

# Diversity of the picoplankton community at Helgoland

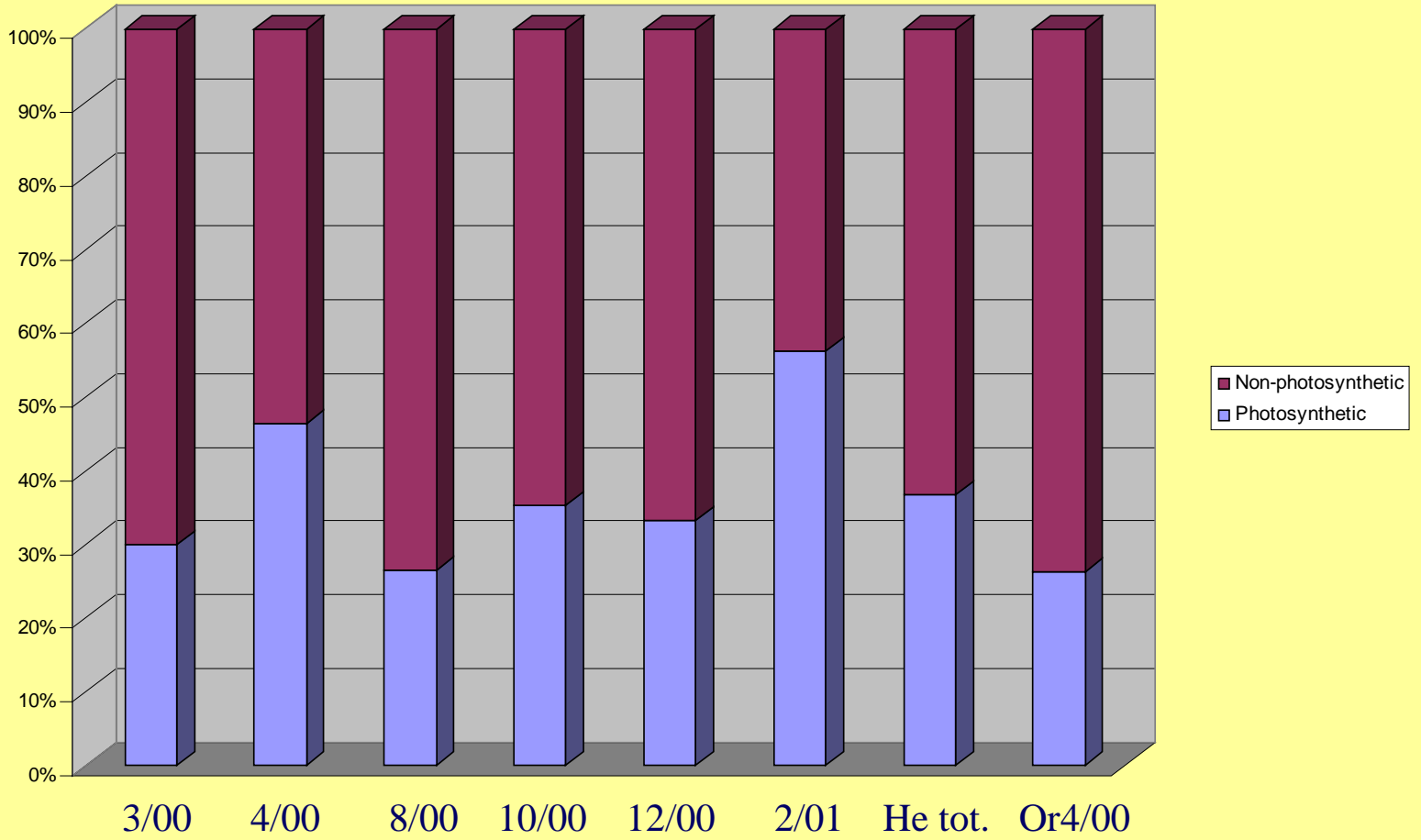
Klaus Valentin, Helga Mehl and Linda Medlin

