Limnic and hydrochemical study Source AinRegrag (Middle Atlas, Morocco)

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Abstract- The plain of Saïs-Middle Atlas perimeter is home to a considerable number of water resources which still remain and which stands of the macro invertebrates unexplored real stethoscope of the health of streams and rivers are still poorly known. This study has for main objective the determination of the overall composition and monitoring of the epigeous benthic macro dynamics subservient to the source AinRegrag (Middle Atlas) in relation to the main abiotic factors of the environment. To do so, we opted for monthly sampling over a period of a year (2013).Overall crops fauna, a total of 7253 individuals belonging to 40 species have been collected, these taxa are divided into 8 classes 23 families and 29 genera. Arthropods are the most numerous with 26 species. They represent 52% of the total population,Gammarusmarocanus represents the more abundant species (16.81%). Other statistical analyses by PCR showed many positive correlations between certain species creating benthic associations, so another vision of the multi-species food chain.

Key words: Benthic Macro invertebrate, biodiversity, source, Morocco.

1. Introduction

the Middle Atlas, a real Castle Water of Morocco, the main rivers of the country take birth in this massive, it is also the North African Mountain rich in wetlands, particularly in natural lakes, rivers and fresh sources. These freshwater ecosystems perform hydrological, socio-economic functions and ecological valuable across the country, their biodiversity and their originality give them worldwide interest [1]. Among all its limnic ecosystems, sources are of crucial importance as water resource and as a remarkable aquatic environment related to groundwater and surface waters. They play an essential role in the regulation of flows, and reloading of subsurface flows [2]. Their good health is a guarantee of the quantity and quality of water.

In addition to their socio-economic value, it is our responsibility to consider the ecological importance of the sources to the extent that this are biotopes which usually contain a variety of forms of life. All the links uniting these different groups is a food chain, in which benthic macro-invertebrates form an angular piece, they participate in the transformation of organic matter and constitute the largest share of the food of fish. Species diversity of aquatic invertebrate communities depends on including diversity and stability of habitats [3,4]. Therefore, invertebrates are widely used as indicators of environmental change in the medium and long term. Their diversity and structure of their stands are likely to provide accurate information on the ecosystem and the disruptions that it can undergo. In this context, the study of the natural biodiversity of bound Macroinvertebrates to sources of freshwater, appears as an essential decision aid to define management and conservation plans. In Morocco, this type of study is practiced for a very long time and established lists are constantly updated for all the countries for each region. They have great importance as they allow to know the range of each species are based on an intensive study of the local fauna. Without these details we would never get a complete picture of the distribution of various taxa.

The objective of this work is to investigate the Limnological State of one of the major sources of the basin of Sebou, to make an inventory of invertebrates that are bound to analyse their

distribution and identify the abiotic parameters structuring these stands. Inventory of the biotic community, occupying the study sites will therefore provide a good representation of the general State of these aquatic ecosystems and is of crucial importance not only in terms of knowledge of biodiversity, but also in the context of an integrated ecological status of a crenal system monitoring. In addition to the assessment of the water quality. These surveys will also document the evolution of the biodiversity in this wetland and can thus contribute to release evidence, yet unsuspected nuisance and a rapid implementation of appropriate corrective measures. This work is an indispensable basis aimed at the development of taxonomic and functional biological quality indices, and taking into account the spatial variation of biodiversity of benthic macroinvertebrates.

2. Material and method

2.1. Study site

Located 40 km southeast of the city of Fez (figure 6), AinRegrag is part of the hydrogeological unit of the CausseAtlassic way to 1060 m above sea level, according to the classification of Emberger, makes station in sub-humid bioclimatic upstairs cold winter. She deaf aquifer liassic corridor Fez-Taza, a sheet that covers an area of 1500 Km2 and is based on an impermeable bedrock consisting of Triassic clayey-diabase. It represents an extension to the East of the deep water of basin Fez-Meknes [5]. The velocity at the source level is 111 (cm/s), the vegetation lining the bottom of the bed is formed mainly of the lily and the Reed. The main value of this emerging (AR) lies in its particularity, running water permanent high-volume 305 l/s, despite measures of capture by the network of drinking water supply and wells pumped groundwater all around its perimeter.AinRegrag is not just a water resource jealously preserved by the riverain populations throughout its history, it is also a real seaside resort thanks to its Lake and its flat shores covered by shaved vegetation (grass) which makes a particular type of source of fresh water in North African Mountain. This source is currently undergoing the effects of anthropogenic pressure accentuated. Several boreholes are set up and draw the waters of groundwater for a fruit which is in full swing, is that risk by runoff to impair the physico-chemical quality of groundwater and measures to capture to meet a growing demand in drinking water. The source is also the most coveted tourist resort by local residents, which would imply an organic pollution which may be threatening.

