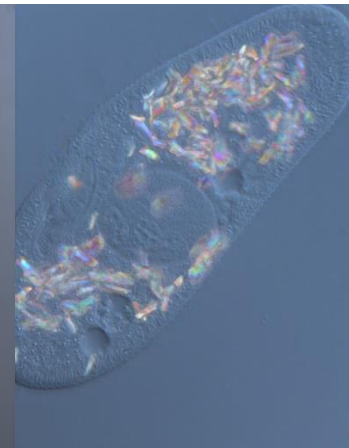
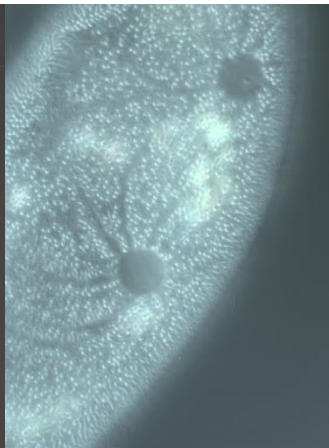
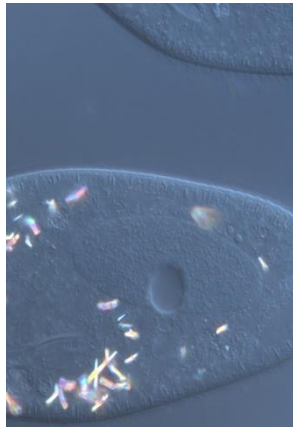
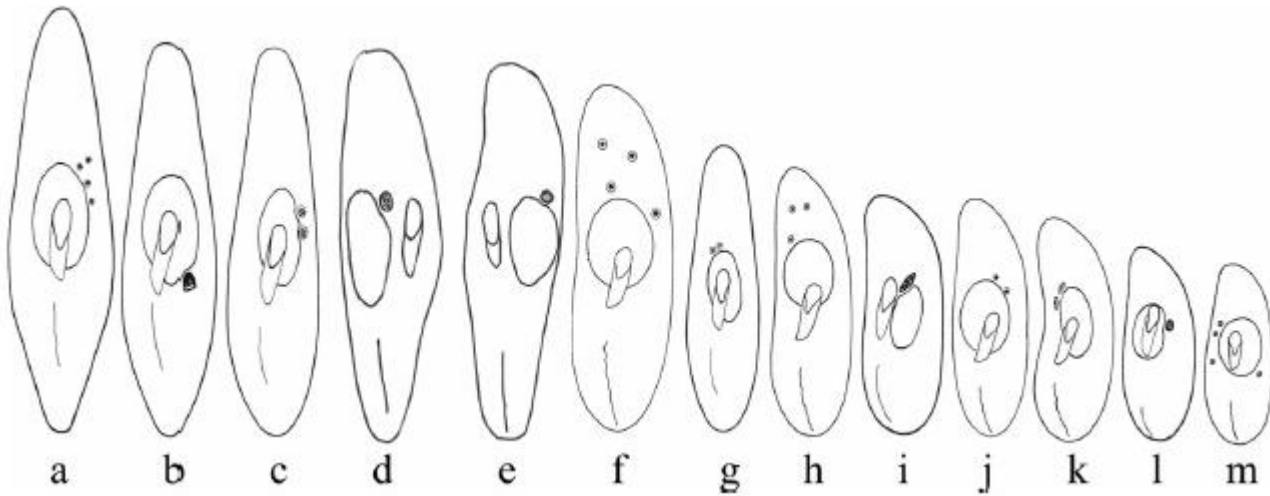
A microscopic image of two Paramecium cells, which are elongated, spindle-shaped ciliates. The cells are light greenish-brown and show internal structures like the oral groove and contractile vacuoles. They are positioned diagonally across the frame.

IRCN-BC, Guam, 26-29 July, 2016

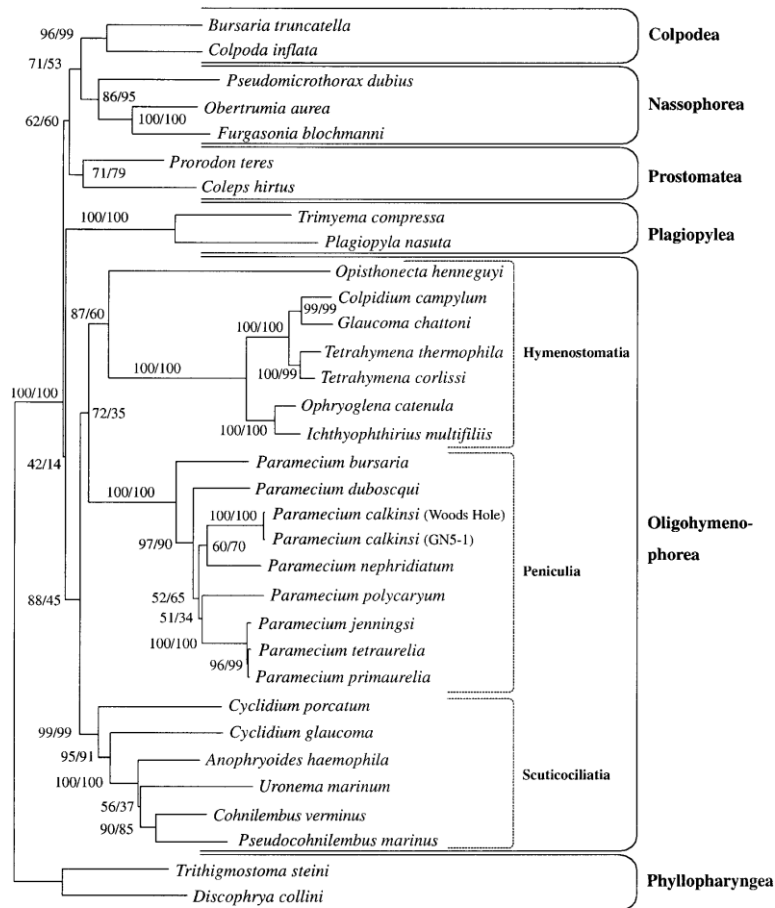
**Genus *Paramecium* as a model system for study
biodiversity in Ciliates**

**Maria Rautian
St Petersburg State University
St. Petersburg, Russia**

Schematic images of maior *Paramecium* morphospecies according to Fokin, 2010



Phylogenetic Relationships of the Genus *Paramecium* Inferred from Small Subunit rRNA Gene Sequences



