EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

CephsInAction

For: CephsInAction scientific meeting in Barcelona (March, 14th -15th, 2014)

Biology of *Illex coindetii* (Vérany, 1839) (Cephalopoda: Ommastrephidae) in the Eastern Adriatic Sea

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Abstract

Results of research on the broadtail shortfin squid *Illex coindetii* (Vérany, 1839) inhabiting the eastern Adriatic Sea are presented. Data show wide distribution of shortfin squid over the eastern Adriatic, with the highest species density in the Adriatic Pit and South Adriatic Pit. Dorsal mantle length ranged from 36 to 216 mm (101.20 ± 31.74 mm), while body weight ranged from 1.79 to 356.90 g (37.19 ± 40.98 g). During its life cycle, shortfin squid feeds intensively, mostly on fishes (%F = 62.07), crustaceans (%F = 30.09) and cephalopods (%F = 27.90). Shortfin squid acquires parasites, nematode *Anisakis pegreffii* and cestode *Phyllobothrium* sp., early in life stage by ingesting infected prey. Life span of this species was estimated at around six months by the analysis of statolith microstructure. Both sexes mature over a wide range of age and full sexual maturity is reached at age of four months. This species reproduces throughout the whole year with two spawning peaks during winter and spring-summer months. Average number of spermatophores found in male spermatophoric sac was 331, while average potential fecundity estimated 105184 oocytes and relative fecundity 705 oocytes/g. Histological analysis of gonads confirmed synchronous ovulation and intermittent spawning of this species.

BIOLOGY OF *ILLEX COINDETII* (VÉRANY, 1839) (CEPHALOPODA: OMMASTREPHIDAE) IN THE EASTERN ADRIATIC SEA

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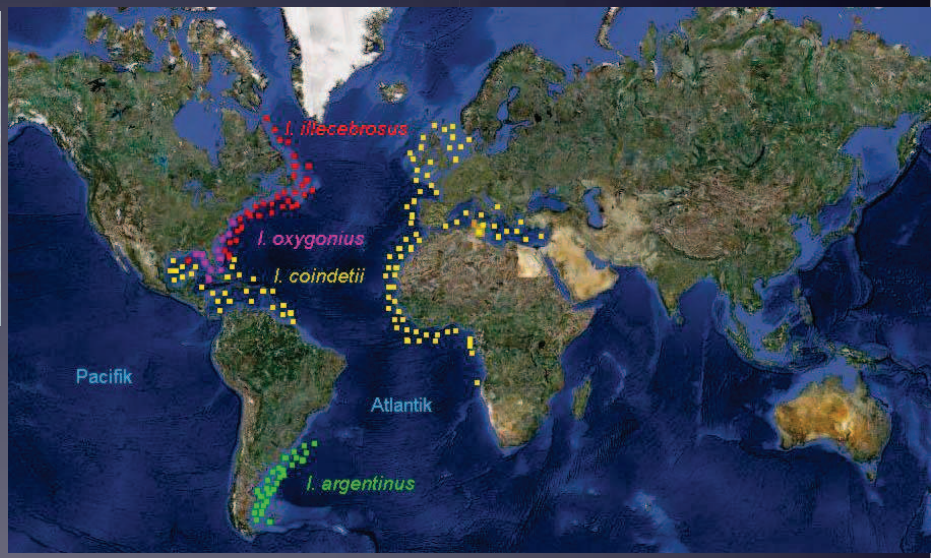
COST Action FA1301 CephInAction

