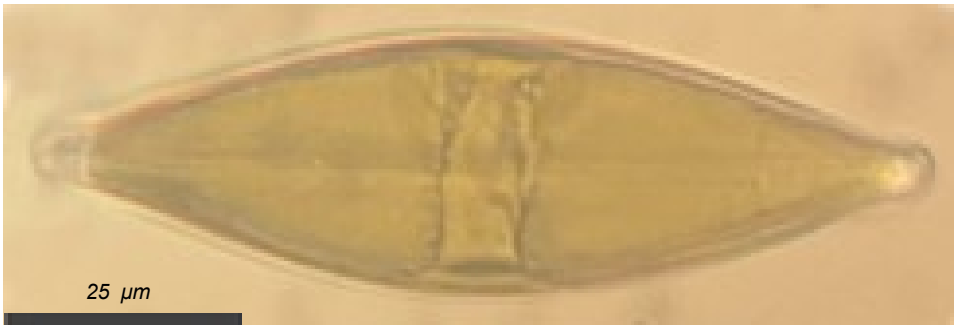
***Oscillatoria princeps* Vaucher ex Gomont;** Spring canal near VRC, Tepelena.



***Cosmarium formosulum* Hof;** Dragoti, Vjosa River.

***Cosmarium* sp.**; Lekli, Drino River.





Craticula cuspidata (Kützing) D.G.Mann; Lekli, Drino River

***Melosira varians* C.Agardh;** Hotel waterfall, Cold Water Spring, Tepelena.

Figure 4. Microscopic photos of the most important and abundant algae found in Tepelena waters, in September 2025 (*continue*…).

A young individual two leaf watermilfoil, *Myriophyllum* cf. *heterophyllum* (Fig. 6), known as endemic to the eastern part of the United States and Canada, and as alien in different EU countries, was found occasionally at the Lekli station, Drino, with some uncertainty on the right scientific name.

Cladophora, *Spirogyra*, *Zygnema* and *Vaucheria* species and other macrophytes play a significant role as primary producers in their habitats, contributing to food webs and nutrient cycling, while also providing habitat for various aquatic organisms. The chlorophyte *Cladophora glomerata* was found abundant in Dragoti, Vjosa (Fig. 5D), and forming visible masses over submersed stones. *Zygnema* species were present in a vegetative stage in all stations (Fig. 3). *Zygnema* cf. *kashmiriense* was abundant in Cold Water Spring and Hotel waterfall, Tepelena; *Zygnema* cf. *decussatum* and *Spirogyra* (Fig. 3; Fig. 5B) species were found relatively abundant in Lekli, Drino waters. The yellow-green algae *Vaucheria* cf. *sessilis* was found abundant in Hotel waterfall (Fig. 2), Cold Water, Tepelena. *Vaucheria* is noted for the first time in Vjosa waters; it is noted only occasionally in Shishtaveci, Kukesi, and Erzeni, Tirana (Kashta & Miho, 2016).

Zygenma, *Spirogyra* and *Vaucheria* species (Figs. 2&3) grow in waters moderately loaded with organic matter (to bms; quality II); while *C. glomerata* is tolerant in eutrophic freshwater ecosystems loaded with nutrients (N & P) or os/bms-ams waters (I-III) (Streble *et al*. 2018), up to highly polluted waters.

Evidences of reproductive stages (oogonium and antheridium) were reported for the two *Chara* species (os/bms; I/II) (Fig. 2). *C. vulgaris* var. *longibracteata* was relatively abundant in Lekli, Drino River; while *C. gymnophylla* in Spring Canal, near VRC, Tepelena. They prefer hard, alkaline, and nutrient-poor water (N&P); considered rare in Europe and in Albania (Kashta & Miho, 2016), for they face threats such as pollution, water use and habitat disturbance (Trbojević *et al.* 2024). Cyanobacteria species of *Oscillatoria* (Figs. 2-4) or *Phormidium* were scarcely of moderately observed; they are known also to be toxic, potentially risky to human and animal health, and to environment (e.g. Swanson-Mungerson *et al.,* 2017).

Figure 5. Views of the main visited stations: **A,** Upstream part of the Cold Water Spring, Tepelena, where the aquatic moss *Cratoneuron filicinum* is abundant on wet stones; **B,** View of the Drino River at Lekli, full of filamentous algae of the genera *Zygnema* and *Spirogyra*; **C & D,** view of the Vjosa River at Dragoti; ***left***, the high turbidity and the muddy-covered submersed rocks are easy visible; ***right***, the view of the submersed rocks covered with the green filamentous alga *Cladophora glomerata*, also muddy.

The water quality belongs to **first class (I), not polluted, only at the most upstream part of Cold Water spring, Tepelena**; it is shown by the dense presence of oligosaprobe (os) species, such as the aquatic moss *Cratoneuron filicinum*, the centric diatom *Ellerbeckia arenaria* (os; I) (Fig. 4A), etc. *C filicinum* is typically moss found in riverine ecosystems with low levels of

biodegradable organic material. It is an indicator species for clean, high-quality water; it prefers clean, well-oxygenated water, and not tolerant of organic pollution (NBC, 2025).