0.05

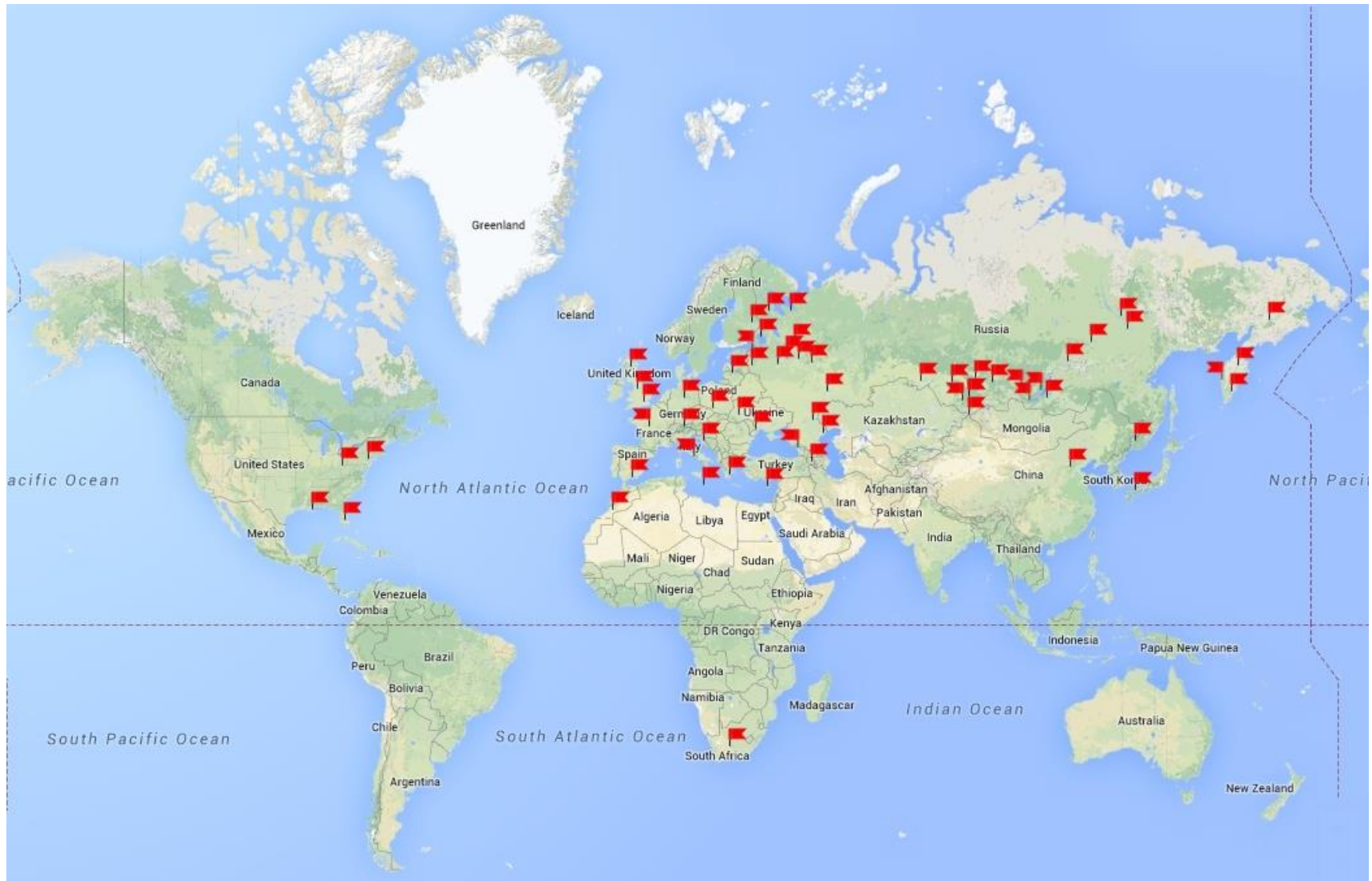
Struder-Kypke et al., 2000

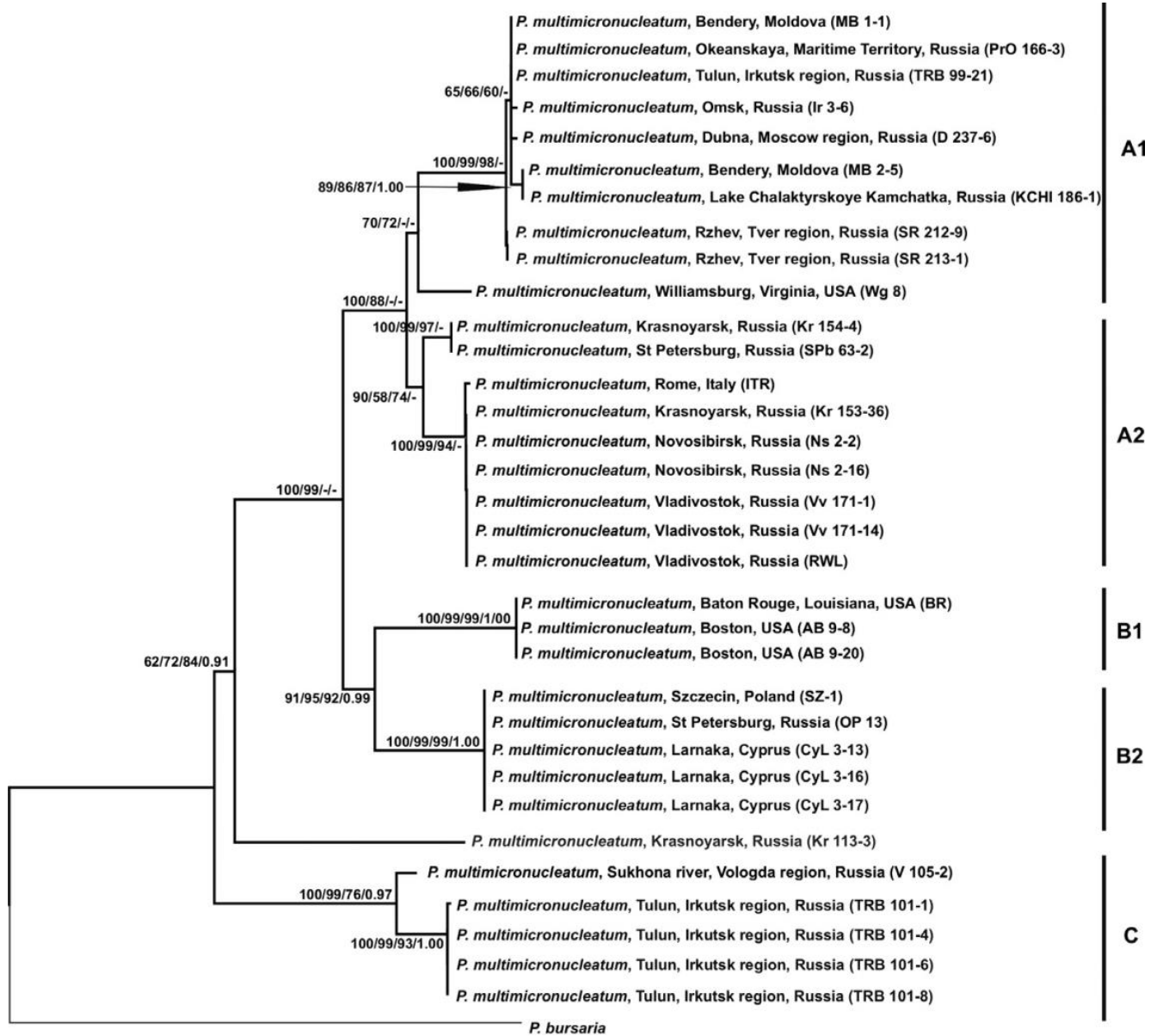
- **Морфология**
- **Молекулярная филогения**
- **Географическое распространение**
- **Внутривидовая структура (*syngens*)**

- **Сингены – репродуктивно изолированные группы внутри морфологических видов, не имеющие морфологических различий (виды-двойники)**

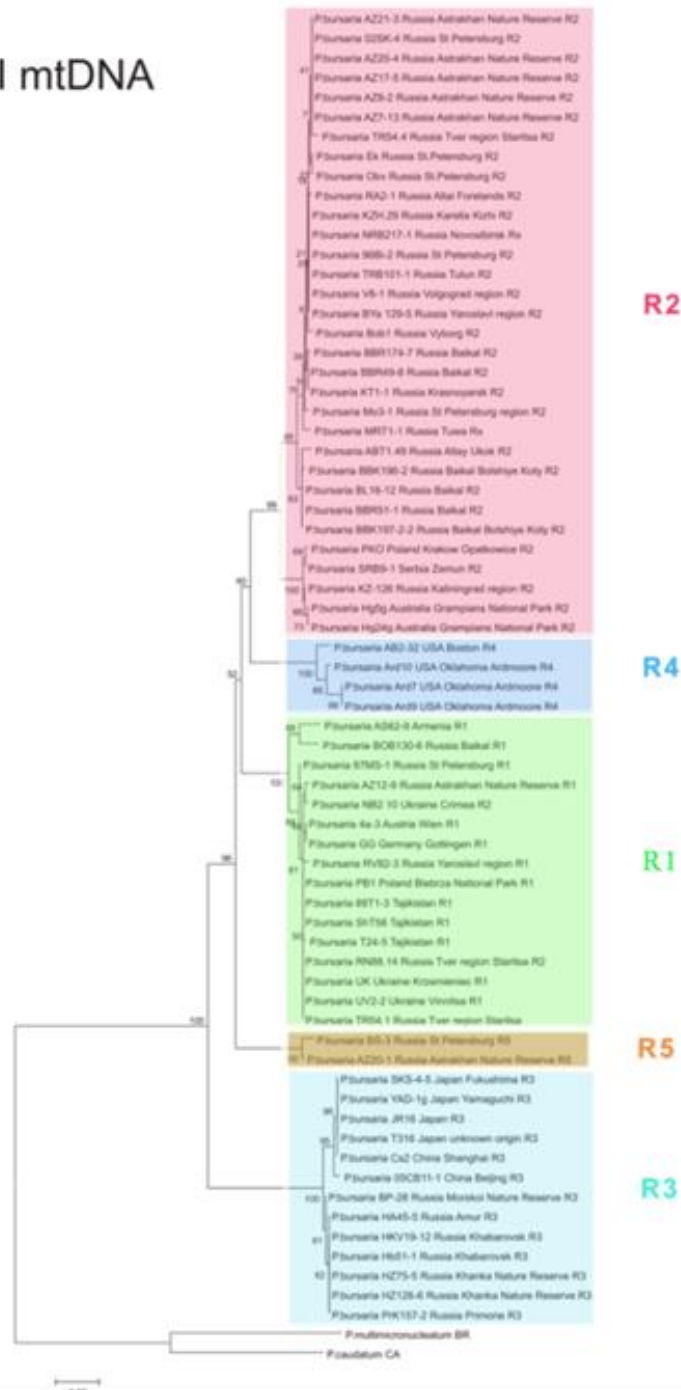
CCCS (Culture collection of Ciliates and their symbionts).

It includes more than 1000 clones of different Paramecium species, intraspecific groups, geographic locations.