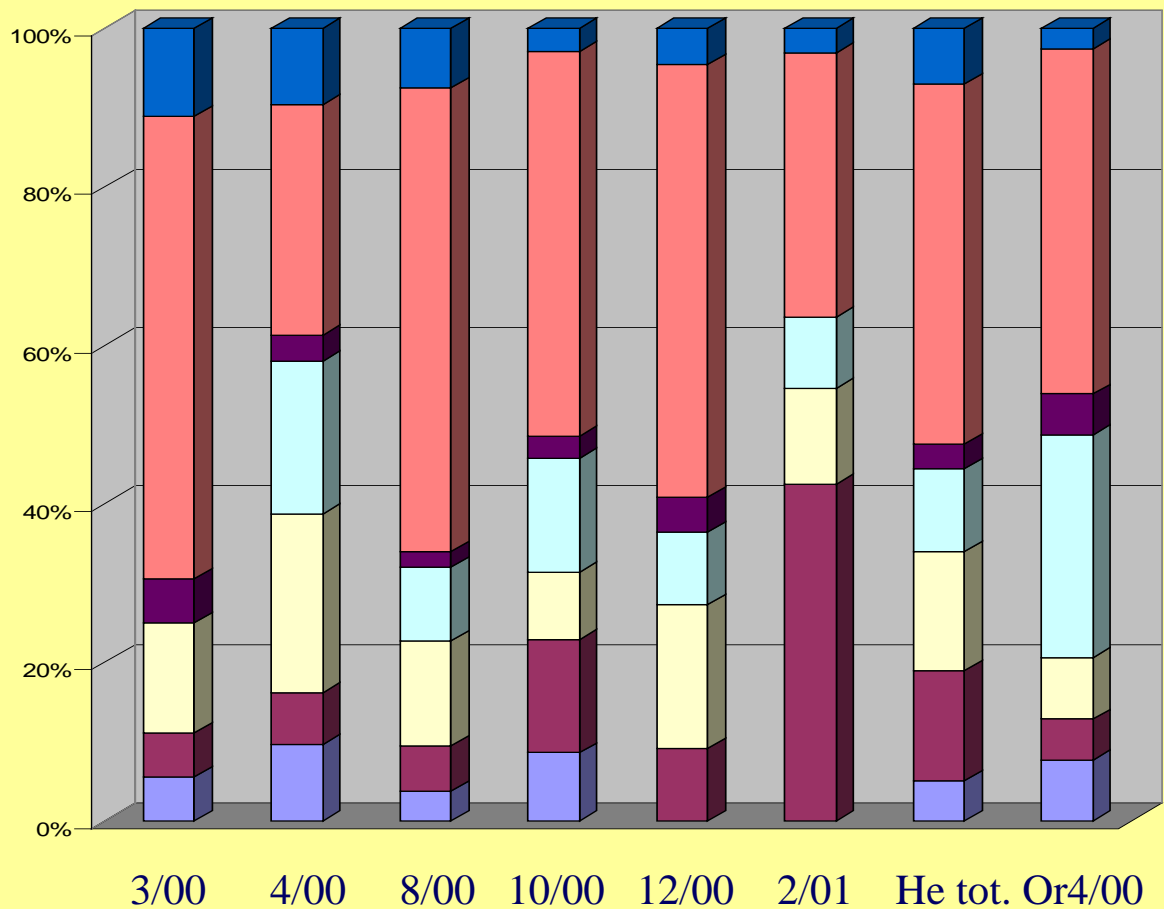
1 - Clone libraries (3/00 - 2/01)

2 - Time series using SSCP (1/01 - 5/02)

