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ZONALITY IN THE OCCURRENCE OF ZOOPLEUSTON IN THE SHALLOW LITTORAL ZONE OF THE PIASECZNO LAKE (LUBLIN POLESIE REGION)

W. Płaska

Departament of Hydrobiology and Ichtiobiology, University of Agriculture
Akademicka 13 str., 20-950 Lublin, Poland

S u m m a r y. Investigations on the qualitative and quantitative structure of zoopleuston were curried out in four zones of the mesotrophic the Piaseczno Lake. Eighteen taxa were found in the lake, 11 of them belonged to *Heteroptera.* The number of species in each zone was varied. The largest density occurred in spring in the water/land site among submerged macrophytes. It was then decreasing in the direction of reed bed. The highest density of pleuston (512 ind. m^{-2}) was found among submerged macrophytes in autumn. A dominant plant was *Collembola.* It accounted over 80% of all pleuston. Among *Heteroptera* the most numerous were: *Sigara falleni, Mesovelia furcata, Plea minutissima, Gerris argentatus.* It was discovered, that during vanish away from shore, the diversity and quantity were decreasing. In all zones *Collembola* dominated, but at the edge of reed beds *Nepomorpha* dominated as well.

K e y w o r d s: zoopleuston, lake, shallow littoral, zonality

INTRODUCTION

Zoopleuston is a group of organisms occurring on water surface. First of all, it consists of organisms existing in the littoral zone of the lake. Depending on the habitat conditions and ability to horizontal moving of each taxa, it is possible to found distribution of pleuston in the shallow littoral zone. There are only few papers concerning biology and ecology of this group of organisms [1,4]. The aim of this research was to learn about quantitative and qualitative structure of pleuston in the selected littoral zones of the Piaseczno Lake.

MATERIAL AND METHODS

The present research was curried out in the mesotrophic the Piaseczno Lake with an area of 83.2 ha and the maximum depth of 38,8 m [7]. This lake is under strong pressure from tourists, especially in the summer when tourist absorptive power is twice exceeded [2]. The dominance of the psammolittoral, in the litoral type and phytolittoral in some places small-lake was noted. Samples were collected in the shallow phytolittoral from June to November in 2000 in the four zones specified: I – water/land site, II – beginning of *Carex* sp. and *Juncus* sp. bed, III – among *Carex* sp. and *Juncus* sp. bed – IV – beginning of the reed bed. In order to collect samples, a modified frame and hand net was used [8]. In each zone, two quantity samples from an area of 0.25 m^2 were taken, and one quality sample from the whole habitat. Organisms belonging to four pleuston taxons groups: *Culicidae, Coleoptera, Heteroptera, Collembola* [6] were selected in laboratory, and then they were divided into groups and their density per 1 m^2 counted.

RESULTS AND DISCUSSION

Existence of 18 zoopleuston taxsons in the Piaseczno Lake was confirmed, 11 of them belonged to *Heteroptera* (Table 1). The number of species was varied in different zones. The largest number of taxons was found in the I zone in the water/land site in spring, but the highest diversity of species was found in the II zone in autumn. The smallest number of taxsons was always found at the beginning

Table 1. Average density of zoopleuston in the investigated zones of the Piaseczno Lake (ind. m^{-2})

Taxon/zone	I	II	III	IV
Gerris lacustris	1<	1<	0	1<
Gerris argentatus	2	2	2	1<
Mesovelia furcata	10	1	2	0
Microvelia reticulata	3	0	0	0
Notonecta glauca	0	4	0	0
Iliocoris cimicoides	2	6	0	0
Nepa cinerea	0	1<	1<	0
Plea minutissima	3	6	8	2
Sigara falleni	4	12	2	0
Sigara distincta	0	1<	0	0
Sigara striata	1<	0	0	0
Collembola	176	174	30	15
Coleoptera	2	3	3	1<
Culicidae	1<	0	0	0