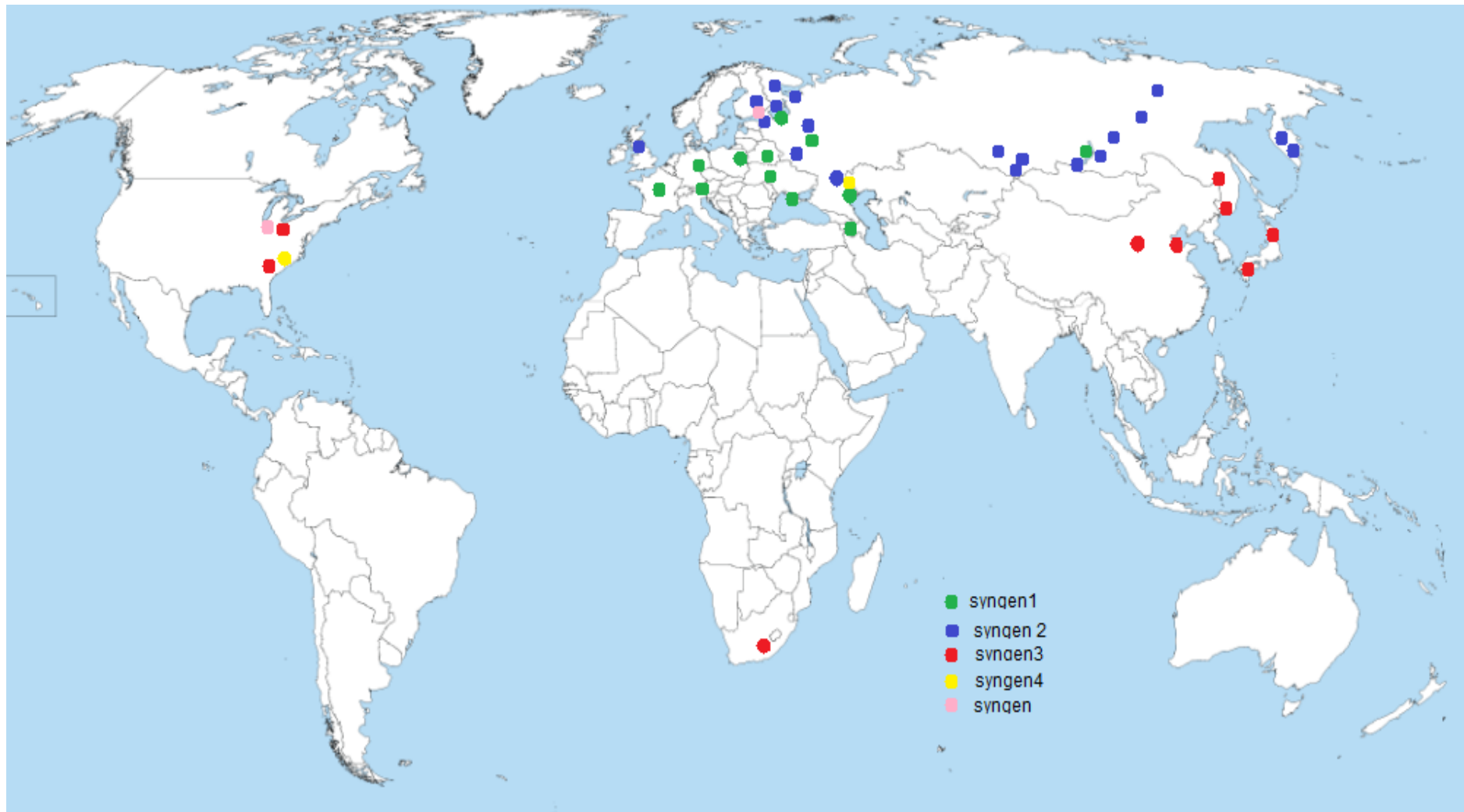




COI mtDNA



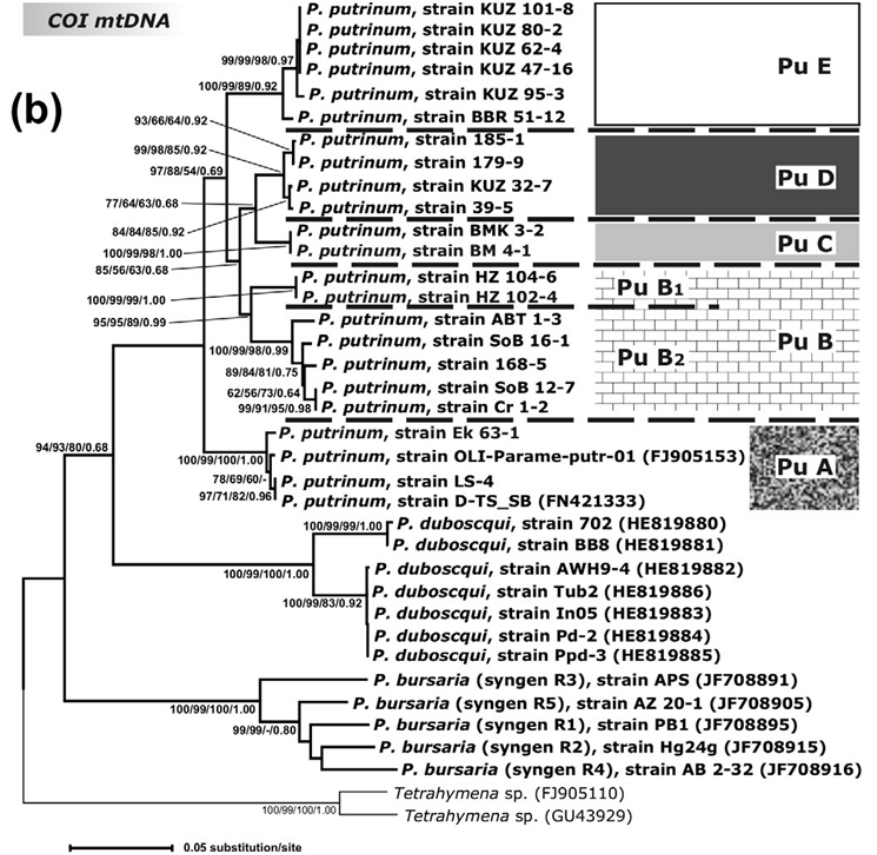
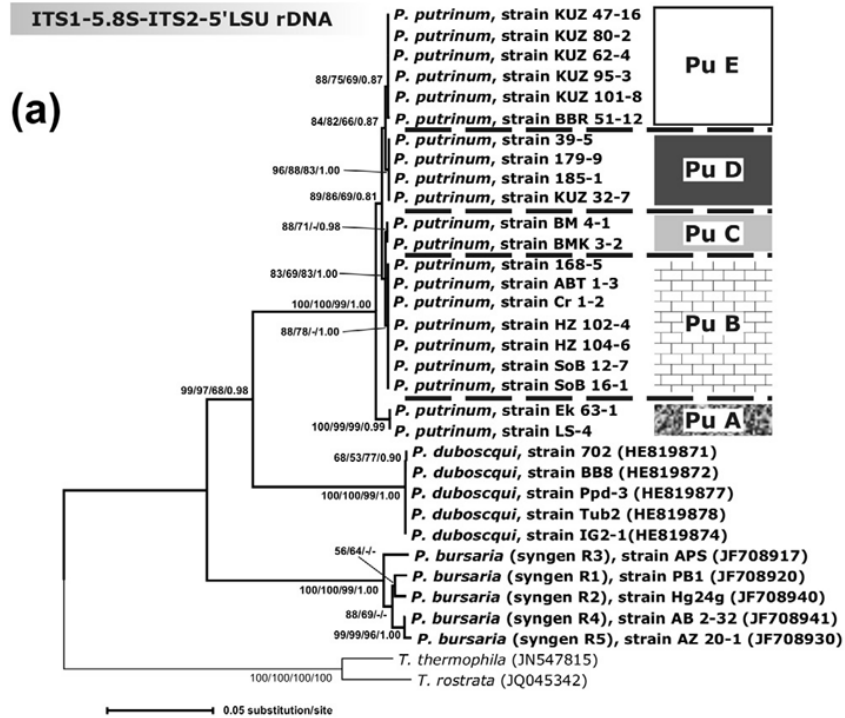
Distribution of different *P.bursaria* syngens all over the world.



Conclusions

- Молекулярная филогения отражает сингенную структуру, т.е. по последовательностям маркерных генов можно идентифицировать виды-двойники (сингены)
- По крайней мере, в случае *P.bursaria*, сингены занимают обширные, пересекающиеся, но тем не менее, различные ареалы.