Scientific & WGs Meetings – Barcelona March 14-15, 2014

INTRODUCTION

shortfin squid, *Illex coindetii*



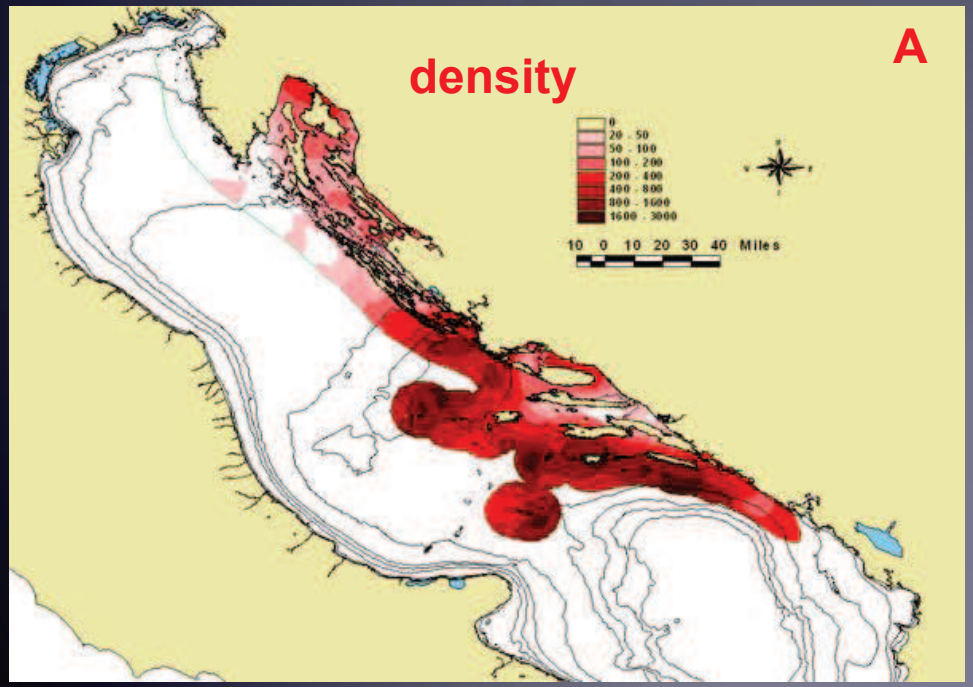
- only representative of the ommastrephid squid genus *Illex* in the Adriatic
- a valuable demersal resource - one of the most important cephalopod species in the Adriatic basin caught by trawlers
- semidemersal, oceanic and neritic species
- short life span, continuous recruitment, fast growth and high mortality rate

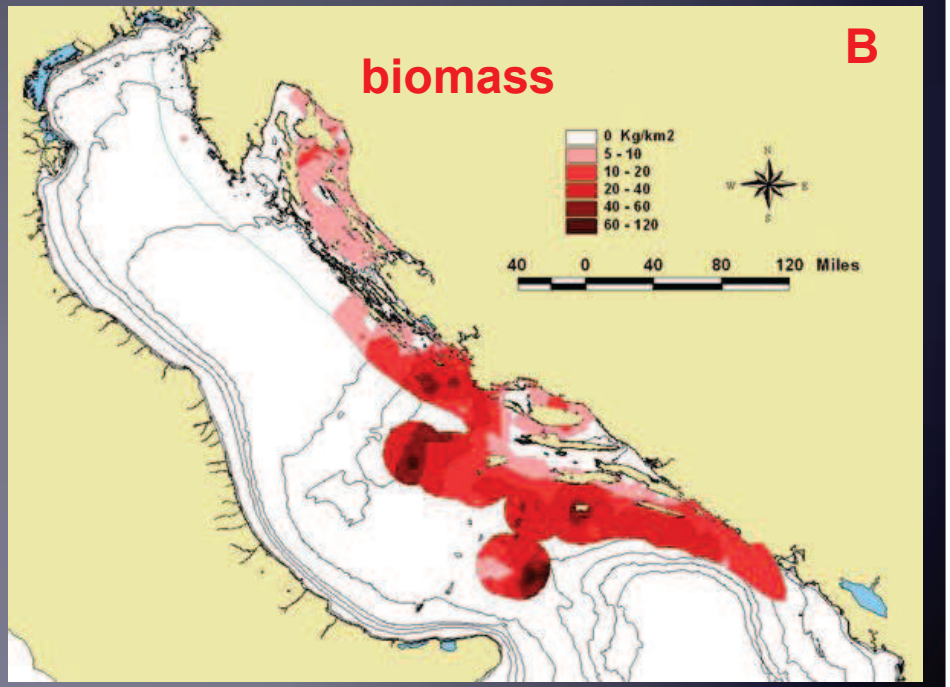
SAMPLING

- MEDITS data
- monthly year-round sampling
- commercial bottom trawl
  - 1.5 m vertical opening and 48 mm mesh size
  - speed of 2.7 – 2.9 knots
  - 5 to 6 hours
- depths from 170 to 200 m
- analysed
  - biometry, diet, parasites, age, reproduction