The water quality seems soon to decrease to the second quality (II) at the Hotel waterfall, only few meters downstream, as could be evidenced by the high presence of yellow green algae, *Vaucheria sessilis* (bms; II). It comes probably from the human impact from dense services (restaurants, hotel) over the spring area; they might cause habitat fragmentation, pollution, etc. The same could be for Spring Canal, VRC, Tepelena and Lekli, Drino River (Tab. 1). Additional pressures might be excessive water use: water supply, bottled water abstraction, irrigation etc. that may disturb the headwaters in Vjosa,as elsewhere in Albania.

The water quality in Dragoti, Vjosa River seems to decrease even further to the third class (III, α-mesosaprobe–ams) evidenced by the high presence of *C. glomerata*, a saprophyte species that grow up to moderate to high pollution. It is probably related with organic content, and nitrogen and phosphorus load, especially in Vjosa and Drino, caused by the discharge of untreated urban water from the towns, but also from the villages, from livestock, enhanced by the high erosion, urban, agricultural runoff and climate warming.

Figure 6. The twoleaf watermilfoil *Myriophyllum* cf. *heterophyllum*, a young individual is found by us occasionally at the Lekli station, Drino; there is uncertainty on the right scientific name, and we report it here to stir up further research by the experts in this part of the river.

Worth mentioning the submersed stones and macrophytes in Dragoti, Vjosa River, were heavily covered with fine mud and lime (more than 1 mm thick) (Figs. 4C&D); and the water was slightly milky colored; it was less visible in Lekli, Drino, and spring waters (Figs. 4A&B). The weather conditions were mostly arid and without noted precipitations. It was observed also in previous visits in Vjosa (Miho, *pers. com*.), either in wet and dry seasons, as a quick evidence of **high erosion** happening along Vjosa riverscape and watershed. It is from the bare erodible limestones and conglomerates, especially in its headwaters and middle sections (*Anonymous*, 2017), and the poor vegetation cover (Hasenauer *et al.,* 2022), enhanced by logging, overgrazing (especially goats), fires, improper use of agricultural land and/or unfriendly construction towards the riparian belt.

During our short stay at the end of September 2025 in the area two **fires** were active: on the Trebeshina slopes (above the Beshishti village) and on front slope (near the Luzati village). A wide spent spot was clearly visible on the Dhembeli slopes (above the Lekli village). All these forested burnt spots, leaving behind charred or blackened ground and vegetation, help to supply waters with sediment and other pollutants, with severe impact on biodiversity, water quality, flooding and microclimate harshness.

Worth noting the presence of **solid waste** dumped here and there along the riverbanks, or transported by the river floods. Beside the ugliness, all these liquid or solid wastes are a source of pollution, with coliforms, heavy metals, microplastics, harmful either to the river life of the Park, but also to human health, as water users (agriculture, livestock, drinking water, etc.).

Recommendations

It would be challenging to the local government, municipalities and other relevant stakeholders in their **efforts towards the restoration measures**, plant cover increase, forestation activities, fire protection, livestock structure, water treatment, and careful management of urban waste, in towns and villages. Taking care of riverbanks and hilly slopes, of shrubs and forests, alert to fires, water treatment and better waste management must be permanent objectives within the Vjosa basin; it would help to preserve the water quality of the Vjosa NP (Kovarovics & Michael, 2024), but also human health within the Vjosa basin, now an UNESCO Biosphere Reserve, as well as the tourist attraction of the area.

Acknowledgments

The visit of students on the field was fully covered by the Dresden University of Applied Sciences (HTWD). A. Miho was partly supported by the VjosSusDev project (2022-2026) (food & accommodation) and partly by HTWD (part of travelling). Vjosa Research Center 'Fritz Schiemer' (VRC), Tepelena, where we worked is administrated by EcoAlbania. Microscopic instruments in Tirana were provided by the AKKSHI project, PIKSh 2022-UT. Grateful for their assistance in taxonomic confirmation of aquatic macrophytes to: Prof. L. Kashta, former expert at the National Herbarium, Research Center for Flora and Fauna, FNS, UT; Dr. J. Marka and Dr. M. Meço, Department of Biology, FNS, UT. This information was presented to the IIIrd International Scientific Student Conference (KShSN-UT 2025) (https://sites.google.com/fshnstudent.info/kshsn-ut2025/).

References

Anonymous (2017). Vjosa River: Europe's Unknown Wild Jewel, Albania. Save the Blue Heart of Europe. http://v2.balkanrivers.net/en/key-areas/vjosa-river#:Albania

Bellinger, G.E., & Sigee, C.D. (2010). Freshwater Algae Identification and Use as Bioindicators. 1. Edition. Wiley-Blackweell. 285 pp.

