

## Finding of *Paramecium dodecaurelia* in Europe

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### Summary

The presence of *Paramecium dodecaurelia* in Europe was recorded for the first time, in Italy (Elba Island) and Germany (Muenster).

**Key words:** distribution, *Paramecium aurelia* species complex, temperature barriers

### Introduction

*Paramecium dodecaurelia* from the *P. aurelia* spp. complex was previously known only from the territory of the southern USA bordering on the Gulf of Mexico (Sonneborn, 1975), six strains were found there, namely: 246, 251, 270, 271, 273, and 274 (Sonneborn, 1974). Thus, the species had a rather limited range. Recently, the species has also been recorded in Japan, Honshu Island, Ube city (Przyboś et al., 2003) and in Hawaii (Przyboś and Fokin, 2003). Among 15 known species of the *P. aurelia* complex (Sonneborn, 1975; Aufderheide et al., 1983), *P. dodecaurelia* is a member of the group of species with the smallest cell size, along with *P. tetraurelia*, *P. octaurelia*, and *P. decaurelia* (cell length 120 µm). The paper presents new habitats of the species in Europe.

### Material and methods

The strain designated GMS-1 was collected by H.-D. Görtz in 1998 in Germany, Muenster suburb. It has

bacterial endocytobionts belonging to *Caedibacter* sp. in the cytoplasm. The strain designated IEA1-8 was collected by S.I. Fokin in 1999 in Italy, Elbe Island, Azurro.

Culturing and identification of the strains were carried out according to Sonneborn's methods (1970). The species was identified by mating the investigated reactive for conjugation clones with the mating types of the standard strains of known species of the *P. aurelia* spp. complex. The following standard strains were used: strain 90 of *P. primaurelia*, the Rieff strain, Scotland, of *P. biaurelia*, strain 324 of *P. triaurelia*, strain from Sydney, Australia, of *P. tetraurelia*, strain 87 of *P. pentauurelia*, strain 159 of *P. sexaurelia*, strain 325 of *P. septaurelia*, strain 138 of *P. octaurelia*, strain 510 of *P. novaurelia*, strain 223 of *P. decaurelia*, strain 219 of *P. undecaurelia*, strain 246 of *P. dodecaurelia*, strains 209 and 321 of *P. tredecaurelia*, strain 328 of *P. quade-caurelia*.

Autogamy was induced in daily isolated lines (Sonneborn, 1950) and its appearance was checked on the slides stained using acetocarmine.

Paramecia were cultivated on a lettuce medium inoculated with *Enterobacter aerogenes*.

## Results and discussion

The strains from Italy and Germany were identified as *Paramecium dodecaurelia* on the basis of 100% conjugation between the complementary mating types of the strains under examination with the corresponding ones of the strain 246 of *P. dodecaurelia* (from the southern USA).

No reaction was observed with the standard strains of the other species of the *P. aurelia* complex.

The viability of the offspring of the hybrid exconjugant clones of the inter-strain crosses (German strain x 246 strain from the southern USA and Italian strain x 246 strain) was observed in F1 obtained by conjugation and in F2 obtained by autogamy. A high viability was observed in F1 and in F2 generations.

Autogamy was observed in the strains after 15 fissions (the growth rate of culture was 3 fissions per day) in the daily isolated lines cultivated at 24°C. The strains studied are available in the Institute of Systematics and Evolution of Animals (Department of Experimental Zoology), Polish Academy of Sciences, Krakow, Poland.

This is the first finding of *P. dodecaurelia* in Europe. Since species discrimination inside the *P. aurelia* complex is almost impossible without testing collection or RAPD-PCR technique, it is not so surprising that in many cases these species are still being recorded just as *P. aurelia* complex spp. In Europe, the most investigated area of the world, nine species of the *P. aurelia* complex have been found so far, i.e., *P. primaurelia*, *P. biaurelia*, *P. triaurelia*, *P. tetraurelia*, *P. pentaurelia*, *P. sexaurelia*, *P. novaurelia*, *P. octaurelia*, and *P. tredecaurelia* (Przyboś and Fokin, 2000). *P. novaurelia* and *P. biaurelia* are the most common species in Europe (Przyboś, 1998; Przyboś and Fokin, 2000). Some other members of the complex seem to be true endemics and have never been found in Europe.

As *Paramecium* species have been the subject of investigation for over 250 years, it is very unlikely that

in Europe taxonomists could miss such well-noticeable ciliates as paramecia during checking of water samples. But for identification of even such «simple» ciliates as members of the *Paramecium* genus, protozoologist should have an adequate taxonomical knowledge. It is especially true in the case of the *P. aurelia* species complex. Expansion of the species list in the last decade shows that the zoogeographical status of some *Paramecium* species could be changed.

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