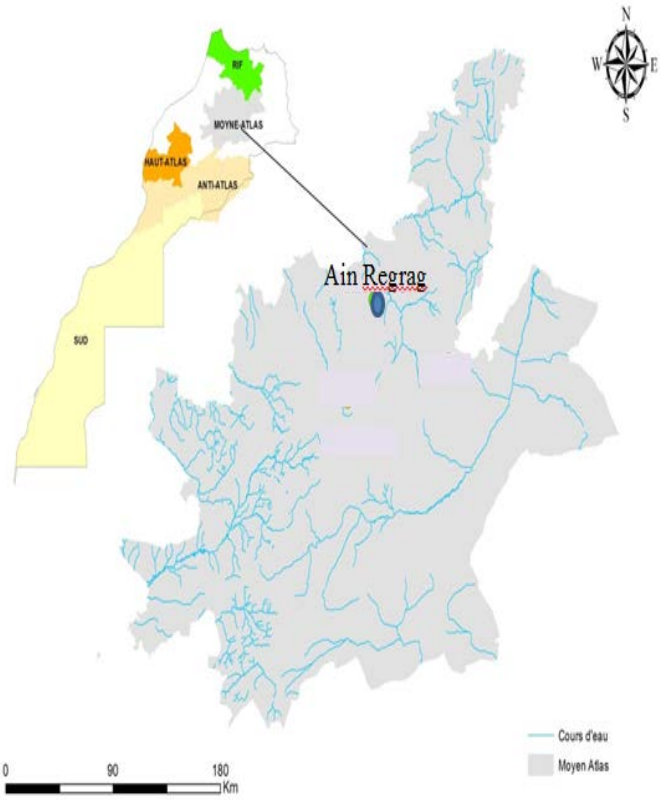

Figure 1: Location of the Regrag source

2.2 Sampling of the macro invertebrate benthic

2.2.1. Sampling Schedule

Seasonal variability in the structure of the community is high because the life cycle of several benthic macro invertebrates species is annual or shorter and it culminates with an adult phase. Thus, the presence of mature larvae, nymphs or adults may be short. So it is better to collect samples, a monthly frequency in a year, and it is the schedule called for this study. We conducted monthly samplings from the month of January 2013 until December 2013.

2.2.2. Sampling method

For a general sampling, we opted for a surber NET to a width of mesh 400µm. This technique can be used on rocky, Sandy, gravelly and muddy, good that it is difficult on the very organic substrates. In order to collect the maximum of Macroinvertebrates colonizing the site, we should spend 30-45 minutes on the rocky beaches to return stones and search for invertebrates. On detached bodies of stones with pliers and keep them in a jar. The collected samples are fixed at 40% formalin, then stored in water from source to 10%. The sorting of samples is done using the loupe. Zoological groups are separated in vials containing

70% alcohol [6]. Species in each group are sorted, identified, counted, and classified among functional feeding groups according to [7].
In addition to these biological surveys, samples of water samples for chemical and bacteriological analysis was made during the year of study in the same places of sampling to have precisely the evolution of these parameters in local time and monitor their synchronism with benthic stands of sources.

2.3. Analysis of physico-chemical parameters of the water

In order to assess the physicochemical quality of the underground water masses of the station, a monthly survey of water samples was conducted during a year every 4 weeks, for a total of 12 months of sampling between January 2013 and December 2013. According to the who recommendations, a volume of 1, 5 litres of water is collected each month in bottles, polyethylene from the main resurgence. And kept at 4 ° C during transport to the laboratory to be analysed within 24 hours following. The methods of analysis are those recommended by the standards [8; 9]. Measurements of temperature, pH and electrical conductivity were conducted in the field using a multi-parameter pH/conductivity Analyzer / temperature CyberScan PC10. The methods used are: volumetric measurement for dissolved oxygen, bicarbonates, chlorides, calcium and magnesium and sulfates and ortho molecular absorption spectrophotometry phosphates (table 1).