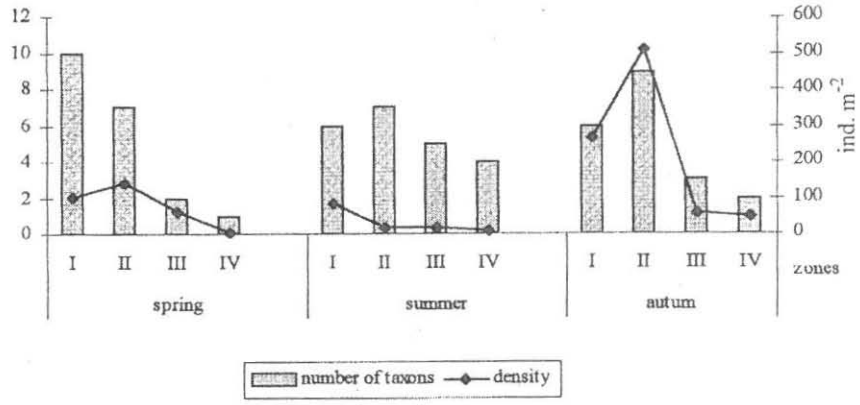

Fig. 1. Number of species and density of pleuston in the Piaseczno Lake

of the reed bed, in the IV zone (Fig. 1).

The quantity of zoopleuston was the largest in zones I and II; then it was gradually decreasing in zones III and IV in each season. The smallest quantity (4 ind. m^{-2}) was foundatn the border of the reed bed in spring (Fig. 1).

In the species structure in the *Collembola,* was predominant usually acounted over 80% in all pleuston. An exception occurred once in zone IV in spring when *Nepomorpha* made 100% and in zone III in summer, when *Nepomorpha* dominated by 43%, *Collembola* made 35% and *Gerromorpha* 18% (Fig. 2). Among *Heteroptera* the most numerous species were: *Sigara falleni, Mesovelia furcata, Plea minutissima, Gerris argentatus.*

Very high quantity and large variability in zones I and II were determined by very favourable conditions in these zones. The most of zoopleuston species colonised shallow water protected from waiving, making numerous clusters there [3,5]. These conditions were created in zones I and II. It was also confirmed, that percentage of each pleuston taxon group showed variability in the investigated zones. It was clearly seen on the example of *Nepomorpha,* which water/land zone took up the smallest percentage part, but on the edge of the reed bed made 33%; *Collembola* was much lower in the same zone (Fig. 3).

CONCLUSIONS

1. The most numerous of taxons and their highest concentration levels were found in I and II zones; then in direct of vanish away the taxons number and the quantity were decreasing.

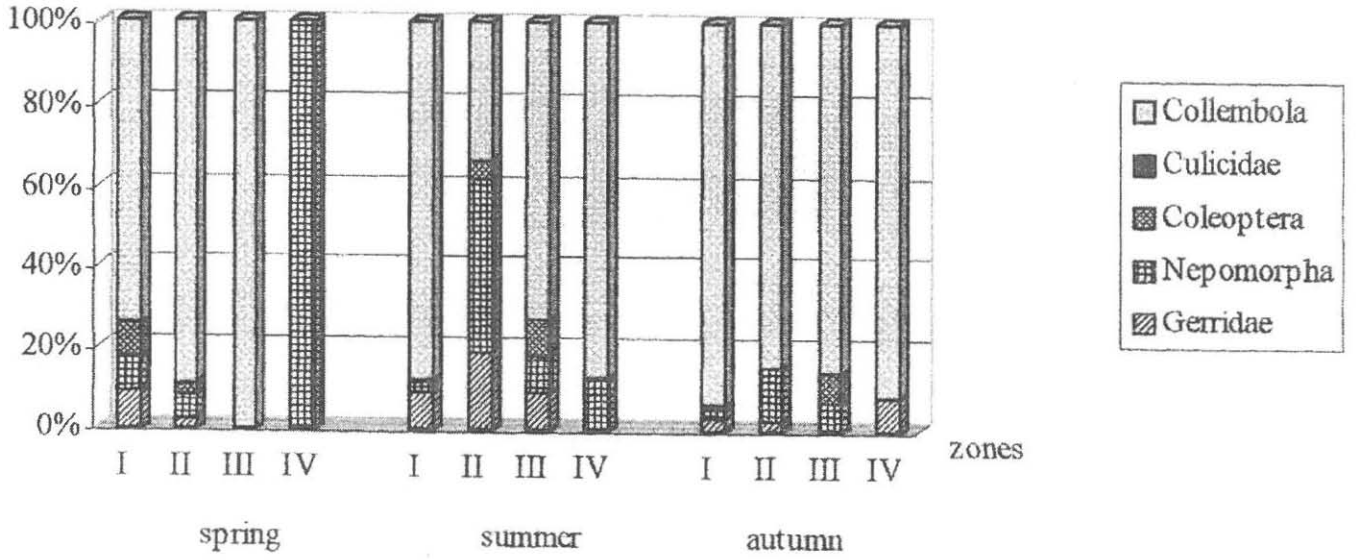

Fig. 2. Seasonal changes in the percentage share of pleustonic taxa in some zones of the Piaseczno Lake

