

## Answer to Photo Quiz: *Paracoccus yeei*

(See page 215 in this issue [doi:10.1128/JCM.06019-11] for photo quiz case presentation)

**P**aracocci are obligate aerobic, nonfermenting, Gram-negative cocci, diplococci, or coccobacilli that appear vacuolated or O shaped. The genus *Paracoccus* is classified within the family *Rhodobacteraceae* and currently contains 31 recognized species. The species *Paracoccus yeei* was originally classified with other nonfermenting Gram-negative bacteria in CDC eugonic oxidizer group 2 (EO-2). In 2003, 13 EO-2 isolates, all of which had been isolated from human samples, were recognized as belonging to a unique species, *Paracoccus yeeii* (the name was later corrected to *P. yeei*), on the basis of biochemical tests, DNA-DNA hybridization, cellular fatty acid profiling, and 16S RNA sequencing (1).

*P. yeei* has been found in a variety of environments. The 16S rRNA gene sequences of several environmental *P. yeei* isolates have been submitted to GenBank ([www.ncbi.nlm.nih.gov/genbank/](http://www.ncbi.nlm.nih.gov/genbank/)). These strains were isolated from marine sediments in India and Costa Rica, a spacecraft clean room, a sweet pepper, naturally fermented dairy products, old books in a Korean library, and insecticide-contaminated soil in China. Since the natural habitat of *P. yeei* is not fully defined, it is difficult to know how patients acquire the organism.

The 13 clinical isolates originally in the EO-2 group were from the United States and Canada. They were obtained from patients aged 6 weeks to 77 years. Sources of these isolates include abdominal dialysate, ankle wound ( $n = 2$ ), toe, leg lesion, neck incision drainage, cerebrospinal fluid, bile, blood, skin, ear ( $n = 2$ ), and eye.

Since the species *P. yeei* was proposed, there have been several additional reports from various countries of *P. yeei* as an unusual opportunistic human pathogen. A case of peritonitis in a young ambulatory dialysis patient with *P. yeei* in France has been reported (5). A 67-year-old German man with a history of heart failure developed bullous lesions on his leg, followed by bacteremia with blood and aspirated fluid cultures that grew *P. yeei* (3).

Several published reports have associated *P. yeei* with eye infections. One case of eye infection was mentioned in the article that proposed *P. yeei* as a new species, but no details of the nature of the infection were given. In a study of culture-negative uveitis, *P. yeei* was associated with a single case detected by PCR and 16S rRNA gene sequencing directly on intraocular fluid specimens (2). In another report, *P. yeei* was cultured from an aqueous humor specimen from a corneal transplant recipient with rejection and subsequent rapidly progressive infection of the graft (4). Since no other pathogenic microorganisms were detected in the purulent discharge of the patient in our current case, his conjunctivitis was attributed to *P. yeei*.

Cell wall fatty acid analysis or molecular methods are often used for identification since *P. yeei* can be difficult to identify using conventional biochemical methods. The Vitek 2 (bioMérieux, Inc., Durham, NC) Gram-negative GN card has also been reported to accurately identify *P. yeei* (5).

Antibiotic susceptibility profiles have been addressed in some of the case reports. MIC results obtained using reference broth

microdilution for the isolate from the peritonitis case report suggest that *P. yeei* has low MICs for the  $\beta$ -lactam antibiotics, especially the aminopenicillins and carbapenems, and somewhat higher MICs for the broad-spectrum cephalosporins (5). The patient in that case report rapidly improved with intraperitoneal administration of piperacillin and cephalothin.

Disk diffusion susceptibility testing of the blood and bullous fluid isolate indicated that this isolate was susceptible to ampicillin, ampicillin-sulbactam, amoxicillin-clavulanic acid, piperacillin-tazobactam, cefazolin, cefuroxime sodium, and cefepime, although the interpretive criteria used were not reported. The organism was isolated from the patient in that case, despite ongoing treatment with intravenous cefazolin, but the patient subsequently improved when treatment was changed to oral administration of ofloxacin (3).

The corneal-transplant recipient became infected while being treated with fusidic acid, and his infection progressed despite intravitreal, topical, and intravenous treatment with vancomycin and ceftazidime, but he was also receiving concomitant steroid therapy (topical and subconjunctival) for graft rejection (4).

In our case, the patient had responded to treatment with topical moxifloxacin but not to sulfacetamide in previous conjunctivitis episodes and was treated this time with a ciprofloxacin ophthalmic (0.3%) solution, which resulted in improvement of symptoms.

### REFERENCES

1. Daneshvar MI, et al. 2003. *Paracoccus yeeii* sp. nov. (formerly CDC group EO-2), a novel bacterial species associated with human infection. *J. Clin. Microbiol.* 41:1289–1294.
2. Drancourt M, et al. 2008. High prevalence of fastidious bacteria in 1520 cases of uveitis of unknown etiology. *Medicine (Baltimore)* 87:167–176.
3. Funke G, Frodl R, Sommer H. 2004. First comprehensively documented case of *Paracoccus yeei* infection in a human. *J. Clin. Microbiol.* 42:3366–3368.
4. Kanis MJ, Oosterheert JJ, Lin S, Boel CHE, Ekkelenkamp MB. 2010. Corneal Graft rejection complicated by *Paracoccus yeei* infection in a patient who had undergone a penetrating keratoplasty. *J. Clin. Microbiol.* 48:323–325.
5. Wallet F, et al. 2010. *Paracoccus yeei*: a new unusual opportunistic bacterium in ambulatory peritoneal dialysis. *Int. J. Infect. Dis.* 14:e173–e174.

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