Table 1: Chemical component analysis method

Parametres	Unit	Measuring equipment and method of analysis
Temperature	° C	Analyzer multi parameters
Conductivity	µS/cm	Analyzer multi parameters
pH		Analyzer multi parameters
Dissolved O_2	mg/l	Winklermethod
Total hardness	mg/l	EDTA Complexometry
Calcium hardness	mg/l	EDTA Complexometry
Magnesiumhardness	mg/l	Difference between total and calcium hardness
Alkalinity	meq/l	Volumetric dosing
Organicmatter	mg/l	Oxidizability of hot potassium permanganate
Chlorides	mg/l	Metering,withMohrmethod
sulphates	mg/l	absorption spectrometryat 650 nm
Orthophosphates	mg/l	absorption spectrometry at 750 nm

2.4 calculation of statistical descriptors of data

2.4.1. Specific diversity index

The most used index and the Shannon-Weaver, it reflects the diversity of species that make up the stands in a medium and establishes the link between the number of species and the number of individuals of a same ecosystem or a community. Is calculated using the formula:

H'= -∑ (ni/ N) . Log 2 (ni/ N)

H': diversity specific
N: total number of individuals
ni: number of species i

Index of species diversity is high, when the taxon richness is important and the distribution of individuals among the taxa is balanced.

2.4.2. FairnessIdex

Knowledge of species diversity index is used to determine the fairness, equity is a second fundamental dimension of diversity. It is the ratio between the maximum diversity (Hmax). It varies between 0 and 1, tends towards 0 when almost all of the staff is focused on a species; It is 1 when all species have same abundance. Index of fairness determines, either reconciliation or even the remoteness between H' and Hmax. It is expressed by the formula

E= H' / Hmax
Hmax= Log2 (S)

E= H' / Hmax
Hmax= Log2 (S)
S: Total number of species

2.4.3 Relative abundance

Relative abundance of a species is the percentage of the number of it compared to the total number of individuals collected from a station. It is expressed by the formula

Pi = Ab(a)*100/ Ab(t)

Where, Ab (a): total number of individuals of a species.
Ab (t): total number of individuals

2.4.4. The frequency

The frequency of a species is the ratio, expressed as a percentage, between the total number of samples where this species is noted and the total number of all samples taken.

Fi = Pa * 100 /Pt

PA: number of samples where the species was collected,
Pt: total number of samples

A species is ubiquitous if its F is 100%, constant if the F is strictly between 75% and 100%, regular if the F is between 50 and 75%, accessory if the F is between 25 and 50% Finally, a species is accidental if F is less than 25%

2.5. Analysis of principal components (ACP)

On the other hand, to visualize and analyze existing correlations between the different variables through

their behaviors and orientations, to identify the main factors responsible for the quality of the waters of the searched environment. We statistically processed all the data by component analysis main c.p.a. by the Unscrambler 9.2 software.
The Unscrambler 9.2 focuses on the interpretation rather than statistics to improve the decision-making process and the speed at which decisions can be taken.

3. Results and discussion

3.1. Physical chemistry of water

Dissolved oxygen levels, apart from June (2.69 mg/l), are higher than 5.4 mg/l with a maximum in November (7.2 mg/l) (table 2), this dissolved oxygen availability could be explained by the fact that (AR) station is held by an important vegetation cover of macrophytes and algae. IP levels are between 0.2 and 1.7 (mg/l) concentrations in wet period are significantly lower than those that mark the dry season. We note a remarkable homothermy of the source water average temperature stands around 18.8 ° C. The waters of the station are moderately mineralized, their electrical conductivity varies little with values ranging between 1094µS/cm (November) and 1115 µS/cm (July). Calcium hardness is very high, with an average of 156 (mg/l), the deaf resurgence of a purely Karst aquifer and such concentrations in calcium ion would seem to be a no-brainer. Concentrations of phosphates graze the value zero. As the sulphate content, it varies between 16.44 mg/l (January) and 19.89 mg/l (February). These levels remain significantly below the Moroccan standards laid down in 200(mg/l) for drinking water 250 (mg/l) and for irrigation.
Indeed, the review and interpretation of the results of physico-chemical analyses of water samples collected shows that the waters of AinRegrag are under the direct leadership of two important factors. First of all the geological bedrock underlying and this report has several previous works [9; 10; 11], then anthropogenic activities.