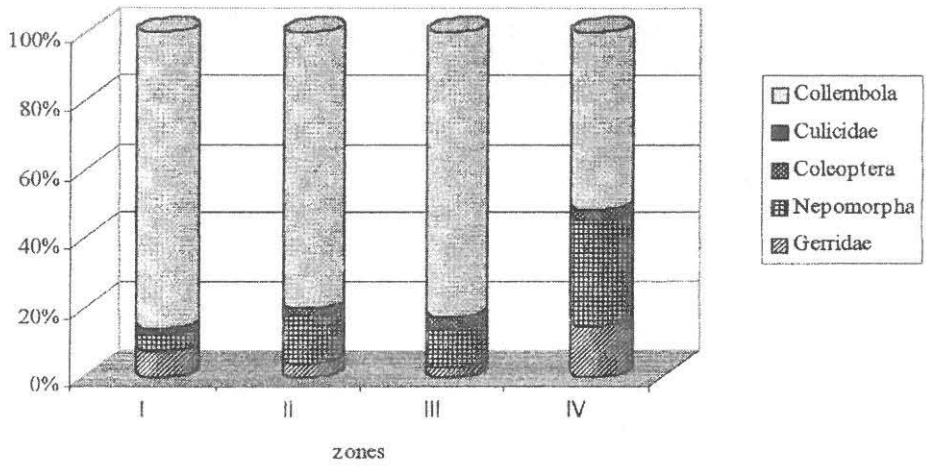

Fig. 3. Percentage share of the pleuston taxa in some investigated zones of the Piaseczno Lake

2. The most significant predominant species in pleuston in all zones was *Collembola.*

3. Eighteen taksons of zoopleuston were found, 11 out of them belonged to *Heteroptera.*

4. In the Piaseczno Lake, water/land site and the beginning of reeds were the most favourable conditions for the zoopleuston growing.

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STREFOWOŚĆ WYSTĘPOWANIA ZOOPLEUSTONU W PŁYTKIM LITORALU JEZIORA PIASECZNO (POLESIE LUBELSKIE)

W. Płaska

Katedra Hydrobiologii i Ichtiobiologii, Akademia Rolnicza
ul. Akademicka 13, 20-950 Lublin, Polska

S t r e s z c z e n i e. W 2000 roku prowadzono ilościowe badania zoopleustonu w czterech strefach mezotroficznego jeziora Piaseczno. Stwierdzono łącznie występowanie 18 taksonów zoopleustonu, z których 11 należało do *Heteroptera*. Liczba gatunków w poszczególnych strefach kształtowała się zmiennie. Największą liczbę taksonów stwierdzono wiosną na styku woda/ląd. Liczebność zoopleustonu w każdym sezonie największe wartości osiągała w strefie stykowej woda-ląd i wśród makrofitów zanurzonych, następnie stopniowo malała w kierunku trzcinowiska. Największe zagęszczenie wynoszące 512 osobn. m^{-2} stwierdzono wśród makrofitów zanurzonych jesienią. W badanym jeziorze zdecydowanym dominantem były *Collembola*, stanowiły one ponad 80% w ogólnej liczebności pleustonu. Wśród *Heteroptera* gatunkami najliczniej występującymi były: *Sigara falleni, Mesovelia furcata, Plea minutissima, Gerris argentatus*. Stwierdzono iż w miarę oddalania się od brzegu różnorodność gatunkowa i liczebność pleustonu malała. We wszystkich strefach dominowały *Collembola*, jednak na skraju trzcinowiska dominantami były również *Nepomorpha*.

S ł o w a k l u c z o w e: zoopleuston, jezioro, płytki litoral, strefowość