DISTRIBUTION

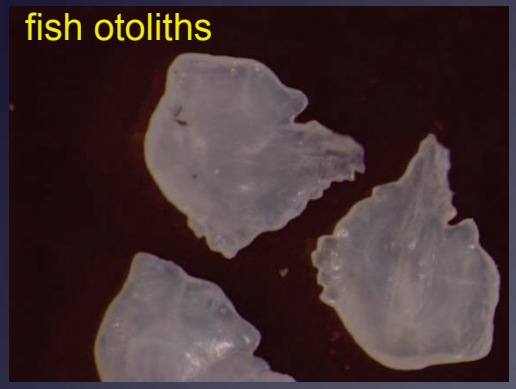
- occurred over the entire range of depths (A)
- greatest abundance → Adriatic (Jabuka) Pit and South Adriatic Pit (B)
- DML: 36 - 216 mm; BW: 1.79 - 356.9 g



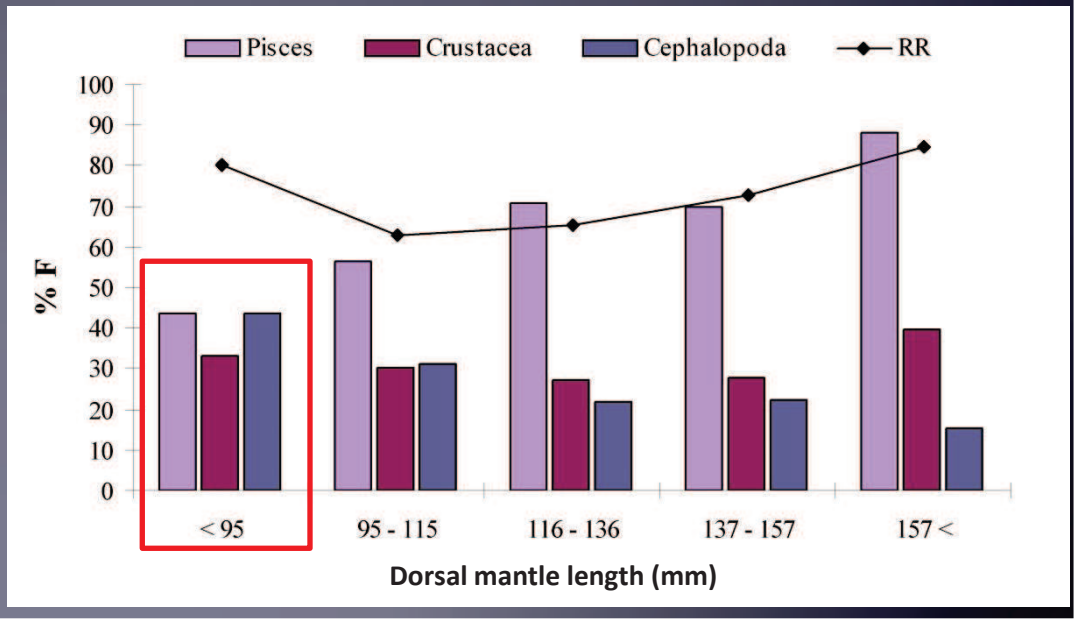


DIET

- from 453 analysed stomachs → 70,42% full and 29,58% empty



- immature squids prefer cephalopods and crustaceans, unlike adults that prefer fish



Prey item	%F	f
PISCES	**62,07**	**0,62**
Maurolicus muelleri	16,93	0,17
Trisopterus minutus	0,31	< 0,01
Gadiculus argenteus	0,31	< 0,01
Phycis blennoides	0,31	< 0,01
Trachurus trachurus	0,31	< 0,01
Unidentified fish	43,89	-
CRUSTACEA	**30,09**	**0,30**
Euphausiacea	5,96	0,06
Alpheus sp.	0,94	0,01
Aegaeon cataphracta	0,94	0,01
Unidentified crustaceans	22,26	-
CEPHALOPODA	**27,9**	**0,28**
Illex coindetii	6,90	0,07
Todaropsis eblanae	3,13	0,03
Unidentified cephalopods	**17,87**	-
GASTROPODA	**0,31**	**< 0,01**
Unidentified pteropods	0,31	< 0,01