Table 2: Results of the physicochemical analyses the source Regrag year 2013

	Ca_2^+ (mg/l)	Mg_2^+ (mg/l)	TAC (meq/l)	Cl- (mg/l)	I.P (mg/l)	SO_4^{2-} (mg/l)	PO_4^{3-} (mg/l)	Dissolved O2 (mg/l)	EC (µS/cm)	pH	T °C
J	146,7	39,5	1,0	211,2	0,2	16,44	0,0002	6,5	1097,0	7,043	18,5
F	166,4	20,8	1,0	205,9	0,6	19,89	0,0074	5,8	1095,0	7,091	18,6
M	156,0	32,2	0,7	241,4	1,7	18,89	0,0065	5,8	1099,0	7,095	18,7
A	158,1	32,2	0,9	220,1	1,0	17,80	0,0175	5,7	1100,0	7,100	18,8
M	159,2	38,5	1,0	216,6	1,1	18,22	0,0051	5,8	1105,0	7,102	18,9
J	147,7	38,5	0,7	230,8	1,2	17,22	0,0002	5,6	1109,0	7,103	19,1
JL	157,1	39,5	0,9	213,0	1,0	17,78	0,0044	5,4	1112,0	7,100	19,1
A	162,3	35,4	1,1	216,6	0,9	17,22	0,0000	5,8	1108,0	7,092	18,9
S	156,0	39,0	1,0	223,7	1,6	18,24	0,0000	5,4	1095,0	7,085	18,9
O	163,3	30,2	1,0	220,1	1,1	19,11	0,0002	5,0	1098,0	7,090	19,0
N	151,9	33,3	1,0	216,6	0,9	17,67	0,2419	7,2	1094,0	7,030	18,5
D	147,7	32,2	1,0	213,0	0,3	16,69	0,2823	6,0	1087,0	7,038	18,5

3.2 study of benthic macrofauna

3.2.1. Inventory of the benthic community

The understanding of the structure and the overall functioning of benthic ecosystems through a fundamental first step: the description of the communities that constitute. This initial stage is often used as basis for the development of more complex curriculum, focused on the study of the interactions between the various benthic compartments (relations inter and intra specific, relations fauna - substrate,...). Table 3 is a detailed inventory showing the numbers of each species in the source AinRegrag in the 12 months.

Table 3: Monthly changes in the abundance of benthic macrofauna in the year 2013 AR station

Species	**J**	**F**	**M**	**Ap**	**M**	**J**	**Jl**	**A**	**S**	**O**	**N**	**D**
Pisidiumpersonatum	3	-	-	-	-	-	2	-	-	-	-	-
MélanopsisPraemorsa	214	189	258	305	139	163	175	158	230	244	230	171
Theodoxusnumidica	42	25	38	34	27	12	9	13	51	48	37	29
Theodoxusfluviatilis	81	19	26	18	18	10	7	9	43	72	55	31
*Horatia*sp.	15	3	3	19	19	4	-	10	7	2	16	5
Gammarusmarocanus	65	73	61	89	83	99	145	204	105	111	98	86
Gammarusrouxii	75	27	39	41	32	48	64	179	56	38	24	29
*Gammarus*sp.	58	52	55	71	79	70	112	183	97	92	60	73
Potamon fluviatile	4	2	5	6	2	3	3	2	2	3	4	5
*Cypridina*sp.	2	3	3	9	6	5	3	4	3	3	1	
SimuliumPseudoquinum	7	6	13	9	5	1	9	7	9	11	10	6
Simuliumornatum	-	-	-	-	-	-	-	-	-	1	3	2
Simuliumsergenti	-	1	2	3	-	-	-	1	-	2	-	-
Simuliumcostatum	1	1	1	2	1	-	-	3	1	-	-	-
Calopterixhemoroidalis	-	2	3	2	4	3	-	-	1	2	1	1
Calopterixsplendens	-	-	-	1	1	-	-	2	-	-	-	-
*Nepa*sp.	-	-	1	1	-	1	-	-	-	-	-	-
*Aquarius*sp.	-	-	3	1	5	-	1	-	3	-	-	-
Gerris sp.	-	2	1	1	-	2	-	-	-	-	-	-
Baetisalpinus	-	-	-	-	1	-	-	-	-	-	-	-
Baetisrhodani	28	8	28	24	29	21	18	25	19	23	17	19
Baetispavidus	10	-	9	10	12	8	9	5	11		12	10
*Cloëon*sp.	4	1	3	4	3	3	-	-	1	4	2	3
*Procloeon*sp.	3	-	1	3	1	1	-	-	3	3	-	2
Caenispusilla	-	-	-	-	-	-	1	-	-	-	-	-
Caenisluctuosa	11	3	8	8	7	5	20	4	8	5	13	9
*Brachycercus*sp.	-	-	-	-	1	1	-	6	-	-	-	-
Ecdyonorusifranensis	1	9	8	11	10	6	-	3	6	5	4	3
*Heptagenia*sp.	-	-	-	-	1	-	7	6	1	1	-	-
*Hydrachnidia*sp.	-	2	2	2	6	3	2	1	1	4	3	
Pionauncata.	-	-	-	-	1	-	1	-	-	-	1	-
Dugesiagonocephala	-	-	-	-	-	-	-	2	-	3	-	1
Dugesiatigrina	-	-	-	-	-	-	19	-	6	-	-	-
*Phagocata*sp.	-	-	-	-	-	-	-	1	-	4	3	2
*Lumbricus*sp.	-	-	-	-	-	2	-	-	-	-	3	3
Tubifex tubifex	9	-	4	-	-	-	-	2	3	5	-	-
*Haplotaxis*sp.	1	-	-	-	4	-	-	3	2	-	1	-
Eiseniella tetraedra	-	3	14	-	-	-	-	5	4	7	6	3
*Glossiphonidae*sp.	1	-	-	5	-	-	-	-	-	-	-	-
*Helobdella*sp.	12	-	1	3	2	8	-	11	6	-	-	-