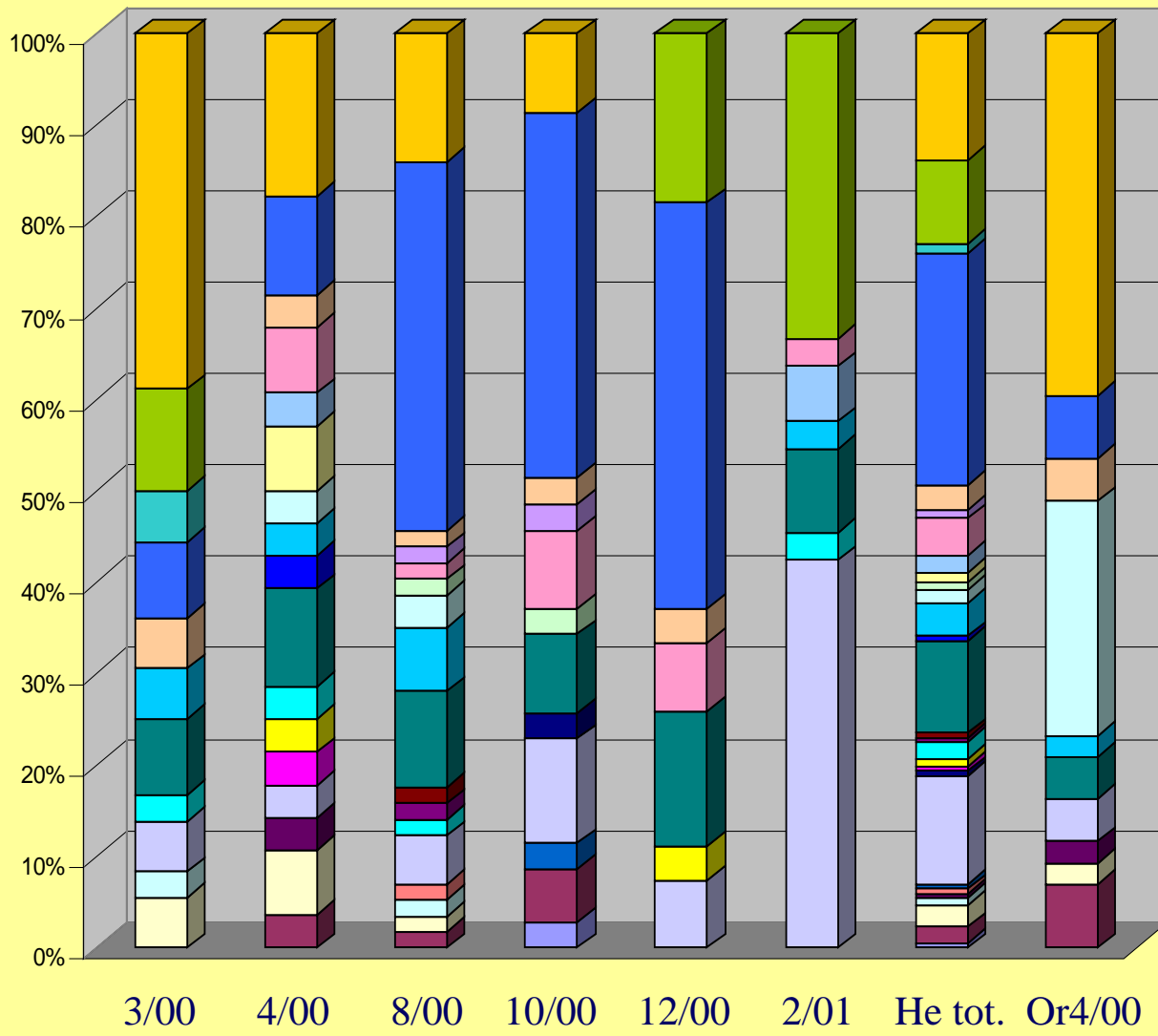
3 - Short-term time series using SSCP (6/02)