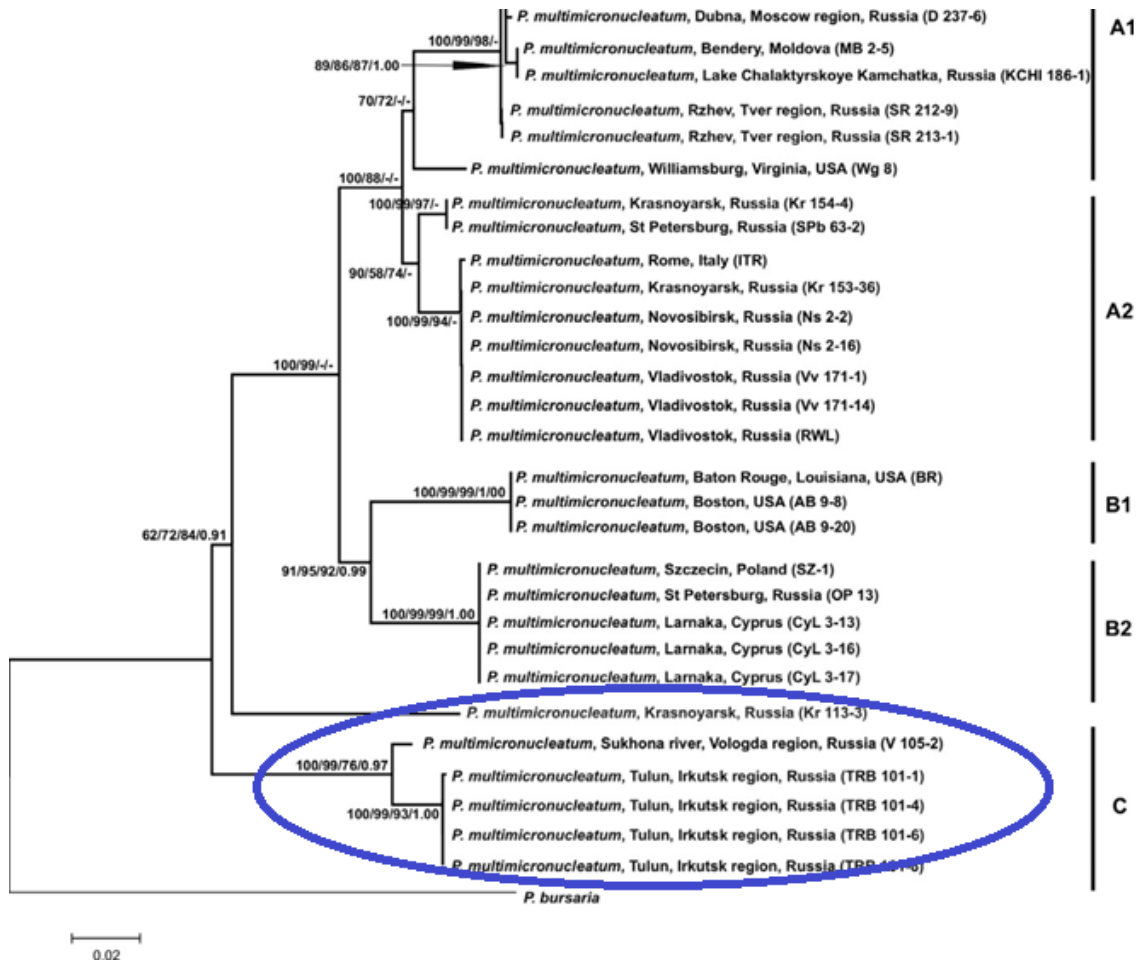
P. putrinum phylogeny



Distribution of *P.putrinum* syngens

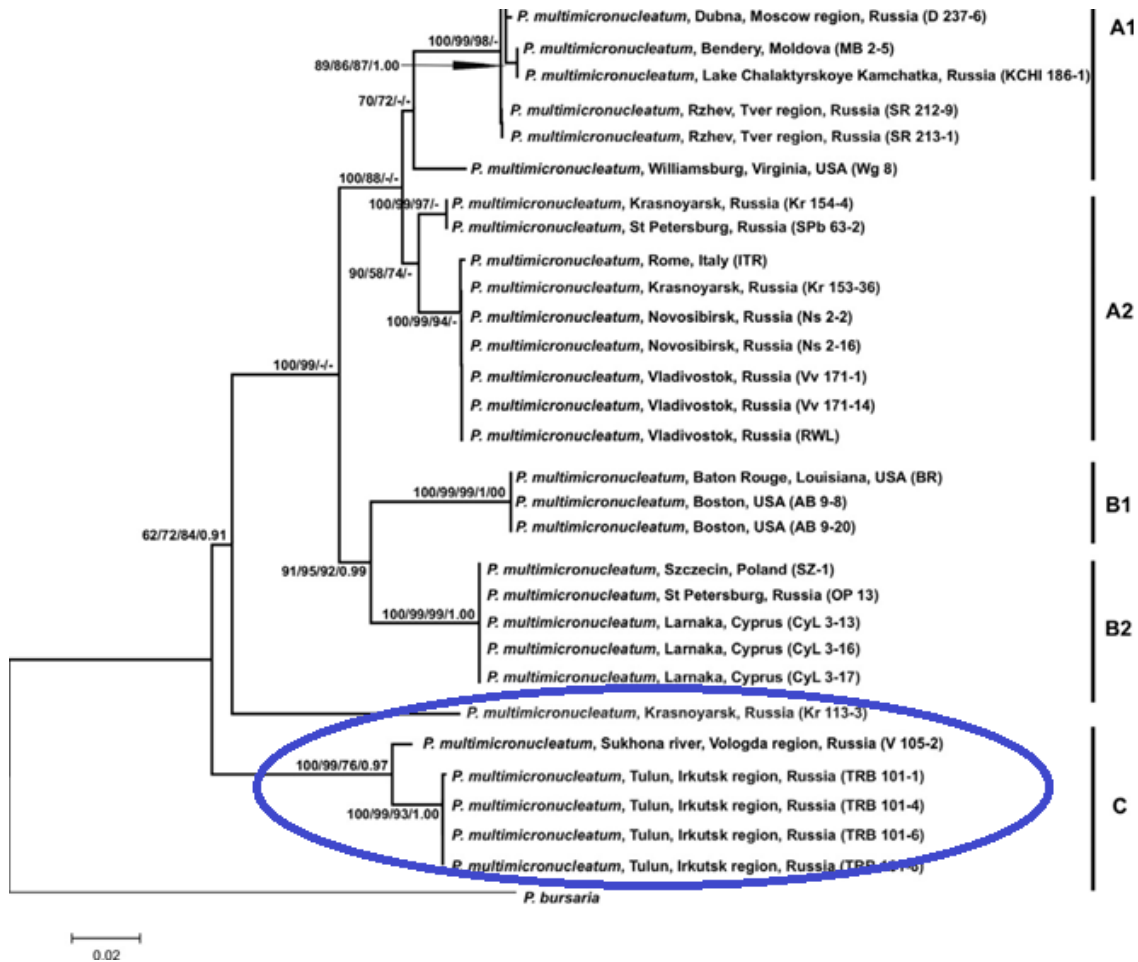


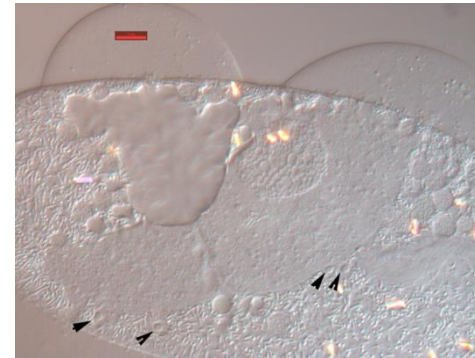
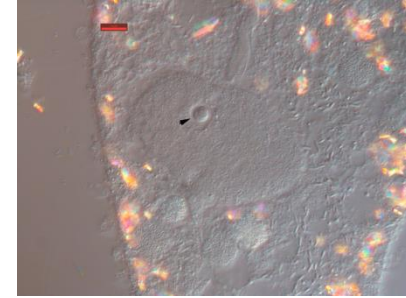
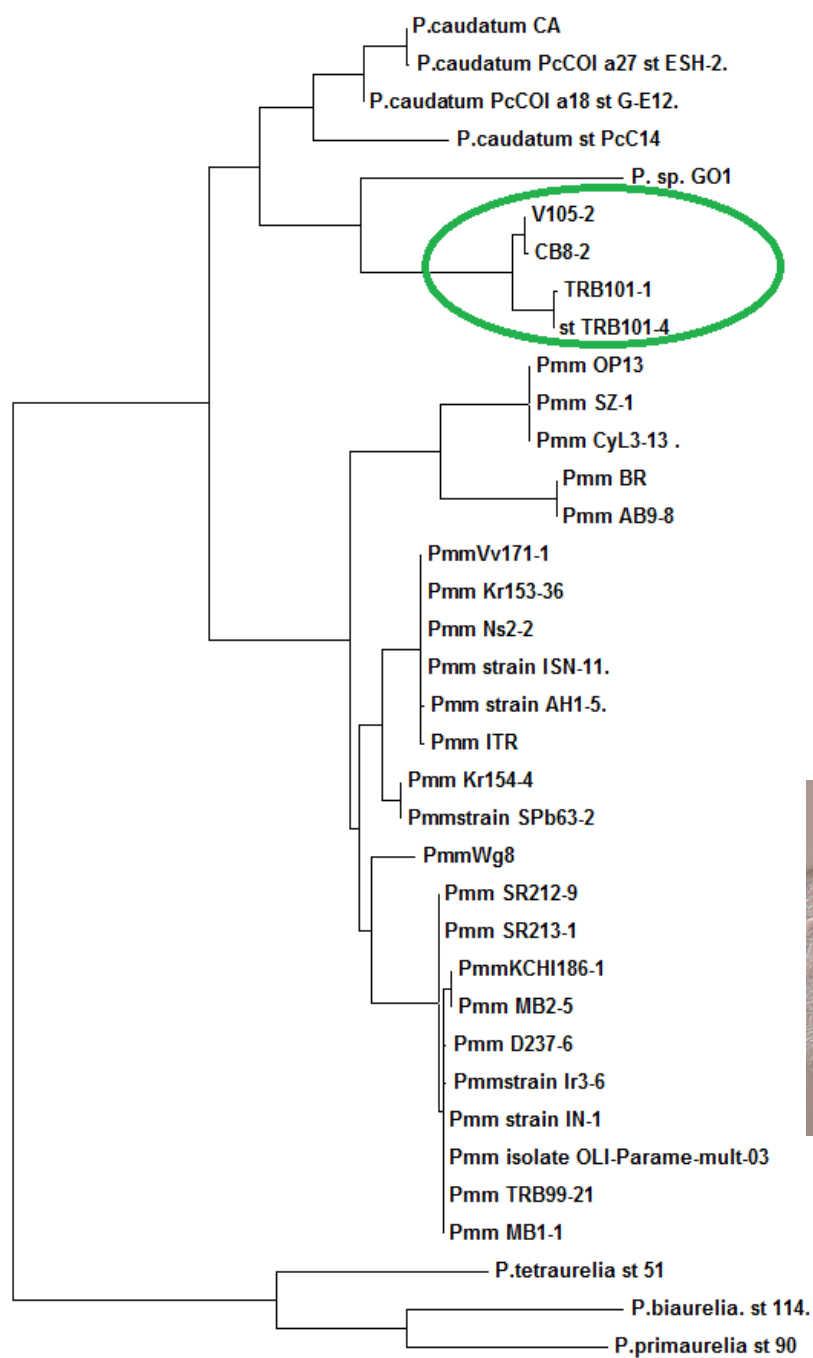
P. multimicronucleatum molecular diversity inferred by COI sequence