-Absence

AinRegragshelter a very rich and diverse benthic invertebrate fauna. Overall crops fauna, a total of 7253 individuals belonging to 40 species have been collected, these taxa are divided into 8 classes 23 families and 29 genera. Insects are the most numerous with 19 species, followed by crustaceans and gastropods mollusc represented by 5 species (figure 2). These three groups are alone more than 97.13% of total abundance of agencies. It should be noted the harvested invertebrates macro stand is marked by the absence of stoneflies. This group known by its strong polluted sensitivity is non-existent; This suggests in the light of our sample, or the existence of organic pollution affecting water stations of studies which is a factor limiting life for this group; or can be, the ecological requirements of this group (temperature, dissolved oxygen, vegetation bordering and the nature of the substrate) are not satisfied in the three study sites.

In addition, the high levels of calcium and magnesium (hardness) of the waters of the resurgence may also explain the absence of stoneflies, which according to [13], ill support very calcareous water, especially as the Middle Atlas

was renowned for his great poverty in Plecoptera [14].

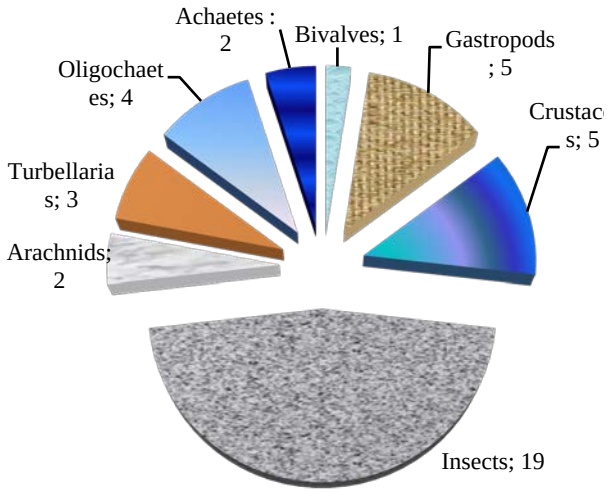

Figure 2: Number of taxonomic not classified species in station AinRegrag

3.2.2 Total abundance

Analysis of all stands harvested during the study period, shows that in the source AR, gastropods are numerically the most inventoried and represent the highest strength at the level of the station (3333 individuals) followed by crustaceans (2956 individuals), and insects (756 individuals) (Figure 3). In terms of percentage of different orders, they are amphipods that prevail with a percentage of 39.61% followed by the Architaenioglossa. (34.14%), the Neritoida (10.4%) and finally the other orders to different percentage.

