

# APPEARANCE OF HYDROMEDUSAE IN THE NORTHERN ADRIATIC SEA IN 1992 AND 1993

A. BENOVIC and D. LUCIC

Biological Institute, P.O.Box 39, 50000 Dubrovnik, Croatia

Hydromedusae are among best studied plankton groups in the Northern Adriatic Sea (NEPPI & STIASNY, 1913, BENOVIC, 1973). Northern Adriatic fauna, including hydromedusae, is subjected to strong ecological stress due to hypoxic and anoxic events during summer months (OREL *et al.*, 1993), and many species have disappeared from the area (BENOVIC *et al.*, 1987). To check hydromedusan fauna after these ecological stresses, the present work reports the incidence of hydromedusae collected during the Alpe-Adria Cooperative Research Program (Italy, Austria, Slovenia and Croatia) cruises of 1992 and 1993. Hydromedusae were sampled monthly at stations indicated in Figure 1. Bottom-to-surface vertical tows with 0.20 mm WP2 (stations A, A3, F1) and 0.25 mm NANSEN (other stations) mesh plankton nets were used to measure abundance. Total numbers of hydromedusae were determined from entire catch and are expressed on a per-square-meter basis. Fourteen species were identified (Table 1): 6 Anthomedusae, 6 Leptomedusae, 1 Trachymedusa and 2 Narcomedusae (because of inadequate preservation, Narcomedusae were not separable between *Solmaris leucostyla* and *S. vanhoeffeni*). Seven species (a, d, g, h, k, m, n) were found in both warmer and colder months, but highest abundance was restricted to warmer months. Other seven species were rarely encountered and 3 (e, j, l) were noted but once (Table 1). Number of individuals shows domination of only 3 Anthomedusae (a, c, d) and 2 Leptomedusae (g, h). Leptomedusae i and k, Trachymedusa m and Narcomedusa n have shown notable presence, while we can indicate as very rare other species of Anthomedusae (b, e, f) and Leptomedusae (j, l). With the exception of stations SJ-007 and ZI-012, spatial distribution of hydromedusae was higher along the eastern portion of the study area (Fig.1). The lowest number of species was observed in front of the Pô River (Station SJ-101). These data support earlier observations on the decrease in the number of hydromedusae species in the Northern Adriatic (BENOVIC *et al.*, 1987). The few rare species reported in 1965 (BENOVIC, 1973) were noted again; their appearance, mainly in the eastern part of the area, could be related to the stronger currents from the south observed in 1991-1993 (M. CELIO, pers.comm.).

Fig. code	SPECIES	Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
a	<i>Sarsia gemmifera</i>		1	1	31	7	514	1093	1	42	9			
b	<i>Corymorpha nutans</i>				1			3						
c	<i>Podocoryne minutina</i>				1		14	61	7	294		2	12	
d	<i>Podocoryne minuta</i>				12	8	29	259	53	257	258	19	118	9
e	<i>Bougainvillia ramosa</i>							1						
f	<i>Thamnostoma dibalia</i>								5				2	2
g	<i>Obelia</i> sp.		1	1	41	30	19	2	4	2	1	27	29	28
h	<i>Clytia hemisphaerica</i>				1	1	10	2	1	905	1549	1	16	9
i	<i>Eirene viridula</i>				11		1	1	7		1			
j	<i>Aequorea aequorea</i>						1							
k	<i>Eutima gracilis</i>					1	10	10	6	5	2	1	1	
l	<i>Helgicirrha schulzei</i>									13				
m	<i>Liriope tetraphylla</i>					1		85		7		1	14	
n	<i>Solmaris</i> spp.		1			1	2		1	2		3	1	

Tab. 1. Annual appearance of hydromedusae in the Northern Adriatic Sea. Numbers represent total monthly appearance of species for 1992 and 1993 in entire area of investigation in water column of the surface area of 1m<sup>2</sup>.

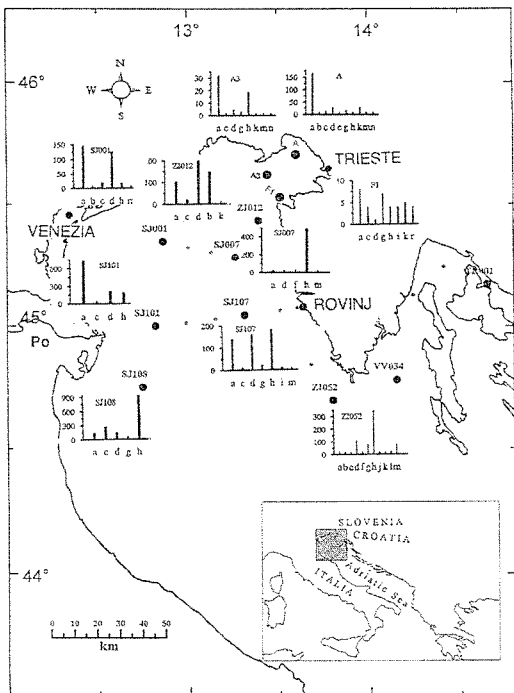


Fig. 1. Spatial appearance of hydromedusae in the Northern Adriatic Sea. Ordinate numbers represent total appearance of individuals for 1992 and 1993 in water column of the surface area of 1m<sup>2</sup>.

## REFERENCES

- BENOVIC A. 1973. Idromeduse dell'Adriatico Settentrionale nell'anno 1965. *Boll. Pesca Piscic. Idrobiol.* 28, 1 : 59-70.  
 BENOVIC A., D. JUSTIC and A. BENDER. 1987. Enigmatic changes in the hydromedusan fauna of the Northern Adriatic Sea. *Nature*, 6113 : 597-600.  
 NEPPIV. and STIASNY G. 1913. Die Hydromedusen des Golfes von Triest. *Arb. Zool. Inst. Wien-Triest*, 20 : 23-92.  
 OREL G., S.FONDA-UMANI et ALEFFI, F. 1993. Ipossie e anossie di fondali marini L'Alto Adriatico e di Golfo di Trieste. Ed. Regione Autonomia Friuli-Venezia Giulia, Trieste, pp. 104.

*Rapp. Comm. int. Mer Médit.*, 34, (1995).