Описание новых видов

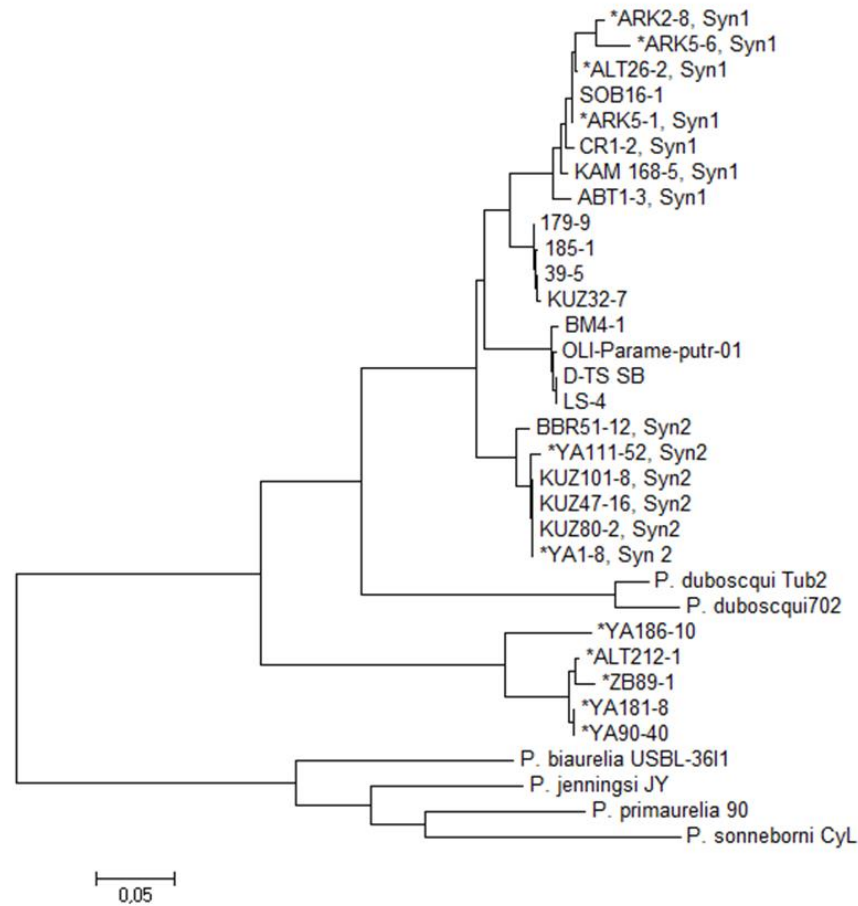
P. multimicronucleatum molecular diversity inferred by COI sequence



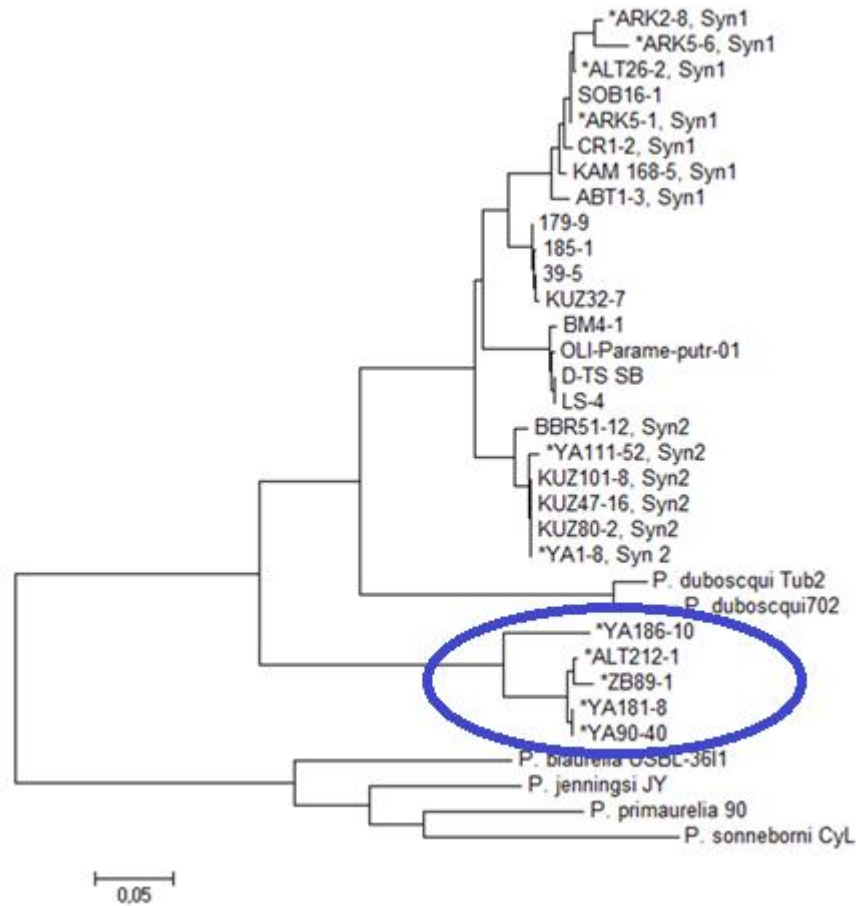


0,05

Paramecium ossipovi sp. nov.

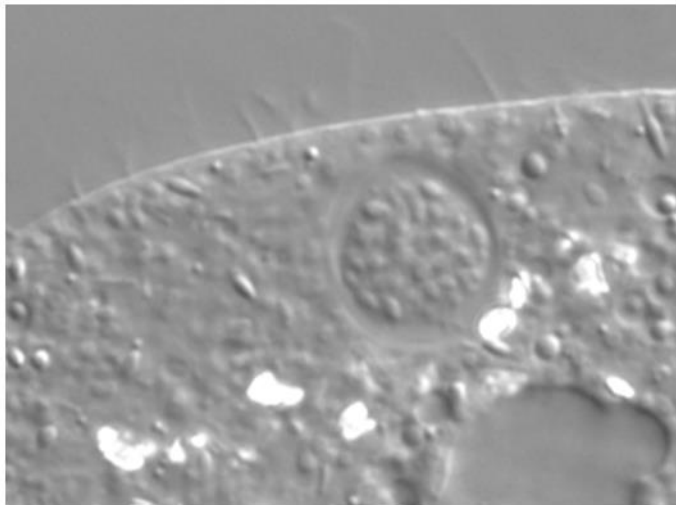
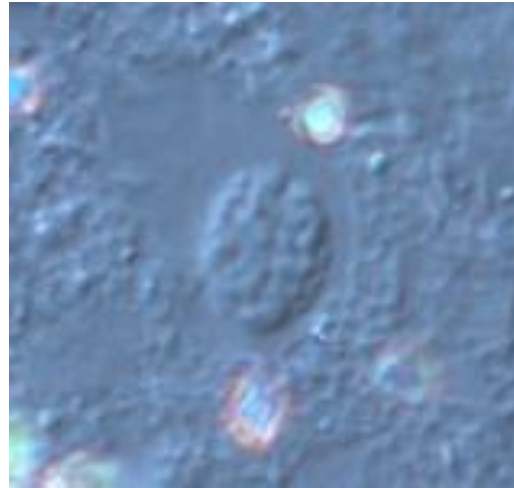
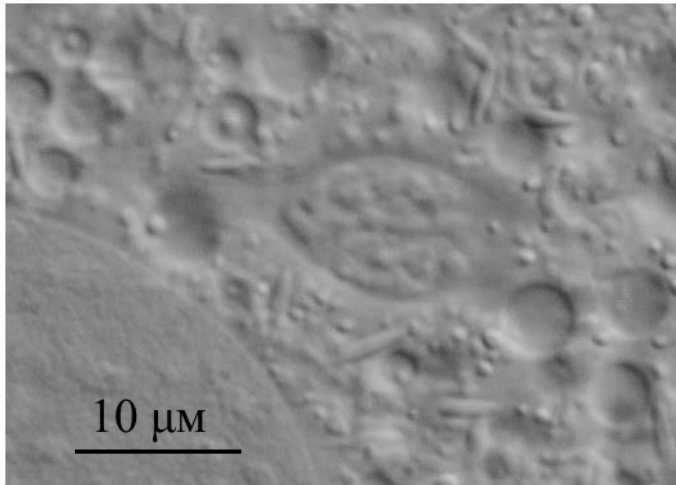


Paramecium ossipovi sp. nov.



Paramecium sp.nov. (*Paramecium ossipovi*)

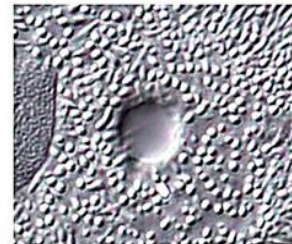
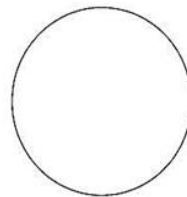
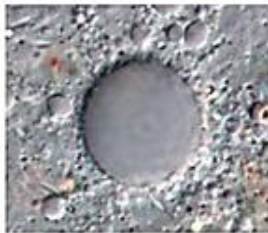
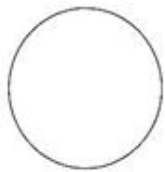
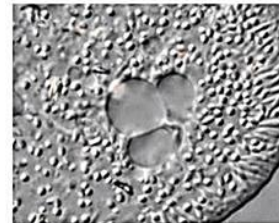
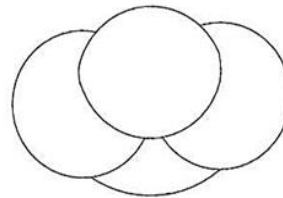
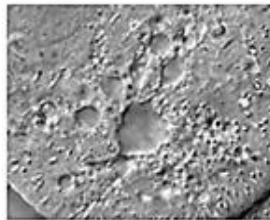
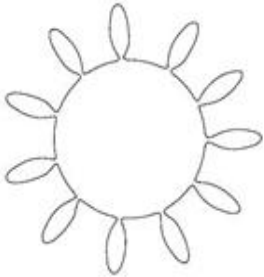
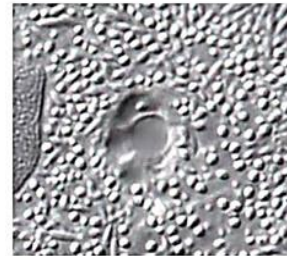
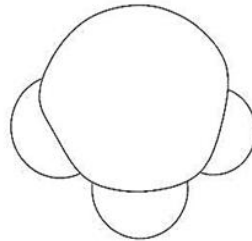
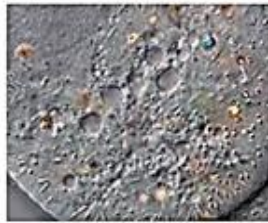
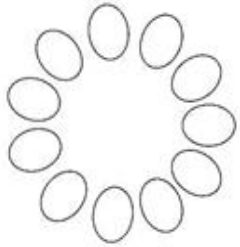
Interphase MI big and definitely has internal structure