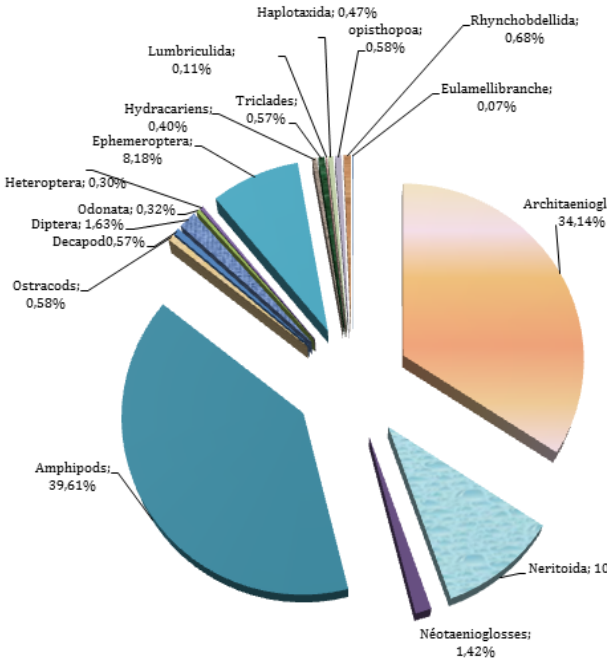

Figure 3: Abundance of different orders in AinRegrag

3.2.3 Specific diversity index

Associated with the synthetic parameters, diversity indices provide complementary results as the stand structure and the way in which individuals are distributed among the different species [15]. It is minimum when the sample contains only a single species. H is maximum (theoretically infinite) when each individual belongs to a different species. Maximum diversity is Log2 (N). AR which has an index of species diversity quite important with a value of 3.18. Stand in AinRegrag is very diverse, with families of different orders that occupy the whole of microhabitats. This maximum diversity in this source which is a station of average mountain (1150 m altitude), is the result of several that abiotic as well biotic parameters that favoured its installation: a heterogeneous substrate, relatively abundant vegetation, low temperature and rapid power at moderate speed.

3.2.4 specific fairness index

Fairness is also called regularity or equi-distribution, varies between 0 and 1, more a taxon is abundant, lower than we is fairness, a status that differs from that of AinRegrag or the fairness index is high it is 0.60.

3.2.5 Relative abundance

Analysis of all stands harvested during the study period, shows that AinRegrag, Melanopsispraemorsa species is the most inventoried and represents the largest percentage (34.14%) followed by two crustacean Gammarusmarocanus (16,81%), Gammarus sp. (13.81%) and finally the procession of the 37 remaining species, with an address for service at this station (figure 4).

Species	Frequency (%)	Presence
Mélanopsispraemorsa	100	Constant (≥50%)
Theodoxusnumidica	100	
Theodoxusfluviatilis	100	
*Horatia*sp.	100	
Gammarusmarocanus	100	
Gammarusrouxii	100	
Potamon fluviatile	100	
SimuliumPseudoquinum	100	
Baetisrhodani	100	
Caenisluctuosa	100	
*Cypridina*sp.	92	
Ecdyonorusifranensis	92	
Baetispavidus	83	
*Cloëon*sp.	83	
*Hydrachnidia*sp.	83	
*Procloeon*sp.	67	
Simuliumcostatum	58	
Calopteryxhemorrhoidalis	58	
Eiseniella tetraedra	58	
*Helobdella*sp.	58	
Simuliumsergenti	42	50<accessory<25
*Aquarius*sp.	42	
*Heptagenia*sp.	42	
Tubifex tubifex	42	
*Haplotaxis*sp.	42	
*Phagocata*sp.	33	
Gerris sp.	33	
Pionauncata	25	Accidental ≤25
Dugesiagonocephala	25	
Calopterixsplendens	25	
*Nepa*sp.	25	
Simuliumornatum	25	
*Lumbricus*sp.	25	
Pisidiumpersonatum	17	
Dugesiatigrina	17	
*Glossiphonidae*sp.	17	
Baetisalpinus	8	
Caenispusilla	8	