4 - Implications for future work





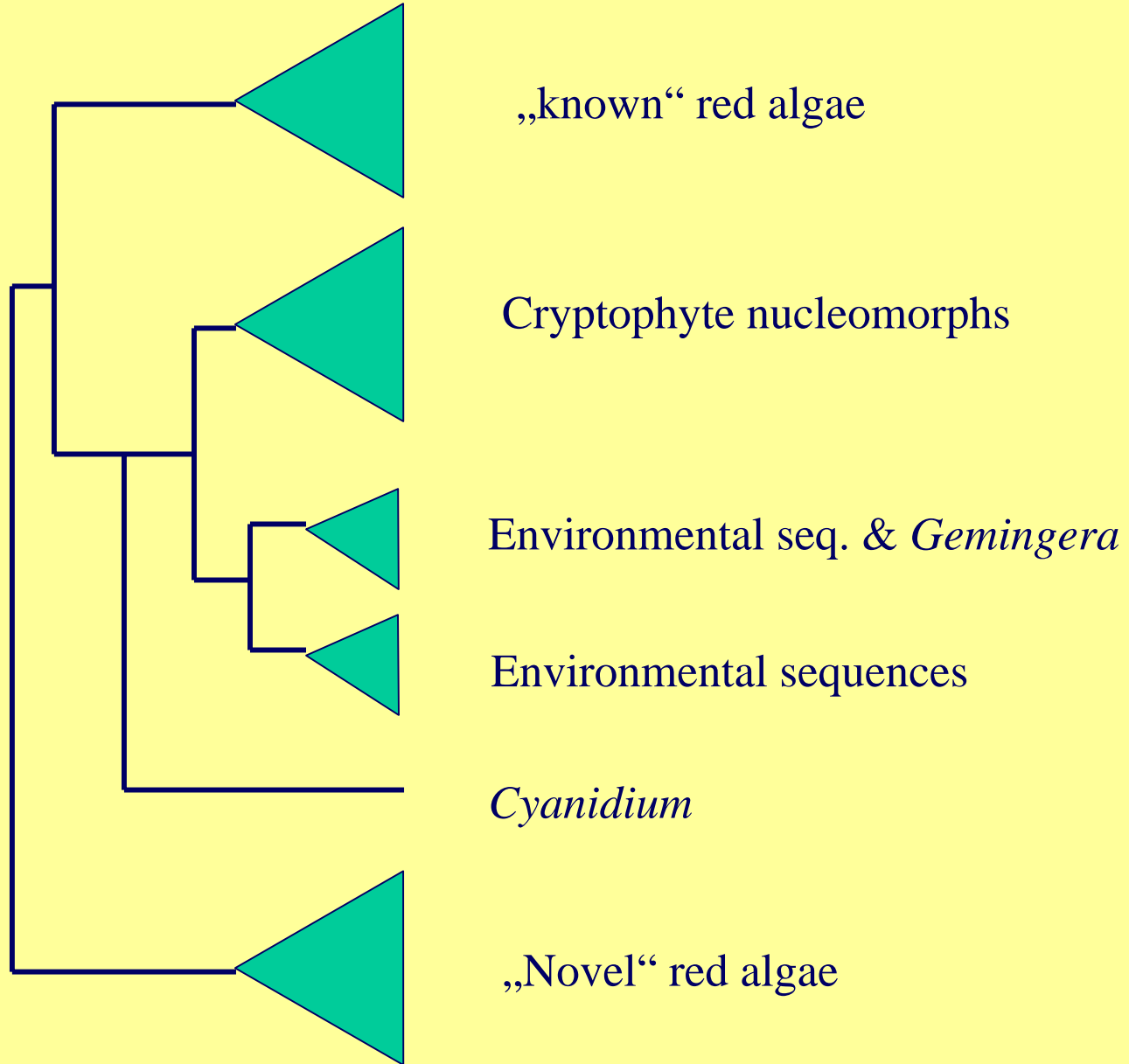
- Others
- Alveolates (I, II, and Ciliates), non photosyn.
- Dinoph. (pot. Photosynth.)
- Non-photosynth. Stramenopiles
- Photosynthetic Stramenopiles
- Prasinophytes
- "Red" and Crypto.



- Alveolates/Ciliates
- Alveolates group I
- He0003 29/72
- Alveolates Group II (Amoebophyra)
- Alveolates/Dinophyta
- Strameno./Traustochytr.-like
- Strameno./Bisecoids (Caecitellus)
- Strameno. IIIB, non-photosyn.
- Strameno. II, non-photosyn.
- Strameno. IV, non-photosyn.
- Strameno. VII & VIII, non-photosyn.
- Strameno./Chrysophytes
- Strameno./Dictyochiophytes
- Strameno./Bolidophytes
- Strameno./Diatoms
- Chlorarchnioph. Nucleus
- Euglypha
- Haptophyta
- Prasinol./Pyramimonadales
- Prasinol./Pseudoscourfeldia
- Prasinol./Mamiellales
- Chlorophyta/Chlamy-like
- Choanofl.
- "LKM 74" - Perkinsus
- "He0003 26"
- Cryptoph. Nucleus
- Red algal clade ("Porph. 4")
- Cryptoph./Nucleomorph

# Interesting clades

- Novel red algae I: 27 sequences
- Novel red algae II = base of Cryptophyte nucleomorph clade: ca. 10 seq.