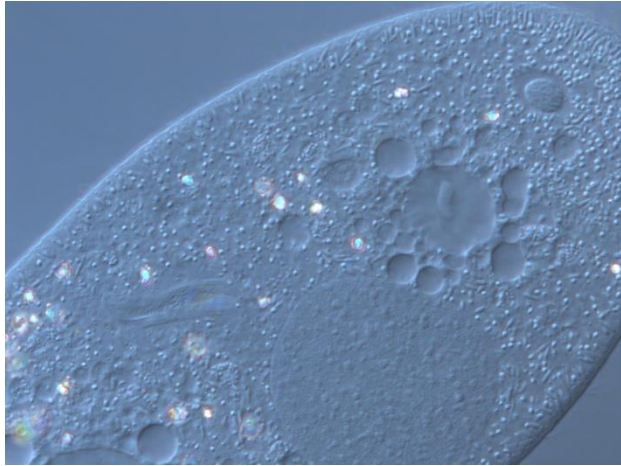


Different types of the CV in *Paramecium*

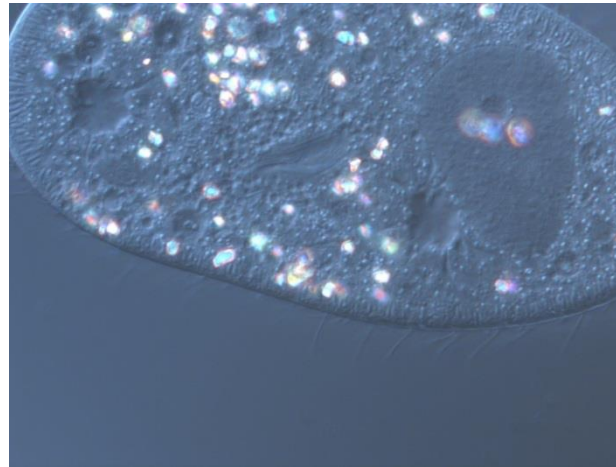
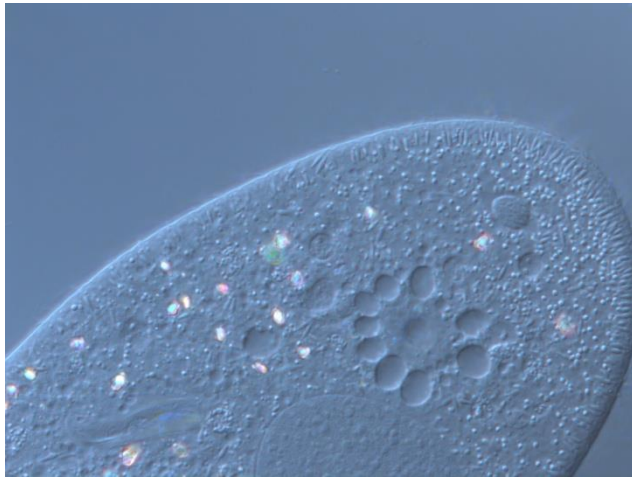
Type 1

Type 2





***Paramecium ossipovi*, sp. nov.**
has short collected channales



Collecting places of *P.ossipovi* sp.nov.



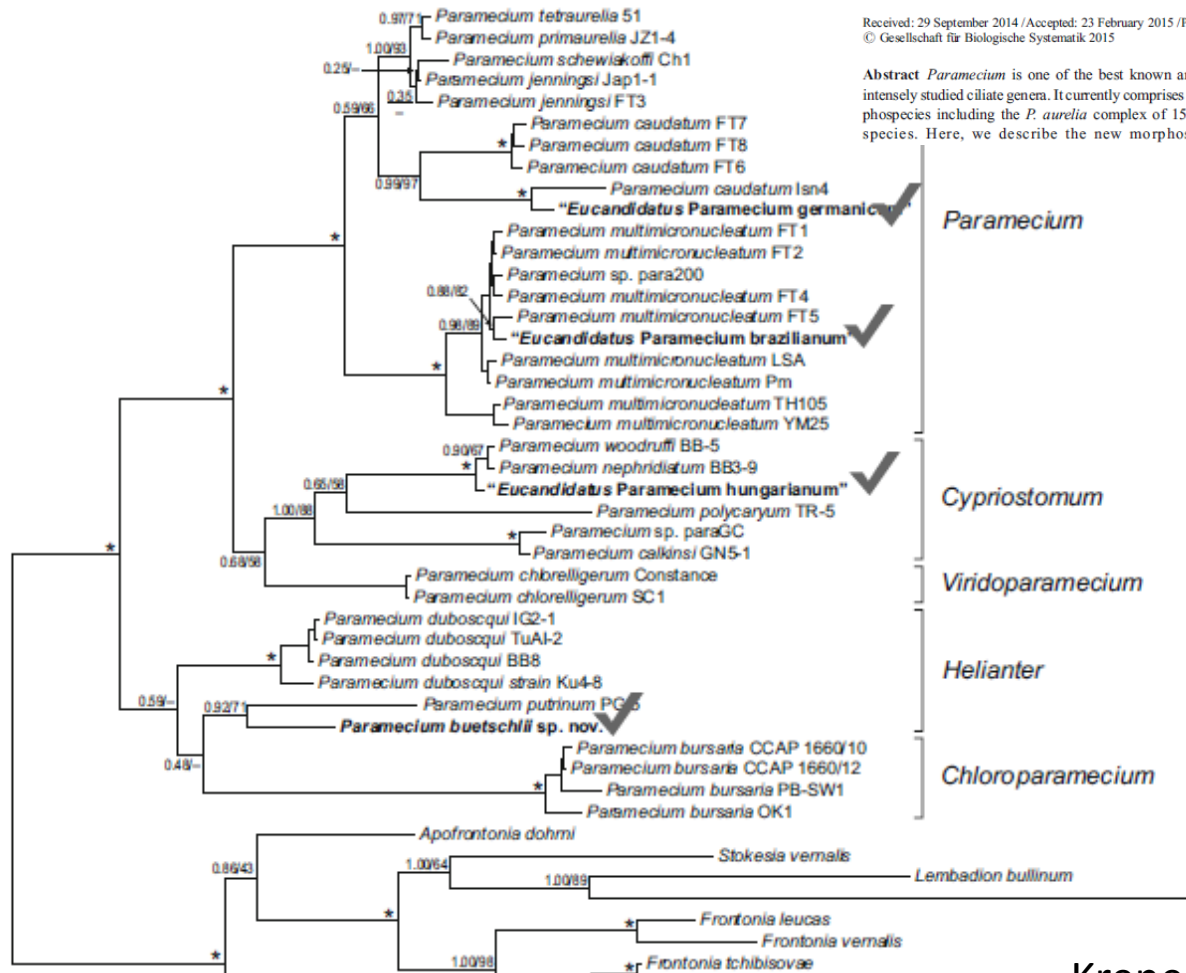
New *Paramecium* (Ciliophora, Oligohymenophorea) congeners shape our view on its biodiversity

Sascha Krenk · Thomas U. Berendonk · Sergei I. Fokin

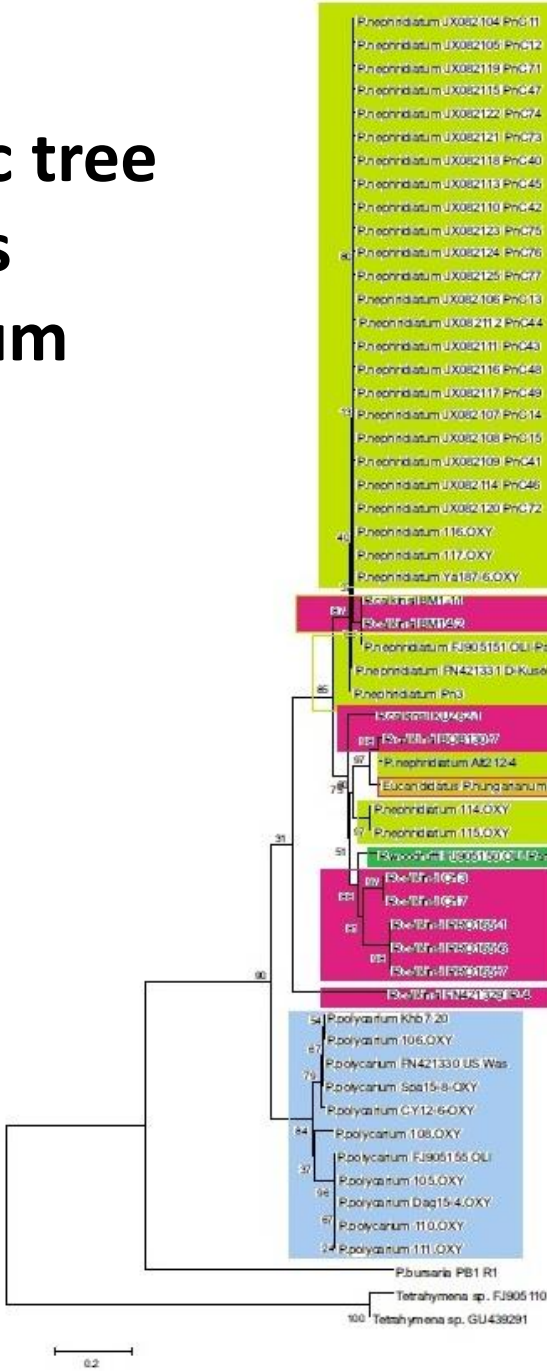
Received: 29 September 2014 / Accepted: 23 February 2015 / Published online: 22 March 2015
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Abstract *Paramecium* is one of the best known and most intensely studied ciliate genera. It currently comprises 18 morphospecies including the *P. aurelia* complex of 15 sibling species. Here, we describe the new morphospecies

