Letters to the Editor

Ochrobacterum anthropi Misidentified as *Shewanella putrefaciens*

Nonfermentative, gram-negative bacilli that are uncommonly isolated may be quite difficult to identify to the species level (herein, bacteria are described as fermentative or nonfermentative with regard to their ability to ferment glucose). In our laboratory, we use the MicroScan Walkaway-96 system (Dade Behring, West Sacramento, Calif.) for primary identification and attempt to confirm the identification of any unusual nonfermentative bacterium with the RapID NF Plus system (Remel, Norcross, Ga.). This latter, rapid system utilizes conventional biochemical assays for the identification of medically important gram-negative, nonfermentative bacteria and has been evaluated in several studies (11, 12). The system generally performed very well in the studies described here, with same-day turnaround once the organism had been isolated in pure culture.

We recently encountered a 30-year old febrile trauma patient whose blood culture yielded an isolate identified as *Ochrobacterum anthropi* by the MicroScan Walkaway-96 system. The RapID NF Plus system subsequently identified the same isolate as *Shewanella putrefaciens*. The organism yielded positive results in tests for urea, ornithine, and esculin hydrolysis and failed to produce hydrogen sulfide in triple-sugar-iron agar. This biochemical phenotype is much more consistent with *O. anthropi* than with *S. putrefaciens*. Moreover, the organism was confirmed to be *O. anthropi* by the Vitek Legacy system (bio-Merieux, Durham, N.C.) in another local laboratory.

O. anthropi, formerly known as CDC group Vd or *Achromobacter* taxon Vd, is obligately aerobic and motile by peritrichous flagella and hydrolyzes oxidase (7). Strong and rapid urease production is characteristic (15). *O. anthropi* has been isolated from a number of environmental sources but is most commonly recovered from clinical specimens, especially blood. It has been associated primarily with bacteremia and sepsis, especially in cases involving infected intravenous catheter lines (4, 6, 8, 9), but it has also been associated with noma, endophthalmitis, osteochondritis, and infection of retained pacemaker leads (1, 2, 5, 14).

S. putrefaciens is a facultatively anaerobic, nonmotile, gram-negative, nonfermentative bacterium that hydrolyzes oxidase. *S. putrefaciens* and the closely related *Shewanella alga* typically produce hydrogen sulfide on triple-sugar-iron agar slants and are the only nonfermentative bacteria to do so consistently (10, 15). *S. putrefaciens* is most frequently recovered from non-human sources and is well-known to be a cause of food spoilage but has on rare occasion been associated with diseases, including bacteremia, endocarditis, skin and soft tissue infections, and septic arthritis, in humans (3, 13; B. Dhawan, R. Chaudhry, B. M. Mishra, and R. Agarwal, Letter, J. Clin. Microbiol. **36**:2394, 1998; P. Y. Levy and J. L. Tessier, Letter, Clin. Infect. Dis. **26**:536, 1998; S. Yohe, J. T. Fishbain, and M. Andrews, Letter, J. Clin. Microbiol. **35**:3363, 1997).

The case described above underscores the difficulty sometimes encountered in identifying unusual gram-negative, non-

fermentative bacteria. Accurate identification may require comparison of results obtained by using several identification systems and may sometimes also require comparison of those results with the results of conventional tests such as growth on triple-sugar-iron agar. Differentiating these organisms is not purely an academic pursuit, either: nonfermentative bacteria may have variable clinical significance and different antimicrobial susceptibility spectra.

REFERENCES

1. Barson, W. J., B. A. Cromer, and M. J. Marcon. 1987. Puncture wound osteochondritis of the foot caused by CDC group Vd. J. Clin. Microbiol. **25**:2014-2016.
2. Berman, A. J., L. V. Del Priore, and C. K. Fischer. 1997. Endogenous *Ochrobacterum anthropi* endophthalmitis. Am. J. Ophthalmol. **123**:560-562.
3. Chen, Y. S., Y. C. Liu, M. Y. Yen, J. H. Wang, S. R. Wann, and D. L. Cheng. 1997. Skin and soft-tissue manifestations of *Shewanella putrefaciens* infection. Clin. Infect. Dis. **25**:225-229.
4. Cieslak, T. J., M. L. Robb, C. J. Drabick, and G. W. Fischer. 1992. Catheter-associated sepsis caused by *Ochrobacterum anthropi*: report of a case and review of related nonfermentative bacteria. Clin. Infect. Dis. **14**:902-907.
5. Earhart, K. C., K. Boyce, W. D. Bone, and M. R. Wallace. 1997. *Ochrobacterum anthropi* infection of retained pacemaker leads. Clin. Infect. Dis. **24**:281-282.
6. Gransden, W. R., and S. J. Eykyn. 1992. Seven cases of bacteremia due to *Ochrobacterum anthropi*. Clin. Infect. Dis. **15**:1068-1069.
7. Holmes, B., M. Popoff, M. Kiredjian, and K. Kersters. 1988. *Ochrobacterum anthropi* gen. nov., sp. nov. from human clinical specimens and previously known as group Vd. Int. J. Syst. Bacteriol. **38**:406-416.
8. Jelveh, N., and B. A. Cunha. 1999. *Ochrobacterum anthropi* bacteremia. Heart Lung. **28**:145-146.
9. Kettaneh, A., F. X. Weill, I. Poilane, O. Fain, M. Thomas, J. L. Herrmann, and L. Hocqueloux. 2003. Septic shock caused by *Ochrobacterum anthropi* in an otherwise healthy host. J. Clin. Microbiol. **41**:1339-1341.
10. Khashe, S., and J. M. Janda. 1998. Biochemical and pathogenic properties of *Shewanella alga* and *Shewanella putrefaciens*. J. Clin. Microbiol. **36**:783-787.
11. Kiska, D. L., A. Kerr, M. C. Jones, J. A. Caracciolo, B. Eskridge, M. Jordan, S. Miller, D. Hughes, N. King, and P. H. Gilligan. 1996. Accuracy of four commercial systems of identification of *Burkholderia cepacia* and other gram-negative nonfermenting bacilli recovered from patients with cystic fibrosis. J. Clin. Microbiol. **34**:886-891.
12. Kitch, T. T., M. R. Jacobs, and P. C. Appelbaum. 1992. Evaluation of the 4-hour RapID NF Plus method for identification of 345 gram-negative nonfermentative rods. J. Clin. Microbiol. **30**:1267-1270.
13. Pagani, L., A. Lang, C. Vedovelli, O. Moling, G. Rimenti, R. Pristera, and P. Mian. 2003. Soft tissue infection and bacteremia caused by *Shewanella putrefaciens*. J. Clin. Microbiol. **41**:2240-2241.
14. Paster, B. J., W. A. Falkler, Jr., C. O. Enwonwu, E. O. Idigbe, K. O. Savage, V. A. Levanos, M. A. Tamer, R. L. Ericson, C. N. Lau, and F. E. Dewhirst. 2002. Prevalent bacterial species and novel phylotypes in advanced noma lesions. J. Clin. Microbiol. **40**:2187-2191.
15. Schreckenberger, P. C., and A. von Graevenitz. 1999. *Acinetobacter*, *Achromobacter*, *Alcaligenes*, *Moraxella*, *Methylobacterium*, and other nonfermentative gram-negative rods, p. 539-560. In P. R. Murray, E. J. Baron, M. A. Pfaller, F. C. Tenover, and R. H. Tenover (ed.), Manual of clinical microbiology, 7th ed. ASM Press, Washington, D.C.

Jeffrey W. Oliver
Department of Pathology
Texas Tech University Health
Sciences Center
3601 4th St.
Lubbock, TX 79430