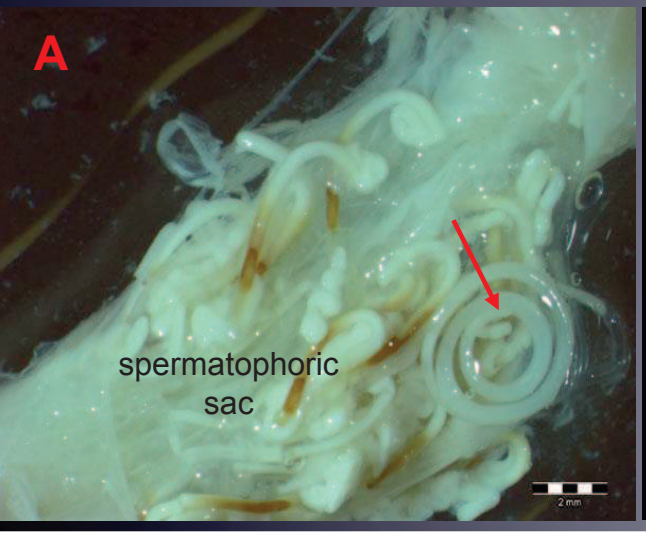
primary prey

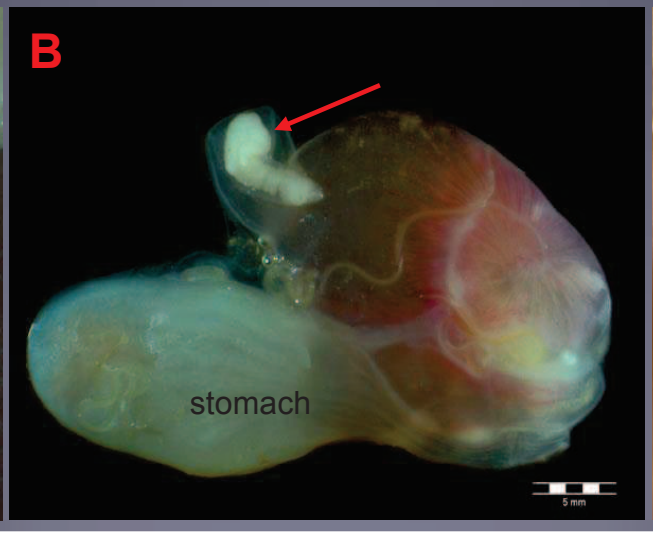
secondary prey

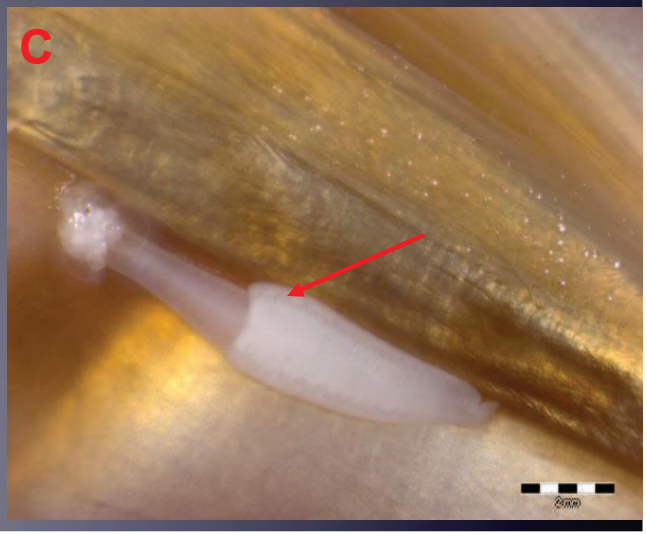
%F – percentage occurence
f – occurence index (0-1)

PARASITES

- nematode *Anisakis pegreffii* – prevalence of 30.5% (A)
- cestode *Phyllobothrium* sp. – prevalence of 2.3% (B, C)
- no pathological changes
- larval stages of both parasites – in the hosts' digestive system
  - paratenic nature of *Illex coindetii*