# Interesting clades

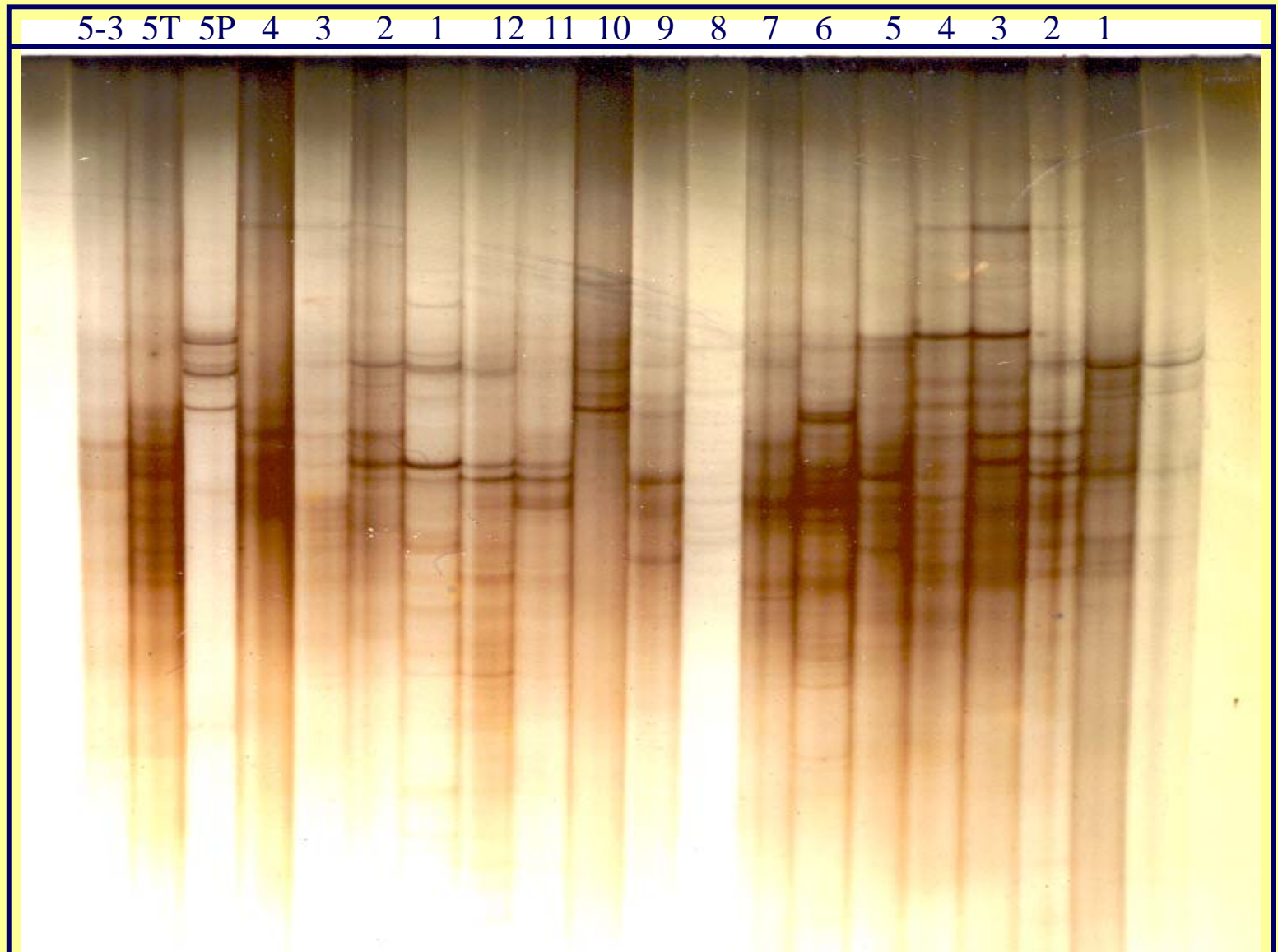
- Base of Cryptophyte nucleus/Acantamoeba (He0003.26): 4 sequences
- Base of Choanoflagellates: ca. 5 sequences
- Base of Euglypha (3)
- Base of Chlorarachniophytes (4)
- Base of Oomyces (5)
- Base of Amphidinium: (2)