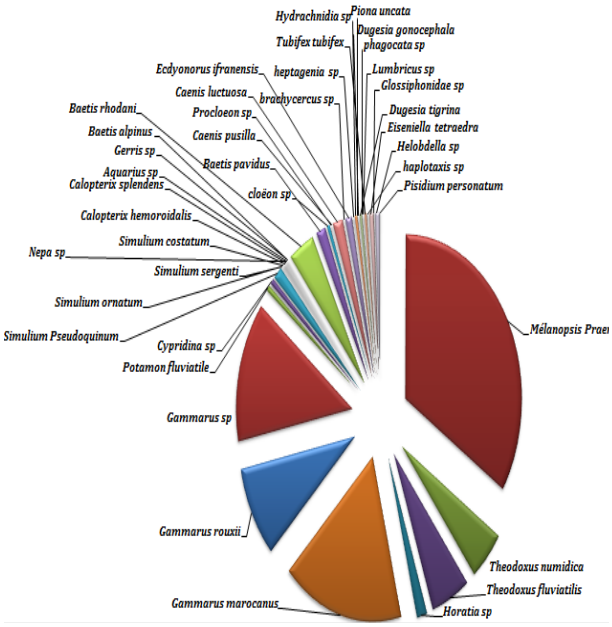

Figure 4: Relative abundance of various taxa in AinRegrag

3.2.6 Frequency

In the AinRegrag resort, 65% of the species are considered constants with a frequency of greater than 50% occurrence. These are - among others -: Melanopsispraemorsa, Theodoxusnumidica, Gammarusmarocanus and Potamonfluviatile freshwater of the Morocco only crab. As species referred to as accessory we found 7 species among which lies the fly Simuliumsergenti and mayfly species Heptageniasp. For what is very accidental species, we count 11 species (table 4).

Table 4: frequency of occurrence of the species colonizing the source AinRegrag

3.3. Statistical analysis of the stands by ACP

3.3.1 Studies correlations between species

The meta-communautes is an emerging concept that considers the impact of the exchange of cash between it and the various environmental variables. It seems particularly important to understand the interactions between species, to understand the consequences of the erosion of biodiversity on the eco-geochemical balance and determine to what extent this network of interactions can be changed before its operation becomes unstable [16]. The principal component of this resurgence analysis revealed the presence of 4 major groups (figure 5). The first consists of the genus Gammarus assembling *Gammarusmarocanus*, *Gammarus* sp. *Gammarusrouxii*, the second is an alloy between *Theodoxusnumidica*, *Theodoxusfluviatilis*, the third is represented by the single species *Melanopsispraemorsa* and a fourth set represented by the rest of the species.

The explanation of these groups is the more logical that is: first of all the three species are crustaceans that have a clear preference for calcareous environments, then, there is snail Theodoxus group who have great similarities and, referring to several works investigating the ecology of these two species [17; 18]. praemorsa and a fourth set represented by the rest of the species.*Melanopsispraemorsa* here is a specimen very represented in the calcareous waters of the Middle Atlas and the Morocco in general [18] and finally other species which have chosen the source AinRegrag as medium home but with significantly lower than other abundant taxa.

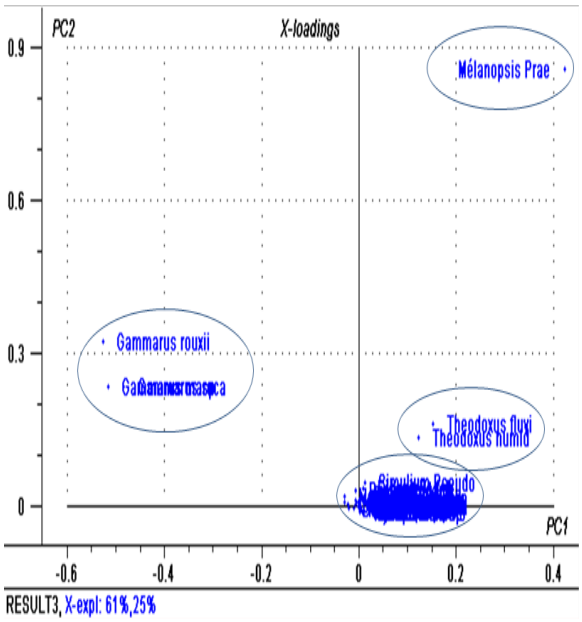

Figure 5: Analysis of associations between the benthic macroinvertebrates of the source AinRegrag

3.3.2 Studies of the influence of the factor 'season' in the distribution of species

As shown in figure 6, the macrobenthos of the source AR is indifferent vis à vis of the season factor. The presence of the species is almost stable throughout the year with the exception of the month of August. It is here, a source which has the best index of biodiversity, abundant vegetation throughout the year, ranging between 17 ° and 18 ° c, water temperature a current velocity ensuring good ventilation of the environment and in addition to all these conditions, a rather conscious surrounding population of the heritage of their wetland values. Therefore several factors set in motion for the preservation and the proliferation of a rich and diverse biota within a relatively stable environment.