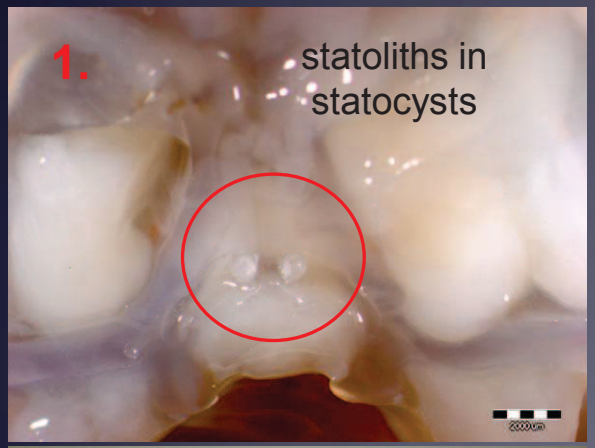


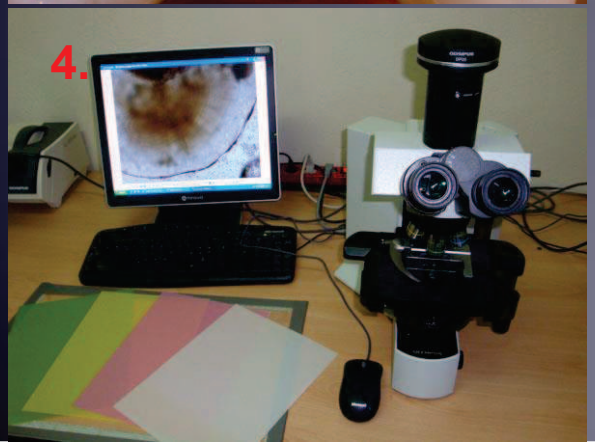


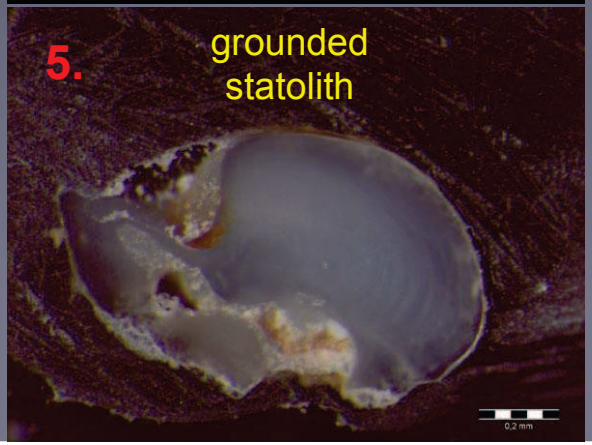


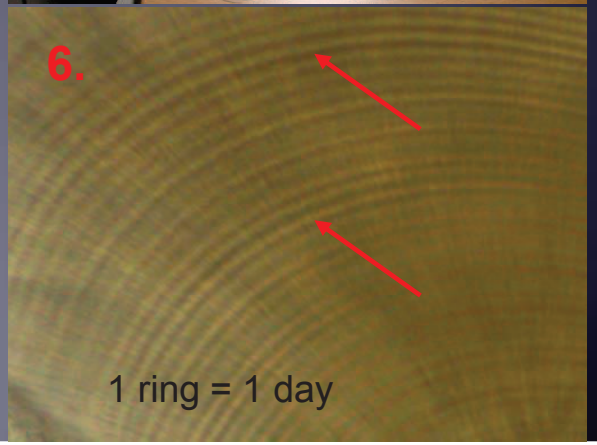
AGE

- analysis of statolith microstructure (1. → 6.)
- determined age: 52 to 186 days
  - life span around six months



