

SHORT COMMUNICATION

AGE DETERMINATION OF MEGAPHYLLUM UNILINEATUM  
(C.L.KOCH) (DIPLOPODA: JULIDAE)

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Knowledge of age groups, separation of developmental stages is a basic problem of population studies. A good method can be especially important at populations which have overlapping generations. We met this problem at studying the population dynamics of *Megaphyllum unilineatum* (C.L. KOCH) (HORNING and VAJDA, 1987). This species is an iteroparous one, surviving after laying her first brood and reproduces more times during its life-span (up to 5 years; SCHUBART, 1934). Adults are always present in the population. Eight development stages -seven larval and an adult- can be distinguished in the species (VACHON, 1947).

*M. unilineatum* is mentioned in taxonomical (SCHUBART, 1934; VERHOEFF, 1910—14; STOJALOWSKA, 1961) and some faunistical, general ecological studies (HAACKER, 1968; DUNGER and STEINMETZGER, 1981) but no population study is known for us on this species, wide-spread in Hungary.

Different authors used more kinds of methods for age determination at diplopods such as counting body segments, defensive glands, leg pairs, rows of ocelli, measuring body length, body weight, mid-segment width (see *Table I.*) We tested some of them but they showed — with the exception of rows of ocelli — large overlaps (*Table II.*), especially in stages VI—VIII. and didn't give unambiguous limits for determination of single stages. We found counting the number of ocelli to be the best method in the studied species.

Specimens of *M. unilineatum* were collected at Bugac, in the frame of the complex ecological studies of the ecological group of Zoological Department of JATE University. The material of seventy pit-fall traps (working from April till December) of 1983—85 was evaluated. Animals were stored in 70% alcohol. Ocelli of every single specimen (5961 individuals during the three years) were counted under dissecting microscope. Its result is shown by Fig. 1. On the basis of the present study the larval stages (I.—VII.) can be separated unambiguously. There is no or not significant overlap in the number of ocelli. At the VIII. stage five maxima (Fig 1.: A1—A5) were found which can be presumably corresponded to the age of adults. The life-span of *M. unilineatum* is estimated for 3—5 years (SCHUBART, 1934). As *M. unilineatum* is able to develop to the VIIIth stage within one year, the five maxima refers to the five years of adult stages. The decreasing frequency in individual numbers from A2 to A5 seems to present the natural tendency of decreasing adult number because of increasing age, that is the adult mortality.

Table I. Methods for age determination used by different authors.

	No. of segments	No. of legs	No. of def. glands	Rows of ocelli	Body length	Mid-segment width	Body weight
BAKER (1978b)	x			x			
BANO and KRISHNAMOORTHY (1985)	x	x			x		
BERCOVITZ and WARBURG (1985)					x	x	x
BLOWER (1985)				x			
HALKKA (1958)	x	x	x		x		
MEYER (1985)				x			
PEITSALMI (1981)			x				
SAUDRAY (1952)				x			
STRIGANOVA and MAZANTSEVA (1979)				x			x
PEITSALMI (1981)			x				

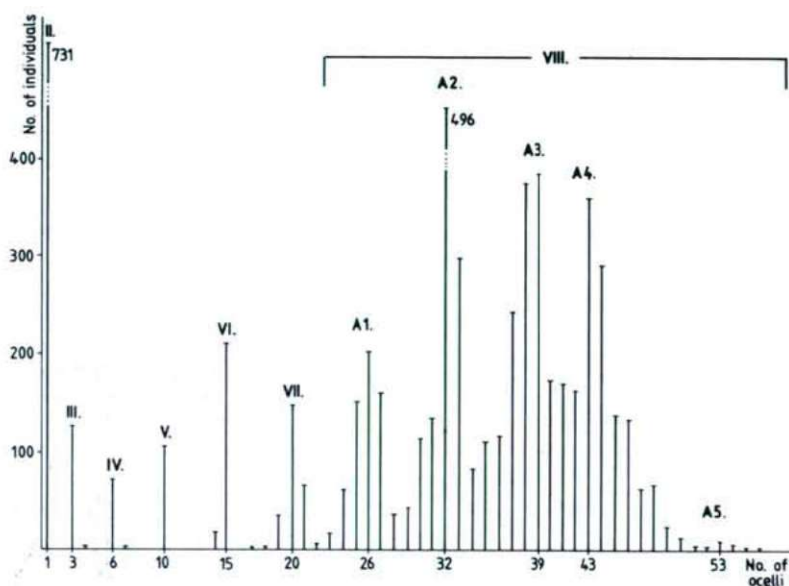


Fig. 1. Developmental stages in function of ocellus number

Table II. Results of the different methods for age determination of *Megaphyllum unilineatum* from II. to adult (VIII.) stage

Developmental stage	No. of segments average $\pm$ SD	Mid-segment width (mm) average $\pm$ SD		Peaks of ocellus number
II.	12.71 $\pm$ 1.36 (12—14)	*		1
III.	17.07 $\pm$ 0.65 (16—18)	*		3 (3—4)
IV.	21	0.56 $\pm$ 0.05 (0.48—0.65)	**	6 (5—7)
V.	28 $\pm$ 0.72 (27—29)	0.67 $\pm$ 0.06 (0.6—0.71)	0.69 $\pm$ 0.0 (0.62—0.88)	10
VI.	33.84 $\pm$ 1.11 (31—36)	0.83 $\pm$ 0.06 (0.72—0.92)	0.88 $\pm$ 0.08 (0.7—1.01)	15 (14—15)
VII.	38.01 $\pm$ 1.52 (32—44)	0.97 $\pm$ 0.08 (0.81—1.09)	1.07 $\pm$ 0.22 (0.9—1.46)	20 (17—22)
VIII.	43.59 $\pm$ 1.3 (42—48)	1.58 $\pm$ 0.17 (1.08—2.23)	1.99 $\pm$ 0.36 (1.1—2.7)	age group 1. 26 2. 32 3. 39 4. 43 5. 53

Remarks: \* — mid segment width cannot be measured;

\*\* — sex cannot be distinguished;  
minimum-maximum values in brackets

With this method we could separate developmental stages correctly. It became possible to follow the changes of age groups within the population that is to make the population's temporal dynamics.

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