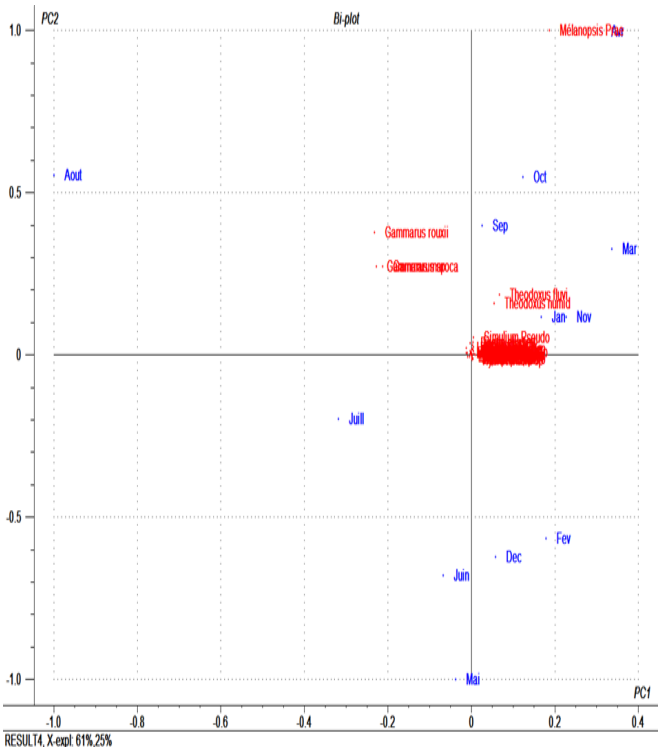

Figure 6: Principal component analysis of the distribution of the species in the source AR during the different months of the year 2013

3.3.3 Studies of Correlations between species and the physico-chemical parameters of the environment

Table 5 shows negative correlations between BaetispavidusLumbricus sp. and the Ca2 + ion, so these are taxa that appear intolerant water calcium, the Aquarius spHemiptera. is positively correlated with the index of permanganate, i.e. the dynamics of the population of this specimen would be in synergy with the organic matter content in the middle. A latter taxon is the fly Simuliumornatum which is positively correlated avecl' oxygen dissolved in the medium. It is commonly known that in general the Diptera tolerate pollution, in other words, they can live in a deficit environment oxygen (hypoxia), our results do not confirm this tolerance that the abundance of thiNumber of observations s fly is closely related to the oxygen content.

Table 5: Statistically significant Correlations between the macrobenthic species of the AinRegrag source and the physicochemical parameters of the environment.

Species	P.C parameters	r	Nb.Obs
Baetispavidus	Ca_2^+	-0,654	12

*Lumbricus*sp.	Ca_2^+	-0,618	12
*Aquarius*sp.	IP	0,585	12
Simuliumornatum	O_2^+	0,581	12

Conclusion

Biodiversity and freshwater habitats are recognized as particularly threatened at global level. Monitoring of freshwater basins is proving so be a necessary measure to prevent the loss of these ecosystems. a taxonomic inventory coupled with a synthesis of the biological/ecological knowledge of wildlife should be drawn up in the preamble to any methodological development in bio-indication. Indeed, examination and interpretation of the results of physico-chemical analyses of water samples collected shows that the waters of AinRegrag, are highly charged ion calcium, an average temperature of 18 ° C and medium mineralized, availability of dissolved oxygen. The approach benthic stand, through conventional descriptors (abundance, diversity...) allowed to show that benthic fauna in AinRegrag level is represented by a very large number of taxa specialized compared to another work of [19] on the Middle Sebou. [20] on the High Sebou. [21] on the ouedBouRegreg and [22] on the Tensift of the High Atlas. Analysis of all of the settlements collected during the study period, shows that AinRegrag, the *Melanopsispraemorsa* species is the most inventoried and represents the largest percentage (34.14%) followed by two crustacean *Gammarusmarocanus* (16,81%), *Gammarus* sp. (13.81%) and finally the procession of the 37 remaining species, with an address for service at this station. Other statistical analyses by PCR showed many positive correlations between certain species creating benthic associations, so another vision of the multi-species food chain.
This diagnosis should encourage the public authority to make recommendations to contribute to strategic thinking for biodiversity management and integration data in decision making, developing a biodiversity monitoring network and promote dialogue and communication between stakeholders.

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