Cemagref (1982). Étude des methods biologiques d'appreciation quantitative de la qualité des eaux. Rapport Q.E. Lyon - Agence de l'Eau Rhône-Medtierrane Corse. 218 pp.

DOC (2025). Freshwater algae. Department of Conservation, New Zeeland Government. https://www.doc.govt.nz/nature/native-plants/freshwater-algae/#

EN13946 (2003). Water quality. Guidance standard for the routine sampling and pretreatment of benthic diatoms from rivers. ISBN 0 580 41960 6; 18 pp. http://standards.mackido.com/en/en-standards24_view_3175.html

Rieth, A. (1980). Süßwasserflora von Mitteleuropa, Bd. 04: Xanthophyceae 2: Ettl, H., Gerloff, J, & Heynig, H. (eds). Gustav Fischer Verlag. ISBN3-437-30304-X. 147 pp.

Hasenauer, H., Leiter, M., & Toromani, E. (2022). The Forest in the Vjosa River basin: an assessment of the situation. University of Natural Resources and Life Sciences, Vienna. 88 pp. https://riverwatch.eu/sites/default/files/Vjosa_Reforestation_2022_web.pdf

Kadlubowska, Z. (1984). Süßwasserflora von Mitteleuropa, Bd. 16: Chlorophyta VIII:Conjugatophyceae I: Zygnemales.Ettl, H., Gerloff, J, Heynig, H., & Mollenhauer, D.(eds). Gustav Fischer Verlag. ISBN3-437-30415-1. 532 pp.

Kashta, L., & Miho, A. (2016). The more frequently occurring macroalgae in Albanian running waters. BuletiniiShkencaveNatyrore (BShN), Faculty of Natural Sciences, University of Tirana: Vol. 21: 31-40. https://jns.edu.al/wp-content/uploads/2023/08/4_L_KASHTA_A_Miho_Perf_f83f3632fb.pdf.

Kovarovics, A., & Michael, H. (eds.) (2024). Vjosa Wild River National Park - A Management Plan 2024-2033. V 1.0 of the Draft. IUCN, PATAGONIA, MTM. 168 pp. https://turizmi.gov.al/wp-content/uploads/2024/10/Kapitulli-A-Plani-i-Menaxhimit-te-Zones-se-Mbrojtur.pdf

Miho, A., Ngjela, K., Hoxha, B., Sejdo, I., & Meço, M. (2018). Diversity of diatoms and related quality of free-flowing rivers in Albania (the Vjosa catchment) / Kieselalgen-Diversität und verbundene Qualität von freifließenden Flüssen in Albanien (Vjosa-Einzugsgebiet). In: The Vjosa in Albania – a riverine ecosystem of European significance. Acta ZooBot Austria, 155/1: 107-134. https://balkanrivers.net/sites/default/files/Acta155-1_Web_FINAL.pdf

Miho, A. (*under preparation*). Alga nga pellgu i Vjosës (pjesa shqiptare) - diversiteti dhe ekologjia. Raporti final VjoSusDev, DB, FShN, UT. / Algae from the Vjosa basin (Albanian part) - diversity and ecology. VjosSusDev final Report, DB, FNS, UT.

NBC (2025). National Biodiversity Data Centre, Ireland, Fern-leaved Hook-moss (*Cratoneuron filicinum*), accessed 30 October 2025; https://maps.biodiversityireland.ie/Dataset/8/Species/124628

Sharma, N. (2025). Economic Importance of Algae. Microbe Notes. https://microbenotes.com/economic-importance-of-algae/#

Streble, H., Krauter, D., Bäuerle, A., & Lange, W. (2018). Das Leben im Wassertropfen: Mikroflora und Mikrofauna des Süsswassers. Ein Bestimmungsbuch. ISBN 10: 344015694X / ISBN 13: 9783440156940. Franckh-Kosmos. 400 pp.

Swanson-Mungerson, M., Incrocci, R., Subramaniam, V., Williams, P., Hall, M.L., & Mayer, A.M.S. (2017). Effects of cyanobacteria *Oscillatoria* sp. lipopolysaccharide on B cell activation and Toll-like receptor 4 signaling. Toxicol Lett. 2017 Jun 5;275:101-107. doi: 10.1016/j.toxlet.2017.05.013. Epub 2017 May 9. PMID: 28499610; PMCID: PMC5510639.

Trbojević, I., Marković, A., Šinžar-Sekulić, J., SubakovSimic, V.G., & Romanov, R. (2024). *Chara squamosa* (Characeae, Charophyceae) in Serbia - insights from the taxonomic revision of the BEOU charophyte collection and recent field records. April Botanica Serbica 48(1): 85-92. DOI: 10.2298/BOTSERB2401085T

Vata, Sh. (2024). Alga mikroskopike dhe cilësia biologjike e ujërave sipërfaqësorë nga pellgu i Vjosës. Diploma theses, DB, FShN, UT. 140 pp.