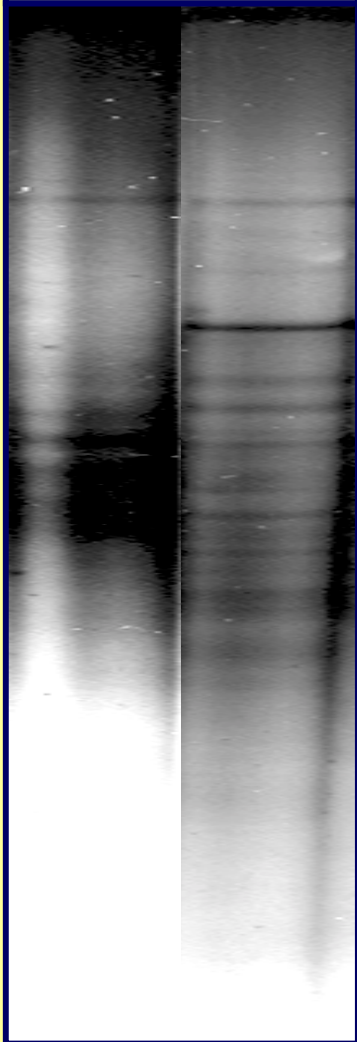
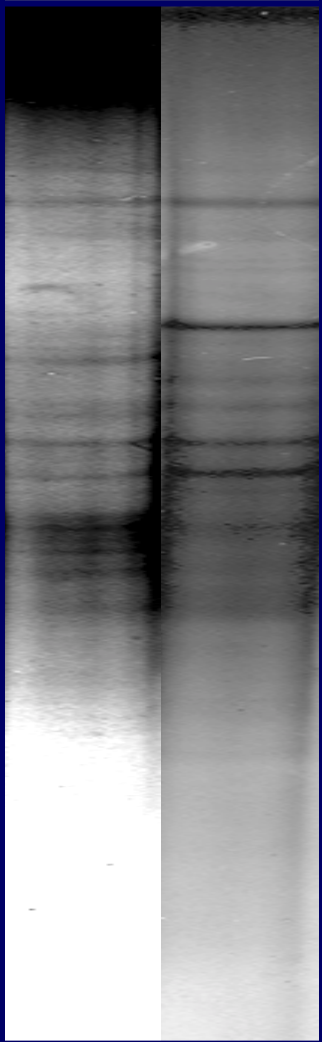
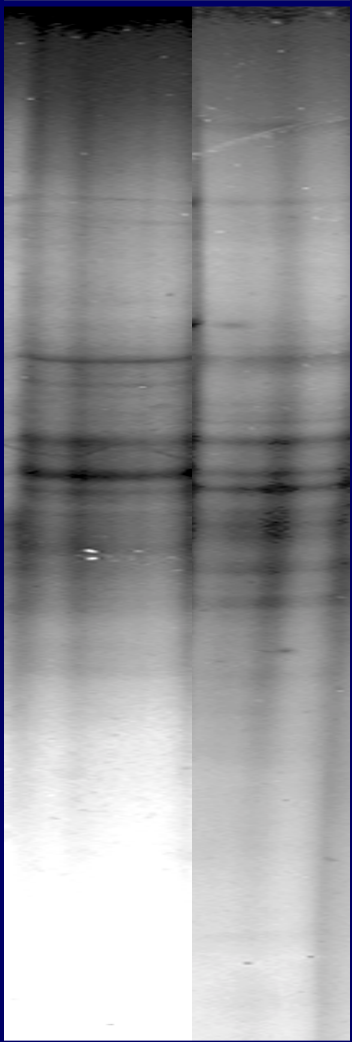
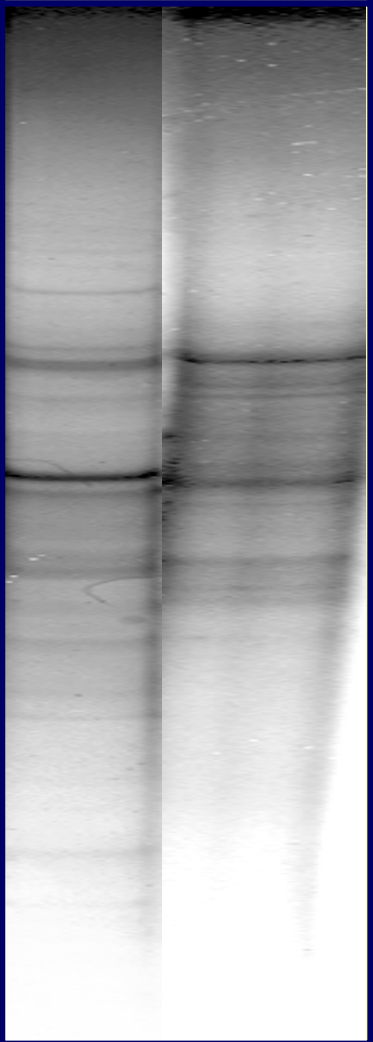
# SSCP profiles from environmental DNA - PICODIV

- Isolate environmental DNA from <math><3\mu\text{m}</math> fraction
- run PCR with 528F and 926R, check on gel
- purify product with Qiagen columns
- digest with lamda exonuclease
- purify again
- run PAGE at 20°C, low power (8 W), current (5 mA), and voltage (400 V),
- silver stain gel