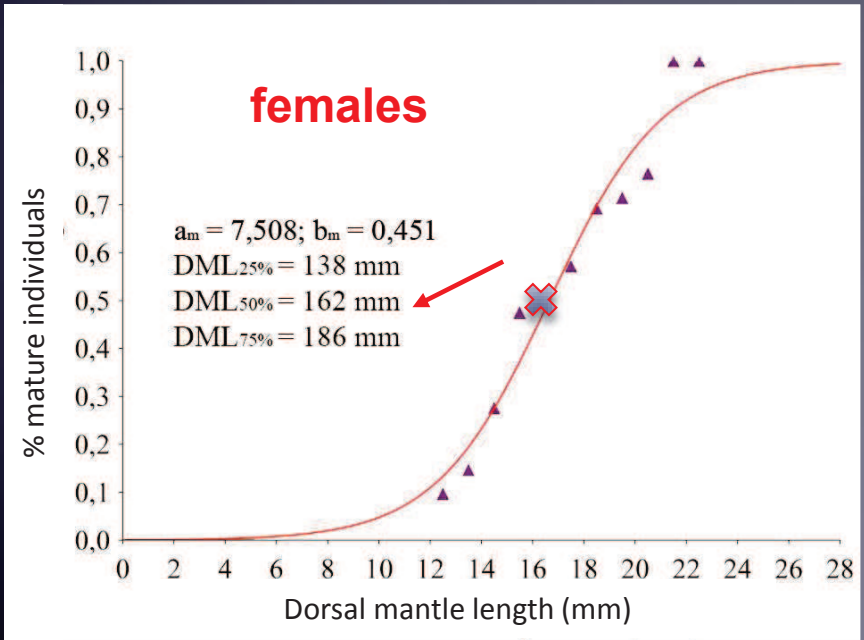


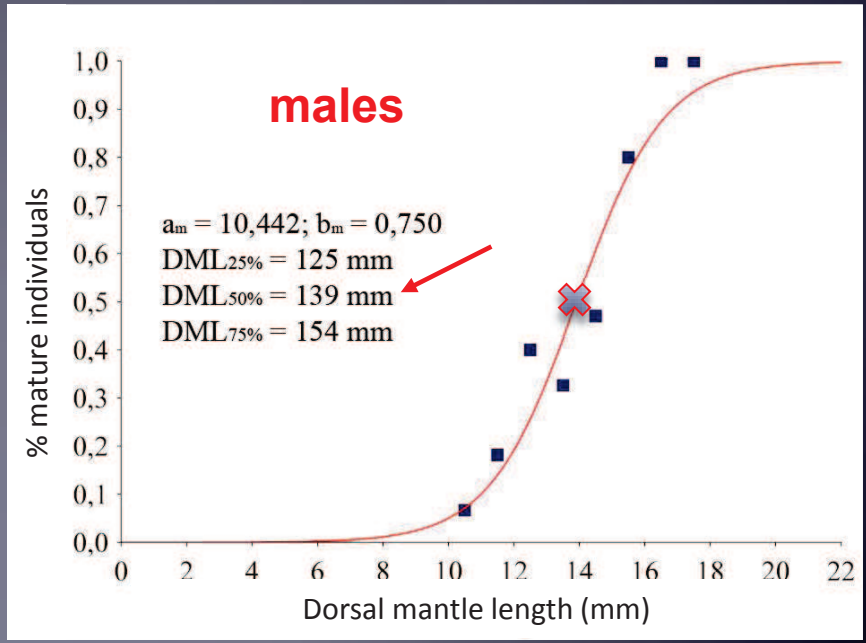




REPRODUCTION

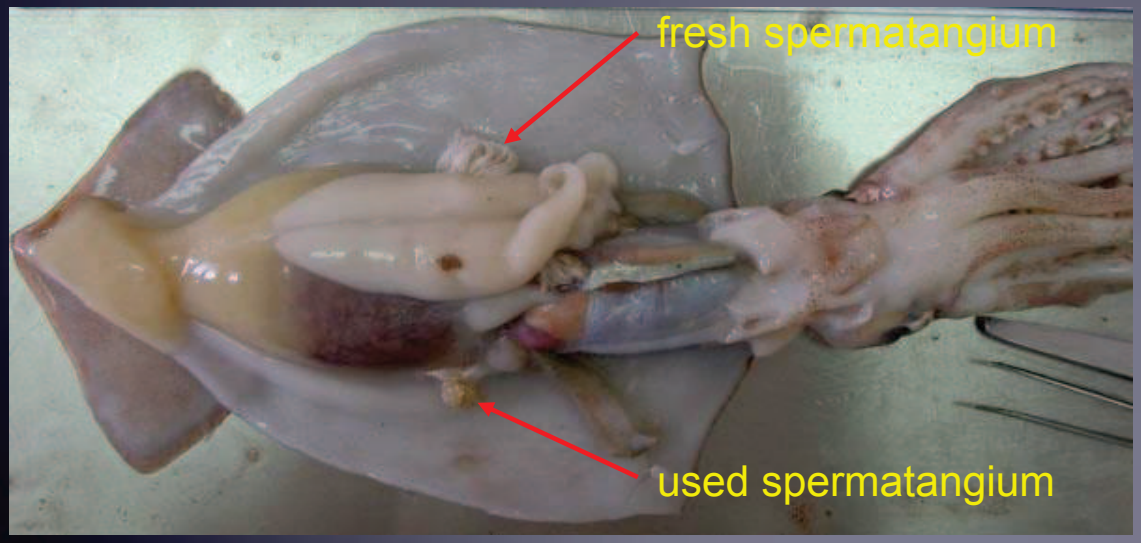
- full sexual maturity reached at four months
  - females → DML50% = 162 mm & males → DML50% = 139 mm
- reproduction occurs throughout the whole year
  - 2 spawning peaks: winter and spring-summer
- spent individuals were not found