there is a higher biodiversity within this common ciliate group that is heavily used in the classroom. By uncovering potentially distinct species that have been classified under the same species names, our molecular analyses further suggest a



Phylogenetic tree of Subgenus *Cypriastomum*

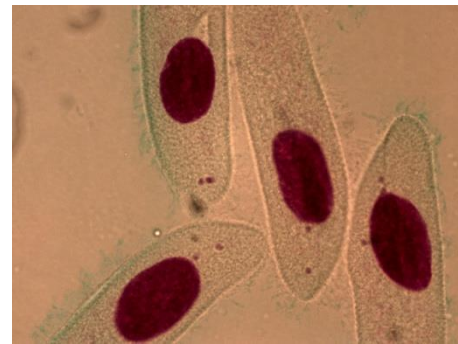


A

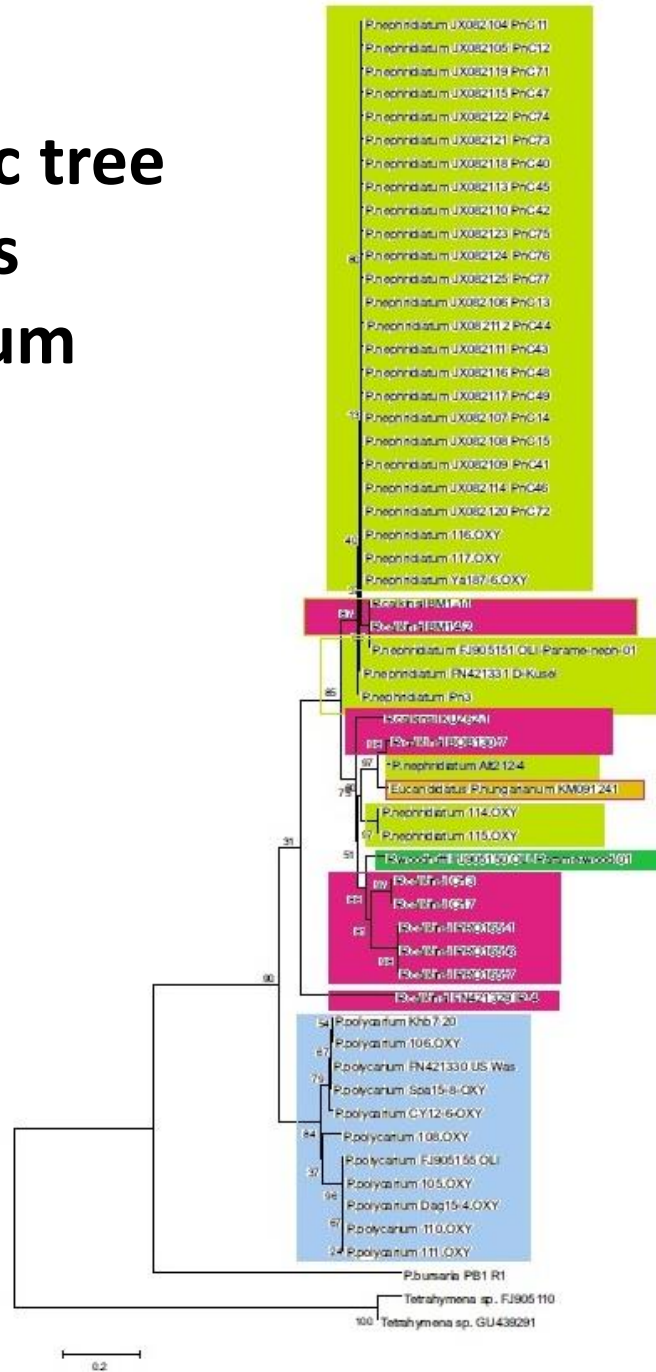
B



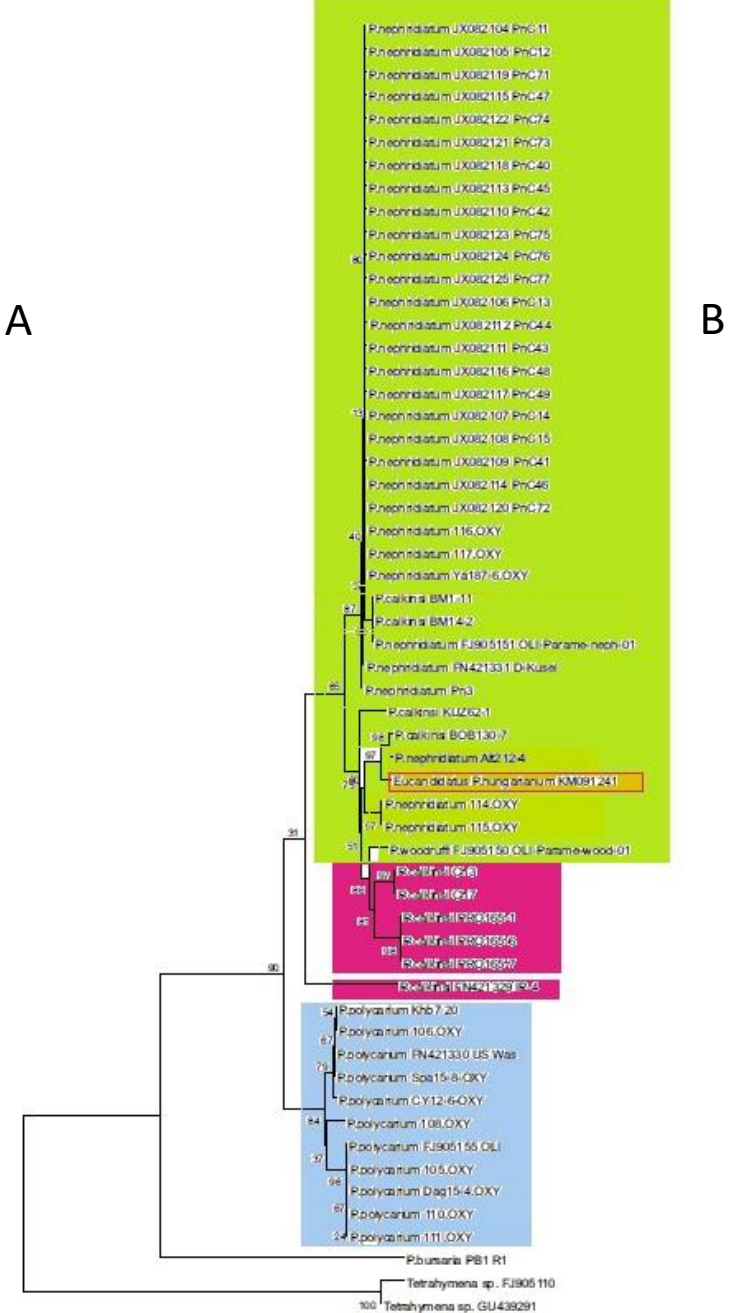
Paramecium nephridiatum
KUZ 62-1



Phylogenetic tree of Subgenus Cypriastomum



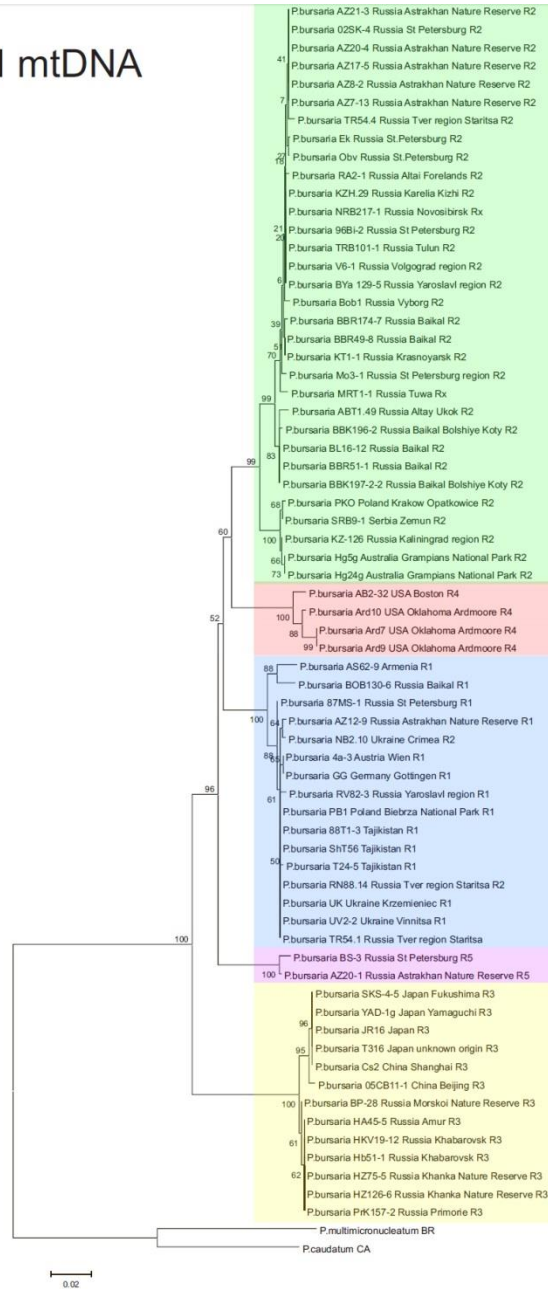
A



B

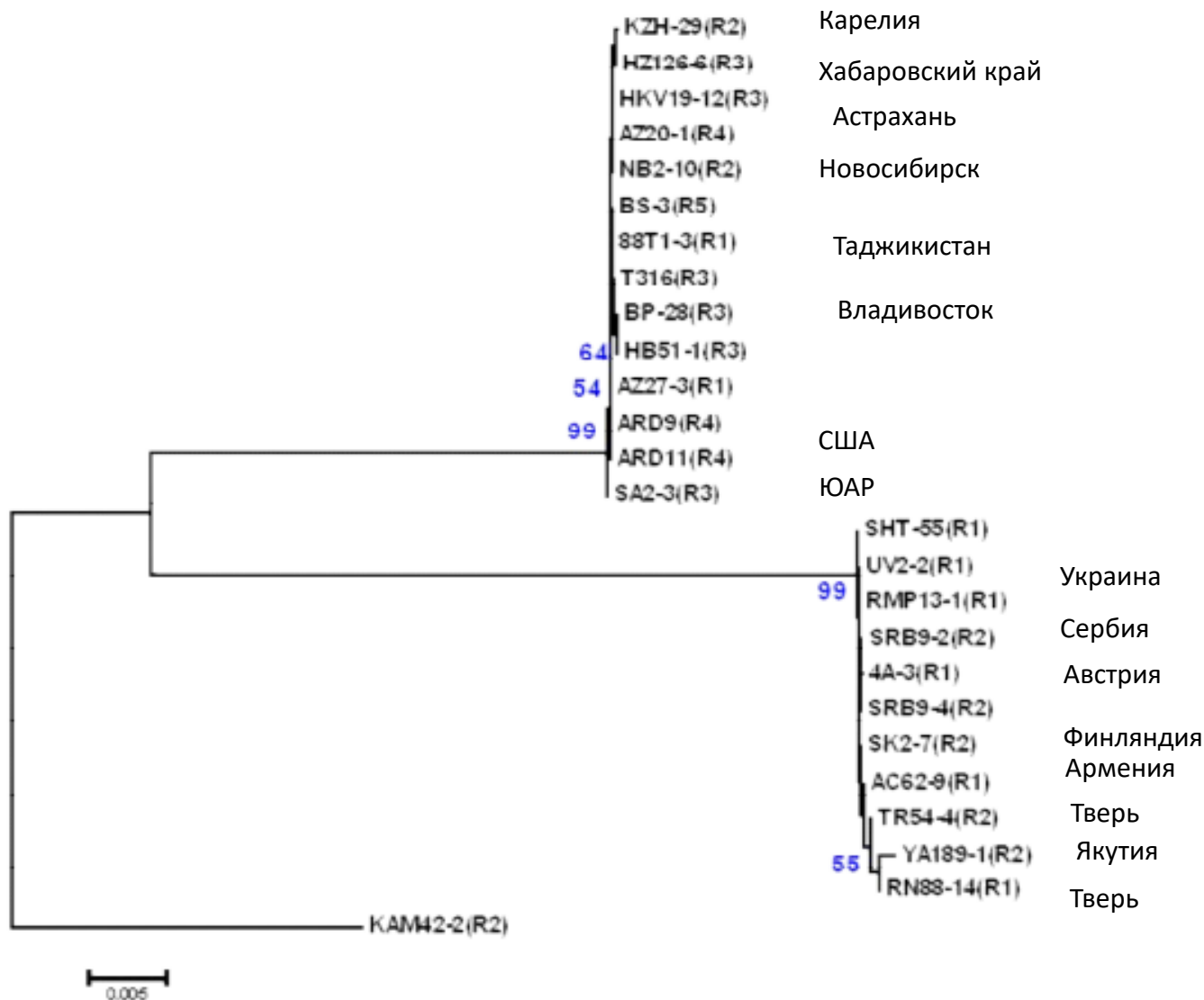
- Описание нового вида – сравнение одного множества разнообразных организмов с другим множеством и поиск хиатуса.