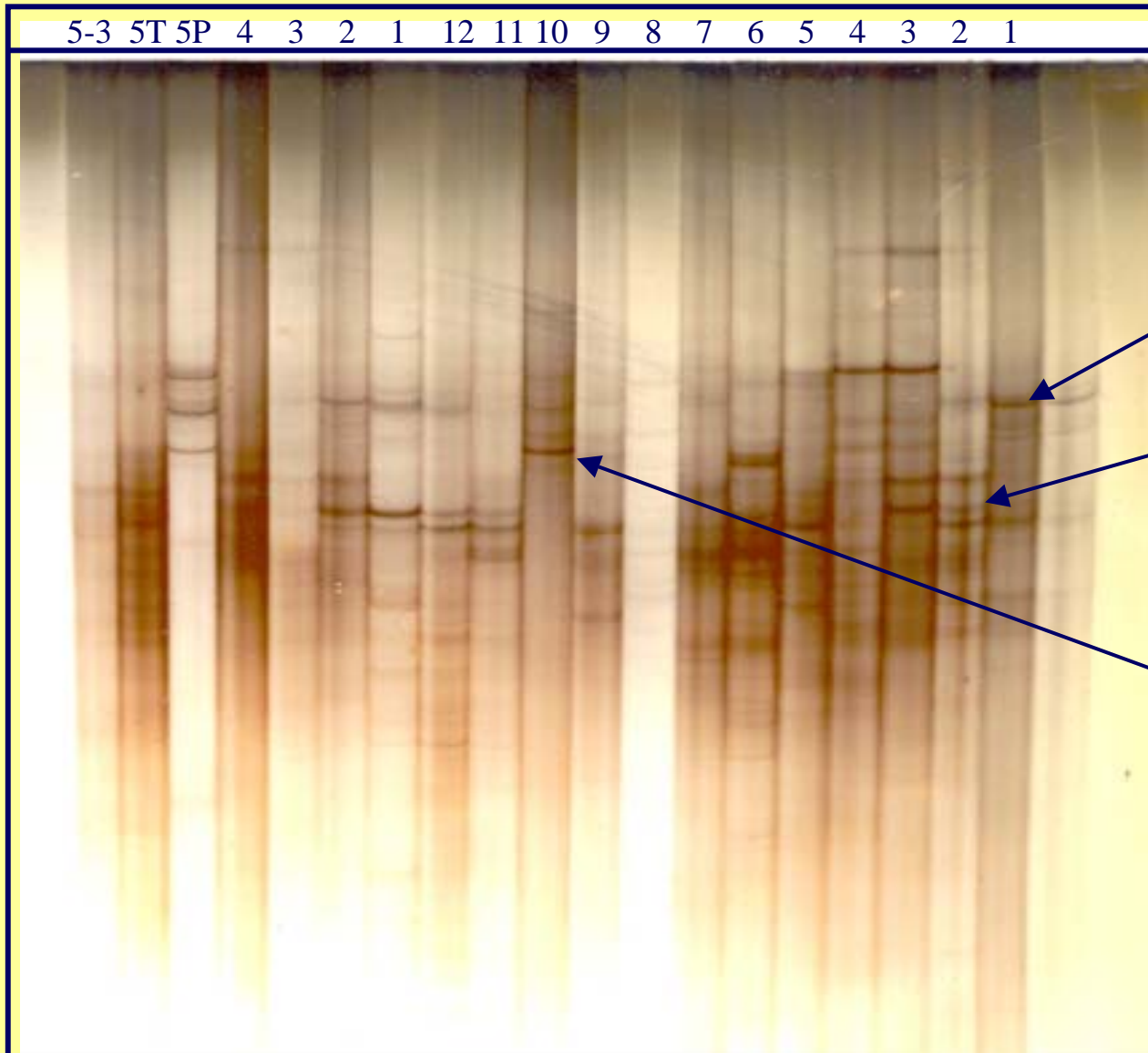
Bands can be cut out, reamplified, checked on an SSCP gel, and sequenced with 528F and 926R, allowing direct comparison with the PICODIV data bank.