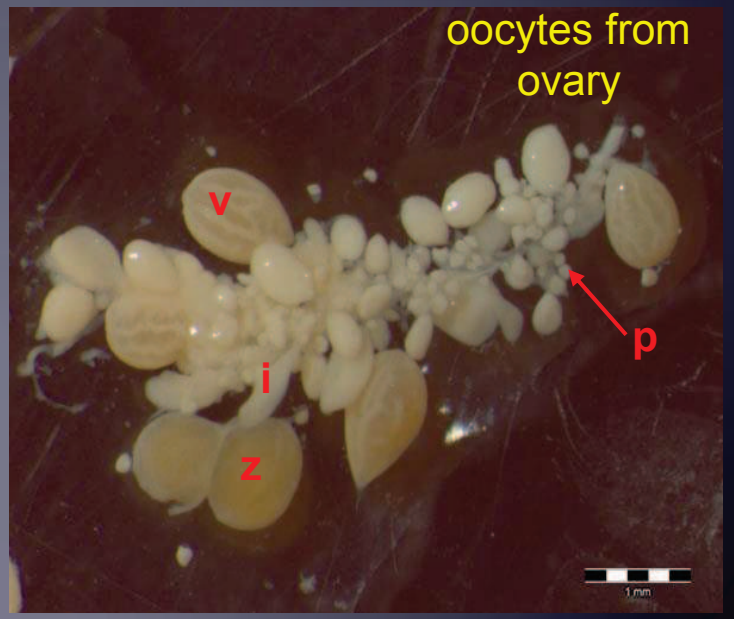




REPRODUCTION

- 9,43% females with spermatangium
- potential fecundity → 28024 – 207660 oocites (~ 105184)
- relative fecundity → 422 – 1028 oocites/g (~ 705)
- ovaries with different oocytes:
  - protoplasmic (p), intercalary (i), vitellogenic (v) and mature (m)