- Следовательно, невозможно описывать вид по одному представителю

COI mtDNA



0.02

Филогения симбиотических хлорелл по гену RuBisCo





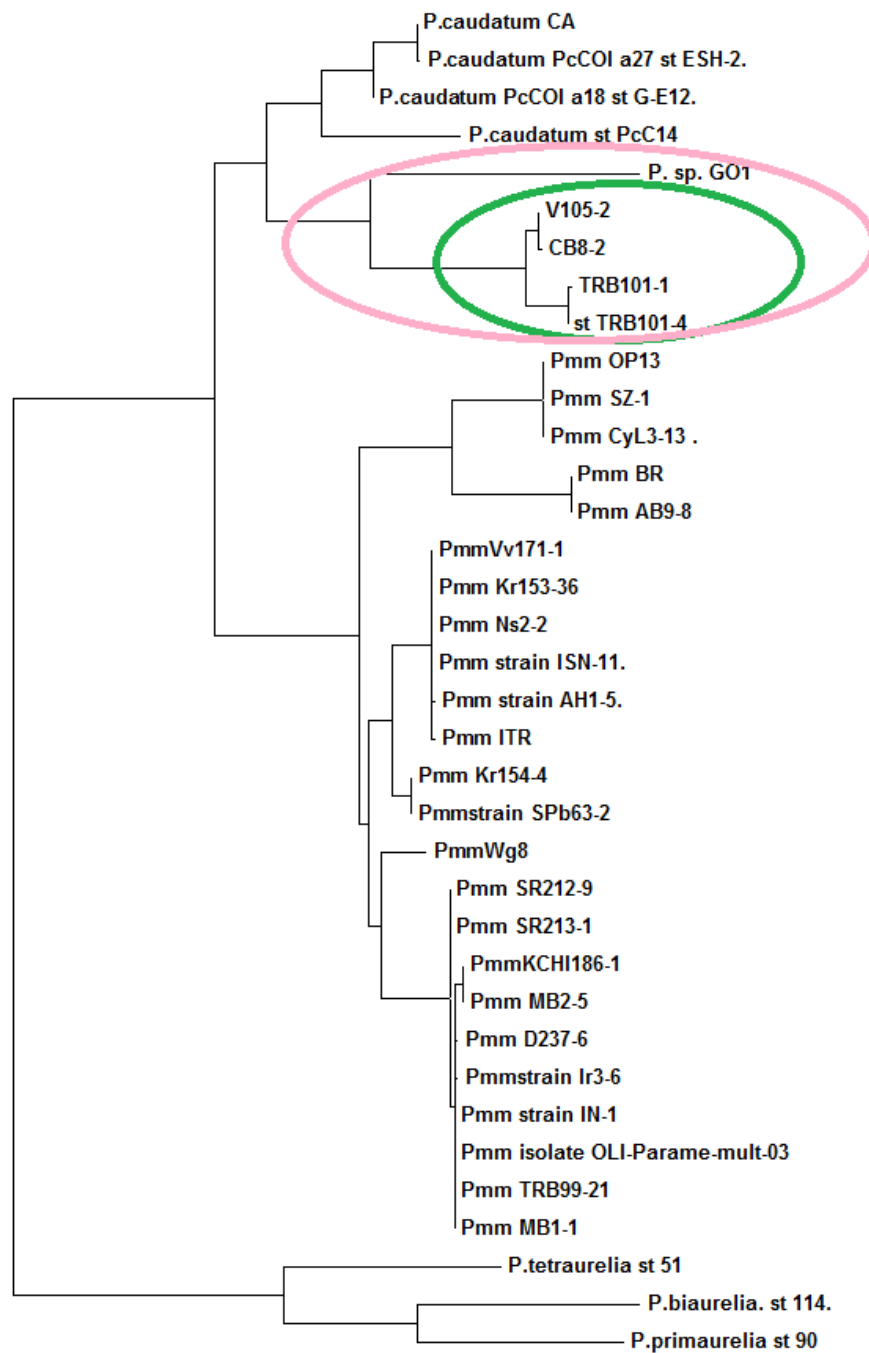
Благодарю за внимание!

Co-laborators:

**Alexandra Belyavskaya and Andrey Kiselev - St. Petersburg State University,
St. Petersburg, Russia**

**Ewa Przybos, Sebastian Tarcz and Małgorzata Prajer - Institute of Systematics and
Evolution of Animals, Polish Academy of Sciences,
Krakow, Poland**

**Thanks to RFBR, RNF
RC “Cellular and molecular technologies”
RC “Cultivation of Microorganisms”**



0.05

**For describing a new morphospecies, it should be sufficient to have one obvious morphological character that differs from relative ciliates
(Foissner et al. 1999).**