# Helgoland picoplankton time series 1/01 - 5/02, SSCP profiles



April 2002 01	March 02 01	Feb. 02 01	Jan 02 01
			

# Helgoland picoplankton time series 1/01 - 5/02, SSCP profiles

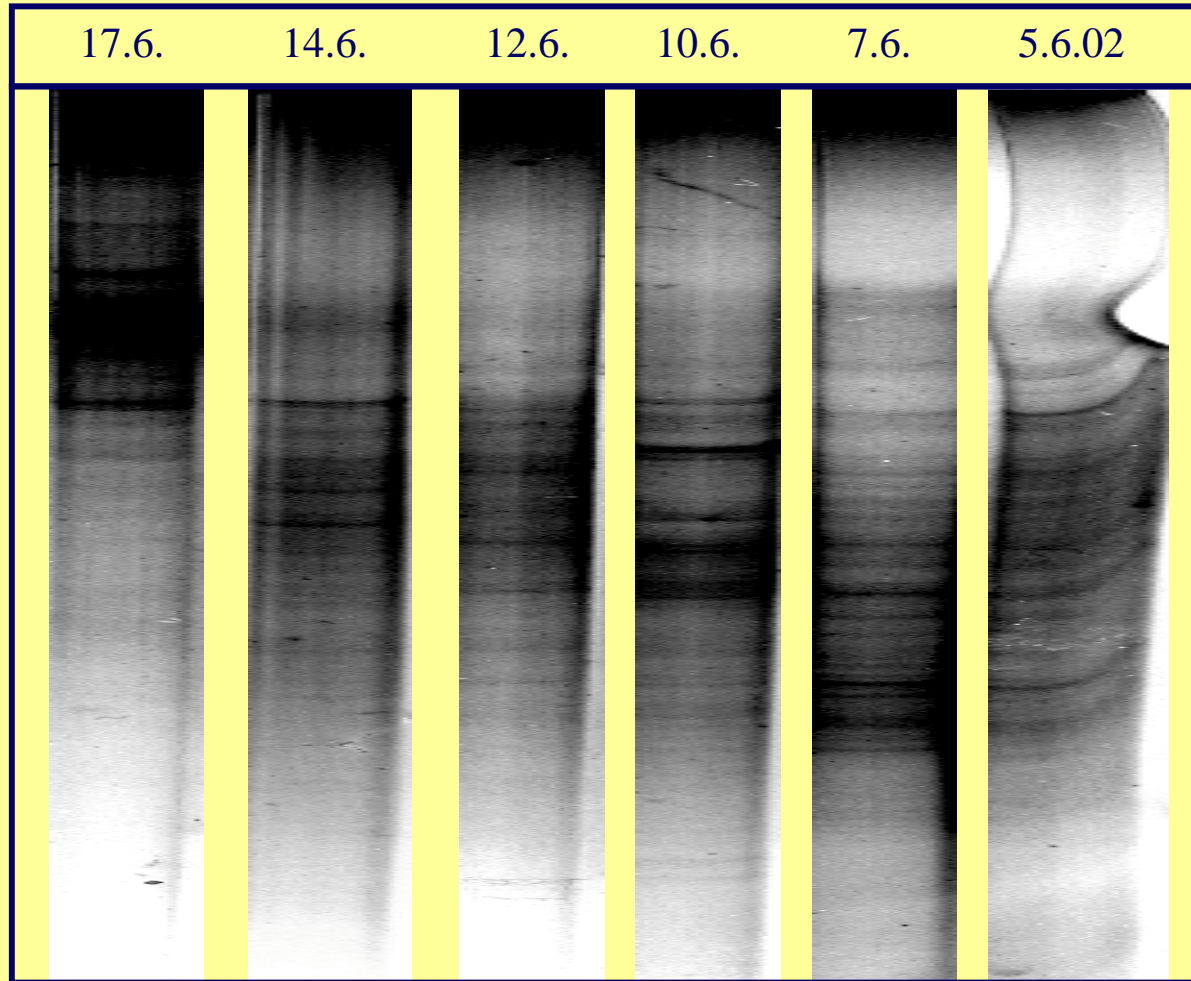


Alveolate group I  
98% identity

Dinophyte  
95% identity

Ciliphora  
(Halteria-like)  
93% identity

# Short-term time series Helgoland June 2002 SSCP profiles of the picoplankton fraction



# Summary and conclusions:

- **The picoplankton community at Helgoland in terms of species number is dominated by non-photosynthetic species.**
- **Among non-photosynthetic species the alveolates are most abundant.**
- **Prasinophytes/Mamiellales are the most dominant photosynthetic group.**
- **Other dominant taxa include: Rhodophytes(?), Euglypha, Bolidophytes, Chrysophytes, Bisecoids, and Dinophytes.**
- **The picoplankton community can change drastically within weeks or even days with only few species being present for longer than 1-2 months.**
- **Some species seem to return every year at about the same time.**
- **Clone libraries should be analysed on shorter time intervals rather than over longer periods.**