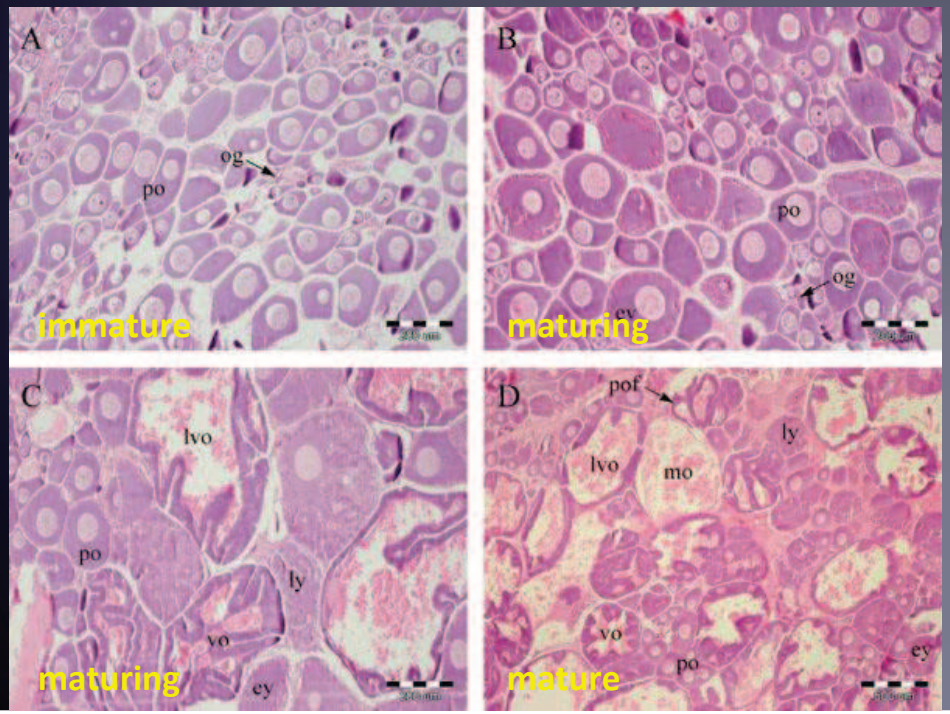




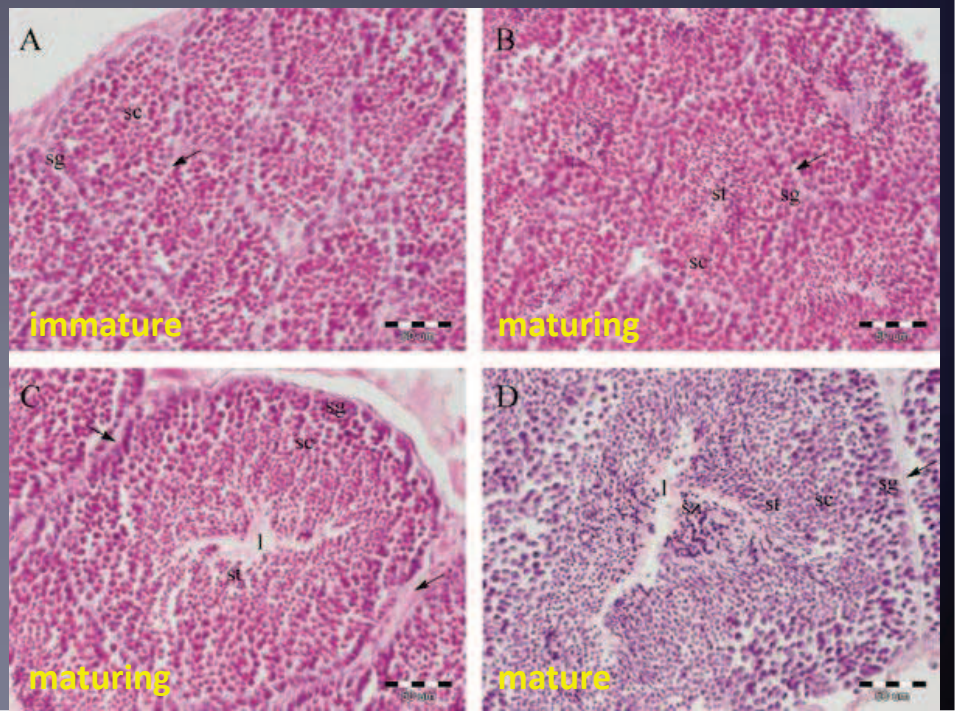
REPRODUCTION

- histological analysis:
  - oocytes of all stages present in mature ovaries
  - mature testis with early spermatogenic cells
- synchronous ovulation and intermittent spawning

females



males



MAIN CONCLUSIONS

- interannual variability in abundance, most probably due to different recruitment period
- oportunistic predator that feeds on the most available pelagic prey common for muddy sediments of the middle Adriatic
- evident ontogenic shift from diet based on cephalopods to diet based on fish
- second paratenic host for nematode *Anisakis pegreffii* and cestode *Phyllobothrium* sp., with significant seasonal variation in anisakid intesity influenced by prey preferences
- life span estimated at around six months, with reaching sexual maturity at four months
- synchronous ovulation and intermittent spawning confirmed with simultaneous findings of numerous previtellogenic and vitellogenic oocytes in mature ovaries, as well as all stages of spermatogenic cells in mature testes

Thank you!

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